APPENDIX G BIODIVERSITY DEVELOPMENT ASSESSMENT REPORT

Canyonleigh Battery Energy Storage System

Biodiversity Development Assessment Report

FIGUREPREPARED FOR

X-ELIO

DATE
13 January 2026

REFERENCE
0711340



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Canyonleigh Battery Energy Storage System

Biodiversity Development Assessment Report

0711340



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ACRONYMS AND ABBREVIATIONS

Acronym	Description
BAM	Biodiversity Assessment Method
BAM-C	Biodiversity Assessment Method Calculator
BBUS	Bird and Bat Utilisation Survey
BC	Bird Census
BC Act	*Biodiversity Conservation Act 2016*
BC Regulation	*Biodiversity Conservation Regulation 2017*
BCS	Biodiversity, Conservation and Science
BCT	Biodiversity Conservation Trust
BDAR	Biodiversity Development Assessment Report
BESS	Battery Energy Storage System
BMP	Biodiversity Management Plan
BOS	Biodiversity Offsets Scheme
CEMP	Construction Environmental Management Plan
COP28	Conference of Parties 28
Cth	Commonwealth
CTMP	Construction Traffic Management Plan
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DEC	Department of Environment and Conservation
DF	Development Footprint
DP	Deposited Plan
DPE	Department of Planning and Environment
DPHI	Department of Planning, Housing and Environment
DPI	Department of Primary Industries
DPIE	Department of Planning, Industry and Environment
DSEWP&C	Department of Sustainability, Environment, Water, Population and Communities
E&II	Ecology and Infrastructure International

Acronym	Description
EIS	Environmental Impact Statement
EP&A Act	*Environmental Planning & Assessment Act 1979*
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
ERM	Environmental Resources Management Pty Ltd
ESCP	Erosion and Sediment Control Plan
FTE	Fulltime Equivalent
GHG	Greenhouse Gas
ha	Hectares
IBRA	Interim Biogeographical Regionalisation for Australia
ISP	Integrated System Plan
kV	Kilovolt
LGA	Local Government Area
LLS	Local Land Services
LLS Act	*Local Land Services Act 2013*
MNES	Matters of National Environmental Significance
MW	Megawatts
MWh	Megawatt Hour
NSW	New South Wales
NVR	Native Vegetation Regulatory
PBR	Preliminary Biodiversity Report
PCT	Plant Community Type
PMST	Protected Matters Search Tool
REZ	Renewable Energy Zone
SAII	Serious and Irreversible Impact
SEAR	Secretary's Environmental Assessment Requirement
SEPP	State Environmental Planning Policy
SPRAT	Species Profiles and Threats
SSD	State Significant Development
SVTM	State Vegetation Type Map
TBDC	Threatened Biodiversity Database Collection
TEC	Threatened Ecological Community
VIS	Vegetation Integrity Score
VZ	Vegetation Zone
X-Elio	X-Elio Aus2 Pty Ltd

DEFINITIONS

Term	Description
The Applicant	X-Elio Aus2 Pty Ltd
The Project	The Project refers to the proposal by the Applicant (X-Elio Aus2 Pty Ltd) to construct and operate the Canyonleigh Battery Energy Storage System as described in this report.
Subject Land	The area of land as defined in the Biodiversity Assessment Method 2020 as being subject to a development, activity, clearing, biodiversity certification or a biodiversity stewardship proposal. Land subject to development, activity or clearing that may consist of multiple lots and contains a Project Area within the land. The Subject Land may also be referred to as the Project Area where activities and field investigations occur across all areas of affected lots.
BESS Project Area	The extent of surveyed lands associated with the proposed development surrounding and encompassing the BESS Development Footprint.
Road Resurfacing Project Area	The extent of surveyed lands associated with the proposed development surrounding and encompassing the Road Resurfacing Development Footprint.
Development Footprint	The term Development Footprint refers to maximum area directly impacted by the construction and operation of the Battery Energy Storage System and the associated Roadworks.
BESS Development Footprint	The term BESS Development Footprint refers to maximum area directly impacted by the construction and operation of the Battery Energy Storage System. The relevant BAM-C Case associated to this area is 00049779 / BAAS2009 / 25 / 00049780.
Road Resurfacing Development Footprint	The term Road Resurfacing Development Footprint refers to the maximum area directly impacted through the resurfacing of Canyonleigh Rd to support traffic of OSOM and heavy vehicles during construction. The relevant BAM-C Case associated to this area is 00049779 / BAAS2009 / 25 / 00060283.

DECLARATIONS

Certification under clause 6.15 Biodiversity Conservation Act 2016

I, Ashleigh McTackett, certify that this report has been prepared based on the requirements of, and information provided under, the Biodiversity Assessment Method and clause 6.15 of the ***Biodiversity Conservation Act 2016*** (BC Act).

Signature:	
Date:	13 January 2026
BAM Assessor Accreditation no: BAAS20028	

Conflict of interest

I, Ashleigh McTackett, declare that I have considered the circumstances and there is no actual, perceived or potential conflict of interest.

This declaration has been made in the interest of full disclosure to the decision-maker. Full disclosure has also been provided to the client.

Signature:	
Date:	13 January 2026
BAM Assessor Accreditation No: BAAS20028	

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Name	BAM Assessor Accreditation no.	Position/Role	Tasks Performed	Relevant Qualifications
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Name	BAM Assessor Accreditation no.	Position/Role	Tasks Performed	Relevant Qualifications
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EXECUTIVE SUMMARY

OVERVIEW

X-Elio Aus2 Pty Ltd (the Applicant) proposes to construct and operate the Canyonleigh Battery Energy Storage System (BESS) (the Project), a renewable energy development located in Brayton, New South Wales (NSW) 2579, within the Goulburn Mulwaree Local Government Area (LGA). The Project has an area of approximately 130.57 hectares (ha). The proposed BESS facility is anticipated to have up to 300 Megawatts (MW) / 1,200 MW hour (MWh) storage capacity. The Applicant seeks development approval under Part 4 of the Commonwealth (Cth) *Environmental Planning & Assessment Act 1979* as State Significant Development requiring preparation of a Biodiversity Development Assessment Report (BDAR) as the Project has a significant impact on biodiversity values (Section 7.14 of the NSW *Biodiversity Conservation Act 2016* (BC Act)).

THE PROJECT

The Project involves the construction, operation, maintenance and decommissioning of a BESS and associated infrastructure, including:

- Large-scale BESS with a storage capacity of up to 300 megawatts (MW) / 1,200 megawatt hours (MWh);
- Electrical reticulation infrastructure, including an onsite substation, switching station, and internal transmission and feeder lines;
- Permanent associated and ancillary infrastructure;

  Temporary construction facilities; andRe-surfacing of Canyonleigh Road to support construction and operation of the BESS.

The Project proposes to connect to the national grid via the existing Transgrid Marulan Substation, which sits at the junction of several 330 kV and 132 kV transmission lines.

AREAS SUBJECT TO ASSESSMENT

For the purposes of this BDAR, the Subject Land extent area is 130.57 ha and is comprised of two freehold allotments (Lot 2341 DP622834 and Lot 12 DP727493) located at 962 Canyonleigh Road, Brayton, as well as the road easement and small sections of freehold lots along Canyonleigh Road. The Project is located entirely within the Goulburn Mulwaree LGA, though the Project borders the Upper Lachlan Shire LGA.

The Development Footprint is defined as the area of direct impact. The overall Development Footprint totals 21.60 ha and is located entirely within the Subject Land. The Development Footprint consists of two assessed areas:

- 15.20 ha within the BESS Development Footprint; and
- 6.40 ha within the Road Resurfacing Development Footprint.

The BESS Development Footprint represents the maximum impacts associated with its construction and operation whilst the Road Resurfacing Development Footprint encompasses 10 km along Canyonleigh Road, between the site access point and the intersection with Brayton Road.

Impacts on biodiversity that do not involve the clearing of native vegetation (i.e. prescribed impacts) are also evaluated where relevant.

METHODS

Impacts to biodiversity values have been assessed in accordance with the Biodiversity Assessment Method (BAM) (NSW DPIE, 2020). Field surveys were undertaken over seven survey events as summarised in Table E-1.

TABLE E-1 SUMMARY OF SURVEY EVENTS FOR THE SUBJECT LAND

Company	Dates	Survey Methods
Summer 2024		
Environmental Resources Management Pty Ltd (ERM)	19 – 23 January 2024	• BAM plots; • Rapid Vegetation Assessments; • Habitat Quality Assessments; and • Targeted Area Searches
Autumn 2024		
ERM	29 April – 1 May 2024	• BAM plots; • Rapid Vegetation Assessments; • Habitat Quality Assessments; and • Targeted Area Searches
Spring 2024		
RedGum Environmental Consulting	23 – 24 October 2024 11 – 13 November 2024	• BAM plots; • Habitat Quality Assessments; and • Targeted Area Searches
Summer 2025		
RedGum Environmental Consulting	22 – 23 January 2025 29 – 30 January 2025 4 and 6 February 2025 26 – 27 February 2025	• Habitat Quality Assessments; • Targeted Area Searches; • Acoustic Detection Deployment; and • Camera Trap Deployment
Ecology and Infrastructure International	27 – 28 February 2025	• Expert Report
Autumn 2025		
Capital Ecology	11 April 2025	• Expert Report
RedGum Environmental Consulting	19 – 20 May 2025	• Koala Spot Assessment Techniques (SATs); and • Tree Hollow Census
Capital Ecology and ERM	29 May 2025	• Targeted Keys Matchstick Grasshopper Survey, • Breeding Bird Survey
Winter 2025		
ERM	12 – 16 August 2025	• BAM plots; • Rapid Vegetation Assessments; • Hollow Bearing Tree (HBT) assessments; and • Habitat Quality Assessment

Company	Dates	Survey Methods
Spring 2025		
Capital Ecology	7 – 8 October 2025	• Targeted surveys: Striped Legless Lizard (*Delma impar)*
ERM	7 – 13 October 2025	• Hollow Bearing Tree (HBT) assessments; and • Habitat Quality Assessment • Targeted Flora surveys (Road Resurfacing Development Footprint) • Targeted Insect surveys: Key's Matchstick Grasshopper (*Keyacris scurra*) (Road Resurfacing Development Footprint) • Nocturnal fauna surveys (Road Resurfacing Development Footprint) • Koala Spot Assessment Techniques (SATs);

BIODIVERSITY VALUES OF THE SUBJECT LAND

The overall Development Footprint includes 11.40 ha of native vegetation, encompassing four Plant Community Types (PCTs). Several broad condition states (i.e. Vegetation Zones (VZs) have been delineated. A summary of this native vegetation cover is provided in Table E-2.

TABLE E-2 NATIVE VEGETATION AND BROAD CONDITION STATES OF THE DEVELOPMENT FOOTPRINT

Vegetation Zone	Project Area Extent		Within Development Footprint?	Development Footprint Extent	
	BESS	Roadworks		BESS	Roadworks
3373_VZ1_Woodland	36.92	-	No	-	-
3373_VZ2_Grassland	18.39	-	No	-	-
3746_VZ3_Woodland	5.10	-	Yes	0.42	-
3746_VZ4_Grassland	18.88	-	Yes	5.36	-
3746_VZ5_Shrubland	3.68	-	Yes	3.14	-
3746_VZ6_Planted Natives	6.72	-	Yes	0.39	-
3746_VZ7_Highly Disturbed	0.72	-	Yes	0.64	-
4063_VZ8_Woodland	1.02	-	Yes	0.04	-
3347_VZ9_Woodland	-	1.02	Yes	-	0.09
3347_VZ10_Grassland	-	2.28	Yes	-	0.16
3347_VZ11_Highly Disturbed	-	1.62	Yes	-	0.09
3373_VZ12_Woodland	-	1.52	Yes	-	0.13

Vegetation Zone	Project Area Extent		Within Development Footprint?	Development Footprint Extent	
	BESS	Roadworks		BESS	Roadworks
3373_VZ13_Grassland	-	4.84	Yes	-	0.43
3373_VZ14_Shrubland	-	1.04	Yes	-	0.01
3373_VZ15_Highly Disturbed	-	1.42	No	-	-
3746_VZ16_Woodland	-	4.14	Yes	-	0.14
3746_VZ17_Grassland	-	2.06	Yes	-	0.28
3746_VZ18_Shrubland	-	0.75	Yes	-	0.10
3746_VZ19_Highly Disturbed	-	3.23	No	-	-
0_VZ20_Planted Non-native vegetation	0.74	0.11	Yes	0.69	0.01
0_VZ21_Infrastructure	5.97	8.03	Yes	4.52	4.97
0_VZ22_Dam	0.25	0.02	No	-	-
0_VZ23_Stream	-	0.08	No	-	-

One Threatened Ecological Community (TEC) identified White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland under the *Biodiversity Conservation Act 2016* (BC Act) and also the *Environmental Protection and Biodiversity Conservation Act* 1999 (EPBC Act) has been mapped within areas of PCT 3373, including:

- 3373_VZ1_Woodland (36.92 ha)
- 3373_VZ2_Grassland (18.39 ha)
- 3373_VZ12_Woodland (1.52 ha)
- 3373_VZ13_Grassland (4.84 ha)

The total extent of this TEC within the Development Footprint has been limited to 0.56 ha of fringing vegetation within the Road Resurfacing Development Footprint and consists of 3373_VZ12_Woodland (0.13 ha) and 3373_VZ13_Grassland (0.43 ha). No other TECs occur within the Development Footprint.

Three candidate species were detected within the Development Footprint during surveys:

- Gang-gang Cockatoo (*Callocephalon fimbriatum*)
- Squirrel Glider (*Petaurus norfolcensis*)
- Key's Matchstick Grasshopper (*Keyacris scurra*)

Additionally, a two candidate species were considered present as a result of the findings of expert reports, including:

- Pink-tailed Legless Lizard (*Aprasia parapulchella*)
- Striped Legless Lizard (*Delma impar*)

Due to seasonal limitations, areas of the Road Resurfacing Development Footprint were unable to be surveyed in the recommended survey period for the Superb Midge Orchid (*Genoplesium superbum*), resulting in this candidate species being assumed present within areas of the Road Resurfacing Development Footprint considered to provide suitable habitat.

PRESCRIBED IMPACTS

The Project is anticipated to have prescribed impacts as outlined below:

- Impacts on the habitat of threatened entities, within:
  - Karst, caves, crevices, cliffs, rocks and other geological features of significance; and
  - Non-native vegetation.
- Impacts to habitat connectivity;
- Impacts on water quality, water bodies and hydrological processes; and
- Vehicle strikes.

Impacts are considered to be minor to each prescribed impact entity. Measures to mitigate these impacts will be implemented through a range of management plans.

AVOID, MINIMISE AND MITIGATE

During the preparation of the original concept project design, the Project has been subject to an ongoing iterative design and siting process with the objective of developing an efficient Project that avoids and minimises environmental impacts as much as possible and retains lands considered to contain greater biodiversity value. Amendments to the Project elements have also attempted to maximise the use of existing public and internal access tracks and minimises vegetation clearance of woody vegetation and disruption to threatened species and threatened species' habitat. The project layout has considered the identified environmental constraints within the broader property boundary (outside of the subject land), notably the occurrence of high biodiversity values associated with the Wollondilly River.

Where the potential for impacts could not be avoided, design principles were sought to minimise environmental impacts and/or mitigation measures were proposed to manage the extent and severity of any residual impacts.

Measures to mitigate these impacts would be implemented through the following management plans:

- Construction Environmental Management Plan (CEMP);
- Construction Traffic Management Plan (CTMP);
- Biodiversity Management Plan (BMP);
- Erosion and Sediment Control Plan (ESCP); and
- Pest Animal Management Plan (PAMP).

The plans have the purpose of minimising impacts and addressing any indirect impacts from the Project.

SERIOUS AND IRREVERSIBLE IMPACTS

Two Serious and Irreversible Impact entities (SAII) have been assessed in this BDAR as either being recorded or assumed present within the Development Footprint.

- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland
- Superb Midge Orchid (*Genoplesium superbum*)

Impacts to White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland have been avoided and minimised with impacts associated with 0.56 ha of PCT 3373 within the Road Resurfacing Development Footprint.

Superb Midge Orchid (*Genoplesium superbum*) has been assumed present within areas of the Road Resurfacing Development Footprint where targeted surveys were unable to be completed within the species recommended survey period.

Individual recommendations have been made for each SAII entity assessed to assist the decision-maker in their assessment.

RESIDUAL IMPACTS AND BIODIVERSITY OFFSET LIABILITY

A total of 74 ecosystem credits have been calculated as the overall project's residual impact. The Project's direct impact on biodiversity by PCT is outlined in Table E-3.

TABLE E-3 IMPACTS THAT REQUIRE OFFSET – ECOSYSTEM CREDITS

Vegetation Zone	HBTs	Impact Area	Change in VI Score	Number of ecosystem credits required
3746_VZ3_Woodland	Yes	0.42	-62.9	13
3746_VZ4_Grassland	No	5.36	-12.9	0
3746_VZ5_Shrubland	No	3.14	-18.9	30
3746_VZ6_Planted Natives	No	0.39	-64.5	13
3746_VZ7_Highly Disturbed	No	0.64	-11.5	0
3746_VZ16_Woodland	Yes	0.14	-60.0	4
3746_VZ17_Grassland	No	0.28	-13.1	0
3746_VZ18_Shrubland	No	0.10	-24.1	1
4063_VZ8_Woodland	Yes	0.04	-60.2	1
3347_VZ9_Woodland	No	0.09	-44.8	2
3347_VZ10_Grassland	No	0.16	-8.5	0
3347_VZ11_Highly Disturbed	No	0.09	-8.5	0
3373_VZ12_Woodland	No	0.13	-55.6	5
3373_VZ13_Grassland	Yes	0.43	-16.1	4
3373_VZ14_Shrubland	No	0.01	-33.7	1

The recording of threatened candidate species, expert reports and assumed presence has also generated an offset liability as outlined in Table E-4.

TABLE E-4 IMPACTS THAT REQUIRE OFFSET – SPECIES CREDITS

Kingdom	Species	BC Act	EPBC Act	Record	Total impact area (ha)	Total number of species credits required
Flora	Superb Midge Orchid (*Genoplesium superbum*)	E	-	Assumed present	0.38 ha	5
Fauna	Gang-gang Cockatoo (*Callocephalon fimbriatum*) (breeding)	E	E	Recorded	0.73 ha	22
	Squirrel Glider (*Petaurus norfolcensis*)	V	-	Recorded	9.99 ha	95
	Key's Matchstick Grasshopper (*Keyacris scurra*)	E	E	Recorded	10.47 ha	101
	Pink-tailed Legless Lizard (*Aprasia parapulchella*)	V	V	Expert Report	9.95 ha	94
	Striped Legless Lizard (*Delma impar*)	V	V	Expert Report	0.72 ha	7

OFFSET STRATEGY

The Applicant is developing a biodiversity offset strategy in parallel with this BDAR. This strategy will detail the offset approach to be undertaken to retire credit obligations and will be achieved by:

- Retiring 'like for like' credits as specified in Table E-3 and Table E-4 to the amount and from the regions indicated; and/or
- Funding a biodiversity conservation action instead of, or in combination with, the retirement of species credits; and/or
- Entering into a Strategic Offset Delivery Agreement with the Environment Agency Head to meet the biodiversity offset obligations; or
- In part or full payment into the Biodiversity Conservation Trust in lieu of satisfying the offset liability specified in Table E-3 and Table E-4.

PREFACE

1. ASSESSMENT OVERVIEW

Environmental Resources Management Pty Ltd (ERM) has prepared this Biodiversity Development Assessment Report (BDAR) for the Canyonleigh Battery Energy Storage System (BESS) (the Project) on behalf of X-Elio Aus2 Pty Ltd (X-Elio) (the Applicant). Approval for the Project is sought under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) as the project was declared a State Significant Development (SSD) under Part 2.2, clause 2.6 and Schedule 1 of the *State Environmental Planning Policy (Planning Systems) 2021* (Planning Systems SEPP).

Approval is also sought under Part 9 of the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). An EPBC Referral was made for the Project (EPBC Ref: 2025/10233). The outcome of the Referral was determined on the 8th August 2025 by the Department of Climate Change, Energy, the Environment and Water (DCCEEW) to be a Controlled Action.

This BDAR has been prepared in accordance with the Biodiversity Assessment Method (NSW DPIE, 2020), as the Biodiversity Offset Scheme (BOS) applies to the Project. It also addresses the:

- Secretary's Environmental Assessment Requirements (SEARs) issued by the Department of Planning, Housing and Infrastructure (DPHI) (SSD-78247462, received: 12 December 2024); and
- Supplementary SEARs received from the Commonwealth Department of Agriculture, Water and the Environment (DAWE) - now the Department of Climate Change, Energy, the Environment and Water (Cwth DCCEEW) (SSD-78247462, received:28 August 2025).

In support of the SSD application (SSD-78247462), an Environmental Impact Statement (EIS) will be prepared for the Project. The EIS will be publicly exhibited by the NSW DPHI. This BDAR will accompany the EIS as part of the SSD application.

1.1 RELEVANT LEGISLATION AND POLICIES

This BDAR addresses Stage 1 (Biodiversity Assessment) and Stage 2 (Impact Assessment) of the BAM and omits Stage 3 (Improving Biodiversity Values) as this is only required for Biodiversity Stewardship Site Assessment Reports. The BDAR also addresses the assessment requirements of the Cth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and relevant State Environmental Planning Policies (SEPPs).

1.1.1 ASSESSMENT FRAMEWORK

The Project requires approval under Part 4 of the EP&A Act. Section 1.7 of the EP&A Act specifies that the Act has effect subject to the provisions of Part 7 of the NSW *Biodiversity Conservation Act 2016* (BC Act). Part 7 of the BC Act mandates the application of the BAM (NSW DPIE, 2020) where the Project exceeds a BOS threshold (i.e., Section 7.2 of the BC Act) and/or is "likely to significantly affect threatened species" upon application of the test (Section 7.3 of the BC Act). In this case, these thresholds do not apply as the Project is a declared SSD, thus mandating the preparation of a BDAR (Section 7.14 of the BC Act) in the absence of a successful BDAR waiver. The Minister for Planning must consider impacts on Serious and Irreversible Impacts (SAIIs) and determine if any additional measures are required to minimise impacts to those entities (Section 7.16(3) of the BC Act).

1.1.2 NEED FOR A BDAR

The BOS applies to the Project as there is native vegetation present, and it has been declared as SSD (Section 7.14 of the BC Act). The Applicant has engaged an independent accredited assessor without any conflicts of interest to apply the BAM to assess the impacts of the Project on biodiversity values.

1.1.3 APPLICATION OF THE BAM

1.1.3.1 CONTENT

This BDAR has been prepared in accordance with the relevant parts of the BAM, as required under the BC Act for development identified as "likely to significantly affect threatened species". The information supplied in this BDAR is in accordance with the relevant details specified in Table 24 and 25 of Appendix K of the BAM (NSW DPIE, 2020).

1.1.3.2 ACCREDITED PERSON

A BDAR, which documents the assessment and 'No Net Loss' outcomes, must be prepared by a person accredited under Section 6.10 of the BC Act. An accredited person is referred to as an assessor.

This BDAR was authorised by Ashleigh McTackett (BAAS20028), with contributions from Joe Clement, Natasha Smith and Gabriella Drakopoulos. The BDAR was reviewed and certified by Ashleigh McTackett on 13 January 2026.

The Assessment provided in the report is based on the BAM-Calculator (BAM-C) (Version: 82), last updated on 05 August 2025. The BDAR is linked to one Development Assessment (Parent) Case created in the BAM-C, separated into two related (child) cases as follows:

BESS Development Footprint

BOAM Case 00049779 / BAAS20009 / 24 / 00049780 – Revision 04 – Major Projects (SSD under Part 4 of the EP&A Act)

Road Resurfacing Development Footprint

BOAM Case 00049779 / BAAS20009 / 25 / 00060283 – Revision 02 – Major Projects (SSD under Part 4 of the EP&A Act).

1.1.3.3 CERTIFICATION

The BDAR is certified by the accredited assessor indicated on page (viii) of this document as of the date corresponding with the signature. The BAM-C reports associated with this BDAR have the status of 'finalised' as per the requirements of the BAM. As such, this BDAR is to be submitted to the consent authority within 14 days of the BAM-C being finalised.

1.1.3.4 LICENCING

With regards to the field surveys conducted and described in this BDAR, ERM operated under Scientific Licence Number SL100196 and Animal Ethics Accreditation Number 53055.

1.1.3.5 CHANGES TO THE BAM

Clause 6.31 of the NSW *Biodiversity Conservation Regulation 2017* (BC Regulation) outlines how an accredited assessor can address changes to the BAM that occur whilst preparing a BDAR for a Project. This clause is reproduced below for clarity:

6.31 Changes in biodiversity assessment method

(1) If the biodiversity method is changed, a biodiversity assessment report may, during the designated period after the method is changed, be prepared on the basis of the method in force before the change, but only if the report states that it has been prepared on that basis.

(2) For the purposes of this clause, the designated period is—

(a) except as provided by this subclause—6 months, or

(b) in the case of a biodiversity development assessment report in respect of State significant development or State significant infrastructure—12 months, or

(c) in the case of a biodiversity certification assessment report for an application that is not a strategic biodiversity certification application—12 months, or

(d) in the case of a biodiversity certification assessment report for a strategic biodiversity certification application—12 months or such longer period as the Minister approves in a particular case.

The BAM refers to the Threatened Biodiversity Data Collection (TBDC) and NSW BioNet Atlas as published databases that must be used in preparing a BDAR (see Section 1.4 of the BAM). Under this section, a change in these published databases has the effect of changing the BAM. Thus, such changes during the preparation of a BDAR for this Project may be interpreted as a change to the BAM. On this basis, and with reference to the specified designated periods above, the accredited assessor may prepare the BDAR based on the methods in force before the change and in so doing will state this as the case in the BDAR.

This BDAR contains site-based information capable of determining the Plant Community Types (PCTs) present, thus provides a sound basis for the generation of the candidate species applicable to the Project. Changes in the candidate species list after the publishing of this BDAR may represent a change in the BAM and, for this reason, these additional species may be excluded from the assessment. The BDAR will state this if the circumstance arises.

A change to survey methods for candidate species specified in the TBDC during the preparation of the BDAR is also interpreted as a change to the BAM. The accredited assessor may choose to apply the survey methods in force before the change and, if so, the decision to do so will be stated in the BDAR.

1.1.4 MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

The EPBC Act provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities, and heritage places – defined as Matters of National Environmental Significance (MNES).

A referral was submitted by the Applicant to the Cth DCCEEW (EPBC 2025/10233). The referral identified potential for significant impacts to EPBC Act listed MNES, which are likely to occur or use habitat present and be impacted by the Project.

A delegate of the Minister for the Environment determined that the Project is likely to have a significant impact on MNES and therefore is a 'controlled action' under s75 of the EPBC Act. Consequently, the Project will be assessed under an Assessment Bilateral Agreement, allowing a single environmental impact assessment process for both the Cth and NSW government. Supplementary SEARs have been provided where the Cth has identified additional matters for consideration, the EPBC Act controlling provisions for the proposed action included listed threatened species and communities:

- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland
- Hoary Sunray (*Leucochrysum albicans* subsp*. tricolor*)
- Gang-gang Cockatoo (*Callocephalon fimbriatum*)
- Key's Matchstick Grasshopper (*Keyacris scurra*)
- Pink-tailed Legless Lizard (*Aprasia parapulchella*)
- Striped Legless Lizard (*Delma impar*)
- Diamond firetail (*Stagonopleura guttata*)

An additional assessment of the threatened community White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland has been included as a result of the findings of this BDAR.

The assessment requirements include (but are not limited to) the Environmental Impact Statement (EIS) identifying each EPBC Act listed threatened species and community and migratory species likely to be impacted by the action. This must include a description of the impacts, habitat, survey methodologies and avoidance, mitigation and offset measures. The threatened species and communities identified within the Development Footprint and / or in the supplementary SEARs are provided in Table 1-1.

TABLE 1-1 REQUIREMENTS OF SUPPLEMENTARY SEARS

MNES	EPBC Act Listing	Section Addressed
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Not included under the Supplementary SEARs. This community was recorded during survey. Assessment of TECs is provided in Section 4.2.3. Indirect impacts have been considered and identified in Section 8.2 of this report with mitigation recommendations provided in Section 8.5 and credit offset liabilities are detailed in Section 10.1.
Key's Matchstick Grasshopper (*Keyacris scurra*)	Endangered	This species was recorded during survey. It was identified as having a likely significant impact in the Supplementary SEARs. Survey methodology is detailed in Section 5.2. Species polygons are further discussed in Section. Indirect impacts have been considered and identified in Section 8.2 of this report with mitigation recommendations provided in Section 8.5 and credit offset liabilities are detailed in Section 10.1.

MNES	EPBC Act Listing	Section Addressed
Diamond Firetail (*Stagonopleura guttata*)	Vulnerable	This species was not recorded during survey. It was identified as having a likely significant impact in the Supplementary SEARs. Survey methodology is detailed in Section 5.2. Potential indirect impacts have been considered and identified in Section 8.2 of this report with mitigation recommendations provided in Section 8.5 and credit offset liabilities associated with ecosystem credits and predicted species are detailed in Section 10.1.
Pink-tailed Legless Lizard (*Aprasia parapulchella*)	Vulnerable	This species was considered present through expert report. Survey methodology is detailed in Section 5.2. Species polygons are further discussed in Section. Indirect impacts have been considered and identified in Section 8.2 of this report with mitigation recommendations provided in Section 8.5 and credit offset liabilities are detailed in in Section 10.1.
Gang-gang Cockatoo (*Callocephalon fimbriatum*)	Endangered	This species was recorded during survey. It was identified as having a potentially significant impact in the Supplementary SEARs. Survey methodology is detailed in Section 5.2. Species polygons are further discussed in Section Indirect impacts have been considered and identified in Section 8.2 of this report with mitigation recommendations provided in Section 8.5 and credit offset liabilities are detailedin Section 10.1.
Hoary Sunray (*Leucochrysum albicans subsp. Tricolor*)	Endangered	This species was not recorded during survey. It was identified as having a potentially significant impact in the Supplementary SEARs. Survey methodology is detailed in Section 5.2. Potential indirect impacts have been considered and identified in Section 8.2 of this report with mitigation recommendations provided in Section 8.5 and credit offset liabilities associated with ecosystem credits and predicted species are detailed in Section 10.1.
Striped Legless Lizard (*Delmar impar*)	Vulnerable	This species was considered present through expert report. It was identified as having a potentially significant impact in the Supplementary SEARs. Survey methodology is detailed in Section 5.2. Species polygons are further discussed in Section. Indirect impacts have been considered and identified in Section 8.2 of this report with mitigation recommendations provided in Section 8.5 and credit offset liabilities are detailed in Section 10.1.

1.1.5 NSW SECRETARY'S ENVIRONMENTAL ASSESSMENT REQUIREMENTS

Supporting information and comment relating to the NSW SEARs, relevant to the BDAR, are provided in Table 1-2.

TABLE 1-2 NSW SEARS

SEARs Comment	Response
The EIS must address the following specific matters:	
An assessment of the biodiversity values and the likely biodiversity impacts of the project in accordance with Section 7.9 of the *Biodiversity Conservation Act 2016* (NSW), the Biodiversity Assessment Method (BAM) and documented in a Biodiversity Development Assessment Report (BDAR). The BDAR must:	
• Be prepared using the approved BDAR template;	Addressed in Section 1.6
• Document the application of the avoid, minimize and offset framework including assessing all direct, indirect and prescribed impacts in accordance with the BAM;	Addressed in Section 7 and Section 8
• Assess the impacts associated with all ancillary infrastructure, including the Road Resurfacing Development Footprint Road upgrades;	
• Include an assessment for Serious and Irreversible Impacts (SAII) in accordance with Section 9.1 of the BAM;	Addressed in Section 9.1
• Include a strategy to offset any residual impacts of the development in accordance with the BC Act; and	Addressed in Section 10
• Be finalised by an accredited assessor as BAM-compliant within 14 days of submission.	Addressed in Section 1.1.3.2
An assessment of the likely impacts on listed aquatic threatened species, populations or ecological communities, scheduled under the *Fisheries Management Act 1994*, and a description of the measures to minimize and rehabilitate impacts	Addressed in Section 7 and Section 8
A cumulative impact assessment of biodiversity values in the region from nearby developments	Addressed in Section 8.4
If an offset is required, details of the measures proposed to address the offset obligation	Addressed in Section 10

1.1.6 AGENCY ADVICE

In relation to biodiversity, Biodiversity, Conservation and Science (BCS) and Goulburn Mulwaree Council provided advice on the NSW SEARs on 9 and 10 December 2024, respectively. Supporting information and comment relating to the agency advice is detailed in Table 1-3.

TABLE 1-3 AGENCY ADVICE

Agency Advice	Response
BCS	
Prior to the BDAR being submitted to the consent authority, the accredited assessor should submit a proposed land categorisation method to the BCS South East Planning team for review	Appendix A
The EIS must assess biodiversity impacts related to the proposed development in accordance with Section 7.9 of the BC Act using the BAM and documented in a BDAR, unless: • A BDAR waiver is granted; or • The site is on biodiversity certified land. The BDAR must include information in the form detailed in the BC Act (Section 6.12), BC Regulation (Section 6.8) and the BAM.	Addressed throughout this BDAR
The BDAR must apply the avoid, minimise and offset hierarchy including assessing all direct, indirect, uncertain and prescribed impacts in accordance with the BAM	Addressed in Section 7 and Section 8
The BDAR must be submitted with all spatial data associated with the survey and assessment as per Appendix K of the BAM	Spatial data has been submitted to BCS with this BDAR
The BDAR must include details of the measures proposed to address the offset obligation as follows: • The total number and classes of biodiversity credits required to be retired for the development / project; • The number and classes of like-for-like biodiversity credits proposed to be retired; • The number and classes of biodiversity credits proposed to be retired in accordance with the variation rules; • Any proposal to fund a biodiversity conservation action; • Any proposal to conduct ecological rehabilitation (if a mining project); and/or • Any proposal to make a payment to the Biodiversity Conservation Fund If seeking approval to use the variation ruled, the BDAR must contain details of the reasonable steps that have been taken to obtain requisite like-for-like biodiversity credits	Addressed in Section 10
The BDAR must be prepared by a person accredited in accordance with the *Accreditation Scheme for the Application of the Biodiversity Assessment Method Order 2017* under Section 6.10 of the BC Act	Addressed in Section 1.1.3.2
The EIS must contain a summary of the commitments set out in the BDAR to avoid, minimise and mitigate the biodiversity impacts of development that are to be implemented, post approval, by their inclusion in a Biodiversity Management Plan (BMP). The preparation of a BMP to fulfil the avoid and minimise requirements of the BDAR must be included as a condition of consent/approval, unless otherwise agreed with BCS. The BMP must include detailed measures to minimise impacts on biodiversity, monitoring and reporting requirements, proposed adaptive management measures, performance criteria recommended to meet states outcomes, remedial actions to be undertaken if actions fail to achieve stated outcomes and any additional actions relevant to the management of biodiversity	Addressed in Section 8.5

Agency Advice	Response
If the development is on biodiversity certified land, provide information to identify the site (using associated mapping) and demonstrate the proposed development is consistent with the relevant biodiversity measure conferred by the biodiversity certification	Not applicable
The project must address any SAII that may be impacted from the development. BCD recommends early engagement between BCD and the proponent where such entities are likely to be impacted	Addressed in Section 9.1
The Category 1 land must be assessed for additional biodiversity impacts under Clause 6.1 of the BC Regulation. These are referred to as prescribed impacts in accordance with Section 1(d) of the BAM	Addressed in Section 8.3
The BDAR must include surveys for grassland fauna such as Striped Legless Lizard and Pink-tailed Legless Lizard	Addressed in Section 5.2 and Section
The following prescribed impacts in accordance with Clause 6.1 of the BC Act are to be assessed: • The impacts of development on the following habitat of threatened species or ecological communities: ◦ Karst, caves, crevices, cliffs and other geological features of significance; ◦ Rocks; ◦ Human made structures; and/or ◦ Non-native vegetation • The impacts of development on the connectivity of different areas of habitat of threatened specie that facilitates the movement of those species across their range; • The impacts of development on movements of threatened species that maintains their lifecycle; • The impacts of development on water quality, water bodies and hydrological processes that sustain threatened species and TECs (including from subsidence or upsidence resulting from underground mining or other development or other development); • The impacts of wind turbine strikes on protected animals; and/or • The impacts of vehicle strikes on threatened species of animals or on animals that are part of a TEC	Addressed in Section 8.3
Offsets for prescribed impacts are to be considered if avoidance and mitigation measures are not applicable, or will not result in the complete reduction of prescribed impacts occurring. The assessments and calculation of a predicted offset obligation in accordance with Section 7.14 of the BC Act should be presented in the BDAR	Addressed in Section 9.2.1
Cumulative impacts should be assessed through application of the *Cumulative Impact Assessment Guidelines for State Significant Projects* (NSW DPE, 2022)	Addressed in Section 8.4
Goulburn Mulwaree Council	
The proposed development area is zoned RU2 Rural Landscape and the area to be directly impacted is mapped as Category 2-Regulated Land. The area supports a mix of grassy woodland and open grassland. Based on aerial imagery, cleared areas on the land comprise derived native grassland. NSW Government SEED SVTM Extant PCT mapping shows the area as containing three PCTs: • PCT 3486 Wollondilly – Shoalhaven slopes grassy open forest; • PCT 3738 Goulburn Lithgow Tableland Hills Grassy Forest; and • PCT 3746 Southern Tableland Snow Gum – Candlebark Shrub Forest	Field surveys have been carried out during appropriate months as outlined in Section 2.2.2, Section 2.3.3 and Section2.3.4

Agency Advice	Response
A Preliminary Biodiversity Report (PBR) has been prepared by ERM. The report's authors Georgina Thompson and Jessica Gardener are qualified and experienced ecologists. The report has been reviewed and approved by Lorena Boyle, who is a BAM accredited assessor. Ground truthing has confirmed the presence of native vegetation on the site and has determined that the PCTs present on the site comprise: • PCT 3373 Goulburn Tableland Box-Gum Grassy Forest; • PCT 3746 Southern Tableland Snow Gum – Candlebark Shrub Forest; and • PCT 4063 Central and Southern Tableland River Oak Forest Survey work for the PBR was undertaken in January and April, which is not an optimum time of year for assessing native vegetation in the local area. Biodiversity survey work in the Central and Southern Tablelands, especially in grassy woodlands and derived native grasslands, should be undertaken during spring (September/October/November). The preliminary report notes that further field survey work will be required to prepare a formal BDAR and that a BDAR will be required for later stages of the project. Based on desktop survey of available databases and maps, and review of the information provided, the findings of the PBR are broadly supported.	

1.2 BIODIVERSITY CREDITS AND CLASSES

The BAM uses biodiversity credits to measure:

- The residual impacts of on Project biodiversity values; or
- Gains in biodiversity values at biodiversity stewardship sites.

In this application, the BDAR is measuring the direct impacts of the Project on biodiversity values using two kinds of credits, being 'ecosystem credits' and 'species credits'. These attributes are:

- The PCT impacted by the Project;
- Any TEC associated with the PCT;
- The offset trading group for the TEC or, if no associated TEC, for the PCT;
- The vegetation class of the PCT;
- The presence or absence of Hollow Bearing Trees (HBTs); and
- The Interim Biogeographical Regionalisation for Australia (IBRA)and IBRA subregion(s) in which the Project occurs.

Each species credit is assigned four attributes. Matching of attributes is used to apply the 'like-for-like' rules as set out in the BC Regulation. These attributes are:

- The threatened species impacted by the Project;
- The threat status of the threatened species;
- The kingdom to which the threatened species belongs; and
- The IBRA subregion in which the Project occurs.

1.3 DATA AND INFORMATION USED

Each ecosystem credit is assigned up to seven attributes that are used to distinguish the type of biodiversity values represented by the credit and to determine whether a credit within a class is 'like' another credit.

Each species credit is assigned four attributes. Matching of attributes is used to apply the 'like-for-like' rules and variation rules as set out in the BC Regulation.

The full list of information sources referred to in this report is provided in Section 2.2. Digital shapefiles for all maps and spatial data have been submitted with this report. Information sources included (but were not necessarily limited to) the following:

- Proposal layers and concept designs provided by the Applicant;
- Interim Biogeographical Regionalisation for Australia (IBRA) bioregions and sub-regions, version 7 (Cth DCCEEW, 2023) (http://www.environment.gov.au/land/nrs/science/ibra);
- NSW Mitchell Landscapes map (NSW Government, 2025) and descriptions (NSW DEC, 2002);
- Biodiversity Assessment Method (BAM) 2020 (NSW DPIE, 2020);
- Biodiversity Offset Assessment Management System (BOAMS), incorporating the BAM Calculator (BAM-C) (https://customer.lmbc.nsw.gov.au/assessment/s/userlogin);
- Cth Government's Species Profiles and Threats (SPRAT) database (Cth DCCEEW, 2025) (http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl);
- EPBC Act Protected Matters Search Tool (PMST) (Cth DCCEEW, 2025) (http://www.environment.gov.au/epbc/protectedmatters- search-tool);
- Guidance to assist a decision-maker to determine a serious and irreversible impact (SAII) (NSW DPIE, 2019);
- NSW BioNet, incorporating the Threatened Biodiversity Data Collection (TBDC) and BioNet Vegetation Classification (NSW DCCEEW, 2025) (https://www2.environment.nsw.gov.au/topics/animals-and-plants/biodiversity/nsw-bionet);
- NSW SEED Portal (NSW Government, 2025) (https://www.seed.nsw.gov.au/);
- NSW State Vegetation Type Map (SVTM) (Edition C2.0.M2.1) (NSW DCCEW, 2024) (https://datasets.seed.nsw.gov.au/dataset/nsw-state-vegetation-type-map);
- NSW Biodiversity Values Map (NSW DCCEEW, 2025) (https://www.lmbc.nsw.gov.au/Maps/index.html? viewer=BVMap); and
- PlantNet (Royal Botanic Gardens and Domain Trust, 2025) (https://plantnet.rbgsyd.nsw.gov.au/).

1.4 BIODIVERSITY VALUES NOT ASSESSED

The BAM does not assess biodiversity values for:

- Marine mammals;
- Wandering seabirds;
- Biodiversity that is endemic to Lord Howe Island; and/or
- Native vegetation and loss of habitat on Category 1–Exempt Land (within the meaning of Part 5A of the *Local Land Services Act 2013* (LLS Act)), other than the additional biodiversity impacts under clause 6.1 of the BC Regulation (referred to as prescribed impacts in the BAM).

This BDAR does not include an assessment of these matters. The extent of Category 1–Exempt Land is outlined in the following section.

1.5 CATEGORY 1-EXEMPT LAND

Under the LLS Act, three land categories are defined relating to vegetation clearing:

- Category 1-Exempt Land: land not subject to clearing approval;
- Category 2-Regulated Land: land on which clearing of native vegetation may be carried out with or without approval in accordance with an 'allowable activity' or 'code' under the LLS Act; and
- Excluded Land: land not categorised in the Regulatory Maps and to which the LLS Act does not apply.

The Draft Native Vegetation Regulatory (NVR) Map identifies the Subject Land as containing Category 1-Exempt Land and Category 2-Regulated Land. The mapped extent of the land categories as defined by the Draft NVR Map is shown in Figure 1-1.

The Subject Land comprises rural zoned land and is thus regulated under the LLS Act. During field survey events, no vegetation aligning with Category 1–Exempt Land under the LLS Act has been identified, except for the existing infrastructure, dams and the row of planted non-native woody vegetation. Vegetation within the Subject Land is largely considered to align with Category 2–Regulated Land. The proposed land categorisation is shown in the Land Category Assessment (ERM, 2024) and is provided in Appendix B.

The extent of proposed land categorisation has been considered in this BDAR by way of mapping condition states among non-woody vegetation cover (e.g., grasslands) to produce Vegetation Zones (VZs) generally distinguishing between grasslands likely to be in a moderate condition (i.e., Category 2) or low condition (i.e., Category 1) state. A Vegetation Integrity Score (VIS) has been calculated for each VZ to evaluate any requirement to offset (i.e., residual impacts on native vegetation and habitat).

Clearing of native vegetation and loss of habitat on Category 1–Exempt Land is not subject to consideration in this assessment; however, the assessment of prescribed impacts does incorporate assessment of impacts to threatened entities and other species on Category 1–Exempt Land. Clearing of Category 2–Regulated Land within the Subject Land will be subject to approval and has been considered throughout this BDAR in accordance with the BAM.

1.6 STRUCTURE OF THE BDAR

A BDAR requires completion of Stages 1 and 2 of the BAM (NSW DPIE, 2020). These stages include:

- Stage 1 establishes a consistent approach to assessing the biodiversity values of land; and
- Stage 2 outlines the guidance and requirements to apply the hierarchy of avoid, minimise and offset for assessing direct, indirect or prescribed impacts on biodiversity values arising from the proposed development, activity, clearing or biodiversity certification. Stage 2 also provides guidance on the use of mitigation measures where there is uncertainty on the timing or extent of impacts.

The structure of this BDAR follows the corresponding BAM sections to assist with readability for compliance with the BAM. In omitting the Stage 3 assessment, the BDAR section structuring ends with the last section in Stage 2 (Section 10: Applying the no net loss standard).

Documents appended to this BDAR include:

- Appendix A AGENCY ADVICE – BCS
- Appendix B CANYONLEIGH BESS LAND CATEGORY ASSESSMENT (ERM, 2024)
- Appendix C BAM PLOT DATA
- Appendix D STREAMLINED ASSESSMENT – PLANTED NATIVE VEGETATION
- Appendix E EXPERT REPORT (APRASIA PARAPULCHELLA) (CAPITAL ECOLOGY, 2025)
- Appendix F EXPERT REPORT (PHASCOGALE TAPOATAFA) (E&II, 2025)
- Appendix G EXPERT REPORT – STRIPED LEGLESS LIZARD (DELMA IMPAR)
- Appendix H PMST REPORT
- Appendix I PREDICTED SPECIES BAM-C REPORTS
- Appendix J ULTRASONIC CALL ANALYSIS (GREEN TAPE SOLUTIONS, 2025A)
- Appendix K PASSIVE AUDIO CALL ANALYSIS (GREEN TAPE SOLUTIONS, 2025B)
- Appendix L CANDIDATE SPECIES BAM-C REPORTS
- Appendix M EPBC SUPPLEMENTARY SEARS
- Appendix N EPBC REFERRAL DECISION
- Appendix O BAM-C CREDIT SUMMARY REPORTS

Legend

- Project Area
- Development Footprint

Draft Native Vegetation Regulatory (NVR) Map

- Category 1 - Exempt (draft)
- Category 2 - Regulated Land (draft)
- Category 2 - Vulnerable regulated land (in-force)
- Category 2 - Sensitive regulated land (in-force)
- Areas where category 2 - Vulnerable and category 2 - sensitive regulated lands overlap (in-force)
- Land Excluded from the LLS Act

Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Coordinate System:
GDA 1994 MGA Zone 55
Date: 16/01/2026
Created By: NB
Drawing Size: A3
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F1-1 Draft Native Vegetation Regulatory Map of the Subject Land

Canyonleigh Battery Energy Storage System
BDAR
X-Elio Aus2

ERM

STAGE 1: BIODIVERSITY ASSESSMENT

2. INTRODUCTION

The Project will involve the construction, operation, and decommissioning of a BESS facility and associated infrastructure in the locality of Brayton in the Goulburn Mulwaree Council LGA. The Project extends across approximately 130.57 hectares (ha), including the Subject Land, made up of the BESS Project Area (98.40 ha) and associated Road Resurfacing Project Area (32.16 ha) along Canyonleigh Rd. The Subject Land is made up of two allotments that make up the land ownership (Lot 2341 DP 622834 and Lot 12 DP 727493) as well as the existing Transgrid Marulan Substation.

The Subject Land consists of one site-based assessment associated with the BESS Development Footprint and one linear assessment associated with the Road Resurfacing Development Footprint, which stretches over 10 km. To ensure clarity throughout the report, the overall Development Footprint has been identified as including the BESS Development Footprint and Road Resurfacing Development Footprint. The two areas have been addressed separately in parts of the report, to help depict the level of survey effort for each area and outline how the relevant threatened species have been assumed present in different areas.

2.1 PROPOSED DEVELOPMENT

2.1.1 SUBJECT LAND

Subject Land totals approximately 130.57 ha and consists of approximately:

- 98.40ha within the BESS Project Area; and
- 32.16 ha within the Road Resurfacing Project Area.

It is comprised of two freehold allotments (Lot 2341 DP622834 and Lot 12 DP727493) located at 962 Canyonleigh Road, Brayton, NSW, as well as road casement and small sections of freehold lots along Canyonleigh Road between the site access point and the intersection with Canyonleigh Road. The boundary of the overall Subject Land is shown in Figure 2-1 and further details are provided in Table 2-1.

TABLE 2-1 SUBJECT LAND DESCRIPTION

Feature	Description
Locality	962 Canyonleigh Road, Brayton NSW 2579 Grid connection to the Transgrid Marulan Substation at 947 Canyonleigh Road
LGA	Goulburn Mulwaree Council
Lot and DP Numbers	• Lot 12 DP727493; and • Lot 2341 DP622834.
Land Zone	RU2 Rural Landscape
Current Land Use	Agricultural activities – Livestock grazing

2.1.2 DEVELOPMENT FOOTPRINT

Within the Subject Land, the Project consists of an overall Development Footprint of 21.60 ha and includes:

- 15.20 ha identified as the BESS Development Footprint; and
- 6.40 ha identified as the Road Resurfacing Development Footprint.

2.1.2.1 BESS DEVELOPMENT FOOTPRINT

The BESS Development Footprint totals 15.20 ha and is situated within the BESS Project Area of the Subject Land, as shown in Figure 2-2 . The BESS Development Footprint represents the potential maximum area of impact associated with the construction and operation of the BESS. The BESS Development Footprint is separate to the Road Resurfacing Development Footprint.

The Project will involve a BESS facility with connection to an existing 330 / 132 kV substation operated by Transgrid (Marulan Substation). The indicative Project components and specifications are outlined in **Table 2-2**, with an indicative Project layout shown in **Figure 2-2.**

TABLE 2-2 INDICATIVE PROJECT COMPONENTS

Project Component	Summary
BESS	• One BESS with 300 MW / 1,200 MWh storage capacity. Located on Lot 2341 DP 622834 and Lot 12 DP 727493.
Electrical Reticulation Infrastructure	• The Project will connect to the existing Transgrid 330 kV Marulan Substation located on Lot 2341 DP 622834. • New proposed step-up substation will connect from 33 kV to 330 kV underground feeder/connection line, which lead to existing Marulan substation.
Access	The Project will be accessed via three site access points, located on Canyonleigh Road.
On-site Supporting Infrastructure	• Temporary construction and laydown area; • Permanent Operations & Maintenance (O&M) facility including: ◦ A control room; ◦ Storage facilities; ◦ Supervisory Control and Data Acquisition (SCADA) facilities; ◦ Car parking; ◦ Basic office and associated amenities; and ◦ Utilities and waste facilities. • New and/or upgraded internal access roads; • New and/or upgraded drainage system; and • Security fencing and lighting.
Off-site Supporting Infrastructure	• Waste and wastewater disposal facilities • Existing public road and communications network • Existing transport network and minor roadworks, including: ◦ Canyonleigh Road between the intersection with Brayton Road and the site access will be resurfaced where required and in consultation with Goulburn Mulwaree Council; ◦ Brayton Road / Canyonleigh Road intersection will require a Basic Right Turn treatment to access Canyonleigh Road from Brayton Road, including a temporary hardstand and temporary signage relocation; ◦ Installation of sealed hardstand and mountable kerb at the intersection of Botany Road / Bunnerong Road (Matraville, NSW); and • Quarries for construction material (as required).

2.1.3 ROAD RESURFACING DEVELOPMENT FOOTPRINT

The Road Resurfacing Development Footprint encompasses 6.40 ha along Canyonleigh Road, between the site access point and the intersection with Brayton Road, as shown in Figure 2-3. This section of Canyonleigh Road requires resurfacing of Canyonleigh Rd to support traffic of OSOM and heavy vehicles during construction.

The Road Resurfacing Development Footprint is located within the road easement, which is under the jurisdiction of Goulburn Mulwaree Council. Small sections of Canyonleigh Road within the Road Resurfacing Development Footprint are located within freehold lots, as outlined in Table 2-3, due to a misalignment of the road corridor with cadastral boundaries. However, Goulburn Mulwaree Council assume jurisdiction over the entirety of the Canyonleigh Road, including all sections located within freehold lots/DPs.

The Road Resurfacing Development Footprint was added to the project following the completion of all targeted surveys in 2024/25; therefore, this area has not been surveyed to the same extent and has been addressed separately to the BESS Development Footprint in stages of this report.

TABLE 2-3 ROAD RESURFACING DEVELOPMENT FOOTPRINT LOT AND DP DETAILS

Lots	DP	Title	Comment
5, 10, 14, 15	113590	Freehold	The road resurfacing land is excluded from the titles. Muswellbrook Shire Council is the owner of Brayton Road and Canyonleigh Road.
302	257368	Freehold	
1	558111	Freehold	
11, 12	562226	Freehold	
3, 4	599048	Freehold	
2341	622834	Freehold	
2	708022	Freehold	
6, 8, 9, 12	727493	Freehold	
45, 101, 127, 128, 138	750003	Freehold	
1, 2, 5, 6	1050688	Freehold	
1, 2	1064153	Freehold	
33	1071830	Freehold	
2, 3	1120270	Freehold	
14, 15	1123374	Freehold	
1	1175013	Freehold	
1, 2, 3	1190304	Freehold	

2.1.4 ASSESSMENT AREA

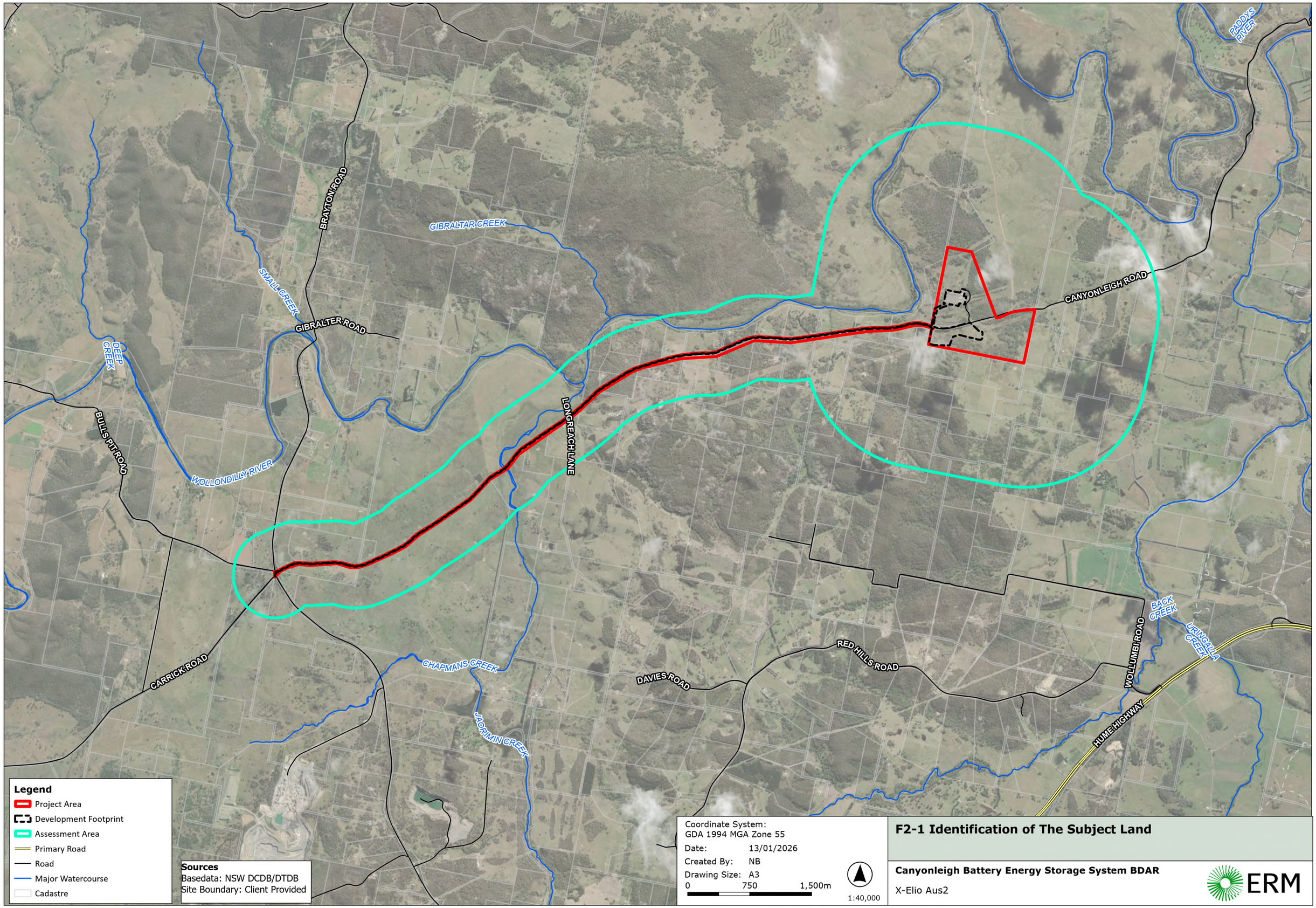
BESS Development Footprint

Assessment of the BESS Development Footprint has relied on a site-based (non-linear) assessment approach. The Assessment Area for the Development Footprint of the BESS, as a non-linear development, is all lands within a 1,500 m buffer of the Subject Land, as shown in Figure 2-1**.** The Assessment Area (1,481 ha) comprises agricultural lands, residential areas (Canyonleigh and Brayton) and the Hume Highway.

Road Resurfacing Development Footprint

Assessment of the Road Resurfacing Development Footprint has relied on a linear assessment approach due to the long, narrow nature of proposed works. The Assessment Area for the Development Footprint for the Road resurfacing as a linear development, is all lands within a 500 m buffer of the road corridor, as shown in Figure 2-1**.** The Assessment Area (1,043 ha) again consists mainly of agricultural lands and includes sections of the Wollondilly River.

It is noted that some minor road upgrades are required in association with the proposed transport route with changes to the intersection of Bunnerong Road and Botany Road in Sydney required. These proposed upgrades have been shown in Figure 2-4. No impacts to biodiversity values are anticipated and as such, no assessment of the minor modifications to the Bunnerong Road / Botany Road intersection is required.



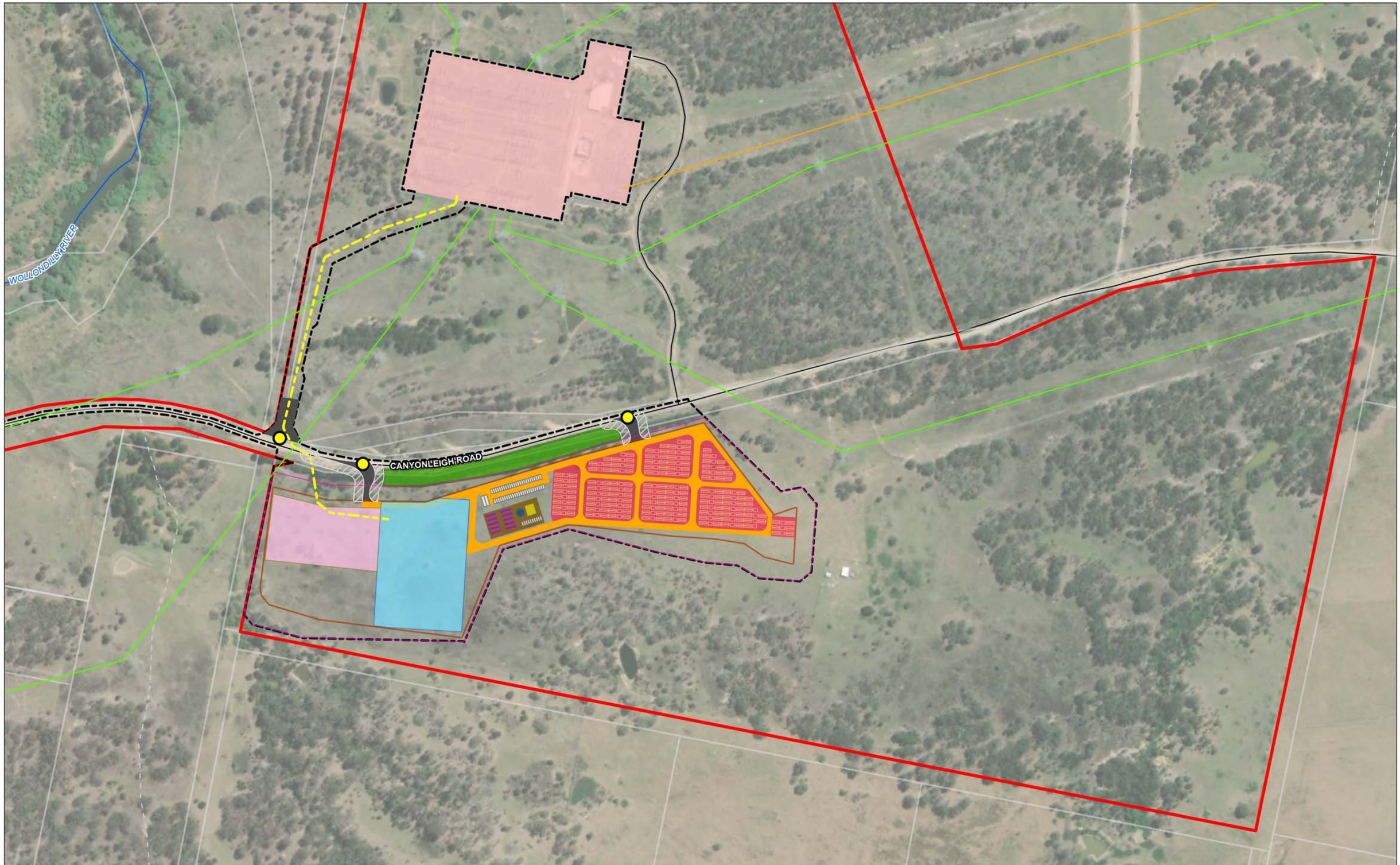
F2-1 Identification of The Subject Land

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx



Legend

- Project Area
- Development Footprint
- Access Roads - Earthworks
- Site Access
- Indicative 330kV Connection
- Fence
- Tree Protection Area
- 500kV
- 330kV
- 132kV
- 66kV
- Platform
- Water Tank
- Laydown Area
- BESS Battery Containers
- BESS Area
- O&M Control Building
- Parking Slots
- Storage Containers
- Substation
- Site Access
- Internal Roads
- Existing substation
- O&M Facility
- Cadastre
- Primary Road
- Road
- Track-Vehicular
- Major Watercourse

Coordinate System:
GDA 1994 MGA Zone 55

Date: 14/01/2026

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F2-2 Final Project Layout - BESS Development Footprint

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

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WOLLONDILLY RIVER

CANYONLEIGH ROAD

Legend

- Access Roads - Earthworks
- Site Access
- Indicative 330kV Connection
- Fence
- Tree Protection Area

Transmission Lines (kV)

- 330kV
- Platform
- Water Tank
- Laydown Area
- BESS Battery Containers
- BESS Area
- O&M Control Building
- Parking Slots
- Storage Containers
- Substation
- Site Access
- Internal Roads
- Development Footprint
- Existing substation
- Project Area
- O&M Facility
- Cadastre
- Primary Road
- Road
- Track-Vehicular

Coordinate System:
GDA 1994 MGA Zone 55

Date: 13/01/2026

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F2-3 Final Project Layout - Road Resurfacing Development Footprint Map 1 of 7

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

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Legend

- Access Roads - Earthworks
- Site Access
- Indicative 330kV Connection
- Fence
- Tree Protection Area

Transmission Lines (kV)

- 330kV
- Platform
- Water Tank
- Laydown Area
- BESS Battery Containers
- BESS Area
- O&M Control Building
- Parking Slots
- Storage Containers
- Substation
- Site Access
- Internal Roads
- Development Footprint
- Existing substation
- Project Area
- O&M Facility
- Cadastre
- Primary Road
- Road
- Track-Vehicular

Coordinate System:
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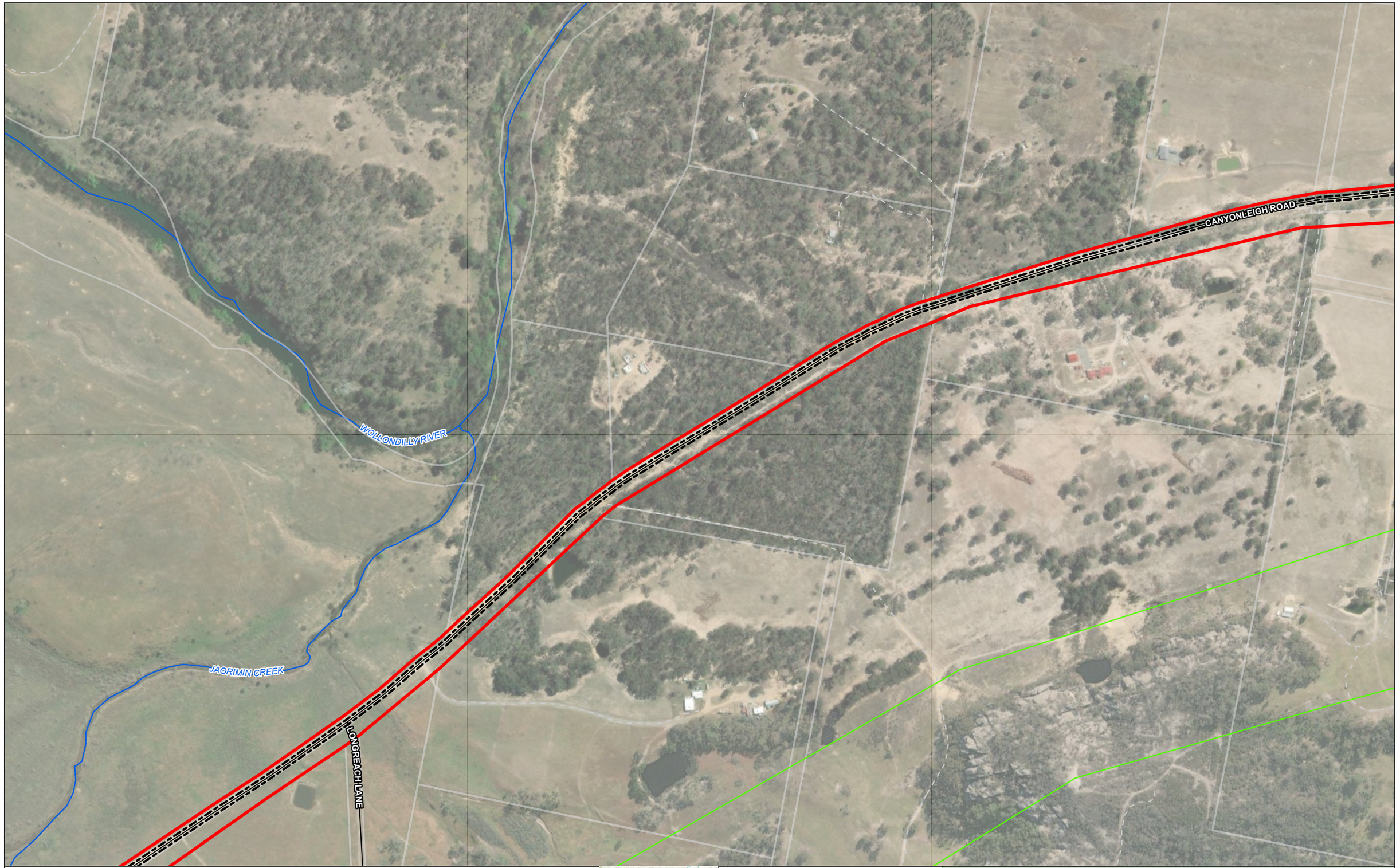
F2-3 Final Project Layout - Road Resurfacing Development Footprint Map 2 of 7

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

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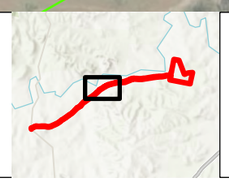


Legend

- Access Roads - Earthworks
- Site Access
- Indicative 330kV Connection
- Fence
- Tree Protection Area

Transmission Lines (kV)

- 330kV
- Platform
- Water Tank
- Laydown Area
- BESS Battery Containers
- BESS Area
- O&M Control Building
- Parking Slots
- Storage Containers
- Substation
- Site Access
- Internal Roads
- Development Footprint
- Existing substation
- Project Area
- O&M Facility
- Cadastre
- Primary Road
- Road
- Track-Vehicular



Coordinate System:
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F2-3 Final Project Layout - Road Resurfacing Development Footprint Map 3 of 7

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx



Legend

- Access Roads - Earthworks
- Site Access
- Indicative 330kV Connection
- Fence
- Tree Protection Area

Transmission Lines (kV)

- 330kV
- Platform
- Water Tank
- Laydown Area
- BESS Battery Containers
- BESS Area
- O&M Control Building
- Parking Slots
- Storage Containers
- Substation
- Site Access
- Internal Roads
- Development Footprint
- Existing substation
- Project Area
- O&M Facility
- Cadastre
- Primary Road
- Road
- Track-Vehicular

Coordinate System:
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Date: 13/01/2026
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Drawing Size: A3

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F2-3 Final Project Layout - Road Resurfacing Development Footprint Map 4 of 7

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx

CANYONLEIGH ROAD

Legend

- Access Roads - Earthworks
- Site Access
- Indicative 330kV Connection
- Fence
- Tree Protection Area

Transmission Lines (kV)

- 330kV
- Platform
- Water Tank
- Laydown Area
- BESS Battery Containers
- BESS Area
- O&M Control Building
- Parking Slots
- Storage Containers
- Substation
- Site Access
- Internal Roads
- Development Footprint
- Existing substation
- Project Area
- O&M Facility
- Cadastre
- Primary Road
- Road
- Track-Vehicular

Coordinate System:
GDA 1994 MGA Zone 55

Date: 13/01/2026

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Drawing Size: A3

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F2-3 Final Project Layout - Road Resurfacing Development Footprint Map 5 of 7

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx



Legend

- Traffic sign
- Access Roads - Earthworks
- Site Access
- Indicative 330kV Connection
- Fence
- Tree Protection Area

Transmission Lines (kV)

- 330kV
- Platform
- Water Tank
- Laydown Area
- BESS Battery Containers
- BESS Area
- O&M Control Building
- Parking Slots
- Storage Containers
- Substation
- Site Access
- Internal Roads
- Development Footprint
- Existing substation
- Project Area
- O&M Facility
- Cadastre
- Primary Road
- Road
- Track-Vehicular

Coordinate System:
GDA 1994 MGA Zone 55

Date: 13/01/2026
Created By: NB
Drawing Size: A3

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F2-3 Final Project Layout - Road Resurfacing Development Footprint
Map 6 of 7

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx



Legend

- Traffic sign
- Access Roads - Earthworks
- Site Access
- Indicative 330kV Connection
- Fence
- Tree Protection Area
- Platform
- Water Tank
- Laydown Area
- BESS Battery Containers
- BESS Area
- O&M Control Building
- Parking Slots
- Storage Containers
- Substation
- Site Access
- Internal Roads
- Development Footprint
- Existing substation
- Project Area
- O&M Facility
- Cadastre
- Primary Road
- Road
- Track-Vehicular

Coordinate System:
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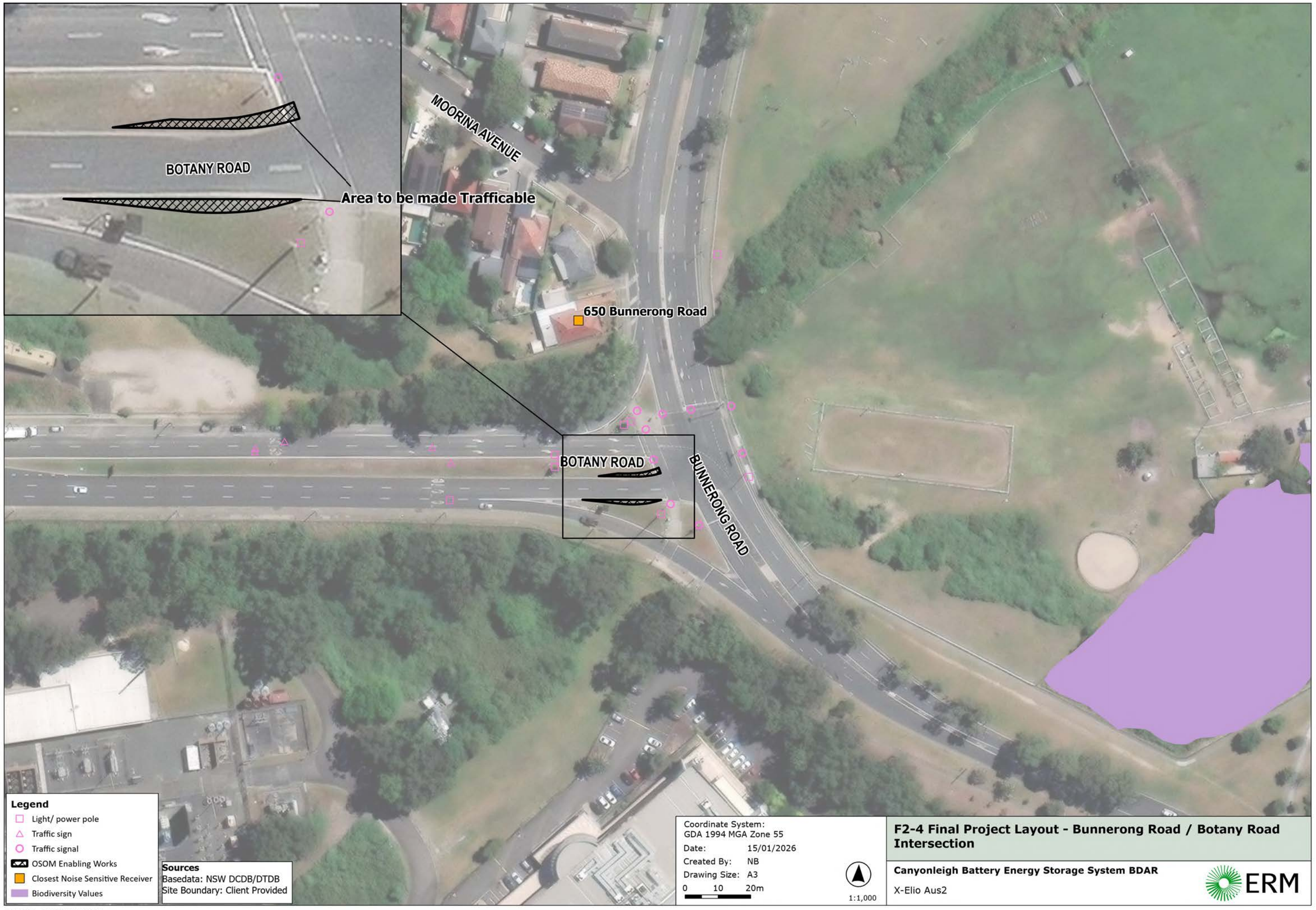
F2-3 Final Project Layout - Road Resurfacing Development Footprint Map 7 of 7

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx



F2-4 Final Project Layout - Bunnerong Road / Botany Road Intersection

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx

2.2 METHODOLOGY

2.2.1 SITE CONTEXT

2.2.1.1 LANDSCAPE FEATURES

Landscape features requiring consideration were initially determined via desktop assessment. Field surveys undertaken between January 2024 and May 2025 across the BESS Development Footprint, and in August 2025 across the Road Resurfacing Development Footprint, sought to verify the following landscape features (in accordance with Section 3.1 and Section 3.2 of the BAM):

- IBRA bioregions and subregions, NSW landscape region and area (ha);
- Native vegetation extent and cleared areas within the buffer area;
- Rivers and streams (classified according to stream order);
- Wetlands within, adjacent to and downstream of the site;
- Connectivity features;
- Areas of geological significance and soil hazard features;
- Site context components, including:
    - Identification of method applied (i.e. linear or site-based); and
    - Percent native vegetation cover in the landscape (development site and biodiversity stewardship site).

No amendments were required to any landscape features identified through spatial assessment of publicly available datasets.

2.2.1.2 NATIVE VEGETATION COVER

A desktop assessment was initially conducted to determine the extent (ha) of vegetation cover on the Subject Land and the surrounding Assessment Area, as shown in Figure 2-1. The following resources were used:

- Historic aerial imagery (NSW Spatial Services, 2025);
- Transitional NVR Map (NSW Government, 2025);
- Draft NVR Map (NSW Government, 2025);
- NSW Landuse 2017 v1.5 (NSW Government, 2025);
- NSW Environmental Planning Instrument - Land Zoning (NSW DPHI, 2024);
- NSW Woody Vegetation Extent and Foliage Projection Cover 2011 (NSW Government, 2025); and
- NSW State Vegetation Type Map (NSW DCCEW, 2024).

Desktop assessment and field surveys conducted between January 2024 and August 2025 confirmed the extent and condition of native vegetation cover within the Subject Land.

Native vegetation in the Assessment Area situated outside of the Subject Land were not ground-truthed in their entirety and in some areas, relies on state vegetation mapping that may be outdated and/or inaccurate. Consequently, there may be some minor additions or omissions to the actual extent of native vegetation as defined in the BAM.

The SVTM (NSW DCCEW, 2024) and BioNet Vegetation Information System were used to identify candidate PCTs and TECs that may be present within the Subject Land. This was used as the basis for survey design as part of preparing a site-specific vegetation map identifying PCTs and condition states (i.e., VZs).

The SVTM of the BESS Project Area is shown in Figure 2-5 whilst the SVTM of the Road Resurfacing Project Area is shown in Figure 2-6.

Recent high-resolution imagery (ESRI basemaps) was used in ArcMap at a scale of 1:1,000 to generate vector data (i.e., polygons) to describe variation in vegetation structure, character and condition. Field-based data was obtained to assign vegetation classification and calculate condition states.

2.2.2 NATIVE VEGETATION, THREATENED ECOLOGICAL COMMUNITIES AND VEGETATION INTEGRITY

Sections of the BAM relevant to vegetation mapping are:

- Section 4.1 – Map native vegetation extent on the Subject Land;
- Section 4.2 – Identify and map plant community types and ecological communities; and
- Section 4.3 – Map vegetation zones and assessment vegetation integrity (vegetation condition)
- Appendix D - Streamlined assessment module – Planted Native Vegetation

The State Vegetation Type Map (SVTM) (NSW DCCEEW, 2023) and BioNet Vegetation Classification (BioNet VIS) system were used to identify candidate PCTs and threatened ecological communities (TECs) that may be present within the Subject Land. This was used as the basis for survey design as part of preparing a site-specific vegetation map identifying PCTs and condition states (i.e., vegetation zones).

Recent high-resolution imagery (ESRI basemaps) was used in ArcMap at a scale of 1:1,000 to generate vector data (i.e., polygons) to describe variation in vegetation structure, character and condition. Field based data was obtained to assign vegetation classification and calculate condition states.

The following sections outline the approach taken in generating the vegetation map for the Subject land.

2.2.2.1 MAPPING NATIVE VEGETATION EXTENT

Section 4.1 of the BAM requires the extent of native vegetation to be mapped across the Subject Land. The definition of native vegetation in the BAM is reproduced below:

Native vegetation: *has the same meaning as in section 1.6 of the BC Act and section 60B of the LLS Act, repeated here:*

1. *For the purposes of this Part, native vegetation means any of the following types of plants native to New South Wales:*
   a) *trees (including any sapling or shrub or any scrub),*
   b) *understorey plants,*
   c) *groundcover (being any type of herbaceous vegetation),*
   d) *plants occurring in a wetland.*

2. *A plant is native to New South Wales if it was established in New South Wales before European settlement. The regulations may authorise conclusive presumptions to be made of the species of plants native to New South Wales by adopting any relevant classification in an official database of plants that is publicly accessible.*
3. *For the purposes of this Part, native vegetation extends to a plant that is dead or that is not native to New South Wales if:*
   a) *the plant is situated on land that is shown on the native vegetation regulatory map as category 2-velunerbale regulated land, and*
   b) *it would be native vegetation for the purposes of this Part if it were native to New South Wales.*
4. *For the purposes of this Part, native vegetation does not extend to marine vegetation (being mangroves, seagrasses or any other species of plant that at any time in its life cycle must inhabit water other than fresh water). A declaration under Section 14.7 of the BC Act that specified vegetation is or is not marine vegetation also has the effect for the purposes of this Part.*

Native vegetation and vegetation community delineation and mapping across the Subject Land involved review of desktop available data, including the State Vegetation Type Mapping (SVTM) available through the NSW Sharing and Enabling Environmental Data (SEED) portal, as well as threatened species records available through BioNet.

Field surveys were conducted during the following dates and were undertaken to verify desktop mapping:

- Summer 2024: 19 – 23 January 2024;
- Autumn 2024: 29 April – 1 May 2024;
- Spring 2024: 23 - 30 October 2024;
- Spring 2024: 11 – 13 November 2024;
- Summer 2025: 22 January – 27 February 2025;
- Autumn 2025: 19 – 20 May 2025;
- Autumn 2025: 29 May 2025;
- Winter 2025: 12 – 16th August 2025 (Road Resurfacing Development Footprint); and
- Spring 2025: 7 – 13 October 2025 (Road Resurfacing Development Footprint).

Vegetation surveys undertaken included:

- Rapid Vegetation Assessments (RVA) undertaken initially to assist in identifying potential Plant Community Types (PCTs) and vegetation communities present.
- Plot-based vegetation integrity surveys (BAM Plots) including full floristic plots (see Section 2.2.2).

Areas of native vegetation which could be validated as a PCT were identified and delineated in the field, and their condition determined. Identification of PCTs within the Subject Land was confirmed with reference to the community profile descriptors provided in NSW BioNet (NSW DCCEEW, 2025).

2.2.2.2 PLOT-BASED VEGETATION SURVEYS

The vegetation integrity score (VIS) for a Vegetation Zone (VZ) was calculated from 36 BAM plots performed collected over January 2024 to August 2025 and in accordance with s.4.2.1 of the BAM. BAM plots were established by walking a random distance into the vegetation zone and establishing the plot on a random bearing. Each BAM Plot was established around a central 50 m transect and each included:

- A 20 m x 20 m plot sampled for the presence of flora species. The plots were carefully examined to identify all flora species present. This search continued until it was confident that all flora species within the plot were detected. Data collected for each species included:
  - Stratum and layers in which each species occurs;
  - Growth form for each species;
  - Scientific and common name for each species;
  - Percentage foliage cover across the plot, of each species rooted in or overhanging the plot;
- Abundance rating for each species;
- One 1,000 m^2 (20 m x 50 m) plot to assess the function attributes:
  - Number of larger trees;
  - Stem size class;
  - Tree regeneration;
  - Length of logs;
- Five 1 m^2 sub-plots to assess average litter cover (and other groundcover components).

To account for the configuration of the road corridor, several (11 out of 15) BAM plots for the Road Resurfacing Development were completed as linear plots (10 x 100 m), rather than the standard 20 x 50 m plot. Full details of the BAM plots are given in Appendix C , this change in methodology is acceptable under the BAM and not considered as a limitation (NSW DPIE, 2020).

BAM plot locations for the BESS Development Footprint and Road Resurfacing Development Footprint, along with other survey methods that informed the ground-truthed PCT mapping are shown in in Figure 2-7 (BESS Project Area) Figure 2-8 (Road Resurfacing Project Area).

2.2.2.3 RAPID VEGETATION ASSESSMENTS

A total of 69 RVAs were conducted in addition to BAM plots to facilitate delineation of VZs within the Subject Land. RVAs were undertaken at regular intervals while travelling through the Subject Land and at locations where changes in PCT or vegetation condition were observed. The following attributes were noted within the rapid vegetation assessments:

- Location;
- Overall vegetation description;
- Landform pattern;
- Soil type, colour and description;
- Drainage properties;
- Dominant plant species in each structural layer;
- Sub-dominant species in each structural layer;
- Height and density of each stratum; and
- Photographs.

Legend

- Project Area
- Development Footprint
- Cadastre

PCT

- 3228,Wollondilly-Shoalhaven Siltstones Sheltered Forest
- 3373,Goulburn Tableland Box-Gum Grassy Forest
- 3416,Southern Tableland Valley Flats Damp Grassland
- 3486, Wollondilly-Shoalhaven Slopes Grassy Open Forest
- 3492,Wollondilly-Shoalhaven Quartz Hills Forest
- 3498,Wingecarribee Gorges Stringybark-Grey Gum Forest
- 3737,Bungonia Tableland Scribbly Gum Shrub Forest
- 3738, Goulburn-Lithgow Tableland Hills Grassy Forest
- 3746, Southern Tableland Snow Gum-Candlebark Shrub Forest
- 3932,Central and Southern Tableland Swamp Meadow Complex
- 4063,Central and Southern Tableland River Oak Forest
- 0, Not classified

Coordinate System:
GDA 1994 MGA Zone 55

Date: 14/01/2026

Created By: NB

Drawing Size: A3

0 150 300m

1:6,000

F2-5 State Vegetation Type Mapping of the BESS Project Area

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx



Legend

- Project Area
- Development Footprint
- Cadastre

PCT

- 3486, Wollondilly-Shoalhaven Slopes Grassy Open Forest
- 3492,Wollondilly-Shoalhaven Quartz Hills Forest
- 3746, Southern Tableland Snow Gum-Candlebark Shrub Forest
- 0, Not classified



Coordinate System:
GDA 1994 MGA Zone 55

Date: 15/01/2026

Created By: NB

Drawing Size: A3

0 100 200m

1:5,000

F2-6 State Vegetation Type Mapping of the Road Resurfacing Project Area Map 1 of 7

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx

Legend

- Project Area
- Development Footprint
- Cadastre

PCT

- 3486, Wollondilly-Shoalhaven Slopes Grassy Open Forest
- 3492,Wollondilly-Shoalhaven Quartz Hills Forest
- 3738, Goulburn-Lithgow Tableland Hills Grassy Forest
- 3746, Southern Tableland Snow Gum-Candlebark Shrub Forest
- 0, Not classified



Coordinate System:
GDA 1994 MGA Zone 55

Date: 15/01/2026
Created By: NB
Drawing Size: A3

0 100 200m

1:5,000

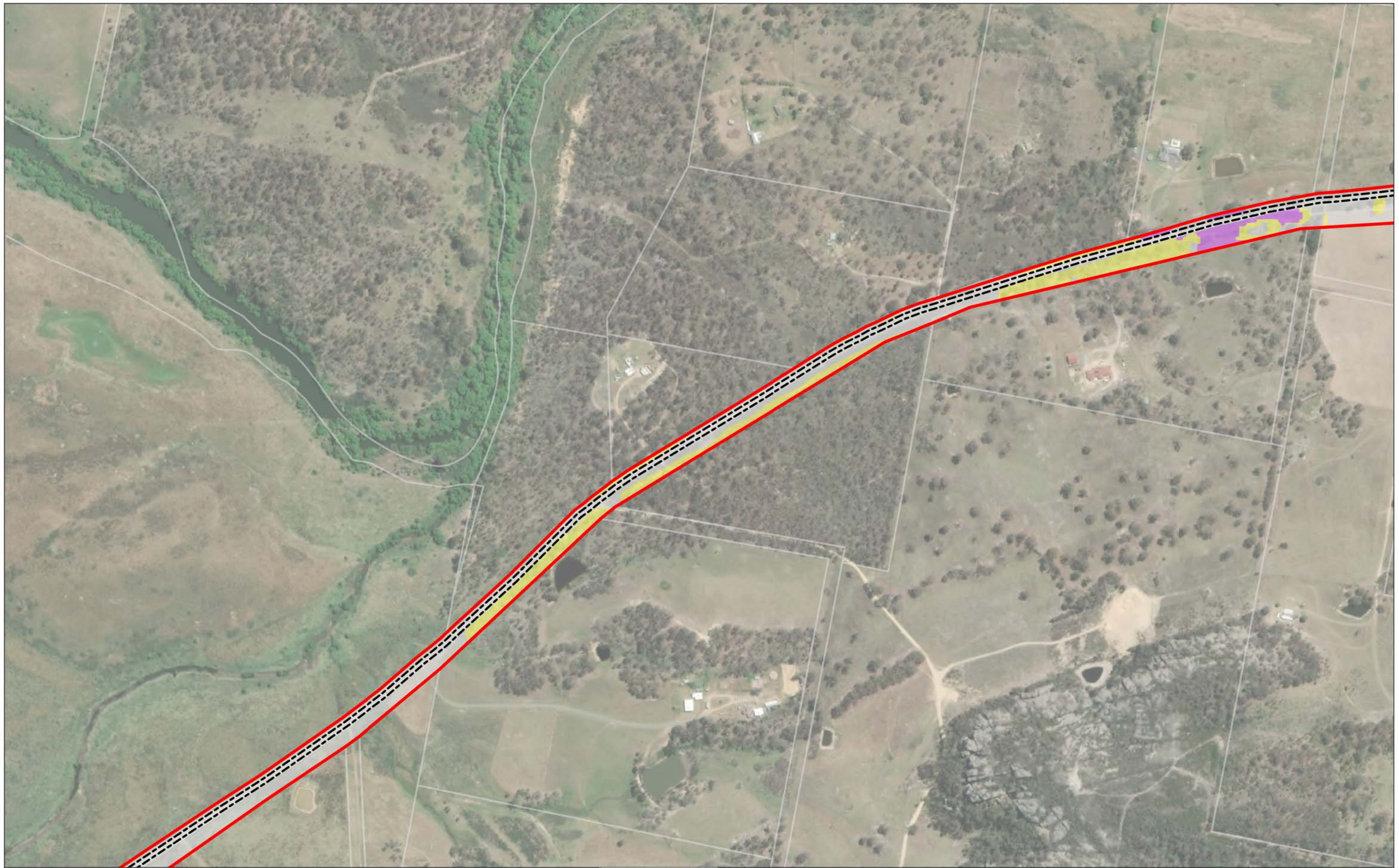
F2-6 State Vegetation Type Mapping of the Road Resurfacing Project Area
Map 2 of 7

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx



Legend

- Project Area
- Development Footprint
- Cadastre

PCT

- 3486, Wollondilly-Shoalhaven Slopes Grassy Open Forest
- 3746, Southern Tableland Snow Gum-Candlebark Shrub Forest
- 0, Not classified



Coordinate System:
GDA 1994 MGA Zone 55

Date: 15/01/2026

Created By: NB

Drawing Size: A3

0 100 200m

1:5,000

F2-6 State Vegetation Type Mapping of the Road Resurfacing Project Area Map 3 of 7

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx

Legend

- Project Area
- Development Footprint
- Cadastre

PCT

- 0, Not classified



Coordinate System:
GDA 1994 MGA Zone 55

Date: 15/01/2026

Created By: NB

Drawing Size: A3

0 100 200m

1:5,000

F2-6 State Vegetation Type Mapping of the Road Resurfacing Project Area
Map 4 of 7

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

Legend

- Project Area
- Development Footprint
- Cadastre

PCT

- 3373,Goulburn Tableland Box-Gum Grassy Forest
- 3486, Wollondilly-Shoalhaven Slopes Grassy Open Forest
- 0, Not classified



Coordinate System:
GDA 1994 MGA Zone 55

Date: 15/01/2026

Created By: NB

Drawing Size: A3

0 100 200m

1:5,000

F2-6 State Vegetation Type Mapping of the Road Resurfacing Project Area
Map 5 of 7

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx

Legend

- Project Area
- Development Footprint
- Cadastre

PCT

- 3373,Goulburn Tableland Box-Gum Grassy Forest
- 3486, Wollondilly-Shoalhaven Slopes Grassy Open Forest
- 3932,Central and Southern Tableland Swamp Meadow Complex
- 0, Not classified



Coordinate System:
GDA 1994 MGA Zone 55

Date: 15/01/2026
Created By: NB
Drawing Size: A3

0 100 200m

1:5,000

F2-6 State Vegetation Type Mapping of the Road Resurfacing Project Area
Map 6 of 7

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx



Legend

- Project Area
- Development Footprint
- Cadastre

PCT

- 3373,Goulburn Tableland Box-Gum Grassy Forest
- 0, Not classified



Coordinate System:
GDA 1994 MGA Zone 55

Date: 15/01/2026
Created By: NB
Drawing Size: A3

0 40 80m

1:2,000

F2-6 State Vegetation Type Mapping of the Road Resurfacing Project Area
Map 7 of 7

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx

Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Project Area
- Development Footprint
- Scattered Tree Assessment
- Habitat Assessment (October 2024)
- Rocky Outcrops
- External Roadworks Study Area
- BAM Plot
- Rapid Vegetation Assessment

Plant Community Types

- 0,Infastructure
- 0,Non-native
- 3373,Goulburn Tableland Box-Gum Grassy Forest
- 3746,ST Snow Gum-Candlebark Shrub Forest
- 4063,Central and Southern Tableland River Oak Forest
- 3373,Goulburn Tableland Box-Gum Grassy Forest
- 3746,ST Snow Gum-Candlebark Shrub Forest
- 3347,Southern Tableland Creekflat Ribbon Gum Forest
- 0,Stream
- 0, Dam

Coordinate System:
GDA 1994 MGA Zone 55
Date: 15/01/2026
Created By: NB
Drawing Size: A3
0 110 220m
1:6,000

F2-7 Vegetation Survey Effort - BESS Project Area

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx

Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Project Area
- Development Footprint
- Rapid Vegetation Assessment
- BAM Plot
- External Roadworks Study Area
- Habitat Assessment (October 2024)
- Rocky Outcrops
- Scattered Tree Assessment

Plant Community Types

- 0,Infastructure
- 0,Non-native
- 3746,ST Snow Gum-Candlebark Shrub Forest
- 4063,Central and Southern Tableland River Oak Forest
- 0,Stream
- 0, Dam
- Habitat Assessment (October 2025)

Coordinate System:
GDA 1994 MGA Zone 55
Date: 15/01/2026
Created By: NB
Drawing Size: A3
0 100 200m
1:5,000

F2-8 Vegetation Survey Effort - Road Resurfacing Project Area Map 1 of 6

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx

Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Project Area
- Development Footprint
- Rapid Vegetation Assessment
- BAM Plot
- External Roadworks Study Area
- Habitat Assessment (October 2024)
- Rocky Outcrops
- Scattered Tree Assessment

Plant Community Types

- 0,Infastructure
- 0,Non-native
- 3373,Goulburn Tableland Box-Gum Grassy Forest
- 3746,ST Snow Gum-Candlebark Shrub Forest
- 3347,Southern Tableland Creekflat Ribbon Gum Forest
- Habitat Assessment (October 2025)

Coordinate System:
GDA 1994 MGA Zone 55
Date: 15/01/2026
Created By: NB
Drawing Size: A3
0 100 200m
1:5,000

F2-8 Vegetation Survey Effort - Road Resurfacing Project Area Map 2 of 6

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx

Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Project Area
- Development Footprint
- Rapid Vegetation Assessment
- BAM Plot
- External Roadworks Study Area
- Habitat Assessment (October 2024)
- Rocky Outcrops
- Scattered Tree Assessment

Plant Community Types

- 0,Infastructure
- 3373,Goulburn Tableland Box-Gum Grassy Forest
- 3746,ST Snow Gum-Candlebark Shrub Forest
- 3347,Southern Tableland Creekflat Ribbon Gum Forest
- 0, Dam
- Habitat Assessment (October 2025)

Coordinate System:
GDA 1994 MGA Zone 55
Date: 15/01/2026
Created By: NB
Drawing Size: A3
0 100 200m
1:5,000

F2-8 Vegetation Survey Effort - Road Resurfacing Project Area Map 3 of 6

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx

Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Project Area
- Development Footprint
- Rapid Vegetation Assessment
- BAM Plot
- External Roadworks Study Area
- Habitat Assessment (October 2024)
- Rocky Outcrops
- Scattered Tree Assessment

Plant Community Types

- 0,Infastructure
- 3373,Goulburn Tableland Box-Gum Grassy Forest
- 3746,ST Snow Gum-Candlebark Shrub Forest
- 3347,Southern Tableland Creekflat Ribbon Gum Forest
- 0,Stream
- Habitat Assessment (October 2025)

Coordinate System:
GDA 1994 MGA Zone 55
Date: 15/01/2026
Created By: NB
Drawing Size: A3
0 100 200m
1:5,000

F2-8 Vegetation Survey Effort - Road Resurfacing Project Area Map 4 of 6

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx

Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Project Area
- Development Footprint
- Rapid Vegetation Assessment
- BAM Plot
- External Roadworks Study Area
- Habitat Assessment (October 2024)
- Rocky Outcrops
- Scattered Tree Assessment

Plant Community Types

- 0,Infastructure
- 3373,Goulburn Tableland Box-Gum G·assy Forest
- 3347,Southern Tableland Creekflat Ribbon Gum Forest
- Habitat Assessment (October 2025)

Coordinate System:
GDA 1994 MGA Zone 55
Date: 15/01/2026
Created By: NB
Drawing Size: A3
0 100 200m
1:5,000

F2-8 Vegetation Survey Effort - Road Resurfacing Project Area Map 5 of 6

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx

Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Project Area
- Development Footprint
- Rapid Vegetation Assessment
- BAM Plot
- External Roadworks Study Area
- Habitat Assessment (October 2024)
- Rocky Outcrops
- Scattered Tree Assessment

Plant Community Types

- 0,Infastructure
- 0,Non-native
- 3373,Goulburn Tableland Box-Gum Grassy Forest
- Habitat Assessment (October 2025)

Coordinate System:
GDA 1994 MGA Zone 55
Date: 15/01/2026
Created By: NB
Drawing Size: A3
0 100 200m
1:5,000

F2-8 Vegetation Survey Effort - Road Resurfacing Project Area Map 6 of 6

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx

2.3 IDENTIFYING PLANT COMMUNITY TYPES AND ECOLOGICAL COMMUNITIES

Assessable vegetation is required to be classified into Plant Community Types (PCTs) using quantitative methods (Section 4.2.3 of the BAM).

The flora composition and structure of full floristic plots was used to cognitively assign best fit PCTs available from the NSW BioNet Vegetation Type Database. In addition to the consideration of floristic composition and structure, other factors were considered including topographic position, elevation and climatic variables (e.g., average annual rainfall), and disturbance.

PCTs are further discussed in Section 4.2.1 of this report.

2.3.1 PLANTED NATIVE VEGETATION ASSESSMENT

Where Planted Native Vegetation is identified, assessment of that vegetation is required under Appendix D – Planted Native Vegetation Streamlined Assessment Module of the BAM.

Approximately 6.72 ha of Planted Native Vegetation (PNV) occurs within the northern section of the BESS Project Area. The streamlined assessment framework provided in Appendix D of the BAM (NSW DPIE, 2020) was applied to this area. The PNV was identified to contain a mosaic of planted and remnant native vegetation and has been allocated to the best-fit PCT, PCT 3746 and identified as PCT 3746_VZ6_Planted Natives within this report.

The Streamlined Assessment has been provided in Appendix D.

Therefore, the BAM has been applied in full throughout this BDAR and the streamlined assessment was not used.

2.3.2 VEGETATION ZONES AND VEGETATION INTEGRITY

A Vegetation Zone (VZ) is an area of native vegetation comprising a PCT in a similar (homogeneous) condition state. The VZs within the development footprint were defined from PCT mapping undertaken and confirmed by ERM, along with the observable condition states from the field surveys and desktop mapping.

Vegetation Zones are identified and further discussed in Section 4.2.2 of this report.

2.3.3 THREATENED FLORA SURVEY

2.3.3.1 REVIEW OF EXISTING INFORMATION

The BAM-C, BioNet Atlas Database and Atlas of Living Australia were reviewed prior to the flora surveys conducted for this BDAR. Threatened flora sightings recorded within the Subject Land were further investigated and considered throughout this BDAR.

2.3.3.2 HABITAT CONSTRAINTS ASSESSMENT

Desktop review and field surveys within the Subject Land included the assessment of habitat constraints and microhabitats and their suitability for predicted species credit flora species.

2.3.3.3 SURVEY EFFORT AND METHODOLOGY

The BAM-C identifies candidate species that require consideration to determine whether targeted field surveys are required for each species. A total of 21 threatened candidate flora species were identified in the BAM-C associated with the chosen PCTs on the subject land. A review of the Threatened Species Database (TBDC) was undertaken to determine likelihood of species within the Subject Land against habitat constraints and geographic limitations, and to review the survey requirements to undertake appropriate field surveys.

Of the 14 threatened flora species listed, two have been excluded from assessment:

- *Callitris oblonga* subsp. *parva* – This species is listed as being geographically restricted to the Corang River Catchment and between Charleyong and Nerriga. The Subject Land does not occur within either area and has been excluded from assessment.
- Matted Bush-pea (*Pultenaea pedunculata*) – This species is listed as being geographically restricted to the region between Boro (Borough) and Marulan. The Subject Land occurs approximately 5 kilometres (km) north-west of Marulan and does not occur within the geographic extent of this species.

For the remaining listed threatened flora species, surveys undertaken included:

- **Parallel Field Traverse (transects):** Undertaken across the Subject Land in accordance with the guideline 'Surveying threatened plants and their habitats' (NSW DPIE, 2020). Traverses were conducted by two ecologists spaced 10 m or 5 m apart, as appropriate for the detection of herbs, forbs, grasses and other graminoids, ferns and orchids. Walking speeds were maintained at suitable speeds for the detection of the target species. Calculations of hours of effort and area (ha) covered was based on the assumption that 1 km of walking and searching would take approximately 15 minutes to complete (0.25 hours) and that 1 km of traversing would cover an area of 1 ha.
- **Rapid Vegetation Assessments:** RVAs were completed in accordance with the BAM 2020 to assess all flora and were relied upon to provide high-level information on vegetation composition and dominant flora species, whilst also noting features.
- **BAM Plots**: Undertaken in accordance with BAM 2020 and relied upon as supplementary sampling in relation to targeted species surveys. BAM plots aimed to collect data on all flora species and support targeted species survey.

Targeted flora surveys were undertaken across the Subject Land on the following dates:

<u>BESS Project Area</u>

- Summer: 19th – 23rd January 2024, 22nd – 23rd January 2025, 29th – 30th January 2025, 5th – 6th February 2025 and 26th – 27th February 2025.
- Winter: 29th April – 1st May 2024 and 19th – 20th May 2025.
- Spring: 23rd – 30th October 2024 and 11th – 13th November 2024

<u>Road Resurfacing Project Area</u>

Winter: 12th – 16th August 2025.

Spring: 7th – 13th October 2025.

Threatened flora survey effort across the Subject Land is detailed in Table 2-4 and shown in in Figure 2-9 (BESS Project Area) and Figure 2-10 (Road Resurfacing Project Area). Additionally, a general habitat assessment, noting the abundance of various habitat features as well as an assessment of the likelihood of occurrence of potentially occurring threatened flora species was also undertaken at all times during survey.

During all survey events (Spring 2024 and Summer 2025), only one of the two ecologists recorded their tracks, as shown in Figure 2-9 (BESS Project Area) and Figure 2-10 (Road Resurfacing Project Area). This has been discussed as a limitation in Section 2.3.6.

Further details of the targeted flora species surveyed are provided in Section 5.2.1.3 of this report.

TABLE 2-4 THREATENED FLORA FIELD SURVEY SUMMARY

Target Species	Associated PCTs in Subject Land	Survey Period	Survey Method	Survey period conducted – BESS Project Area	Survey period conducted – Roadworks Project Area
Kanangra Wattle (*Acacia clunies-rossiae*)	4063	All Year	BESS Project Area • Parallel Field traverse - 5m transects • Opportunistic survey	• 19th – 23rd January 2024 • 22nd – 23rd January 2025 • 29th – 30th January 2025 • 5th – 6th February 2025 • 26th – 27th February 2025 • 29th April – 1st May 2024 • 19th – 20th May 2025 • 23rd – 30th October 2024 • 11th – 13th November 2024	NA
Bombay Bossiaea (*Bossiaea bombayensis*)	3746	All Year	BESS Project Area • Parallel Field traverse - 5m transects • Opportunistic survey Road Resurfacing Project Area • Variable Parallel Field Traverse – 0 - 10m transects • Opportunistic survey	• 19th – 23rd January 2024 • 22nd – 23rd January 2025 • 29th – 30th January 2025 • 5th – 6th February 2025 • 26th – 27th February 2025 • 29th April – 1st May 2024 • 19th – 20th May 2025 • 23rd – 30th October 2024 • 11th – 13th November 2024	• 12th – 16th August 2025 • 7th – 13th October 2025
Dwarf Kerrawang (*Commersonia prostrata*)	3347 4063	All Year	BESS Project Area • Parallel Field traverse - 5m transects • Opportunistic survey Road Resurfacing Project Area • Variable Parallel Field Traverse – 0 - 10m transects • Opportunistic survey	• 19th – 23rd January 2024 • 22nd – 23rd January 2025 • 29th – 30th January 2025 • 5th – 6th February 2025 • 26th – 27th February 2025 • 29th April – 1st May 2024 • 19th – 20th May 2025 • 23rd – 30th October 2024 • 11th – 13th November 2024	• 12th – 16th August 2025 • 7th – 13th October 2025

Target Species	Associated PCTs in Subject Land	Survey Period	Survey Method	Survey period conducted – BESS Project Area	Survey period conducted – Roadworks Project Area
Michelago Parrot-pea (*Dillwynia glaucula*)	3347 3373 3746	September - December	<u>BESS Project Area</u> • Parallel Field traverse - 5m transects • Opportunistic survey <u>Road Resurfacing Project Area</u> • Variable Parallel Field Traverse – 0 - 10m transects • Opportunistic survey	• 23rd – 30th October 2024 • 11th – 13th November 2024	• 7th – 13th October 2025
Buttercup Doubletail (*Diuris aequalis*)	3347 3373	October - November	<u>Road Resurfacing Project Area</u> • Variable Parallel Field Traverse – 0 - 10m transects • Opportunistic survey	NA	• 7th – 13th October 2025
Black Gum (*Eucalyptus aggregata*)	3347 3746 4063	All Year	<u>BESS Project Area</u> • Parallel Field traverse - 5m transects • Opportunistic survey <u>Road Resurfacing Project Area</u> • Variable Parallel Field Traverse – 0 - 10m transects • Opportunistic survey	• 19th – 23rd January 2024 • 22nd – 23rd January 2025 • 29th – 30th January 2025 • 5th – 6th February 2025 • 26th – 27th February 2025 • 29th April – 1st May 2024 • 19th – 20th May 2025 • 23rd – 30th October 2024 • 11th – 13th November 2024	• 12th – 16th August 2025 • 7th – 13th October 2025

Target Species	Associated PCTs in Subject Land	Survey Period	Survey Method	Survey period conducted – BESS Project Area	Survey period conducted – Roadworks Project Area
Paddys River Box, Camden Woollybutt (*Eucalyptus macarthurii*)	3746	All Year	<u>BESS Project Area</u> • Parallel Field traverse - 5m transects • Opportunistic survey <u>Road Resurfacing Project Area</u> • Variable Parallel Field Traverse – 0 - 10m transects • Opportunistic survey	• 19th – 23rd January 2024 • 22nd – 23rd January 2025 • 29th – 30th January 2025 • 5th – 6th February 2025 • 26th – 27th February 2025 • 29th April – 1st May 2024 • 19th – 20th May 2025 • 23rd – 30th October 2024 • 11th – 13th November 2024	• 12th – 16th August 2025 • 7th – 13th October 2025
Mongarlowe Mallee (*Eucalyptus recurva*)	3347 3746	All Year	<u>BESS Project Area</u> • Parallel Field traverse - 5m transects • Opportunistic survey	• 19th – 23rd January 2024 • 22nd – 23rd January 2025 • 29th – 30th January 2025 • 5th – 6th February 2025 • 26th – 27th February 2025 • 29th April – 1st May 2024 • 19th – 20th May 2025 • 23rd – 30th October 2024 • 11th – 13th November 2024	NA
Superb Midge Orchid (*Genoplesium superbum*)	3746	February-March	<u>BESS Project Area</u> • Parallel Field traverse - 5m transects • Opportunistic survey	• 19th – 23rd January 2024 • 22nd – 23rd January 2025 • 29th – 30th January 2025 • 5th – 6th February 2025 • 26th – 27th February 2025	Nil
Nerriga Grevillea (*Grevillea renwickiana*)	3746	All Year	<u>BESS Project Area</u> • Parallel Field traverse - 5m transects • Opportunistic survey	• 19th – 23rd January 2024 • 22nd – 23rd January 2025 • 29th – 30th January 2025 • 5th – 6th February 2025 • 26th – 27th February 2025 • 29th April – 1st May 2024 • 19th – 20th May 2025 • 23rd – 30th October 2024 • 11th – 13th November 2024	NA

Target Species	Associated PCTs in Subject Land	Survey Period	Survey Method	Survey period conducted – BESS Project Area	Survey period conducted – Roadworks Project Area
Hoary Sunray (*Leucochrysum albicans subsp. tricolor*)	3347 3373 3746	September - April	<u>BESS Project Area</u> • Parallel Field traverse - 5m transects • Opportunistic survey <u>Road Resurfacing Project Area</u> • Variable Parallel Field Traverse – 0 - 10m transects • Opportunistic survey	• 19th – 23rd January 2024 • 22nd – 23rd January 2025 • 29th – 30th January 2025 • 5th – 6th February 2025 • 26th – 27th February 2025 • 23rd – 30th October 2024 • 11th – 13th November 2024	• 7th – 13th October 2025
Cotoneaster Pomaderris (*Pomaderris cotoneaster*)	3746	October - November	<u>BESS Project Area</u> • Parallel Field traverse - 5m transects • Opportunistic survey <u>Road Resurfacing Project Area</u> • Variable Parallel Field Traverse – 0 - 10m transects • Opportunistic survey	• 23rd – 30th October 2024 • 11th – 13th November 2024	• 7th – 13th October 2025
Solanum armourense	4063	August – May	<u>BESS Project Area</u> • Parallel Field traverse - 5m transects • Opportunistic survey	• 19th – 23rd January 2024 • 22nd – 23rd January 2025 • 29th – 30th January 2025 • 5th – 6th February 2025 • 26th – 27th February 2025 • 29th April – 1st May 2024 • 19th – 20th May 2025 • 23rd – 30th October 2024 • 11th – 13th November 2024	NA

Target Species	Associated PCTs in Subject Land	Survey Period	Survey Method	Survey period conducted – BESS Project Area	Survey period conducted – Roadworks Project Area
Silky Swainson-pea (*Swainsona sericea*)	3373	September - November	<u>Road Resurfacing Project Area</u> • Variable Parallel Field Traverse – 0 - 10m transects • Opportunistic survey	•	• 7th – 13th October 2025



F2-9 Threatened Flora Survey Effort - Roadworks Project Area Map 1 of 6

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx

Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Project Area
Development Footprint
Flora Transects (October 2025)



Coordinate System:
GDA 1994 MGA Zone 55
Date: 09/01/2026
Created By: NB
Drawing Size: A3
0 100 200m
1:5,000

F2-9 Threatened Flora Survey Effort - Roadworks Project Area
Map 2 of 6

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx



F2-9 Threatened Flora Survey Effort - Roadworks Project Area Map 3 of 6

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Project Area
Development Footprint
Flora Transects (October 2025)



Coordinate System:
GDA 1994 MGA Zone 55
Date: 09/01/2026
Created By: NB
Drawing Size: A3
0 100 200m
1:5,000

F2-9 Threatened Flora Survey Effort - Roadworks Project Area
Map 4 of 6

Canyonleigh Battery Energy Storage System BDAR
X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx

Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Project Area
Development Footprint
Flora Transects (October 2025)



Coordinate System:
GDA 1994 MGA Zone 55
Date: 09/01/2026
Created By: NB
Drawing Size: A3
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F2-9 Threatened Flora Survey Effort - Roadworks Project Area
Map 5 of 6

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx

Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Project Area
Development Footprint
Flora Transects (October 2025)



Coordinate System:
GDA 1994 MGA Zone 55
Date: 09/01/2026
Created By: NB
Drawing Size: A3
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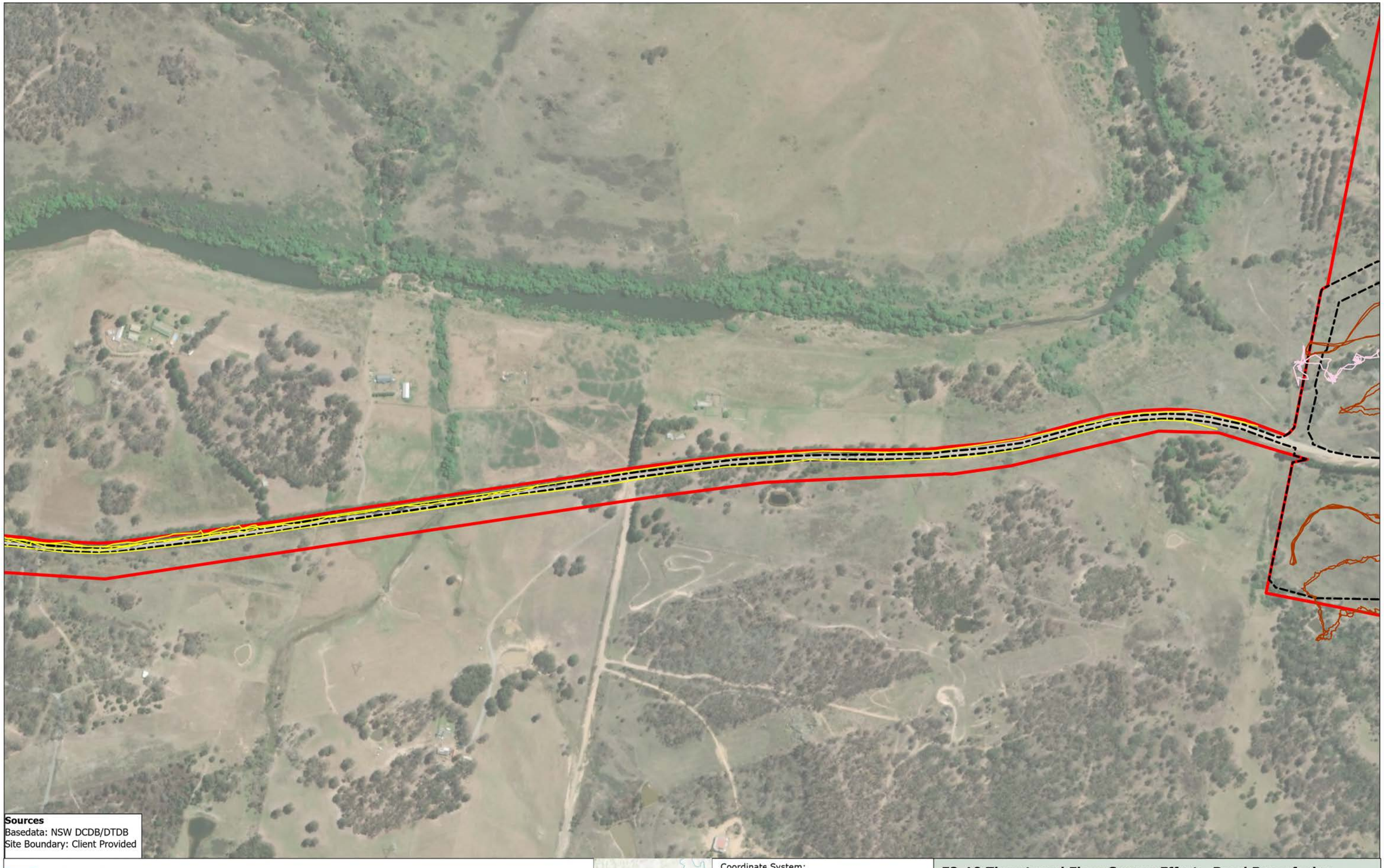
F2-9 Threatened Flora Survey Effort - Roadworks Project Area
Map 6 of 6

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Project Area
Development Footprint
Flora Transects (October 2025)
Bird Census (May 2025)
Habitat Assessment (October 2024)

Coordinate System:
GDA 1994 MGA Zone 55
Date: 15/01/2026
Created By: NB
Drawing Size: A3
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F2-10 Threatened Flora Survey Effort - Road Resurfacing Project Area

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx

Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Project Area
Development Footprint
Flora Transects (October 2025)



Coordinate System:
GDA 1994 MGA Zone 55
Date: 15/01/2026
Created By: NB
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F2-10 Threatened Flora Survey Effort - Road Resurfacing Project Area

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Project Area
Development Footprint
Flora Transects (October 2025)

Coordinate System:
GDA 1994 MGA Zone 55
Date: 15/01/2026
Created By: NB
Drawing Size: A3
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F2-10 Threatened Flora Survey Effort - Road Resurfacing Project Area

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Project Area
Development Footprint
Flora Transects (October 2025)



Coordinate System:
GDA 1994 MGA Zone 55
Date: 15/01/2026
Created By: NB
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F2-10 Threatened Flora Survey Effort - Road Resurfacing Project Area

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx

Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Project Area
Development Footprint
Flora Transects (October 2025)



Coordinate System:
GDA 1994 MGA Zone 55
Date: 15/01/2026
Created By: NB
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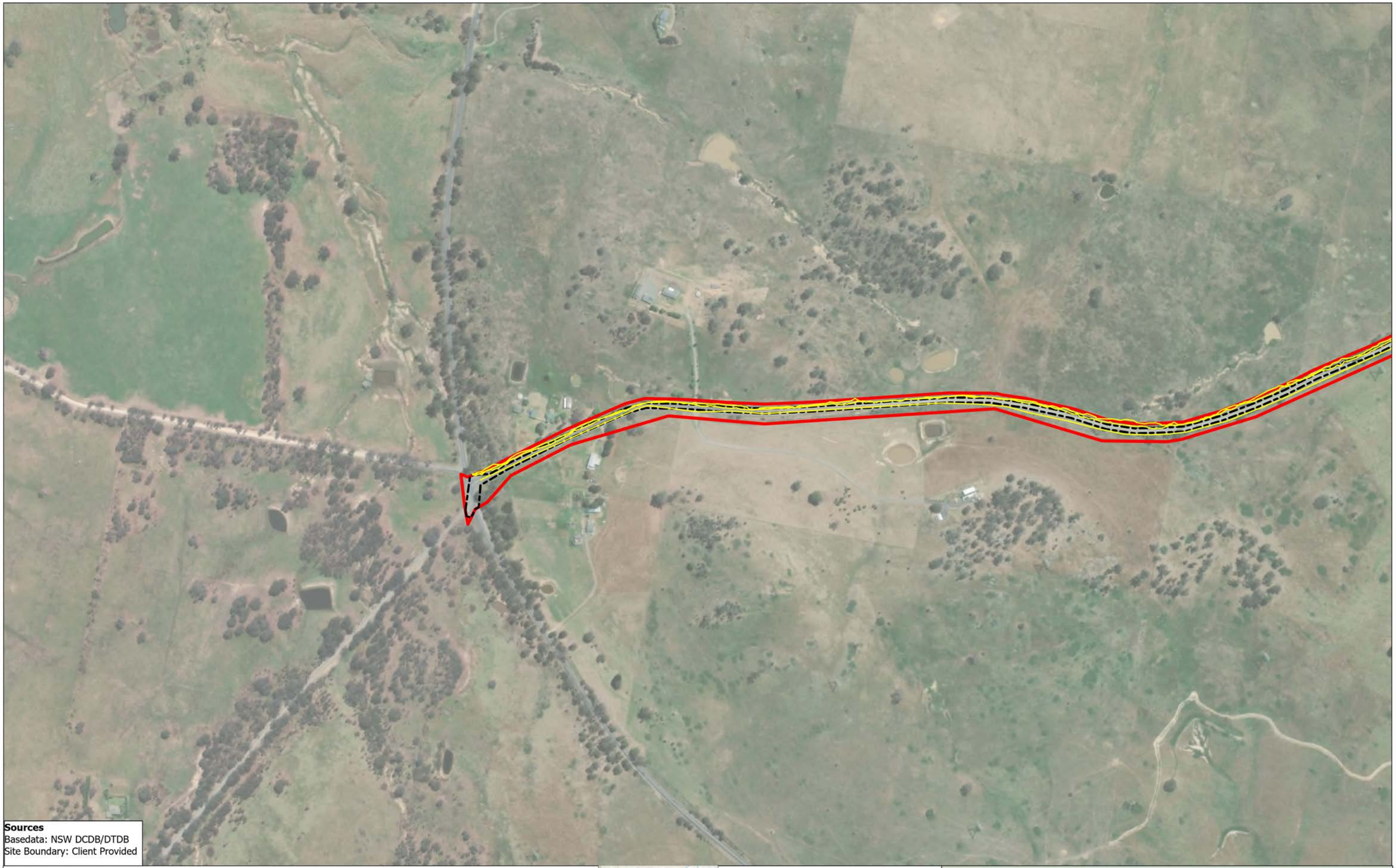
F2-10 Threatened Flora Survey Effort - Road Resurfacing Project Area

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Project Area
Development Footprint
Flora Transects (October 2025)

Coordinate System:
GDA 1994 MGA Zone 55
Date: 15/01/2026
Created By: NB
Drawing Size: A3
0 100 200m
1:5,000

F2-10 Threatened Flora Survey Effort - Road Resurfacing Project Area

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx

2.3.4 THREATENED FAUNA SURVEY METHODS

2.3.4.1 REVIEW OF EXISTING INFORMATION

The BAM-C, NSW BioNet Atlas Database and ALA were reviewed prior to the fauna surveys conducted for this BDAR. Threatened fauna sightings recorded within the Subject Land were recorded and investigated thoroughly.

2.3.4.2 HABITAT CONSTRAINTS ASSESSMENT

Desktop assessments and field surveys within the Subject Land included assessment of habitat constraints and microhabitats and their suitability for threatened fauna species. This included desktop assessment of the Assessment Area for features such as caves and waterways, and field inspection of microhabitats including leaf litter, stick nests and hollow-bearing trees within the Subject Land.

2.3.4.3 FIELD SURVEYS

The BAM-C identifies candidate species that require consideration to determine whether targeted field surveys are required for each species.

A total of 42 threatened candidate fauna species were identified in the BAM-C associated with the chosen PCTs on the subject land. A review of the Threatened Species Database was undertaken to determine likelihood of species within the Subject Land against habitat constraints and geographic limitations, and to review the survey requirements to undertake appropriate field surveys.

Of the 42 threatened species listed, four have been excluded from assessment due to habitat constraints, geographical limitations and vagrancy of species records within the Assessment area and broader study area:

- Pink-tailed Legless Lizard (*Aprasia parapulchella*) – This species has been excluded from the Road Resurfacing Development Footprint due to the area containing degraded habitat. Additionally, an expert was approached to confirm habitat suitability (see Appendix E). The expert identified that the Road Resurfacing Development Footprint contains no suitable habitat for this species.
- Booroolong Frog (*Litoria booroolongensis*) Habitat is considered to be degraded within the BESS Development Footprint and Road Resurfacing Development Footprint to support this species with no suitable habitats observed. Additionally, records of this species within the broader area are limited. As such, this species has been considered to be a vagrant.
- Stuttering Frog (*Mixophyes balbus*). Habitat is considered to be degraded within the BESS Development Footprint and Road Resurfacing Development Footprint to support this species with no suitable habitats observed. Additionally, records of this species within the broader area are limited. As such, this species has been considered to be a vagrant.
- Brush-tailed Phascogale *(Phascogale tapoatafa)* Habitat is considered to be degraded within the BESS Development Footprint and Road Resurfacing Development Footprint to support this species with no suitable habitats observed. An expert was approached to confirm habitat suitability (see Appendix F). The expert identified that the Subject Land contains no suitable habitat for this species.

Further details regarding candidate species is provided in Section 5.1.2 of this report.

For the remaining threatened fauna species of interest, targeted field surveys were undertaken in habitat throughout the broader Subject Land. Targeted surveys were not restricted to one form of targeted survey approach and multiple survey methods deemed suitable for the landscape and species were deployed where possible to provide comprehensive targeted survey.

BESS Development Footprint

Targeted field surveys were undertaken in habitat throughout the BESS Project Area and BESS Development Footprint to inform design alterations of the design.

The following targeted fauna survey events were completed across the BESS Project Area and BESS Development Footprint:

- Spring 2024: 23 – 24 October 2024;
- Spring 2024: 11 – 13 November 2024;
- Summer 2025: 22 January – 27 February
- Autumn 2025: 19 – 20 May 2025; and
- Autumn 2025: 29 May 2025

Road Resurfacing Development Footprint

Initial habitat assessments of the Road Resurfacing Project Area and Road Resurfacing Development Footprint were undertaken in August 2025 to identify suitable habitat features, such as Hollow Bearing Trees (HBTs), stick nests and rock areas that may support a number of threatened fauna species. Targeted surveys were then conducted in October 2025 to determine potential and likely impacts associated with any road upgrade activities.

Targeted fauna survey events were completed across the Road Resurfacing Project Area and Road Resurfacing Development Footprint:

- 12th to 16th August 2025
- 7th to 13th October 2025.

Requirements for targeted surveys include the survey months specified in the BAM-C, as well as the survey effort and methods described in the TBDC and other relevant survey guidelines.

Relevant survey guidelines considered include the following:

- Biodiversity Assessment Method 2020 (DPIE, 2020);
- Streamlined Assessment Module Planted Native Vegetation (NSW DCCEEW, 2024);
- Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities (DEC, 2004);
- Survey Guidelines for Australia's threatened birds: Guidelines for detecting birds listed as threatened under the EPBC Act (DEWHA, 2010b);
- Koala (Phascolarctos cinereus) Biodiversity Assessment Method Survey Guide (NSW DPE, 2022);
- Survey Guidelines for Australia's Threatened Bats (DEWHA, 2010a);
- Survey guidelines for Australia's threatened mammals (DEWHA, 2011);
- Survey Guidelines for Australia's Threatened Reptiles (DSEWPC, 2011); and
- Threatened Reptiles: Biodiversity Assessment Method Survey Guide (DPE, 2022).

The threatened fauna survey effort across the BESS Development Footprint is detailed in Table 2-5 with survey effort across the Road Resurfacing Development Footprint provided in Table 2-6. Fauna survey efforts across the Subject Land have been shown within the following figures:

BESS Project Area

Figure 2-11 – Targeted Amphibian Surveys within the BESS Project Area

Figure 2-12 – Targeted Invertebrate Surveys within the BESS Project Area

Figure 2-13 – Targeted Bird Surveys within the BESS Project Area

Figure 2-14 – Targeted Mammal Surveys within the BESS Project Area

Road Resurfacing Project Area

Figure 2-15 – Targeted Amphibian Surveys within the Road Resurfacing Project Area

Figure 2-16 – Targeted Invertebrate Surveys within the Road Resurfacing Project Area

Figure 2-17 – Targeted Bird Surveys within the Road Resurfacing Project Area

Figure 2-18 – Targeted Mammal Surveys within the Road Resurfacing Project Area

TABLE 2-5 TARGETED FAUNA SURVEYS WITHIN THE BESS DEVELOPMENT FOOTPRINT

Target Species	Associated PCTs in BESS Development Footprint	Recommended Survey Period	Effort	Survey Dates
Amphibians				
Giant Burrowing Frog *(Heleioporus australiacus)*	3746	September – May	Habitat Assessment Initial assessment of habitat values undertaken on the 22 January and 5 February 2025 to confirm targeted survey locations. Aural – Visual Surveys Surveys undertaken at targeted locations where habitat was deemed suitable (i.e. dams). 4 x nights surveys undertaken in January 2025 and 4 x nights survey undertaken in February 2025. Call Playback 4 x nights surveys undertaken in January 2025 and 4 x nights survey undertaken in February 2025. Spotlighting 4 x nights surveys undertaken in January 2025 and 4 x nights survey undertaken in February 2025 in associated with call playback events. Opportunistic survey at all times on site.	• 22 and 23 January 2025 • 29 and 30 January 2025 • 5 and 6 January 2025 • 26 and 27 February 2025

Target Species	Associated PCTs in BESS Development Footprint	Recommended Survey Period	Effort	Survey Dates
Arboreal Mammals				
Squirrel Glider (Petaurus norfolcensis)	3746, 4063	All Year	<u>HBT Assessment</u> Identification of suitable HBTs within the Road Resurfacing Project Area undertaken across October 2024. <u>Camera traps</u> 12 x baited arboreal camera traps were set across the project area in January and February 2025, totalling 216 survey days / nights. <u>Spotlighting</u> 6 x consecutive nights of spotlighting with 2 locations per night for 4 nights and 2 nights surveying the entire length of the Road Resurfacing Project Area during October 2025. Opportunistic survey at all times on site. <u>Spotlighting</u> 3 x nights surveys undertaken in January 2025 and 3 x nights survey undertaken in February 2025. Opportunistic survey at all times on site.	• 22 January 2025 – 5 February 2025 • 5 – 27 February 2025
Southern Greater Glider *(Petauroides volans)*	3746, 4063	All Year		
Eastern Pygmy-possum (*Cercartetus nanus)*	3746, 4063	October – March		

Target Species	Associated PCTs in BESS Development Footprint	Recommended Survey Period	Effort	Survey Dates
Koala *(Phascolarctos cinereus)*	3746, 4063	All Year	Koala SATs 5 x SATs were undertaken across the project area in May 2025. Camera traps 12 x baited arboreal camera traps were set across the project area in January and February 2025, totalling 216 survey days / nights. Spotlighting 3 x nights surveys undertaken in January 2025 and 3 x nights survey undertaken in February 2025. Opportunistic survey at all times on site.	• 22 January 2025 • 29 – 30 January 2025 • 5 – 27 February 2025 • 26 – 27 February 2025 • 19 – 20 May 2025
Terrestrial Mammals				
Brush-tailed Rock-wallaby *(Petrogale penicillata)*	3746, 4063	All Year	Camera traps 6 x baited terrestrial camera traps were set across the project area over January and February 2025, totalling 74 survey nights. Spotlighting 3 x nights surveys undertaken in January 2025 and 3 x nights survey undertaken in February 2025. Opportunistic survey at all times on site.	22 January – 5 February 2025 5 – 27 February 2025

Target Species	Associated PCTs in BESS Development Footprint	Recommended Survey Period	Effort	Survey Dates
Micro Bats				
Large-eared Pied Bat (*Chalinolobus dwyeri*)	3746, 4063	November – January	Habitat Assessment Initial assessment of habitat values undertaken in January 2025 to determine likely habitat. Ultrasonic Audio Recording 2 x ultrasonic audio recorders were placed within the Project Area within areas of suitable habitat for 10 nights in January 2025 and for 24 nights in February 2025. Opportunistic survey at all times on site.	21 – 31 January 2025 31 January – 12 February 2025
Large Bent-winged Bat *(Miniopterus orianae oceanensis)*	4063	December - February		
Megachiropteran Bats				
Grey-headed Flying-fox – Breeding (*Pteropus poliocephalus*)	3746, 4064	October - December	Habitat Assessment Initial assessment of habitat values undertaken in October 2024 to determine likely habitat. Camp Habitat Searches Searches across suitable habitat within the Project Area and in adjacent lands, including the Wollondilly Rover occurred in October 2024 to identify the presence of any current camps. Fly-out / Spotlighting Dusk fly-out surveys were undertaken over 3 nights in January 2025 and a further 3 nights in February 2025 to observe any fly-out of this species from any unseen camps. Opportunistic survey at all times on site.	23 October 2024 22 January 2025 29 – 30 January 2025 6 February 2025 26 – 27 February 2025

Target Species	Associated PCTs in BESS Development Footprint	Recommended Survey Period	Effort	Survey Dates
Owls				
Barking Owl (*Ninox connivens*)	3746, 4063	All year	<u>HBT Assessment</u> Identification of suitable HBTs within the Project Area undertaken in January 2025. <u>Call Playback</u> 6 x nights consecutive survey call playback in January 2025 and 2 x call playback completed in February 2025 targeting forest owls. <u>Spotlighting</u> 6 x consecutive nights of spotlighting across the Project Area in January 2025 following call playback. <u>Stagwatching</u> Stagwatch of suitable HBTs within the Project Area in January 2025 and February 2025. <u>Acoustic Recording</u> 2 x Passive audio recorders set within the Project area over the 21 – 31 January and again from the January – 12 February 2025, totalling 44 survey nights. Opportunistic survey at all times on site.	21 – 31 January 2025 31 January – 12 February 2025
Powerful Owl *(Ninox strenua)*	3746, 4063	All year		
Masked Owl *(Tyto novaehollandiae*	3746, 4063	All year		

Target Species	Associated PCTs in BESS Development Footprint	Recommended Survey Period	Effort	Survey Dates
Diurnal Birds (Raptors)				
Little Eagle - Breeding *(Hieraaetus morphnoides)*	3746, 4063	August – October	<u>Habitat Assessment</u> Initial assessment of habitat values undertaken in October 2024 to determine likely habitat. <u>Stick Nest Survey</u> Searches for stick nests were undertaken across the project area on the 20 February 2024 and the 23 October 2024. <u>Bird Census</u> 6 x bird census undertaken in November 2024 during morning, midday and dusk periods. Opportunistic survey at all times on site.	• 20 February 2024 • 23 October 2024 • 12 – 13 November 2024
White-bellied Sea-Eagle - Breeding *(Haliaeetus leucogaster)*	3746, 4063	July - December		

Target Species	Associated PCTs in BESS Development Footprint	Recommended Survey Period	Effort	Survey Dates
Diurnal Birds (excluding raptors)				
Gang-gang Cockatoo - Breeding *(Callocephalon fimbriatum)*	3746, 4063	October - January	<u>Habitat Assessment</u> Initial assessment of habitat values undertaken in October 2024 to determine likely habitat. <u>HBT Assessment</u> Identification of suitable HBTs within the Project Area undertaken in October 2024. A one-hour search was conducted on the 29 May 2025 targeting searches of HBTs and presence of breeding pairs. <u>Bird Census</u> 6 x bird census undertaken in November 2024 with a further 6 surveys completed in January 2025 and an additional 4 surveys completed in February 2025 during morning, midday and dusk periods. Opportunistic survey at all times on site.	• 23 October 2024 • 12 – 13 November 2024 • 22 – 23 January 2025 • 29 – 30 January 2025 • 5 – 6 February 2025 • 26 27 February 2025 • 29 May 2025
South-eastern Glossy Black-Cockatoo – Breeding *(Calyptorhynchus lathami)*	3746, 4063	April - August		

Target Species	Associated PCTs in BESS Development Footprint	Recommended Survey Period	Effort	Survey Dates
Reptiles				
Pink-tailed Legless Lizard (*Aprasia parapulchella)*	3373, 3746	September - November	<u>Habitat Assessment</u> Initial assessment of habitat values undertaken in October 2024 to determine likely habitat. <u>Targeted Searches</u> Diurnal surveys were undertaken for the target species, which involved turning over suitably sized rocks in areas of suitable habitat (NSW DPE, 2022).	• 23 October 2024 • 11 – 13 November 2024
Striped Legless Lizard *(Delma impar)*	3373	September - December		
Invertebrates				
Key's Matchstick Grasshopper (*Keyacris scurra)*	3373 (not within the BESS Development Footprint)	March – May September - November	<u>Habitat Assessment</u> Initial assessment of habitat values undertaken in October 2024 <u>Targeted Surveys</u> Targeted surveys were undertaken across the Project Area on the 12 – 13 November 2024 by two ecologists and again on the 29 May 2025.	• 23 October 2024 • 12 – 13 November 2024 • 29 May 2025

TABLE 2-6 TARGETED FAUNA SURVEYS WITHIN THE ROAD RESURFACING DEVELOPMENT FOOTPRINT

Target Species	Associated PCTs in Road Resurfacing Development Footprint	Recommended Survey Period	Effort	Survey Dates
Amphibians				
Giant Burrowing Frog *(Heleioporus australiacus)*	3347, 3746	September – May	Habitat Assessment Initial assessment of habitat values undertaken in August 2025 to determine likely habitat. Aural – Visual Surveys Active listening at suitable locations near dams and waterways for 5 consecutive nights at 2 locations per night in October 2025. Call Playback 5 x nights consecutive survey at 2 locations per night, totalling 10 survey events in October 2025. Spotlighting 5 x consecutive nights spotlighting at 2 locations per night associated with call playback in October 2025. Opportunistic survey at all times on site.	• 12th – 16th August 2025 • 7th – 13th October 2025
Green and Golden Bell Frog (*Litoria aurea*)	3373, 3347	November – March		
Mammals				
Squirrel Glider (Petaurus norfolcensis)	3373, 3347, 3746	All Year	Habitat Assessment Initial assessment of habitat values undertaken in August 2025 to determine likely habitat.	• 12th – 16th August 2025 • 7th – 13th October 2025
Southern Greater Glider *(Petauroides volans)*	3373, 3347, 3746	All Year		

Target Species	Associated PCTs in Road Resurfacing Development Footprint	Recommended Survey Period	Effort	Survey Dates
Eastern Pygmy-possum (*Cercartetus nanus)*	3373, 3347, 3746	October – March	Camera traps 10 x baited cameras were installed for 6 consecutive survey days/nights in October 2025. HBT Assessment Identification of suitable HBTs within the Road Resurfacing Project Area undertaken across 6 days by 2 teams of 2 ecologists in October 2025. Call Playback 6 x nights consecutive survey call playback in October 2025 targeting Squirrel Glider. Spotlighting 6 x consecutive nights of spotlighting with 2 locations per night for 4 nights and 2 nights surveying the entire length of the Road Resurfacing Project Area during October 2025. Stagwatching Stagwatch of suitable HBTs within the Road Resurfacing Project Area by 2 teams of 2 x ecologists for 5 consecutive nights in October 2025. Opportunistic survey at all times on site.	

Target Species	Associated PCTs in Road Resurfacing Development Footprint	Recommended Survey Period	Effort	Survey Dates
Brush-tailed Rock-wallaby (*Petrogale penicillata*)	3373, 3347, 3746	All year	Habitat Assessment Initial assessment of habitat values undertaken in August 2025 to determine likely habitat. Camera traps 10 x baited cameras were installed for 6 consecutive survey days/nights in October 2025. Spotlighting 6 x consecutive nights of spotlighting with 2 locations per night for 4 nights and 2 nights surveying the entire length of the Road Resurfacing Project Area during October 2025. Opportunistic survey at all times on site.	• 12th – 16th August 2025 • 7th – 13th October 2025
Koala	3373, 3347, 3746	All year	Habitat Assessment Initial assessment of habitat values undertaken in August 2025 to determine likely habitat. Koala SATs A total of 8 SATs were undertaken across the project area in October 2025 by 2 teams of 2 ecologists. Camera traps 10 x baited cameras were installed for 6 consecutive survey days/nights in October 2025.	• 7th – 13th October 2025

Target Species	Associated PCTs in Road Resurfacing Development Footprint	Recommended Survey Period	Effort	Survey Dates
			Call Playback 6 x nights consecutive survey call playback in October 2025 targeting Koala. Spotlighting 6 x consecutive nights of spotlighting with 2 locations per night for 4 nights and 2 nights surveying the entire length of the Road Resurfacing Project Area during October 2025. Opportunistic survey at all times on site.	
Microchiropteran Bats				
Large-eared Pied Bat (*Chalinolobus dwyeri*)	3373, 3347, 3746	November – January	Habitat Assessment Initial assessment of habitat values undertaken in August 2025 to determine likely habitat. Ultrasonic Audio Recording 2 x Anabat recorders were placed within the Project Area within areas of suitable habitat for 6 consecutive nights in October 2025. Opportunistic survey at all times on site.	• 12th – 16th August 2025 • 7th – 13th October 2025
Southern Myotis (*Myotis macropus*)	3373, 3347, 3746	October - March		

Target Species	Associated PCTs in Road Resurfacing Development Footprint	Recommended Survey Period	Effort	Survey Dates
Megachiropteran Bats				
Grey-headed Flying-fox – Breeding (*Pteropus poliocephalus*)	3373, 3347, 3746	September - December	Habitat Assessment Initial assessment of habitat values undertaken in August 2025 to determine likely habitat. Camp Habitat Searches Searches along the Wollondilly River occurred during August 2025. Fly-out / Spotlighting Dusk fly-out surveys were undertaken over 5 consecutive nights in October 2025 to observed any fly-out of this species from any unseen camps. Opportunistic survey at all times on site.	• 12th – 16th August 2025 • 7th – 13th October 2025
Owls				
Barking Owl (*Ninox connivens*)	3373, 3347, 3746	All year	Habitat Assessment Initial assessment of habitat values undertaken in August 2025 to determine likely habitat. HBT Assessment Identification of suitable HBTs within the Road Resurfacing Project Area undertaken across 6 days by 2 teams of 2 ecologists in October 2025. Call Playback 6 x nights consecutive survey call playback in October 2025 targeting Squirrel Glider.	• 12th – 16th August 2025 • 7th – 13th October 2025
Powerful Owl *(Ninox strenua)*	3373, 3347, 3746	All year		
Masked Owl *(Tyto novaehollandiae*	3373, 3347, 3746	All year		

Target Species	Associated PCTs in Road Resurfacing Development Footprint	Recommended Survey Period	Effort	Survey Dates
			Spotlighting 6 x consecutive nights of spotlighting with 2 locations per night for 4 nights and 2 nights surveying the entire length of the Road Resurfacing Project Area during October 2025. Stagwatching Stagwatch of suitable HBTs within the Road Resurfacing Project Area by 2 teams of 2 x ecologists for 5 consecutive nights in October 2025. Opportunistic survey at all times on site.	
Birds				
Little Eagle - Breeding *(Hieraaetus morphnoides)*	3373, 3347, 3746	August – October	Habitat Assessment Initial assessment of habitat values undertaken in August 2025 to determine likely habitat. Stick Nest Survey Searches for stick nests were undertaken across the project area during October 2025 by 2 teams of 2 ecologists. Opportunistic survey at all times on site.	• 12th – 16th August 2025 • 7th – 13th October 2025
White-bellied Sea-Eagle - Breeding *(Haliaeetus leucogaster)*	3373, 3347, 3746	July - December		

Target Species	Associated PCTs in Road Resurfacing Development Footprint	Recommended Survey Period	Effort	Survey Dates
Gang-gang Cockatoo - Breeding *(Callocephalon fimbriatum)*	3373, 3347, 3746	October - January	<u>Habitat Assessment</u> Initial assessment of habitat values undertaken in August 2025 to determine likely habitat. <u>HBT Assessment</u> Identification of suitable HBTs within the Road Resurfacing Project Area undertaken across 6 days by 2 teams of 2 ecologists in October 2025. Opportunistic survey at all times on site.	• 12th – 16th August 2025 • 7th – 13th October 2025
South-eastern Glossy Black-Cockatoo – Breeding *(Calyptorhynchus lathami)*	3373, 3347, 3746	April - August		• 12th – 16th August 2025 • 7th – 13th October 2025
Reptiles				
Striped Legless Lizard *(Delma impar)*	3373, 3347	October - December	<u>Habitat Assessment</u> Initial assessment of habitat values undertaken in August 2025 and October 2025 to determine likely habitat.	The expert ecologist confirmed that there was potential habitat for the Striped Legless Lizard and that an expert report will be required for this species within the Road Resurfacing Development Footprint (see).
Invertebrates				
Key's Matchstick Grasshopper (*Keyacris scurra)*	3373	March – May September - November	<u>Habitat Assessment</u> Initial assessment of habitat values undertaken in August 2025 <u>Targeted Surveys</u> Targeted surveys were undertaken by 2 teams of 2 ecologists over October 2025.	• 12th – 16th August 2025 • 7th – 13th October 2025

WOLLONDILLY RIVER

Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Project Area
- Development Footprint
- Rocky Areas
- Aural Visual Surveys (January 2025)
- Aural Visual Surveys (October 2025)
- Opportunistic Survey
- Major Watercourse
- Minor Watercourse

Coordinate System:
GDA 1994 MGA Zone 55
Date: 15/01/2026
Created By: NB
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F2-11 Targeted Amphibian Surveys within the BESS Project Area

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx

WOLLONDILLY RIVER

Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Project Area
- Development Footprint
- Targeted Keyacris scurra Transects (November 2024)
- Targeted Keyacris scurra Transects (May 2025)
- Targeted Keyacris scurra Transects (October 2025)
- Major Watercourse
- Minor Watercourse



Coordinate System:
GDA 1994 MGA Zone 55
Date: 15/01/2026
Created By: NB
Drawing Size: A3
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1:6,000

F2-12 Targeted Invertebrate Surveys within the BESS Project Area

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

WOLLONDILLY RIVER

Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Project Area
- Development Footprint
- Hollow Bearing Trees
- Song Meter Mini (owls)
- Bird Census (January 2025)
- Bird Census (November 2024)
- Nocturnal Call Playback & Spotlighting (January 2025)
- Bird Census (October 2025)
- Opportunistic Survey (May 2025)
- Opportunistic Survey (October 2025)
- Major Watercourse
- Minor Watercourse

Coordinate System:
GDA 1994 MGA Zone 55
Date: 15/01/2026
Created By: NB
Drawing Size: A3
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F2-13 Targeted Bird Surveys within the BESS Project Area

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx

WOLLONDILLY RIVER

Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Project Area
- Development Footprint
- Hollow Bearing Trees
- Song Meter Mini (bats)
- Camera Trap Locations
- Spotlighting
- Koala SAT - Centre Tree
- Koala SAT - Trees
- Grey-headed Flying Fox Dusk Searches
- Rocky Areas
- Opportunistic Survey (August 2025)
- Major Watercourse
- Minor Watercourse

Coordinate System:
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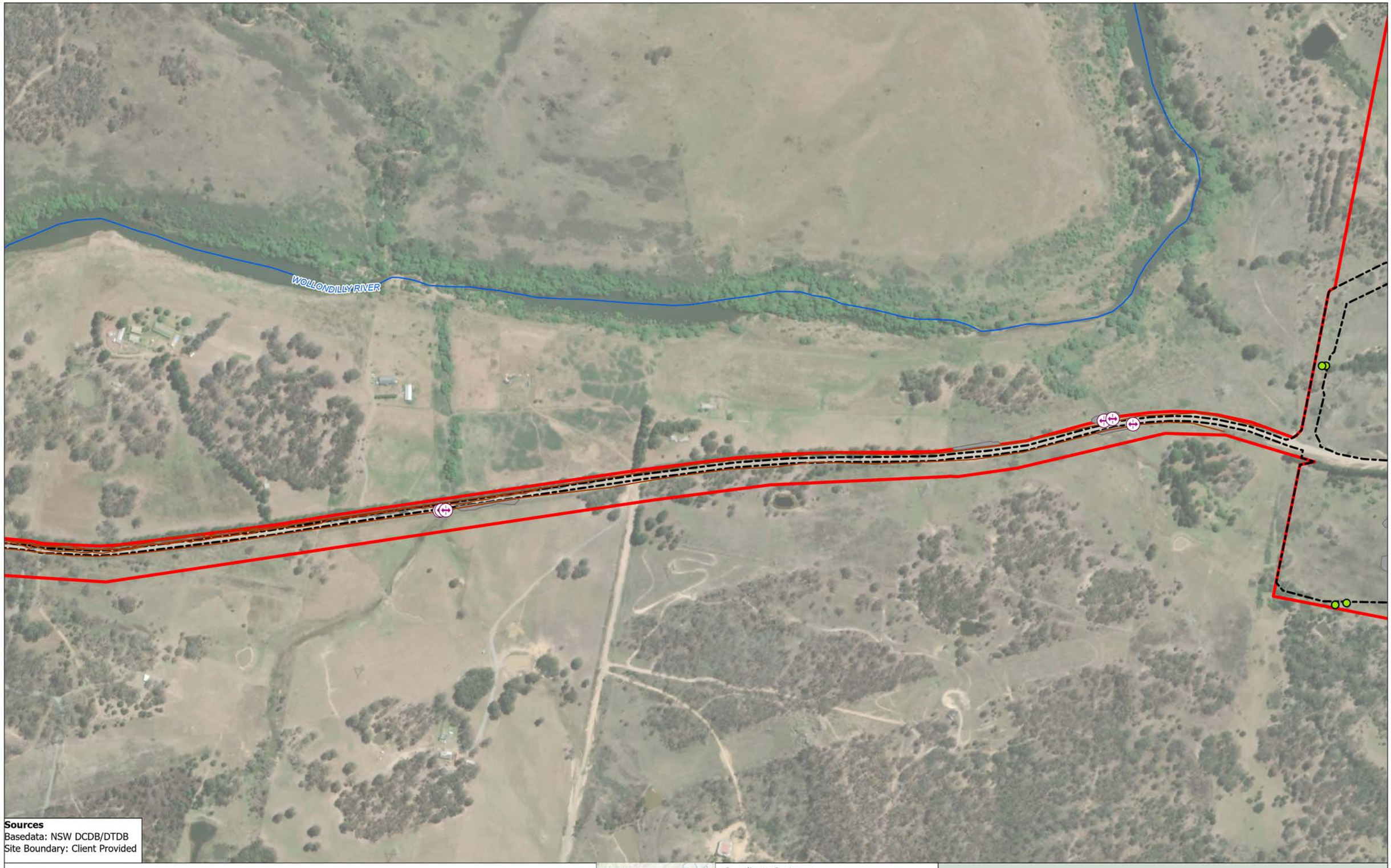
F2-14 Targeted Mammal Surveys within the BESS Project Area

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Project Area
- Development Footprint
- Active listening and call playback (October 2025)
- Rocky Areas
- Aural Visual Surveys (January 2025)
- Opportunistic Survey (October 2025)

Coordinate System:
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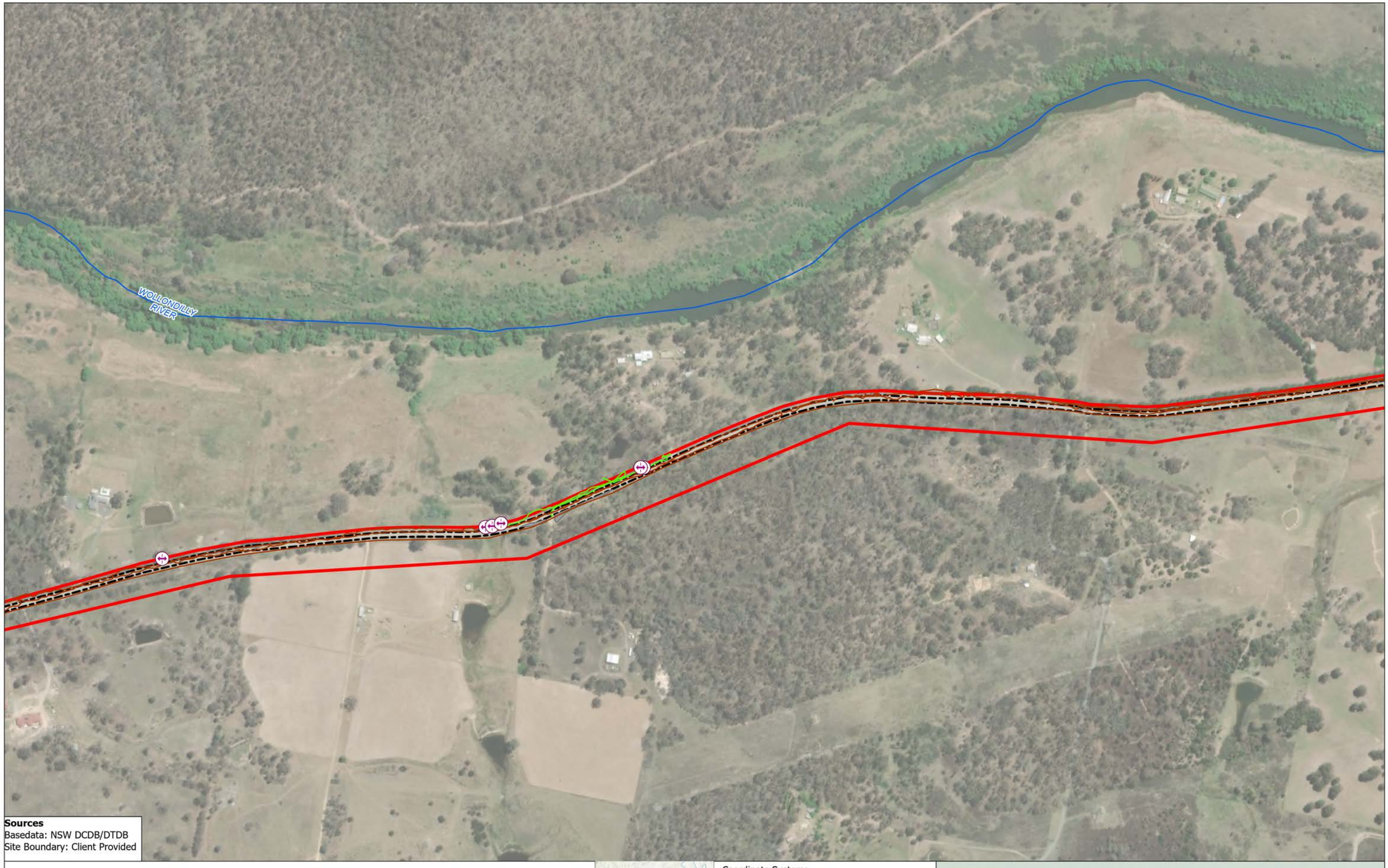
F2-15 Targeted Amphibian Surveys within the Road Resurfacing Project Area
Map 1 of 6

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Project Area
- Development Footprint
- Frog Transects (October 2025)
- Active listening and call playback (October 2025)
- Opportunistic Survey (October 2025)

Coordinate System:
GDA 1994 MGA Zone 55

Date: 15/01/2026
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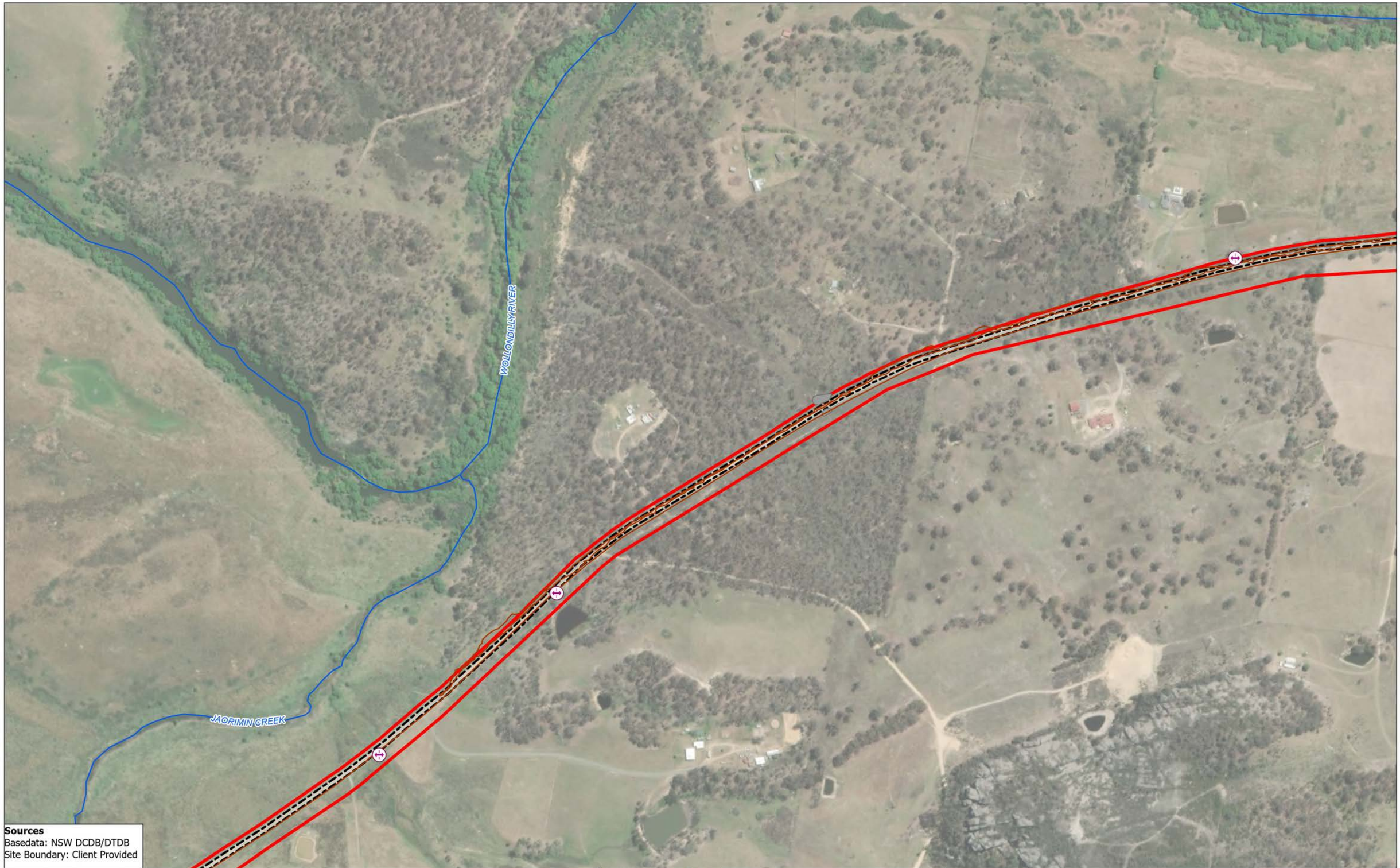
F2-15 Targeted Amphibian Surveys within the Road Resurfacing Project Area
Map 2 of 6

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend
- Project Area
- Development Footprint
- Active listening and call playback (October 2025)
- Opportunistic Survey (October 2025)

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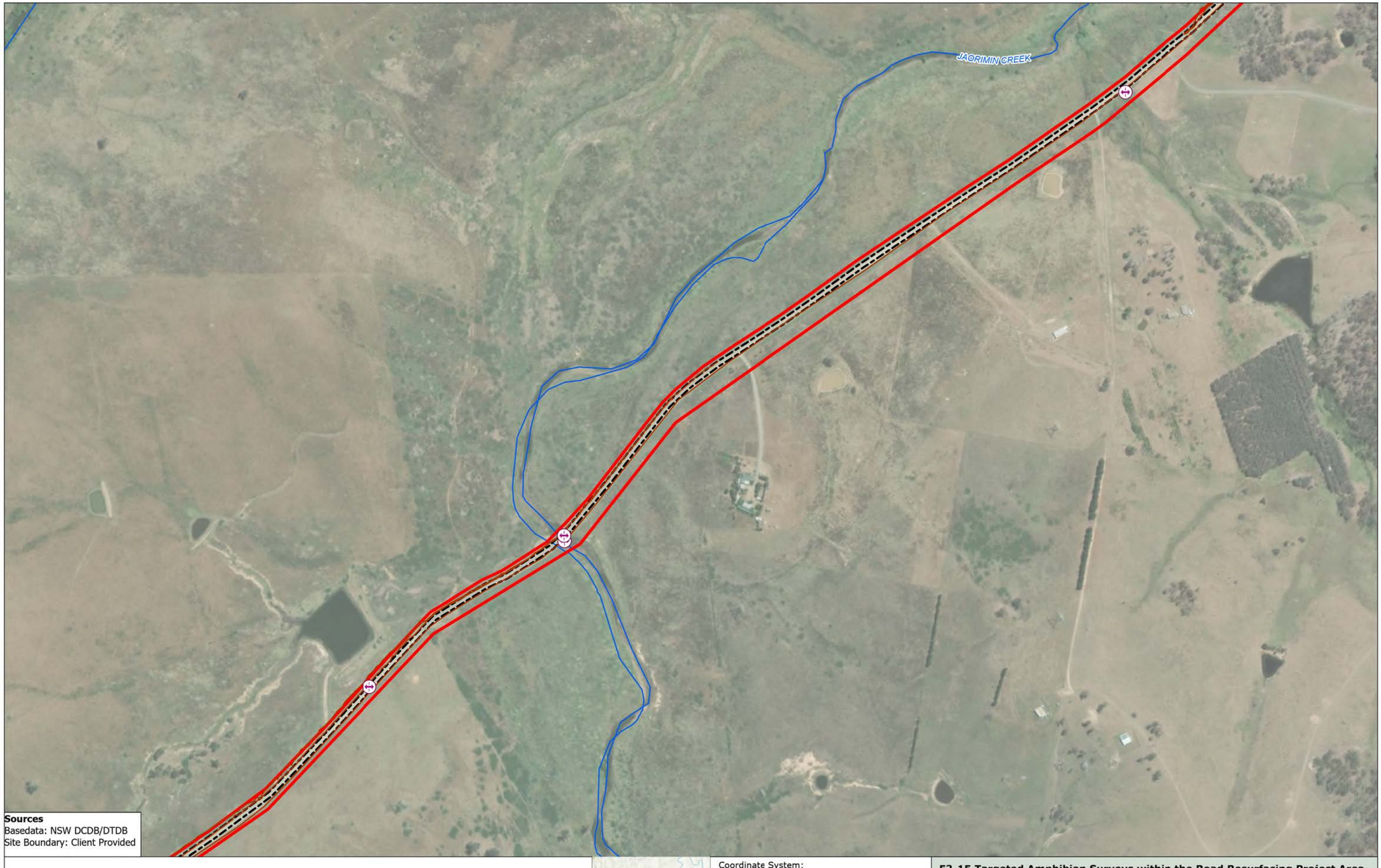
F2-15 Targeted Amphibian Surveys within the Road Resurfacing Project Area Map 3 of 6

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend
- Project Area
- Development Footprint
- Active listening and call playback (October 2025)
- Opportunistic Survey (October 2025)

Coordinate System:
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F2-15 Targeted Amphibian Surveys within the Road Resurfacing Project Area
Map 4 of 6

Canyonleigh Battery Energy Storage System BDAR
X-Elio Aus2

ERM



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Project Area
- Development Footprint
- Frog Transects (October 2025)
- Active listening and call playback (October 2025)
- Opportunistic Survey (October 2025)

Coordinate System:
GDA 1994 MGA Zone 55
Date: 15/01/2026
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0 90 180m
1:5,000

F2-15 Targeted Amphibian Surveys within the Road Resurfacing Project Area Map 5 of 6

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Project Area
- Development Footprint
- Frog Transects (October 2025)
- Active listening and call playback (October 2025)
- Opportunistic Survey (October 2025)



Coordinate System:
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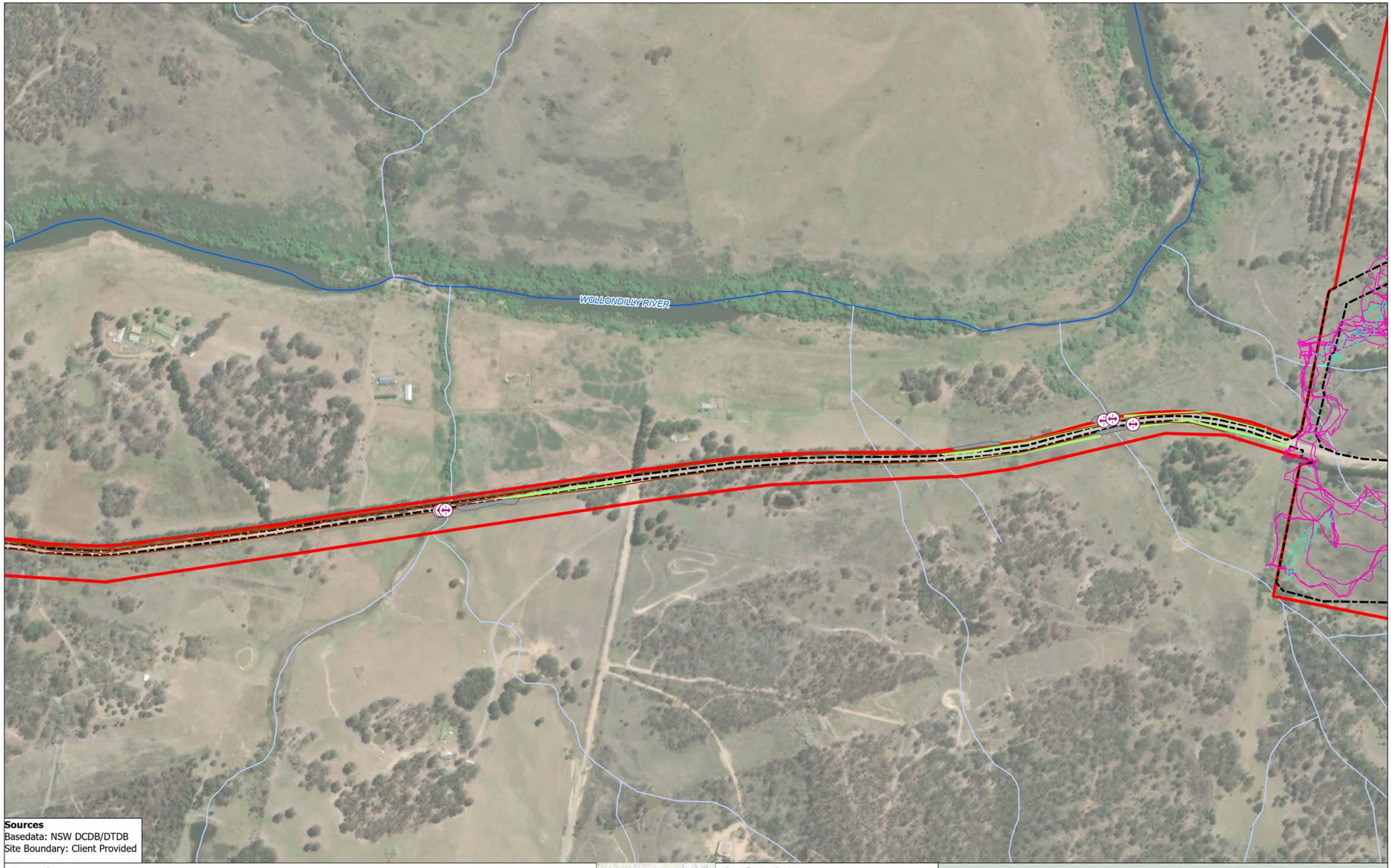
F2-15 Targeted Amphibian Surveys within the Road Resurfacing Project Area
Map 6 of 6

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Project Area
- Development Footprint
- Targeted Keyacris scurra Transects (November 2024)
- Targeted Keyacris scurra Transects (May 2025)
- Targeted Keyacris scurra Transects (October 2025)
- Opportunistic Survey (October 2025)
- Rocky Areas
- Active listening and call playback (October 2025)
- Major Watercourse
- Minor Watercourse

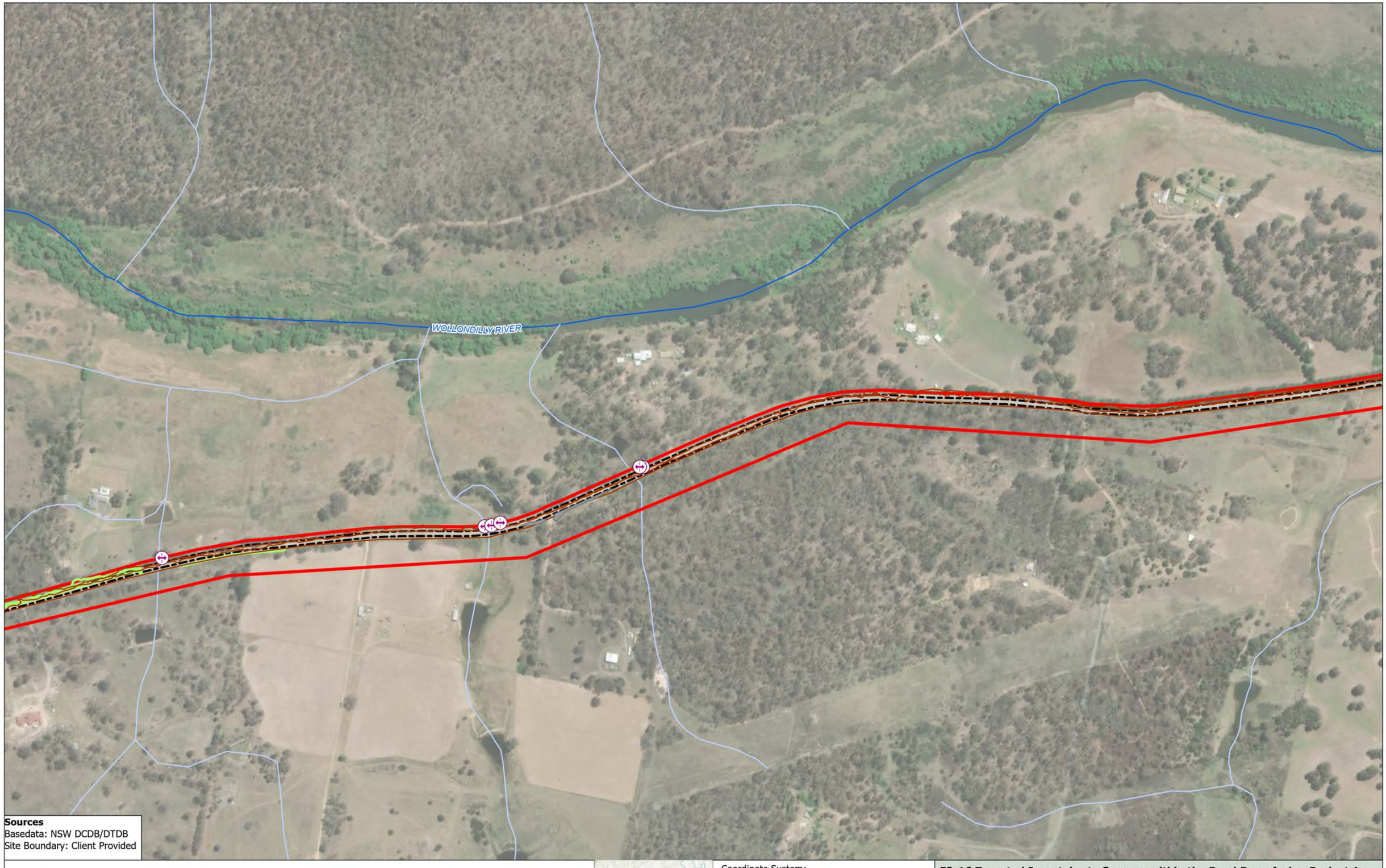
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F2-16 Targeted Invertebrate Surveys within the Road Resurfacing Project Area
Map 1 of 6

Canyonleigh Battery Energy Storage System BDAR
X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Project Area
- Development Footprint
- Targeted Keyacris scurra Transects (October 2025)
- Opportunistic Survey (October 2025)
- Rocky Areas
- Active listening and call playback (October 2025)
- Major Watercourse
- Minor Watercourse



Coordinate System:
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F2-16 Targeted Invertebrate Surveys within the Road Resurfacing Project Area
Map 2 of 6

Canyonleigh Battery Energy Storage System BDAR
X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx

WOLLONDILLY RIVER

JAORIMIN CREEK

Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Project Area
- Development Footprint
- Targeted Keyacris scurra Transects (October 2025)
- Opportunistic Survey (October 2025)
- Rocky Areas
- Active listening and call playback (October 2025)
- Major Watercourse
- Minor Watercourse



Coordinate System:
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F2-16 Targeted Invertebrate Surveys within the Road Resurfacing Project Area Map 3 of 6

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Project Area
- Development Footprint
- Targeted Keyacris scurra Transects (October 2025)
- Opportunistic Survey (October 2025)
- Rocky Areas
- Active listening and call playback (October 2025)
- Major Watercourse
- Minor Watercourse

Coordinate System:
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F2-16 Targeted Invertebrate Surveys within the Road Resurfacing Project Area
Map 4 of 6

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx

Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Project Area
- Development Footprint
- Opportunistic Survey (October 2025)
- Rocky Areas
- Active listening and call playback (October 2025)
- Major Watercourse
- Minor Watercourse



Coordinate System:
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F2-16 Targeted Invertebrate Surveys within the Road Resurfacing Project Area Map 5 of 6

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx

Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Project Area
- Development Footprint
- Targeted Keyacris scurra Transects (October 2025)
- Opportunistic Survey (October 2025)
- Rocky Areas
- Active listening and call playback (October 2025)
- Major Watercourse
- Minor Watercourse



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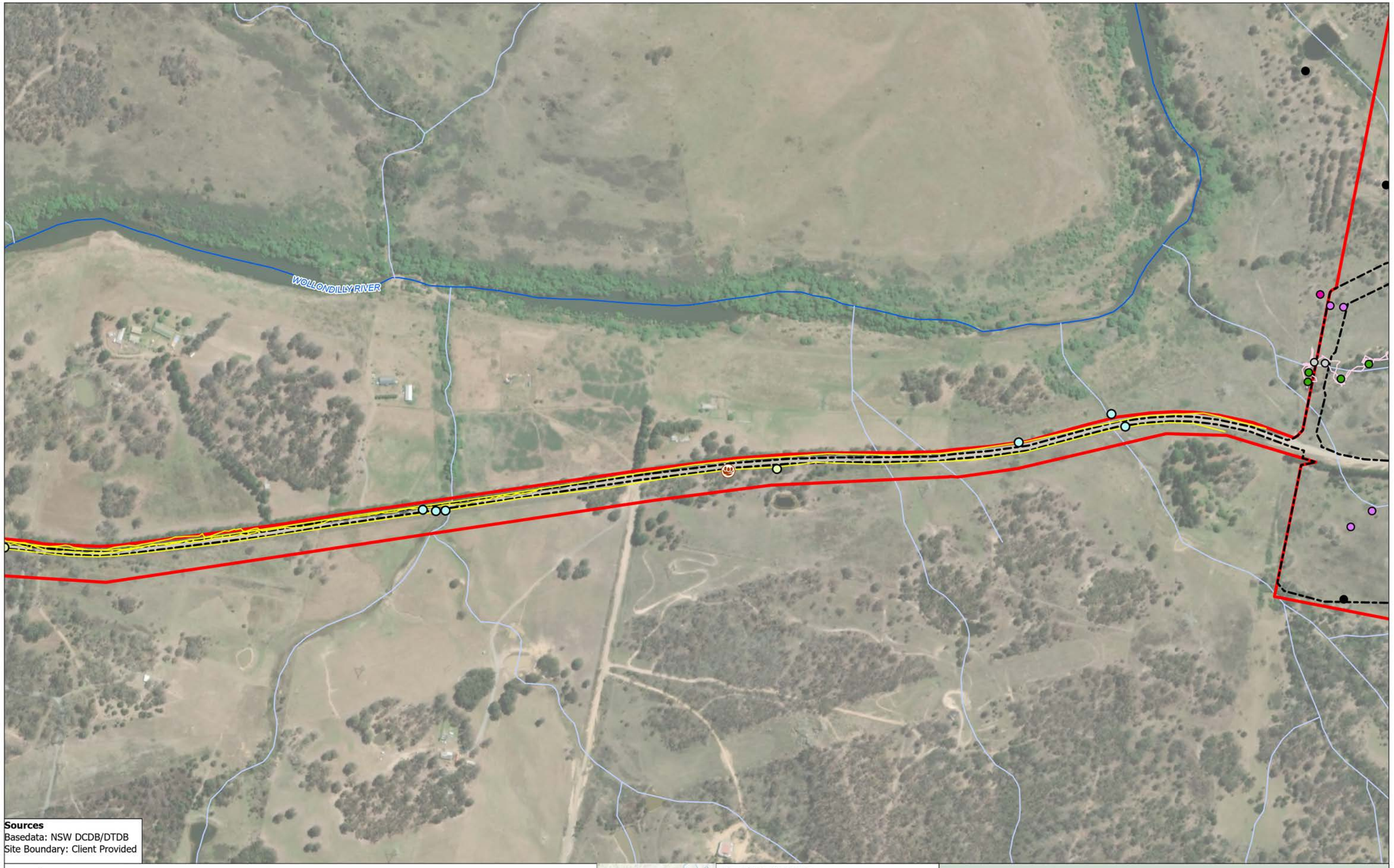
F2-16 Targeted Invertebrate Surveys within the Road Resurfacing Project Area Map 6 of 6

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend
- Project Area
- Development Footprint
- Hollow Bearing Trees (May 2025)
- Song Meter Mini (owls)
- Bird Census (January 2025)
- Bird Census (November 2024)
- Nocturnal Call Playback & Spotlighting (January 2025)
- Bird Cencus (October 2025)
- Bird Census (May 2025)
- Opportunistic surveys (October 2025)
- Owl Call Playback (October 2025)
- Stick Nests
- Major Watercourse
- Minor Watercourse

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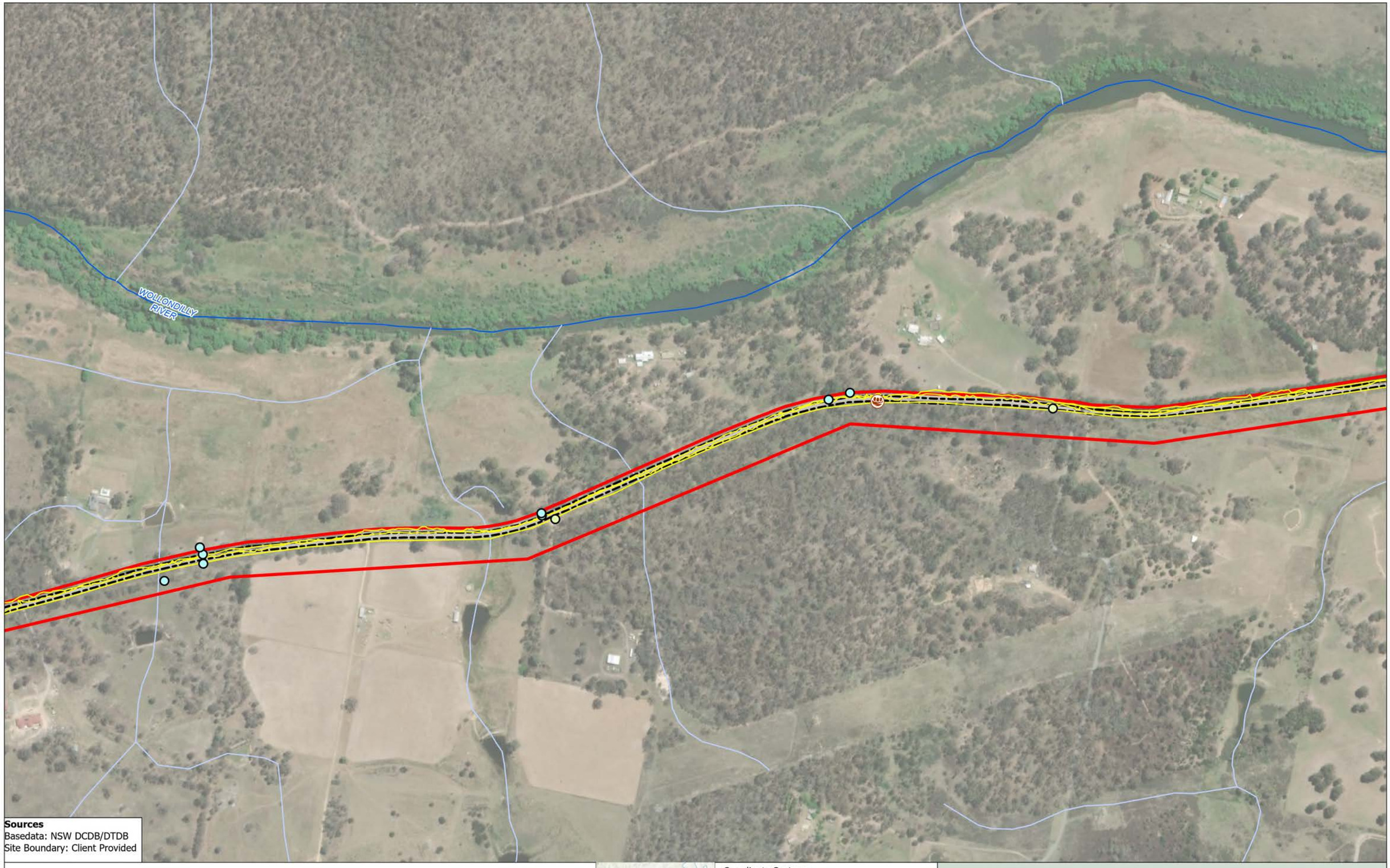
F2-17 Targeted Bird Surveys within the Road Resurfacing Project Area Map 1 of 6

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend
- Project Area
- Development Footprint
- Bird Cencus (October 2025)
- Opportunistic surveys (October 2025)
- Owl Call Playback (October 2025)
- Stick Nests
- Major Watercourse
- Minor Watercourse

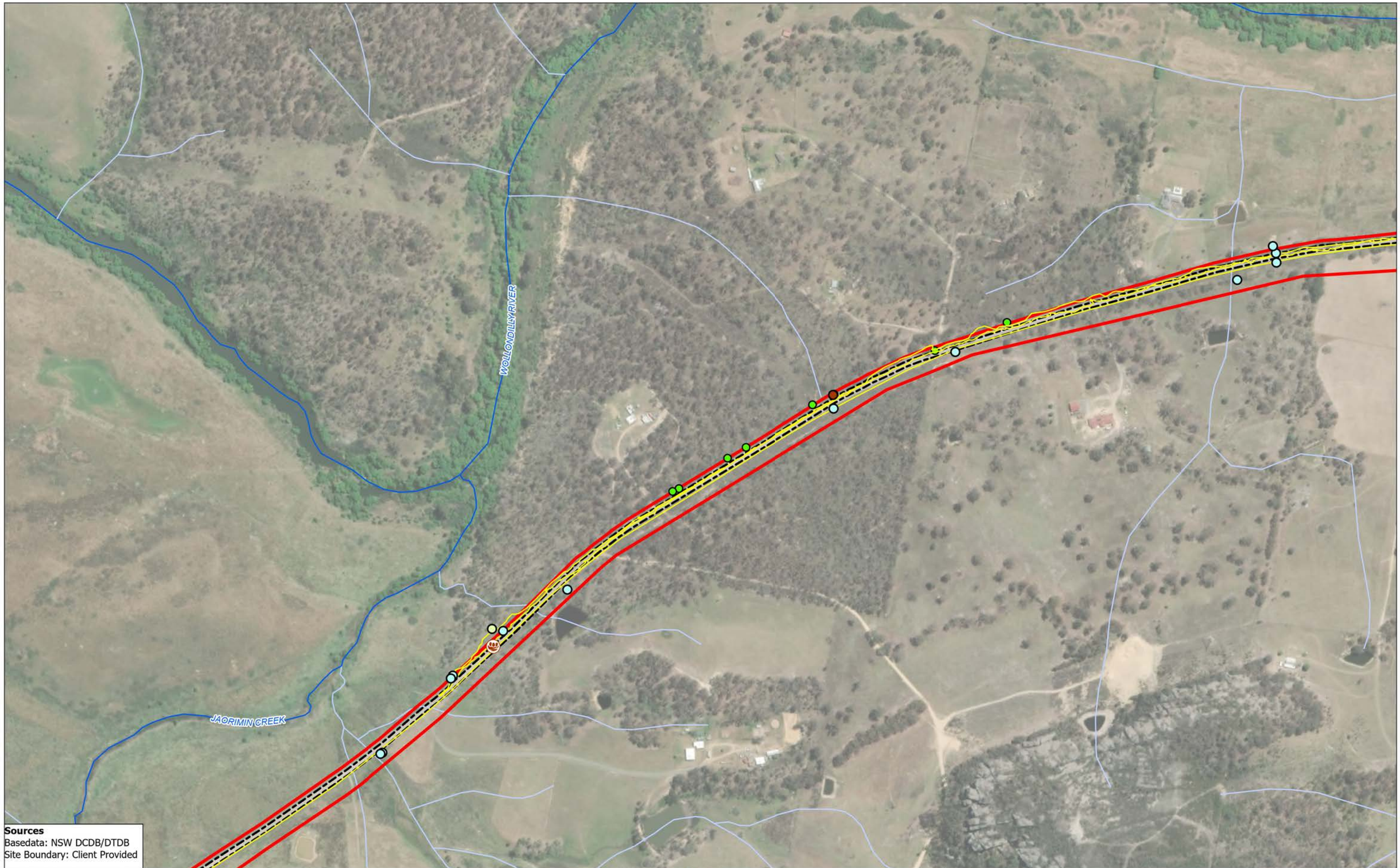
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F2-17 Targeted Bird Surveys within the Road Resurfacing Project Area
Map 2 of 6

Canyonleigh Battery Energy Storage System BDAR
X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Project Area
- Development Footprint
- Bird Cencus (October 2025)
- Opportunistic surveys (October 2025)
- Owl Call Playback (October 2025)
- Stag Watch (October 2025)
- Stick Nests
- Major Watercourse
- Minor Watercourse
- Hollow Bearing Trees (October 2025)

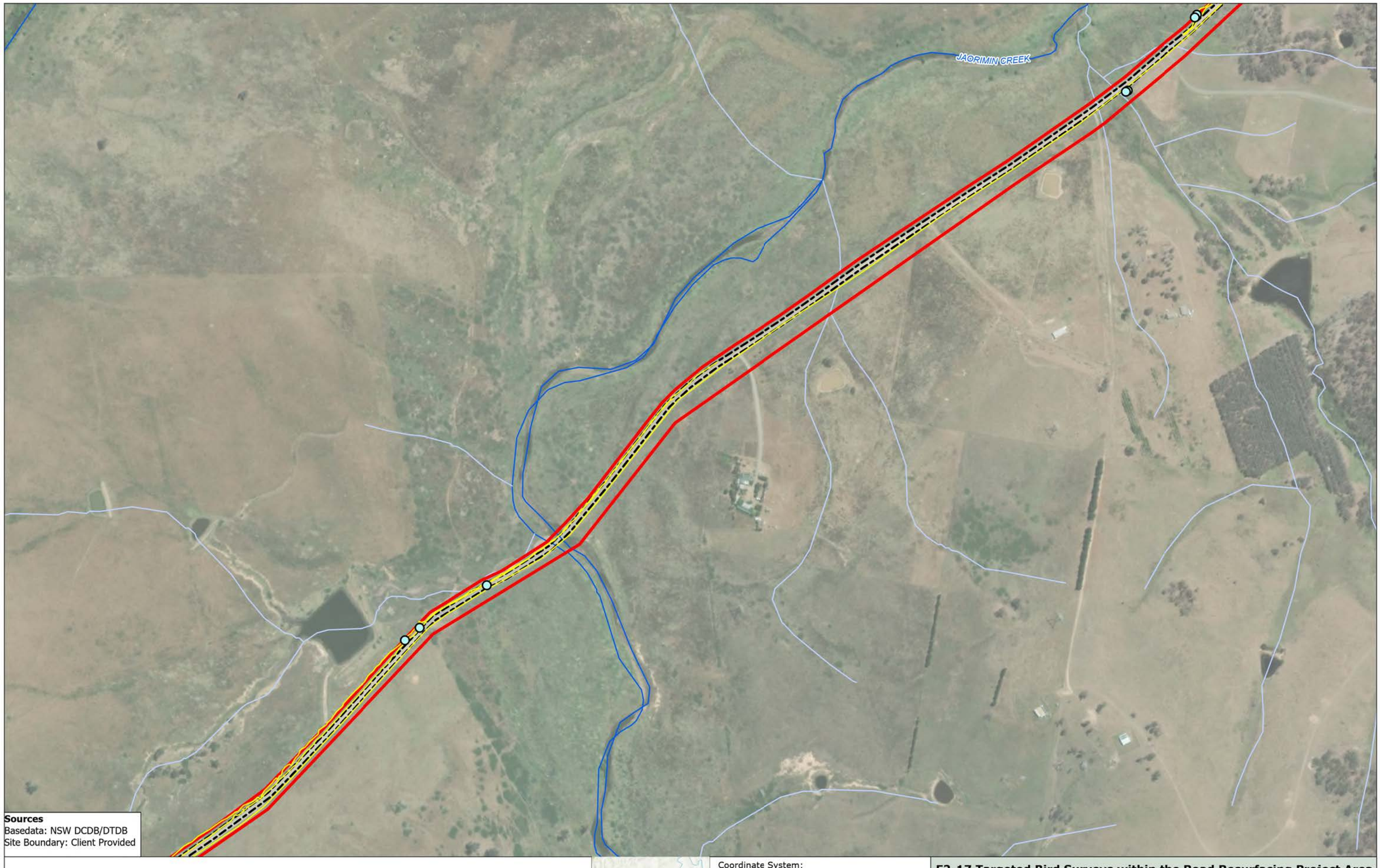
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F2-17 Targeted Bird Surveys within the Road Resurfacing Project Area
Map 3 of 6

Canyonleigh Battery Energy Storage System BDAR
X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend
- Project Area
- Development Footprint
- Bird Census (October 2025)
- Opportunistic surveys (October 2025)
- Major Watercourse
- Minor Watercourse

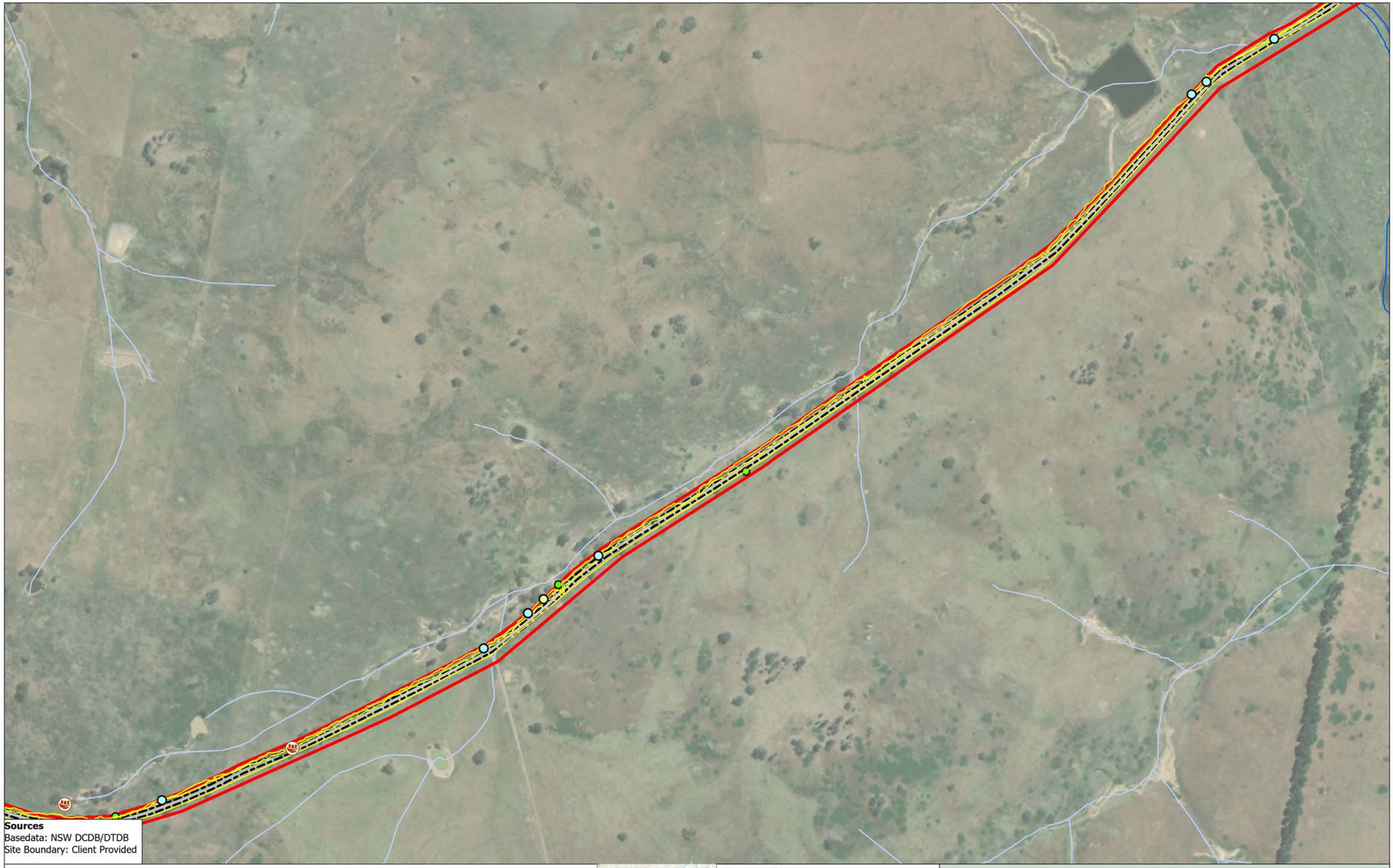
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F2-17 Targeted Bird Surveys within the Road Resurfacing Project Area
Map 4 of 6

Canyonleigh Battery Energy Storage System BDAR
X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Project Area
- Development Footprint
- Bird Cencus (October 2025)
- Opportunistic surveys (October 2025)
- Owl Call Playback (October 2025)
- Stick Nests
- Major Watercourse
- Minor Watercourse
- Hollow Bearing Trees (October 2025)

Coordinate System:
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Created By: NB
Drawing Size: A3
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F2-17 Targeted Bird Surveys within the Road Resurfacing Project Area Map 5 of 6

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx

Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Project Area
- Development Footprint
- Bird Cencus (October 2025)
- Opportunistic surveys (October 2025)
- Owl Call Playback (October 2025)
- Stick Nests
- Major Watercourse
- Minor Watercourse
- Hollow Bearing Trees (October 2025)



Coordinate System:
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Date: 15/01/2026
Created By: NB
Drawing Size: A3
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F2-17 Targeted Bird Surveys within the Road Resurfacing Project Area Map 6 of 6

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx

Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Project Area
- Development Footprint
- Hollow Bearing Trees
- Song Meter Mini (bats)
- Camera Trap Locations
- Spotlighting
- Koala SAT - Centre Tree
- Koala SAT - Trees
- Grey-headed Flying Fox Dusk Searches
- Stick Nests
- Rocky Areas
- Habitat Assessment (August 2025)

Coordinate System:
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Date: 12/01/2026
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Drawing Size: A3
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F2-18 Targeted Mammal Surveys within the Roadworks Project Area Map 1 of 6

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx

Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend
- Project Area
- Development Footprint
- Stick Nests
- Rocky Areas
- Habitat Assessment (August 2025)



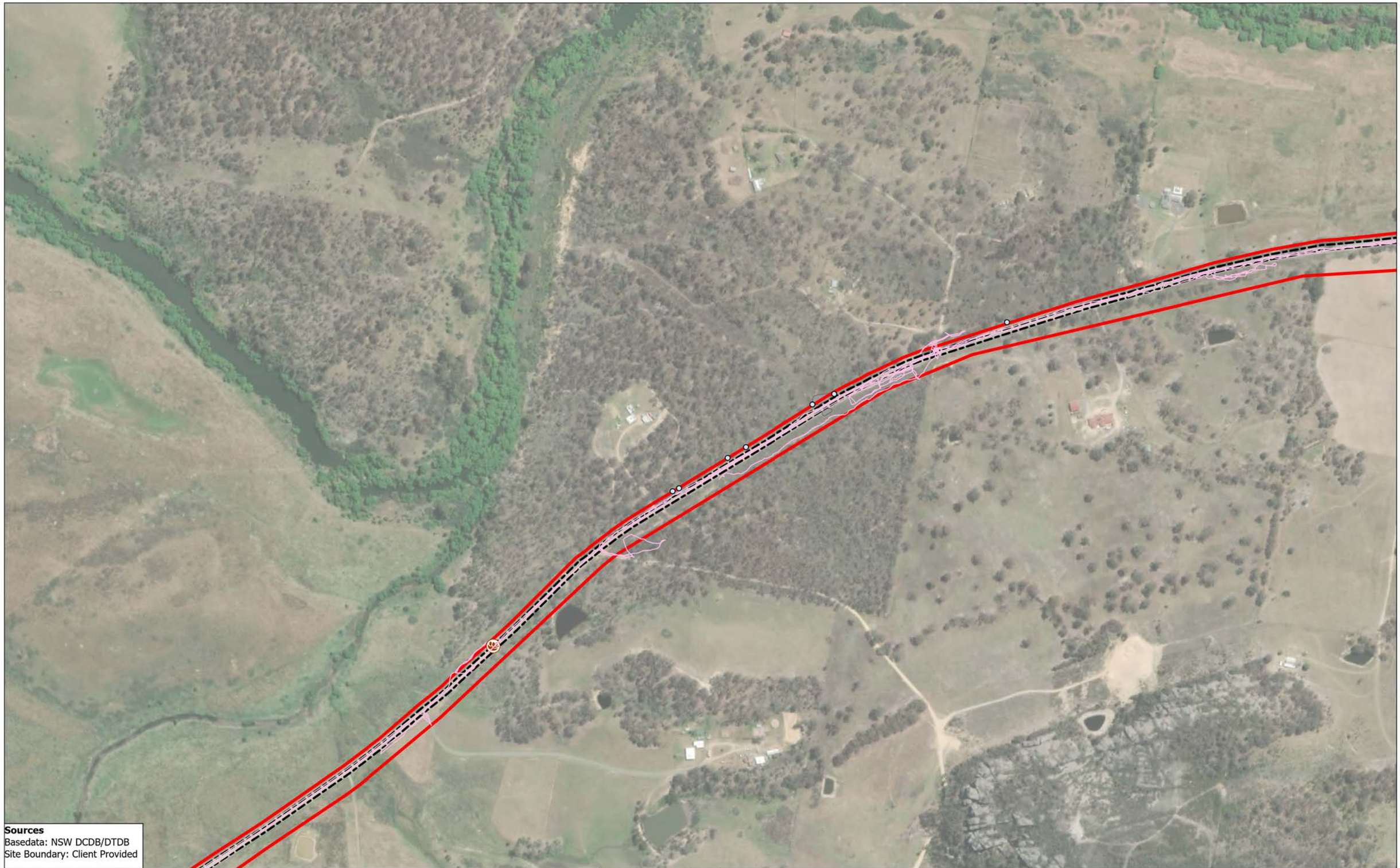
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F2-18 Targeted Mammal Surveys within the Roadworks Project Area
Map 2 of 6

Canyonleigh Battery Energy Storage System BDAR
X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Project Area
- Development Footprint
- Hollow Bearing Trees
- Stick Nests
- Rocky Areas
- Habitat Assessment (August 2025)

Coordinate System:
GDA 1994 MGA Zone 55

Date: 12/01/2026
Created By: NB
Drawing Size: A3

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F2-18 Targeted Mammal Surveys within the Roadworks Project Area Map 3 of 6

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx

Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend
Project Area
Development Footprint
Habitat Assessment (August 2025)

Coordinate System:
GDA 1994 MGA Zone 55
Date: 12/01/2026
Created By: NB
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F2-18 Targeted Mammal Surveys within the Roadworks Project Area
Map 4 of 6

Canyonleigh Battery Energy Storage System BDAR
X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

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Coordinate System:
GDA 1994 MGA Zone 55

Date: 12/01/2026
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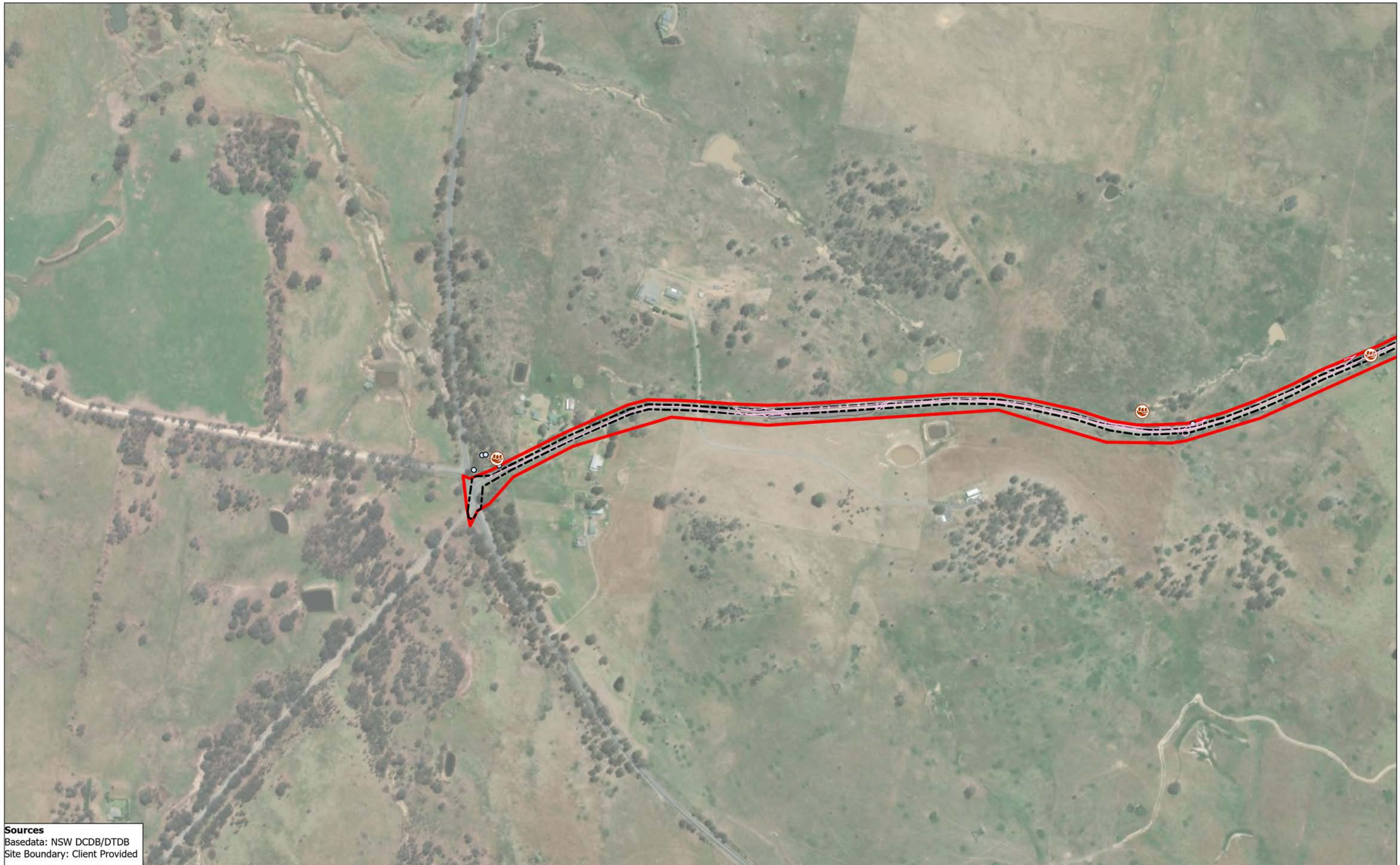
F2-18 Targeted Mammal Surveys within the Roadworks Project Area Map 5 of 6

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Project Area
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Date: 12/01/2026
Created By: NB
Drawing Size: A3

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F2-18 Targeted Mammal Surveys within the Roadworks Project Area Map 6 of 6

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx

2.3.5 WEATHER CONDITIONS

The weather conditions during the field survey events were appropriate for the survey of a variety of flora and fauna. Daily weather observations were taken from the following nearby Bureau of Meteorology (BoM) weather stations:

- Goulburn Airport AWS (Station No. 070330);
- Marulan (George St) (Station No. 070063); and
- Goulburn TAFE NSW (Station no. 070263).

A summary of the recorded conditions on the Subject Land during the survey periods are provided in Table 2-7.

TABLE 2-7 WEATHER CONDITIONS DURING SURVEYS IN THE SUBJECT LAND

Date	Minimum Temperature (˚C)	Maximum Temperature (˚C)	Rainfall (mm)	Wind Direction and Speed (km/h) at 9am
Summer 2024				
19 January	10.1	25.6	0	W 28
20 January	15.7	28.7	0	N 9
21 January	11.1	32.4	0	NW 6
22 January	12.3	23.3	0	E 9
23 January	13.8	25.1	0	NE 9
Autumn 2024				
29 April	1.0	21.6	0	NE 9
30 April	9.6	12.4	6.0	SE 9
1 May	0.3	16.1	0	SE 9
Spring 2024				
23 October	4.9	23.4	0	NW 9
24 October	3.8	19.9	0	WNW 17
11 November	11.1	22.7	0	ENE 11
12 November	10.2	23.9	0	SE 15
13 November	9.2	24.5	0	N 11
January 2025				
22 January	11.8	34.0	0	NW 20
23 January	13.6	19.7	0	E 24
29 January	13.0	24.1	0	E 17
30 January	11.2	22.8	0	SE 2
31 January	15.0	20.2	4.0	SE 15
February 2025				
1 February	13.8	27.5	0	E 13
2 February	14.7	29.4	0	N 13

Date	Minimum Temperature (˚C)	Maximum Temperature (˚C)	Rainfall (mm)	Wind Direction and Speed (km/h) at 9am
3 February	8.5	30.7	0	N 6
4 February	11.3	34.3	0	NNW 9
5 February	17.0	32.0	0	Calm
6 February	14.7	30.6	10	NNE 7
7 February	11.9	33.9	0	Calm
8 February	17.0	28.6	0	SE 11
9 February	14.2	25.8	23.0	SE 11
10 February	15.4	22.1	10.0	SW 13
11 February	13.5	26.2	10.0	ENE 7
12 February	14.0	25.7	2.0	SSE 6
27 February	14.8	31.1	0	Calm
28 February	13.8	32	0	W 15
Autumn 2025				
11 April	4.7	27.3	0	WNW 15
19 May	6.2	12.9	0.4	SEE 19
20 May	1.5	14.1	0	SE 22
29 May	-2.5	14.3	0	N 9
Winter 2025				
12 August	0.8	14.5	0	WNW 4
13 August	-1.7	14.6	0	N 7
14 August	0.5	14.2	0.2	S 9
15 August	0.1	15.5	0.2	WNW 6
16 August	2.7	11.9	0	W 35
Spring 2025				
7 October	3.4	18.6	0	WNW 9
8 October	4.5	20.9	0.6	NNE 20
9 October	6.8	26.4	0	WNW 9
10 October	15.4	22.0	0	WNW 20
11 October	13.1	22.1	0	W 30
12 October	9.3	23.5	0	WNW 20
13 October	8.4	19.2	1.8	WSW 31

W=West, N=North, E=East, NW=Northwest, NE=Northeast, SE=Southeast, WNW=West Northwest, ENE=East Northeast, Calm=No wind, NNW=North Northwest, NNE=North Northeast

Source: Goulburn, NSW – Daily Weather Observations (BoM, 2025)

2.3.6 ASSUMPTIONS, LIMITATIONS AND DISCLAIMERS

The field and desktop assessments undertaken to inform this report provides a detailed overview of the biodiversity values that exist within the Subject Land. However, results are potentially limited by the inherent nature of the native vegetation communities and targeted species.

2.3.6.1 ROAD RESURFACING DEVELOPMENT FOOTPRINT

The Road Resurfacing Development Footprint was added to the project following the completion of previous targeted surveys in 2024. Additional targeted surveys were completed in 2025 and has been addressed separately to the BESS Development Footprint to provide clarity in impact assessment in the stages of this report.

The field assessments undertaken to inform this report in relation to the Road Resurfacing Development Footprint provides a detailed assessment of the biodiversity values that exist within the available road reserve. However, as surveys were limited to only occur within areas of accessible road reserve and not within adjoining properties, results are potentially limited by the inherent nature of the accessibility to complete comprehensive surveys.

2.3.6.2 MAPPING OF NATIVE VEGETATION, PCTS AND BROAD CONDITION STATES

Vegetation mapping and classification (i.e., PCTs and broad condition states) is iterative involving analysis of field survey/observations and desktop analysis. Aerial photography interpretation performed prior to field survey was used to inform survey design, with data obtained from field surveys used to re-interpret vegetation type and condition mapping. Updates to vegetation type and broad condition state mapping occurred throughout this process.

Vegetation classifications are informed by quantitative analytical methods, as required by the BAM. This approach reduces the potential for cognitive bias to adversely influence PCT and condition state assignments. This process may require the use of data obtained from an imperfect sampling design where unavoidable influences from land use related disturbance may inherently confound the analysis. This effect has been minimised where possible.

2.3.6.3 EVALUATING VEGETATION INTEGRITY

Variation in flora composition and structure can occur over time and is likely due to natural seasonal variation, severe weather/climatic events (e.g., drought, floods and fire), land use history and pest vertebrate/invertebrate impacts. The effect of this variation has been limited, where possible, by performing surveys in appropriate conditions to minimise any adverse impact on survey results and associated data analysis contained in this report.

Observer variation is also anticipated where teams of ecologists are used to obtain data from the Subject Land over the course of all investigations. The effect of this has been minimised, where possible, through post survey data review and discussion with investigators. In this instance, the percentage (%) cover or abundance of non-native species were not recorded, including the high threat weeds, when completing several of the BAM plots (BAM11 – BAM22) As such, informed assumptions on these values using photographs and data from previous BAM plots (BAM1-BAM10) has occurred.

2.3.6.4 CANDIDATE SPECIES

The BAM states that the accredited assessor must use the following databases published by the NSW Department of Planning, Industry and Environment (s1.4.1 of the BAM):

- BioNet Vegetation Classification;
- BioNet Threatened Biodiversity Data Collection; and
- BioNet Atlas.

The threatened species survey requirements are primarily governed by the candidate species outputs from the BAM-C, which is obtained from the above BioNet resources. Some of these species may be identified by a pseudoscientific decision framework (e.g., generalised assignment of a threatened species to multiple PCTs at a vegetation class or formation level, often from a single recorded observation within an IBRA bioregion).

This BDAR has considered these databases and used this information to contextualise threatened species associations generated by the BAM-C (i.e., Candidate species output). Notably, this information has been used to consider the six steps of assessment for candidate species as required by s5.2 of the BAM.

2.3.6.5 TARGETED SURVEYS

Targeted field surveys for threatened flora and fauna have been conducted in habitat throughout the Subject Land, leading to design refinements preceding the current Development Footprint. A period of several seasons or years is often needed to identify all the species present in an area, especially as some species are only apparent at certain times of the year (e.g., orchids, migratory birds) and require specific weather conditions for optimum detection.

These potential limitations have been addressed by the application of the precautionary principle (assumed presence), applied where habitat was identified, or species were predicted to utilise habitat components at some stage during their life cycle and survey effort was insufficient to detect species.

2.3.6.6 FLORA TRANSECTS

Only one of the two ecologists surveying recorded their tracks during the parallel field traverse surveys for threatened floras species. To account for this limitation in the survey effort calculations, the area covered by one transect has been doubled. The flora transect survey effort is extensive, and it is clear the whole Development Footprint has been covered.

Surveys within the Road Resurfacing Development Footprint encompassed all areas of accessible vegetation following the existing pathway of Canyonleigh Road for approximately 10 km from the BESS Development Footprint site access point to the intersection of Canyonleigh Road and Brayton Road. Due to the confined nature of the road reserve and limitations with applications, floristic survey tracks along the Road Resurfacing Development Footprint were not recorded. However, points of interest were marked and recorded in FieldMaps.

2.3.6.7 GENOPLESIUM SUPERBUM

The recommended survey period for *G. superbum* as identified in BioNet occurs from February to March. 10m parallel transects were conducted across 0.57 ha of potential habitat within PCT 3746 during the February survey period. The survey effort covered all areas which provided

the suitable conditions for the species in the northern section of the BESS Development Footprint. The southern section is substantially degraded, such that the species is unlikely to utilise this area. Therefore, this section was not subject to targeted surveys. Opportunistic searches were also completed in February, during two different survey events (February 2024 and February 2025) and the species was not detected. Therefore, the target species was not recorded, and the survey effort is deemed sufficient.

Within the Road Resurfacing Development Footprint, surveys not able to be completed within the February to March survey period for this species. Therefore, this species has been assumed present within areas of potential habitat.

2.3.6.8 FAUNA TRANSECTS

The following surveys should be completed along transects through suitable habitat, ensuring representative coverage of PCTs where possible:

- Aural Visual Surveys
- Spotlighting
- Bird Censuses
- Grey Headed Flying Foxes Dusk Searches

However, the Project design has avoided any significant woodland or shrubland and consists almost entirely of grassland habitat within the BESS Development Footprint, which does not provide suitable features for the surveys listed above. Based on this, it was considered appropriate to identify the best available/viable habitat within the BESS Development Footprint, then complete a detailed 'meander-wander' around a 100m buffer cantered on the viable habitat. This allowed the survey team to focus on the small areas where they were more likely to find the species within the BESS Development Footprint, rather than traversing unsuitable habitat (open grassland with no trees).

Limitations to fauna surveys with the Road Resurfacing Development Footprint were associated with accessibility to adjoining properties where habitat features were largely present. However, surveys were completed across the extent of the Road Resurfacing Development Footprint and are considered to have saturated the road reserve with survey. Fauna transects were completed within the Road Resurfacing Development Footprint and included:

- Aural Visual Surveys
- Spotlighting
- Bird Censuses

Dusk searches and Fly-out watches for the Grey-headed Flying-fox were undertaken in areas within proximity (approximately 200 m) to Wollondilly River.

2.3.6.9 BAT CALL MONITORING

The recommended survey period for the Large-eared Pied Bat is between November and January. The monitoring across the BESS Development Footprint was undertaken at the end of January into February, with two detectors out for 10 nights within the recommended survey period. An additional 24 nights (two detectors for 12 nights) were then carried out from 1 February 2025 to the 12 February 2025. Monitoring across the Road Resurfacing Development Footprint was undertaken during surveys in October 2025 with two detectors out for 6 nights to capture microbat activity within the road reserve.

There is limited information on the preferred conditions for the species, but Table 2-7 shows that the weather conditions in February 2025 remained similar to those in January 2025. Therefore, even though a portion of the survey effort was completed just outside the recommended window, the survey effort is still considered valid.

2.3.6.10 KEYS MATCHSTICK GRASSHOPPER

BESS Development Footprint

Only one set of tracks were recorded for the targeted insect surveys in November 2024 across the BESS Development Footprint, even though two ecologists completed the survey. When working out the survey effort, the tracks were doubled to account for both ecologists. Further to this, the species was re-surveyed on 29 May 2025, recording parallel transects that covered the entire BESS Development Footprint.

The survey completed on the 29 May 2025, was at the end of the recommended survey window and the conditions did not meet those set out in the guidelines (at least 4 hours in the middle of the day with temps over 18 degrees (NSW DCCEEW, 2025)). Despite this, multiple (100+) Keys Matchstick Grasshoppers were detected. Based on this result, the survey is considered valid even though the conditions did not meet the requirements set out in the guidelines.

Road Resurfacing Development Footprint

Targeted surveys were undertaken within the accessible road reserve in October 2025, consisting of two teams of two ecologists. Survey locations were recorded using FieldMaps where possible. However, limitations with the application were experienced by all surveyors and tracks for targeted insect surveys were only partially recorded accurately. Survey locations for the species that occurred after the 10th October 2025 are considered approximate locations due to technological challenges.

2.3.7 LICENSING

Regarding the flora and fauna surveys conducted for this BDAR, ERM operated under the Scientific Licence of SL100196 and Animal Ethics Accreditation number 53055.

3. SITE CONTEXT

3.1 LANDSCAPE FEATURES

Site context features have been identified through a combination of site surveys, desktop assessment of publicly available, relevant digital mapping layers and aerial imagery. Table 3-1 presents the site context features for the Subject Land. Where possible, landscape features have been identified on the Site Map provided in Figure 3-1 and the Location Map including the assessment area provided in Figure 3-2.

TABLE 3-1 LANDSCAPE FEATURES OF THE SUBJECT LAND

Landscape Feature	Description
IBRA Bioregion and Subregion	The Subject Land occurs within the Bungonia subregion of the NSW South Eastern Highlands IBRA bioregion.
NSW (Mitchell) Landscape Regions	The Subject Land is situated in both the Bungonia Tableland and Gorge, and the Wollondilly-Bindook Tablelands and Gorges NSW Landscape Regions. The Bungonia Tableland and Gorge Landscape Region is situated within the southeast portion of the Subject Land; whilst the Wollondilly-Bindook Tablelands and Gorges Landscape Region mainly encapsulates Canyonleigh Road and the northern portion of the Subject Land. The Bungonia Tableland and Gorge Landscape Region is described as "Tableland on Ordovician and Devonian slate, phyllite and quartzite, a small Carboniferous granodiorite stock, caps of Tertiary quartz sands and gravels and limited basalt. The margin of the tableland is the Great Escarpment and is cut by a 400m deep gorge with vertical walls through west dipping Silurian limestones. Numerous deep caves and dolines present. General elevation 600 to 800m, local relief 500m. Red-brown well structured clay with alkaline pH on limestone, skeletal rubble on scree slopes from slates and volcanics, red and red-yellow texture-contrast profiles over sedimentary rocks on the tableland. Tableland covered by woodland of apple box (*Eucalyptus bridgesiana*), argyle apple (*Eucalyptus cinerea*), broadleaved peppermint (*Eucalyptus dives*), brittle gum (*Eucalyptus mannifera*), drooping red gum (*Eucalyptus parramattensis*), forest red gum (*Eucalyptus tereticornis*), black wattle (*Acacia mearnsii*), Parramatta wattle (*Acacia parramattensis*), kurrajong (*Brachychiton populneus*), black she-oak (*Casuarina litoralis*) with numerous shrubs and grasses. The same trees extend onto the limestone. Species largely limited to the limestone include; eastern bitter bush (*Adriana glabrata*), silver banksia (*Banksia marginata*), Australian senna (*Senna aciphylla*), narrow-leaf logania (*Logania albiflora*), mock olive (*Motelaea longifolia*), slender westringia (*Westringia eremicola*), and passion flower (*Passiflora herbertiana*). Within the gorge, on scree slopes and at the base of high waterfalls rainforest elements occur including; stinging tree (*Dendrocnide* sp.), Maiden's gum (*Eucalyptus maidenii*), sandpaper fig (*Ficus coronata*), rusty fig (*Ficus rubiginosa*), white cedar (*Melia azedarach*), red cedar (*Toona australis*), bleeding heart (*Omalanthus populifolius*), and sweet pittosporum (*Pittosporum undulatum*). River oak (*Casuarina cunninghamiana*) is abundant along the stream banks with some river peppermint (*Eucalyptus elata*)." (NSW DEC, 2002). The Wollondilly-Bindook Tablelands and Gorges Landscape Region is described as "Dissected tablelands, marginal gorges and scree slopes on massive Devonian quartz porphyry and small areas of massive Devonian granite. General elevation 600 to 900m, local relief 250m. Thin gritty uniform profiles on steep slopes and around rock outcrops, grey and yellow texture-contrast profiles on flatter slopes. Woodland and open forest of; forest red gum (*Eucalyptus tereticornis*), yellow box (*Eucalyptus melliodora*), grey box (*Eucalyptus molucanna*), white box (*Eucalyptus albens*), black wattle (*Acacia mearnsii*), Parramatta wattle (*Acacia parramattensis*), black she-oak (*Casuarina litoralis*) with numerous shrubs, bracken (*Pteridium esculentum*) and grasses." (NSW DEC, 2002).

Landscape Feature	Description
Rivers, Streams, Estuaries, and Wetlands	The BESS Development Footprint is located approximately 160 m east of the Wollondilly River. Jaorimin Creek runs through the Road Resurfacing Development Footprint, as well as serval unnamed ephemeral watercourses as per NSW hydrological mapping (NSW Government, 2025). Farm dams also occur throughout the Subject Land, however these artificial features possess low vegetation quality with minimal or no floating, fringing, emerged and submerged vegetation present. The Development Footprint of the Project has avoided these features. There are no Ramsar Wetlands or Important Wetlands as listed in the Directory of Important Wetlands of Australia located within the Subject Land.
Habitat Connectivity	Habitat connectivity throughout the Subject Land is considered moderate. Small patches of woodland occur which provide connectivity to larger vegetated areas within the Subject Land and the surrounding area. Larger patches of vegetation occur in the east and northeast of the Subject Land but otherwise occur predominantly on elevated areas. Corridors of vegetation are mostly restricted to vegetation along fence lines, roadsides and riparian areas. Riparian vegetation present on the western boundary of the Subject Land, near the Wollondilly River, continues westerly and connects with other larger patches of vegetation in the broader landscape. The habitat connectivity present will be of greatest value to fauna species that can cross cleared areas or utilise narrow strips of woody vegetation for dispersal, and for avian species.
Geological Features of Significance	The presence of geological features including karst, caves, crevice and cliffs or other areas of geological significance were assessed throughout the Subject Land during the field surveys. There are some scattered rocks / rocky outcrops within the Subject Land, but no other significant geological features.
Areas of Outstanding Biodiversity Value	The Subject Land is not identified as an Area of Outstanding Biodiversity Value, as defined under the BC Act.
Soil Hazard Features	The overall land and soil capability of the Subject Land is ranked Class 5 (NSW DPIE, 2025). Class 5 land has severe limitations for high impact land management uses such as cropping and includes sloping lands (10–20% slope) containing highly erodible soils and/or significant existing soil erosion. These lands are not generally suitable for cultivation (NSW OEH, 2012). The sodosol soil type is the dominant soil present across the Subject Land, according to the Australian Soil Classification (ASC) Soil Type Map (NSW Government, 2025). Sodosols are categorised as soils which have a strong texture contrast between A and B horizons, with impermeable subsoils, and have very low agricultural potential due to the presence of sodium which can lead to high erodibility and poor structure (Isbell, 2016). A search of the NSW Environment Protection Authority Contaminated Sites Register returned five current results for the Goulburn Mulwaree Council LGA: • Former Goulburn Gasworks, Goulburn; • Goulburn Roundhouse, Goulburn; • Mobil Service Station, Goulburn; • Tarago former Station Masters Cottage, Tarago; and • Tarago Railway Siding, Tarago None of the above results are in proximity to the Subject Land nor are they expected to impact the Project.
Additional landscape features identified in SEARs	No additional landscape features were identified in the SEARs.

3.1.1 AQUATIC HABITAT

The NSW DPI Fisheries Spatial Data Portal was reviewed to determine aquatic values and potential presence of threatened species in the Subject Land listed under the EPBC Act, BC Act as well as the NSW *Fisheries Management Act 1994* (FM Act). The NSW Hydrography mapping and key fish habitats are shown in Figure 3-1

The Subject Land occurs nearby to the Wollondilly River, which saddles the BESS Project Area and runs relatively parallel to the Road Resurfacing Project Area (see Figure 3-1). Additionally, Jaorimin Creek crosses Canyonleigh Road with an existing culvert running in an approximate north-south direction. Both of these waterways have been mapped as Key Fish Habitat, that connect to a network of first and second order streams across the Road Resurfacing Development Footprint.

Impacts to Key Fish Habitats have been avoided by the proposed development with no impacts to Key Fish Habitats likely as a result of the BESS Development Footprint and no impacts to Key Fish Habitats, including those associated with Jaorimin Creek by the Road Resurfacing Development Footprint proposed by the resurfacing activities required.

UPPER LACHLAN

UPPER LACHLAN SHIRE

WOLLONDILLY RIVER

South Eastern Highlands

Bungonia

GOULBURN MULWAREE

Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Project Area
- Development Footprint
- Assessment Area
- Key Fish Habitat
- Rocky Outcrops
- Major Watercourse
- LGAs
- IBRA Bioregions
- IBRA Subregions
- Planted non-native vegetation
- Human made structures

NSW (Mitchel) Landscape boundaries

- Bungonia Tableland and Gorge
- Wollondilly - Bindook Tablelands and Gorges

Coordinate System:
GDA 1994 MGA Zone 55
Date: 15/01/2026
Created By: NB
Drawing Size: A3
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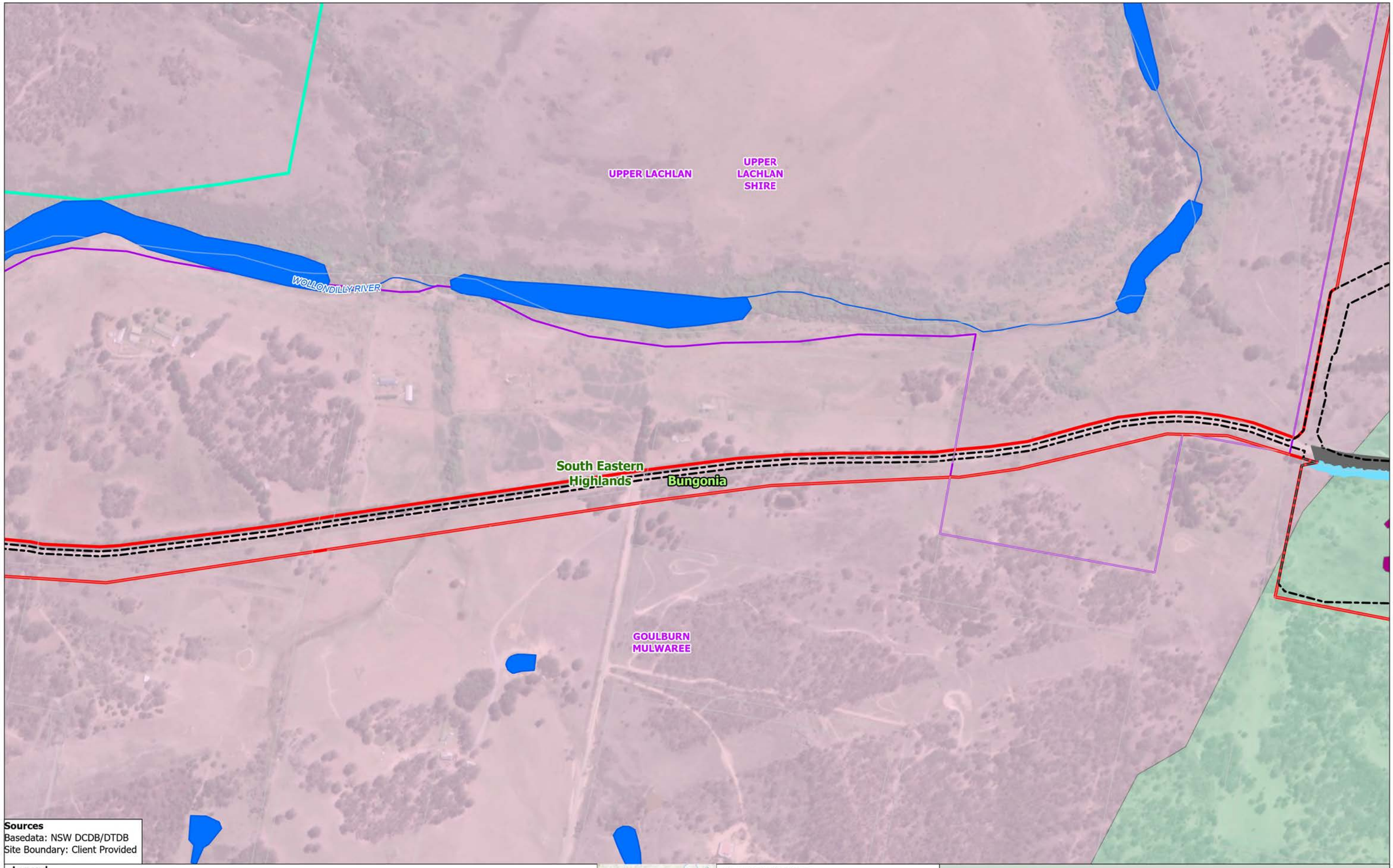
F3-1 Site Map
Map 1 of 7

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

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Sources
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Site Boundary: Client Provided

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F3-1 Site Map
Map 2 of 7

Canyonleigh Battery Energy Storage System BDAR

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ERM

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UPPER LACHLAN SHIRE

UPPER LACHLAN

WOLLONDILLY RIVER

South Eastern Highlands

Bungonia

GOULBURN MULWAREE

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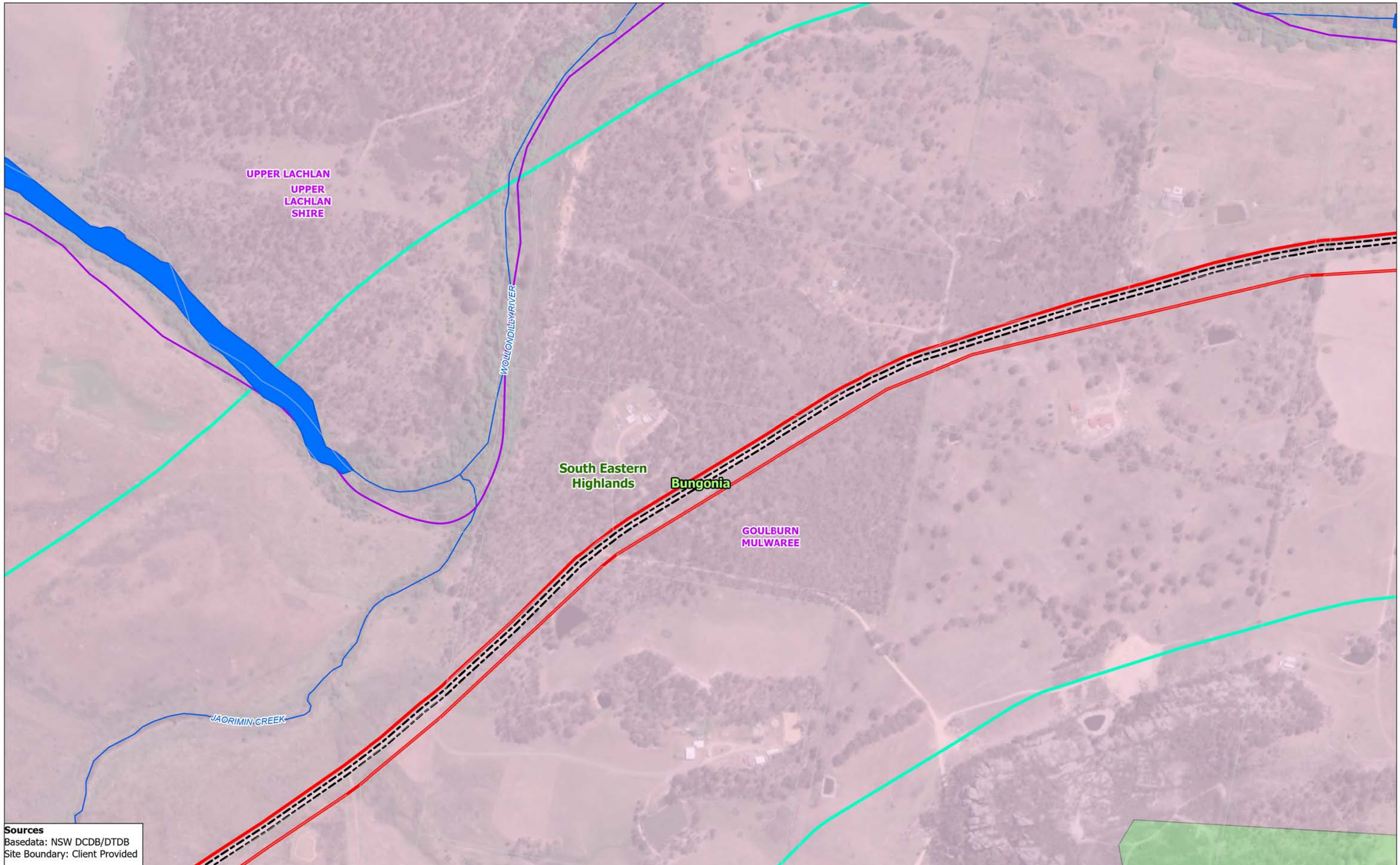
F3-1 Site Map
Map 3 of 7

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

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Site Boundary: Client Provided

Legend

- Project Area
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- Assessment Area
- Key Fish Habitat
- Major Watercourse
- LGAs
- IBRA Bioregions
- IBRA Subregions

NSW (Mitchel) Landscape boundaries

- Moss Vale Highlands
- Wollondilly - Bindook Tablelands and Gorges

Coordinate System:
GDA 1994 MGA Zone 55
Date: 15/01/2026
Created By: NB
Drawing Size: A3
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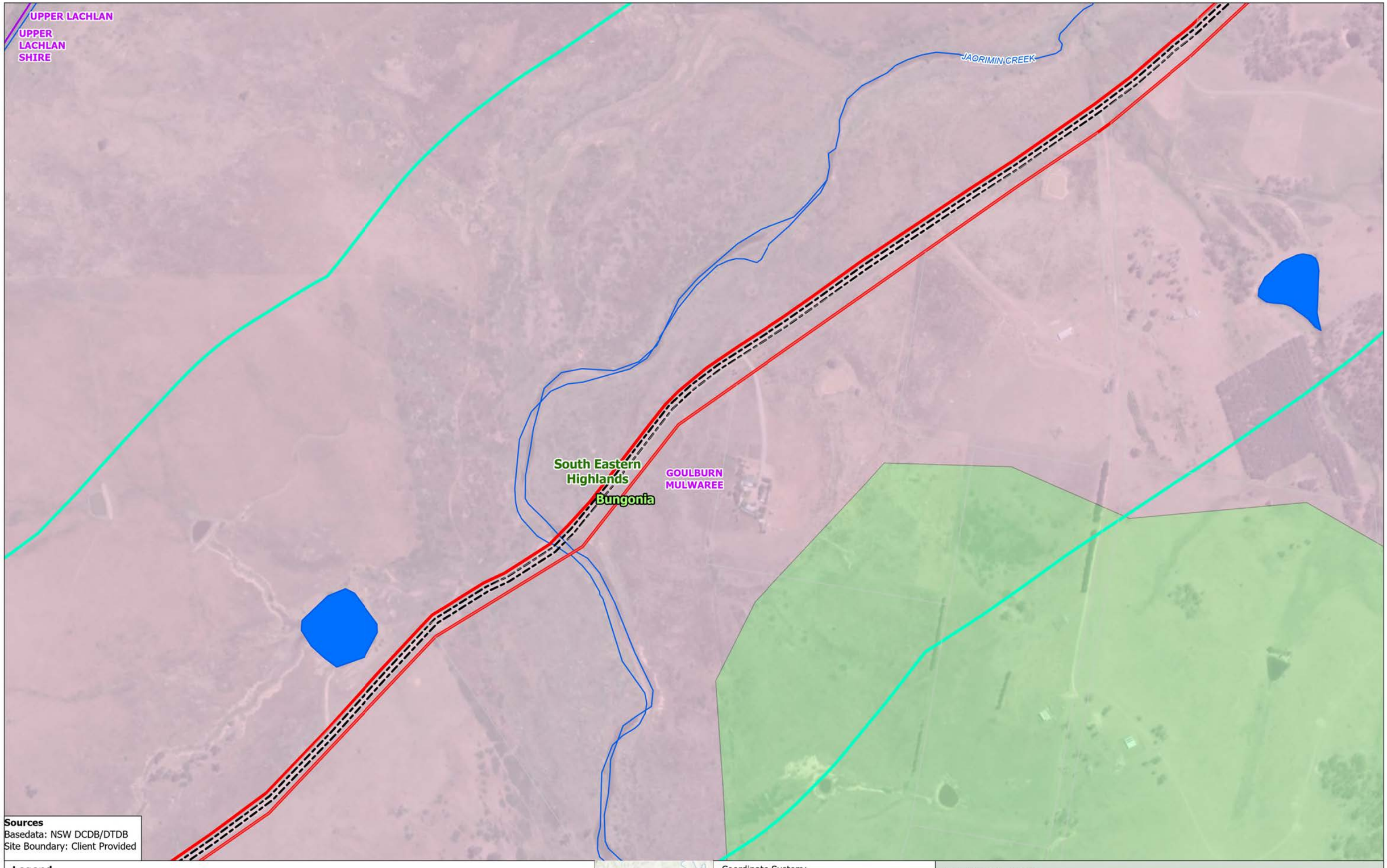
F3-1 Site Map
Map 4 of 7

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx



Sources
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- LGAs
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F3-1 Site Map
Map 5 of 7

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx

South Eastern Highlands

GOULBURN MULWAREE

Bungonia

Sources
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Site Boundary: Client Provided

Legend

- Project Area
- Development Footprint
- Assessment Area
- Key Fish Habitat
- Major Watercourse
- LGAs
- IBRA Bioregions
- IBRA Subregions

NSW (Mitchel) Landscape boundaries

- Wollondilly - Bindook Tablelands and Gorges



Coordinate System:
GDA 1994 MGA Zone 55
Date: 15/01/2026
Created By: NB
Drawing Size: A3
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F3-1 Site Map
Map 6 of 7

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

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South Eastern Highlands

GOULBURN MULWAREE

Bungonia

Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Project Area
- Development Footprint
- Assessment Area
- LGAs
- IBRA Bioregions
- IBRA Subregions

NSW (Mitchel) Landscape boundaries

- Rockley Plains
- Wollondilly - Bindook Tablelands and Gorges



Coordinate System:
GDA 1994 MGA Zone 55
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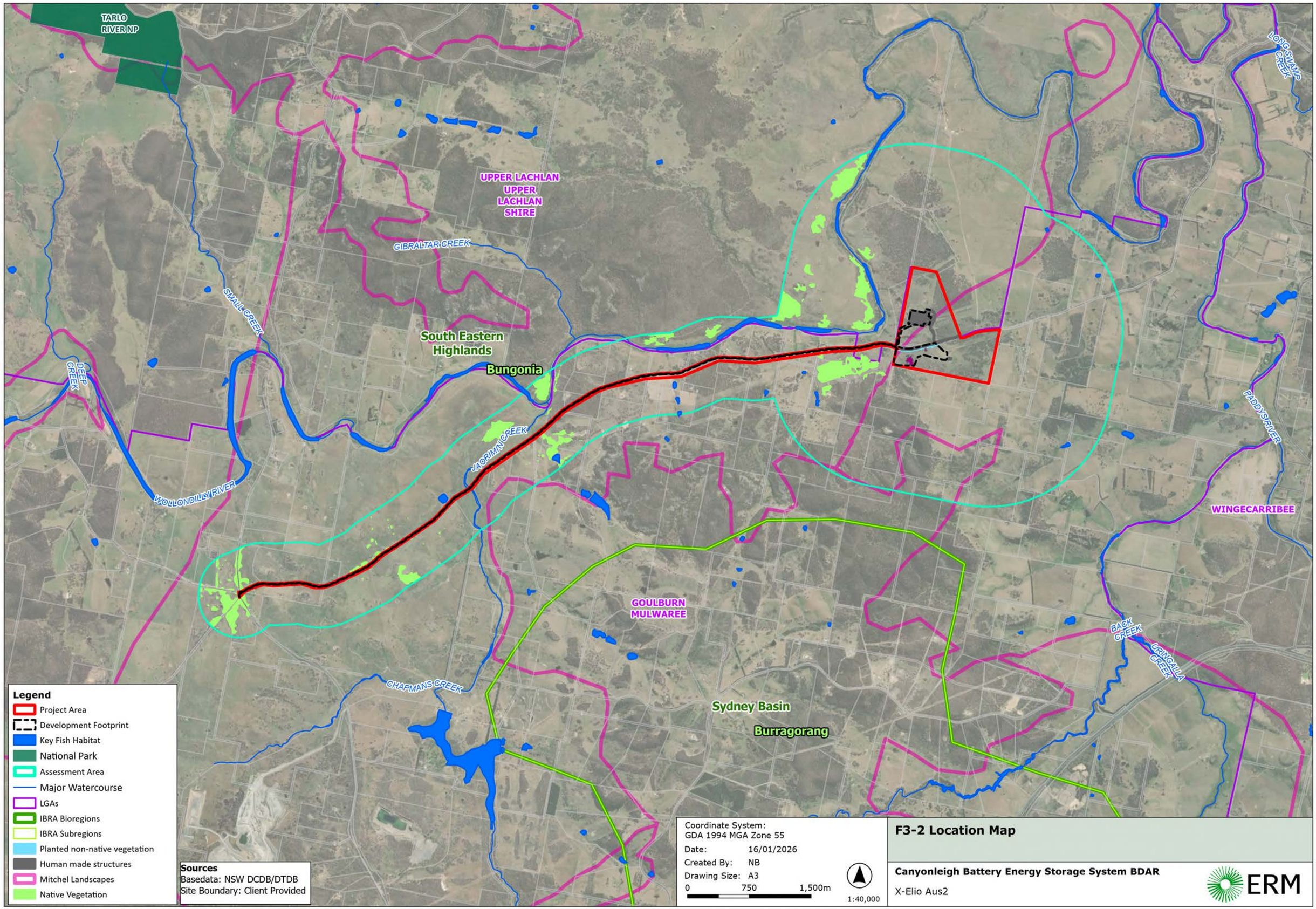
F3-1 Site Map
Map 7 of 7

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

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3.2 NATIVE VEGETATION COVER AND PATCH SIZE

3.2.1 NATIVE VEGETATION COVER

The native vegetation cover of the Assessment Area was determined in accordance with s3.2 of the BAM.

The Assessment Area for a non-linear development is defined as a 1,500 m buffer applied to the BESS Development Footprint and 500m buffer for the linear Road Resurfacing Development Footprint. Native vegetation cover within the Assessment Area is used to inform the BAM-C in predicting Candidate Species relevant to the assessment. Assessment of native vegetation cover beyond that comprehensively ground-truthed within the Subject Land mainly relies on the NSW Native Vegetation Extent layer from SEED (NSW DCCEEW, 2019) and detailed spatial analysis. The extent of native vegetation across the Assessment Area is summarised in Table 3-2 and shown in Figure 3-2.

TABLE 3-2 NATIVE VEGETATION COVER IN THE SUBJECT LAND ASSESSMENT AREA

Aspect	Value
BESS Development Footprint	
Assessment Area type	Site-based
Assessment Area	1,481.94 ha
Total area of native vegetation cover	786.42 ha
Percentage of native vegetation cover	53%
Class (0-10, >10-30, >30-70 or >70%)	>30-70
Road Resurfacing Development Footprint	
Assessment Area type	Linear
Assessment Area	1043.52 ha
Total area of native vegetation cover	587.81 ha
Percentage of native vegetation cover	56%
Class (0-10, >10-30, >30-70 or >70%)	>30-70

3.2.2 PATCH SIZE

Patch size is defined in the BAM As '*an area of native vegetation that occurs on the development site and includes native vegetation that has a gap of less than 100 m from the next area of native vegetation (or ≤30 m for non-woody ecosystems)'* (NSW DPIE, 2020). A patch size may extend onto adjoining land that is not part of the Subject Land.

Vegetation Zones (VZs) within the BESS Project Area were all considered to have a patch size of >100 ha with the Assessment Area considered well-connected to woody and non-woody (grassland) native vegetation. Similarly, patch size within the Road Resurfacing Project Area has been classified as >100 ha for each VZ due to the extent of native grasslands that provide connections between non-woody and woody ecosystems.

4. NATIVE VEGETATION, THREATENED ECOLOGICAL COMMUNITIES AND VEGETATION INTEGRITY

4.1 NATIVE VEGETATION OVERVIEW

This section of the BDAR identifies native vegetation occurring on the Subject Land in accordance with the requirements of s4 of the BAM. PCTs within the Subject Land are described using the following attributes:

- Vegetation formation and class;
- Area (ha) for each PCT;
- Species relied upon for PCT identification;
- Justification of evidence used to identify a PCT (as outlined in s4.2.3 of the BAM);
- TEC status (as outlined in s4.2.2 of the BAM); and
- Estimate of percent cleared value of PCT (as outlined in paragraph 4.2.1.5 of the BAM).

This section also includes the results of vegetation integrity assessments completed for the Project, including:

- Vegetation Zones (in accordance with s4.3.1 of the BAM);
- Assessing vegetation integrity using benchmark data (in accordance with s4.3.3 of the BAM);
- Survey effort summary (as described in s4.3.4 of the BAM) (additional details provided in Section 2.2.2); and
- Vegetation integrity scores (in accordance with Appendix H of the BAM).

4.1.1 MAPPED NATIVE VEGETATION

Ground-verified vegetation mapping was conducted over the Subject Land. Changes were made to the SVTM (NSW DCCEW, 2024), including the reassignment and reshaping of polygons to better fit the occurrence of PCTs on the ground.

4.1.2 NON-NATIVE VEGETATION

Review of historical imagery obtained through the Historical Imagery Viewer (NSW Spatial Services, 2025) identified that portions of the Subject Land were cleared of woody vegetation prior to 1963. However, no significant disturbances such as cropping, modified pasture management, or agricultural machinery lines are visible throughout the historical imagery available. Furthermore, the remnant vegetation consists predominately of native species.

Layers available from the Draft NVR map (see Figure 1-1) have been analysed and it was determined that there was no Category 2–Vulnerable Regulated Land, no Category 2–Sensitive Regulated Land and no Excluded Land within the Subject Land.

During field survey events, no vegetation aligning with Category 1–Exempt Land under the LLS Act has been identified. Vegetation within the Subject Land is largely considered to align with Category 2-Regulated Land to which the BAM will apply.

Site investigations identified an area of approximately 0.72 ha of planted non-native vegetation occurring in the form of planted *Pinus* sp. within the BESS Development Footprint and 0.13 ha of *Pinus* sp and *Populus alba* along the road reserve and within the Road Resurfacing Development Footprint. Subsequently, these areas were determined to be of similar condition and were assigned to PCT 0_VZ20_Planted Non-native vegetation in this report.

4.2 IDENTIFY AND MAP PCTS

4.2.1 PLANT COMMUNITY TYPES

The vegetation within the BESS Development Footprint and Road Resurfacing Development Footprint have been assessed separately as the road corridor is significantly disturbed and of low quality, leading to a varied species composition and integrity. There are also geographic and geological differences between the two areas, as the road resurfacing works stretch 10km to the west of the proposed BESS Development Footprint.

Factors influencing the determination of PCTs respective of each Development Footprint include the following:

- The BESS Development Footprint is generally flat with gentle undulations, transitioning into low-lying hills and ridges in the southwest and northeast sections;
- The Road Resurfacing Development Footprint is generally sloping with gentle undulations;
- Elevation across the BESS Development Footprint ranges from around 600 m to 667 m above sea level (asl), peaking in the northeast section whilst elevation across the Road Resurfacing Development Footprint ranges from around 570 m to 680 m above sea level; and
- Average rainfall across the Subject Land encompassing the BESS Development Footprint and Road Resurfacing Development Footprint is 650 mm.

The BESS Project Area (98.40 ha) was identified as containing three differing Plant Community Types (PCTs), of which only two occur within the BESS Development Footprint with the Roadworks Project Area (32.16 ha) identified as containing three PCTs within the Road Resurfacing Development Footprint. Classification of PCTs identified within each Project Area and Development Footprint is shown in Table 4-1.

The extent of each PCT is shown in Figure 4-1 (BESS Development Footprint) and Figure 4-2 (Road Resurfacing Development Footprint). Detailed descriptions of each PCT are provided in Table 4-2 (PCT 3347), Table 4-3 (PCT 3373), Table 4-4 (PCT3746) and Table 4-5 (PCT 4063).

TABLE 4-1 IDENTIFIED PLANT COMMUNITY TYPES

PCT	PCT Name	Extent				
		Subject Land	**BESS Project Area**	**Road Resurfacing Project Area**	**BESS Development Footprint**	**Road Resurfacing Development Footprint**
3347	Southern Tableland Grassy Woodlands	4.92 ha	-	4.92 ha	-	0.33 ha
3373	Goulburn Tableland Box-Gum Grassy Forest	664.13 ha	55.32 ha	8.82 ha	-	0.56 ha
3746	Southern Tableland Snow Gum-Candlebark Shrub Forest	45.29 ha	35.10 ha	10.18ha	9.95 ha	0.52 ha
4063	Central and Southern Tableland River Oak Forest	1.02 ha	1.02 ha	-	0.04 ha	-
0	Planted Non-native vegetation	0.85 ha	0.74 ha	0.11 ha	0.69 ha	0.01 ha
0	Infrastructure	14.00	5.97 ha	8.03 ha	4.52 ha	4.97 ha
0	Stream	0.08 ha	-	0.08 ha	-	-
0	Dam	0.27 ha	0.25 ha	0.02 ha	-	-
Total Native Vegetation (Total)		**115.23 ha (130.57 ha)**	**91.33 ha (98.40 ha)**	**23.90 ha (32.16 ha)**	**9.99 ha (15.20 ha)**	**1.35 ha (6.40 ha)**

WOLLONDILLY RIVER

Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Subject Land
- Development Footprint
- Major Watercourse
- Minor Watercourse

PCTID VegZone Condition

- 0_VZ20_Planted non-native woody vegetation
- 0_VZ21_Infastructure
- 0_VZ21_Infrastructure
- 0_VZ22_Dam
- 0_VZ23_Stream
- 3373_VZ1_Woodland
- 3373_VZ2_Grassland
- 3746_VZ16_Woodland
- 3746_VZ17_Grassland
- 3746_VZ19_Highly Disturbed
- 3746_VZ3_Woodland
- 3746_VZ4_Grassland
- 3746_VZ5_Shrubland
- 3746_VZ6_Planted Natives
- 3746_VZ7_Highly Disturbed
- 4063_VZ8_Woodland - Moderate to Low

Coordinate System:
GDA 1994 MGA Zone 55
Date: 16/01/2026
Created By: NB
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F4-1 ERM Vegetation Mapping - BESS Development Footprint

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Project Area
- Development Footprint
- Major Watercourse
- Minor Watercourse

PCTID VegZone Condition

- 0_VZ20_Planted non-native woody vegetation
- 0_VZ21_Infastructure
- 0_VZ21_Infrasctructure
- 0_VZ22_Dam
- 0_VZ23_Stream
- 3746_VZ16_Woodland
- 3746_VZ17_Grassland
- 3746_VZ18_Shrubland
- 3746_VZ19_Highly Disturbed
- 3746_VZ3_Woodland
- 3746_VZ4_Grassland
- 3746_VZ5_Shrubland
- 3746_VZ6_Planted Natives
- 3746_VZ7_Highly Disturbed
- 4063_VZ8_Woodland - Moderate to Low

Coordinate System:
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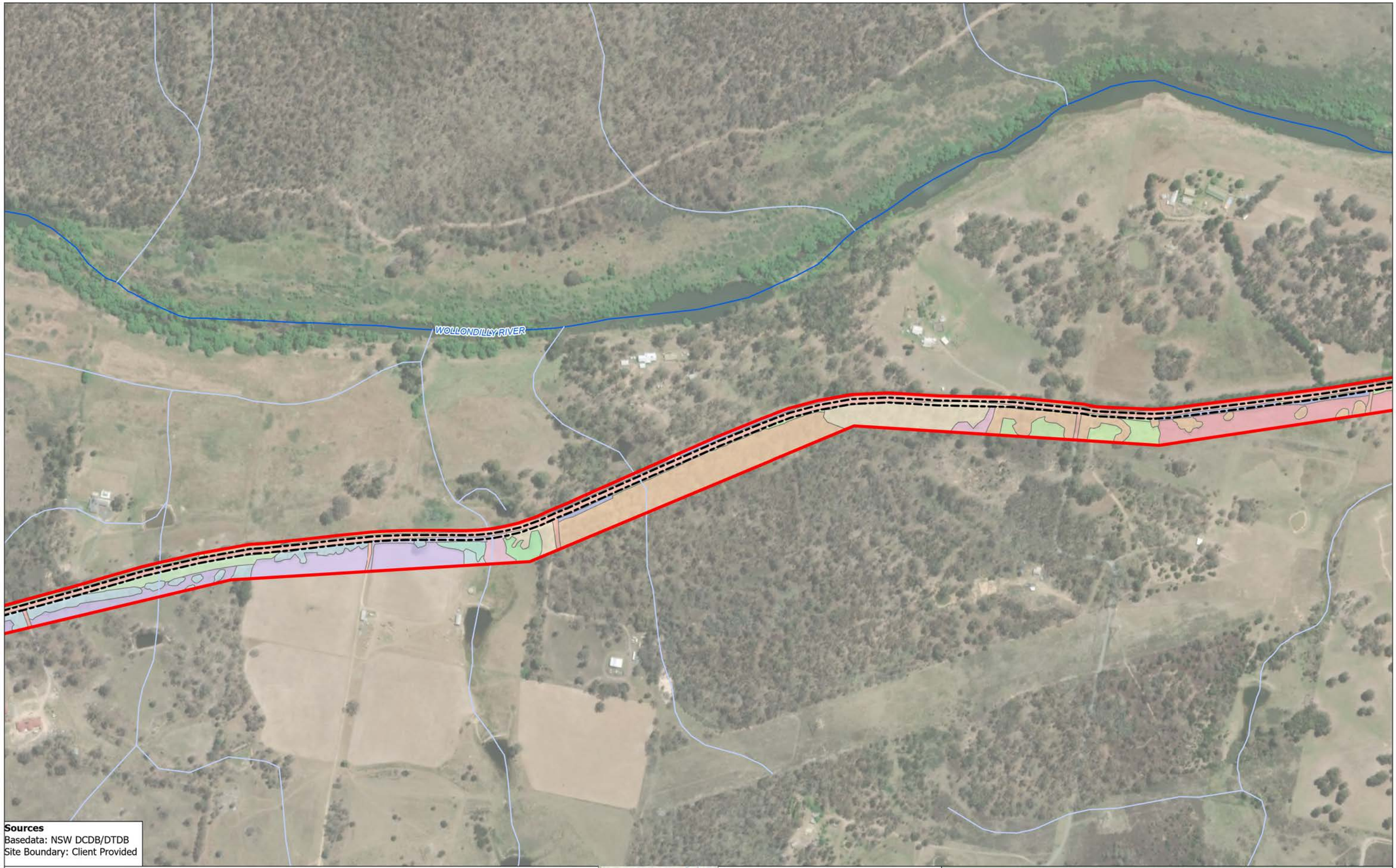
F4-2 ERM Vegetation Mapping - Road Resurfacing Development Footprint
Map 1 of 7

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Project Area
- Development Footprint
- Major Watercourse
- Minor Watercourse

PCTID VegZone Condition

- 0_VZ20_Planted non-native woody vegetation
- 0_VZ21_Infrasctructure
- 3347_VZ10_Grassland
- 3347_VZ11_Highly Disturbed
- 3347_VZ9_Woodland
- 3373_VZ12_Woodland
- 3373_VZ13_Grassland
- 3373_VZ14_Shrubland
- 3746_VZ16_Woodland
- 3746_VZ17_Grassland
- 3746_VZ18_Shrubland
- 3746_VZ19_Highly Disturbed



Coordinate System:
GDA 1994 MGA Zone 55
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F4-2 ERM Vegetation Mapping - Road Resurfacing Development Footprint
Map 2 of 7

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

WOLLONDILLY RIVER

JAORIMIN CREEK

Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Project Area
- Development Footprint
- Major Watercourse
- Minor Watercourse

PCTID VegZone Condition

- 0_VZ21_Infrasctructure
- 0_VZ22_Dam
- 3347_VZ10_Grassland
- 3347_VZ11_Highly Disturbed
- 3373_VZ12_Woodland
- 3373_VZ13_Grassland
- 3373_VZ14_Shrubland
- 3746_VZ16_Woodland
- 3746_VZ17_Grassland
- 3746_VZ18_Shrubland

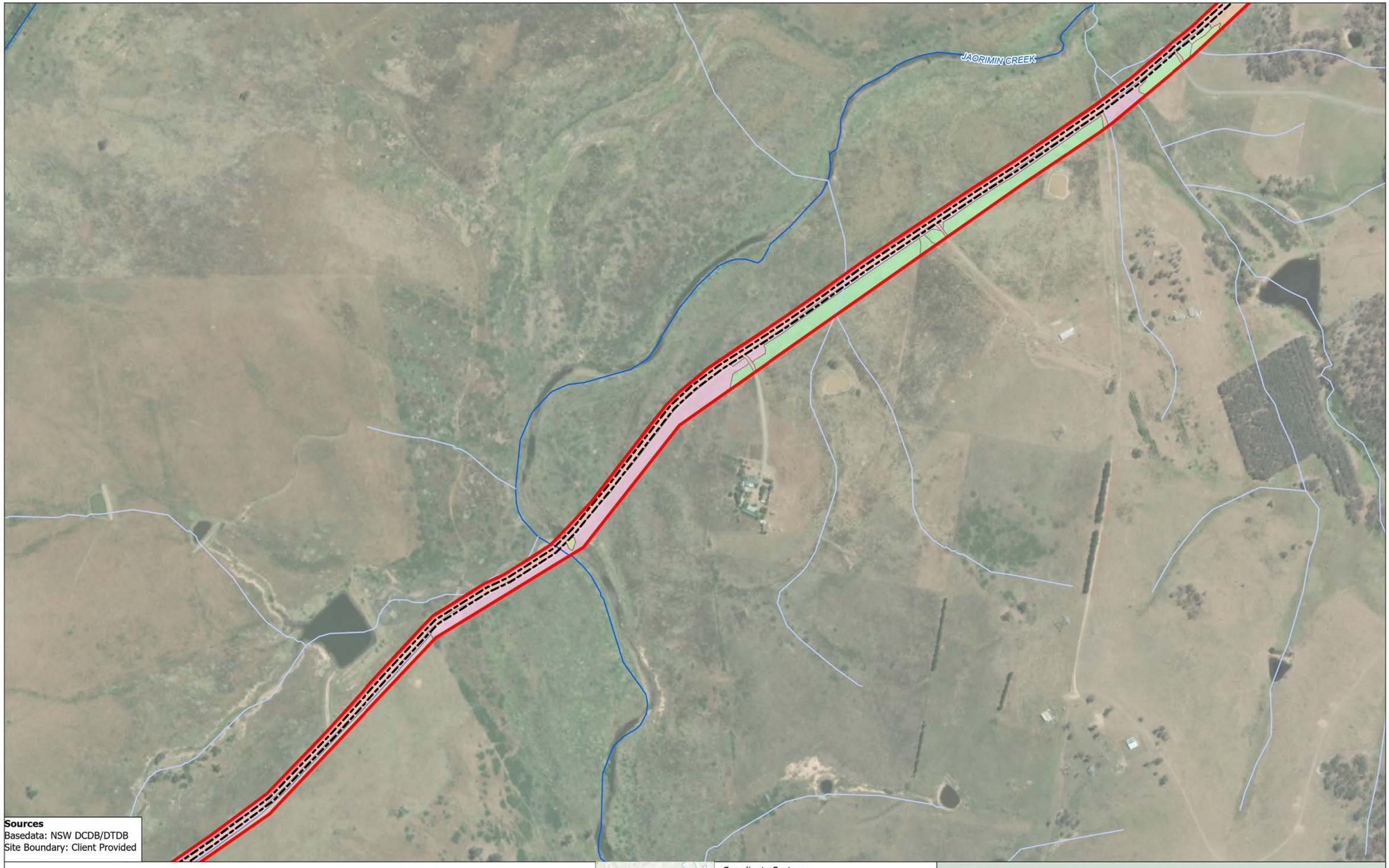
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F4-2 ERM Vegetation Mapping - Road Resurfacing Development Footprint
Map 3 of 7

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Project Area
- Development Footprint
- Major Watercourse
- Minor Watercourse

PCTID VegZone Condition

- 0_VZ21_Infrasctructure
- 0_VZ23_Stream
- 3347_VZ10_Grassland
- 3347_VZ11_Highly Disturbed
- 3373_VZ12_Woodland
- 3373_VZ13_Grassland
- 3373_VZ15_Highly Disturbed
- 3746_VZ16_Woodland
- 3746_VZ17_Grassland

Coordinate System:
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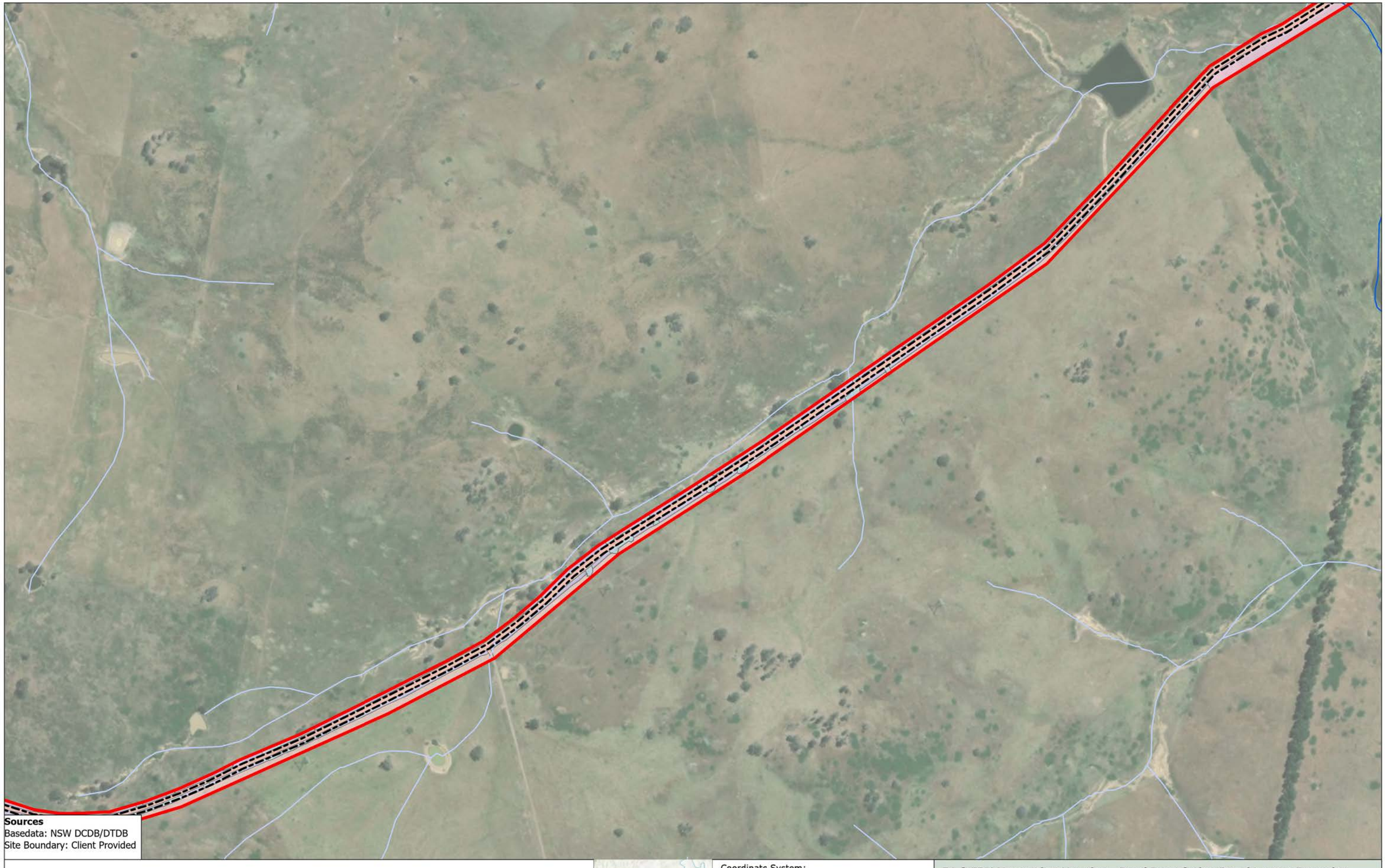
F4-2 ERM Vegetation Mapping - Road Resurfacing Development Footprint
Map 4 of 7

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Project Area
- Development Footprint
- Major Watercourse
- Minor Watercourse

PCTID VegZone Condition

- 0_VZ21_Infrasctructure
- 3347_VZ10_Grassland
- 3373_VZ12_Woodland
- 3373_VZ13_Grassland
- 3373_VZ15_Highly Disturbed

Coordinate System:
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F4-2 ERM Vegetation Mapping - Road Resurfacing Development Footprint
Map 5 of 7

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx

Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Project Area
- Development Footprint
- Major Watercourse
- Minor Watercourse

PCTID VegZone Condition

- 0_VZ20_Planted non-native woody vegetation
- 0_VZ21_Infrasctructure
- 3373_VZ12_Woodland
- 3373_VZ13_Grassland
- 3373_VZ15_Highly Disturbed



Coordinate System:
GDA 1994 MGA Zone 55
Date: 16/01/2026
Created By: NB
Drawing Size: A3
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F4-2 ERM Vegetation Mapping - Road Resurfacing Development Footprint
Map 6 of 7

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx

Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Project Area
- Development Footprint
- Major Watercourse
- Minor Watercourse

PCTID VegZone Condition

- 0_VZ20_Planted non-native woody vegetation
- 0_VZ21_Infrasctructure
- 3373_VZ12_Woodland
- 3373_VZ13_Grassland

Coordinate System:
GDA 1994 MGA Zone 55
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Created By: NB
Drawing Size: A3
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F4-2 ERM Vegetation Mapping - Road Resurfacing Development Footprint
Map 7 of 7

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx

TABLE 4-2 DESCRIPTION OF PCT 3347 SOUTHERN TABLELAND CREEKFLAT RIBBON GUM FOREST

PCT 3347 Southern Tableland Creekflat Ribbon Gum Forest	
Vegetation Formation	Grassy Woodlands
Vegetation Class	Tableland Clay Grassy Woodlands
Associated TECs	PCT 3347 is not associated with any listed TECs.
Percent Cleared	65%
NSW BioNet PCT Description	A tall to very tall grassy sclerophyll open forest to woodland of creek flats and gentle footslopes in undulating tablelands of higher eastern parts of the South Eastern Highlands bioregion. This PCT is widely distributed, occurring from Delegate north to Portland and west to Eucumbene, Grabben Gullen and Orange, at elevations of 600-1300 m asl, with means of 550-1000 mm precipitation and 10-80 frost days annually. Soils are often relatively deep, including alluvium or colluvium, derived from a wide range of sedimentary and granitic rocks. The canopy is sparse to mid-dense and commonly includes *Eucalyptus viminalis* and/or *Eucalyptus pauciflora*, occasionally with *Eucalyptus stellulata*. A sparse small tree layer is sometimes present, and includes scattered occasional *Acacia melanoxylon*. Smaller shrubs are also sparse and commonly include scattered *Acacia dealbata*, or rarely *Cassinia longifolia*. The ground layer is generally dense and grassy, and very frequently dominated by large tussocks of *Poa labillardierei var. labillardierei*, commonly with other grasses *Microlaena stipoides*, *Poa sieberiana*, *Elymus scaber*, *Themeda triandra* and occasionally *Rytidosperma racemosum*. The ground layer also includes a suite of soft-leaved forbs (*Dichondra repens*, *Acaena novae-zelandiae*, *Viola betonicifolia*, *Geranium solanderi*, *Hydrocotyle laxiflora*, *Stellaria pungens*, *Gonocarpus tetragynus*, *Rumex brownii*, *Oreomyrrhis eriopoda*, *Hypericum gramineum*), small vines (*Glycine clandestina*, *Desmodium varians*), and occasional clumps of the large riparian sedge *Carex appressa*. This community grades into a wide variety of other types on hillslopes adjacent to its riparian habitats. In more rugged tableland ranges it may be replaced along watercourses by PCT 3303, or by PCT 4063 on rocky, gravelly fast-flowing streams.
Description within the BESS Development Footprint	Does not occur in the BESS Development Footprint.
Description within the Road Resurfacing Development Footprint	PCT 3347 was observed in a few patches across the Road Resurfacing Development Footprint in both grassland and woodland conditions. The key determining factors for selecting this PCT include the following: • The dominant soil type is Sodosols over either clastic sediment or saprolite.; • Areas are close to waterbodies, the Wollondilly River and the Jaorimin Creek; • The tree canopy is sparse and dominated by *Eucalyptus viminalis*; • There are no small trees present; • There is a very sparse shrub stratum which includes *Leptospermum myrtifolium*; • Ground layers are predominantly dominated by large tussocks of *Poa labillardierei var. labillardierei* with *Microlaena stipoides, Poa sieberiana, Elymus scaber, Themeda triandra* and *Rytidosperma racemosum* and occasional clumps of *Carex appressa*; and • Forbs include *Dichondra repens*, *Geranium solanderi* and *Hydrocotyle laxiflora*.

PCT 3347 Southern Tableland Creekflat Ribbon Gum Forest	
Associated Species Present	Road Resurfacing Development Footprint *Hydrocotyle laxiflora, Carex appressa, Eucalyptus viminalis, Pteridium esculentum, Haloragis heterophylla, Dichondra repens, Geranium solanderi, Juncus subsecundus, Themeda triandra, Lomandra longifolia, Austrostipa scabra, Microlaena stipoides, Elymus scaber, Rytidosperma racemosum, Poa labillardierei var. Labillardierei, Poa sieberiana* and *Juncus australis.*
Vegetation Zones	Road Resurfacing Development Footprint PCT 3347_VZ9_Woodland PCT 3347_VZ10_Grassland PCT 3347_VZ11_Highly Disturbed
BAM Plots	PCT 3347_VZ9_Woodland • CTR_012 PCT 3347_VZ10_Grassland • CTR_006 PCT 3347_VZ11_Highly Disturbed No plots were done within VZ11 as it does not fall within the Road Resurfacing Development Footprint.





Images: 1: VZ9_Woodland; VZ10_Grassland

TABLE 4-3 DESCRIPTION OF PCT 3373 GOULBURN TABLELAND BOX-GUM GRASSY FOREST WITHIN THE SUBJECT LAND

PCT 3373 Goulburn Tableland Box-Gum Grassy Forest	
Vegetation Formation	Grassy Woodlands
Vegetation Class	Southern Tableland Grassy Woodlands
Associated TECs	PCT 3373 is associated with the following TECs: • BC Act: White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions (Critically Endangered); and • EPBC Act: White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (Critically Endangered).
Percent Cleared	92.10%
NSW BioNet PCT Description	A mid-high to tall dry sclerophyll grassy open forest to woodland of northern parts of the Southern Tablelands, occurring from Canberra and Queanbeyan north to Pejar and east to Durran Durra and Canyonleigh, with a northern outlier at Golspie. It is found in landscape positions with moderately deep soil profiles, particularly footslopes of gently undulating low hills, on a wide range of substrates including sedimentary (sandstone, arenite, greywacke, shale), acid volcanic (ignimbrite, rhyolite) and granitic rocks. This PCT is found at elevations of 600-850 metres asl with mean annual rainfall of 650-800 mm. Remnants of this community often have a long history of disturbance and the tree canopy may be sparse to very sparse, commonly including *Eucalyptus melliodora* and occasionally with *Eucalyptus macrorhyncha*, *Eucalyptus blakelyi* or *Eucalyptus dives*. A very sparse shrub stratum commonly includes scattered *Lissanthe strigosa*, *Pimelea curviflora*, *Melichrus urceolatus* or *Hibbertia obtusifolia*, while the ground layer is predominantly grassy and commonly includes *Themeda triandra*, *Microlaena stipoides*, *Poa sieberiana*, *Elymus scaber* and *Aristida ramosa*, with occasional high cover of *Rytidosperma laeve*. Common forbs include *Lomandra filiformis, Lomandra multiflora subsp. multiflora, Goodenia hederacea, Hydrocotyle laxiflora, Oxalis perennans, Chrysocephalum apiculatum, Tricoryne elatior, Gonocarpus tetragynus* and *Hypericum gramineum*. In lower landscape positions subject to cold air drainage this community may be replaced by PCT 3338, while on stony dry hills it commonly grades into PCT 3747.
Description Within the BESS Development Footprint	PCT 3373 was observed as several large patches to the north, east and southeast of the Subject Land in both grassland and woodland conditions. The key determining factors for selecting this PCT include the following: • Soils range from light grey / brown fine sandy / silty loams to chocolate brown fine silty clays over granite; • There is evidence of disturbance from clearing and grazing, some signs of fire and storm damage and some occasional weedy herbs; • Tree canopies are sparse and include *Eucalyptus dives*; • There are very sparse shrub stratums which include *Melichrus urceolatus*; • Ground layers are predominantly grassy and include *Themeda triandra*, *Microlaena stipoides*, *Poa sieberiana* and *Aristida ramose*; and • Forbs include *Lomandra filiformis*, *Lomandra multiflora subsp. multiflora*, *Goodenia hederacea*, *Hydrocotyle laxiflora*, *Oxalis perennans*, *Chrysocephalum apiculatum* and *Hypericum gramineum*.

PCT 3373 Goulburn Tableland Box-Gum Grassy Forest	
Description within the Road Resurfacing Development Footprint	PCT 3373 was observed as patches mainly towards the start of the Road Resurfacing Development Footprint (southwest) in grassland, woodland and shrubland conditions. The key determining factors for selecting this PCT include the following: • Soils range from light grey / brown to dark brown kurosols over pyroclastic rock or saprolite; • Tree stratums include *Eucalyptus macrorhyncha*, *Eucalyptus blakelyi* and *Eucalyptus dives*; • Shrub stratums are typically sparse and include *Pimelea curviflora*; • Ground layers are predominantly grassy and include *Themeda triandra, Microlaena stipoides, Poa sieberiana, Elymus scaber* and *Aristida ramosa;* Forbs include *Hydrocotyle laxiflora, Chrysocephalum apiculatum, Gonocarpus tetragynus* and *Hypericum gramineum*.
Associated Species Present	<u>BESS Development Footprint</u> *Themeda triandra, Rubus fruticosus, Fimbristylis dichotoma, Kunzea parvifolia, Hypochaeris radicata, Conyza bonariensis, Acacia parramattensis, Euchiton sphaericus, Cheilanthes sieberi, Chrysocephalum apiculatum, Hypericum gramineum, Panicum effusum, Aristida ramosa, Eragrostis trachycarpa, Cassinia aculeata, Eucalyptus blakelyi, Eucalyptus dives, Eucalyptus eugenioides, Microlaena stipoides, Nassella trichotoma, Wahlenbergia stricta, Eucalyptus melliodora, Cassinia sifton, Cassinia laevis, Cassinia uncata, Olearia viscidula, Melichrus urceolatus, Hibbertia obtusifolia, Gonocarpus tetragynus, Goodenia hederacea, Lomandra multiflora subsp. multiflora, Lomandra filiformis, Hydrocotyle laxiflora, Euchiton japonicus, Dichondra repens, Ajuga australis, Conyza bonariensis, Nassella trichotoma* and *Rubus fruticosus.* <u>Road Resurfacing Development Footprint</u> *Eucalyptus macrorhyncha, Eucalyptus mannifera, Eucalyptus pauciflora, Eucalyptus rubida, Eucalyptus amplifolia, Eucalyptus blakelyi, Acacia parramattensis, Themeda triandra, Cassinia sifton, Austrostipa scabra, Lomandra longifolia, Juncus australis, Lepidosperma limicola, Leptospermum myrtifolium, Pimelea curviflora, Haloragis heterophylla, Aristida ramosa, Aristida vagans, Dichelachne micrantha, Rytidosperma spp., Hydrocotyle laxiflora, Poa sieberiana, Opercularia aspera, Gonocarpus tetragynus, Hypericum gramineum, Acaena echinata, Acaena ovina, Bothriochloa macra, Dichondra repens, Euchiton involucratus, Euchiton sphaericus, Microlaena stipoides, Panicum effusum* and *Cynodon dactylon.*
Vegetation Zones	<u>BESS Development Footprint</u> PCT 3373_VZ1_Woodland PCT 3373_VZ2_Grassland <u>Road Resurfacing Development Footprint</u> PCT 3373_VZ12_Woodland PCT 3373_VZ13_Grassland PCT 3373_VZ14_Shrubland PCT 3373_VZ15_Highly Disturbed
Associated BAM Plots	<u>PCT 3373_VZ1_Woodland</u> • BAM01; • BAM04; • BAM06; and • BAM21 <u>PCT 3373_VZ2_Grassland</u> • BAM03;

PCT 3373 Goulburn Tableland Box-Gum Grassy Forest	
	• BAM15; • BAM16 <u>PCT 3373_VZ12_Woodland</u> • CTR_001; • CTR_003; and • CTR_004 <u>PCT 3373_VZ13_Grassland</u> • CTR_002; and • CTR_005 <u>PCT 3373_VZ14_Shrubland</u> • CTR_009 <u>PCT 3373_VZ15_Highly Disturbed</u> No plots undertaken due to VZ15 occurring outside of the Road Resurfacing Development Footprint.









Images: 1: VZ1_Woodland; 2: VZ2_Grassland; 3: VZ13_Grassland; 5: VZ14_Shrubland.

TABLE 4-4 DESCRIPTION OF PCT 3746 SOUTHERN TABLELAND SNOW GUM-CANDLEBARK SHRUB FOREST WITHIN THE SUBJECT LAND

PCT 3746 Southern Tableland Snow Gum Candlebark Shrub Forest	
Vegetation Formation	Dry Sclerophyll Forests (Shrubby sub-formation)
Vegetation Class	Southern Tableland Dry Sclerophyll Forests
Associated TECs	PCT 3746 is not associated with any listed TECs.
Percent Cleared	74.69%
NSW BioNet PCT Description	A mid-high to tall shrubby sclerophyll open forest to woodland restricted to intermittently damp flats along streams in north-east parts of the southern tablelands, and western parts of the Southern Highlands. This PCT is known from Nerriga west to Boro and south to Snowball, and from Mandemar south to Penrose and west to Brayton. It occurs at elevations of 500-900 m asl with mean annual precipitation of 650-1,050 mm, commonly on sandy-clay alluvium derived from sandstone, rhyolite and granitoid substrates. A sparse to mid-dense canopy very frequently includes *Eucalyptus pauciflora*, commonly with *Eucalyptus rubida* and occasionally *Eucalyptus viminalis*. The shrub stratum may be sparse to mid-dense and commonly includes *Kunzea parvifolia* and *Melichrus urceolatus*, occasionally *Brachyloma daphnoides, Leptospermum myrtifolium, Bossiaea buxifolia* or *Kunzea ericoides*, and rarely *Aotus ericoides, Banksia marginata, Daviesia mimosoides* or *Pultenaea subspicata*. A mid-dense ground layer includes a diverse suite of grasses, graminoids, forbs and ferns, commonly including *Goodenia hederacea, Hypericum gramineum, Microlaena stipoides, Gonocarpus tetragynus, Themeda triandra, Lomandra longifolia, Hydrocotyle laxiflora, Poranthera microphylla, Pteridium esculentum* and *Stylidium graminifolium*, occasionally with *Aristida ramosa*, *Dianella revoluta*, *Lomandra filiformis, Senecio prenanthoides* or *Lomandra multiflora subsp. multiflora*. On well-drained flats derived from more fertile substrates this community may be replaced by PCT 3347.
Description Within the BESS Development Footprint	PCT 3746 was observed in the western section of the Subject Land in various condition states. The key determining factors for selecting this PCT include the following: • Soils are chocolate brown fine silty loams / clays over granite with some waterlogging as evidenced by pugging. • Tree canopies are sparse and include *Eucalyptus pauciflora*. • There are sparse to mid-dense shrub stratums which include *Kunzea parvifolia*, *Melichrus urceolatus*, *Leptospermum myrtifolium*, *Kunzea ericoides*, *Banksia marginata*, *Daviesia mimosoides* and *Pultenaea subspicata;* and • Ground layers are mid-dense and include *Goodenia hederacea*, *Hypericum gramineum*, *Microlaena stipoides*, *Gonocarpus tetragynus*, *Themeda triandra*, *Lomandra longifolia*, *Hydrocotyle laxiflora*, *Stylidium graminifolium*, *Aristida ramosa* and *Lomandra filiformis*.
Description within the Road Resurfacing Development Footprint	PCT 3746 was observed in patches at the eastern end of the Road Resurfacing Development Footprint, extending towards the Subject Land in various condition states. The key determining factors for selecting this PCT include the following: • Soils are soft brown sodosols over saprolite; • Tree canopies include *Eucalyptus pauciflora* and *Eucalyptus rubida*; • Shrub stratums are sparse to mid-dense and include *Leptospermum myrtifolium* and *Banksia marginata*; and Ground layers are mid-dense and include *Goodenia hederacea, Hypericum gramineum, Microlaena stipoides, Gonocarpus tetragynus, Themeda triandra, Lomandra longifolia* and *Hydrocotyle laxiflora*.

PCT 3746 Southern Tableland Snow Gum Candlebark Shrub Forest	
Associated Species Present	BESS Development Footprint *Eucalyptus pauciflora, Acacia parramattensis, Kunzea parvifolia, Cassinia aculeata, Cassinia sifton, Gonocarpus tetragynus, Oxalis perennans, Wahlenbergia stricta, Microlaena stipoides, Lomandra filiformis, Cheilanthes sieberi, Themeda triandra, Glycine tabacina, Chrysocephalum apiculatum, Glycine microphylla, Fimbristylis dichotoma, Eragrostis trachycarpa, Veronica plebeian* and *Digitaria ramularis.* Road Resurfacing Development Footprint *Acacia parramattensis, Allocasuarina littoralis, Aristida vagans, Austrostipa scabra, Brachycome decipiens, Cassinia aculeata, Cassinia sifton, Dichelachne micrantha, Dianella longifolia, Eucalyptus dives, Eucalyptus macrorhyncha, Eucalyptus mannifera, Eucalyptus pauciflora, Eucalyptus rubida, Eucalyptus viminalis, Gonocarpus tetragynus, Hakea sericea, Haloragis heterophylla, Hydrocotyle laxiflora, Hypericum gramineum, Juncus australis, Juncus subsecundus, Kunzea parvifolia, Lepidosperma limicola, Leptospermum myrtifolium, Lomandra longifolia, Opercularia aspera, Panicum effusum, Pimelea curviflora, Poa sieberiana, Pteridium esculentum, Rytidosperma monticola* and *Themeda triandra.*
Vegetation Zones	BESS Development Footprint PCT 3746_VZ3_Woodland PCT 3746_VZ4_Grassland PCT 3746_VZ5_Shrubland PCT 3746_VZ6_Planted Natives PCT 3746_VZ7_Highly Disturbed Road Resurfacing Development Footprint PCT 3746_VZ16_Woodland PCT 3746_VZ17_Grassland PCT 3746_VZ18_Shrubland PCT 3746_VZ19_Highly Disturbed
BAM Plots	PCT 3746_VZ3_Woodland • BAM05; and • BAM19. PCT 3746_VZ4_Grassland • BAM02; • BAM08; • BAM09; • BAM14; and • BAM22. PCT 3746_VZ5_Shrubland • BAM10; • BAM11; and • BAM12. PCT 3746_VZ6_Planted Natives • BAM18. PCT 3746_VZ7_Highly Disturbed • BAM13 PCT 3746_VZ16_Woodland • CTR_010; • CTR_011; and • CTR_014

PCT 3746 Southern Tableland Snow Gum Candlebark Shrub Forest	
	PCT 3746_VZ17_Grassland • CTR_007; and • CTR_015 PCT 3746_VZ18_Shrubland • CTR_008; and • CTR_013 PCT 3746_VZ19_Highly Disturbed No plots were done within VZ19 as it does not fall within the Road Resurfacing Development Footprint.



Images: PCT 3746_VZ3_Woodland; 2: PCT 3746_VZ4_Grassland; 3: PCT 3746_VZ16_Woodland; 4: PCT 3746_VZ17_Grassland

TABLE 4-5 DESCRIPTION OF PCT 4063 CENTRAL AND SOUTHERN TABLELAND RIVER OAK FOREST

PCT 4063 Central and Southern tableland River Oak Forest	
Vegetation Formation	Forested Wetlands
Vegetation Class	Eastern Riverine Forests
Associated TECs	PCT 4063 is not associated with any listed TECs.
Percent Cleared	67.93%
NSW BioNet PCT Description	A tall, dense to open grassy riparian open forest distributed widely across the central and southern tablelands on narrow bands of shallow sand/gravel/boulder alluvium on swift-flowing streams of gorges and hilly country on a variety of bedrocks. This community occurs at elevations of 400-800 m asl with mean annual rainfall of 650-850 mm, from Gardens of Stone National Park and Turon west to Borenore and Barton and south to the Wollondilly River and Jerrara Creek, with outlying plots along the Murrumbidgee in the Australian Capital Territory. It is characterised by a frequently dense and tall canopy of *Casuarina cunninghamiana subsp. cunninghamiana*, and a sparse to patchy shrub layer that may include occasional *Bursaria spinosa, Melicytus dentatus* or *Acacia dealbata*. The predominantly grassy ground layer is almost always dominated by *Microlaena stipoides* and *Lomandra longifolia,* frequently with grasses *Poa labillardierei var. labillardierei, Echinopogon ovatus* and *Rytidosperma racemosum*, and the tussocky riparian sedge *Carex appressa.* Other ground layer species include ferns *Asplenium flabellifolium, Adiantum aethiopicum, Pellaea falcata* and *Pteridium esculentum*, and soft-leaved forbs *Dichondra repens, Urtica incisa, Acaena novae-zelandiae, Hydrocotyle laxiflora, Rumex brownii, Geranium solanderi* and *Senecio quadridentatus*. This community adjoins a wide variety of other vegetation types on adjacent footslopes, such as PCT 3228 in sheltered tributary valleys of the Wollondilly. In similar riparian habitats at lower altitudes to the east it may be replaced by PCT 4084, which shares many species, however, is distinguished by warm and moist rainforest elements.
Description within the BESS Development Footprint	PCT 4063 was observed in a gully to the south of the existing substation. The key determining factors for selecting this PCT include the following: • Located on a west-facing gully with active drainage; • There is a tall, dense tree canopy with *Casuarina cunninghamian*; • There is a very sparse shrub stratum which includes *acacia spp.*; and • The predominantly grassy ground layer is dominated by *Microlaena stipoides* and includes *Carex appressa*, *Dichondra repens* and *Hydrocotyle laxiflora*.
Description within the Road Resurfacing Development Footprint	This PCT does not occur within the Road Resurfacing Development Footprint.
Associated Species Present	<u>BESS Development Footprint</u> *Acacia parramattensis, Rubus fruticosus, Hypochaeris radicata, Cassinia sifton, Dichondra repens, Hydrocotyle laxiflora, Rytidosperma spp., Nassella trichotoma, Microlaena stipoides, Themeda triandra, Dichelachne spp.* and *Poa spp.*
Vegetation Zones	<u>BESS Development Footprint</u> PCT 4063_VZ8_Woodland (Low to Moderate)
BAM Plots	<u>PCT 4063_VZ8_Woodland (Low to Moderate)</u> • BAM07; and

PCT 4063 Central and Southern tableland River Oak Forest	
	• BAM20.



Image: 1: PCT 4063_VZ8_Woodland.

4.2.2 VEGETATION ZONES

Vegetation Zones (VZs) across the Subject Land were identified and delineated based on confirmed PCTs with similar condition states, based on the levels of disturbance to growth form groups and/or the extent of exotic species.

A total of 23 VZs have been identified as shown in Table 4-6 and include non-vegetated lands across the Subject Land. Of the 23 VZs, a total of 17 VZs occur within the BESS Development Footprint and/or Road Resurfacing Development Footprint as shown in Table 4-6.

The mapped extent of VZs within the BESS Development Footprint are shown in Figure 4-1 with the mapped extent of VZs within the Road Resurfacing Development Footprint shown in Figure 4-2.

4.2.2.1 PATCH SIZE

Patch size area was assigned to each vegetation zone as a class, being < 5 ha, 5-24 ha, 25-100 ha or ≥ 100 ha.

The patch size for each VZ is shown in Table 4-6. Patch size was calculated to be >100 ha across the Subject Land due to the connected nature of woody and non-woody ecosystems present within the Assessment Area and more broadly.

TABLE 4-6 VEGETATION ZONES WITHIN THE SUBJECT LAND AND PATCH SIZE

Vegetation Zone	Project Area Extent		Patch Size class	Within Development Footprint?	Development Footprint Extent		No. Vegetation Integrity plots required	No. Vegetation Integrity plots completed / used in assessment	Plot IDs
	BESS	Roadworks			BESS	Roadworks			
3373_VZ1_Woodland	36.92	-	>100 ha	No	-	-	NA	NA	BAM01 BAM04 BAM06 BAM21
3373_VZ2_Grassland	18.39	-	>100 ha	No	-	-	NA	NA	BAM03 BAM15 BAM16
3746_VZ3_Woodland	5.10	-	>100 ha	Yes	0.42	-	1	2	BAM05 BAM19
3746_VZ4_Grassland	18.88	-	>100 ha	Yes	5.36	-	3	5	BAM02 BAM08 BAM09 BAM14 BAM22
3746_VZ5_Shrubland	3.68	-	>100 ha	Yes	3.14	-	2	3	BAM10 BAM11 BAM12
3746_VZ6_Planted Natives	6.72	-	>100 ha	Yes	0.39	-	1	1	BAM18 BAM23 BAM24

Vegetation Zone	Project Area Extent		Patch Size class	Within Development Footprint?	Development Footprint Extent		No. Vegetation Integrity plots required	No. Vegetation Integrity plots completed / used in assessment	Plot IDs
	BESS	Roadworks			BESS	Roadworks			
3746_VZ7_Highly Disturbed	0.72	-	>100 ha	Yes	0.64	-	1	1	BAM13
4063_VZ8_Woodland	1.02	-	>100 ha	Yes	0.04	-	1	2	BAM07 BAM20
3347_VZ9_Woodland	-	1.02	>100 ha	Yes	-	0.09	1	1	CTR_012
3347_VZ10_Grassland	-	2.28	>100 ha	Yes	-	0.16	1	1	CTR_006
3347_VZ11_Highly Disturbed	-	1.62	>100 ha	Yes	-	0.09	1	1	CTR_006
3373_VZ12_Woodland	-	1.52	>100 ha	Yes	-	0.13	1	3	CTR_001 CTR_003 CTR_004
3373_VZ13_Grassland	-	4.84	>100 ha	Yes	-	0.43	1	2	CTR_002 CTR_005
3373_VZ14_Shrubland	-	1.04	>100 ha	Yes	-	0.01	1	1	CTR_009
3373_VZ15_Highly Disturbed	-	1.42	>100 ha	No	-	-	NA	NA	NA
3746_VZ16_Woodland	-	4.14	>100 ha	Yes	-	0.14	1	3	CTR_010 CTR_011 CTR_014

Vegetation Zone	Project Area Extent		Patch Size class	Within Development Footprint?	Development Footprint Extent		No. Vegetation Integrity plots required	No. Vegetation Integrity plots completed / used in assessment	Plot IDs
	BESS	Roadworks			BESS	Roadworks			
3746_VZ17_Grassland	-	2.06	>100 ha	Yes	-	0.28	1	2	CTR_007 CTR_015
3746_VZ18_Shrubland	-	0.75	>100 ha	Yes	-	0.10	1	2	CTR_008 CTR_013
3746_VZ19_Highly Disturbed	-	3.23	>100 ha	No	-	-	NA	NA	NA
0_VZ20_Planted Non-native vegetation	0.74	0.11	NA	Yes	0.69	0.01	NA	1	BAM17
0_VZ21_Infrastructure	5.97	8.03	NA	Yes	4.52	4.97	NA	NA	NA
0_VZ22_Dam	0.25	0.02	NA	No	-	-	NA	NA	NA
0_VZ23_Stream	-	0.08	NA	No	-	-	NA	NA	NA

4.2.3 THREATENED ECOLOGICAL COMMUNITIES

4.2.3.1 BIODIVERSITY CONSERVATION ACT 2016

Under Section 4.2.2 of the BAM, TECs are to be identified where present within the Subject Land. Where the BioNet Vegetation Classification system indicates a PCT may be associate with a TEC, the assessor must also consider information in the NSW Scientific Committee Final Determination for the TEC and assess the potential of the TEC in conjunction with field surveys.

PCT 3373 Goulburn Tableland Box-Gum Grassy Forest is associated with the Critically Endangered Ecological Community (CEEC) White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions under the BC Act. White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland is also listed as critically endangered under the EPBC Act. This community corresponds broadly with Keith's (2004) classification of Southern Tableland Grassy Woodland and occurs at elevations of 600m -850m Above Sea Level (ASL) with mean annual rainfall of 650-800 mm. Remnants of this community often have a long history of disturbance, and the tree canopy may be sparse to very sparse (BioNet, 2025).

Currently, the NSW Government does not have detailed interpretive guidelines associated with the listing under the BC Act but does provide a generalised field identification guide with Key Diagnostic Characteristics to assist in determining the likely presence of this EEC (DECC, 2007). Observations and analysis made during surveys against these key characteristics have been provided in Table 4-7 below.

TABLE 4-7 KEY DIAGNOSTIC CHARACTERISTIC ASSESSMENT – BC ACT 2016

Key characteristic identification of White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland	**PCT 3373 Characteristic**
Site located on the Tablelands or Western Slopes of NSW	**Meets diagnostic characteristic:** The Subject Land is located on the Southern Tablelands of NSW.
Does the site contain, or would the site have recently been likely to contain White Box, Yellow Box, or Blakelyi's Red Gum?	**Partially meets diagnostic characteristic** The BESS Project Area was identified as containing PCT 3373 In two varying conditions: VZ1_Woodland (36.92 ha) VZ2_Grassland (18.39 ha) The extent of VZ1_Woodland contains individuals of Yellow Box (*E.melliodora*) across the extent of this VZ observed within the Subject Land. It is possible that the extent of VZ2_Grassland once had stands of White Box or Yellow Box due to its location and connection to VZ1_Woodland. However, given the agricultural history of the Subject Land, it does not contain any of these characteristic species.

Key characteristic identification of White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland	PCT 3373 Characteristic
	Regardless, no impacts to PCT 3373 are proposed within the BESS Development Footprint. The Road Resurfacing Project Area was identified as containing fringing patches of PCT 3373 in 4 conditions: VZ12_Woodland (1.52 ha) VZ13_Grassland (4.84ha) VZ14_Shrubland (1.04 ha) VZ15_Highly Disturbed (1.42 ha) No characteristic canopy species associated with this TEC were observed within Road Resurfacing Development Footprint. The extent of VZ12_Woodland contains individuals of Blakely's Red Gum (*E.blakelyi*) across well vegetated areas of this VZ, outside of the accessible road reserve associated with the Road Resurfacing Development Footprint. Given the Historical land use and disturbance to VZ13_Grassland, VZ14_Shrubland, and VZ15_Highly Disturbed they do not currently contain any of these characteristic species. Therefore, it is considered that VZ12 meets this criteria but the remaining VZs associated with PCT 3373 do not.
Is the ground layer mainly grassy?	**Meets diagnostic characteristic** <u>BESS Project Area</u> VZ2_Grassland is predominantly made up of a grassy structure whilst areas of VZ1_Woodland contain upper stratum canopy trees with sparse understorey occurring and a persistent ground layer. <u>Road Resurfacing Project Area</u> VZ12_Woodland (1.52 ha) and VZ13_Grassland (4.84 ha) are considered to have a predominant grassy understorey whilst VZ14_Shrubland (1.04 ha) and VZ15_Highly Disturbed (1.42 ha) contain a highly dominant shrub layer.
If the site has been degraded, is there potential for assisted natural regeneration of the tree later or the understorey (by removing grazing, weeds etc)?	**Meets diagnostic characteristic** Given the historical disturbance and current condition of the Subject Land, there is potential for assisted natural regeneration of canopy trees and understorey species in areas where characteristic species are currently absent. Management actions such as removal of grazing pressure, control of invasive weeds, and retention of existing native vegetation could support recruitment of White Box, Yellow Box, or Blakely's Red Gum and facilitate re-establishment of a native understorey consistent with PCT 3373.
Outcome	**TEC Present**

It was determined through analysis that the following areas are considered representative of this CEEC under the BC Act based on observations of floristic composition that are consistent with the NSW Threatened Species Final Determination.

- PCT 3373_VZ1_Woodland (36.92 ha)
- PCT 3373_VZ2_Grassland (18.39 ha)
- PCT 3373_VZ12_Woodland (1.52 ha); and
- PCT 3373_VZ13_Grassland (4.84 ha).

The total extent of this CEEC is 55.32 ha within the BESS Project Area and reflective of moderate condition woodland and grasslands. No impacts to this CEEC are proposed within the BESS Development Footprint.

Within the Road Resurfacing Project Area the total extent of this CEEC is 6.36 ha and reflective of moderate condition woodland and grasslands. Areas of PCT 3373_VZ14_Shrubland and PCT 3373_VZ15_Highly Disturbed are not considered part of this CEEC as they did not contain key characteristic canopy species or a predominantly grassy ground layer.

No other PCTs recorded on the Subject Land form part of any TEC.

The total distribution of TEC across the BESS Project Area and Development Footprint is shown in Figure 4-3 with the distribution of TEC across the Road Resurfacing Project Area and Development Footprint shown in Figure 4-4.

WOLLONDILLY RIVER

Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Subject Land
- Development Footprint
- Major Watercourse
- White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland (BC Act 2016)
- White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland (EPBC Act 1999)

Coordinate System:
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Created By: NB
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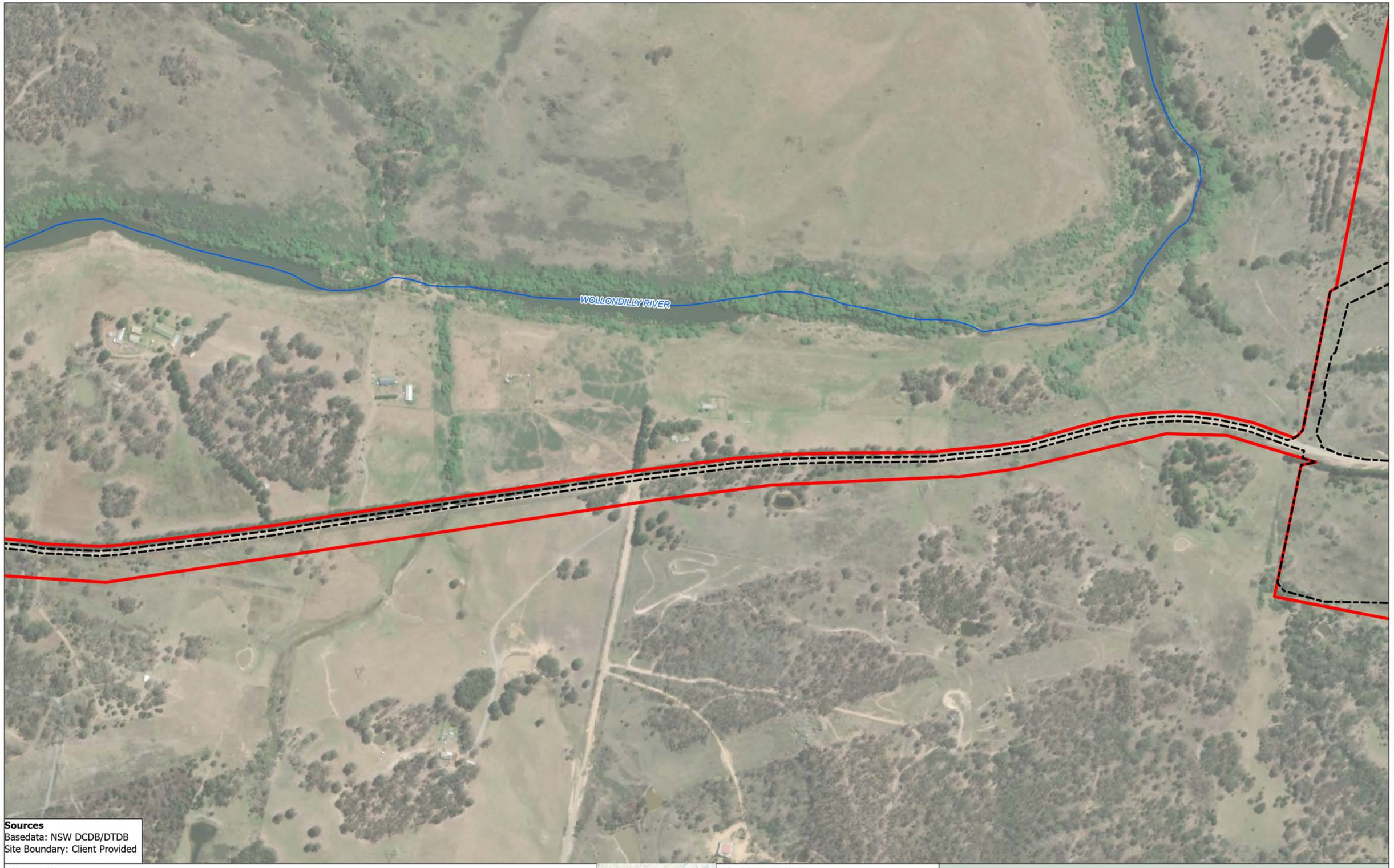
F4-3 Threatened Ecological Communities - BESS Project Area

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Subject Land
- Development Footprint
- Major Watercourse
- White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland (BC Act 2016)
- White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland (EPBC Act 1999)

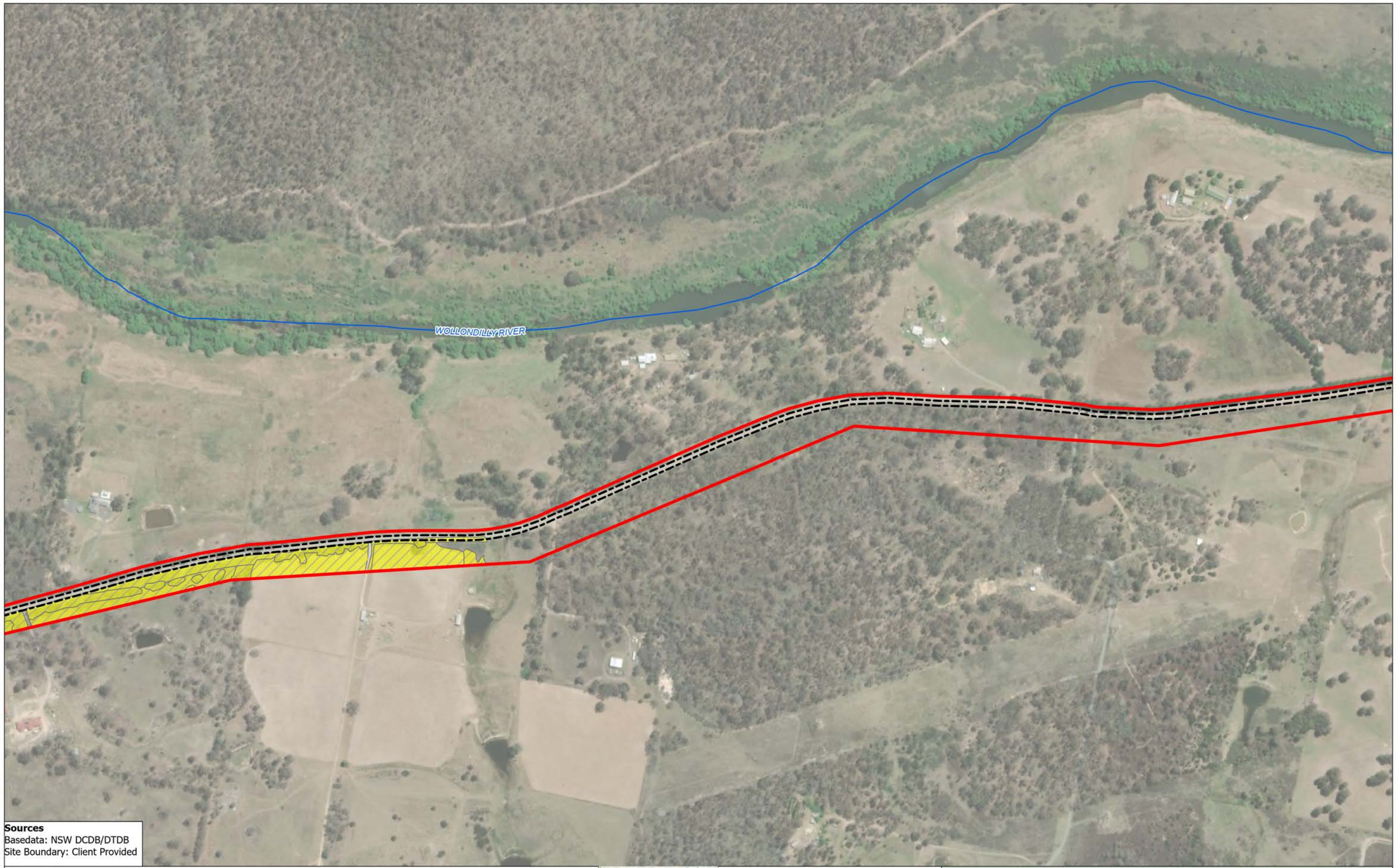
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Date: 16/01/2026
Created By: NB
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F4-4 Threatened Ecological Communities - Road Resurfacing Project Area
Map 1 of 7

Canyonleigh Battery Energy Storage System BDAR
X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Subject Land
- Development Footprint
- Major Watercourse
- White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland (BC Act 2016)
- White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland (EPBC Act 1999)



Coordinate System:
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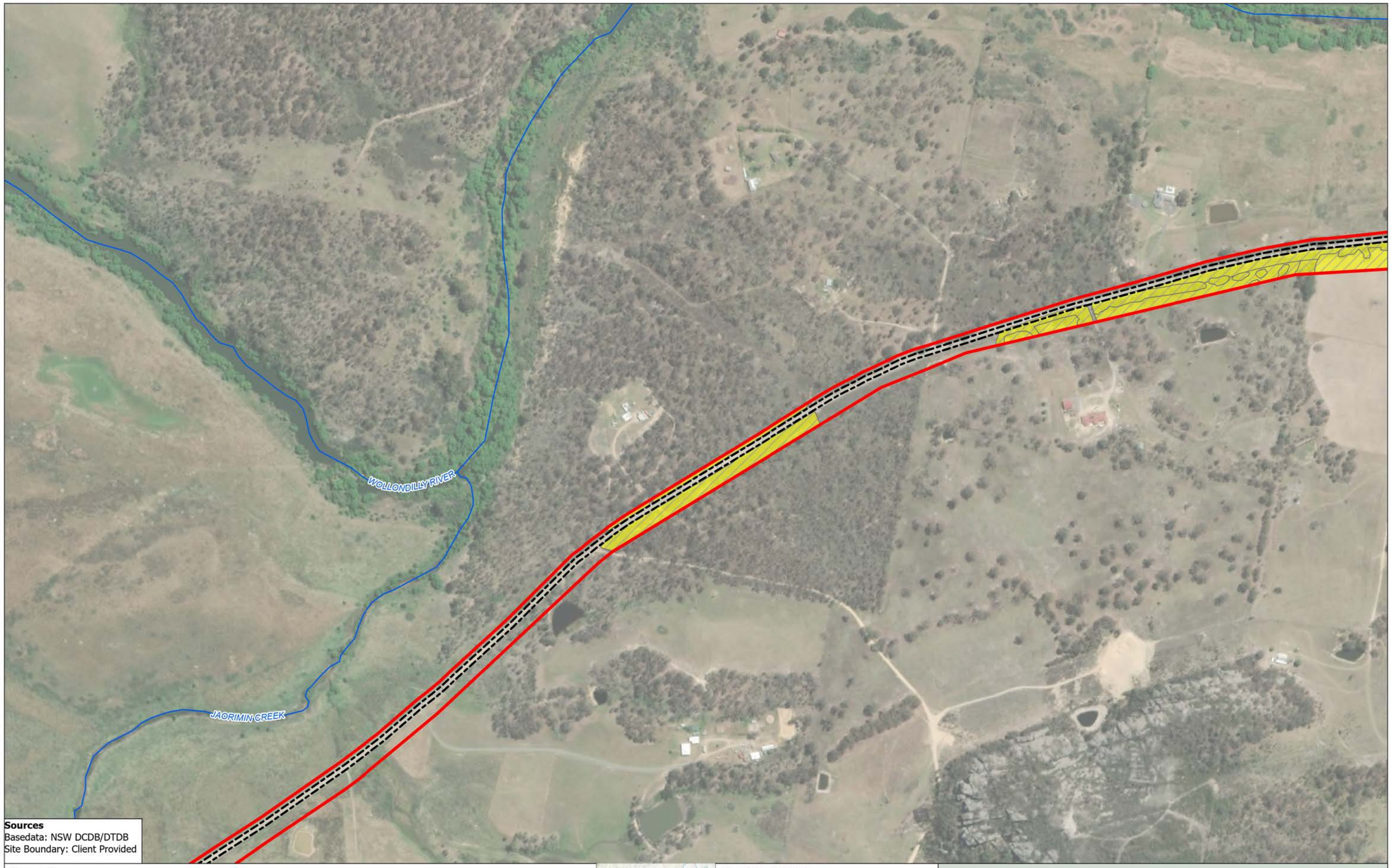
F4-4 Threatened Ecological Communities - Road Resurfacing Project Area
Map 2 of 7

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Subject Land
- Development Footprint
- Major Watercourse
- White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland (BC Act 2016)
- White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland (EPBC Act 1999)

Coordinate System:
GDA 1994 MGA Zone 55
Date: 16/01/2026
Created By: NB
Drawing Size: A3
0 100 200m
1:5,000

F4-4 Threatened Ecological Communities - Road Resurfacing Project Area
Map 3 of 7

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Subject Land
- Development Footprint
- Major Watercourse
- White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland (BC Act 2016)
- White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland (EPBC Act 1999)

Coordinate System:
GDA 1994 MGA Zone 55
Date: 16/01/2026
Created By: NB
Drawing Size: A3
0 100 200m
1:5,000

F4-4 Threatened Ecological Communities - Road Resurfacing Project Area
Map 4 of 7

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Subject Land
- Development Footprint
- Major Watercourse
- White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland (BC Act 2016)
- White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland (EPBC Act 1999)

Coordinate System:
GDA 1994 MGA Zone 55
Date: 16/01/2026
Created By: NB
Drawing Size: A3
0 100 200m
1:5,000

F4-4 Threatened Ecological Communities - Road Resurfacing Project Area
Map 5 of 7

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Subject Land
- Development Footprint
- White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland (BC Act 2016)
- White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland (EPBC Act 1999)



Coordinate System:
GDA 1994 MGA Zone 55
Date: 16/01/2026
Created By: NB
Drawing Size: A3
0 100 200m
1:5,000

F4-4 Threatened Ecological Communities - Road Resurfacing Project Area
Map 6 of 7

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx

Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Subject Land
- Development Footprint
- White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland (BC Act 2016)
- White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland (EPBC Act 1999)



Coordinate System:
GDA 1994 MGA Zone 55

Date: 16/01/2026
Created By: NB
Drawing Size: A3

0 40 80m

1:2,000

F4-4 Threatened Ecological Communities - Road Resurfacing Project Area
Map 7 of 7

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R1.aprx

4.2.3.2 EPBC ACT 1999

A review of the Protected Matters Search Tool (PMST) identified a total of five (5) TECs listed as Matters of National Environmental Significance (MNES) as have the potential of occurring within the Subject Land.

The PMST Report is provided in Appendix H.

An analysis of each of the TECs listed under the EPBC Act was conducted through desktop investigation and PCT identification to determine whether TECs were present. The analysis has been provided in Table 4-8 below.

TABLE 4-8 EPBC LISTED TEC DETERMINATION

EPBC Listed TEC	EPBC Act Listing	Likely Presence	Likely to occur on the Subject Land
Southern Highlands Shale Forest and Woodland in the Sydney Basin Bioregion	CE	May occur within buffer area	No - The Subject Land is not situated within the distribution of this TEC (the Sydney Basin Bioregion).
Upland Basalt Eucalypt Forests of the Sydney Basin Bioregion	E	May occur within the buffer area	No – This TEC is not associated with any of the PCTs mapped and is generally restricted to the Sydney Basin Bioregion.
Temperate Highland Peat Swamps on Sandstone	E	May occur within the buffer area	No – Temporary or permanent swamps occurring on sandstone were not present within the Subject Land.
Natural Temperate Grassland of the South Eastern Highlands	CE	Likely to occur within the buffer area	No – This TEC is not associated with any of the PCTs mapped and suitable vegetation was not identified within the Subject Land.
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	CE	TEC likely to occur within the Subject Land.	Likely – mapped in association with PCT 3373 White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland. However, it is likely restricted to areas where the presence of White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland listed under the BC Act were determined present.

It was determined that the EPBC listing of White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland was likely to occur within the Subject Land in areas associated with the TEC listing of White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland under the BC Act, which has been identified as present on the Subject Land in:

- PCT 3373_VZ1_Woodland (36.92 ha)
- PCT 3373_VZ2_Grassland (18.39 ha)
- PCT 3373_VZ12_Woodland (1.52 ha); and
- PCT 3373_VZ13_Grassland (4.84 ha).

The total distribution of the EPBC listed TEC across the BESS Project Area and Development Footprint is shown in Figure 4-3 with the distribution of the EPBC listed TEC across the Road Resurfacing Project Area and Development Footprint shown in Figure 4-4.

Additionally, Natural Temperate Grassland of the South Eastern Highlands was considered likely to occur within the buffer area (Assessment Area) but not within the Subject Land.

An assessment against the EPBC Act listing likely to occur within the Development Footprints has been undertaken and is provided in Table 4-9 below.

TABLE 4-9 KEY DIAGNOSTIC CHARACTERISTIC ASSESSMENT – EPBC ACT 1999

Key diagnostic characteristic of White Box – Yellow Box – Blakely's Red Gum	**Characteristic outcome**
The ecological community occurs in one of the listed IBRA bioregions.	**Meets diagnostic characteristic** The Subject Land occurs within the NSW South-Eastern Highlands IBRA Bioregion
It has, or previously had, an overstorey dominated or co-dominated, by *Eucalyptus albens* and/or *E. melliodora* and/or *E. blakelyi*.	**Meets diagnostic characteristic** <u>BESS Project Area</u> The overstorey appears dominated by Yellow Box *(E.melliodora*) and Blakely's Red Gum *(E.blakelyi*) with the dominant species largely shifting between these two characteristic tree species across PCT 3373_VZ1_Woodland and PCT 3373_VZ2_Grassland. <u>Road Resurfacing Project Area</u> The Road Resurfacing Project Area was identified as containing fringing patches of PCT 3373. VZ12_Woodland (1.52 ha) and VZ13_Grassland (4.84 ha) both of which are considered to form part of the CEEC listing under the BC Act. Although no characteristic canopy species associated with this TEC were observed within Road Resurfacing Development Footprint the extent of VZ12_Woodland contains individuals of Blakely's Red Gum (*E.blakelyi*) across well vegetated areas of this VZ, outside of the accessible road reserve associated with the Road Resurfacing Development Footprint.
It has a predominantly native ground layer.	**Meets diagnostic characteristic** <u>BESS Project Area</u> VZ2_Grassland is predominantly made up of a grassy structure whilst areas of VZ1_Woodland contain upper stratum canopy trees with sparse understorey occurring and a persistent ground layer. <u>Road Resurfacing Project Area</u> VZ12_Woodland (1.52 ha) and VZ13_Grassland (4.84ha) are considered to have a predominant grassy understorey whilst VZ14_Shrubland (1.04 ha) and VZ15_Highly Disturbed (1.42 ha) contain a highly dominant shrub layer. Ground covers consist of perennial grasses, including characteristic species *Themeda triandra, Euchiton sphaericus, Chrysocephalum apiculatum, Hypericum gramineum, Panicum effusum, Aristida ramosa, Eragrostis trachycarpa, Microlaena stipoides, Wahlenbergia stricta, Melichrus urceolatus, Hibbertia obtusifolia, Gonocarpus*

Key diagnostic characteristic of White Box – Yellow Box – Blakely's Red Gum	Characteristic outcome
	tetragynus, Goodenia hederacea, Lomandra multiflora subsp. multiflora, Lomandra filiformis, Hydrocotyle laxiflora, Euchiton japonicus, Dichondra repens, and *Ajuga australis.*
Tussock grasses are conspicuous in the ground layer (except in some situations, such as under dense groves of shrubs or regenerating trees), usually with several native species from some the following genera: *Austrostipa*, *Bothriochloa*, *Chloris*, *Cymbopogon*, *Dichanthium*, *Microlaena*, *Poa*, *Themeda*, *Rytidosperma* or *Sorghum*.	**Meets diagnostic characteristic** Tussock grasses appear conspicuous within this PCT within areas of the BESS Project Area and Road Resurfacing Project Area with species such as *Themeda triandra* and *Poa sieberiana* being common across this PCT in the Subject Land.
Amongst the grass tussocks and sometimes in swathes, a range of broad-leaved forbs and petaloid monocots may be a major component of the plant diversity.	**Meets diagnostic characteristic** A number of broad-leaved forbs were recorded as present within the extent of PCT 3373 across the BESS Project Area. Areas of PCT 3373_VZ12_Woodland within the Roadworks Project Area consisted of a range of broad-leaved forbs whilst areas of VZ13_Grassland forbs were sparse and are not considered to form a major component of the plant diversity in that VZ.
The shrub cover of the patch size is less than 30%.	**Meets diagnostic characteristic** Generally, within PCT 3373 across the Subject Land the average shrub cover is considered to be less than 30% with floristic composition of shrubs being limited to *Melichrus urceolatus.* Increased mid-storey and weed cover within highly disturbed areas of PCT 3373_VZ14_Shrubland were considered to have a greater than 30% shrub cover with the VZ being dominated by shrub species associated with disturbance.
Is the patch 0.1 ha or greater in size?	**Meets diagnostic characteristic** The patch / extent of each VZ is identified below: PCT 3373_VZ1_Woodland (36.92 ha) PCT 3373_VZ2_Grassland (18.39 ha) PCT 3373_VZ12_Woodland (1.52 ha); and PCT 3373_VZ13_Grassland (4.84 ha). It is considered that each VZ has a patch size of 0.1 ha or greater.
There are 12 or more native understorey species present (excluding grasses) from the provided list, with at least one important species. (Species list attained from: https://www.dcceew.gov.au/sites/default/files/documents/box-gum-species.pdf)	**Meets diagnostic characteristic** VZ1 Woodland VZ1, contains at least 12 native understorey species (excluding grasses) with the following species recorded: *Cassinia aculeata, Cassinia laevis, Brachyloma daphnoides, Melichrus urceolatus, Kunzea parvifolia, Wahlenbergia stricta, Microlaena stipoides, Goodenia hederacea, Chrysocephalum apiculatum, Hypericum gramineum, Glycine clandestina, Gonocarpus tetragynus* and *Plantago lanceolata*.

Key diagnostic characteristic of White Box – Yellow Box – Blakely's Red Gum	Characteristic outcome
	Of these, *Cassinia aculeata* and *Brachyloma daphnoides* are identified as important specie VZ2_Grassland VZ2, contains at least 12 native understorey species (excluding grasses) with the following species recorded: *Gonocarpus tetragynus, Goodenia hederacea, Hydrocotyle spp., Euchiton japonicus, Chrysocephalum apiculatum, Lomandra multiflora subsp. multiflora, Lomandra filiformis, Cassinia sifton, Cassinia aculeata, Cassinia laevis, Cassinia uncata, Olearia viscidula, Melichrus urceolatus, Hibbertia obtusifolia, Eucalyptus eugenioides, Acacia parramattensis*. Of these, *Cassinia aculeata* and *Gonocarpus tetragynus* are identified as important species. VZ12_Woodland VZ12, contains at least 12 native understorey species (excluding grasses) with the following species recorded: *Cassinia aculeata, Cassinia sifton, Dichondra repens, Euchiton involucratus, Euchiton sphaericus, Hypericum gramineum, Desmodium varians, Acacia parramattensis, Acaena echinata, Pimelea curviflora* Of these, *Cassinia aculeata* are identified as important species. VZ13_Grassland VZ13, contains at least 12 native understorey species (excluding grasses) with the following species recorded: *Rubus fruticosus, Plantago lanceolata, Cirsium vulgare, Carthamus lanatus, Acaena ovina, Acaena echinata, Acacia parramattensis, Euchiton sphaericus, Cyperus eragrostis, Trifolium repens, Geranium solanderi, Haloragis heterophylla, Rumex crispus, Pimelea curviflora*. Of these, *Acaena echinata* and *Pimelea curviflora* are identified as important species.
Outcome	**TEC Present** It is considered that the EPBC listing of White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland is present within the Subject Land in the form of: PCT 3373_VZ1_Woodland (36.92 ha) PCT 3373_VZ2_Grassland (18.39 ha) PCT 3373_VZ12_Woodland (1.52 ha); and PCT 3373_VZ13_Grassland (4.84 ha). This TEC is not considered present within PCT 3373_VZ14_Shrubland and PCT 3373_VZ15_Highly Disturbed due to a lack of characteristic species being present and the condition not meeting thresholds.

Areas of this TEC have been avoided in the first instance with no extent of this TEC within the BESS Development Footprint proposed to be impacted.

Impacts to fringing vegetation within the Road Resurfacing Development Footprint are likely to occur to this TEC in a minor way with up to 0.56ha mapped within the Road Resurfacing Development Footprint. However, the proposed resurfacing works have attempted to avoid impacts to this TEC in the first instance and where unavoidable impacts are likely due to resurfacing activities, impacts have been minimised.

Consideration of the TECs identified, including any equivalent communities listed under the BC Act, is detailed in Table 4-9**.**

4.2.4 VEGETATION INTEGRITY SCORES

Under Section 9.2.1 of the BAM, impacts on native vegetation and TECs must be determined for all impacts of the proposed development on PCTs associated with a VZ that has a VI score of:

- ≥15, where the PCT is representative of an EEC or a CEEC;
- ≥17, where the PCT is associated with threatened species habitat (as represented by ecosystem credits) or represents a vulnerable ecological community;
- ≥20, where the PCT does not represent a TEC and is not associated with threatened species habitat.

The VIS has been calculated in the BAM-C using the BAM plot data (i.e., compositional, structural and functional values) for each VZ mapped within the BESS Development Footprint and/or Road Resurfacing Development Footprint. The current Vegetation Integrity Score (VIS) for each VZ within has been provided in Table 4-10.

Of the 15 VZs, five were identified as having a VI score of below the offset thresholds. As such, they do not attract ecosystem credit obligations.

TABLE 4-10 VEGETATION INTEGRITY SCORES

Vegetation Zone	Area of Impact		Vegetation Integrity				VI Score	Offsetable Impact
	BESS	Roadworks	Composition	Structure	Function	HBTs		
3746_VZ3_Woodland	0.42	-	75.2	43.9	75.6	Yes	62.9	Yes
3746_VZ4_Grassland	5.36	-	48.4	44.1	0	No	12.9	No
3746_VZ5_Shrubland	3.14	-	46.5	31.3	4.7	No	18.9	Yes
3746_VZ6_Planted Natives	0.39	-	67.5	57.3	69.3	No	64.5	Yes
3746_VZ7_Highly Disturbed	0.64	-	59	26	0.8	No	11.5	No
4063_VZ8_Woodland	0.04	-	55.7	94.7	41.4	Yes	60.2	Yes
3347_VZ9_Woodland	-	0.09	51.2	32.1	54.6	No	44.8	Yes
3347_VZ10_Grassland	-	0.16	51	11.8	0.4	No	8.5	No
3347_VZ11_Highly Disturbed	-	0.09	51	11.8	0.4	No	8.5	No
3373_VZ12_Woodland[1]	-	0.13	54.7	46.9	67.1	Yes	55.6	Yes
3373_VZ13_Grassland[1]	-	0.43	21.8	14.9	12.8	No	16.1	Yes
3373_VZ14_Shrubland	-	0.01	65.6	20.3	28.8	No	33.7	Yes
3746_VZ16_Woodland	-	0.14	48.8	54	82.1	Yes	60	Yes
3746_VZ17_Grassland	-	0.28	41.1	20.4	2.7	No	13.1	No
3746_VZ18_Shrubland	-	0.10	39.4	25.6	13.9	No	24.1	Yes
0_VZ20_Planted Non-native vegetation	0.69	0.01	NA	NA	NA	No	NA	NA
0_VZ21_Infrastructure	4.52	4.97	NA	NA	NA	NA	NA	NA

[1] Associated with the Critically Endangered Ecological Community listing of White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland under the BC Act and EPBC Act.

5. HABITAT SUITABILITY FOR THREATENED SPECIES

5.1 HABITAT SUITABILITY

'Ecosystem credit species' are threatened species whose occurrence can generally be predicted by vegetation surrogates and/or landscape features, or that have a low probability of detection using targeted surveys. The BAM-C and NSW BioNet (NSW DCCEEW, 2025) identify the threatened species assessed for ecosystem credits. A targeted survey is not required to identify or confirm the presence of ecosystem credit species.

'Species credit species', also referred to as 'candidate species', are threatened species for which vegetation surrogates and/or landscape features cannot reliably predict the likelihood of their occurrence. These species are identified in the BAM-C and NSW BioNet (NSW DCCEEW, 2025). A targeted survey or an expert report is required to confirm the presence or absence of these species from the Subject Land. Alternatively, for a development, activity, clearing or biodiversity certification proposal only, the Applicant may elect to assume the species is present.

In some circumstances NSW BioNet (NSW DCCEEW, 2025) may identify a threatened species that requires assessment for ecosystem credits and species credits (referred to as 'dual credit species'). For dual credit species, part of the habitat is assessed as species credits (e.g., breeding habitat or land mapped on an important habitat map for a species) and the remaining habitat components for the species are assessed as ecosystem credits (e.g., foraging habitat).

For a small number of threatened species, a habitat constraint may refer to a mapped location (Important Mapped Area) that identifies areas that are considered important for those species. Important Mapped Areas for the relevant candidate species are not present within the Subject Land, and no further assessment is required, as discussed below.

The following sections identify the ecosystem credit species, species credit species, dual credit species and species subject to potential serious and irreversible impacts (SAII) associated with the Subject Land.

5.1.1 ECOSYSTEM CREDIT SPECIES

A total of 33 ecosystem credit species (predicted species) were recognised as associated with the PCTs identified within the BESS Development Footprint and/or Road Resurfacing Development Footprint respectively. The ecosystem credit species predicted to occur on or use the Subject Land by the BAM-C are listed in Table 5-1. The Predicted Species Reports generated in the BAM-C for the BESS Development Footprint and Road Resurfacing Development Footprint are provided in Appendix I.

No predicted species have been excluded from further assessment.

TABLE 5-1 ECOSYSTEM CREDIT SPECIES

Common Name	Scientific Name	Listing Status		Species Retained for Further Assessment	Associated PCTs BESS Development Footprint	Associated PCTs Road Resurfacing Development Footprint	Sensitivity to Gain Class	Observed Record Location
		BC Act	EPBC Act					
Australasian Bittern	*Botaurus poiciloptilus*	E	E	Yes	• PCT4063	-	Moderate	-
Black Falcon	*Falco subniger*	V	-	Yes	• PCT 3746 • PCT 4063	• PCT 3347 • PCT 3373 • PCT 3746	Moderate	-
Black-chinned Honeyeater (eastern subspecies)	*Melithreptus gularis gularis*	V	-	Yes	• PCT 3373 • PCT 4063	• PCT 3373	Moderate	-
Brown Treecreeper (eastern subspecies)	***Climacteris picumnus victoriae***	**V**	**V**	**Yes**	• **PCT 3746** • **PCT 4063**	• **PCT 3347** • **PCT 3373** • **PCT 3746**	**High**	**BESS Development Footprint**
Diamond Firetail	*Stagonopleura guttata*	V	V	Yes	• PCT 3746 • PCT 4063	• PCT 3347 • PCT 3373 • PCT 3746	Moderate	-
Dusky Woodswallow	***Artamus cyanopterus cyanopterus***	**V**	**-**	**Yes**	• **PCT 3746** • **PCT 4063**	• **PCT 3347** • **PCT 3373** • **PCT 3746**	**Moderate**	**BESS Development Footprint**
Eastern False Pipistrelle	***Falsistrellus tasmaniensis***	**V**	**-**	**Yes**	• **PCT 3746** • **PCT 4063**	• **PCT 3347** • **PCT 3746**	**High**	**BESS Development Footprint**
Flame Robin	*Petroica phoenica*	V	-	Yes	• PCT 3746 • PCT 4063	• PCT 3347 • PCT 3373 • PCT 3746	Moderate	-

Common Name	Scientific Name	Listing Status		Species Retained for Further Assessment	Associated PCTs BESS Development Footprint	Associated PCTs Road Resurfacing Development Footprint	Sensitivity to Gain Class	Observed Record Location
		BC Act	EPBC Act					
Gang-gang Cockatoo	***Callocephalon fimbriatum***	**E**	**E**	**Yes**	• **PCT 3746** • **PCT 4063**	• **PCT 3347** • **PCT 3373** • **PCT 3746**	**Moderate**	**BESS Development Footprint and Road Resurfacing Development Footprint**
Greater Broad-nosed Bat	*Scoteanax rueppellii*	V	-	Yes	• PCT 4063	-	High	-
Grey-headed Flying-fox	*Pteropus poliocephalus*	V	V	Yes	• PCT 3746 • PCT 4063	• PCT 3347 • PCT 3373 • PCT 3746	High	-
Large Bent-winged Bat	***Miniopterus orianae oceanensis***	**V**	**-**	**Yes**	• **PCT 4063**	• **PCT 3347**	**High**	**BESS Development Footprint**
Little Eagle	*Hieraaetus morphnoides*	V	-	Yes	• PCT 3746 • PCT 4063	• PCT 3347 • PCT 3373 • PCT 3746	Moderate	-
Little Lorikeet	*Parvipsitta pusilla (*previously *Glossopsitta pusilla)*	V	-	Yes	• PCT 3746 • PCT 4063	• PCT 3347 • PCT 3373 • PCT 3746	High	-
Little Whip Snake	*Suta flagellum*	V	-	Yes	-	• PCT 3373	High	-
Olive Whistler	*Pachycephala olivacea*	V	-	Yes	• PCT 3746	• PCT 3347 • PCT 3373 • PCT 3746	Moderate	-

Common Name	Scientific Name	Listing Status		Species Retained for Further Assessment	Associated PCTs BESS Development Footprint	Associated PCTs Road Resurfacing Development Footprint	Sensitivity to Gain Class	Observed Record Location
		BC Act	EPBC Act					
Painted Honeyeater	*Grantiella picta*	V	V	Yes	• PCT 3746 • PCT 4063	• PCT 3373 • PCT 3746	Moderate	-
Pilotbird	*Pycnoptilus floccosus*	V	V	Yes	• PCT 3746	• PCT 3347	Moderate	-
Regent Honeyeater	*Anthochaera phrygia*	CE	CE	Yes	• PCT 4063	• PCT 3373	High	-
Rosenberg's Goanna	*Varanus rosenbergi*	V	-	Yes	• PCT 3746 • PCT 4063	• PCT 3347 • PCT 3373 • PCT 3746	High	-
Scarlet Robin	*Petroica boodang*	V	-	Yes	• PCT 3746 • PCT 4063	• PCT 3347 • PCT 3373 • PCT 3746	Moderate	-
South-eastern Glossy Black Cockatoo	*Calyptorhynchus lathami lathami*	V	V	Yes	• PCT 3746 • PCT 4063	• PCT 3347 • PCT 3373 • PCT 3746	High	-
South-eastern Hooded Robin	*Melanodryas cucullata cucullata*	E	E	Yes	• PCT 3746 • PCT 4063	• PCT 3373 • PCT 3746	Moderate	-
Southern Whiteface	*Aphelocephala leucopsis*	V	V	Yes	• PCT 4063	• PCT 3347	Low	-
Speckled Warbler	*Pyrrholaemus sagittatus* (previously *Chthonicola sagittate)*	V	-	Yes	• PCT 3746 • PCT 4063	• PCT 3347 • PCT 3373 • PCT 3746	High	-

Common Name	Scientific Name	Listing Status		Species Retained for Further Assessment	Associated PCTs BESS Development Footprint	Associated PCTs Road Resurfacing Development Footprint	Sensitivity to Gain Class	Observed Record Location
		BC Act	EPBC Act					
Spotted Harrier	*Circus assimilis*	V	-	Yes	• PCT 4063	• PCT 3347 • PCT 3373	Moderate	-
Spotted-tailed Quoll	*Dasyurus maculatus*	V	E	Yes	• PCT 3746 • PCT 4063	• PCT 3347 • PCT 3373 • PCT 3746	High	-
Swift Parrot	*Lathamus discolor*	E	CE	Yes	• PCT 4063	• PCT 3347 • PCT 3373	Moderate	-
Turquoise Parrot	*Neophema pulchella*	V	-	Yes	• PCT 4063	-	High	-
Varied Sittella	*Daphoenositta chrysoptera*	V	-	Yes	• PCT 3746 • PCT 4063	• PCT 3347 • PCT 3373 • PCT 3746	Moderate	-
White-bellied Sea-Eagle	*Haliaeetus leucogaster*	V	-	Yes	• PCT 3746 • PCT 4063	• PCT 3347 • PCT 3373 • PCT 3746	High	-
White-throated Needletail	*Hirundapus caudacutus*	V	V	Yes	• PCT 3746 • PCT 4063	• PCT 3347 • PCT 3373 • PCT 3746	High	-
Yellow-bellied Sheathtail-bat	***Saccolaimus flaviventris***	**V**	**-**	**Yes**	**N/A – recorded during field surveys**		**High**	**BESS Development Footprint**
V=Vulnerable, E=Endangered, CE=Critically Endangered								

Six predicted species were recorded during surveys, associated with the BESS Development Footprint and/or Road Resurfacing Development Footprint:

- Brown Treecreeper (eastern subspecies) (*Climacteris picumnus victoriae*) – one individual heard calling outside of the BESS Development Footprint to the southeast, during surveys in November 2025.
- Dusky Woodswallow (*Artamus cyanopterus cyanopterus*):
  - One individual was recorded to the south of the BESS Development Footprint in the November 2024 survey.
  - Then, 16 individuals were recorded within the southern section of the BESS Development Footprint during the January 2025 survey.
- Eastern False Pipistrelle (*Falsistrellus tasmaniensis*) – 'Definite' call recorded within the BESS Development Footprint during surveys undertaken January - February 2025.
- Gang-gang Cockatoo (*Callocephalon fimbriatum*):
  - Eight Gang-gang Cockatoos were detected in the northern section of the Development BESS Footprint during the January 2025 surveys;
  - A further five sightings were recorded to the south of the BESS Development Footprint in January 2025;
  - In the August 2025 surveys a pair were seen foraging in the Road Resurfacing Development Footprint; and
  - A pair were also observed flying over the Road Resurfacing Development Footprint within an area of woodland during surveys in October 2025.
- Large Bent-winged Bat (*Miniopterus orianae oceanensis*) – 'Possible' call recorded within the BESS Development Footprint during surveys undertaken January - February 2025.
- Yellow-bellied Sheathtail-bat (*Saccolaimus flaviventris*) – 'Probable' call recorded within the BESS Development Footprint during surveys undertaken January - February 2025.

Where audio recorders were deployed for survey, GreenTape Solutions were sub-contracted to analyse data of ultrasonic audio recordings and passive audio recordings. Call analyses are provided in Appendix J for ultrasonic audio recording data and Appendix K for passive audio recording data.

Further discussion on presence of species is provided in 5.2.1 of this report.

5.1.2 SPECIES CREDIT SPECIES

A total of 42 species credit species (candidate species), including 15 flora species and 27 fauna species were identified by the BAM-C associated with the BESS Development Footprint and/or Road Resurfacing Development Footprint. The candidate species identified by the BAM-C for the Subject Land are listed in Table 5-2 and the BAM-C reports are provided in Appendix L.

TABLE 5-2 CANDIDATE SPECIES

Common Name	Scientific Name	Listing Status		BESS Development Footprint		Road Resurfacing Development Footprint	
		BC Act	EPBC Act	Associated PCT	Retained for assessment	Associated PCT	Retained for assessment
Flora							
Black Gum	*Eucalyptus aggregata*	V	V	PCT 3746 PCT 4063	Yes	PCT 3347 PCT 3746	Yes
Bombay Bossiaea	*Bossiaea bombayensis*	CE	-	PCT 3746	Yes	PCT 3746	Yes
Buttercup Doubletail	*Diuris aequalis*	E	E	No associated PCT		PCT 3347 PCT 3373	Yes
Callitris oblonga subsp. parva	*Callitris oblonga subsp. parva*	CE	-	PCT 3746 PCT 4063	Excluded	PCT 3347 PCT 3746	Excluded
Cotoneaster Pomaderris	*Pomaderris cotoneaster*	E	E	PCT 3746	Yes	PCT 3746	Yes
Dwarf Kerrawang	*Commersonia prostrata*	E	E	PCT 4063	Yes	PCT 3347	Yes
Hoary Sunray	*Leucochrysum albicans subsp. tricolor*	E	E	PCT 3746	Yes	PCT 3347 PCT 3373 PCT 3746	Yes
Kanangra Wattle	*Acacia clunies-rossiae*	V	-	PCT 4063	Yes	No associated PCT	
Michelago Parrot-pea	*Dillwynia glaucula*	E	-	PCT 3746	Yes	PCT 3347 PCT 3373 PCT 3746	Yes
Mongarlowe Mallee	*Eucalyptus recurva*	CE	CE	PCT 3746	Yes	PCT 3347 PCT 3746	Yes
Nerriga Grevillea	*Grevillea renwickiana*	E	-	PCT 3746	Yes	PCT 3746	Yes
Paddys River Box, Camden Woollybutt	*Eucalyptus macarthurii*	E	E	PCT 3746	Yes	PCT 3746	Yes

Common Name	Scientific Name	Listing Status		BESS Development Footprint		Road Resurfacing Development Footprint	
		BC Act	EPBC Act	Associated PCT	Retained for assessment	Associated PCT	Retained for assessment
Matted Bush-pea	*Pultenaea pedunculata*	E	-	PCT 3746 PCT 4063	Excluded	PCT 3746	Excluded
Solanum armourense	*Solanum armourense*	E	-	PCT 4063	Yes	No associated PCT	
Superb Midge Orchid	*Genoplesium superbum*	E	-	PCT 3746	Yes	PCT 3746	Yes
Fauna							
Barking Owl	*Ninox connivens*	V	-	PCT 3746 PCT 4063	Yes	PCT 3347 PCT 3373 PCT 3746	Yes
Booroolong Frog	*Litoria booroolongensis*	E	E	PCT 3746 PCT 4063	Excluded	PCT 3347 PCT 3373 PCT 3746	Excluded
Brush-tailed Phascogale	*Phascogale tapoatafa*	V	-	PCT 3746 PCT 4063	Excluded	PCT 3347 PCT 3373 PCT 3746	Excluded
Brush-tailed Rock-wallaby	*Petrogale penicillata*	E	V	PCT 3746 PCT 4063	Yes	PCT 3347 PCT 3373 PCT 3746	Yes
Eastern Pygmy-possum	*Cercartetus nanus*	V	-	PCT 3746 PCT 4063	Yes	PCT 3347 PCT 3373 PCT 3746	Yes
Gang-gang Cockatoo (Breeding)	*Callocephalon fimbriatum*	E	E	PCT 3746 PCT 4063	Yes	PCT 3347 PCT 3373 PCT 3746	Yes
Giant Burrowing Frog	*Heleioporus australiacus*	V	-	PCT 3746	Yes	PCT 3347 PCT 3746	Yes
Green and Golden Bell Frog	*Litoria aurea*	E	V	PCT 3746	Yes	PCT 3347 PCT 3746	Yes

Common Name	Scientific Name	Listing Status		BESS Development Footprint		Road Resurfacing Development Footprint	
		BC Act	EPBC Act	Associated PCT	Retained for assessment	Associated PCT	Retained for assessment
Grey-headed Flying-fox (Breeding)	*Pteropus poliocephalus*	V	V	PCT 3746 PCT 4063	Yes	PCT 3347 PCT 3373 PCT 3746	Yes
Key's Matchstick Grasshopper	*Keyacris scurra*	E	E	Yes – no associated PCT but the species was recorded.		PCT 3373	Yes
Koala	*Phascolarctos cinereus*	E	E	PCT 3746 PCT 4063	Yes	PCT 3347 PCT 3373 PCT 3746	Yes
Large Bent-winged Bat (Breeding)	*Miniopterus orianae oceanensis*	V	-	PCT 4063	Yes	PCT 3347	Yes
Large-eared Pied Bat	*Chalinolobus dwyeri*	E	E	PCT 3746 PCT 4063	Yes	PCT 3347 PCT 3373 PCT 3746	Yes
Little Eagle (Breeding)	*Hieraaetus morphnoides*	V	-	PCT 3746 PCT 4063	Yes	PCT 3347 PCT 3373 PCT 3746	Yes
Masked Owl	*Tyto novaehollandiae*	V	-	PCT 3746 PCT 4063	Yes	PCT 3347 PCT 3373 PCT 3746	Yes
Pink Robin	*Petroica rodinogaster*	V	-	No associated PCTS		PCT 3347	Yes
Pink-tailed Legless Lizard	*Aprasia parapulchella*	V	V	PCT 3746	Yes	PCT 3347 PCT 3373 PCT 3746	Excluded
Powerful Owl	*Ninox strenua*	V	-	PCT 3746 PCT 4063	Yes	PCT 3347 PCT 3373 PCT 3746	Yes
Regent Honeyeater	*Anthochaera phrygia*	CE	CE	PCT 4063	Excluded	PCT 3373	Excluded

Common Name	Scientific Name	Listing Status		BESS Development Footprint		Road Resurfacing Development Footprint	
		BC Act	EPBC Act	Associated PCT	Retained for assessment	Associated PCT	Retained for assessment
South-eastern Glossy Black-Cockatoo	*Calyptorhynchus lathami*	V	V	PCT 3746 PCT 4063	Yes	PCT 3347 PCT 3373 PCT 3746	Yes
Southern Greater Glider	*Petauroides volans*	E	E	PCT 3746 PCT 4063	Yes	PCT 3347 PCT 3373 PCT 3746	Yes
Southern Myotis	*Myotis macropus*	V	-	PCT 3746 PCT 4063	Yes	PCT 3347 PCT 3373 PCT 3746	Yes
Striped Legless Lizard	*Delma impar*	V	V	No associated PCTS		PCT 3347 PCT 3373	Yes
Squirrel Glider	*Petaurus norfolcensis*	V	-	PCT 3746 PCT 4063	Yes	PCT 3347 PCT 3373 PCT 3746	Yes
Stuttering Frog	*Mixophyes balbus*	E	V	PCT 3746 PCT 4063	Excluded	PCT 3347 PCT 3373 PCT 3746	Excluded
Swift Parrot (Breeding)	*Lathamus discolor*	E	CE	PCT 4063	Excluded	PCT 3347 PCT 3373	Excluded
White-bellied Sea-Eagle (Breeding)	*Haliaeetus leucogaster*	V	-	PCT 3746 PCT 4063	Yes	3746	Yes

5.1.3 EXCLUDED CANDIDATE SPECIES

Modification to the BAM-C generated list is appropriate where one or more of the following factors is relevant to the species:

- Habitat constraints;
- Degraded habitat;
- Geographical limitations; and / or
- Vagrancy.

Five candidate species have been excluded from assessment across the BESS Development Footprint, justification for the exclusion of threatened candidate species in this assessment is provided in Table 5-5.

Eight candidate species have been excluded from assessment across the Road Resurfacing Development Footprint, justification for the exclusion of threatened candidate species in this assessment is provided in Table 5-6.

Further assessment was undertaken for the remaining species credit species.

TABLE 5-3 JUSTIFICATION FOR EXCLUSION OF CANDIDATE SPECIES ACROSS THE SUBJECT LAND

Excluded Species	BC Act	EPBC Act	Reason
Callitris oblonga subsp. *parva*	CE	-	Geographic Limitations This species geographically restricted to land within the Corang River catchment and between Charleyong and Nerriga. The Subject Land does not occur within this region.
Matted Bush-pea *Pultenaea pedunculata*	E	-	Geographic Limitations This species geographically restricted to land between Boro (Borough) and Marulan. The Subject Land occurs approximately 5km north-west of Marulan and is located outside of the species geographic distribution.
Booroolong Frog *Litoria booroolongensis*	E	E	Habitat Degraded / Species Vagrant Habitat is considered to be degraded within Subject Land to support this species with no suitable habitats observed. Additionally, records of this species within the broader area are limited. As such, this species has been considered to be a vagrant.
Brush-tailed Phascogale *Phascogale tapoatafa*	V	-	Habitat Degraded Habitat is considered to be degraded within Subject Land to support this species with no suitable habitats observed. Additionally, an expert opinion confirmed that the Subject Land contains unsuitable habitats.

Excluded Species	BC Act	EPBC Act	Reason
Pink-tailed Legless Lizard *Aprasia parapulchella*	V	V	Habitat Degraded Habitat within the BESS Project Area has been assessed under an Expert Report. However, habitat within the Road Resurfacing Project Area is considered to be degraded and unsuitable for this species. Therefore, this species has been excluded from assessment only within the Road Resurfacing Project Area.
Regent Honeyeater *Anthochaera phrygia*	CE	CE	Important Habitat Mapping The Subject Land does not contain any areas of Important Habitat Mapping associated with this species.
Stuttering Frog *Mixophyes balbus*	E	V	Habitat Degraded / Species Vagrant Habitat is considered to be degraded within Subject Land to support this species with no suitable habitats observed. Additionally, records of this species within the broader area are limited. As such, this species has been considered to be a vagrant.
Swift Parrot (Breeding) *Lathamus discolor*	E	CE	Important Habitat Mapping The Subject Land does not contain any areas of Important Habitat Mapping associated with this species.

5.2 HABITAT SURVEYS: CANDIDATE SPECIES CREDIT SPECIES

A targeted survey or an expert report is required to confirm the presence or absence of candidate species. Alternatively, for a development activity, the Applicant may elect to assume the species is present.

Targeted threatened species surveys have been completed to determine the presence of a candidate species within the Subject Land. Where survey was unable to be completed due constraints, including accessibility and safety, assumed presence in those areas has occurred.

5.2.1 CANDIDATE SPECIES OCCURRENCE

36 candidate species identified across the BESS Development Footprint and/or Road Resurfacing Development Footprint respectively have been retained for further assessment in accordance with the BAM, as identified in Table 5-4 (Flora) and Table 5-5 (Fauna).

Presence of a species can be determined based on the following:

- Assumed presence within the Subject Land; or
- An Important Mapped Area; or
- Targeted threatened species surveys; or
- An expert report.

5.2.1.1 ASSUMED PRESENCE

Targeted threatened species surveys were completed across the Subject Land where access permitted. Targeted surveys of candidate species are detailed in Table 5-4 (Flora) and Table 5-5 (Fauna) below. Presence for threatened flora and fauna has been assumed in areas where survey was not completed within the recommended survey period or where survey was not completed to the level of requirement as detailed in the BAM.

Of the 36 candidate species, only one has been assumed present within areas of suitable habitat within the BESS Development Footprint and/or Road Resurfacing Development Footprint. Superb Midge Orchid (*Genoplesium superbum*) has been assumed present within areas of the Road Resurfacing Development Footprint where suitable habitats are present, including:

- PCT3746_VZ17_Grassland (0.28 ha); and
- PCT 3746_VZ18_Shrubland (0.10 ha)

No other candidate species have been assumed present.

5.2.1.2 IMPORTANT AREAS

The Subject Land contains no important mapped. Species excluded on this basis include:

- Regent Honeyeater; and
- Swift Parrot;

Targeted survey and species polygons are not required for these species.

5.2.1.3 TARGETED THREATENED SPECIES SURVEYS

Candidate species identified as likely to occur within the BESS Development Footprint and/or Road Resurfacing Development Footprint are required to have targeted surveys undertaken.

Targeted survey is the preferred survey method rather than assume presence to confirm whether a species may be present or has habitat available. Where targeted surveys were unable to be completed within areas of the development footprint considered to be inaccessible (as discussed in Section 5.2.1.1 above) species subject to partial targeted survey have been assumed present.

Candidate species recorded as present within the Subject Land after the completion of targeted surveys are listed in Table 5-4. Species polygons are required for these species and have been established.

5.2.1.4 EXPERT REPORTS

Expert Reports have been prepared for three candidate species:

- Brush-tailed Phascogale (*Phascogale tapoatafa*) - An Expert Report has been prepared by Ecology & Infrastructure International Pty Ltd addressing this species within the BESS Development Footprint. The Expert Report is provided in Appendix F. The report concluded that the forest habitat associated with PCT 3746 and PCT 4063 within the BESS Development Footprint is not suitable habitat for the species. The results of the spotlighting and baited camera traps also supported the result of the Expert Report.

- Pink-tailed Legless Lizard (*Aprasia parapulchella*) - An Expert Report has been prepared by Capital Ecology for this species in association with the BESS Development Footprint. The Expert Report for the BESS Development Footprint is provided in Appendix E and concluded that the BESS Development Footprint contains 6.65 ha of suitable habitat within areas of PCT 3746 likely to support the species.
- Striped Legless Lizard (*Delma impar*) - An Expert Report has been prepared by Capital Ecology for this species in association with the Road Resurfacing Development Footprint. The Expert Report for the Road Resurfacing Development Footprint is provided in Appendix G and concluded that the Road Resurfacing Development Footprint contains suitable habitat within areas of PCT 3347_VZ10_Grassland, PCT 3373_VZ12_Woodland and PCT 3373_VZ13_Grassland likely to support the species. The proposed road resurfacing activities are likely to impact 0.65 ha of habitat for this species with:
    - PCT 3347_VZ10_Grassland (0.16 ha);
    - PCT 3373_VZ12_Woodland (0.13 ha); and
    - PCT 3373_VZ13_Grassland (0.43 ha).

No further expert reports have been relied upon and all other species are considered to have been appropriately surveyed in accordance with the BAM, or assumed present where accessibility and safety risks were too high, or where habitat conditions were considered suitable for species.

5.2.1.5 PRESENT CANDIDATE SPECIES

A total of three candidate species were recorded within the Subject Land during surveys. Candidate species recorded as present within the Subject Land after the completion of targeted surveys are identified below:

- Gang-gang Cockatoo (*Callocephalon fimbriatum*)
- Squirrel Glider (*Petaurus norfolcensis*)
- Key's Matchstick Grasshopper (*Keyacris scurra*)

TABLE 5-4 THREATENED FLORA CANDIDATE SPECIES FIELD SURVEY EFFORT

Target Species	Survey Period	Associated PCTs		Parallel Field Traverse Survey effort		Outcome
		BESS	Roadworks	BESS	Roadworks	
Kanangra Wattle (*Acacia clunies-rossiae*)	All Year	4063	-	November 2024 and February 2025: 0.06 ha of targeted flora surveys were completed in PCT 4063.	-	Survey effort met. No individuals or extent of a population was detected.
Bombay Bossiaea (*Bossiaea bombayensis*)	All Year	3746	3746	November 2024, January 2025 & February 2025: 10.90 ha of targeted flora surveys were completed in PCT 3746.	October 2025: Targeted surveys were conducted across the entire Road Resurfacing Development Footprint, including 0.19 ha of targeted flora surveys within PCT 3746.	Survey effort met. No individuals or extent of a population was detected.
Dwarf Kerrawang (*Commersonia prostrata*)	All Year	4063	3347	November 2024 and February 2025: 0.06 ha of targeted flora surveys were completed in PCT 4063.	October 2025: Targeted surveys were conducted across the entire Road Resurfacing Development Footprint, including 0.19 ha of targeted flora surveys within PCT 3347.	Survey effort met. No individuals or extent of a population was detected.
Michelago Parrot-pea (*Dillwynia glaucula*)	September - December	3746	3746 3347 3373	November 2024 9.03 ha of targeted flora surveys were completed in PCT 3746. 5.90 ha of targeted flora surveys were completed in PCT 3373 within the wider Subject Land.	October 2025: Targeted surveys were conducted across the entire Road Resurfacing Development Footprint, including within: PCT 3347 (0.19ha) PCT 3373 (0.54ha) PCT 3746 (0.19ha)	Survey effort met. No individuals or extent of a population was detected.
Black Gum (*Eucalyptus aggregata*)	All Year	3746 4063	3347 3746	November 2024, January 2025 and February 2025: 10.90 ha of targeted flora surveys for were completed in PCT 3746. 0.06 ha of targeted flora surveys were completed in PCT 4063.	October 2025: Targeted surveys were conducted across the entire Road Resurfacing Development Footprint, including within: PCT 3347 (0.19ha) PCT 3746 (0.19ha)	Survey effort met. No individuals or extent of a population was detected.
Paddys River Box, Camden Woollybutt (*Eucalyptus macarthurii*)	All Year	3746	3746	November 2024, January 2025 & February 2025: 10.90 ha of targeted flora surveys were completed in PCT 3746.	October 2025: Targeted surveys were conducted across the entire Road Resurfacing Development Footprint, including within PCT 3746 (0.19ha)	Survey effort met. No individuals or extent of a population was detected.
Mongarlowe Mallee (*Eucalyptus recurva*)	All Year	3746	3347 3746	November 2024, January 2025 & February 2025: 10.90 ha of targeted flora surveys for were completed in PCT 3746.	October 2025: Targeted surveys were conducted across the entire Road Resurfacing Development Footprint, including within: PCT 3347 (0.19ha) PCT 3746 (0.19ha)	Survey effort met. No individuals or extent of a population was detected.

Target Species	Survey Period	Associated PCTs		Parallel Field Traverse Survey effort		Outcome
		BESS	Roadworks	BESS	Roadworks	
Nerriga Grevillea (*Grevillea renwickiana*)	All Year	3746	3746	<u>November 2024, January 2025 & February 2025:</u> 10.90 ha of targeted flora surveys were completed in PCT 3746	<u>October 2025:</u> Targeted surveys were conducted across the entire Road Resurfacing Development Footprint, including within PCT 3746 (0.19ha)	Survey effort met. No individuals or extent of a population was detected.
Hoary Sunray (*Leucochrysum albicans subsp. tricolor*)	September - April	3746	3347 3373 3746	<u>November 2024, January 2025 & February 2025:</u> 10.90 ha of targeted flora surveys were completed in PCT 3746	<u>October 2025:</u> Targeted surveys were conducted across the entire Road Resurfacing Development Footprint, including within: PCT 3347 (0.19ha) PCT 3373 (0.54ha) PCT 3746 (0.19ha)	Survey effort met. No individuals or extent of a population was detected.
Cotoneaster Pomaderris (*Pomaderris cotoneaster*)	October - November	3746	3746	<u>November 2024, January 2025 & February 2025:</u> 10.90 ha of targeted flora surveys were completed in PCT 3746	<u>October 2025:</u> Targeted surveys were conducted across the entire Road Resurfacing Development Footprint, including within PCT 3746 (0.19ha)	Survey effort met. No individuals or extent of a population was detected.
Superb Midge Orchid (*Genoplesium superbum*)	February-March	3746	3746	<u>February 2024:</u> 0.57 ha of targeted flora surveys were completed in PCT 3746. Opportunistic searches were also completed during two survey events: In February 2024, two ecologists completed LCA transects, Rapid Vegetation Assessments and BAM plots over 5 days and did not record the species In February 2025, two ecologists completed an opportunistic search covering 3.92 ha and did not detect the species.	Assumed present	<u>BESS Development Footprint</u> Survey effort met. No individuals or extent of a population was detected. <u>Road Resurfacing Development Footprint</u> Assumed present due to seasonal survey restrictions. Further discussed in Section 5.2.1.5.
Solanum armourense	August – May	4063	-	<u>November 2024 and February 2025:</u> 0.06 ha of targeted flora surveys were completed in PCT 4063.	-	Survey effort met. No individuals or extent of a population was detected.
Buttercup Doubletail *(Diuris aequalis)*	October - November	-	3347, 3373	-	<u>October 2025:</u> Targeted surveys were conducted across the entire Road Resurfacing Development Footprint, including within: PCT 3347 (0.19ha) PCT 3373 (0.54ha)	Survey effort met. No individuals or extent of a population was detected.
Silky Swainson-pea *(Swainsona sericea)*	September - November	-	3373	-	<u>October 2025:</u> Targeted surveys were conducted across the entire Road Resurfacing Development Footprint, including within PCT 3373 (0.54ha)	Survey effort met. No individuals or extent of a population was detected.

TABLE 5-5 THREATENED FAUNA CANDIDATE SPECIES FIELD SURVEY EFFORT

Target Species	Associated PCTs	Survey Period	Survey effort within the Development Footprint		Outcome
			BESS	Roadworks	
Amphibians					
Giant Burrowing Frog *(Heleioporus australiacus)*	3347, 3746	September – May	Aural Visual Surveys: <u>22, 23, 29 and 30 January 2025</u> Eight nights of survey effort were completed as per the guidelines. Broken down as follows • Two nights at one dam in PCT 3746 • Two nights at the second dam in PCT 3746	Aural Visual Surveys: <u>7 – 13 October 2025</u> Six nights of survey effort were completed by two teams of two, totalling 12 nights of survey, meeting the requirements of the guidelines. On some nights multiple locations were surveyed, totalling 21 survey repeats, broken down as follows: • Eight surveys in suitable habitat within PCT 3347. • Eight surveys in suitable habitat within PCT 3746 • Five surveys in suitable habitat within PCT 3373	Survey effort met. No individuals or extent of a population was detected.
Arboreal Mammals					
Squirrel Glider (Petaurus norfolcensis)	3746, 4063	All Year	<u>Baited Camera Monitoring</u> Baited cameras set out for a total of 216 survey nights across the BESS Development Footprint: • 22 January – 5 February 2025: Six cameras deployed for 14 consecutive nights within PCT 3746 and PCT 3373. • 5 February – 27 February 2025: Six cameras re-deployed for 22 consecutive nights within PCT 3746 and PCT 4063. <u>Spotlighting</u> Six spotlighting sessions undertaken across the BESS Development Footprint across January and February 2025. <u>Hollow Bearing Trees</u> HBT searches at all times on site.	<u>Baited Camera Monitoring</u> Baited cameras set out for a total of 45 survey nights across the Road Resurfacing Development Footprint: • 7 October – 13 October 2025 Nine cameras deployed for 6 consecutive nights. <u>Spotlighting</u> Six spotlighting sessions undertaken across the Road Resurfacing Development Footprint during October 2025 surveys. <u>Stagwatching</u> Two stagwatching sessions were undertaken during October 2025 surveys. <u>Hollow Bearing Trees</u> HBT searches at all times on site.	<u>BESS Development Footprint</u> Survey effort met. Further discussed in Section 5.2.1.5 <u>Road Resurfacing Development Footprint</u> Survey effort met. No individuals or extent of a population was detected.
Southern Greater Glider *(Petauroides volans)*	3746, 4063	All Year			<u>BESS Development Footprint</u> Survey effort met. No individuals or extent of a population was detected. <u>Road Resurfacing Development Footprint</u> Survey effort met. No individuals or extent of a population was detected.
Eastern Pygmy-possum (*Cercartetus nanus)*	3746, 4063	October – March			<u>BESS Development Footprint</u> Survey effort met. No individuals or extent of a population was detected. <u>Road Resurfacing Development Footprint</u> Survey effort met. No individuals or extent of a population was detected.

Target Species	Associated PCTs	Survey Period	Survey effort within the Development Footprint		Outcome
			BESS	Roadworks	
Koala *(Phascolarctos cinereus)*	3746, 4063	All Year	Koala Spot Assessment Technique (SAT) Surveys A total of five SATs were undertaken across the BESS Development Footprint over the 19 – 20 May 2025. Baited Camera Monitoring Baited cameras set out for a total of 216 survey nights across the BESS Development Footprint: • 22 January – 5 February 2025: Six cameras deployed for 14 consecutive nights within PCT 3746 and PCT 3373. • 5 February – 27 February 2025: Six cameras re-deployed for 22 consecutive nights within PCT 3746 and PCT 4063. Spotlighting Six spotlighting sessions undertaken across the BESS Development Footprint across January and February 2025.	Koala Spot Assessment Technique (SAT) Surveys A total of eight SATs were undertaken across the Road Resurfacing Development Footprint during October 2025. Baited Camera Monitoring Baited cameras set out for a total of 45 survey nights across the Road Resurfacing Development Footprint: • 7 October – 13 October 2025 Nine cameras deployed for 6 consecutive nights. Call Broadcast Calls of this species were broadcast nightly during surveys undertaken over 7 to 13 October 2025 followed by active listening for any response. Spotlighting Six spotlighting sessions undertaken across the Road Resurfacing Development Footprint during October 2025 surveys. Stagwatching Two stagwatching sessions were undertaken during October 2025 surveys.	BESS Development Footprint Survey effort met. No individuals or extent of a population was detected. Road Resurfacing Development Footprint Survey effort met. No individuals or extent of a population was detected.
Terrestrial Mammals					
Brush-tailed Rock-wallaby *(Petrogale penicillata)*	3746, 4063	All Year	Baited Camera Monitoring Baited cameras set out for a total of 74 survey nights across the BESS Development Footprint: • 22 January – 5 February 2025: Four cameras deployed within PCT 3746. • 5 February – 27 February 2025: Two cameras re-deployed for 14 consecutive nights within PCT 3746. Spotlighting Six spotlighting sessions undertaken across the BESS Development Footprint across January and February 2025.	Baited Camera Monitoring Baited cameras set out for a total of 45 survey nights across the Road Resurfacing Development Footprint: • 7 October – 13 October 2025 Nine cameras deployed for 6 consecutive nights. Spotlighting Six spotlighting sessions undertaken across the Road Resurfacing Development Footprint during October 2025 surveys.	BESS Development Footprint Survey effort met. No individuals or extent of a population was detected. Road Resurfacing Development Footprint Survey effort met. No individuals or extent of a population was detected.
Megachiropteran Bats					
Grey-headed Flying-fox – Breeding (*Pteropus poliocephalus*) (Breeding)	3746, 4064	October - December	Breeding Habitat Searches Targeted surveys were undertaken on the 23 October 2024 along areas of the Wollondilly River within the Subject Land. Dusk / Fly-out surveys Dusk / fly-out surveys were undertaken over one-hour periods within areas of potential camps along the Wollondilly River within the Subject Land over: • 22 January 2025 • 29 – 30 January 2025	Habitat Assessment Initial assessment of habitat values undertaken in October 2024 to determine likely habitat. Camp Habitat Searches Searches across suitable habitat within the Project Area and in adjacent lands, including the Wollondilly Rover occurred in October 2024 to identify the presence of any current camps.	BESS Development Footprint No suitable breeding habitat. No individuals or extent of a population was detected. Road Resurfacing Development Footprint Survey effort met. No individuals or extent of a population was detected.

Target Species	Associated PCTs	Survey Period	Survey effort within the Development Footprint		Outcome
			BESS	Roadworks	
			• 6 February 2025 • 26 – 27 February 2025 <u>Opportunistic</u> Opportunistic surveys at all times on site.	<u>Fly-out / Spotlighting</u> Dusk fly-out surveys were undertaken over 3 nights in January 2025 and a further 3 nights in February 2025 to observe any fly-out of this species from any unseen camps. Opportunistic survey at all times on site.	
Microchiropteran Bats					
Large-eared Pied Bat (*Chalinolobus dwyeri*)	3746, 4063	November – January	<u>Bat Acoustic Monitoring</u> A total of 299 survey hours recorded using two Songmeter Mini devices deployed over the 21 January – 31 January 2025 and the re-deployed in new locations over the 31 January – 12 February 2025.	<u>Habitat Assessment</u> Initial assessment of habitat values undertaken in January 2025 to determine likely habitat. <u>Ultrasonic Audio Recording</u> 2 x ultrasonic audio recorders were placed within the Project Area within areas of suitable habitat for 10 nights in January 2025 and for 24 nights in February 2025.	<u>BESS Development Footprint</u> Survey effort met. No individuals or extent of a population was detected. <u>Road Resurfacing Development Footprint</u> Survey effort met. No suitable breeding habitat identified. No individuals or extent of a population was detected.
Large Bent-winged Bat *(Miniopterus orianae oceanensis)*	4063	December - February			<u>BESS Development Footprint</u> Survey effort met. A 'possible' call was recorded for this species. No suitable breeding habitat identified within the BESS Development Footprint. Further discussed in Section5.2.1.5. <u>Road Resurfacing Development Footprint</u> Survey effort met. No suitable breeding habitat identified within the Road Resurfacing Development Footprint. Further discussed in Section5.2.1.5.
Southern Myotis (*Myotis macropus*)	3746, 4063	October - February			<u>BESS Development Footprint</u> Survey effort met. No individuals or extent of a population was detected. <u>Road Resurfacing Development Footprint</u> Survey effort met. No individuals or extent of a population was detected.

Target Species	Associated PCTs	Survey Period	Survey effort within the Development Footprint		Outcome
			BESS	Roadworks	
Owls					
Barking Owl (*Ninox connivens*)	3746, 4063	All year	<u>Call Broadcast</u> Calls of these species were broadcast nightly over six consecutive nights over the 22 – 30 January 2025 followed by active listening for any response. <u>Spotlighting</u> A total of 12 spotlighting sessions were undertaken across the BESS Development Footprint during surveys in January and February 2025. <u>Passive Acoustic Monitoring</u> A total of 299 survey hours recorded using two Songmeter Mini devices deployed over the 21 January – 31 January 2025 and the re-deployed in new locations over the 31 January – 12 February 2025.	<u>Call Broadcast</u> Calls of this species were broadcast nightly during surveys undertaken over 7 to 13 October 2025 followed by active listening for any response. <u>Spotlighting</u> Six spotlighting sessions undertaken across the Road Resurfacing Development Footprint during October 2025 surveys. <u>Stagwatching</u> Two stagwatching sessions were undertaken during October 2025 surveys.	<u>BESS Development Footprint</u> Survey effort met. No individuals or extent of a population was detected. <u>Road Resurfacing Development Footprint</u> Survey effort met. No suitable breeding habitat identified. No individuals or extent of a population was detected.
Powerful Owl *(Ninox strenua)*	3746, 4063	All year			
Masked Owl *(Tyto novaehollandiae)*	3746, 4063	All year			
Diurnal Birds (Raptors)					
Little Eagle - Breeding *(Hieraaetus morphnoides)*	3746, 4063	August – October	<u>Bird Census</u> Six bird census events were undertaken at 30-minute periods over the 12 – 13 November 2024 and included: • 2 x dawn chorus sessions • 2 x midday sessions • 2 x afternoon / dusk sessions <u>Stick Nest Assessment</u> Targeted searches were undertaken on the 20 February 2024 and 23 October 2024. Stick nest searches were also undertaken opportunistically at all times on site.	<u>Bird Census</u> 20 bird census events were undertaken at 30-minute periods over the 7 – 13 October 2025 and included: • 4 x dawn chorus sessions • 4 x midday sessions • 12 x afternoon / dusk sessions <u>Stick Nest Assessment</u> Stick nest searches were also undertaken opportunistically at all times on site.	<u>BESS Development Footprint</u> Survey effort met. 3 suitable stick nests were recorded within the BESS Development footprint. However, no evidence of raptors or any signs of use were present. No individuals or extent of a population was detected. <u>Road Resurfacing Development Footprint</u> Survey effort met. No suitable breeding habitat identified. No individuals or extent of a population was detected.
Little Eagle - Breeding *(Hieraaetus morphnoides)*	3746, 4063	July - December			

Target Species	Associated PCTs	Survey Period	Survey effort within the Development Footprint		Outcome
			BESS	Roadworks	
Diurnal Birds (excluding raptors)					
Gang-gang Cockatoo -Breeding *(Callocephalon fimbriatum)*	3746, 4063	October - January	Bird Census 16 bird census events were undertaken at 30-minute periods over several survey events, including: • 12 – 13 November 2024 • 22 – 23 January 2025 • 29 – 30 January 2025 • 5 – 6 February 2025 • 26 – 27 February 2025 Hollow Bearing Trees HBT searches at all times on site. Active listening Active listening and opportunistic surveys at all times on site.	Bird Census 20 bird census events were undertaken at 30-minute periods over the 7 – 13 October 2025 and included: • 4 x dawn chorus sessions • 4 x midday sessions • 12 x afternoon / dusk sessions Hollow Bearing Trees HBT searches at all times on site. Active listening Active listening and opportunistic surveys at all times on site.	BESS Development Footprint Survey effort met. Species recorded foraging within BESS Development Footprint. Suitable HBTs recorded. Further discussed in Section 5.2.1.5 Road Resurfacing Development Footprint Survey effort met. Species recorded foraging within vegetation adjacent to the Road Resurfacing Development Footprint. Suitable HBTs recorded. Further discussed in Section5.2.1.5.
South-eastern Glossy Black-Cockatoo – Breeding *(Calyptorhynchus lathami)*	3746, 4063	April - August	Bird Census A one-hour targeted bird census was undertaken by two ecologists on the 29 May 2025 to determine presence of breeding pairs. Census location focused on suitable HBTs identified. Hollow Bearing Trees HBT searches at all times on site. Active listening Active listening and opportunistic surveys at all times on site.	Bird Census 20 bird census events were undertaken at 30-minute periods over the 7 – 13 October 2025 and included: • 4 x dawn chorus sessions • 4 x midday sessions • 12 x afternoon / dusk sessions Hollow Bearing Trees HBT searches at all times on site. Active listening Active listening and opportunistic surveys at all times on site.	BESS Development Footprint Survey effort met. No individuals or extent of a population was detected. Suitable HBTs recorded. Road Resurfacing Development Footprint Survey effort met. No individuals or extent of a population was detected. Suitable HBTs recorded.

Target Species	Associated PCTs	Survey Period	Survey effort within the Development Footprint		Outcome
			BESS	Roadworks	
Pink Robin (*Petroica rodinogaster*)	3347	All year	No suitable habitat associated with the BESS Development Footprint. However appropriate surveys undertaken include: Bird Census 16 bird census events were undertaken at 30-minute periods over several survey events, including: • 12 – 13 November 2024 • 22 – 23 January 2025 • 29 – 30 January 2025 • 5 – 6 February 2025 • 26 – 27 February 2025 Active listening Active listening and opportunistic surveys at all times on site.	Bird Census 20 bird census events were undertaken at 30-minute periods over the 7 – 13 October 2025 and included: • 4 x dawn chorus sessions • 4 x midday sessions • 12 x afternoon / dusk sessions Active listening Active listening and opportunistic surveys at all times on site.	BESS Development Footprint Survey effort met. No individuals or extent of a population was detected. Road Resurfacing Development Footprint Survey effort met. No individuals or extent of a population was detected.
Reptiles					
Pink-tailed Legless Lizard (*Aprasia parapulchella)*	3746	September - November	Expert Report	Excluded	BESS Development Footprint Expert Report prepared (see Appendix E). Further discussed in Section5.2.1.5. The BESS Development Footprint is considered to provide 6.65 ha of suitable habitat. Further discussed in Section 5.2.1.5
Striped Legless Lizard *(Delma impar)*	3347 3373	September - December	Expert Report	Expert Report	Expert Report prepared (see Appendix G). The Road Resurfacing Development Footprint is considered to provide 3.25 ha of suitable habitat. Further discussed in Section5.2.1.5.
Invertebrates					
Key's Matchstick Grasshopper (*Keyacris scurra)*	3373 3746	March – May September - November	Targeted parallel transects Four targeted walking transects were undertaken by two ecologists at approximately 5m spacing during 12 – 13 November 2024. Surveys included transects ranging from 300 m to 650 m in distance. A further six walking transects were completed on 29 May 2025 totalling 20.7 km of targeted survey across the BESS Development Footprint. Opportunistic Opportunistic surveys at all times on site.	Targeted parallel transects Nine targeted walking transects were undertaken by two ecologists at approximately 5m spacing during 7 – 13 October 2025, surveying over a distance of 950 m. Opportunistic Opportunistic surveys at all times on site.	BESS Development Footprint Survey effort met. Species recorded within PCT 3746. Further discussed in Section5.2.1.5. Road Resurfacing Development Footprint Survey effort met. Species recorded. Further discussed in Section5.2.1.5.

5.2.1.6 SPECIES POLYGONS

Species polygons are required to be prepared in accordance with the BAM for each species credit species present, or assumed to be present, with the Subject Land, including species assumed present through expert report.

Species polygons have been developed for a total of six candidate species:

- Superb Midge Orchid (*Genoplesium superbum*)
- Pink-tailed Legless Lizard (*Aprasia parapulchella*)
- Striped Legless Lizard (*Delma impar*)
- Gang-gang Cockatoo (*Callocephalon fimbriatum*)
- Squirrel Glider (*Petaurus norfolcensis*)
- Key's Matchstick Grasshopper (*Keyacris scurra*)

Species polygons are based on the species polygon specifications outlined in the TBDC and relevant guidelines for the species. Species polygons, along with the species records are provided for the list of species identified in Table 5-6.

No species polygon has been prepared for the occurrence of Large Bent-winged Bat (*Miniopterus orianae oceanensis*) or as no breeding habitat for this species occurs within the Subject Land. Therefore, this species has been excluded from assessment as a candidate species but retained as a predicted species for assessment purposes.

TABLE 5-6 LIST OF CANDIDATE SPECIES REQUIRING A SPECIES POLYGON

Species	BC Act	EPBC Act	Biodiversity risk weighting	SAII entity	Record Notes	Species Polygon and Reference
Flora Species						
Superb Midge Orchid (*Genoplesium superbum*)	E	-	Very High	Yes	Assumed Present Species assumed present within areas of potential habitat in the Road Resurfacing Development Footprint. Habitat associated with the species that has been assumed present includes: PCT 3746_VZ17_Shrubland (0.28 ha)	Species polygon of assumed present habitat provided in Figure 5-1
Gang-gang Cockatoo (*Callocephalon fimbriatum*)	E	E	High	No	Recorded Species was largely observed foraging within the BESS Development Footprint during January – February 2025 with one observed occurrence of foraging activity within vegetation adjoining the Road Resurfacing Development Footprint in October 2025. Although the species was not observed within any HBTs, potential impacts to HBTs have been considered.	See Figure 5-2
Squirrel Glider (*Petaurus norfolcensis*)	V	-	High	No	Recorded This species was detected at six different camera locations on eight separate days within the BESS Development Footprint. Four HBTs were identified as suitable breeding hollows and have been included within the species polygon with appropriate buffers. Habitat associated with: • PCT 3746_VZ3_Woodland (0.42 ha) • PCT 3746_VZ4_Grassland (5.36 ha) • PCT 3746_VZ5_Shrubland (3.14 ha) • PCT 3746_VZ6_Planted Natives (0.39 ha) • PCT 3746_VZ7_Highly Disturbed (0.64 ha) • PCT 4063_VZ8_Woodland (0.04 ha)	See Figure 5-3
Key's Matchstick Grasshopper (*Keyacris scurra*)	E	E	High	No	Recorded This species was recorded within suitable grasslands within the BESS Development Footprint and in suitable grassland habitats adjoining within the Road Resurfacing Development Footprint. Five individuals were recorded within the eastern end of the Road Resurfacing Development Footprint during surveyed undertaken in October 2025. However, during the targeted surveys within the BESS Development Footprint, 125 individuals were recorded. Habitat associated with: • PCT 3746_VZ3_Woodland (0.42 ha) • PCT 3746_VZ4_Grassland (5.36 ha) • PCT 3746_VZ5_Shrubland (3.14 ha) • PCT 3746_VZ6_Planted Natives (0.39 ha) • PCT 3746_VZ7_Highly Disturbed (0.64 ha) • PCT 3746_VZ16_Woodland (0.14 ha) • PCT 3746_VZ17_Grassland (0.28 ha) • PCT 3746_VZ18_Shrubland (0.10 ha)	See Figure 5-4

Species	BC Act	EPBC Act	Biodiversity risk weighting	SAII entity	Record Notes	Species Polygon and Reference
Pink-tailed Legless Lizard (*Aprasia parapulchella*)	V	V	High	No	Expert Report An expert report determined that suitable habitat for this species is present across 6.65 ha within the BESS Development Footprint. Habitat associated with: • PCT 3746_VZ3_Woodland (0.42 ha) • PCT 3746_VZ4_Grassland (5.36 ha) • PCT 3746_VZ5_Shrubland (3.14 ha) • PCT 3746_VZ6_Planted Natives (0.39 ha) • PCT 3746_VZ7_Highly Disturbed (0.64 ha)	See Figure 5-5 Expert Report provided in Appendix E.
Striped Legless Lizard (*Delma impar*)	V	V	Moderate	No	Expert Report An expert report determined that suitable habitat for this species is present within areas of PCT 3347 and PCT 3373 within the Road Resurfacing Development Footprint, totalling an impact to: • PCT 3347_VZ10_Grassland (0.16 ha) • PCT 3373_VZ12_Woodland (0.13 ha) • PCT 3373_VZ13_Grassland (0.43 ha)	See Figure 5-6 Expert Report provided in Appendix G.



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Subject Land
- Development Footprint
- Local Road
- Major Watercourse
- Superb Midge Orchid Species Polygon within the Development Footprint
- Superb Midge Orchid Species Polygon



Coordinate System:
GDA 1994 MGA Zone 55
Date: 12/01/2026
Created By: NB/AM
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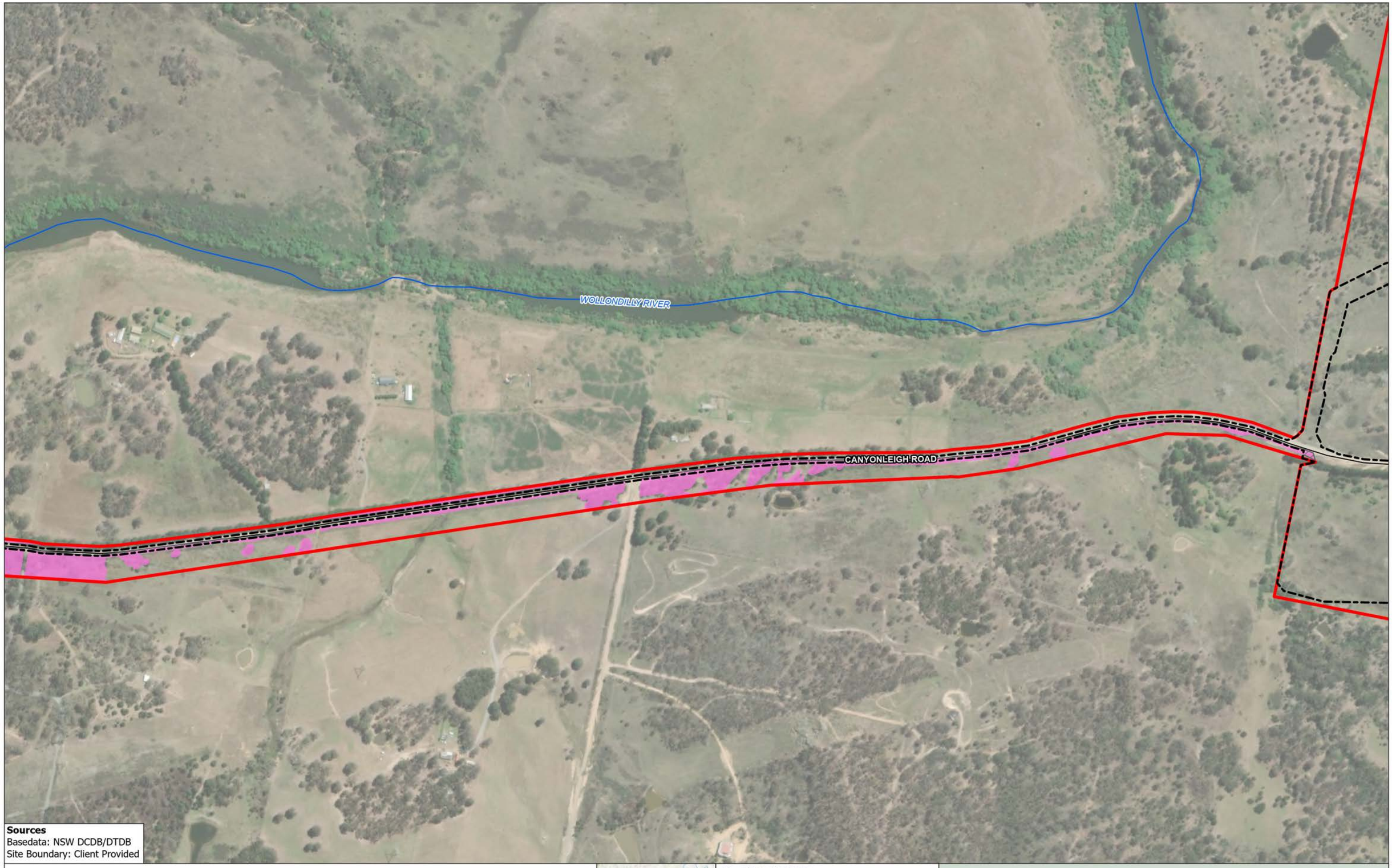
F5-1 Species Polygon for Superb Midge Orchid (Genoplesium superbum) Map 1 of 7

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

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0711340_CBESS_BDAR_R2.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Subject Land
- Development Footprint
- Local Road
- Major Watercourse
- Superb Midge Orchid Species Polygon within the Development Footprint
- Superb Midge Orchid Species Polygon

Coordinate System:
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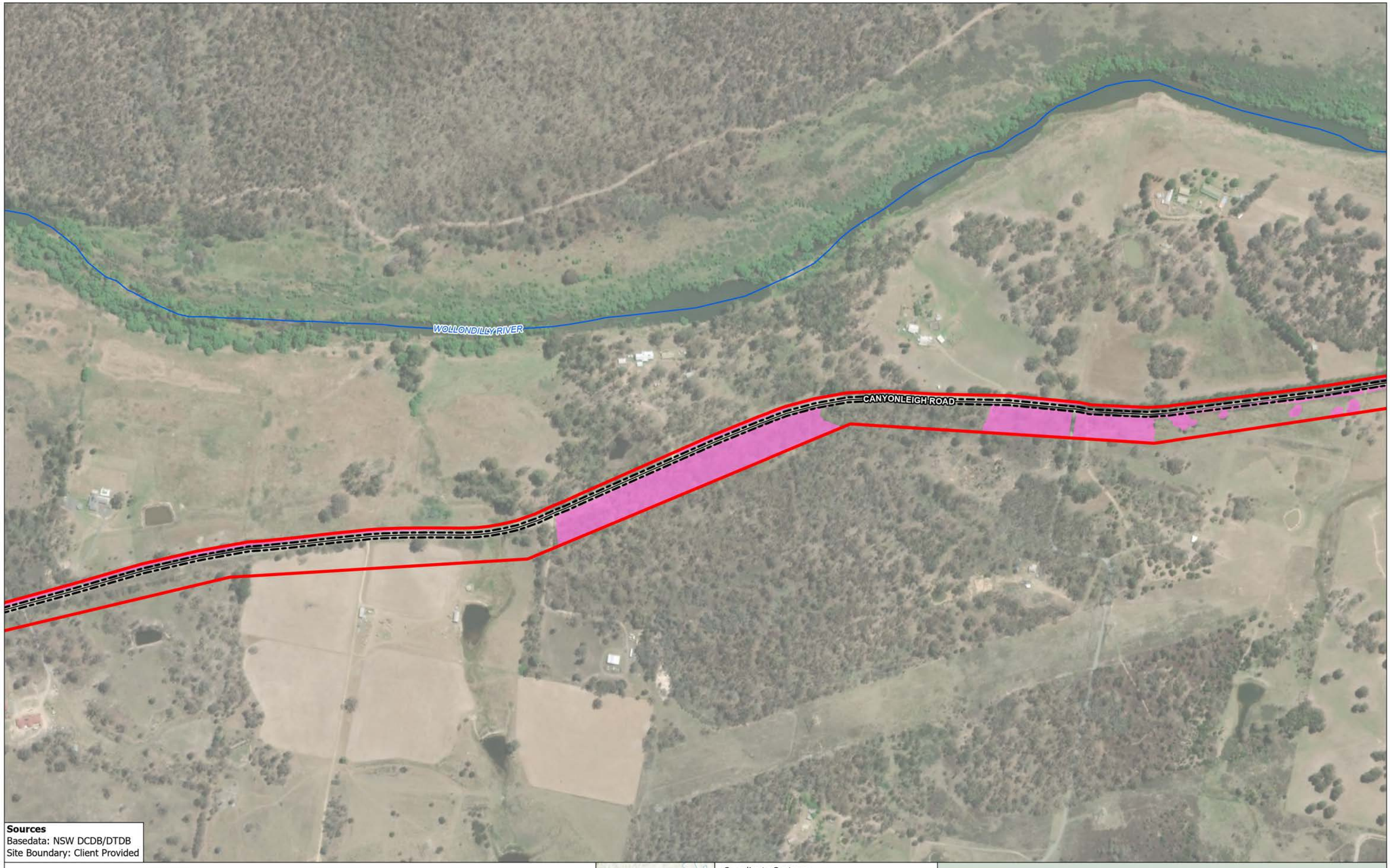
F5-1 Species Polygon for Superb Midge Orchid (Genoplesium superbum)
Map 2 of 7

Canyonleigh Battery Energy Storage System BDAR

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0711340_CBESS_BDAR_R2.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend
- Subject Land
- Development Footprint
- Local Road
- Major Watercourse
- Superb Midge Orchid Species Polygon within the Development Footprint
- Superb Midge Orchid Species Polygon

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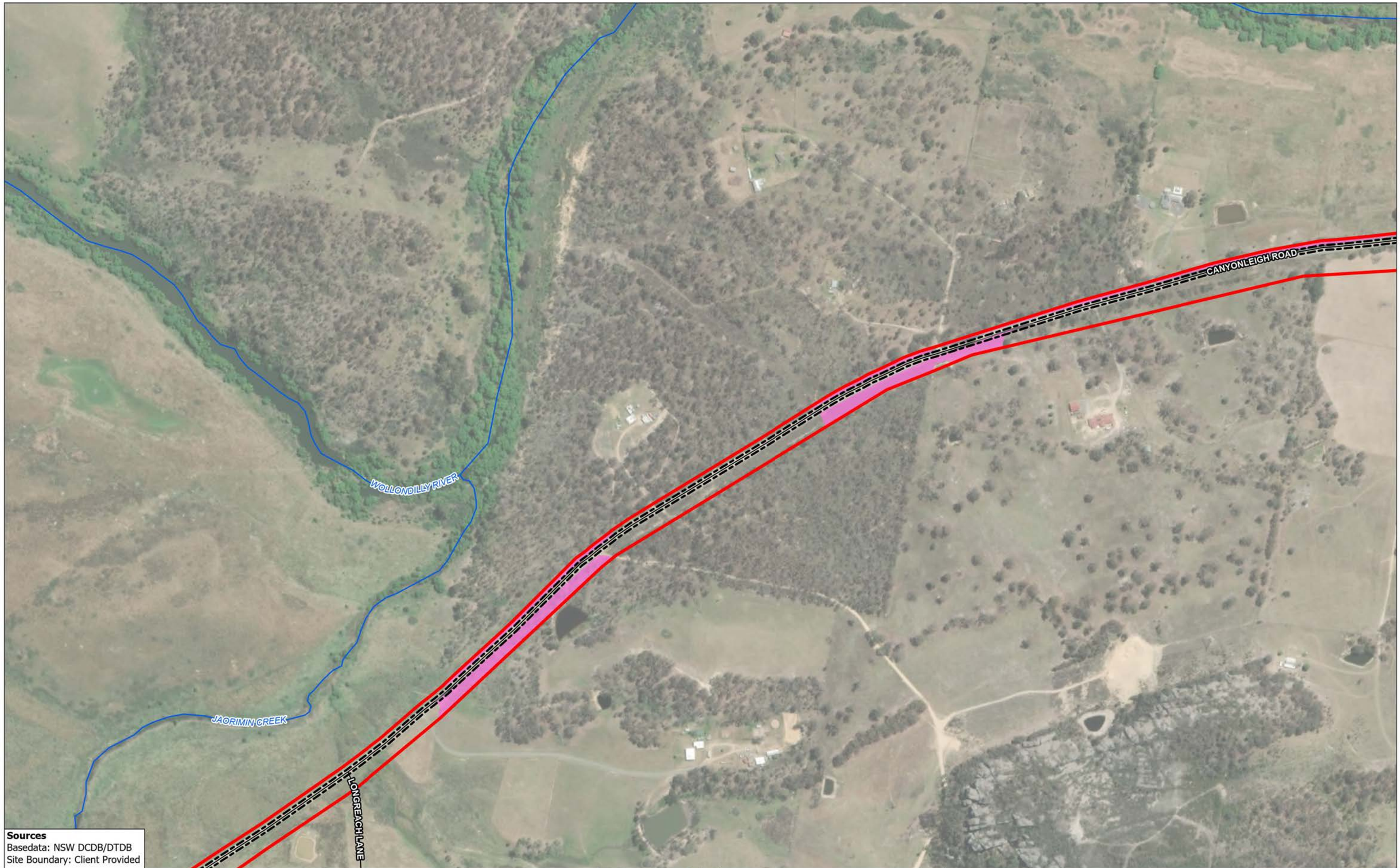
F5-1 Species Polygon for Superb Midge Orchid (Genoplesium superbum)
Map 3 of 7

Canyonleigh Battery Energy Storage System BDAR

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0711340_CBESS_BDAR_R2.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Subject Land
- Development Footprint
- Local Road
- Major Watercourse
- Superb Midge Orchid Species Polygon within the Development Footprint
- Superb Midge Orchid Species Polygon

Coordinate System:
GDA 1994 MGA Zone 55
Date: 12/01/2026
Created By: NB/AM
Drawing Size: A3
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F5-1 Species Polygon for Superb Midge Orchid (Genoplesium superbum)
Map 4 of 7

Canyonleigh Battery Energy Storage System BDAR
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0711340_CBESS_BDAR_R2.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Subject Land
- Development Footprint
- Local Road
- Major Watercourse
- Superb Midge Orchid Species Polygon within the Development Footprint
- Superb Midge Orchid Species Polygon

Coordinate System:
GDA 1994 MGA Zone 55
Date: 12/01/2026
Created By: NB/AM
Drawing Size: A3
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F5-1 Species Polygon for Superb Midge Orchid (Genoplesium superbum)
Map 5 of 7

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

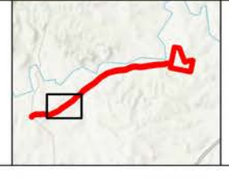
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Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend
- Subject Land
- Development Footprint
- Local Road
- Major Watercourse



Coordinate System:
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F5-1 Species Polygon for Superb Midge Orchid (Genoplesium superbum)
Map 6 of 7

Canyonleigh Battery Energy Storage System BDAR
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Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend
Subject Land
Development Footprint
Local Road

Coordinate System:
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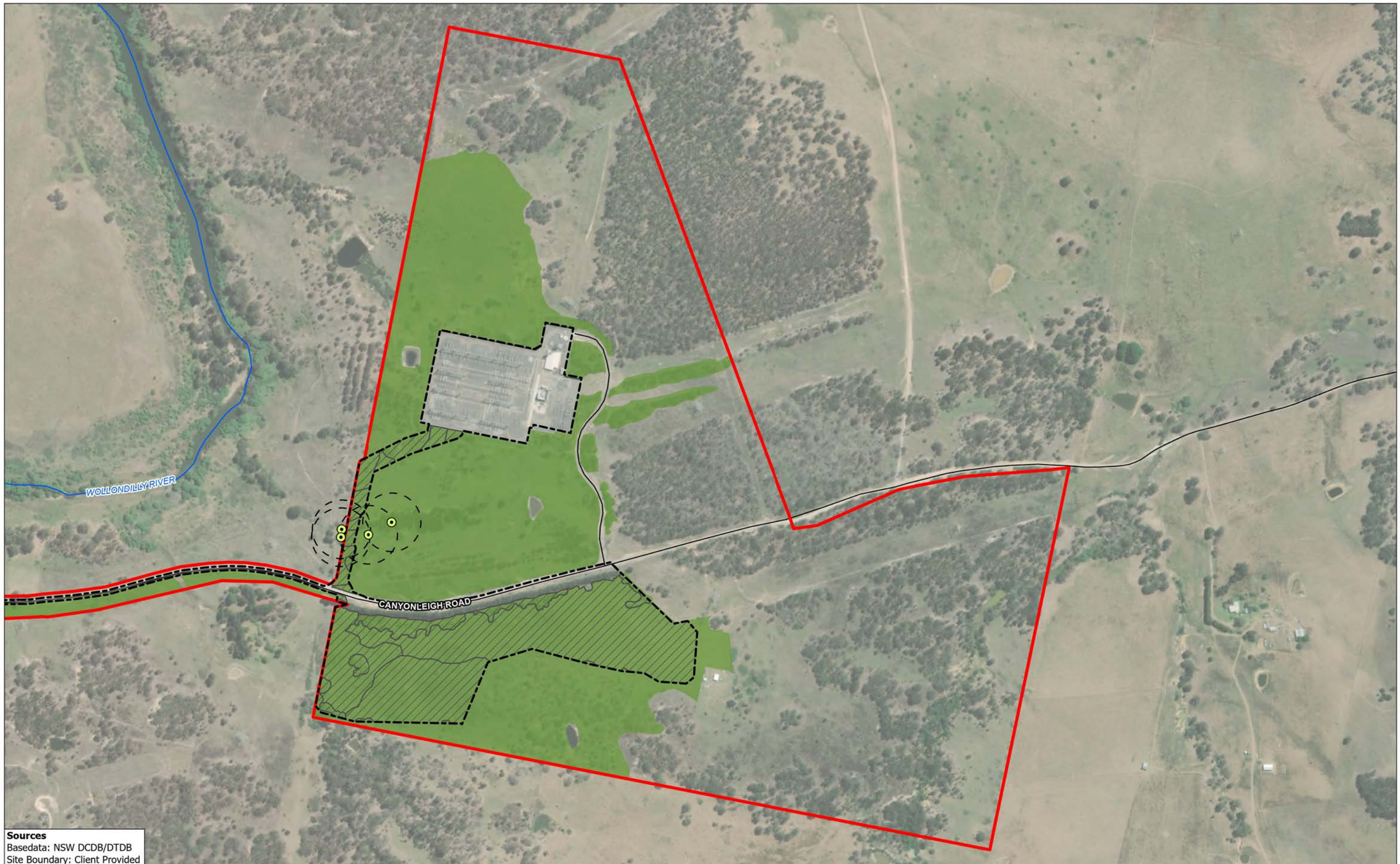
F5-1 Species Polygon for Superb Midge Orchid (Genoplesium superbum)
Map 7 of 7

Canyonleigh Battery Energy Storage System BDAR

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Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Subject Land
- Development Footprint
- Hollow Bearing Tree
- Gang-Gang Cockatoo Species Polygon within the Development Footprint
- Gang-Gang Cockatoo Species Polygon
- Local Road
- Major Watercourse

Coordinate System:
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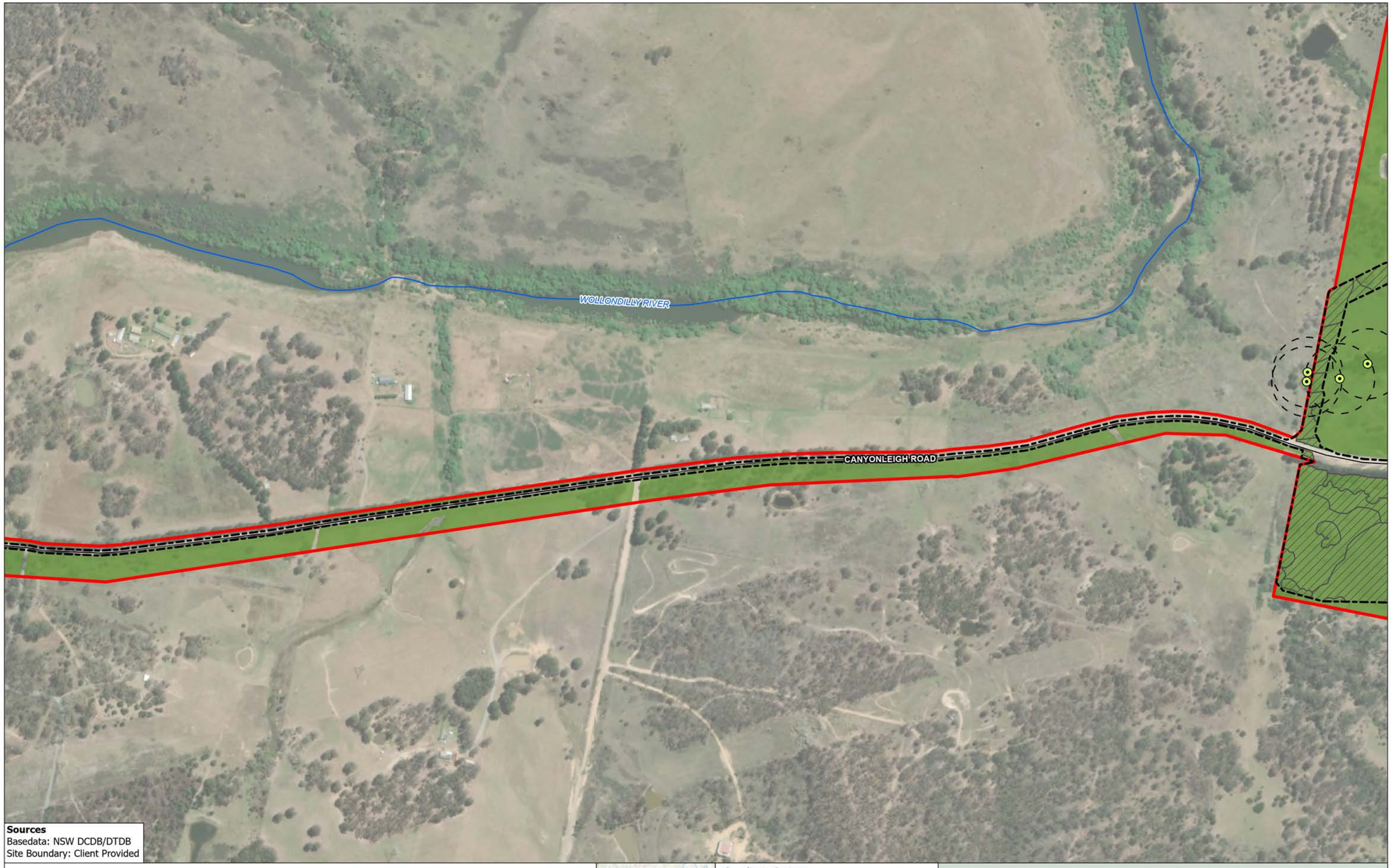
F5-2 Species Polygon for Gang-Gang Cockatoo (Callocephalon fimbriatum)
Map 1 of 8

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Subject Land
- Development Footprint
- Hollow Bearing Tree
- Gang-Gang Cockatoo Species Polygon within the Development Footprint
- Gang-Gang Cockatoo Species Polygon
- Local Road
- Major Watercourse

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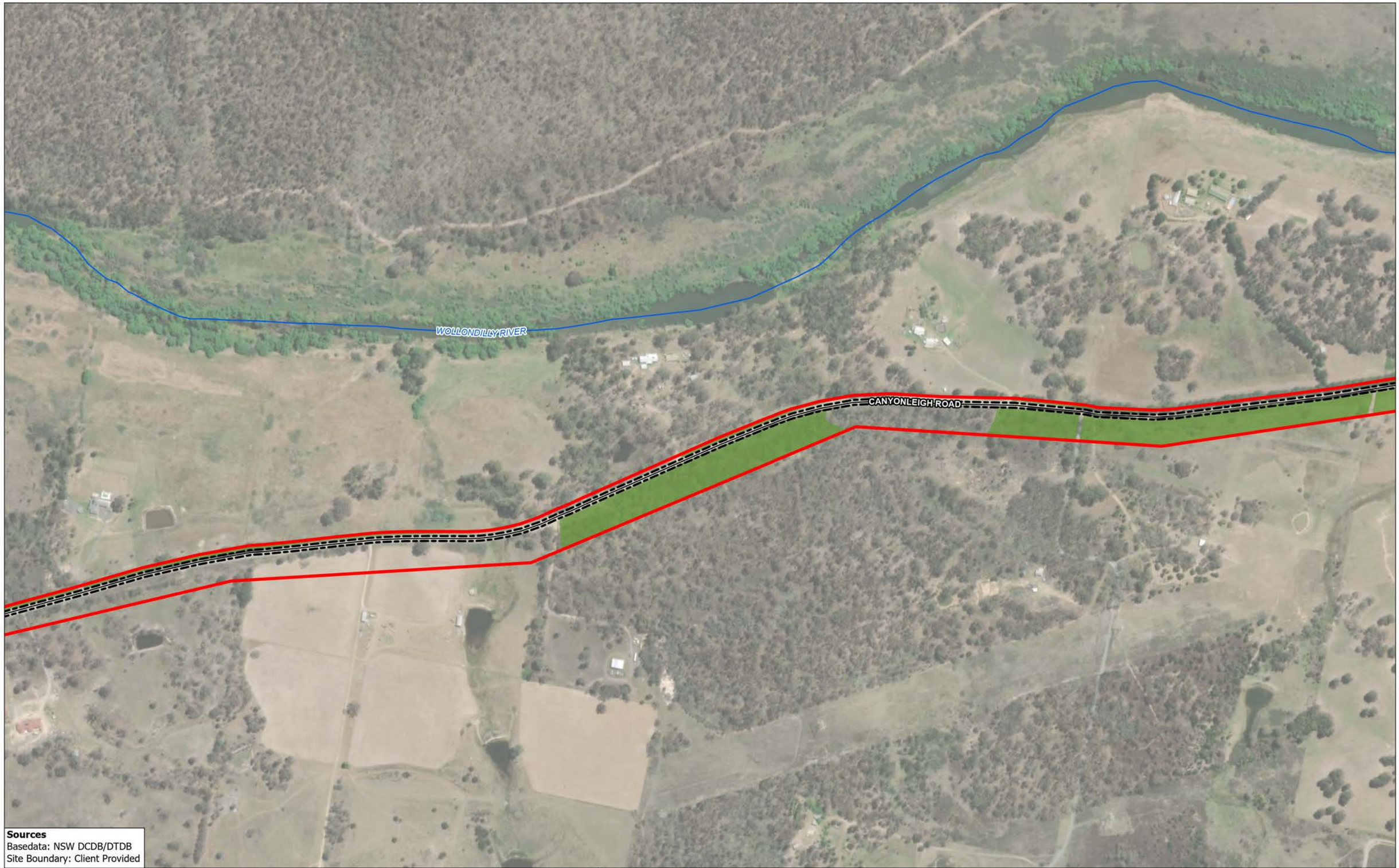
F5-2 Species Polygon for Gang-Gang Cockatoo (Callocephalon fimbriatum)
Map 2 of 8

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Subject Land
- Development Footprint
- Gang-Gang Cockatoo Species Polygon within the Development Footprint
- Gang-Gang Cockatoo Species Polygon
- Local Road
- Major Watercourse

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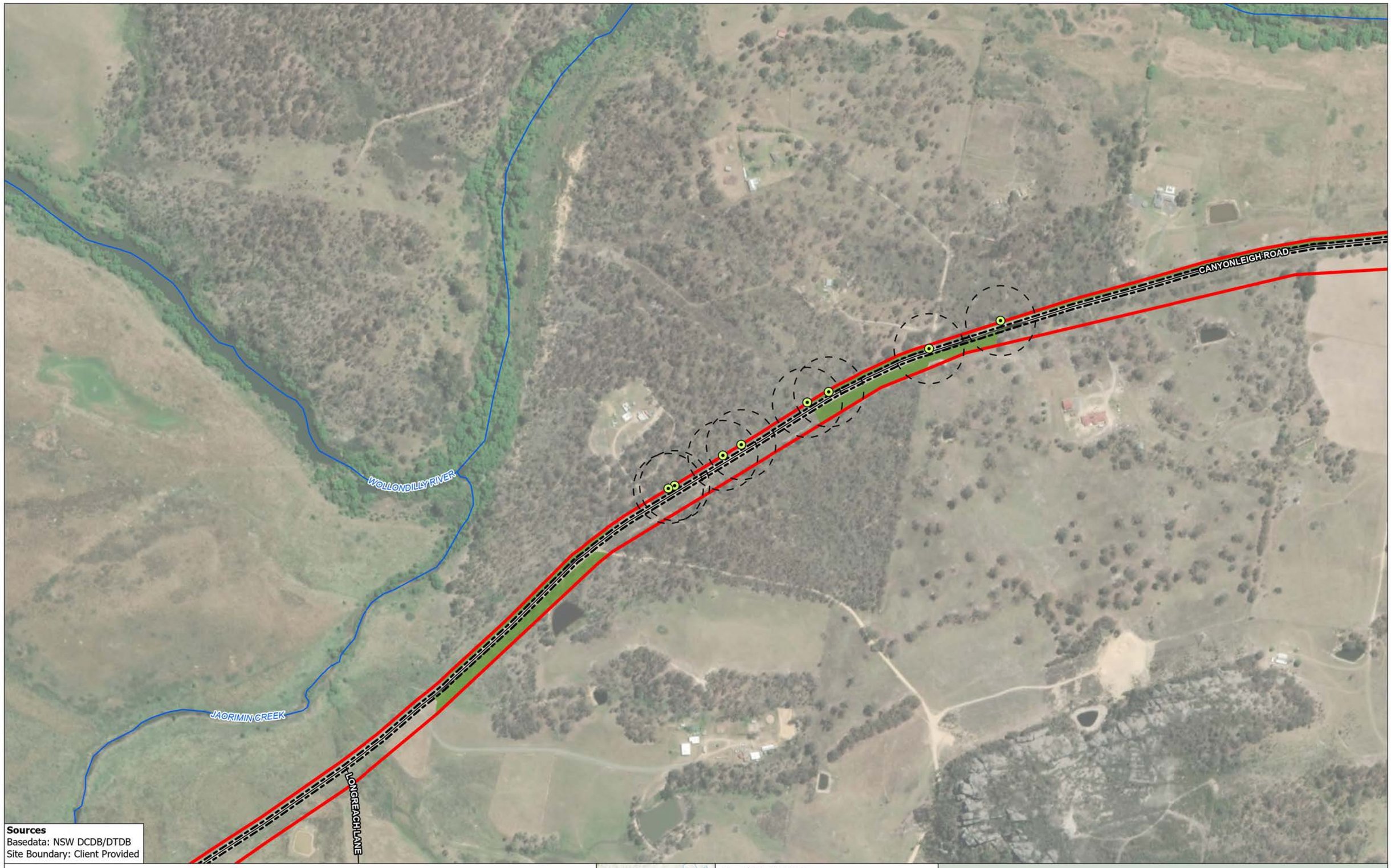
F5-2 Species Polygon for Gang-Gang Cockatoo (Callocephalon fimbriatum)
Map 3 of 8

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Subject Land
- Development Footprint
- Hollow Bearing Tree
- Hollow Bearing Tree 50m Buffer
- Gang-Gang Cockatoo Species Polygon within the Development Footprint
- Gang-Gang Cockatoo Species Polygon
- Local Road
- Major Watercourse

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F5-2 Species Polygon for Gang-Gang Cockatoo (Callocephalon fimbriatum)
Map 4 of 8

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Subject Land
- Development Footprint
- Gang-Gang Cockatoo Species Polygon within the Development Footprint
- Gang-Gang Cockatoo Species Polygon
- Local Road
- Major Watercourse

Coordinate System:
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F5-2 Species Polygon for Gang-Gang Cockatoo (Callocephalon fimbriatum)
Map 5 of 8

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Subject Land
- Development Footprint
- Hollow Bearing Tree
- Hollow Bearing Tree 50m Buffer
- Local Road
- Major Watercourse

Coordinate System:
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F5-2 Species Polygon for Gang-Gang Cockatoo (Callocephalon fimbriatum)
Map 6 of 8

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend
- Subject Land
- Development Footprint
- Hollow Bearing Tree
- Hollow Bearing Tree 50m Buffer
- Local Road

Coordinate System:
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F5-2 Species Polygon for Gang-Gang Cockatoo (Callocephalon fimbriatum)
Map 7 of 8

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend
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- Development Footprint
- Hollow Bearing Tree
- Hollow Bearing Tree 50m Buffer
- Local Road

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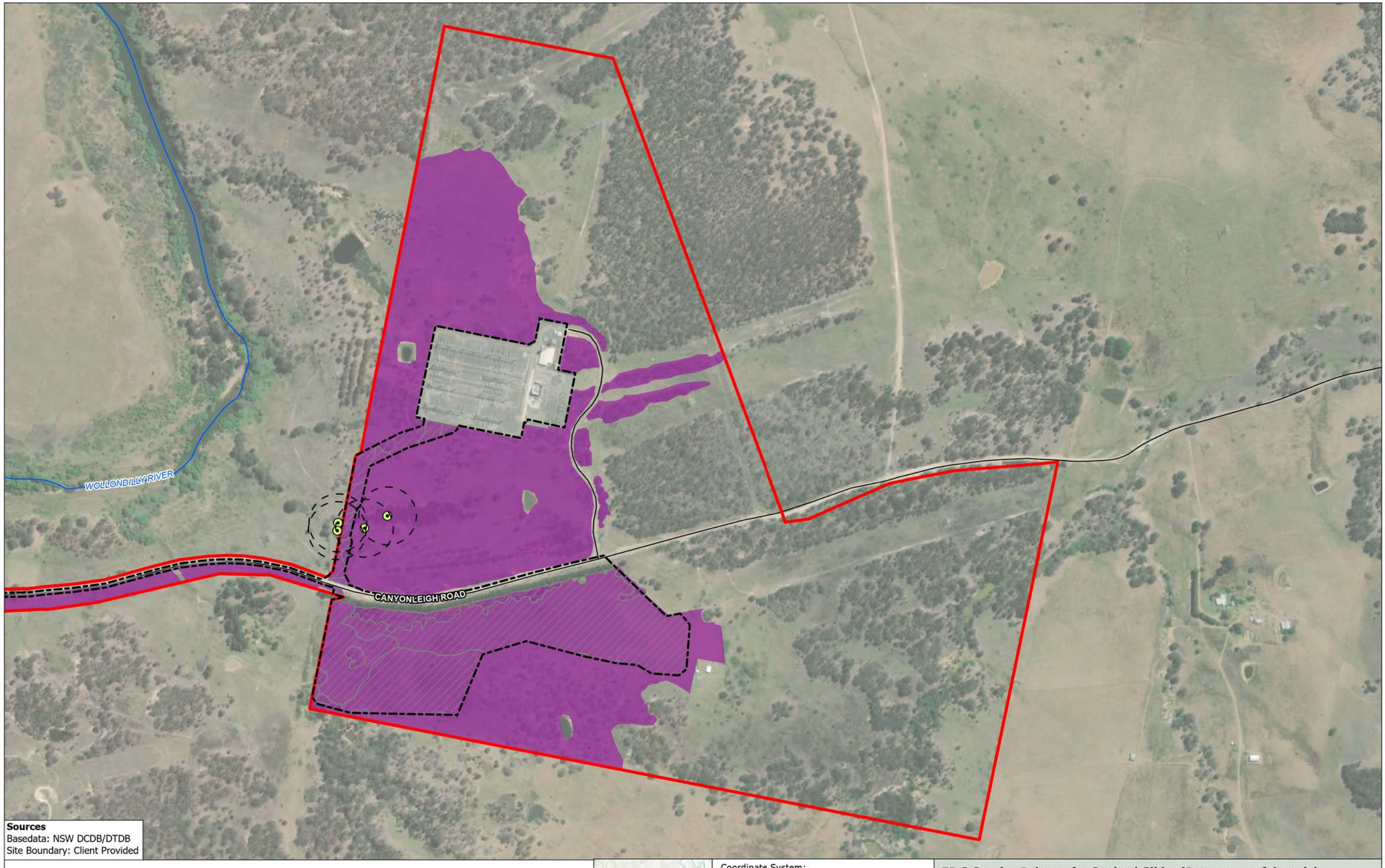
F5-2 Species Polygon for Gang-Gang Cockatoo (Callocephalon fimbriatum)
Map 8 of 8

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Subject Land
- Development Footprint
- Hollow Bearing Tree
- Squirrel Glider Species Polygon within the Development Footprint
- Squirrel Glider Species Polygon
- Local Road
- Major Watercourse



Coordinate System:
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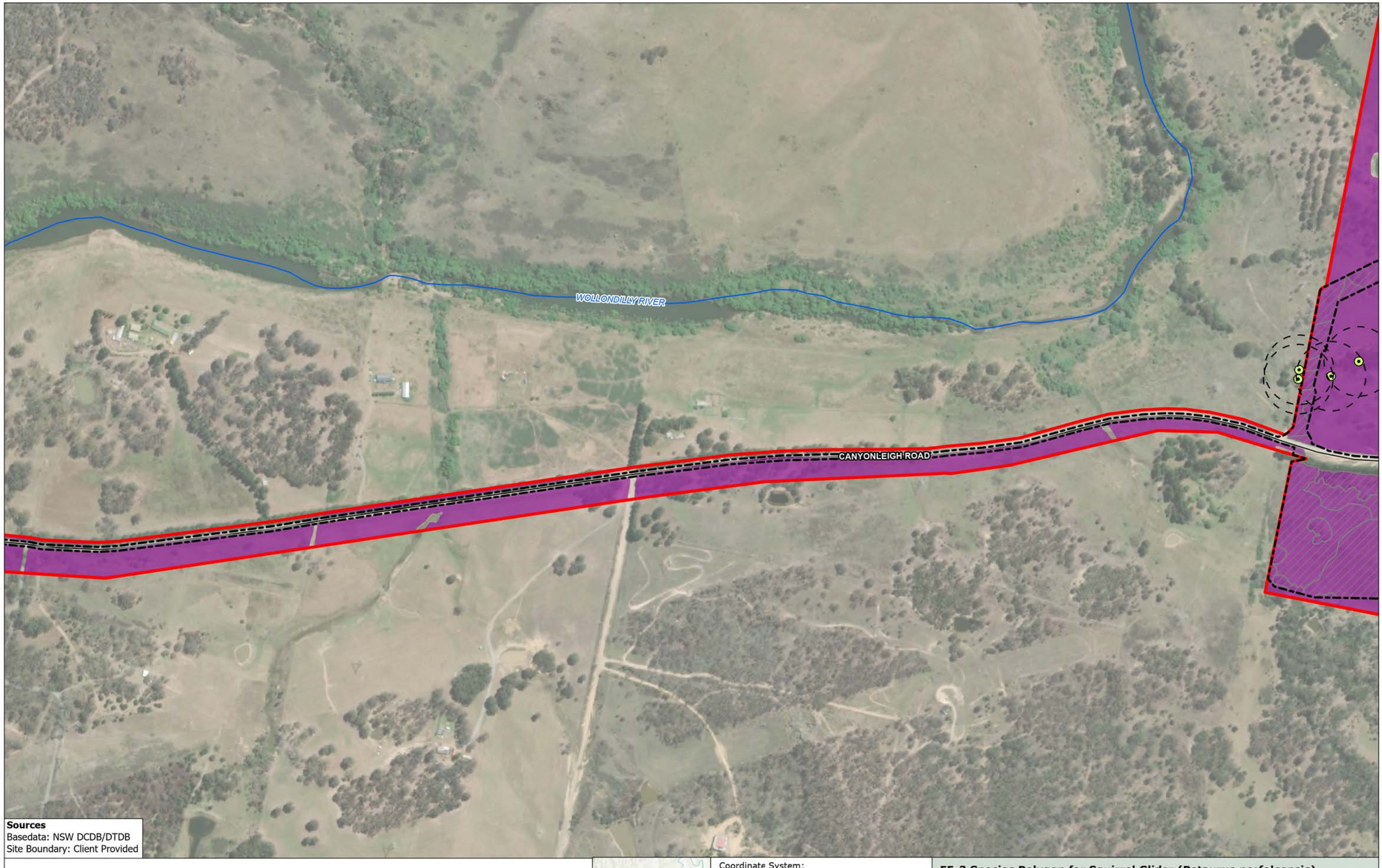
F5-3 Species Polygon for Squirrel Glider (Petaurus norfolcensis)
Map 1 of 8

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Subject Land
- Development Footprint
- Hollow Bearing Tree
- Squirrel Glider Species Polygon within the Development Footprint
- Squirrel Glider Species Polygon
- Local Road
- Major Watercourse

Coordinate System:
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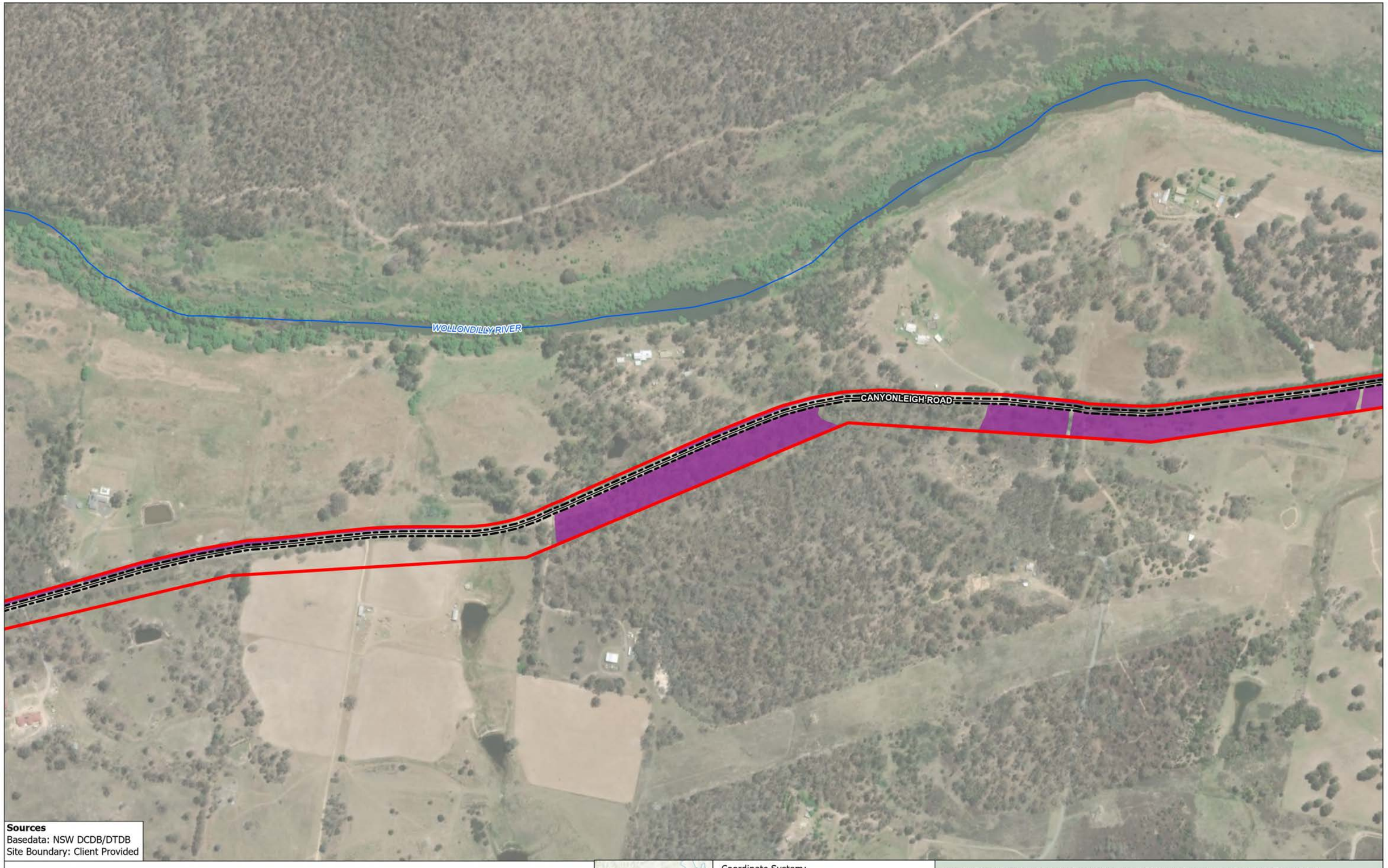
F5-3 Species Polygon for Squirrel Glider (Petaurus norfolcensis)
Map 2 of 8

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

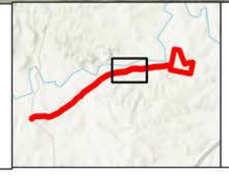
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Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Subject Land
- Development Footprint
- Squirrel Glider Species Polygon within the Development Footprint
- Squirrel Glider Species Polygon
- Local Road
- Major Watercourse



Coordinate System:
GDA 1994 MGA Zone 55
Date: 16/01/2026
Created By: NB/AM
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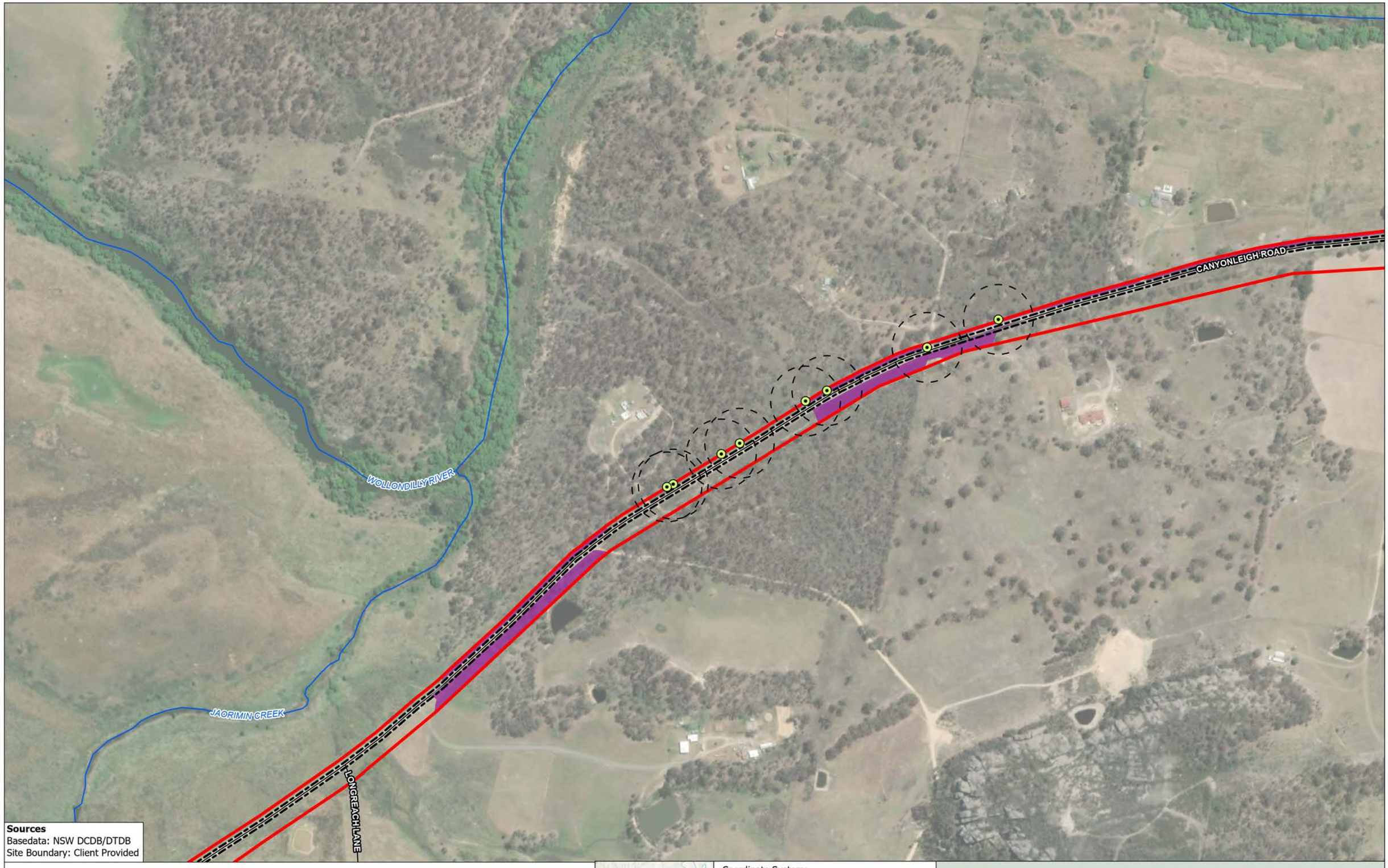
F5-3 Species Polygon for Squirrel Glider (Petaurus norfolcensis)
Map 3 of 8

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Subject Land
- Development Footprint
- Hollow Bearing Tree
- Hollow Bearing Tree 50m buffer
- Squirrel Glider Species Polygon within the Development Footprint
- Squirrel Glider Species Polygon
- Local Road
- Major Watercourse

Coordinate System:
GDA 1994 MGA Zone 55
Date: 16/01/2026
Created By: NB/AM
Drawing Size: A3
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1:5,000

F5-3 Species Polygon for Squirrel Glider (Petaurus norfolcensis)
Map 4 of 8

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Subject Land
- Development Footprint
- Squirrel Glider Species Polygon within the Development Footprint
- Squirrel Glider Species Polygon
- Local Road
- Major Watercourse

Coordinate System:
GDA 1994 MGA Zone 55
Date: 16/01/2026
Created By: NB/AM
Drawing Size: A3
0 90 180m
1:5,000

F5-3 Species Polygon for Squirrel Glider (Petaurus norfolcensis)
Map 5 of 8

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend
- Subject Land
- Development Footprint
- Hollow Bearing Tree
- Hollow Bearing Tree 50m buffer
- Local Road
- Major Watercourse

Coordinate System:
GDA 1994 MGA Zone 55
Date: 16/01/2026
Created By: NB/AM
Drawing Size: A3
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F5-3 Species Polygon for Squirrel Glider (Petaurus norfolcensis)
Map 6 of 8

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend
- Subject Land
- Development Footprint
- Hollow Bearing Tree
- Hollow Bearing Tree 50m buffer
- Local Road

Coordinate System:
GDA 1994 MGA Zone 55
Date: 16/01/2026
Created By: NB/AM
Drawing Size: A3
0 90 180m
1:5,000

F5-3 Species Polygon for Squirrel Glider (Petaurus norfolcensis)
Map 7 of 8

Canyonleigh Battery Energy Storage System BDAR
X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend
- Subject Land
- Development Footprint
- Hollow Bearing Tree
- Hollow Bearing Tree 50m buffer
- Local Road

Coordinate System:
GDA 1994 MGA Zone 55
Date: 16/01/2026
Created By: NB/AM
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F5-3 Species Polygon for Squirrel Glider (Petaurus norfolcensis)
Map 8 of 8

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx

WOLLONDILLY RIVER

CANYONLEIGH ROAD

Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Subject Land
- Development Footprint
- Key's Matchstick Grasshopper Species Polygon within the Development Footprint
- Key's Matchstick Grasshopper Species Polygon
- Local Road
- Major Watercourse



Coordinate System:
GDA 1994 MGA Zone 55
Date: 16/01/2026
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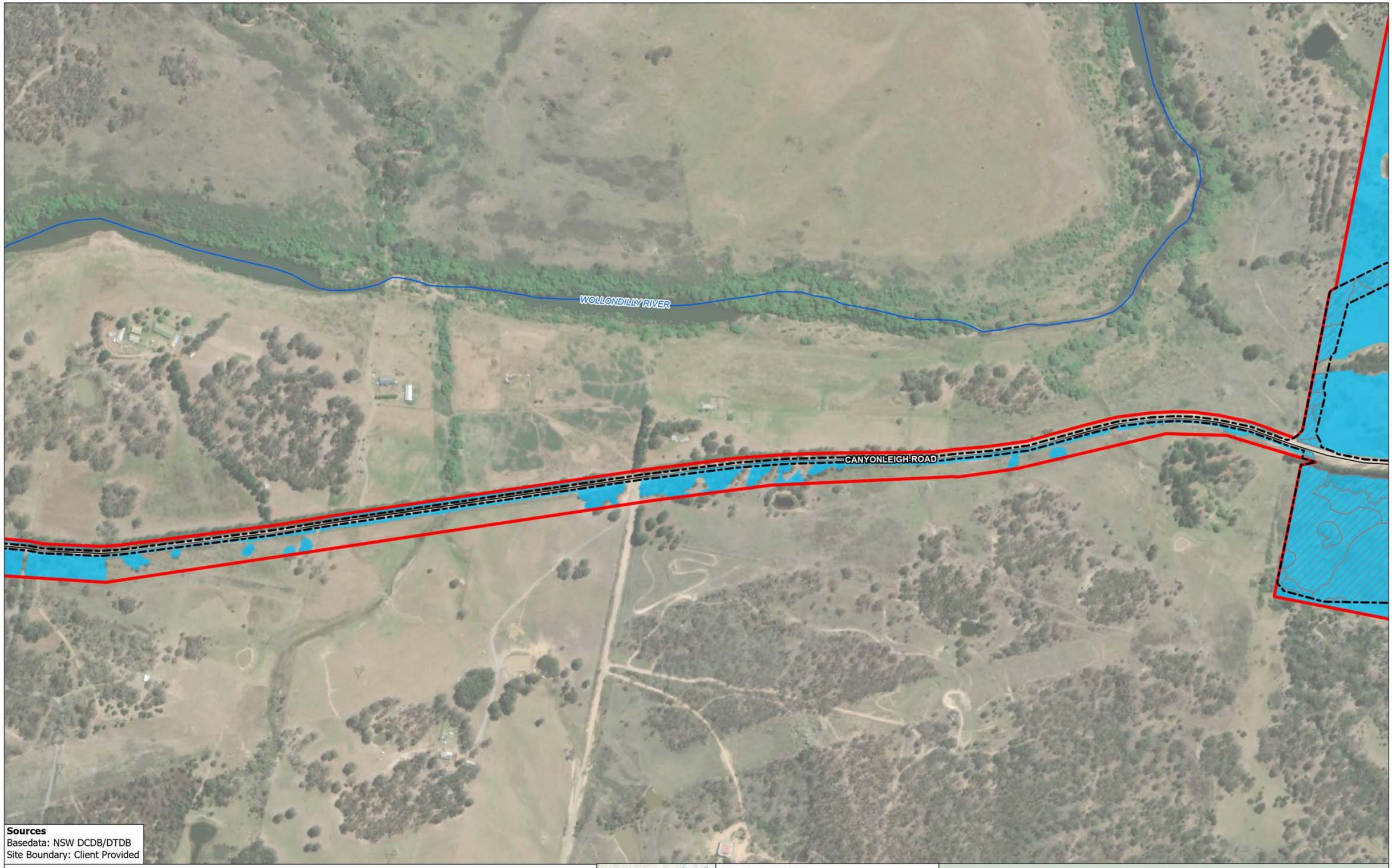
F5-4 Species Polygon for Key's Matchstick Grasshopper (Keyacris scurra)
Map 1 of 8

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Subject Land
- Development Footprint
- Key's Matchstick Grasshopper Species Polygon within the Development Footprint
- Key's Matchstick Grasshopper Species Polygon
- Local Road
- Major Watercourse



Coordinate System:
GDA 1994 MGA Zone 55
Date: 16/01/2026
Created By: NB/AM
Drawing Size: A3
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1:5,000

F5-4 Species Polygon for Key's Matchstick Grasshopper (Keyacris scurra)
Map 2 of 8

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Subject Land
- Development Footprint
- Key's Matchstick Grasshopper Species Polygon within the Development Footprint
- Key's Matchstick Grasshopper Species Polygon
- Local Road
- Major Watercourse



Coordinate System:
GDA 1994 MGA Zone 55
Date: 16/01/2026
Created By: NB/AM
Drawing Size: A3
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F5-4 Species Polygon for Key's Matchstick Grasshopper (Keyacris scurra)
Map 3 of 8

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Subject Land
- Development Footprint
- Key's Matchstick Grasshopper Species Polygon within the Development Footprint
- Key's Matchstick Grasshopper Species Polygon
- Local Road
- Major Watercourse

Coordinate System:
GDA 1994 MGA Zone 55
Date: 16/01/2026
Created By: NB/AM
Drawing Size: A3
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F5-4 Species Polygon for Key's Matchstick Grasshopper (Keyacris scurra)
Map 4 of 8

Canyonleigh Battery Energy Storage System BDAR
X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Subject Land
- Development Footprint
- Key's Matchstick Grasshopper Species Polygon within the Development Footprint
- Key's Matchstick Grasshopper Species Polygon
- Local Road
- Major Watercourse

Coordinate System:
GDA 1994 MGA Zone 55
Date: 16/01/2026
Created By: NB/AM
Drawing Size: A3
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1:5,000

F5-4 Species Polygon for Key's Matchstick Grasshopper (Keyacris scurra)
Map 5 of 8

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend
- Subject Land
- Development Footprint
- Local Road
- Major Watercourse

Coordinate System:
GDA 1994 MGA Zone 55
Date: 16/01/2026
Created By: NB/AM
Drawing Size: A3
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F5-4 Species Polygon for Key's Matchstick Grasshopper (Keyacris scurra)
Map 6 of 8

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx

BRAYTON ROAD

BULLS PIT ROAD

CANYONLEIGH ROAD

CARRICK ROAD

Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend
Subject Land
Development Footprint
Local Road

Coordinate System:
GDA 1994 MGA Zone 55
Date: 16/01/2026
Created By: NB/AM
Drawing Size: A3
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1:5,000

F5-4 Species Polygon for Key's Matchstick Grasshopper (Keyacris scurra)
Map 7 of 8

Canyonleigh Battery Energy Storage System BDAR
X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend
Subject Land
Development Footprint
Local Road

Coordinate System:
GDA 1994 MGA Zone 55
Date: 16/01/2026
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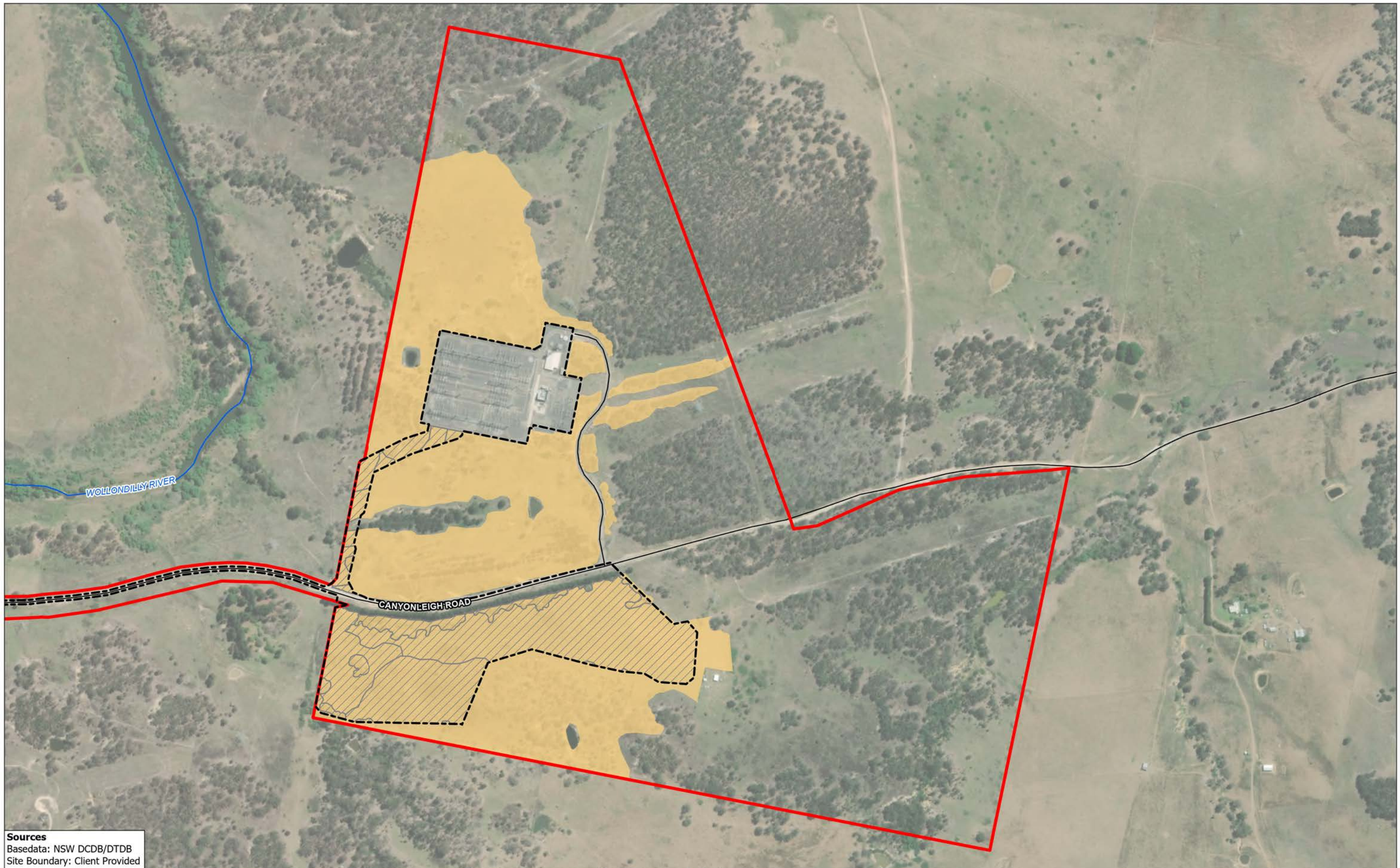
F5-4 Species Polygon for Key's Matchstick Grasshopper (Keyacris scurra)
Map 8 of 8

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Subject Land
- Development Footprint
- Pink-Tailed Legless Lizard Species Polygon
- Pink Tailed Legless Lizard Species Polygon within the Development Footprint
- Local Road
- Major Watercourse

Coordinate System:
GDA 1994 MGA Zone 55
Date: 16/01/2026
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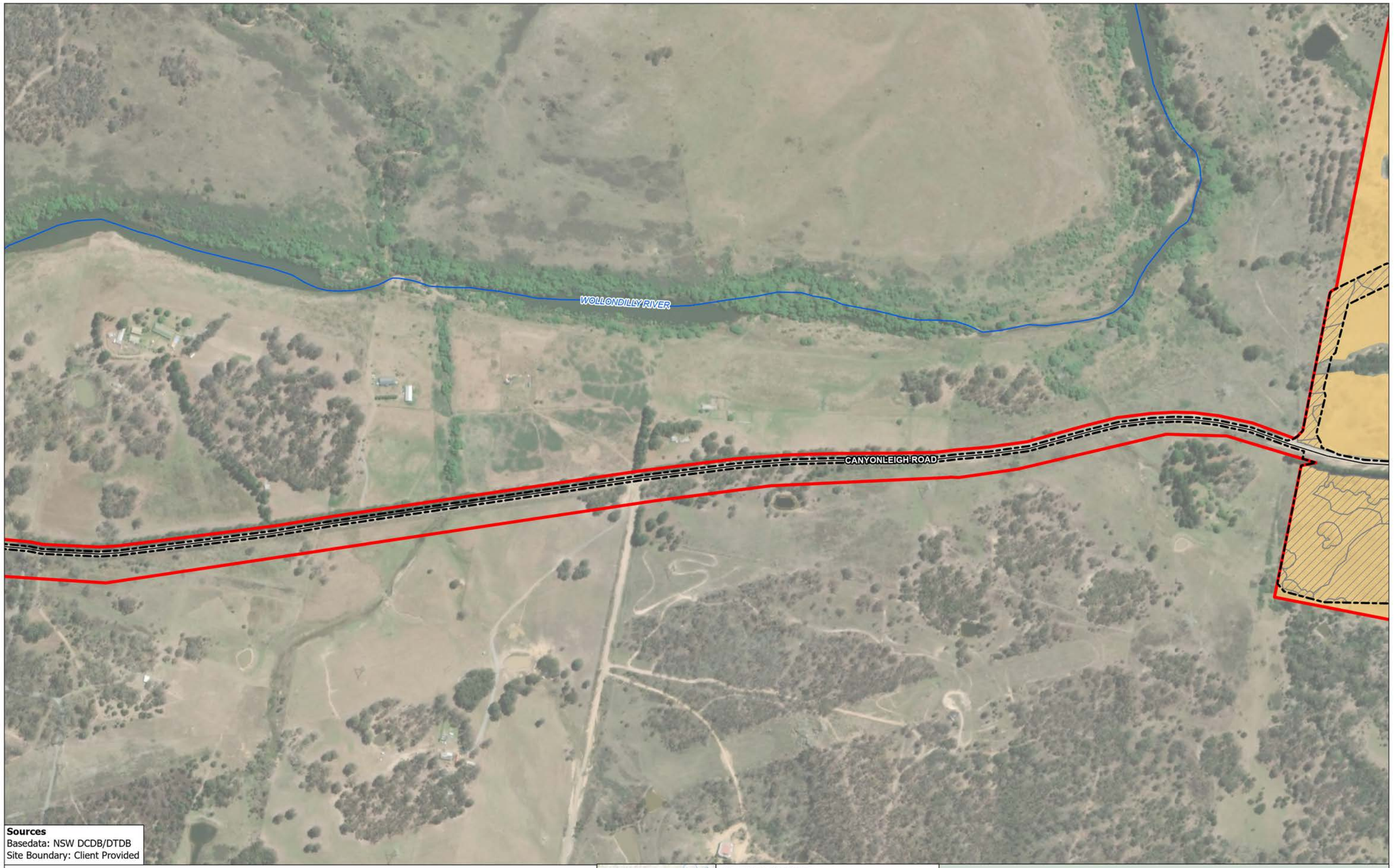
F5-5 Species Polygon for Pink-Tailed Legless Lizard (Aprasia parapulchella)
Map 1 of 8

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Subject Land
- Development Footprint
- Pink-Tailed Legless Lizard Species Polygon
- Pink Tailed Legless Lizard Species Polygon within the Development Footprint
- Local Road
- Major Watercourse



Coordinate System:
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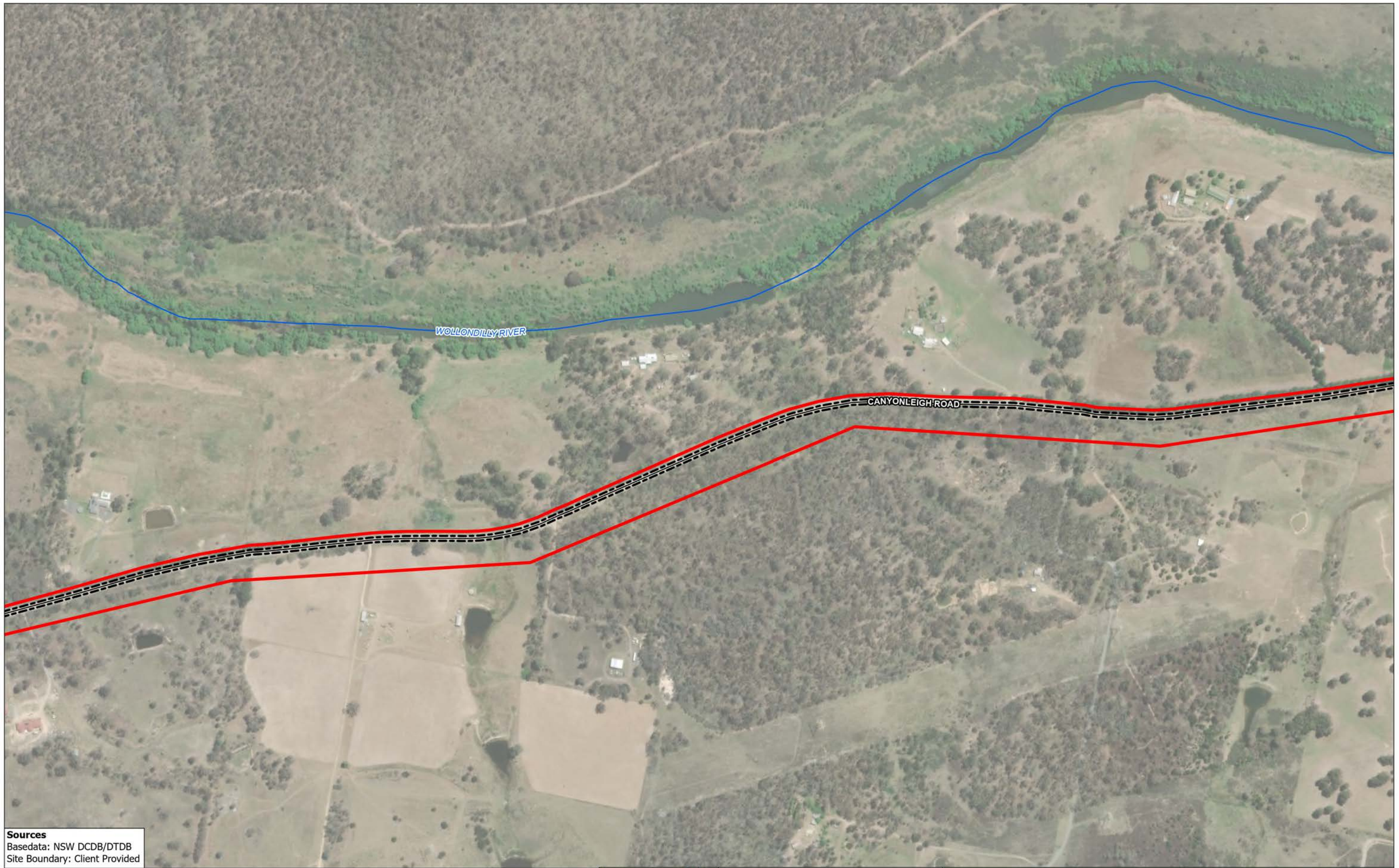
F5-5 Species Polygon for Pink-Tailed Legless Lizard (Aprasia parapulchella)
Map 2 of 8

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend
- Subject Land
- Development Footprint
- Local Road
- Major Watercourse



Coordinate System:
GDA 1994 MGA Zone 55
Date: 16/01/2026
Created By: NB/AM
Drawing Size: A3
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F5-5 Species Polygon for Pink-Tailed Legless Lizard (Aprasia parapulchella)
Map 3 of 8

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend
- Subject Land
- Development Footprint
- Local Road
- Major Watercourse
- Hollow Bearing Tree

Coordinate System:
GDA 1994 MGA Zone 55
Date: 16/01/2026
Created By: NB/AM
Drawing Size: A3
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F5-5 Species Polygon for Pink-Tailed Legless Lizard (Aprasia parapulchella)
Map 4 of 8

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend
- Subject Land
- Development Footprint
- Local Road
- Major Watercourse



Coordinate System:
GDA 1994 MGA Zone 55
Date: 16/01/2026
Created By: NB/AM
Drawing Size: A3
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F5-5 Species Polygon for Pink-Tailed Legless Lizard (Aprasia parapulchella)
Map 5 of 8

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend
- Subject Land
- Development Footprint
- Local Road
- Major Watercourse
- Hollow Bearing Tree

Coordinate System:
GDA 1994 MGA Zone 55
Date: 16/01/2026
Created By: NB/AM
Drawing Size: A3
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F5-5 Species Polygon for Pink-Tailed Legless Lizard (Aprasia parapulchella)
Map 6 of 8

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend
- Subject Land
- Development Footprint
- Local Road
- Hollow Bearing Tree

Coordinate System:
GDA 1994 MGA Zone 55
Date: 16/01/2026
Created By: NB/AM
Drawing Size: A3
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F5-5 Species Polygon for Pink-Tailed Legless Lizard (Aprasia parapulchella)
Map 7 of 8

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend
- Subject Land
- Development Footprint
- Local Road
- Hollow Bearing Tree

Coordinate System:
GDA 1994 MGA Zone 55
Date: 16/01/2026
Created By: NB/AM
Drawing Size: A3
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F5-5 Species Polygon for Pink-Tailed Legless Lizard (Aprasia parapulchella)
Map 8 of 8

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend
- Subject Land
- Development Footprint
- Local Road
- Major Watercourse
- Hollow Bearing Tree

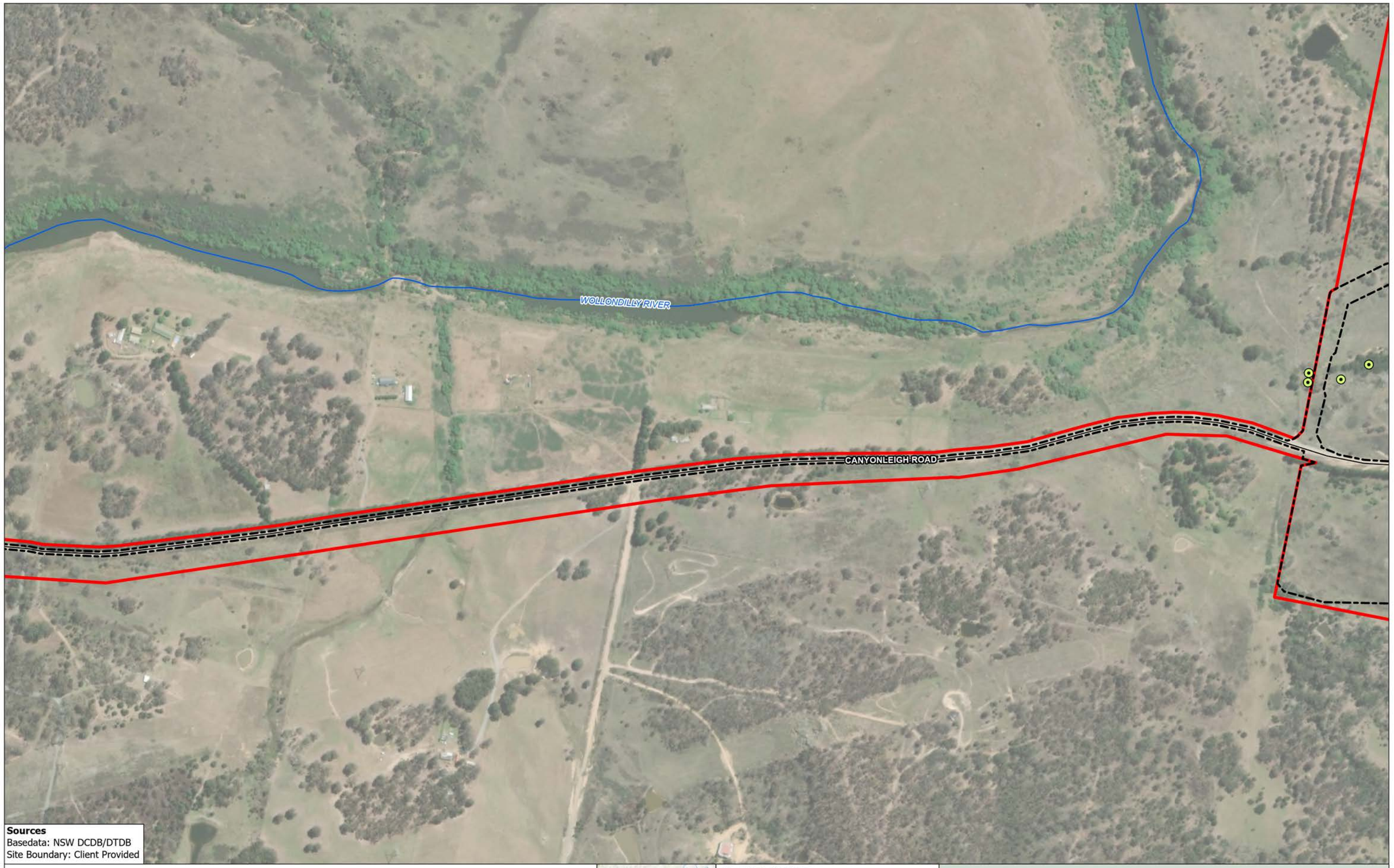
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F5-6 Species Polygon for Striped Legless Lizard (Delma impar)
Map 1 of 8

Canyonleigh Battery Energy Storage System BDAR
X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend
- Subject Land
- Development Footprint
- Local Road
- Major Watercourse
- Hollow Bearing Tree



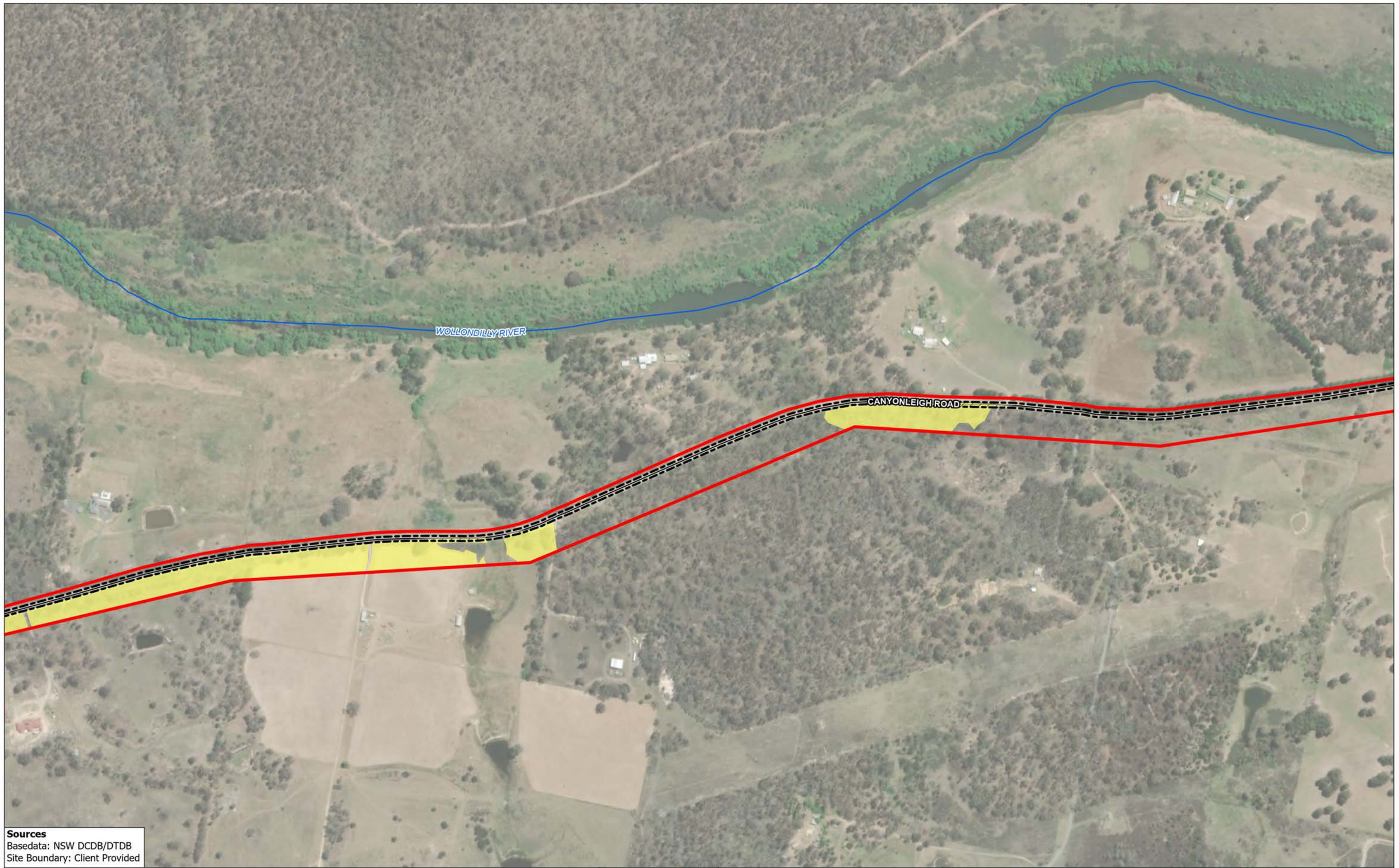
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Date: 16/01/2026
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F5-6 Species Polygon for Striped Legless Lizard (Delma impar)
Map 2 of 8

Canyonleigh Battery Energy Storage System BDAR
X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend
- Subject Land
- Development Footprint
- Striped Legless Lizard Species Polygon within Development Footprint
- Striped Legless Lizard Species Polygon
- Local Road
- Major Watercourse

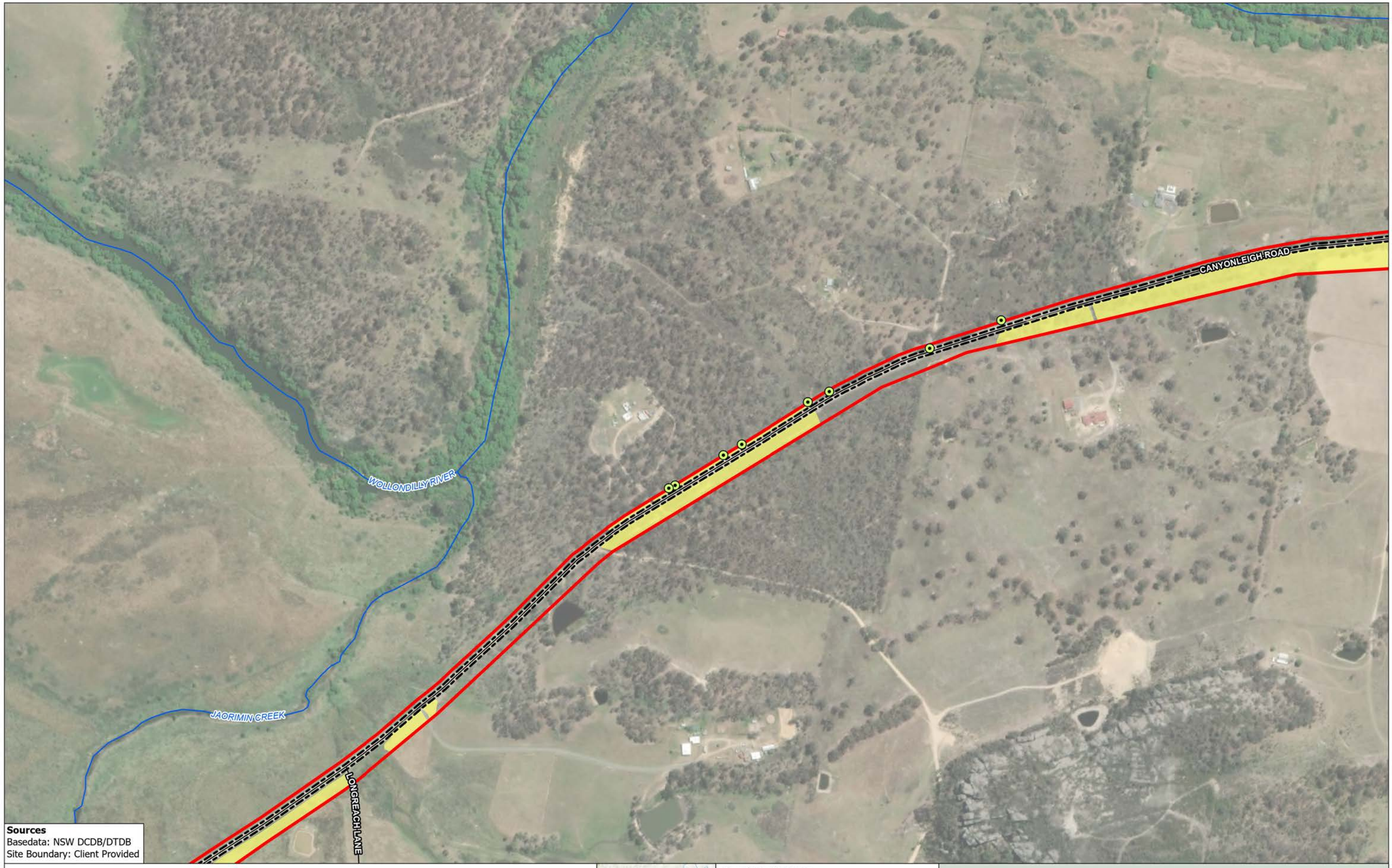
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Date: 16/01/2026
Created By: NB/AM
Drawing Size: A3
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F5-6 Species Polygon for Striped Legless Lizard (Delma impar)
Map 3 of 8

Canyonleigh Battery Energy Storage System BDAR
X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Subject Land
- Development Footprint
- Striped Legless Lizard Species Polygon within Development Footprint
- Striped Legless Lizard Species Polygon
- Local Road
- Major Watercourse
- Hollow Bearing Tree

Coordinate System:
GDA 1994 MGA Zone 55
Date: 16/01/2026
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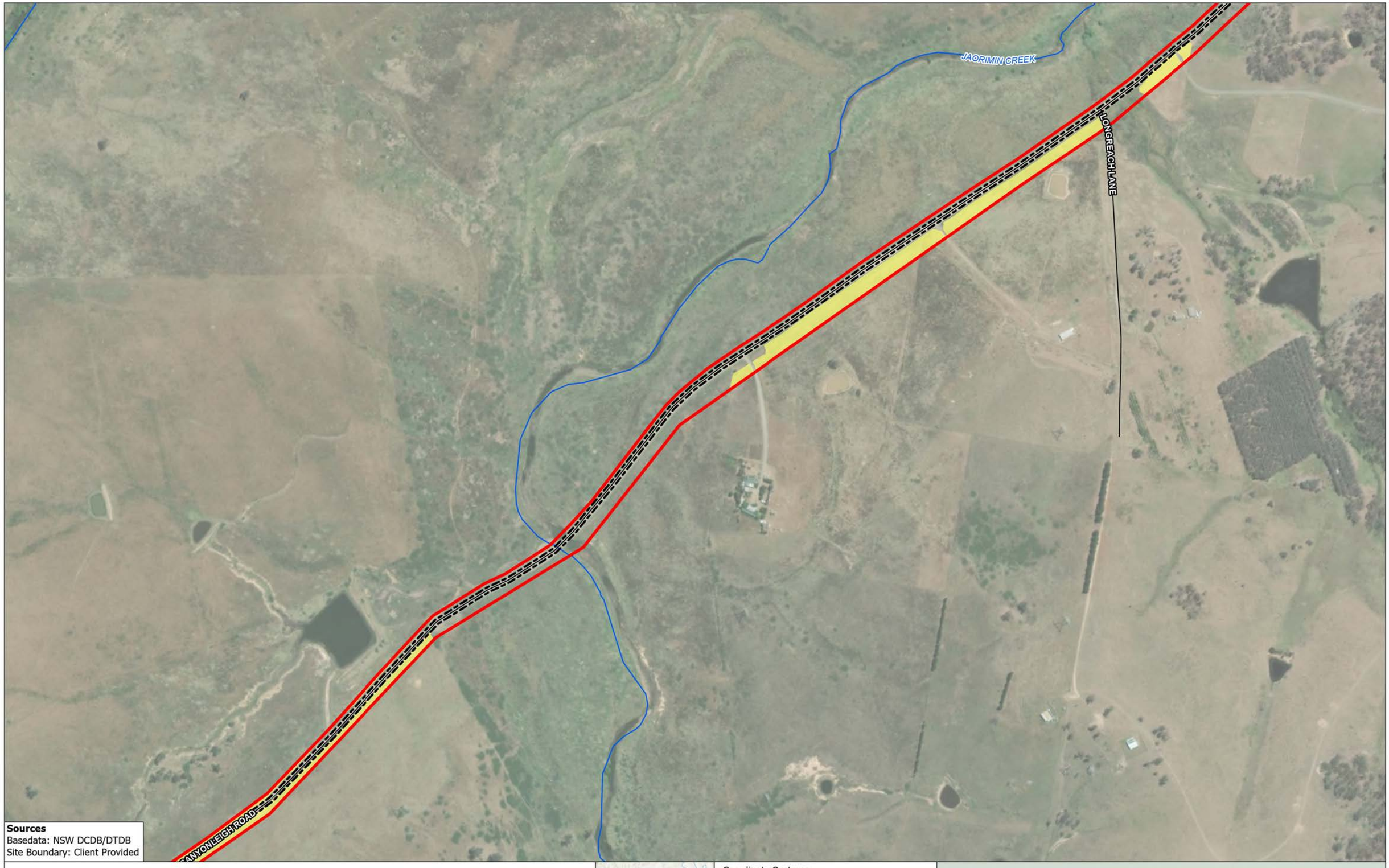
F5-6 Species Polygon for Striped Legless Lizard (Delma impar)
Map 4 of 8

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend
- Subject Land
- Development Footprint
- Striped Legless Lizard Species Polygon within Development Footprint
- Striped Legless Lizard Species Polygon
- Local Road
- Major Watercourse

Coordinate System:
GDA 1994 MGA Zone 55
Date: 16/01/2026
Created By: NB/AM
Drawing Size: A3
0 90 180m
1:5,000

F5-6 Species Polygon for Striped Legless Lizard (Delma impar)
Map 5 of 8

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend
- Subject Land
- Development Footprint
- Striped Legless Lizard Species Polygon within Development Footprint
- Striped Legless Lizard Species Polygon
- Local Road
- Major Watercourse
- Hollow Bearing Tree

Coordinate System:
GDA 1994 MGA Zone 55
Date: 16/01/2026
Created By: NB/AM
Drawing Size: A3
0 90 180m
1:5,000

F5-6 Species Polygon for Striped Legless Lizard (Delma impar)
Map 6 of 8

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend
- Subject Land
- Development Footprint
- Striped Legless Lizard Species Polygon within Development Footprint
- Striped Legless Lizard Species Polygon
- Local Road
- Hollow Bearing Tree

Coordinate System:
GDA 1994 MGA Zone 55
Date: 16/01/2026
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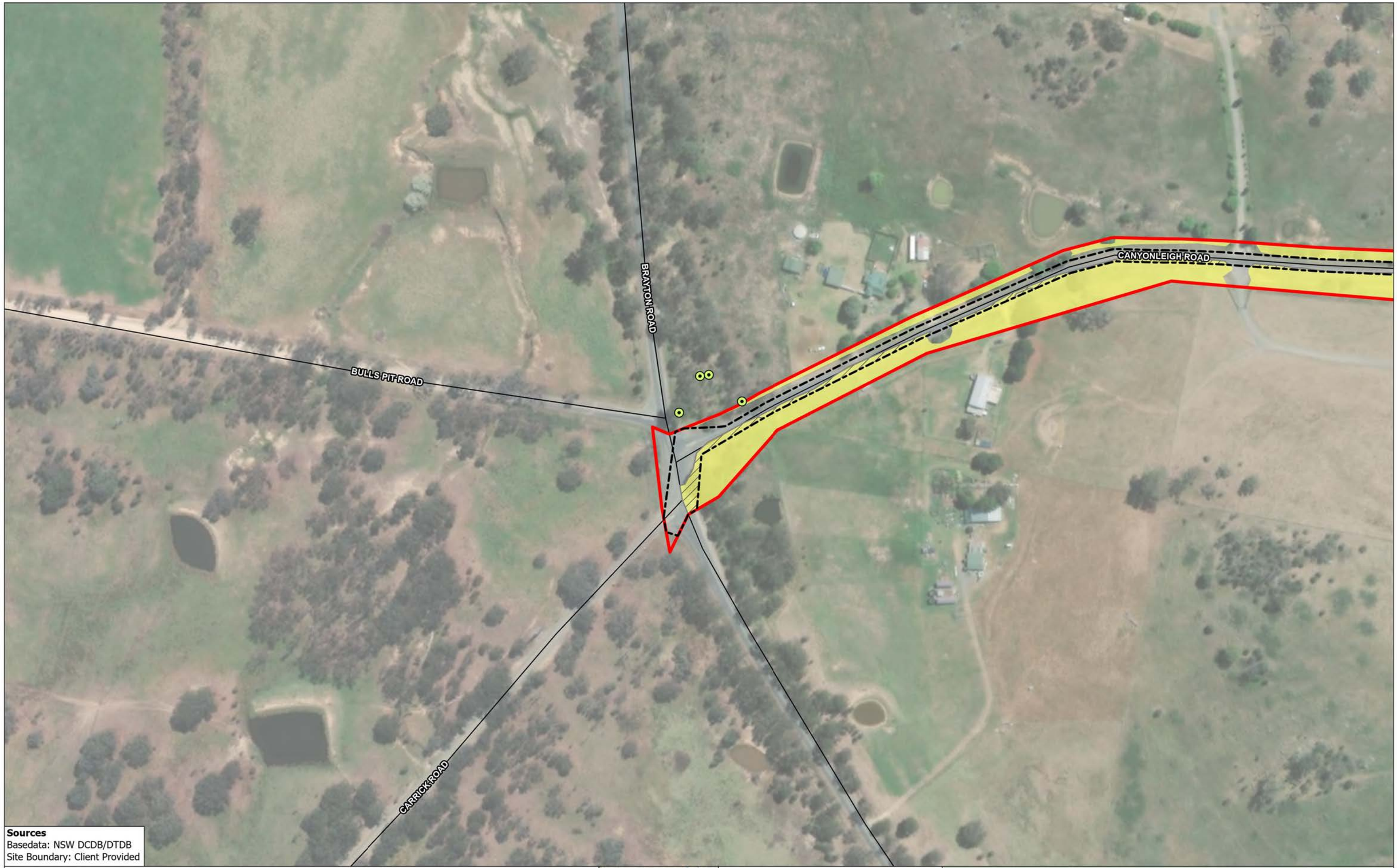
F5-6 Species Polygon for Striped Legless Lizard (Delma impar)
Map 7 of 8

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend
- Subject Land
- Development Footprint
- Striped Legless Lizard Species Polygon within Development Footprint
- Striped Legless Lizard Species Polygon
- Local Road
- Hollow Bearing Tree

Coordinate System:
GDA 1994 MGA Zone 55
Date: 16/01/2026
Created By: NB/AM
Drawing Size: A3
0 30 60m
1:2,000

F5-6 Species Polygon for Striped Legless Lizard (Delma impar)
Map 8 of 8

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx

5.3 SUPPLEMENTARY SEARS REQUIREMENTS

5.3.1.1 MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

An EPBC Referral was made to the Commonwealth DCCEEW (EPBC 2025/10233), and the application was deemed to be a controlled action with the EPBC Referral Decision released on the 8 August 2025.

Supplementary SEARs provided by the Commonwealth (see Appendix M) identified additional matters for consideration. A total of seven Matters of National Environmental Significance (MNES) were identified either through the EPBC Decision (see Appendix N) and/or through survey to be present or are potentially or likely to occur on the Subject Land.

Table 5-7 provides assessment of each entity and discusses the methods used to determine the presence and impact of the Project to the identified threatened entities. Entities are also further discussed in Section 8 of this report.

TABLE 5-7 SUMMARY OF SUPPLEMENTARY SEARS MNES OUTCOMES

EPBC Act listed entity	EPBC Act Status	Description	Survey Method	Impacts and consequences	Mitigation
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	CE	Box Gum Woodland represented by either a shrubby or grassy understorey dominated by White Box (E.albens), Yellow Box (E.melliodora) or Blakely's Red Gum (E.blakelyi). This entity is likely to be impacted by the proposed action.	• BAM Plots • Rapid Vegetation Assessments • Desktop Assessment against key diagnostic criteria and condition thresholds (see Section 0).	This MNES was recorded within the Subject Land across areas of PCT 3373 representative of Woodland and Grassland. Impacts likely to occur are restricted to fringing vegetation within the Road Resurfacing Development Footprint. Impacts likely to occur include: PCT 3373_VZ12_Woodland (0.13 ha) PCT 3373_VZ13_Grassland (0.43 ha) Consequences are limited to: • Clearing and modification of low quality, disturbed areas of this EEC; • Reduction in connectivity and available habitat; • Increased risk of edge effects.	An Offset Strategy will be prepared to offset residual impacts in accordance with the BAM and is likely to be achieved by: • Retiring like-for-like credits. • Payment into the Biodiversity Conservation Fund in lieu of satisfying the offset liability. Additional mitigation may also be provided through relevant management plans.
Hoary Sunray (*Leucochrysum albicans* subsp. *tricolor)*	E	This species is a perennial daisy, endemic to south-east Australia, occurring on the Southern Tablelands in grasslands, woodlands and forested habitats on relatively heavy soils. It is highly dependent on the presence of bare ground for germination.	• Targeted parallel transects • Seasonal surveys • Rapid Vegetation Assessments • Desktop assessment of habitat characteristics.	No significant impacts likely to occur to this species. This species was not recorded during surveys and impacts to available habitats have been avoided and minimised.	Ongoing management of suitable habitats may occur through relevant management plans associated with the proposed development.

EPBC Act listed entity	EPBC Act Status	Description	Survey Method	Impacts and consequences	Mitigation
		The EPBC Decision identified a potential significant impact to this entity. However, It is unlikely to be impacted by the proposed action.			
Gang-gang Cockatoo (*Callocephalon fimbriatum)*	E	Occurs across the south-east coast of NSW in tall mountain forests and woodlands in spring and summer before moving to lower altitudes in drier, open forests during autumn and winter. Favours old growth habitats for nesting and roosting with hollows >7cm in diameter and >3m from the ground in eucalypts being used. This species was recorded foraging across the Subject Land with suitable tree hollows recorded. This entity is likely to be impacted by the proposed action.	• Bird Census Surveys • Hollow Bearing Tree (HBT) Assessments • Opportunistic	Impacts likely include the clearing and modification to 11.40 ha of foraging habitat across the Subject Land, including 9.98 ha within the BESS Development Footprint and 1.42 ha within the Road Resurfacing Development Footprint. Within this extent of habitat, there is also the potential loss of breeding habitat (i.e. HBTs) through impacts associated VZs where HBTs were recorded, including: PCT 3746_VZ3_Woodland (0.42 ha) PCT 4063_VZ8_Woodland (0.04 ha) PCT 3373_VZ12_Woodland (0.13 ha) PCT 3746_VZ16_Woodland (0.14 ha) Consequences are limited to: • Clearing and modification of foraging habitat; • Reduction of potential breeding habitat (HBTs)	An Offset Strategy will be prepared to offset residual impacts in accordance with the BAM and is likely to be achieved by: • Retiring like-for-like credits. • Payment into the Biodiversity Conservation Fund in lieu of satisfying the offset liability. Additional mitigation may also be provided through relevant management plans.

EPBC Act listed entity	EPBC Act Status	Description	Survey Method	Impacts and consequences	Mitigation
				• Reduction in connectivity and available habitat.	
Key's Matchstick Grasshopper (*Keyacris scurra)*	E	Recorded in abundance within the BESS Development Footprint with five individuals recorded within the Road Resurfacing Development Footprint that adjoins the BESS Development Footprint. This entity is likely to be impacted by the proposed action.	• Targeted surveys • Opportunistic	Impacts likely include the removal and modification of 10.47 ha of suitable and known habitat, including: PCT 3746_VZ3_Woodland (0.42 ha) PCT 3746_VZ4_Grassland (5.36 ha) PCT 3746_VZ5_Shrubland (3.14 ha) PCT 3746_VZ6_Planted Natives (0.39 ha) PCT 3746_VZ7_Highly Disturbed (0.64 ha) PCT 3746_VZ16_Woodland (0.14 ha) PCT 3746_VZ17_Grassland (0.28 ha) PCT 3746_VZ18_Shrubland (0.10 ha) Consequences are limited to: • Reduction habitat and potential increased risk to the population; • Reduction in connectivity and available habitat. • Increased risk of edge effects.	An Offset Strategy will be prepared to offset residual impacts in accordance with the BAM and is likely to be achieved by: • Retiring like-for-like credits. • Payment into the Biodiversity Conservation Fund in lieu of satisfying the offset liability. Additional mitigation may also be provided through relevant management plans.
Pink-tailed Legless Lizard	V	EPBC Decision identified a likely significant impact to this MNES. Additionally, an expert report was prepared that	Expert Report	Impacts likely include the clearing and modification to 9.95 ha of habitat within the BESS Development Footprint, comprising as identified in the Expert Report (Appendix E).	An Offset Strategy will be prepared to offset residual impacts in accordance with the BAM and is likely to be achieved by:

EPBC Act listed entity	EPBC Act Status	Description	Survey Method	Impacts and consequences	Mitigation
(*Aprasia parapulchella)*		identified likely habitat associated with the BESS Development Footprint and no suitable habitat within the Road Resurfacing Development Footprint. This entity is likely to be impacted by the proposed action.		Consequences are limited to: • Reduction habitat and potential increased risk to the population; • Reduction in connectivity and available habitat. • Increased risk of edge effects.	• Retiring like-for-like credits. • Payment into the Biodiversity Conservation Fund in lieu of satisfying the offset liability. Additional mitigation may also be provided through relevant management plans.
Striped Legless Lizard (*Delma impar)*	V	EPBC Decision identified a potential significant impact to this MNES. An expert report was prepared that identified likely habitat associated with the Road Resurfacing Development Footprint. This entity is likely to be impacted by the proposed action.	Expert Report	Impacts likely include the clearing and modification to 0.72 ha of habitat within the Road Resurfacing Development Footprint as identified in the Expert Report (Appendix G). Consequences are limited to: • Reduction habitat and potential increased risk to the population; • Reduction in connectivity and available habitat. • Increased risk of edge effects.	An Offset Strategy will be prepared to offset residual impacts in accordance with the BAM and is likely to be achieved by: • Retiring like-for-like credits. • Payment into the Biodiversity Conservation Fund in lieu of satisfying the offset liability. Additional mitigation may also be provided through relevant management plans.

EPBC Act listed entity	EPBC Act Status	Description	Survey Method	Impacts and consequences	Mitigation
Diamond Firetail (*Stagonopleura guttata)*	V	This species is endemic to south-eastern Australia and widely distributed in NSW being found in grassy eucalypt woodland and riparian areas. The EPBC Decision identified that this entity is likely to be impacted by the proposed action. However, it was not recorded during surveys and no globular nests were observed. Therefore, it is unlikely to be impacted by the proposed action.	• Bird Census Surveys • Targeted stick nest searches • Opportunistic	No significant impacts likely to occur to this species. This species was not recorded during surveys and impacts to available habitats have been avoided and minimised.	Ongoing management of suitable habitats may occur through relevant management plans associated with the proposed development.

6. IDENTIFYING PRESCRIBED IMPACTS

Prescribed impacts are identified in Clause 6.1 of the BC Regulation. Prescribed impacts are those that are additional to the clearing of native vegetation and associated habitat. These include:

- Development which will impact the habitat of threatened species or ecological communities associated with:
  - Karst, caves, crevices, cliffs, rock outcrops and other geological features of significance;
  - Human-made structures; and
  - Non-native vegetation.
- Development which will impact areas connecting threatened species habitat, such as biodiversity corridors;
- Development which will impact water quality, waterbodies and hydrological processes that sustain threatened species and TECs (including from subsidence or upsidence from underground mining);
- Wind turbine strikes on protected animals; and
- Vehicle strikes affecting threatened species or animals that are part of a TEC.

The BAM does not provide an approach to determine the number and class of biodiversity credits that are required for a prescribed impact. However, prescribed impacts on biodiversity may be considered by a consent authority when they determine the biodiversity credits required to be retired (or other conservation measures required to be taken) under a planning approval.

An assessment of the relevance of these prescribed impacts to the Project is provided in Table 6-1 for the BESS Development Footprint and for the Road Resurfacing Development Footprint.

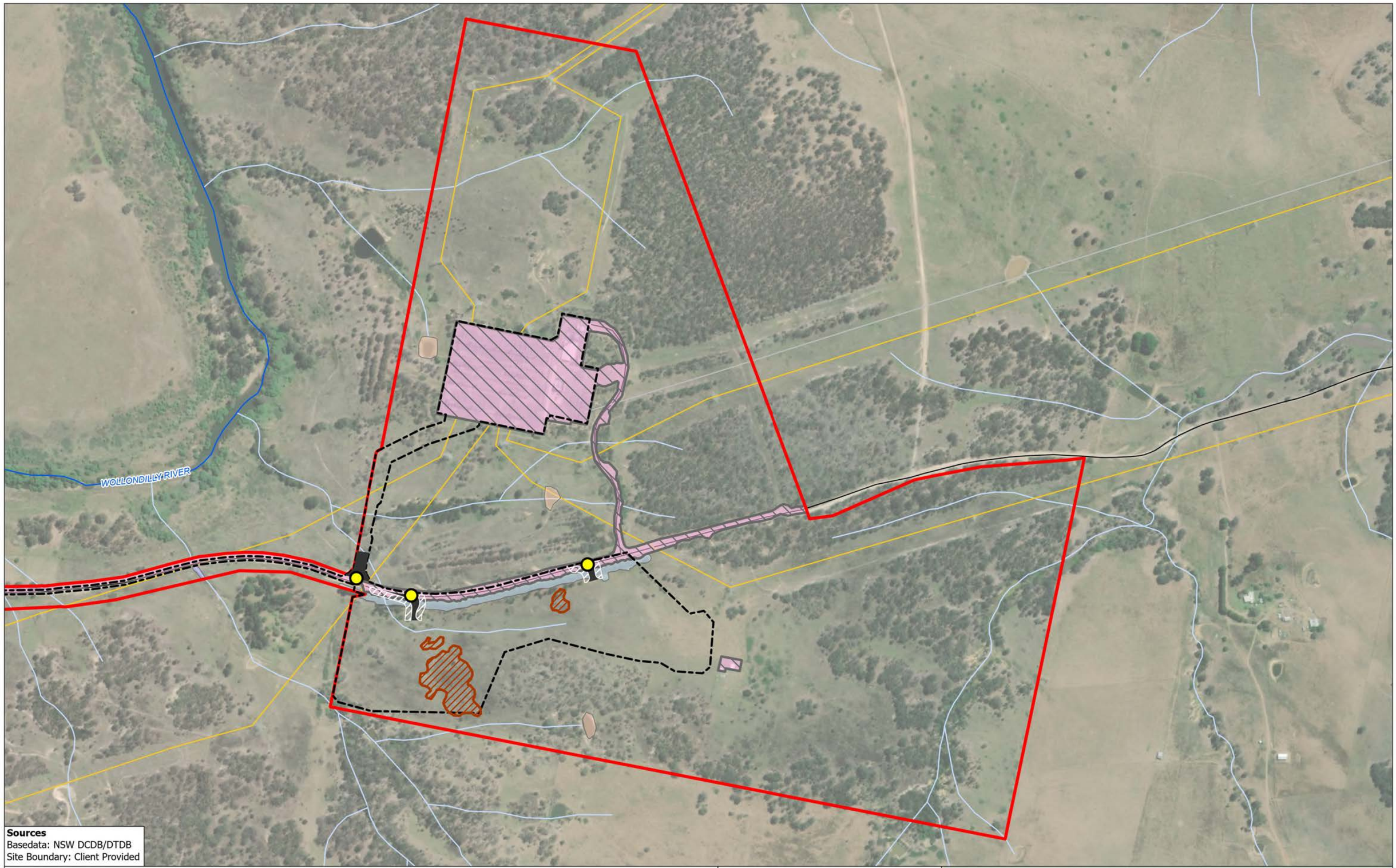
TABLE 6-1 ASSESSMENT OF PRESCRIBED IMPACTS

Prescribed Impact Feature	Present		Description of Feature Characteristics and Locations	Threatened Entities That Use, Are Likely to Use, Or Are Part of the Habitat Feature
	BESS Development Footprint	Road Resurfacing Development Footprint		
Karst, caves, crevices, cliffs, rocks or other geological features of significance	☒Yes ☐No	☒Yes ☐No	Exposed rocky habitat occurs throughout the BESS Development Footprint, as shown in Figure 6-1. The Road Resurfacing Development Footprint has areas of small, isolated rocky outcrop with very little surface rock present. Areas of small rock outcrop within the Road Resurfacing Development Footprint are shown in Figure 6-2.	These rocky areas may act as areas of suitable habitat, particularly as basking and sheltering sites, for threatened reptiles and the Brush-tailed Rock-wallaby (*Petrogale penicillata*). The Striped Legless Lizard (*Delma impar*), Pink-tailed Legless Lizard (*Aprasia parapulchella)* and Brush-tailed Rock-wallaby were listed as candidate species in the BAM-C for the BESS Development Footprint and Road Resurfacing Development Footprint, as shown in Table 5-2**.** Although habitat associated with the Striped Legless Lizard (*Delma impar*) was avoided within the BESS Development Footprint, an expert report identified suitable habitat within the Road Resurfacing Development Footprint. 0.72 ha of suitable habitat will likely be impacted by the proposed Road Resurfacing Development Footprint. For the Pink-tailed Legless Lizard, the expert report (Capital Ecology, 2025) identified suitable habitat within the BESS Development Footprint with no suitable habitat considered available within the Road Resurfacing Development Footprint. Species' polygons have been produced for each species. 9.95 ha of suitable habitat has been assessed within the BAM-C for this species. The Brush-tailed Rock-wallaby was adequately surveyed for and not found within the BESS Development Footprint, as shown in Table 5-6. No habitat occurs within the Road Resurfacing Development Footprint. This prescribed impact is discussed further in Section 7.2.1.

Prescribed Impact Feature	Present		Description of Feature Characteristics and Locations	Threatened Entities That Use, Are Likely to Use, Or Are Part of the Habitat Feature
	BESS Development Footprint	Road Resurfacing Development Footprint		
Human-made structures	☒Yes ☐No	☒Yes ☐No	Human-made structures within the BESS Development Footprint include a road, fences, gates and existing electrical transmission tower and lines. In the wider Subject Land, there is an existing substation, associated infrastructure and a small porta cabin, as shown in Figure 6-1. Human-made structures within the Road Resurfacing Development Footprint include a road, fences, cattle grids, culverts, posts, gates and electrical transmission lines, as shown in Figure 6-2 .	Threatened avian species predicted to occur within the BESS Development Footprint, as shown in Table 5-2, may use human-made structures for foraging, perching and nesting. The human-made structures present within the BESS Development Footprint do not provide suitable breeding habitat for the threatened bat species listed in Table 5-2. However, culverts within the Road Resurfacing Development Footprint are considered to provide suitable roosting habitat for the threatened microbat species listed in Table 5-4**.** It is likely that the number of human-made structures will increase because of the Project. Therefore, there is no expected limitation to the availability of these features and no further assessment is required.
Non-native vegetation	☒Yes ☐No	☒Yes ☐No	The remnant vegetation within the Subject Land consists predominately of native species. The only area of non-native vegetation is a row of planted *Pinus spp.* on the southern side of Canyonleigh Road which partially lies within the BESS Development Footprint (refer to Section 4.1.2 and Figure 6-1). The remnant vegetation along the Road Resurfacing Development Footprint consists predominately of native species. There are only two small areas of non-native vegetation of planted *Populus alba* and *Pinus radiata.* on the northern side of Canyonleigh Road where it meets Brayton Rd, as shown in Figure 6-2.	Threatened avian and bat species predicted to occur within the BESS Development Footprint, as shown in Table 5-2, may use non-native vegetation for foraging, particularly insectivorous species (Robson, Baker, & Murray, 2009). Although not their preferred habitat, Squirrel Glider (*Petaurus norfolcensis*) may also use this woody vegetation for dispersal (Rowston, Catterall, & Hurst, 2002), and this has been included within the species polygon produced (refer to Section 7.2.3) This prescribed impact is discussed further in Section 7.2.3.

Prescribed Impact Feature	Present		Description of Feature Characteristics and Locations	Threatened Entities That Use, Are Likely to Use, Or Are Part of the Habitat Feature
	BESS Development Footprint	Road Resurfacing Development Footprint		
Habitat connectivity	☒Yes ☐No	☒Yes ☐No	Habitat connectivity throughout the BESS Development Footprint is considered moderate, as outlined in Table 3-1 and shown in Figure 6-1. Within the BESS Development Footprint, small patches of woodland occur which provide connectivity to larger vegetated areas within the Subject Land and the surrounding area. Corridors of vegetation within the BESS Development Footprint are mostly restricted to vegetation along fence lines, roadsides and riparian areas. Riparian vegetation present on the western boundary of the BESS Development Footprint, near the Wollondilly River, continues westerly and connects with other larger patches of vegetation in the broader landscape. Habitat connectivity throughout the Road Resurfacing Development Footprint is considered low, as outlined in Table 3-2 and shown in Figure 6-2. The Road Resurfacing Development Footprint is entirely situated along existing tracks, bounded by woodlands and grasslands. This vegetation is consistent with the surrounding landscape. The works include the resurfacing of Canyonleigh Rd to support traffic of OSOM and heavy vehicles during construction.	These areas within the BESS Development Footprint likely provide connectivity between habitat patches, particularly for shelter and movement between water and food sources. All of the threatened fauna species predicted to occur within the BESS Development Footprint, as shown in Table 5-2, may use the habitat connectivity provided within the BESS Development Footprint, noting that the habitat connectivity present will be of greatest value to fauna species that can cross cleared areas or utilise narrow strips of woody vegetation for dispersal. Habitat within the Road Resurfacing Development Footprint has already been fragmented due to the existing road. However, all of the threatened fauna species predicted to occur within the Road Resurfacing Development Footprint, as shown in Table 5-4, may use the limited habitat connectivity, noting that the habitat connectivity present will be of greatest value to fauna species that can cross cleared areas or utilise narrow strips of woody vegetation for dispersal. This prescribed impact is discussed further in Section 7.2.4.

Prescribed Impact Feature	Present		Description of Feature Characteristics and Locations	Threatened Entities That Use, Are Likely to Use, Or Are Part of the Habitat Feature
	BESS Development Footprint	Road Resurfacing Development Footprint		
Waterbodies, water quality and hydrological processes	☒Yes ☐No	☒Yes ☐No	An ephemeral gully line runs into the Wollondilly River to the north of the BESS Development Footprint but there is no permanent water habitat within the BESS Development Footprint, as shown in Figure 6-1. Jaorimin Creek runs through the Road Resurfacing Development Footprint as well as several unnamed ephemeral watercourses, as shown in Figure 6-2. The Wollondilly River also runs adjacent to the Road Resurfacing Development Footprint, ranging between approximately 160 m to 3 km in proximity.	The gully does not provide suitable habitat for the threatened amphibian species identified in Table 5-2; and none of these species were identified during field survey. As such, no further assessment is required. The watercourses within the Road Resurfacing Development Footprint may provide suitable habitat for the threatened amphibian species outlined in Table 5-4. These species have been assumed present within the Road Resurfacing Development Footprint and species' polygons have been created (refer to Section). This prescribed impact is discussed further in Section 7.2.5.
Wind turbine strikes	☐Yes ☒No	☐Yes ☒No	No wind turbines are proposed for the Project.	No further assessment is required.
Vehicle strikes	☒Yes ☐No	☒Yes ☐No	The Project will include the construction of internal access tracks within the BESS Development Footprint, as shown in Figure 6-1. An increase in vehicular traffic will occur during construction and possibly during operation of the Project. The delivery of Project components along the Road Resurfacing Development Footprint will be along existing roads which will require upgrades in places, as shown in Figure 6-2. It is possible that fauna will venture onto or fly across these roads, resulting in vehicle strike.	Low-flying, ground-dwelling and ground-foraging threatened species predicted to occur within the BESS Development Footprint, as shown in Table 5-2 and the Road Resurfacing Development Footprint, as shown in Table 5-4, are at risk of vehicle strike as a result of the Project. Despite being arboreal, Squirrel glider (*Petaurus norfolcensis*), which have been detected within the BESS Development Footprint, are also at risk of vehicle strikes due to their movement over/along roads (McCall, et al., 2010). This prescribed impact is discussed further in Section 7.2.6.



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Subject Land
- Development Footprint
- Site Access
- Access Roads - Earthworks
- Site Access
- Rocky Outcrops
- Highway/Major Road
- Local Road
- Path/Track
- Major Watercourse
- Minor Watercourse
- Human made structures

Transmission Lines

- 132kV
- 330kV
- 33kV
- 500kV
- 66kV

PCT Mapping (Vegetation Zones)

- PCT_0_VZ20_Planted non-native woody vegetation
- PCT_0_VZ21_Infrasctructure
- PCT_0_VZ22_Dam
- PCT_0_VZ23_Stream

Coordinate System:
GDA 1994 MGA Zone 55
Date: 16/01/2026
Created By: NB/AM
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F6-1 Prescribed Impacts within the BESS Project Area

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx

WOLLONDILLY RIVER

CANYONLEIGH ROAD

Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Subject Land
- Development Footprint
- Site Access
- Access Roads - Earthworks
- Site Access
- Rocky Outcrops
- Local Road
- Major Watercourse
- Minor Watercourse
- Waterbodies

Condition
- Human made structures

Transmission Lines
- 132kV
- 330kV
- Rocky Outcrops

PCT Mapping (Vegetation Zones)
- PCT_0_VZ20_Planted non-native woody vegetation
- PCT_0_VZ21_Infrasctructure
- PCT_0_VZ22_Dam
- PCT_0_VZ23_Stream

Coordinate System:
GDA 1994 MGA Zone 55
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Created By: NB/AM
Drawing Size: A3
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F6-2 Prescribed Impacts within the Road Resurfacing Project Area
Map 1 of 7

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Subject Land
- Development Footprint
- Site Access
- Access Roads - Earthworks
- Site Access
- Rocky Outcrops
- Local Road
- Major Watercourse
- Minor Watercourse
- Waterbodies

Condition
- Human made structures

Transmission Lines
- 330kV
- Rocky Outcrops

PCT Mapping (Vegetation Zones)
- PCT_0_VZ20_Planted non-native woody vegetation
- PCT_0_VZ21_Infrasctructure
- PCT_0_VZ22_Dam
- PCT_0_VZ23_Stream

Coordinate System:
GDA 1994 MGA Zone 55
Date: 16/01/2026
Created By: NB/AM
Drawing Size: A3
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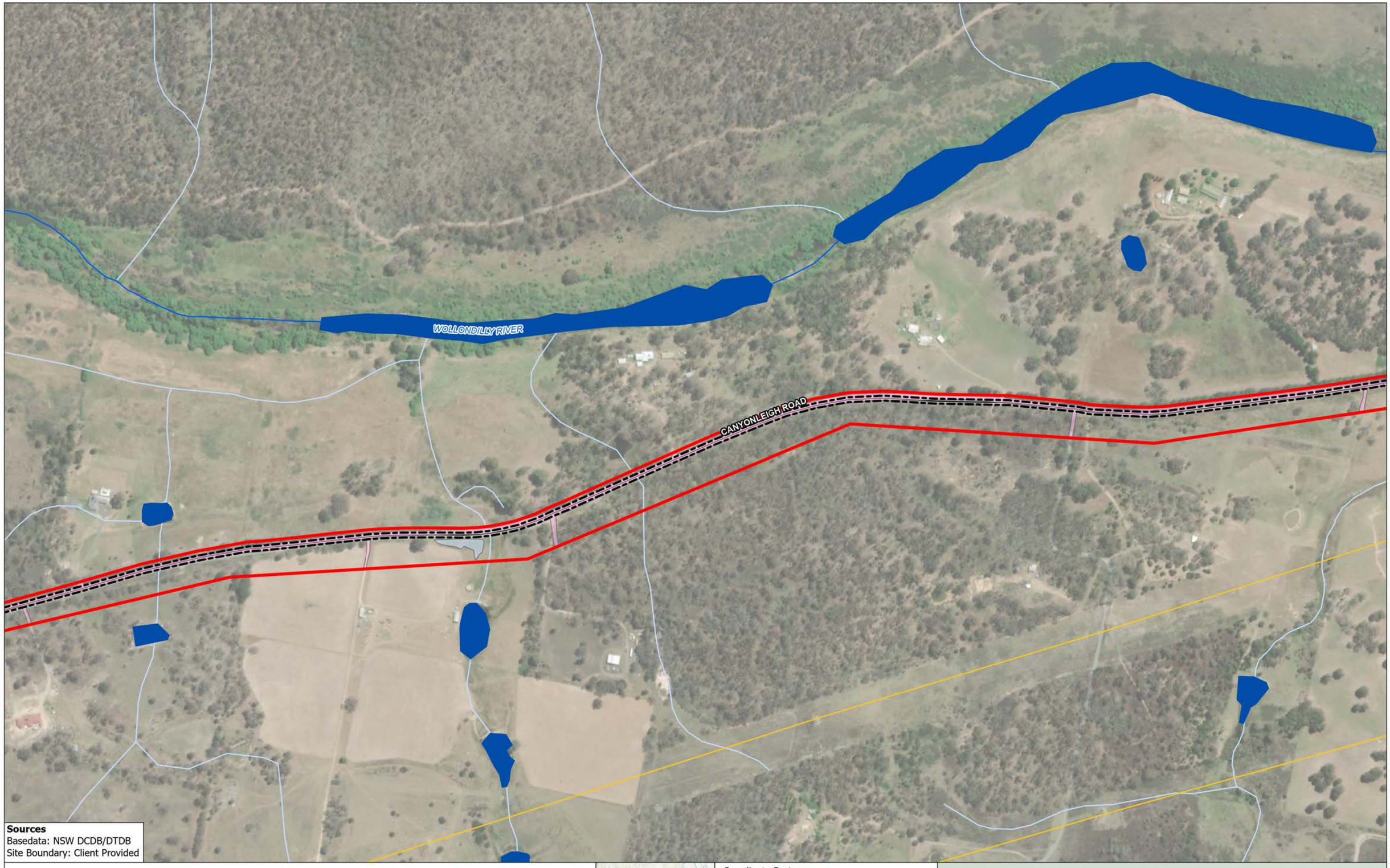
F6-2 Prescribed Impacts within the Road Resurfacing Project Area
Map 2 of 7

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx

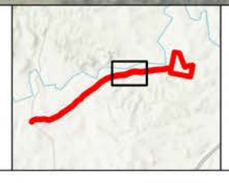


Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend
- Subject Land
- Development Footprint
- Local Road
- Major Watercourse
- Minor Watercourse
- Waterbodies

Transmission Lines
- 330kV

PCT Mapping (Vegetation Zones)
- PCT_0_VZ20_Planted non-native woody vegetation
- PCT_0_VZ21_Infrastructure



Coordinate System:
GDA 1994 MGA Zone 55
Date: 16/01/2026
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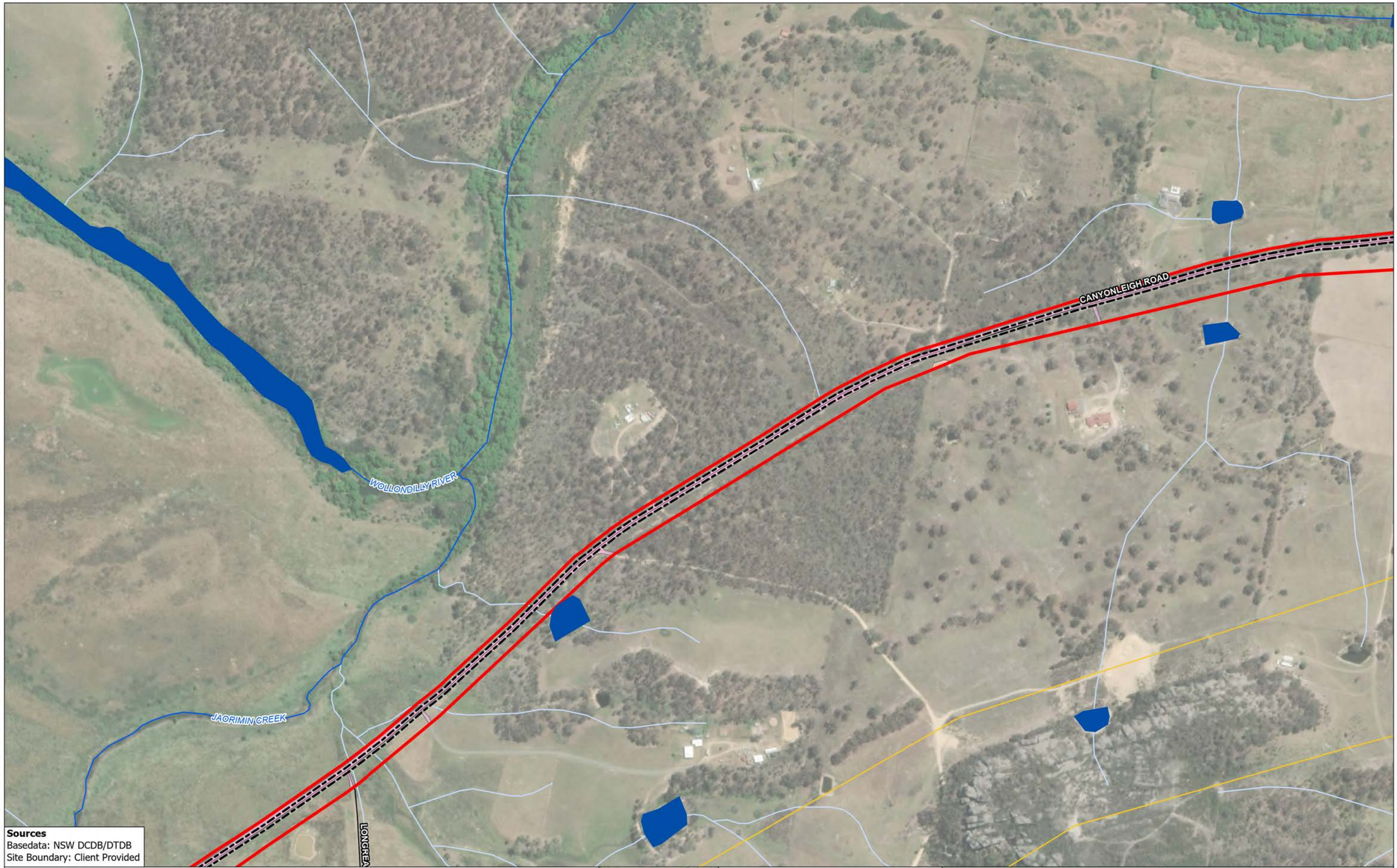
F6-2 Prescribed Impacts within the Road Resurfacing Project Area
Map 3 of 7

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Subject Land
- Development Footprint
- Local Road
- Major Watercourse
- Minor Watercourse
- Waterbodies

Transmission Lines

- 330kV

PCT Mapping (Vegetation Zones)

- PCT_0_VZ21_Infrastructure
- PCT_0_VZ22_Dam



Coordinate System:
GDA 1994 MGA Zone 55
Date: 16/01/2026
Created By: NB/AM
Drawing Size: A3
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1:5,000

F6-2 Prescribed Impacts within the Road Resurfacing Project Area
Map 4 of 7

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx

JAORIMIN CREEK

LONGREACH LANE

CANYONLEIGH ROAD

Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend
- Subject Land
- Development Footprint
- Local Road
- Major Watercourse
- Minor Watercourse
- Waterbodies
- **Transmission Lines**: 330kV
- **PCT Mapping (Vegetation Zones)**: PCT_0_VZ21_Infrastructure; PCT_0_VZ23_Stream

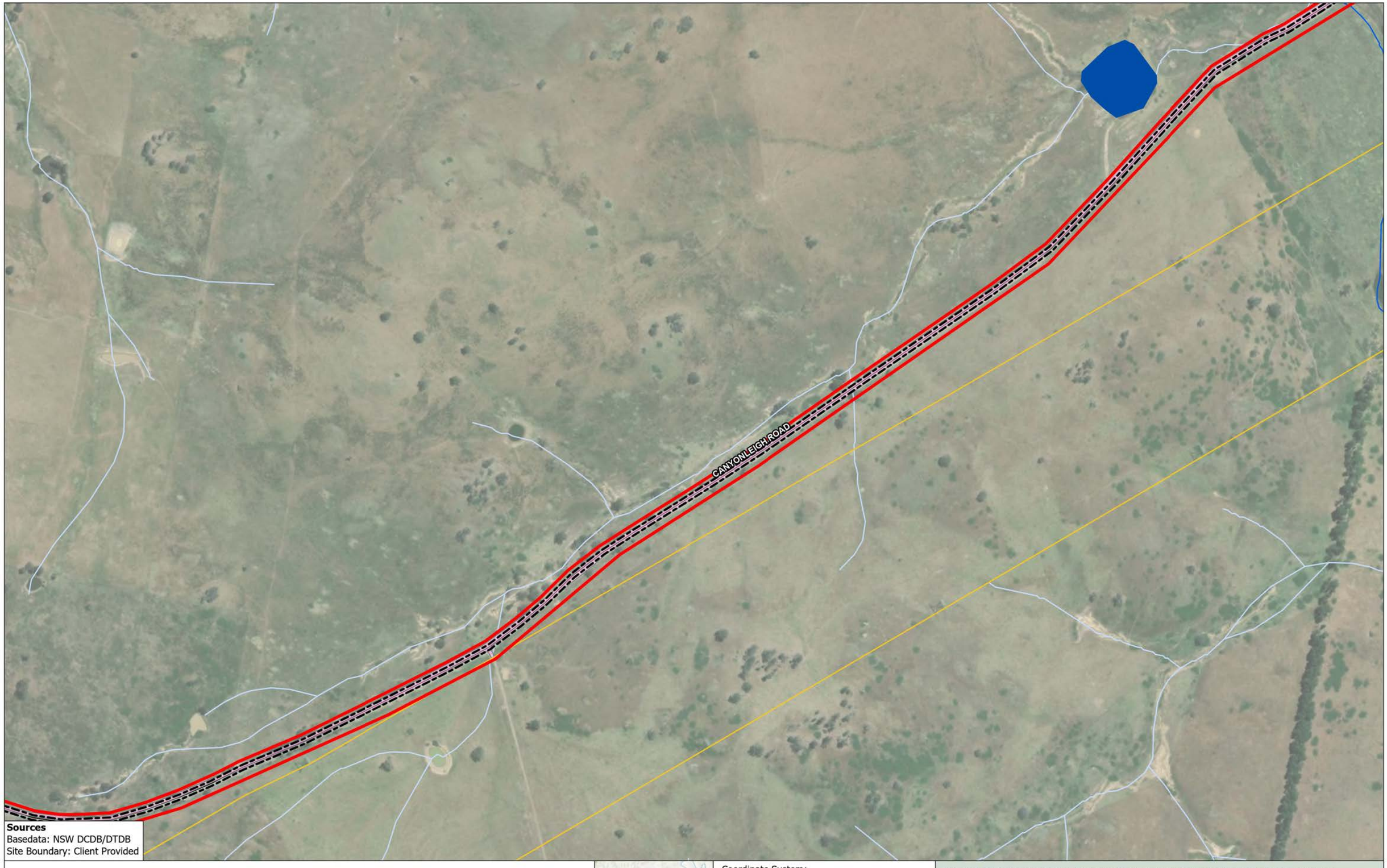
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F6-2 Prescribed Impacts within the Road Resurfacing Project Area
Map 5 of 7

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend
- Subject Land
- Development Footprint
- Local Road
- Major Watercourse
- Minor Watercourse
- Waterbodies

Transmission Lines
- 330kV

PCT Mapping (Vegetation Zones)
- PCT_0_VZ21_Infrasctructure

Coordinate System:
GDA 1994 MGA Zone 55
Date: 16/01/2026
Created By: NB/AM
Drawing Size: A3
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F6-2 Prescribed Impacts within the Road Resurfacing Project Area
Map 6 of 7

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx

BRAYTON ROAD

BULLS PIT ROAD

CANYONLEIGH ROAD

CARRICK ROAD

Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Subject Land
- Development Footprint
- Local Road
- Minor Watercourse
- Waterbodies

Transmission Lines

- 330kV

PCT Mapping (Vegetation Zones)

- PCT_0_VZ20_Planted non-native woody vegetation
- PCT_0_VZ21_Infrastructure

Coordinate System:
GDA 1994 MGA Zone 55
Date: 16/01/2026
Created By: NB/AM
Drawing Size: A3
0 90 180m
1:5,000

F6-2 Prescribed Impacts within the Road Resurfacing Project Area
Map 7 of 7

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx

STAGE 2: IMPACT ASSESSMENT (BIODIVERSITY VALUES AND PRESCRIBED IMPACTS)

7. AVOID AND MINIMISE IMPACTS

7.1 AVOID AND MINIMISE DIRECT AND INDIRECT IMPACTS

In accordance with Section 7.1 of the BAM (NSW DPIE, 2020), impacts from clearing native vegetation and threatened species' habitat can be avoided or minimised by locating the proposal in areas:

- Lacking biodiversity values;
- Where the native vegetation or threatened species' habitat is in the poorest condition (i.e. areas that have a low VIS);
- That avoid habitat for species with a high biodiversity risk weighting or land mapped on the important habitat map, or native vegetation that is a TEC or highly cleared PCT; and
- Outside of the buffer area around breeding habitat features such as nest trees or caves.

For the reasons outlined in the following sections, the Project will utilise lands that will result in unavoidable impacts. This is because the landscape, since European settlement, has only ever been used for agricultural purposes and has retained biodiversity values. However, to ensure impacts have been avoided, the Applicant has completed environmental assessment of the Subject Land and has modified the Project layout based on the outcomes of these assessments and consideration of technical, environmental, and constructability issues, and community feedback.

Throughout the Project design process, the Applicant has undertaken additional design work to avoid and minimise potential environmental impacts and to optimise the Project layout and constructability. Where the potential for impacts could not be avoided, design principles were sought to minimise environmental impacts, and mitigation measures have been proposed to manage the extent and severity of any residual impacts.

7.1.1 STRATEGIC CONTEXT

The Project will align with various strategies, policies, and plans across national, state, regional, and local contexts, as outlined in Table 7-1. Importantly, the Project will contribute to the continued growth of renewable energy storage capacity in NSW and specifically contribute to the overall development of renewable energy infrastructure within the Goulburn Mulwaree LGA.

TABLE 7-1 PROJECT ALIGNMENT WITH STRATEGIC FRAMEWORK

Strategy, Policy or Plan	Description	Project Alignment
National Context		
United Nations Framework Convention on Climate Change Conference of Parties 28 (COP28)	COP28 was the 28th climate change conference held in Dubai, United Arab Emirates in 2023. One of the key outcomes of COP28 was an agreement to "triple the world's renewable energy capacity and double its energy efficiency by 2030" (World Resources Institute, 2023). This pledge was made by 130 countries, including Australia.	The Project will contribute to meeting Australia's commitments through the storage of renewable solar energy and resultant annual reduction in Greenhouse Gas (GHG) emissions. The Project will facilitate the development of additional renewable energy by firming energy supply and providing stability and reliability.
United Nations Framework Convention on Climate Change Conference of Parties 21 – The Paris Agreement	The United Nations Paris Agreement on climate change (Paris Agreement) outlines a framework for all countries to take climate action from 2020 and builds upon the existing international efforts in the period up to 2020. The aim of the Paris Agreement is to limit emissions globally to net-zero in the second half of this century. Australia is one of 195 countries that signed on to the Paris Agreement and has set a target to reduce emissions by 43% below 2005 levels by 2030.	The Project will contribute to meeting Australia's commitments under the Paris Agreement through the storage of renewable solar energy and resultant annual reduction in GHG emissions. It should be noted that NSW targets are to achieve net-zero emissions by 2050, as listed in Part 2 section 9(1)(c) of the *Climate Change (Net Zero Future) Act 2023.*
Integrated System Plan (ISP) 2024	The ISP provides an integrated roadmap for the development of the National Electricity Market over the next 20 years.	The Project will respond to Phase 1 of the ISP: "Development to help meet regional renewable energy targets and other policies, and/or where there is good access to existing network capacity with good system strength". The BESS will connect to the existing network and will provide energy storage and dispatch capacity to facilitate and provide electricity demand management.

Strategy, Policy or Plan	Description	Project Alignment
NSW Context		
Net Zero Plan Stage 1: 2020-2030	The Net Zero Plan Stage 1: 2020–2030 (NSW DPE, 2020) sets the foundation for NSW's action on climate change and how the NSW Government will deliver on its objective to achieve net zero emissions by 2050. The Plan is the NSW Government's overarching strategy to reduce emissions and mitigate the impacts of climate change. In September 2021, the NSW Government announced ambitious new emission reductions, with an updated objective to reduce emissions by 50% below 2005 levels by 2030 under the Net Zero Plan Stage 1: 2020 – 2030 Implementation Update (September 2021).	This Project will contribute to addressing the Net Zero Plan, including the NSW Government's updated 2030 50% target. This will be achieved through a reduction in GHG emissions. The Project will facilitate the development of additional renewable energy by firming energy supply, providing stability and reliability.
NSW Electricity Strategy	The NSW Electricity Strategy is the NSW Government's plan to provide more reliable, affordable and sustainable electricity across in NSW (NSW DPE, 2019). The Strategy encourages approximately $8 billion of new private investment in NSW's electricity system over the next decade, including $5.6 billion in regional NSW. It aligns closely with the NSW Government's Net Zero Plan Stage 1: 2020–2030, and supports a new affordable and reliable energy system by: • Delivering Australia's first coordinated Renewable Energy Zone (REZ) in the Central-West Orana region; • Saving energy via the Energy Security Safeguard; • Supporting the development of new electricity generators; • Setting a target to increase the state's energy resilience; and • Making it easier to do energy business in NSW.	The Project is consistent with the Strategy as it provides renewable energy generation and storage capacity that, together with other renewable generation projects, is expected to result in lower cost of power in comparison to wholesale prices. The Project will also contribute to greater energy resilience through the use of the BESS to support stabilising the supply of electricity to the greater NSW region.

Strategy, Policy or Plan	Description	Project Alignment
NSW Transmission Infrastructure Strategy	The NSW Transmission Infrastructure Strategy is the NSW Government's plan to unlock private sector investment in priority energy infrastructure projects, which can deliver least-cost energy to customers to 2040 and beyond (NSW DPE, 2018). The Strategy forms part of the government's broader plan to make energy more affordable, secure investment in new power stations and network infrastructure and ensure new technologies deliver benefits for consumers. The aims of the Strategy include increasing NSW's connections with Victoria, South Australia and Queensland, and increasing NSW's energy capacity through the prioritisation of REZ in the Central-West, South-West and New England regions of NSW. The Strategy seeks to help meet future energy needs by facilitating new transmission that could support up to 17,700 MW of new electricity generation. Other benefits include improved energy reliability, security, timely project delivery, increased affordability and access to cheaper electricity.	With the provision of a BESS, the Project will provide energy storage and dispatch capacity to facilitate and provide electricity demand management.
NSW Electricity Infrastructure Roadmap	The NSW Electricity Infrastructure Roadmap, released in November 2020, is the NSW Government's plan to transform the NSW electricity sector to be cleaner, cheaper and more reliable (NSW DPE, 2020). The Roadmap builds on the NSW Electricity Strategy and the NSW Transmission Infrastructure Strategy and emphasises the need for NSW to transition to renewable energy. It aims to replace NSW's ageing coal-fired power stations with a coordinated portfolio of energy generation, storage and network investment.	The Project will assist in meeting the NSW Government's emissions reduction targets, NSW's energy generation and storage requirements, and NSW's transition from coal fired power generation to renewable energy. The BESS will provide energy demand management, leading to greater reliability and stability of the National Electricity Market. This in turn should facilitate further renewable energy development.

Strategy, Policy or Plan	Description	Project Alignment
Regional Context		
The South East and Tablelands Regional Plan 2036	The South East and Tablelands Regional Plan 2036 was published in 2017 and considers a 20-year timeframe. It is a land-use plan that set out the strategic vision for the region's ongoing growth (NSW DPE, 2017).. The South East and Tablelands Regional Plan 2036 provides a framework for creating a borderless region with Canberra, having a connected and prosperous economy, interconnecting biodiversity corridors, improving health and connection within communities, and providing environmentally sustainable housing choices (NSW DPE, 2017).	The Project is proposed to connect with the existing transmission lines and will therefore provide ready access to the electricity network, resulting in a contribution to the future economy. The development of the BESS aligns with the aim of a prosperous economy in that it will facilitate the development of additional renewable energy by firming energy supply and providing stability and reliability. The Project also aligns with the intention of interconnecting biodiversity corridors. The development of the BESS would result in the majority of vegetation on the site being retained, in order to minimise any adverse environmental impacts and maintain biodiversity corridors.
Local Context		
Goulburn Mulwaree Local Strategic Planning Statement	The Goulburn Mulwaree Local Strategic Planning Statement provides a framework for the social, economic, and environmental land use needs throughout the Goulburn Mulwaree LGA over the next 20 years (Goulburn Mulwaree Council, 2020).	The Project will provide jobs and investment within the Goulburn Mulwaree LGA, but will ideally not compete with agricultural industries, which contributes to the objectives of *Planning Priority 5: Primary Industry*.
Goulburn Mulwaree Community Strategic Plan 2042	The Goulburn Mulwaree Community Strategic Plan 2042 (Goulburn Mulwaree Council, 2022) outlines the future vision and strategic directions for the Goulburn Mulwaree Regional community. The Community Plan is executed under five themes and strategic objectives: community; economy; environment; infrastructure; and civic leadership.	The Project will directly respond to *Planning Priority B. Our economy* by creating diversified employment opportunities. The Project also meets the goals of *Planning Priority C. Our environment* by expanding renewable energy resources to the region.

7.1.2 PROJECT DESIGN AND ITERATION

The design process developed for this Project is focused around three main principles:

- Minimising and/or avoiding negative environmental and social impacts;
- Maximising energy storage capacity; and
- Incorporating feasible and reasonable mitigation / management measures, safeguards and provisions (e.g. for compliance monitoring) into the construction and operational aspects of the Project.

The Project design revisions have been, and will continue to be, the result of a multivariable and iterative process. These revisions allow for improvement in battery container siting based on information from technical assessment, landowner feedback and inclusion into the Project (as involved landowners), and broader community consultation. Outcomes of engagement with local council, State and Australian Government agencies, and business and stakeholder groups has also informed the Project layout presented in this BDAR.

7.1.2.1 BESS DEVELOPMENT FOOTPRINT

Since the conception of the Project, the Project layout and BESS Development Footprint have been designed to minimise impacts to biodiversity and has undergone multiple revisions to achieve good environmental outcomes. The following key design amendments have occurred throughout the progression of the project planning stage:

- Following initial vegetation surveys the Development Footprint was altered to avoid all PCT 3373 and the associated *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland*;
- The transmission line was originally running through the centre of the Subject Land and the design would have involved significant removal of native vegetation. The transmission line was moved to the western boundary of the Subject Land and put underground to reduce the clearing of native vegetation;
- The transmission line design was also altered to avoid the hollow bearing trees on the western boundary - by diverting the lines path to avoid any of the HBTs and their root protection areas.

The final proposed Development Footprint is shown in Figure 7-1.

7.1.2.2 ROAD RESURFACING DEVELOPMENT FOOTPRINT

The Road Resurfacing Development Footprint is situated along Canyonleigh Road, between the site access point and the intersection with Brayton Road. This section of Canyonleigh Road was chosen as it is the shortest distance to a main road (9.3 km) compared to the opposite direction towards the M31 (22.8 km). As such, there will be considerably less constraints to this section of the road due to a number of factors, including the length of road and traffic capacity.

Initial investigations identified the potential for minor upgrades to Canyonleigh Road may be required to accommodate OSOM vehicles on this section of road compared to the alternatives. However, further assessments, as discussed in the Traffic Impact Assessment (Amber, 2025) indicated that the proposed works associated with Canyonleigh Road are now limited to resurfacing activities only. This will limit works to:

- The resurfacing of the existing roadway of Canyonleigh Road; and
- Temporary construction depots associated with the resurfacing of Canyonleigh Road.

The final proposed Development Footprint for the road resurfacing works is shown in Figure 7-1.

It is considered that the proposed location of the development footprint offers the most appropriate setting for development to occur within the Subject land. These design changes support the principles of avoiding in the first instance and minimising impacts to biodiversity values, with the Road Resurfacing Development Footprint offering considerably fewer impacts to native vegetation and habitats.

7.1.3 ALTERNATIVE LOCATIONS

A project of this scale, alike many similar SSD projects, requires a significant area of land that meets specific requirements to support design and operation of the facility, such as the proximity to existing or proposed transmission or distribution networks and available network capacity. Many alternative sites may be limited in providing such critical design elements.

Although the Subject Land does not form part of an existing REZ, the Project location has been selected due to its strategic advantages and favourable conditions as outlined in Table 7-2.

TABLE 7-2 PREFERABLE SITE CONDITIONS

Preferable Site Condition	Applicability to the Project
Proximity to Infrastructure	The site is located near the existing Transgrid Marulan Substation, ensuring efficient connectivity and minimising the need for extensive additional transmission infrastructure. The existing road network also facilitates easy access for construction and ongoing maintenance activities.
Compatible Land Use	The main land use within the Subject Land is predominantly grazing on native pastures and modified pastures. Other land uses include cropping, residential and farm infrastructure.
Amenity Considerations	The site is situated away from a large number of sensitive receptors, such as residential areas, thereby reducing the likelihood of adverse amenity impacts, such as noise or visual disturbance
Mixed Surrounding Land Uses	The surrounding area consists of a mix of farming, renewable energy infrastructure and transport uses, which are generally compatible with the operation of a BESS. Rural zones in the area support the co-existence of the BESS with ongoing operations, minimising any potential land use conflicts.

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Vegetation Zone

- VZ1
- VZ16
- VZ17
- VZ19
- VZ2
- VZ20
- VZ21
- VZ22
- VZ23
- VZ3
- VZ4
- VZ5
- VZ6
- VZ7
- VZ8

WOLLONDILLY RIVER

CANYONLEIGH ROAD

Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Subject Land
- Development Footprint
- Assessment Area
- Rocky Outcrops
- Local Road
- Major Watercourse

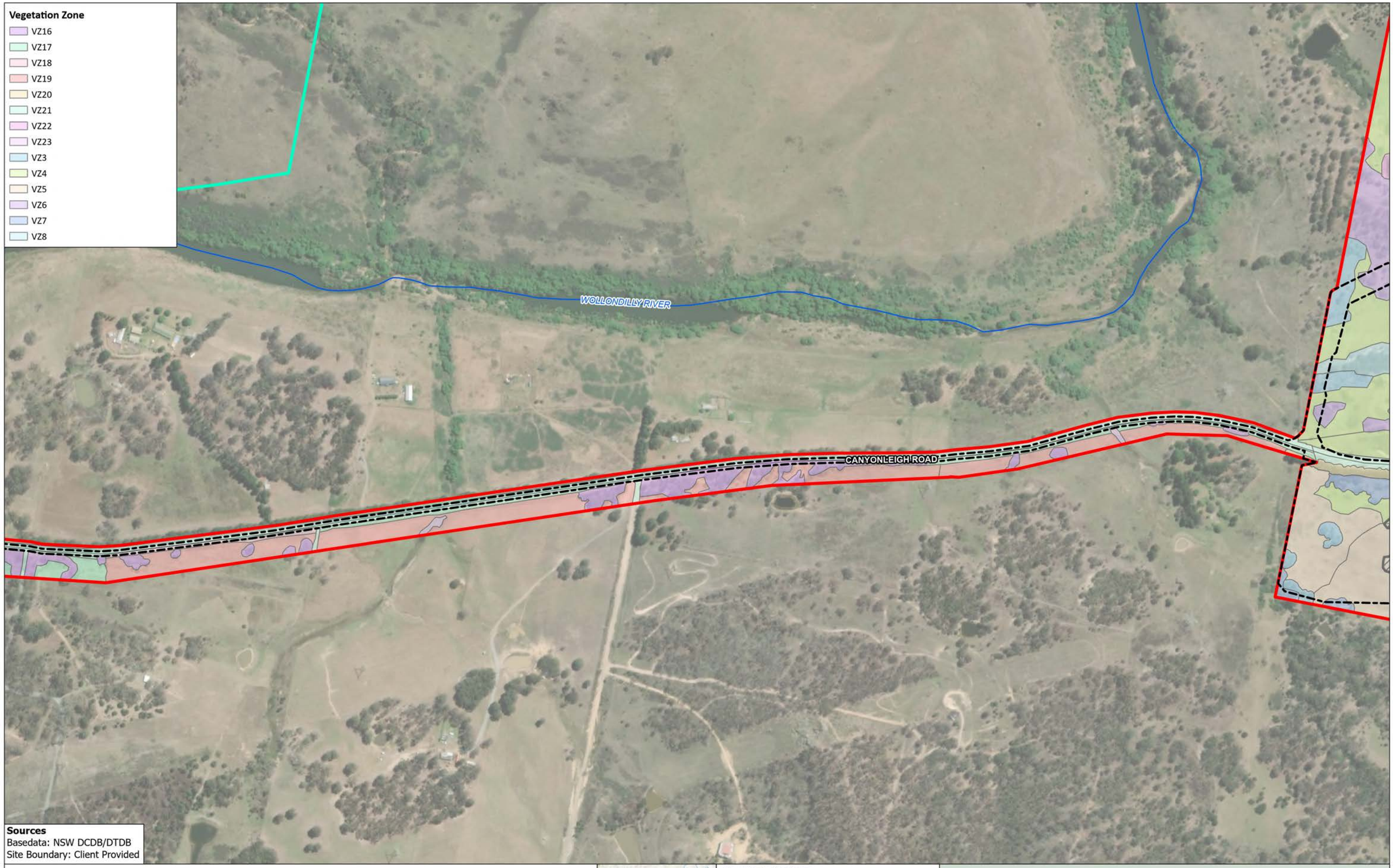
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Date: 19/01/2026
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F7-1 Final Proposed Development Footprint
Map 1 of 8

Canyonleigh Battery Energy Storage System (BESS) BDAR

X-Elio Aus2

ERM



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend
- Subject Land
- Development Footprint
- Assessment Area
- Rocky Outcrops
- Local Road
- Major Watercourse

Coordinate System:
GDA 1994 MGA Zone 55
Date: 19/01/2026
Created By: NB/AM
Drawing Size: A3
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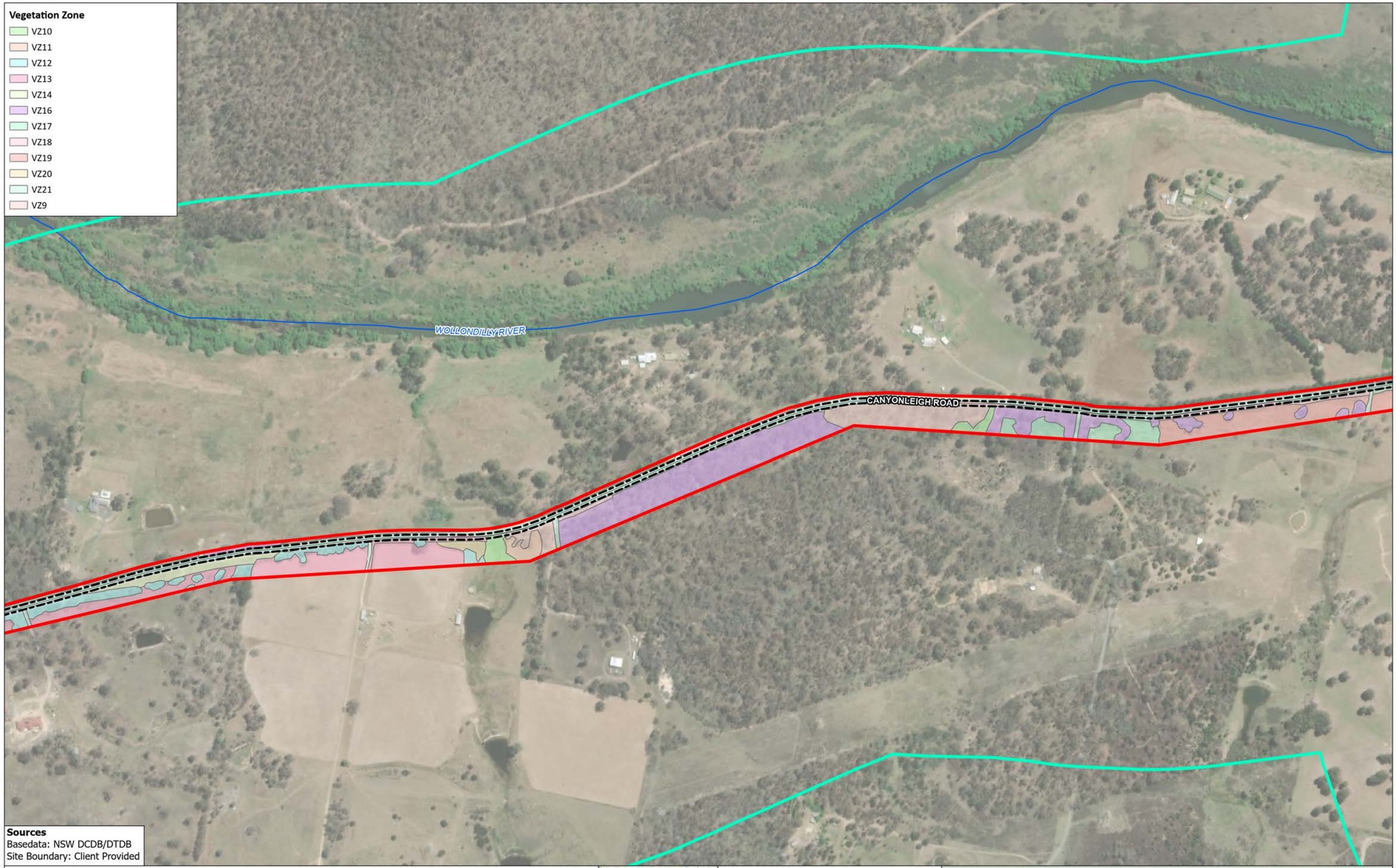
F7-1 Final Proposed Development Footprint
Map 2 of 8

Canyonleigh Battery Energy Storage System (BESS) BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend
- Subject Land
- Development Footprint
- Assessment Area
- Local Road
- Major Watercourse

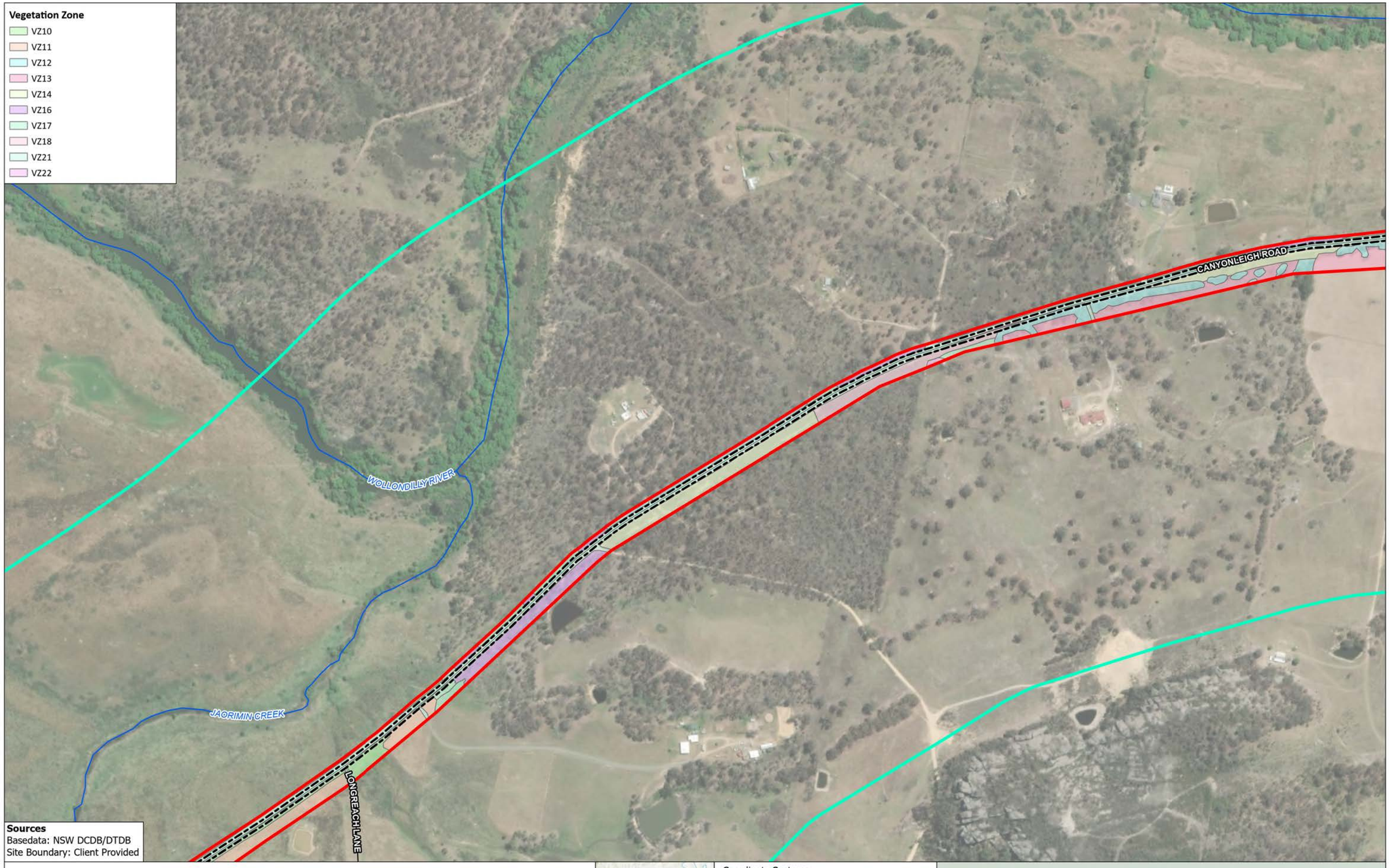
Coordinate System:
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Date: 19/01/2026
Created By: NB/AM
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F7-1 Final Proposed Development Footprint
Map 3 of 8

Canyonleigh Battery Energy Storage System (BESS) BDAR
X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend
- Subject Land
- Development Footprint
- Assessment Area
- Local Road
- Major Watercourse

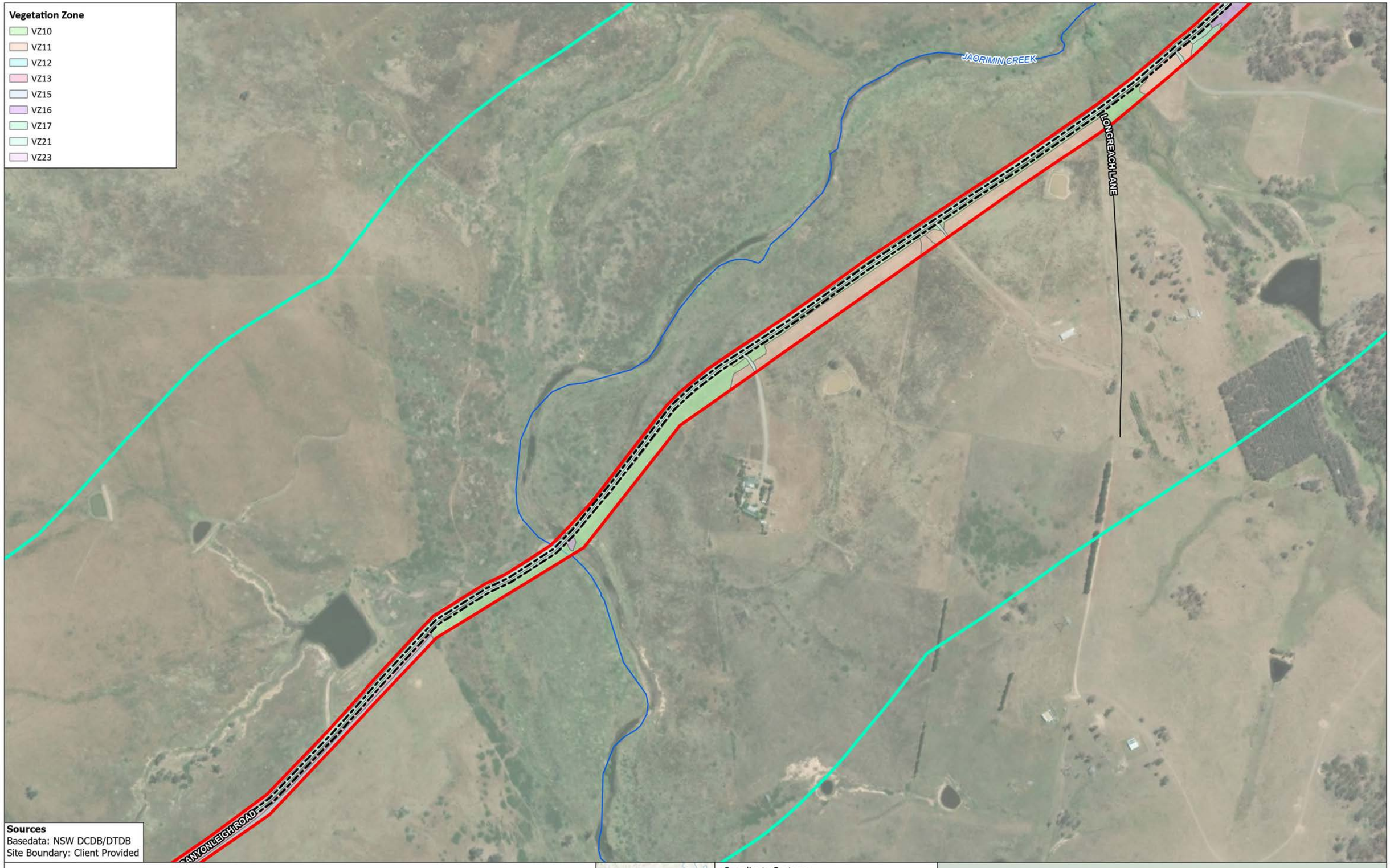
Coordinate System:
GDA 1994 MGA Zone 55
Date: 19/01/2026
Created By: NB/AM
Drawing Size: A3
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F7-1 Final Proposed Development Footprint
Map 4 of 8

Canyonleigh Battery Energy Storage System (BESS) BDAR
X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend
Subject Land
Development Footprint
Assessment Area
Local Road
Major Watercourse

Coordinate System:
GDA 1994 MGA Zone 55
Date: 19/01/2026
Created By: NB/AM
Drawing Size: A3
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F7-1 Final Proposed Development Footprint
Map 5 of 8

Canyonleigh Battery Energy Storage System (BESS) BDAR
X-Elio Aus2

ERM



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend
Subject Land
Development Footprint
Assessment Area
Local Road
Major Watercourse

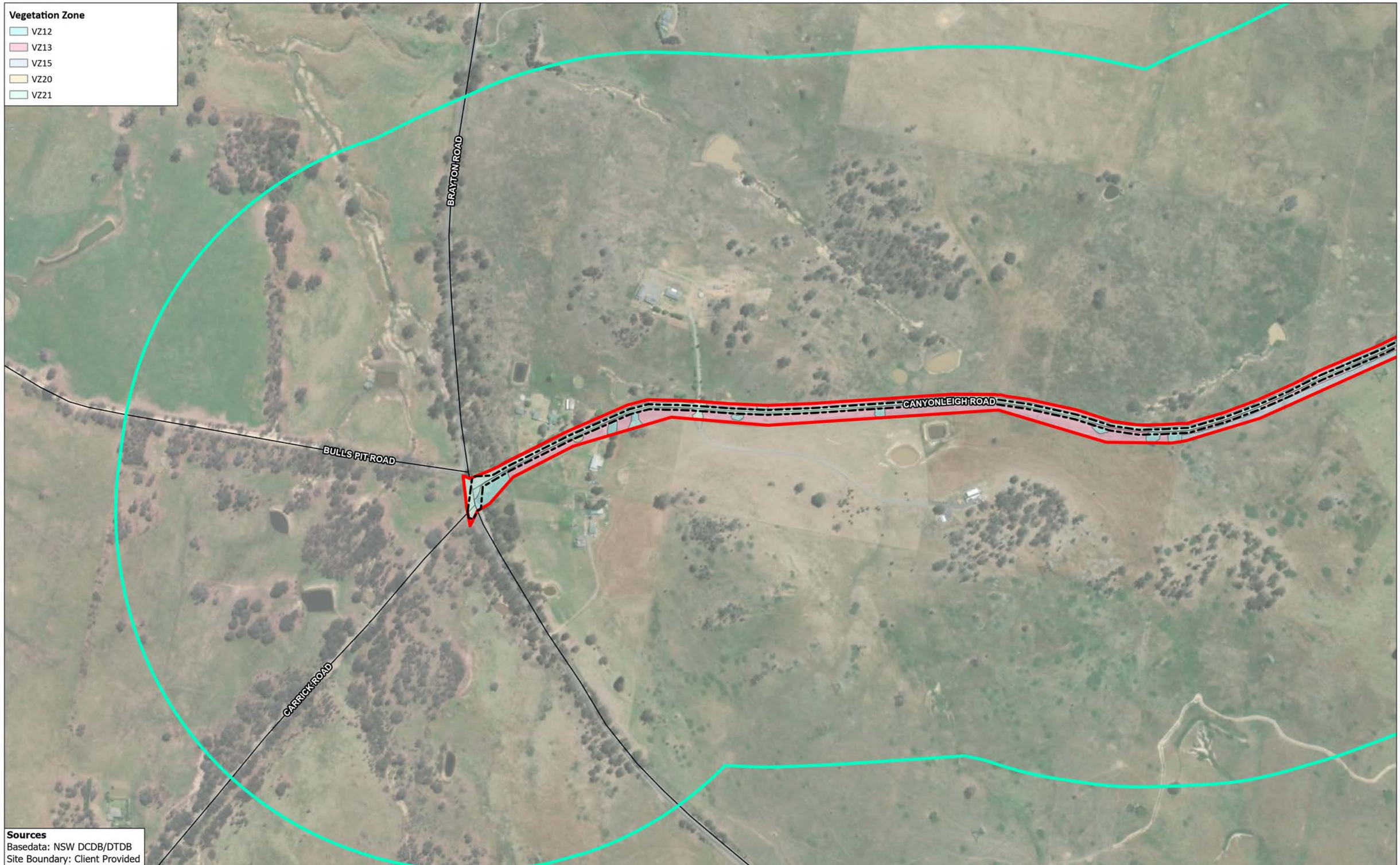
Coordinate System:
GDA 1994 MGA Zone 55
Date: 19/01/2026
Created By: NB/AM
Drawing Size: A3
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F7-1 Final Proposed Development Footprint
Map 6 of 8

Canyonleigh Battery Energy Storage System (BESS) BDAR
X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend
- Subject Land
- Development Footprint
- Assessment Area
- Local Road

Coordinate System:
GDA 1994 MGA Zone 55
Date: 19/01/2026
Created By: NB/AM
Drawing Size: A3
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1:5,000

F7-1 Final Proposed Development Footprint
Map 7 of 8

Canyonleigh Battery Energy Storage System (BESS) BDAR
X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend
- Subject Land
- Development Footprint
- Assessment Area
- Local Road

Coordinate System:
GDA 1994 MGA Zone 55
Date: 19/01/2026
Created By: NB/AM
Drawing Size: A3
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F7-1 Final Proposed Development Footprint
Map 8 of 8

Canyonleigh Battery Energy Storage System (BESS) BDAR
X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx

7.2 AVOID AND MINIMISE PRESCRIBED IMPACTS

Prescribed impacts relevant to the Project are outlined in Section 5.3 of this report. Below provides further information on how relevant prescribed impacts have been avoided and minimised by the proposed development.

7.2.1 KARST, CAVES, CREVICES, CLIFFS, ROCKS OR OTHER GEOLOGICAL FEATURES OF SIGNIFICANCE

Rocky habitat exists within the BESS Development Footprint and in small, isolated patches within the Road Resurfacing Development Footprint. These rocky areas may act as areas of suitable habitat for the following threatened species:

- Brush-tailed Rock-wallaby (Petrogale penicillate)
- Pink-tailed Legless Lizard (Aprasia parapulchella); and
- Striped Legless Lizard (*Delma impar*).

The Brush-tailed Rock-wallaby was adequately surveyed for and not found within the BESS Development Footprint and no habitat occurs within the Road Resurfacing Development Footprint.

For the Pink-tailed Legless Lizard, the expert report (Capital Ecology, 2025) identified 6.65 ha of suitable habitat within the BESS Development Footprint with no suitable habitat considered available within the Road Resurfacing Development Footprint.

Habitat associated with the Striped Legless Lizard (*Delma impar*) has been avoided within the BESS Development Footprint whilst an expert report identified suitable habitat within the Road Resurfacing Development Footprint.

Although the proposed development may require minor modifications or temporary disruptions to some small, rocky areas within the Subject Land across 0.72 ha of habitat, larger areas of suitable rocky habitat exist within the broader locality and areas of rocky outcrops will be retained within the Subject Land. Removal of the small areas of suitable rocky habitat, present in a disturbed state due to agricultural practices and the existing road, are unlikely to result in a significant impact.

7.2.2 HUMAN-MADE STRUCTURES

Human-made structures within the BESS Development Footprint include a road, fences, gates and existing electrical transmission tower and lines. In the wider Subject Land, there is an existing substation, associated infrastructure and a small porta cabin, as shown in Figure 6-1.

Human-made structures within the Road Resurfacing Development Footprint include a road, fences, cattle grids, culverts, posts, gates and electrical transmission lines, as shown in Figure 6-2.

Avian species may use human-made structures, such as those present within the Subject Land (i.e. fences) for foraging, perching and nesting. Small to medium sized culverts occur along Canyonleigh Road and offer potential roosting habitat for a range of microbats and small birds, as well as habitat for amphibians.

No changes to existing human-made structures are proposed. It is likely that the number of human-made structures will increase as a result of the Project, offering increased roosting and perching habitat.

7.2.3 NON-NATIVE VEGETATION

The Subject Land predominantly contains native vegetation. There are small sections of planted non-native woody vegetation occurring as a row of planted *Pinus radiata* on the southern side of Canyonleigh Rd, which partially lies within the BESS Development Footprint, and areas of planted *Populus alba* and *Pinus radiata* on the northern side of Canyonleigh Rd at the intersection of Brayton Rd. Threatened avian and bat species may use this vegetation for foraging and Squirrel Glider (*Petaurus norfolcensis*) may use this vegetation for dispersal.

The Project has been designed to minimise the clearing of vegetation by maximising the use of existing roads. Given that the areas of non-native vegetation are relatively small in comparison to the extent of suitable habitat to be retained within the Subject Land and broader locality and that the non-native vegetation is expected to be used in a transient manner by highly mobile species, it is unlikely that removal of non-native vegetation would lead to a significant impact.

7.2.4 HABITAT CONNECTIVITY

The Subject Land is well-connected to surrounding bushland with several patches of woodland within the BESS Development Footprint connecting to surrounding bushland on either side of Canyonleigh Road. Similarly, the vegetation within the Road Reserve directly connects to large expanses of woodland that connect to the Wollondilly River and into the surrounding foothills.

The proposed development will ultimately reduce the extent of connectivity currently available across the Subject Land. However, the proposed development ha been designed to retain connectivity features and vegetation.

To minimise impacts to connectivity and movement corridors the BESS Development Footprint has been largely located within areas that are already highly modified due to the existing substation infrastructure and past agricultural land use practices. Areas of well-connected and high value vegetation have been avoided and retained. Habitat within the Road Resurfacing Development Footprint is already fragmented due to the road, the proposed works involve resurfacing of Canyonleigh Rd to support traffic of OSOM and heavy vehicles during construction. As the works are restricted to the existing road corridor, the loss of habitat will be minor and the reduction in connectivity is insignificant.

The Project has been designed to maximise use of existing public and internal access tracks and access points across the Subject Land, minimising vegetation clearance required and avoiding development where the highest concentration of habitat connectivity is present. Connectivity suitable for a range of fauna species will remain across the Subject Land and will be managed under a Biodiversity Management Plan.

7.2.5 WATERBODIES, WATER QUALITY AND HYDROLOGICAL PROCESSES

The Subject Land is located approximately 250 m east of the Wollondilly River and four unnamed ephemeral watercourses intersect the BESS Development Footprint as per NSW hydrological mapping (NSW Government, 2025). Within the BESS Development Footprint, PCT 4063 was observed in a west-facing gully, with active drainage to the south of the existing substation. Changes to drainage can affect the integrity, structure and composition of habitat and thus, have secondary impacts on the species that rely on them; however, the BESS Development Footprint largely avoids the gully, works will be restricted to the transmission line that will connect the BESS to the existing substation.

Farm dams also occur throughout the Subject Land. Although these artificial features possess low vegetation quality with minimal or no floating, fringing, emerged and submerged vegetation present, the Project has avoided these features.

The Wollondilly River runs adjacent to the Road Resurfacing Development Footprint and ranges between approximately 160 m to 3 km in proximity. Jaorimin Creek intersects the Road Resurfacing Development Footprint as well as three other unnamed ephemeral watercourses, which may provide suitable habitat for threatened amphibian species. The Road Resurfacing Development Footprint occurs on land that has already been modified and where hydrological processes have already been altered. Therefore, it is unlikely that any alteration because of the proposed road upgrade will significantly impact threatened species and/or their habitat.

These areas may provide suitable habitat for threatened amphibian species. However, the impacts on waterbodies, water quality and hydrological processes are expected to be minimal following the implementation of mitigation measures outlined in the Erosion and Sediment Control Plan.

7.2.6 VEHICLE STRIKES

Vehicle strikes can pose a substantial threat to wildlife. Whilst the Project has been designed to maximise the use of existing roads and tracks, it will involve upgrades to Canyonleigh Road and the construction of internal access tracks which will result in an increased vehicular presence across the Subject Land.

A Traffic Impact Assessment (Amber, 2025) has been undertaken to evaluate the potential construction, operational and decommissioning transport impacts. The highest risk period for vehicle collision is anticipated during the construction and decommissioning stages, which generate trips associated with the workforce accessing and traversing the site and the delivery / removal of raw materials and plant. During operation, vehicle movement will be considerably reduced; however, this also presents potential collision hazards with a limited number of vehicles entering for routine maintenance and monitoring purposes.

Native wildlife mortality due to vehicle strike is possible; however, it is expected to be relatively low following implementation of mitigation measures. These measures will be addressed in the Construction Traffic Management Plan and Construction Environmental Management Plan.

7.3 FURTHER MEASURES TO AVOID AND MINIMISE IMPACTS

Impacts will be further avoided and minimised where possible through additional detailed design to protect retained and adjacent vegetation and habitat during the construction, operations and decommissioning phases of the Project. Further measures are detailed in Section 8.5 of this BDAR.

8. IMPACT ASSESSMENT

8.1 DIRECT IMPACTS

The 21.60 ha Development Footprint, encompassing 15.20 ha (BESS Development Footprint) and 6.40 ha (Road Resurfacing Development Footprint) has included a buffer to infrastructure and access roads to ensure both direct and indirect impacts to native vegetation are appropriately assessed.

The construction, operations and decommissioning phases of the development will result in direct impacts to biodiversity values (change in vegetation integrity score and habitat suitability) within the BESS Development Footprint and the Road Resurfacing Development Footprint which cannot be avoided. Direct impacts include the clearing and modification of native vegetation and threatened species' habitat.

Direct impacts as a result of the Project will occur to:

- Native vegetation and habitat of associated predicted species (outlined in Table 8-1); and
- Threatened candidate species and species' habitat (outlined in Table 8-2).

TABLE 8-1 SUMMARY OF DIRECT IMPACTS ON NATIVE VEGETATION

Vegetation Zone	TEC		Area of Impact		Current VI Score	Project Timing
	BC Act	EPBC Act	BESS	Roadworks		
3746_VZ3_Woodland	-	-	0.42	-	62.9	Construction
3746_VZ4_Grassland	-	-	5.36	-	12.9	Construction
3746_VZ5_Shrubland	-	-	3.14	-	18.9	Construction
3746_VZ6_Planted Natives	-	-	0.39	-	64.5	Construction
3746_VZ7_Highly Disturbed	-	-	0.64	-	11.5	Construction
4063_VZ8_Woodland	-	-	0.04	-	60.2	Construction
3347_VZ9_Woodland	-	-	-	0.09	44.8	Construction
3347_VZ10_Grassland	-	-	-	0.16	8.5	Construction
3347_VZ11_Highly Disturbed	-	-	-	0.09	8.5	Construction

Vegetation Zone	TEC		Area of Impact		Current VI Score	Project Timing
	BC Act	EPBC Act	BESS	Roadworks		
3373_VZ12_Woodland	White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	-	0.13	55.6	Construction
3373_VZ13_Grassland			-	0.43	16.1	Construction
3373_VZ14_Shrubland	-	-	-	0.01	33.7	Construction
3746_VZ16_Woodland	-	-	-	0.14	60	Construction
3746_VZ17_Grassland	-	-	-	0.28	13.1	Construction
3746_VZ18_Shrubland	-	-	-	0.10	24.1	Construction
0_VZ20_Planted Non-native vegetation	NA	NA	0.69	0.01	NA	No
0_VZ21_Infrastructure	NA	NA	4.52	4.97	NA	No

Directs impacts to candidate species are summarised in Table 8-2 The direct impact on candidate species includes habitats associated with candidate species recorded and those assumed present or assumed present through an expert report.

TABLE 8-2 SUMMARY OF DIRECT IMPACTS TO THREATENED SPECIES AND THREATENED SPECIES' HABITAT

Species	BC Act	EPBC Act	Record	SAII entity	Associated Impacts	Total area of impact (ha)
Superb Midge Orchid (*Genoplesium superbum*)	E	-	Assumed present	Yes	PCT 3746_VZ17_Grassland (0.28 ha) PCT 3746_VZ18_Shrubland (0.10 ha)	0.38 ha

Species	BC Act	EPBC Act	Record	SAII entity	Associated Impacts	Total area of impact (ha)
Gang-gang Cockatoo (*Callocephalon fimbriatum*) (breeding)	E	E	Recorded	No	Impacts to VZs with HBTs: PCT 3746_VZ3_Woodland (0.42 ha) PCT 4063_VZ8_Woodland (0.04 ha) PCT 3373_VZ12_Woodland (0.13 ha) PCT 3746_VZ16_Woodland (0.14 ha)	0.73 ha
Squirrel Glider (*Petaurus norfolcensis*)	V	-	Recorded	No	PCT 3746_VZ3_Woodland (0.42 ha) PCT 3746_VZ4_Grassland (5.36 ha) PCT 3746_VZ5_Shrubland (3.14 ha) PCT 3746_VZ6_Planted Natives (0.39 ha) PCT 3746_VZ7_Highly Disturbed (0.64 ha) PCT 4063_VZ8_Woodland (0.04 ha)	9.99 ha
Key's Matchstick Grasshopper (*Keyacris scurra*)	E	E	Recorded	No	PCT 3746_VZ3_Woodland (0.42 ha) PCT 3746_VZ4_Grassland (5.36 ha) PCT 3746_VZ5_Shrubland (3.14 ha) PCT 3746_VZ6_Planted Natives (0.39 ha) PCT 3746_VZ7_Highly Disturbed (0.64 ha) PCT 3746_VZ16_Woodland (0.14 ha) PCT 3746_VZ17_Grassland (0.28 ha) PCT 3746_VZ18_Shrubland (0.10 ha)	10.47 ha

Species	BC Act	EPBC Act	Record	SAII entity	Associated Impacts	Total area of impact (ha)
Pink-tailed Legless Lizard (*Aprasia parapulchella*)	V	V	Expert Report	No	PCT 3746_VZ3_Woodland (0.42 ha) PCT 3746_VZ4_Grassland (5.36 ha) PCT 3746_VZ5_Shrubland (3.14 ha) PCT 3746_VZ6_Planted Natives (0.39 ha) PCT 3746_VZ7_Highly Disturbed (0.64 ha)	9.95 ha
Striped Legless Lizard (*Delma impar*)	V	V	Expert Report	No	PCT 3347_VZ10_Grassland (0.0.16 ha) PCT 3373_VZ12_Woodland (0.13 ha) PCT 3373_VZ13_Grassland (0.43 ha)	0.72 ha

8.1.1 CHANGE IN VEGETATION INTEGRITY SCORE

The change in VIS for each VZ impacted by the proposed development is detailed in Table 8-3. It is assumed that the direct impacts of the Project will result from the total clearing of specific areas of native vegetation within VZs identified within the BESS Development Footprint and the Road Resurfacing Development Footprint.

TABLE 8-3 CHANGE IN VEGETATION INTEGRITY SCORE

Vegetation Zone	Area of Impact		Before Development				Change in VI Score
	BESS	Roadworks	Composition	Structure	Function	VI Score	
3746_VZ3_Woodland	0.42	-	75.2	43.9	75.6	62.9	- 62.9
3746_VZ4_Grassland	5.36	-	48.4	44.1	0	12.9	- 12.9
3746_VZ5_Shrubland	3.14	-	46.5	31.3	4.7	18.9	- 18.9
3746_VZ6_Planted Natives	0.39	-	67.5	57.3	69.3	64.5	- 64.5
3746_VZ7_Highly Disturbed	0.64	-	59	26	0.8	11.5	- 11.5
4063_VZ8_Woodland	0.04	-	55.7	94.7	41.4	60.2	- 60.2
3347_VZ9_Woodland	-	0.09	51.2	32.1	54.6	44.8	- 44.8
3347_VZ10_Grassland	-	0.16	51	11.8	0.4	8.5	- 8.5
3347_VZ11_Highly Disturbed	-	0.09	51	11.8	0.4	8.5	- 8.5
3373_VZ12_Woodland[1]	-	0.13	54.7	46.9	67.1	55.6	- 55.6
3373_VZ13_Grassland[1]	-	0.43	21.8	14.9	12.8	16.1	- 16.1
3373_VZ14_Shrubland	-	0.01	65.6	20.3	28.8	33.7	- 33.7

Vegetation Zone	Area of Impact		Before Development				Change in VI Score
	BESS	Roadworks	Composition	Structure	Function	VI Score	
3746_VZ16_Woodland	-	0.14	48.8	54	82.1	60	- 60
3746_VZ17_Grassland	-	0.28	41.1	20.4	2.7	13.1	- 13.1
3746_VZ18_Shrubland	-	0.10	39.4	25.6	13.9	24.1	- 24.1

1 PCT 3373_VZ12_Woodland and PCT 3373_VZ13_Grassland were identified as being associated with the Critically Endangered Ecological Community listing of White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland under the BC Act and EPBC Act. PCT 3373_VZ1_Woodland and PCT 3373_VZ2_Grassland were also identified as being associated with this TEC. However, no impacts are proposed to these VZs. As such they have not been shown.

8.2 INDIRECT IMPACTS

Section 8.2.2 of the BAM (NSW DPIE, 2020) identifies 16 potential indirect impacts that, as a minimum, must be considered as a part of a BDAR. Indirect impacts of the Project on native vegetation, threatened entities and their habitat beyond the Development Footprint have been considered in accordance with the BAM in Table 8-4. Impacts to MNES have also been considered throughout the assessment of indirect impacts.

Note that assessment of indirect impacts as a result of the Project on PCTs and/or threatened species and their habitat have been fully considered, however, there may be some unforeseen indirect impacts that have not been predicted.

Mitigation measures to address the indirect impacts described in Table 8-4 are provided in Section 8.5. Despite the likelihood of occurrence of indirect impacts as a result of the Project, it is considered that the proposed mitigation measures are reliable and capable of limiting the effects of these impacts without causing harm to the adjoining environment.

TABLE 8-4 SUMMARY OF INDIRECT IMPACTS AND MITIGATION MEASURES

Indirect impact	Nature	Extent	Impact entities	Project phase	Consequences	Mitigation
(a) Inadvertent impacts on adjacent habitat or vegetation	Construction activities may result in inadvertent impacts on retained vegetation, such as increased sedimentation, disturbance and compaction by construction vehicles, or accidental removal of vegetation external to the approved development area.	Uncertain, but generally in retained native vegetation adjacent to the approved development footprint.	PCTs and threatened species habitat	Construction	Reduced condition of retained native vegetation and threatened species habitat adjacent to the approved development footprint, resulting in loss and dispersal of species.	Risks will be mitigated through environmental management measures and controls via the preparation of a CEMP. Clear boundaries are to be created using fencing, tape, etc. to ensure that no retained vegetation is incidentally impacted.
(b) Reduced viability of adjacent habitat due to edge effects	Increase in edge: core habitat ratio, resulting in edge effects such as light and noise pollution, weed invasion and altered moisture, wind and temperature	Uncertain, but generally in retained native vegetation adjacent to the approved development footprint.	PCTs and threatened species habitat	Construction	Reduced condition of retained native vegetation adjacent to the approved development area. May reduce habitat quality or affect habitat use or movements of some species.	To minimise edge effects as a result of the Project, mitigation measures will be incorporated into the CEMP to manage impacts to soil quality, hydrology regimes and habitat degradation. Clear boundaries are to be created using fencing, tape, etc. to ensure that no retained vegetation adjacent to the development footprint is impacted by edge effects.
(c) Reduced viability of adjacent habitat due to noise, dust or light spill	Construction and operational activities are likely to increase the noise, dust and light above current levels within and beyond the Subject Land.	Uncertain, but generally in retained native vegetation adjacent to the approved development footprint.	PCTs and threatened species habitat	Construction and operation	Disruption of fauna habitat usage during construction and operation.	The CEMP will work to mitigate potential impacts to the viability of adjacent habitat as a result of artificial light, runoff, noise and dust incursions during construction of the Project. The CEMP will specify how artificial lighting is to be directed away from the neighbouring lands and potentially use barriers to further minimise noise and disturbance. By limiting construction hours, noise and light and can be managed to provide the least amount of disruption to species vulnerable to these disturbances.
(d) Transportation of weeds and pathogens from the subject site to adjacent vegetation	High threat weeds and other exotic species may be inadvertently spread to other areas within and beyond the Subject Land.	Uncertain, but generally in retained native vegetation adjacent to the approved development footprint.	PCTs and threatened species habitat	Construction, operation and rehabilitation	Reduced condition of retained native vegetation adjacent to the approved development footprint and a change in the composition of foraging resources, which may be detrimental to certain fauna species.	There is a potential risk of transportation of introduced weeds and pathogens during construction and operation to adjacent vegetation with increased vehicular movements. This risk will be mitigated within the CEMP and Pest Management Control Programs to be implemented.
(e) Increased risk of starvation, exposure and loss of shade or shelter	Construction and operational impacts may cause a decline in habitat suitability, particularly for species with specific habitat requirements.	Uncertain, but generally in retained native vegetation adjacent to the approved development footprint.	Threatened fauna species	Construction and operation	Clearing of native vegetation for the construction of the Project will result in reduction of resources available for threatened fauna species that may result in starvation, exposure and loss of shade or shelter.	The extent of clearing of native vegetation has been minimised where possible and the extent of clearing is not considered critical to the survival of any threatened species. Ongoing monitoring through a BMP and CEMP will identify any increase in risk to threatened species and will manage this accordingly.
(f) Loss of breeding habitat due to vegetation clearance	Construction and operational impacts may cause a decline in habitat suitability, particularly for species with specific breeding requirements.	Uncertain, but generally in retained native vegetation adjacent within the Subject Land.	Threatened fauna species	Construction and operation	Reduced function of retained native vegetation and other breeding habitats adjacent to the approved development area which may force species to disperse or be detrimental to their survival.	Project will result in reduction of breeding habitat available for a range of threatened fauna species. Habitat features known to be of importance for breeding, such as hollow bearing trees, have been avoided where possible. Ongoing monitoring through a BMP and CEMP will identify any increase in risk to threatened species and will manage this accordingly.
(g) Trampling of threatened flora species	Construction and operational activities may result in inadvertent trampling of threatened flora by humans and construction and / or operational vehicles.	Uncertain, but generally in retained native vegetation adjacent within the Subject Land.	Threatened flora species habitat	Construction, operation and rehabilitation	Reduction in the number and extent of threatened flora species.	Risk of trampling of flora, including threatened flora such as the Superb Midge Orchid (*Genoplesium superbum*), which has been assumed present within 0.28 ha of the Road Resurfacing Development Footprint will be mitigated through measures and controls via the preparation and implementation of the CEMP. No-go zones are to be established to ensure no incidental trampling occurs. There is unlikely to be residual inadvertent impacts to threatened flora.

Indirect impact	Nature	Extent	Impact entities	Project phase	Consequences	Mitigation
(h) Inhibition of nitrogen fixation and increased soil salinity	Construction and operational activities may result in disruption to soil microbial activity and processes which occur in the soil due to compaction by heavy vehicles, introduction of chemicals and altered vegetation.	Uncertain, but generally in the approved development footprint and retained native vegetation, and other habitats adjacent to the approved development area.	PCTs, threatened species and their habitat	Construction phase and operation	Reduced vegetation function and subsequent impacts on foraging resources and habitat.	The Project is not expected to result in the inhibition of nitrogen or increased soil salinity.
(i) Fertiliser drift	Construction and operational activities may result in a reduction in vegetation extent which means that fertiliser drift from existing agricultural activities will be able to spread further into the landscape affecting other areas of vegetation and habitat.	Uncertain, but generally in retained native vegetation adjacent to the approved development footprint.	PCTs and threatened species habitat	Construction, operation and rehabilitation	Reduced native vegetation function and the subsequent impacts on foraging resources and habitat. Potential reduction in water quality in waterbodies, including dams.	The Project is not expected to result in any fertiliser drift.
(j) Rubbish dumping due to improper management of waste	Construction and operational activities may result in inadvertent rubbish dumping which can negatively affect vegetation communities and habitat resources.	Uncertain, but generally in the approved development footprint.	Threatened species and their habitat	Construction and operation	Reduce native vegetation function and impacts on suitable habitat. Improper waste disposal, particularly food waste can contribute to an increase in feral animal populations, posing a significant threat to threatened fauna.	The Project is not expected to result in rubbish dumping. However, this risk will be mitigated within the CEMP
(k) Wood collection	Construction and operational activities will result in a reduction in vegetation extent which means that existing wood collection will need to be undertaken in other areas of vegetation and habitat.	Uncertain, but generally in retained native vegetation and other habitats adjacent to the approved development footprint.	Threatened fauna species, including threatened birds that build stick nests.	Construction	Reduced native vegetation function and impacts on suitable habitat, particularly for species which use fallen logs for foraging or shelter. Removal of dead wood and dead trees is a Key Threatening Process in schedule 4 of the BC Act and can result in the loss of important habitat, such as hollow logs and decaying wood, for a wide variety of species.	The Project is not expected to result in increased wood collection. In the instance that coarse woody debris requires removal for the development, it is to be relocated within retained native vegetation to continue to support habitat.
(l) Removal and disturbance of rocks, including bush rocks	Construction and operational activities may result in disturbance and removal of habitat containing surface rocks.	Uncertain, but generally in retained native vegetation and other areas of rock adjacent to and within the approved development footprint.	Threatened species and habitats	Construction	Loss of potential shelter, basking and habitat resources.	The Project is not expected to result in any indirect impacts resulting in Removal and disturbance of rocks, including bush rocks.
(m) Increase in predators	Construction and operational activities may result in a disturbance to the natural ecological balance of fauna and vegetation communities which may lead to an increase in predators. For example, disruption to existing fauna corridors may mean prey become exposed to predation and thus predator numbers increase as food becomes more readily available.	Uncertain, but generally in approved development footprint and retained native vegetation and other habitats adjacent to the approved development footprint.	Threatened flora and fauna species	Construction and operation	Reduction in fauna numbers and genetic material within populations. Reduction in the number of herbivores in vegetation communities, potentially disrupting the ecological balance.	The Project will involve the construction and upgrading of access tracks throughout the Subject Land, resulting in the potential to increase predator activity. The Project will involve the implementation of a Pest Control Management Program that will aim to eliminate or reduce the risk of increase in predator activity.

Indirect impact	Nature	Extent	Impact entities	Project phase	Consequences	Mitigation
(n) Increase in pest animal populations	Construction and operational activities may result in a disturbance to the natural ecological balance of fauna and vegetation communities which may lead to an increase in pest animal populations.	Uncertain, but generally in approved development footprint and retained native vegetation and other habitats adjacent to the approved development footprint.	PCTs, threatened species and their habitat	Construction and operation	Increase in the number of herbivores in vegetation communities, potentially disrupting the ecological balance. Negative impacts to vegetation communities and habitats by pest animals. Competition with and predation of native fauna	The Project will involve the construction and upgrading of access tracks and associated infrastructure for the BESS Development Footprint, including resurfacing of a portion of Canyonleigh Road identified as the Road Resurfacing Development Footprint, resulting in the potential to increase pest animal activity. The Project will involve the implementation of a Pest Control Management Program that will aim to eliminate or reduce the risk of increase in pest animal populations. There is unlikely to be residual inadvertent impacts to threatened fauna species.
(o) Change in fire regimes	Construction and operational activities may result in vegetation community changes which lead to different fuel consumption patterns, increased intensity and severity of fires, increased or altered fire frequency, larger patch size, and changes to the timing of fires.	Uncertain, but generally in approved development footprint and retained native vegetation and other habitats adjacent to the approved development footprint.	PCTs, threatened species and their habitat	Construction and operation	Altered vegetation community composition, structure and function as a result of the Project may lead to fires in shrub and grass communities in very dry conditions, following good growth of vegetation in wet conditions (and hence a fuel source). Loss or changes to habitats and resources.	The Project is not expected to result in any change in fire regimes.
(p) Disturbance to specialist breeding and foraging habitat, e.g. beach nesting for shorebirds	Construction and operational activities may result in loss or alteration to specialist breeding and foraging habitat.	Uncertain, but generally in retained native vegetation and other habitats adjacent to the approved development footprint.	Threatened fauna species	Construction and operation	Reduction in fauna numbers, fitness and the gene pool of populations.	The Project is not expected to result in any disturbance to specialist breeding habitat

8.3 PRESCRIBED IMPACTS

Prescribed impacts on the Subject Land were identified in Section 5.3 of this report. The following prescribed impacts are relevant to the Development Footprint:

- Impacts on habitat of threatened entities provided by Karst, caves, crevices, cliffs, rock outcrops and other geological features of significance;
- Impacts on habitat of threatened entities provided by non-native vegetation and human-made structures;
- Impacts on areas connecting threatened species habitat and which maintain their lifecycle, such as movement corridors;
- Impacts that affect waterways, water quality and hydrological processes that sustain threatened entities; and
- Impacts on threatened species or fauna that are part of a TEC from vehicle strike.

Table 8-5 below details the nature, extent, frequency, duration, timing, consequence and any limitations of each prescribed impact and for the identification of potentially affected threatened entities. It is considered that the most serious of these impacts involve mortality and injury of ground-dwelling fauna potentially resulting from vehicle strike.

TABLE 8-5 SUMMARY OF PRESCRIBED IMPACTS

Impact	Nature	Extent	Frequency, Timing & Duration	Associated Threatened Entities	Consequences & Limitations
Impacts on caves, rocky outcrop and geological features	The Subject Land contains scattered areas of small rocky outcrop within the BESS Development Footprint as well as isolated small rocky areas within the Road Resurfacing Development Footprint.	Minor impacts have the potential to occur to small, isolated rocky outcrop where the Development Footprint intersects these features.	Construction	Threatened flora and fauna species, including herbs and reptiles. Loss of potential shelter resources and habitat association.	May decrease available microhabitats for flora species and reduce rocky refuges suitable for reptiles. The design of the project has avoided and minimised impacts to such features.
Human-made structures	Human-made structures within the Subject Land are largely associated with the existing substation, including access roads and fencing associated with the Subject Land as well as farm fencing delineating private lands from the road reserve within the Road Resurfacing Project Area.	Avoided	Construction	Threatened fauna species, including raptors and microbats.	The proposed development has avoided impacts and development within the vicinity of existing structures. It is noted that additional fencing and infrastructure will be installed for and by the project.
Removal and/or disturbance to non-native vegetation	The Development Footprint contains non-native vegetation, including planted non-native vegetation within the BESS Development Footprint and Road Resurfacing Development Footprint.	0.70 ha of non-native vegetation classified as PCT 0_VZ20_Planted Non-native vegetation, including 0.69 ha within the BESS Development Footprint and 0.01 ha.	Construction	Loss of potential foraging and sheltering habitat, and disruption to dispersal.	Likely to decrease non-native foraging resources that fauna may utilise in the vicinity. Impacts are expected to be minimal due to the small areas of non-native vegetation to be removed and the extent of non-native vegetation to be retained and within the broader locality.

Impact	Nature	Extent	Frequency, Timing & Duration	Associated Threatened Entities	Consequences & Limitations
Increased habitat fragmentation / impacts on habitat connectivity	The Subject land is well-connected to surrounding bushland that connects the broader landscape. Habitat connectivity within the Road Resurfacing Development Footprint is largely associated with woodland and scattered trees within adjoining properties.	Approximately 115 ha of the Subject Land consists of native vegetation connected to adjoining areas of woodland and grassland, including areas of riparian habitat associated with the Wollondilly River. Impact to connectivity have been avoided and minimised with anticipated impactsto native vegetation and connectivity totalling 11.40 ha across the BESS Development Footprint (9.98 ha) and Road Resurfacing Development Footprint (1.42 ha).	Construction and operation	All threatened fauna species, including predicted species, detected candidate species and other threatened species, and Threatened fauna species that may attempt to cross the Subject land.	Some species may avoid edge habitat, increasing competition for resources and disrupting home ranges. Gene flow may be restricted to subpopulations no longer connected by suitable habitat to facilitate dispersal. It is important to note however, that the vegetation removal would not result in complete isolation of any habitat patches due to the project design maintaining connectivity features. Impacts to habitat connectivity have been minimised throughout Project design to retain connectivity features and integrate nature where possible into the overall development footprint. Habitat connectivity will remain well-connected across the Subject Land and will retain significant connections to nature reserves in the location area.
Waterbodies, water quality and hydrological processes	The most significant waterway occurring within the Assessment Area of the Subject Land is the Wollondilly River, which occurs approximately 230m west of the BESS Development Footprint (at its closest point) and 160m north of the Road Resurfacing Development Footprint (at its closest point). Jaorimin Creek also crosses the Road	Minor impacts have the potential to occur to the mapped waterway of Jaorimin Creek and several unnamed first order streams where the Road Resurfacing Development Footprint connects with this feature. Standard erosion control methods will be used during construction and standard stormwater	Construction	No threatened aquatic species have been identified as being associated with these areas of mapped Key Fish Habitats. All threatened fauna species including ecosystem credit species, detected candidate species and other threatened species.	May decrease downstream water quality, which would affect pollution-sensitive species, and may impact the quality of drinking water for all fauna species. Structures associated with the project such as any existing culverts along the Road Resurfacing Development Footprint may modify hydrological processes by increasing flow with larger culverts (if required) and inundation events within the Road Resurfacing Development Footprint and adjacent lands. The proposed development has been located to avoid impacts to mapped waterways and retain appropriate buffers to their hydrological processes.

Impact	Nature	Extent	Frequency, Timing & Duration	Associated Threatened Entities	Consequences & Limitations
	Resurfacing Development Footprint. Several farm dams also occur within proximity (50m) to the Road Resurfacing Development Footprint.	management measures will be implemented during the operation phase. No impacts to waterways are likely within the BESS Development Footprint.			If any waterway crossings within the Road Resurfacing Development Footprint are required to be upgraded or modified, the design and construction of waterway crossings on the Subject Land will be undertaken in accordance with the Department's Policy and Guidelines for Fish Habitat Conservation and Management (2013) and Why Do fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings (2003). Any temporary waterway crossings will be removed following completion of the various stages of construction.
Vehicle Strikes	The project will include upgrades and resurfacing of existing access tracks, including a portion of Canyonleigh Road. The proposed development will inherently increase vehicular presence and movements due to the tourism-based nature of the development.	Uncertain. Likely minor due to low-speed limits within the Subject Land.	Construction and operation	Ground-dwelling fauna species; and Low-flying or ground foraging avian species, such as raptors, parrots, robins; Low-flying foraging microbats during dusk.	Death or injury to fauna that may cross roads or low flying avian species. To reduce risks of fauna mortality, mitigation measures will be addressed in the Construction Traffic Management Plan (CTMP) and Construction Environmental Management Plan (CEMP), and include measures such as on-site education, identifying and reporting hazards as they occur during construction, use of appropriate signage and creating driving policies such as appropriate working hours and vehicle speed limits.

8.4 CUMULATIVE IMPACTS

Potential direct, indirect and prescribed biodiversity impacts because of the Project have been assessed, additionally it is acknowledged that the Project will contribute to cumulative impacts during construction and operation within the existing environment. Cumulative impacts occur when impacts from a project interact or overlap with impacts from other projects and can potentially result in a larger overall effect on the environment.

The Project will contribute to the overall development of renewable energy infrastructure within the Goulburn Mulwaree LGA. Relevant proposed, approved, under construction and operational SSDs known at the time of finalisation of this BDAR and within and in the vicinity of the Subject Land and LGA have been considered.

A review of these SSDs has been undertaken, with potential relevance to the Project provided in Table 8-6.

The most likely cumulative impacts would be associated with Marulan Gas-Fired Power Station, Wattle Creek Solar Farm and Wattle Creek BESS due to their proximity to the Project (approximately 0.5 km and 4 km, respectively). The potential overlap in construction and operational periods between the four projects could possibly exacerbate indirect and prescribed impacts, such as increases in weeds and pathogens, predator and pest species, and vehicle strikes. However, mitigation measures are proposed to ensure these impacts are either entirely avoided or considerably reduced leading to a low risk of a significant cumulative impact.

The proposed development will attribute 10.49 ha of clearing and modification of native vegetation and habitat toward the overall cumulative impacts in the Goulburn Mulwaree LGA.

The White Box – Yellow Box – Blakely's Red Gum Grassy Woodland TEC is likely to be disturbed by the majority of the projects assessed. However, given the small area to be impacted by this Project (0.56 ha) and the extent of the occurrence of the TEC in the broader locality, it is unlikely to lead to a significant cumulative impact.

To minimise cumulative impacts, the Project proposes to retain approximately 103.96 ha, or 90% of the native vegetation across the Subject Land, of which 61.11 ha is TEC. Additionally, proposed management of cumulative impacts to TECs, threatened species and habitats that are likely to be impacted by the cumulative impact of the development have been considered in Section 8.5 of this BDAR.

TABLE 8-6 SUMMARY OF POTENTIAL CUMULATIVE IMPACTS

SSD Description	SSD Impacts on Biodiversity	Potential Cumulative Impacts
Marulan Gas-Fired Power Station (MP07_0174, MP07_0175 and MP07_0176) Status: Approved Approximate distance to Project: 0.5 km Development of either a peaking 250-350 MW open cycle gas-fired power station (Stage 1) or an intermediate / base load 400-450 MW combined cycle gas-fired power station (Stage 2) or development of the Stage 1 plant with later conversion to the Stage 2 plant, and associated infrastructure, including an access road, a transmission line, a gas pipeline and option for a water supply pipeline. Approval was granted in 2009 for the development of the gas-fired power station and associated infrastructure excluding the water supply pipeline. Following modification approval in 2024, the lapse date has been extended to 26 October 2026.	As per the Assessment Report (NSW Department of Planning, 2009), impacts as a result of Marulan Gas-Fired Power Station include: • Removal of approximately 19.15 ha of native vegetation, including: ◦ 18.94 ha of native woodland and forest; and ◦ 0.21 ha of native grassland. • Removal of approximately 23.27 ha of non-native vegetation; • Disturbance to one TEC: ◦ White Box – Yellow Box – Blakely's Red Gum Grassy Woodland. • Disturbance to the following threatened species and/or their habitat: ◦ Diamond Firetail (*Stagonopleura guttata*); ◦ Gang-gang Cockatoo (*Callocephalon fimbriatum*); ◦ Hooded Robin (*Melanodryas cucullata*); ◦ Powerful Owl (*Ninox strenua*); ◦ Eastern False Pipistrelle (*Falsistrellus tasmaniensis*); ◦ Greater Broad-nosed Bat (*Scoteanax rueppellii*); and ◦ Little Bent-winged Bat (*Miniopterus australis*). • An increase in: ◦ Weeds and pathogens; ◦ Predator and pest species; and ◦ Vehicle strikes.	As the initial assessment was carried out prior to 2009, native vegetation has not been assigned a corresponding PCT. Given the proximity to the Project, removal of native vegetation for the Marulan Gas-Fired Power Station may coincide with the PCTs present within the Development Footprint for the Project. However, this impact would be minimal given the extent to be removed by both projects (total of 37.46 ha). The removal of non-native vegetation will not lead to a cumulative impact due to the extent in the surrounding area. White Box – Yellow Box – Blakely's Red Gum Grassy Woodland will be impacted by both projects. However, given the small area to be impacted within the Road Resurfacing Development Footprint (3.62 ha) and the extent of the TEC within NSW, this is unlikely to lead to a significant impact. Gang-gang Cockatoo, Powerful Owl and Large Bent-wing Bat could be impacted by both Projects which may lead to a cumulative impact on the number of individuals and/or available habitat within the area. However, management plans, mitigation measures, and offset strategies will be implemented for both Projects. Due to proximity and the potential overlap in construction and operational periods, the following impacts may be exacerbated: • Increase in weeds and pathogens; • Increase in predator and pest species; and • Increase in vehicle strikes.
Wattle Creek Solar Farm (SSD-63344210) Status: Response to Submissions Approximate distance to Project: 2 km Development of a 265 MW solar farm with energy storage and associated infrastructure with a Development Footprint of approximately 580.62 ha. Construction is expected to commence late 2025, be completed in approximately 18 months, and generate 96 to 147 FTE jobs. Operations are expected to commence mid 2027, last up to 35 years, 24 hours a day, seven days a week, and generate up to five FTE jobs.	As per the BDAR (Umwelt, 2025a), impacts as a result of Wattle Creek Solar Farm include: • Removal of approximately 572.62 ha of native vegetation, including: ◦ 2.05 ha of PCT 4063; ◦ 1.66 ha of PCT 3347; ◦ 3.3 ha of PCT 3376; and ◦ 565.61 ha of PCT 3374. • Removal of approximately 8 ha of non-native vegetation; • Disturbance to one TEC: ◦ White Box-Yellow Box-Blakely’s Red Gum Grassy Woodland and Derived Native Grassland. • Disturbance to the following threatened species and/or their habitat: ◦ Gang-gang Cockatoo (*Callocephalon fimbriatum*); ◦ Large-eared Pied Bat (*Chalinolobus dwyeri*); ◦ South-eastern Glossy Black Cockatoo (*Calyptorhynchus lathami lathami*); and ◦ Squirrel Glider (*Petaurus norfolcensis*). • An increase in: ◦ Weeds and pathogens; ◦ Predator and pest species; and ◦ Vehicle strikes.	Removal of PCTs 3347 and 4063 will be carried out by both projects, however, given the extent to be removed for both Projects (total of 5.48 ha), this will not lead to a significant cumulative impact. White Box – Yellow Box – Blakely's Red Gum Grassy Woodland will be impacted by both projects. However, given the small area to be impacted within the Road Resurfacing Development Footprint (3.62 ha) and the extent of the TEC within NSW, this is unlikely to lead to a significant impact. Gang-gang Cockatoo, Large-eared Pied Bat, South-eastern Glossy Black Cockatoo and Squirrel Glider could be impacted by both Projects which may lead to a cumulative impact on the number of individuals and/or available habitat within the area. However, management plans, mitigation measures, and offset strategies will be implemented for both Projects. Due to proximity and the overlap in construction and operational periods, the following impacts may be exacerbated: • Increase in weeds and pathogens; • Increase in predator and pest species; and • Increase in vehicle strikes.

SSD Description	SSD Impacts on Biodiversity	Potential Cumulative Impacts
Wattle Creek BESS (SSD-63345458) Status: Response to Submissions Approximate distance to Project: 4 km Development of a 350MW / 1400MWh BESS with associated infrastructure with a Development Footprint of approximately 75.7 ha. Construction is expected to commence late 2025, be completed in approximately 13 months, and generate 250 to 302 FTE jobs. Operations are expected to commence mid 2027, last for up to 35 years, 24 hours a day, seven days a week, and generate up to 15 FTE jobs.	As per the BDAR (Umwelt, 2025b), potential impacts as a result of Wattle Creek BESS include: • Removal of approximately 72.97 ha of native vegetation, including: ◦ 2.05 ha of PCT 4063; ◦ 68.8 ha of PCT 3374; and ◦ 2.12 ha of PCT 3376. • Removal of approximately 2.73 ha of non-native vegetation; • Disturbance to one TEC; ◦ White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland. • Disturbance to the following threatened species and/or their habitat: ◦ Gang-gang Cockatoo (*Callocephalon fimbriatum*); ◦ Large-eared Pied Bat (*Chalinolobus dwyeri*); ◦ South-eastern Glossy Black Cockatoo (*Calyptorhynchus lathami lathami*); and ◦ Squirrel Glider (*Petaurus norfolcensis*). • An increase in: ◦ Weeds and pathogens; ◦ Predator and pest species; and ◦ Vehicle strikes.	Removal of PCT 4063 will be carried out by both projects, however, given the extent to be removed for Canyonleigh BESS (0.02 ha), this will not lead to a significant cumulative impact. The removal of non-native vegetation will not lead to a cumulative impact due to the extent in the surrounding area. White Box – Yellow Box – Blakely's Red Gum Grassy Woodland will be impacted by both projects. However, given the small area to be impacted within the Road Resurfacing Development Footprint (3.62 ha) and the extent of the TEC within NSW, this is unlikely to lead to a significant impact. Gang-gang Cockatoo, Large-eared Pied Bat, South-eastern Glossy Black Cockatoo and Squirrel Glider could be impacted by both Projects which may lead to a cumulative impact on the number of individuals and/or available habitat within the area. However, management plans, mitigation measures, and offset strategies will be implemented for both Projects. Due to proximity and the overlap in construction and operational periods, the following impacts may be exacerbated: • Increase in weeds and pathogens; • Increase in predator and pest species; and • Increase in vehicle strikes.
Gunlake Quarry Continuation Project (SSD-12469087(Mod-1 and Mod-2)) Status: Assessment Approximate distance to Project: 8 km Gunlake Quarry has been operational since 2009. The Gunlake Quarry Continuation Project was approved on 2 March 2023 meaning quarry operations continue to 2 March 2053. Mod-1 seeks to include an additional area within the approved disturbance boundary and revised biodiversity offset areas to provide an improved conservation outcome. Mod-2 seeks to increase heavy vehicle movements from 375 to 475 per day and remove the limit for daily average heavy vehicle movements.	As per the BDAR for Mod-1 (EMM, 2024a), the potential impacts include: • Removal of approximately 4.52 ha of PCT 3376; and • Disturbance to one TEC: ◦ White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland. As per the Response to Submissions Report for Mod-2 (EMM, 2024b), there are no associated impacts to biodiversity. A Fauna Vehicle Strike Assessment was carried out and found that the increase in traffic movements on the local road network is unlikely to substantially impact fauna within the locality.	The PCTs to be removed for both projects do not coincide so there will be no cumulative impact on PCTs. White Box – Yellow Box – Blakely's Red Gum Grassy Woodland will be impacted by both projects. However, given the small area to be impacted within the Road Resurfacing Development Footprint (3.62 ha) and the extent of the TEC within NSW, this is unlikely to lead to a significant impact. No other impacts were identified, therefore, there will be no overall cumulative impact.
Marulan South Limestone Mine Continued Operations Project (SSD-7009) Status: Approved Approximate distance to Project: 10 km Marulan South Limestone Mine has been operational since the 1860s. Marulan South Limestone Mine Continued Operations Project was approved on 19 August 2021 meaning operations continue to August 2051. An expansion was also approved with a Development Footprint of approximately 252 ha.	As per the Assessment Report (NSW DPIE, 2021), approved impacts as a result of the Marulan South Limestone Mine Continued Operations Project include: • Removal of approximately 182.4 ha of native vegetation, including: ◦ 88.6 ha of PCT 1334; ◦ 65.4 ha of PCT 778; ◦ 16.3 ha of PCT 1150; ◦ 12 ha of PCT 731; and ◦ 0.1 ha of PCT 1334. • Removal of approximately 69.6 ha of non-native vegetation; • Disturbance to one TEC: ◦ White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland. • Disturbance to the following threatened species and/or their habitat: ◦ Koala (*Phascolarctos cinereus*);and ◦ *Solanum celatum*.	The PCTs to be removed for both projects do not coincide so there will be no cumulative impact on PCTs. The removal of non-native vegetation will not lead to a cumulative impact due to the extent in the surrounding area. White Box – Yellow Box – Blakely's Red Gum Grassy Woodland will be impacted by both projects. However, given the small area to be impacted within the Road Resurfacing Development Footprint (3.62 ha) and the extent of the TEC within NSW, this is unlikely to lead to a significant impact. No records of, or suitable habitat for, Koala (*Phascolarctos cinereus*) and *Solanum celatum* were identified within the BESS Development Footprint, therefore, there will be no cumulative impact on these species within the BESS Area. However, suitable habitat for Koala does exist within the Road Resurfacing Development Footprint. However, given the small area to be impacted this is not likely to lead to a significant impact. No other impacts were identified, therefore, there will be no overall cumulative impact.

SSD Description	SSD Impacts on Biodiversity	Potential Cumulative Impacts
Marulan Solar Farm (SSD-13137914) Status: Approved Approximate Distance to Project: 14 km Development of a 152 MW solar farm with energy storage and associated infrastructure with a Development Footprint of approximately 330 ha. Construction is expected to commence late 2024, be completed in approximately 18 months, and generate up to 300 FTE jobs. Operations are expected to commence mid 2026, last between 30 to 35 years, and generate two to five FTE jobs.	As per the Assessment Report (NSW DPIE, 2023), approved impacts as a result of the Marulan Solar Farm include: • Removal of approximately 7.89 ha of native vegetation, including: ◦ 1.33 ha of PCT 351; ◦ 5.63 ha of PCT 1330; and ◦ 0.94 ha of PCT 1110. • Removal of approximately 322.83 ha of non-native vegetation / derived native grassland in poor condition; • Disturbance to one TEC: ◦ White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland. • Disturbance to the following threatened species and/or their habitat: ◦ Pink-tailed Legless Lizard (*Aprasia parapulchella*); ◦ Striped Legless Lizard (*Delma impar*); ◦ South-eastern Glossy Black Cockatoo (*Calyptorhynchus lathami lathami*); ◦ Masked Owl (*Tyto novaehollandiae*); ◦ Powerful Owl (*Ninox strenua*); and ◦ Barking Owl (*Ninox connivens*).	The PCTs to be removed for both projects do not coincide so there will be no cumulative impact on PCTs. The removal of non-native vegetation / derived native grassland in poor condition will not lead to a cumulative impact due to the extent in the surrounding area. White Box – Yellow Box – Blakely's Red Gum Grassy Woodland will be impacted by both projects. However, given the small area to be impacted within the Road Resurfacing Development Footprint (3.62 ha) and the extent of the TEC within NSW, this is unlikely to lead to a significant impact. Pink-tailed Legless Lizard, Striped Legless Lizard, South-eastern Glossy Black Cockatoo, Powerful Owl and Barking Owl could be impacted by both Projects which may lead to a cumulative impact on the number of individuals and/or available habitat within the area. However, management plans, mitigation measures, and offset strategies will be implemented for both Projects.
Marulan Quarry (SSD-65146459) Status: Assessment Approximate distance to Project: 24 km Proposal is for a new hard rock quarry in Marulan to extract up to 500,000 tonnes per annum of hard rock aggregate products with a Development Footprint of approximately 32.81 ha. The quarry is planned to operate for 18 years.	As per the BDAR (GHD, 2024), potential impacts as a result of Marulan Quarry include: • Removal of approximately 29.19 ha of native vegetation, including: ◦ 10.45 ha of PCT 888; ◦ 18.26 ha of PCT 731; ◦ 0.34 ha of PCT 765; and ◦ 0.14 ha of PCT 1330. • Removal of approximately 3.62 ha of non-native vegetation; • Disturbance to one TEC: ◦ White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland. • Disturbance to the following threatened species and/or their habitat: ◦ Southern Myotis (*Myotis macropus*); ◦ Large-eared Pied Bat (*Chalinolobus dwyeri*); ◦ Scarlet Robin (*Petroica boodang*); ◦ Varied Sittella (*Daphoenositta chrysoptera*); ◦ Large Bent-winged Bat (*Miniopterus orianae oceanensis*); ◦ Yellow-bellied Sheath-tail Bat (*Saccolaimus flaviventris*); ◦ Speckled Warbler (*Chthonicola sagittata*); ◦ Squirrel Glider (*Petaurus norfolcensis*); ◦ Black-chinned Honeyeater (*Melithreptus gularis*); ◦ Striped Legless-lizard (*Delma impar*); and ◦ Austral Toadflax (*Thesium australe*). • An increase in: ◦ Weeds and pathogens; ◦ Predator and pest species; and ◦ Vehicle strikes.	The PCTs to be removed for both projects do not coincide so there will be no cumulative impact on PCTs. The removal of non-native vegetation will not lead to a cumulative impact due to the extent in the surrounding area. White Box – Yellow Box – Blakely's Red Gum Grassy Woodland will be impacted by both projects. However, given the small area to be impacted within the Road Resurfacing Development Footprint (3.62 ha) and the extent of the TEC within NSW, this is unlikely to lead to a significant impact. Southern Myotis, Large-eared Pied Bat, Large Bent-winged Bat, Squirrel Glider and Striped Legless-lizard could be impacted by both Projects which may lead to a cumulative impact on the number of individuals and/or available habitat within the area. However, management plans, mitigation measures, and offset strategies will be implemented for both Projects.
Willavale Park BESS (SSD-78100252) Status: Prepare EIS Approximate distance to Project: 48 km Development of a 300 MW / 1200 MWh BESS and associated infrastructure and connection works with a Development Footprint of approximately 20.42 ha. Construction is expected to commence early 2026, be completed in four stages, each lasting approximately 18 months, and generate 75 to 115 Fulltime Equivalent (FTE) jobs. Operations are expected to commence mid-2027, last between 20 to 30 years, 24 hours a day, seven days a week, and generate two to five FTE jobs.	As per the Scoping Report (ERM, 2024), impacts as a result of Willavale Park BESS include: • Removal of approximately 20.42 ha of non-native vegetation; • Disturbance to the Green and Golden Bell Frog (*Litoria aurea*) and their habitat; and • An increase in vehicle strikes.	The removal of non-native vegetation will not lead to a cumulative impact due to the extent in the surrounding area. Green and Golden Bell Frog could be impacted by both Projects which may lead to a cumulative impact on the number of individuals and/or available habitat within the area. However, management plans, mitigation measures, and offset strategies will be implemented for both Projects. Although construction and operational periods may overlap, it is not expected that this will lead to a cumulative impact on vehicle strikes due to different transport routes / site access.

8.5 MITIGATING RESIDUAL IMPACTS – MANAGEMENT MEASURES AND IMPLEMENTATION

A range of mitigation measures have been developed for the Project to mitigate the impacts to native vegetation and habitat that are unable to be avoided. These include a range of measures to be undertaken before and during construction to limit the impact of the Project.

In accordance with Section 8.4 of the BAM (NSW DPIE, 2020), adaptive management is to be used to address impacts that are infrequent or difficult to measure, such as indirect or prescribed impacts, or other remaining biodiversity impacts. There is scope to ensure that the principles of adaptive management are included in the construction and ongoing function of the Development Footprint through monitoring of operational performance and by providing flexibility to adjust management measures where required. Several management plans will be produced for the construction, operation and decommissioning of the Project, including:

- Construction Environmental Management Plan (CEMP);
- Construction Traffic Management Plan (CTMP);
- Biodiversity Management Plan (BMP);
- Erosion and Sediment Control Plan (ESCP); and
- Pest Animal Management Plan (PAMP).

Vegetation removal will be undertaken in accordance with a Vegetation Clearing Protocol set out in the CEMP. The CEMP will advise on the reduction of indirect and residual impacts on biodiversity values adjacent to the BESS Development Footprint and the Road Resurfacing Development Footprint. To minimise disturbance, vegetation adjacent to the Development Footprint will be bordered off with temporary fencing and signed as 'Environmental Sensitive No-Go Zones' prior to the commencement of clearing. These exclusion areas will also be protected from vehicle movement, materials storage, and placement of temporary facilities. Additionally, chemical use will be restricted in sensitive zones, including areas supporting threatened flora or fauna outside the Development Footprint. Construction personnel and visitors will be briefed during site inductions to ensure full awareness of these boundaries and associated protocols.

Construction timing and operational procedures will be carefully managed to reduce impacts from artificial light, noise, and dust. Works will generally be limited to daylight hours, and where lighting is required, it will be low-intensity and directed away from surrounding habitat. Dust will be actively monitored and managed to avoid visible emissions, with control measures adjusted as needed to maintain air quality.

The CTMP will detail mitigation and management measures which aim to minimise the impact of construction traffic. Measures include suitable signage and driving protocols as means of reducing risk of vehicle strike and vehicles veering off the tracks and reducing dust and light spill from vehicles. To further protect native fauna, fencing will be installed to prevent fauna access to the facility. Vehicle movement within the BESS Development Footprint and the Road Resurfacing Development Footprint will be regulated through reduced speed limits and the designation of exclusion zones around retained vegetation.

The BMP will be implemented to manage indirect impacts on adjoining vegetation and habitat. Invasive species management will also be addressed through the BMP which will align with Goulburn Mulwaree Council's Local Weed Management Plan (2019) and the South East Regional Strategic Weed Management Plan 2023 – 2027 (NSW LLS, 2022). This will involve early weed control treatments targeting high-threat exotic species, follow-up monitoring, and site hygiene practices to reduce the spread of weeds during construction. In parallel, a pathogen management protocol will be applied to minimise the risk of spreading infectious agents, with clear communication to staff through toolbox talks and training. The BMP will also address feral pest management in line with the South East Regional Strategic Pest Animal Management Plan 2024 – 2028 (NSW LLS, 2024) and will be developed and implemented to minimise the impacts of introduced predators on existing native fauna.

Erosion and sediment risks will be mitigated through a dedicated ESCP tailored to the conditions of the Subject Land. The ESCP will detail mitigation measures to reduce run-off, soil erosion and to protect water resources to ensure that nearby watercourses and hydrological features are not adversely affected by including procedures for managing heavy rainfall, surface water runoff, and sediment discharge. The PAMP will be developed and implemented to minimise the impacts of introduced predators on existing native fauna.

These plans are designed to complement one another and collectively they aim to ensure construction and operations activities are carried out responsibly and that ecological integrity is preserved throughout the life of the Project. Each mitigation measure is discussed in detail in Table 8-7.

TABLE 8-7 SUMMARY OF PROPOSED MITIGATION AND MANAGEMENT MEASURES FOR RESIDUAL IMPACTS (DIRECT, INDIRECT AND PRESCRIBED)

Mitigation measure	Action / Method	Outcome	Timing / Frequency	Responsibility	Adaptive Management Strategy
Offsets	Residual impacts on habitat will be offset through the Biodiversity Offset Scheme.	Retirement of credit liability	Detailed design at the planning phase	Applicant	Nil. In the event like for like credits are not available, payment into the BCF will occur or a Strategic Offset Delivery Agreement (SODA) will be sought to assist in meeting credit obligations.
Vegetation Clearing	Where vegetation is to be removed it will be undertaken in accordance with specifications provided in a vegetation clearing protocol, detailed within the CEMP. A BMP will include mitigation measures such as pre-clearance surveys in the pre-construction phase to avoid loss (where practicable) of threatened entities not previously observed, particularly SAII entities.	Reduction of negative impacts due to vegetation clearing, such as soil erosion and sedimentation and run off, and management of biodiversity values.	Pre-construction and throughout the construction phase	Construction contractor	Construction manager must ensure protocols are followed by construction team and activities are supervised. Any inadvertent vegetation removal or impacts must be repaired through restoration activities.
Relocation of habitat features	The BMP will include specifications for the relocation of habitat features, such as hollows, hollow logs, timber and bush rocks to suitable areas in adjacent retained vegetation. No trees or shrubs will be planted within bushfire Asset Protection Zones as outlined within the Bushfire Risk Assessment (ERM, 2025). Details of revegetation work and ongoing management will be defined in the BMP following consideration of operational matters.	Habitat retention for flora and fauna.	Pre-construction, throughout the construction phase and ongoing.	Construction contractor and operations contractors	Construction and operations managers must ensure protocols are followed by staff and contractors and activities are supervised. Restoration, habitat replacement and monitoring activities should be ongoing throughout the lifetime of the Project. Careful pre-construction planning and negotiations with landholders must be undertaken to ensure all parties agree to planned restoration or habitat replacement activities.
Reduce impacts to resident fauna during construction activities	Construction works involving clearing of vegetation and habitat are timed to avoid critical life cycle events of resident fauna, such as breeding, parental care and dispersal of juveniles. These critical life cycle events will be detailed in the BMP so the timing of vegetation and habitat removal for construction can be scheduled carefully. The BMP, implemented in conjunction with the CEMP, will include clearing protocols, such as the specification of timing of construction activities involving vegetation and habitat clearing to minimise harm to resident fauna (such as Keys' Matchstick Grasshopper), pre-clearing surveys, daily fauna surveys, staged clearing and the provision that any vegetation or habitat clearing must be supervised by a trained ecologist or licensed fauna handler. The BMP will also incorporate ongoing monitoring of biodiversity over the lifespan of the Project.	Reduction of negative impacts to local fauna.	Pre-construction and throughout the construction phase	Construction contractor	Construction manager must ensure protocols are followed by construction team and activities are supervised. Construction planning must be undertaken in a timely manner to ensure a fauna ecologist / licensed fauna handler is present during construction activities.
Fencing	Plain wire perimeter fences (as opposed to barbed wire fencing) will be used where practicable, and details agreed with landowners based on the requirements for specific areas of the property. The use of plain wire will reduce the risk of entrapment of fauna on fences. The locations and specifications of fencing options and their potential impacts to resident fauna will be identified and outlined in the BMP.	Reduction in harm of resident fauna and fauna using the Subject Land for dispersal.	Construction phase and ongoing	Construction contractor	Negotiations must be undertaken with landowners in the pre-construction phase in a timely manner to ensure all landholders agree to plain wire fencing.
Impacts on water quality, waterbodies and hydrological processes	'Environmental Sensitive No-Go Zones' will be established around areas of significance including threatened fauna habitat and threatened flora species locations outside the Development Footprint.	Prevention and minimization of negative impacts to waterbodies and water quality, including those downstream of the Subject Land.	Pre-construction, Construction phase and ongoing	Construction contractor	Construction and operational staff and landholders implement best practice land management activities which cumulatively limit impacts to waterbodies.

Mitigation measure	Action / Method	Outcome	Timing / Frequency	Responsibility	Adaptive Management Strategy
Delineation of clearing areas	To avoid unnecessary removal or damage to retained vegetation, the limit of clearing will be clearly demarcated as 'Environmental Sensitive No-Go Zones' prior to the commencement of clearing. This will be detailed within the BMP, CEMP and CTMP, including the following measures: • Vehicles or machinery will not be permitted to park within or drive through areas of retained vegetation; • Construction materials will not be stockpiled or stored within areas of retained vegetation; • Ancillary facilities, such as site compounds and construction zones, will not be located beyond the limits of clearing; • Temporary fencing and signage will be maintained throughout construction; and Site inductions will be given by the civil contractor to all personnel and visitors to ensure all site workers and visitors are aware of any No-Go Zones.	Reduction in negative impacts to adjacent vegetation and habitat.	Pre-construction and throughout the construction phase	Construction contractor and operations contractors.	Construction and operational managers must ensure protocols are followed by staff and contractors and activities are supervised. Construction planning must be undertaken in a timely manner to ensure indirect impacts can be avoided.
Daily/seasonal timing of construction activities to reduce impact of noise and light spill	Measures must be implemented to monitor the generation of light and noise during construction activities. The CEMP will also outline measures to minimise the impact of excess noise and light on fauna during the construction phase of the Project, including: • Restricting construction works to occur only within daylight hours; • Ensuring all plant and construction equipment is maintained in good working order to minimise noise; • Where external artificial light is required, low-level wildlife sensitive lighting options will be used to ensure impacts to fauna are reduced; • Lighting arrays and noise barriers will be used in order to shield adjoining native vegetation and habitat from stray light and excessive noise levels; • Artificial lighting structures will be removed once no longer required for the completion of construction activities; and Where flashing lights are required, ensure that lights are synchronised to minimise disturbance to local fauna	Reduce impacts of noise and light spill	Pre-construction and throughout the construction phase	Construction contractor	Construction and operational managers must ensure protocols are followed by staff and contractors and activities are supervised.
Adaptive dust monitoring programs to control air quality	The CEMP will introduce measures to monitor the generation of dust during construction activities. All construction activities will be undertaken with the objective of preventing visible dust emissions. Preventative measures include soil wetting, erosion controls and weather consideration which will be implemented alongside the ESCP.	Reduce impacts of dust	Construction phase and clearing phase	Construction contractor	Construction and operational managers must ensure protocols are followed by staff and contractors and activities are supervised. Construction planning must be undertaken in a timely manner to ensure CEMP and ESCP protocols can be implemented.
Chemical protocol	'Environmental Sensitive No-Go Zones' will be established around areas of significance, including threatened species' habitat, outside the Development Footprint. Protocols for the use of spraying exclusion zones around threatened species and their habitat to be detailed and implemented within the BMP.	Reduction in inappropriate spray regimes and reduced impacts flora and fauna.	Construction and operation, then ongoing	Construction and operations contractors	Construction and operations managers must ensure protocols are followed by staff and contractors and activities are supervised. Should additional threatened species observations be made beyond the existing exclusion zones, additional exclusion zones must be established prior to the commencement of additional chemical spraying. Careful pre-construction planning and negotiations with landholders must be undertaken to ensure all parties agree to planned chemical spraying protocols. Regular communication must be undertaken with landholders throughout the construction and operational phases to ensure chemical spraying protocols align with the BMP.

Mitigation measure	Action / Method	Outcome	Timing / Frequency	Responsibility	Adaptive Management Strategy
Pest Control Management Program - Weed Management	To minimise the spread of weeds throughout the Subject Land and surrounding patches, appropriate weed control activities will be outlined within a BMP and undertaken in accordance with State and regional weed management plans. The Subject Land is subject to management of Weeds of National Significance and management of weeds under the NSW *Biosecurity Act 2015* and regulations that provide specific legal requirements for state level priority weeds and high-risk activities. Particular protection will be detailed within a BMP for: • Key's Matchstick Grasshopper (*Keyacris scurra*) from the introduction of St John's Wort (*Hypericum perforatum*) and exotic pasture species (e.g. *Phalaris aquatica*, *Paspalum dilatatum* and *Avena spp.*); and • Dusky Woodswallow (*Artamus cyanopterus cyanopterus*) from the introduction of exotic grasses and woody weeds; • Gang-gang Cockatoo (*Callocephalon fimbriatum*) from the introduction of invasive weeds; and • Brown Treecreeper (south-eastern) (*Climacteris picumnus victoriae*) from the introduction of invasive weeds.	Reduction in weed abundance and new incursions	Construction and operation, then ongoing	Construction and operations contractors	Construction and operational managers must ensure protocols are followed by staff and contractors and activities are supervised. Construction planning must be undertaken in a timely manner to ensure weed management protocols can be implemented. Protocols must be followed despite any time and financial pressures associated with construction activities. Regular communication must be undertaken with landholders to ensure weed management activities align.
Pest Control Management Program - Pathogen Management	All pathogen management and mitigation measures will adhere to relevant legislation. A pathogen management protocol will be outlined within the BMP, supplemented by the CEMP and CTMP, and will include measures such as: • Education and training to be provided to all staff and contractors regarding the risk of spreading pathogens; • All vehicles, construction equipment and plant will adhere to biosecurity requirements before entering the Subject Land and ensure vehicles and plant are free of soil and organic matter that may transport pathogens; and • If evidence of a pathogen's presence within the Subject Land is detected, cleaning of all vehicles will commence, and "no-go" zones will be established around the extent of the area where the pathogen is present. These zones will only be accessed when conditions are dry with all vehicle / personal equipment adhering to biosecurity protocols. There will be a particular focus on protecting: • Large Bent-winged Bat (*Miniopterus orianae oceanensis*) from the introduction of the white-nose fungus (*Pseudogymnoascus destructans*); and • Gang-gang Cockatoo (*Callocephalon fimbriatum*) from the introduction of psittacine circovirus disease.	Reduction in pathogen incursions within the Subject Land and adjacent areas.	Construction and operation, then ongoing	Construction and operations contractors	Construction and operational managers must ensure protocols are followed by staff and contractors and activities are supervised. Construction planning must be undertaken in a timely manner to ensure pathogen management protocols can be implemented. Protocols must be followed despite any time and financial pressures associated with construction activities. Regular communication must be undertaken with landholders to ensure pathogen management activities align.

Mitigation measure	Action / Method	Outcome	Timing / Frequency	Responsibility	Adaptive Management Strategy
Pest Control Management Program - Pest Species Management	A Pest Animal Management Plan (PAMP) will be developed and implemented for the Project, with a focus on feral pig, feral cat and red fox control. There will be a particular focus on protecting: • Squirrel glider (*Petaurus norfolcensis*) from predation by the red fox (*Vulpes vulpes*); and • Large Bent-winged Bat (*Miniopterus orianae oceanensis*) from predation by the feral cat. All control methods will be completed in accordance with relevant legislation / standard operating procedures, including but not limited to: • South East Regional Strategic Pest Animal Management Plan 2024 – 2028 (NSW LLS, 2024); • NSW Code of Practice and Standard Operating Procedures for the Effective and Humane Management of Feral Cats (Sharp, Cope, & Saunders, 2022); and • NSW Threat Abatement Plan: Predation by the Red fox (*Vulpes vulpes*) (NSW OEH, 2010). To avoid an increase in the abundance of feral animal species which may impact native fauna, the BMP will implement the following measures: • Initial feral animal removal – including the identification and removal of feral cats, feral pigs and fox dens within the Development Footprint, as well as the removal of all detected individuals; • Monitoring – undertake regular monitoring of access tracks and roads to ensure that feral animal activity and densities do not increase as a direct result of the Project; and Ongoing removal – ensure, where feral animal species are detected, that suitable control methods are undertaken quickly to remove individuals from the Development Footprint.	Reduction in feral pest animals.	Construction and operation, then ongoing	Construction and operations contractors	Construction and operational managers must ensure protocols are followed by staff and contractors and activities are supervised. Construction planning must be undertaken in a timely manner to ensure feral animal management protocols can be implemented. Regular communication must be undertaken with landholders to ensure feral pest management activities align.
Soil and Water Management Plan - Erosion and Sediment Control Plan	A site-specific ESCP will be developed and implemented to minimise erosion and sediment control risks. The ESCP will include arrangements for managing wet weather events and working with high surface water levels. It will include monitoring requirements for potential high-risk events and specific controls and follow-up measures to be applied in the event of wet weather. The objectives of the ESCP will be to avoid adverse impacts to hydrological processes and the ephemeral creek lines that intersect the Subject Land. Mitigation measures will be incorporated into the ESCP, supplemented by the CEMP, to manage impacts to soil quality, hydrology regimes and habitat degradation. Clear boundaries are to be created using fencing and tape to ensure that no retained threatened species' habitat is impacted by erosion, sediment or run-off.	Reduction in erosion and sediment run-off	Construction phase then ongoing	Construction contractors	Construction and operational managers must ensure protocols are followed by staff and contractors and activities are supervised. Construction planning must be undertaken in a timely manner to ensure ESCP protocols can be implemented. Protocols must be followed despite any time and financial pressures associated with construction activities.
Driving protocol	Speed limit restrictions will be imposed across the Subject Land. The CEMP, CTMP and operational guidelines for the Project will contain driving protocols and measures to improve the knowledge of staff and contractors about fauna movements. Site inductions and toolbox talks should include briefings on driving restrictions and behaviour, identifying and reporting hazards as they occur during construction and operations, and setting appropriate working hours and vehicle speed limits. The BMP will also include provisions for ongoing monitoring of impacts to fauna by vehicle strike.	Reduced risk of vehicle strike	Construction phase then ongoing	Construction contractors	Ongoing monitoring of vehicle strike mortalities should be reported as they occur, as stipulated in the BMP, and more preventative measures introduced if vehicle strike mortalities are occurring.

9. ASSESSING AND OFFSETTING IMPACTS

9.1 SERIOUS AND IRREVERSIBLE IMPACTS

A SAII entity is listed under the BC Act as an impact that is likely to contribute significantly to the risk of extinction of a threatened entity.

An impact is to be regarded as serious and irreversible if it is likely to contribute significantly to the risk of a threatened species or ecological community becoming extinct through one or more of the following principles:

1. It will cause a further decline of a species or ecological community that is currently observed, estimated, inferred or reasonably suspected to be in a rapid rate of decline.
2. It will further reduce the population size of the species or ecological community that is currently observed, estimated, inferred or reasonably suspected to have a very small population size.
3. It is an impact on the habitat of the species or ecological community that is currently observed, estimated, inferred or reasonably suspected to have a very limited geographic distribution; or
4. The impacted species or ecological community is unlikely to respond to measures to improve its habitat and vegetation integrity and therefore its members are not replaceable.

The assessment of entities identified at risk of a SAII, where impacted by an SSD project the Minister for Planning is required to:

- Take those impacts into consideration; and
- Determine whether there are any additional and appropriate measures that will minimise those impacts if consent or approval is to be granted.

Potential SAII has been addressed in the following sections in accordance with Section 9.1 of the BAM (2020).

9.1.1 ASSESSMENT FOR SERIOUS AND IRREVERSIBLE IMPACTS ON BIODIVERSITY VALUES

In accordance with Section 9.1 of the BAM (NSW DPIE, 2020), further information is required for any TECs and/or species at risk of an SAII, including any actions and/or measures taken to avoid the direct and/or indirect impacts on the TECs and/or species at risk of an SAII.

Based on the results of field surveys and the listed candidate species associated with each PCT identified within the BESS Development Footprint and Road Resurfacing Development Footprint, a total of two threatened entities either recorded or assumed present were identified as being at risk of an SAII, being:

- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland
- Superb Midge Orchid (*Genoplesium superbum*)

The TEC White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland is considered present within areas of PCT 3373 across the Subject Land representative of woodland and grassland.

For the Superb Midge Orchid (*Genoplesium superbum*), presence has been assumed only within potential areas of the Road Resurfacing Development Footprint due to surveys being completed outside of the recommended survey period (February – March).

It is noted that the Large Bent-winged Bat (*Miniopterus orianae oceanensis*) was recorded foraging within the BESS Project Area. However, no suitable breeding habitats occur within the Subject Land. For the Large Bent-winged Bat (*Miniopterus orianae oceanensis*), any impacts on breeding habitat used by this species could be considered potentially serious and irreversible. Potential breeding habitat is highly specific and includes caves, tunnels, mines or other structures known or suspected to be used by the species. As no potential breeding habitat occurs within the Subject Land the occurrence of this species within the Subject Land is not considered to be associated with breeding habitat and the SAII trigger (being impacts to breeding habitat) is not activated in this instance. It is considered that the presence of this species does not constitute the SAII entity and it has been excluded from further SAII assessment.

SAII entities have been further summarised in Table 9-1below. An assessment for each SAII as a result of the proposed development has been undertaken for the proposed and potential impacts to the SAII entities in accordance with BAM Section 9.1.2 and presented in below. Species polygons have included the extent of assumed habitats as identified for each SAII species.

TABLE 9-1 SUBJECT LAND ENTITIES AT RISK OF SERIOUS AND IRREVERSIBLE IMPACTS

SAII Entity	SAII Principles	Reason for inclusion in assessment	Assessment Section
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Principle 1 with a population reduction of 80% or more in 10 years or 3 generations. Principle 2 for having a total population of < 50 individuals or <250 individuals where threats are known.	TEC recorded within areas of PCT 3373 where the condition represents woodland and grassland.	Section 4.2.3 Figure 4-3
Superb Midge Orchid (*Genoplesium superbum*)	Principle 2 for having a total population of < 50 individuals or <250 individuals where threats are known.	Species assumed present within areas of PCT 3746_VZ17_Shrubland due to surveys being undertaken outside of the recommended survey period (February – March).	Section 5.2.1.1 Figure 5-1

9.1.1.1 SAII COMMUNITIES

An additional impact assessment for the TEC White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grasslands (CEEC) at risk of SAII recorded on the Subject Land has been undertaken in accordance with Section 9.1.1 of the BAM and presented in Table 9-2.

TABLE 9-2 WHITE BOX – YELLOW BOX – BLAKELY'S RED GUM GRASSY WOODLAND AND DERIVED NATIVE GRASSLANDS

Response to BAM Section 9.1.1 Criteria
1. The action and measures taken to avoid the direct and indirect impact on the TEC at risk of an SAII (or reference to where these have been addressed in the relevant section of the BDAR).
Within the Subject Land (130.57 ha) there is 61.67 ha of the BC Act listed White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland EEC. 55. 325 ha of this EEC is located within the south-western portion of the BESS Project Area whilst 6.36 ha occurs within the Road Resurfacing Project Area associated with road reserve and adjoining lands. Through project design, impacts to this EEC have largely been avoided with no impacts to this EEC within the BESS Development Footprint and a minor impact of 0.55ha of fringing vegetation, adjoining the existing Canyonleigh Road within the Road Resurfacing Development Footprint. Impacts avoided have been further discussed in Section 7of this report with mitigation recommendations provided in Section8.
2. The assessor must consult the TBDC and/or other sources to report on the status of the TEC including: *a. Evidence of reduction in geographic distribution (Principle 1, clause 6.7(2)(a) BC Regulation) as the current total geographic extent of the TEC in NSW AND the estimated reduction in geographic extent of the TEC since 1970 (not including impacts of the proposal)* *b. The extent of reduction in ecological function for the TEC using evidence that describes the degree of environmental degradation or disruption to biotic processes (Principle 2, clause 6.7(2)(b) BC Regulation) indicated by:* *vi. Change in community structure* *vii. Change in species composition* *viii. Disruption of ecological processes* *ix. Invasion and establishment of exotic species* *x. Degradation of habitat* *xi. Fragmentation of habitat* *c. Evidence of restricted geographic distribution (Principle 3, clause 6.7(2)(c) BC Regulation), based on the TEC's geographic range in NSW according to the:* *i. extent of occurrence* *ii. area of occupancy* *iii. number of threat defined locations.* *d. Evidence that the TEC is unlikely to respond to management (Principle 4, clause 6.7(2)(d) BC Regulation).*
The TBDC has been reviewed in relation to the information available for White Box – Yellow Box – Blakey's Red Gum Grassy Woodland and Derived Native Grassland EEC. Interrogation of the TBDC identifies two (2) listings associated with this TEC, one being associated with the NSW BC Act listing (Profile ID: 10837) and one being associated with the EPBC Act listing (Profile ID: 20392). Both profiles

Response to BAM Section 9.1.1 Criteria

were reviewed to gain a comprehensive understanding of this TEC. A response to these criteria is as follows:

a. The current extent of this TEC and the estimated reduction in the geographic extent since 1970 is not available in the TBDC. Therefore, a review of alternate but valid resources was undertaken.

   BioNet Vegetation Classification System

   A review of PCT 3376 Southern Tableland Grassy Box Woodland, associated with this TEC identified that the current extent of PCT 3376 across NSW is 31,900 ha, as estimated from the mapped extent of vegetation. It is estimated to have had a pre-European extent of 452,899 ha making the estimated reduction in the geographic extent approximately 92.96% of its original distribution.

   NSW Threatened Species Scientific Committee (Tozer and Simpson 2020)

   The average areas cleared annually attributable to either agriculture or infrastructure in the New England Tablelands in which White Box – Yellow Box – Blakey's Red Gum Grassy Woodland and Derived Native Grassland occurs over the period of 2009 – 2018 is 934 ha. Since European settlement, the estimated loss of this TEC is 93%.

   Annual Loss and Reduction in Extent Since 1970

   During the period 2009 – 2019 an average of 395 ha of Grassy Woodland (sensu Keith 2004, of which White Box – Yellow Box – Balkey's Red Gum Woodland and Derived Native Grassland is a major component) was lost annually across NSW to agriculture related activities (cropping, conversion to pasture and thinning) and a further 155 ha/ annum due to infrastructure developments (NSW DPIE 2019 in Tozer and Simpson 2020).

   Estimated Total Extent (current)

   Data limitations prohibit the calculation of an accurate aerial extent of this TEC. Varden et al. (2023) estimates NSW comprised 1,963,578 ha (in the likely category) as of 2017. Tozer and Simpson (2020) estimated of 250,729 ha to occur in NSW in 2006, which Varden et al (2023) estimated 1,817,576 ha to occur at the time. The total extent of the TEC is therefore likely to be somewhere between these two estimates.

b. Tozer and Simpson (2020) report the following in relation to TEC change, distribution, degradation and fragmentation:

   Vi. Change in community structure

   The community structure has been substantially modified across its extent of occurrence because of land clearing and modification

   vii. Change in species composition

   species composition has been substantially modified through disturbance history such as clearing of remnants and paddock trees, grazing, cropping, weed invasion and introduction of feral species.

   viii. Disruption of ecological processes

   The TEC largely occurs in the sheep wheat belt of NSW where widespread long term agricultural production has resulted in clearing and medication of this TEC, which adversely affect ecological processes.

Response to BAM Section 9.1.1 Criteria

ix. Invasion and establishment of exotic species

Exotic plant and animal species are commonly encountered in this TEC, including the occurrence of the Hight Threat Weed Sweet Briar (*Rosa rubiginosa*). These species directly compete with native species that characterise this ecological community, resulting in reduced abundance and extent for these species.

x. Degradation of habitat

The ecological community generally occurs in a degraded condition across the entire extent. Reduced patch size and associated edge with cleared lands has resulted in lower species diversity in remaining patches.

xi. Fragmentation of habitat

Most patches of the ecological community are small and are separated by treeless (cleared) lands. The degree of separation varies across the TECs extent; however, occurrence is commonly hallmarked by paddock trees and small patches with large inter tree/ patch distances that often result in fragmentation outcomes (i.e., gaps greater than 30-100m)

c. Principle 3 (geographical distribution) is not relevant to this TEC.

d. Principle 4 (unlikely to respond to management) is not relevant to this TEC.

3. Where the TBDC indicates that data is 'unknown' or 'data deficient' for a TEC for a criterion listed in Section 9.1.1(2), the assessor must record this in the BDAR

The NSW White Box – Yellow Box – Blakey's Red Gum Grassy Woodland and Derived Native Grassland CEEC is not identified as 'unknown' or 'data deficient' in the TBDC.

4. The following questions are addressed in relation to the impacts from the proposal of the TEC.

a. The impact on the geographic extent of the TEC (Principles 1 and 3) by estimating the total area of the TEC to be impacted by the proposal:

i. in hectares

ii. as a percentage of the current geographical extent of the TEC in NSW

b. the extent that the proposed impacts are likely to contribute to further environmental degradation or the disruption of biotic processes (Principle 2) of the TEC by:

i. estimating the size of any remaining, but now isolated, areas of the TEC; including areas of the TEC within 500 m of the development footprint or equivalent area for other types of proposals

ii. describing the impacts on connectivity and fragmentation of the remaining areas of TEC measured by:

- distance between isolated areas of the TEC, presented as the average

- distance if the remnant is retained AND the average distance if the remnant is removed as proposed, and

- estimated maximum dispersal distance for native flora species characteristic of the TEC, and

- other information relevant to describing the impact on connectivity and fragmentation, such as the area to perimeter ratio for remaining areas of the TEC as a result of the development

Response to BAM Section 9.1.1 Criteria

iii. Describing the condition of the TEC according to the vegetation integrity score for the relevant vegetation zone (s) (Section 4.3). The assessor must also include the relevant composition, structure and function condition scores for each vegetation zone.

The Subject Land contains 61.67 ha of this EEC, of which 0.56 ha is proposed to be impacted in a minor way in association with road resurfacing activities within the Road Resurfacing Development Footprint along Canyonleigh Road.

The extent of this EEC impacted by the proposed development was identified as:

- PCT 3373_VZ12_Woodland (0.13 ha); and
- PCT 3373_VZ13_Grassland (0.43 ha)

VZ12_Woodland has an identified Vegetation Integrity (VI) score of 55.6 whilst VZ13_Grassland has an identified VI score of 16.1. VZ12_Woodland is considered to have a moderate VI condition and VZ13_Grassland is considered to have a low VI condition. However, both attract credit liabilities.

Relative to the total extent of this TEC in NSW (as identified above), this impact of 0.56 ha is estimated to be between significantly less than 1% (0.001% and 0.00002% - i.e. 0.05 ha of 1,963,579 ha and 0.05 ha of 250,729 ha).

The Project is not expected to isolate or fragment areas of this TEC within and adjacent to the Subject Land. Connectivity to surrounding patches has been maintained through project design.

By maintaining connectivity and areas of this TEC to surrounding native vegetation dispersal opportunities and dispersal distances for flora species are unlikely to be changed or significantly altered by the proposed development. Additionally, functional habitat (i.e. hollows) will be retained within the Subject Land to support dispersal of fauna species associated with this TEC.

Impacts to this EEC have significantly been avoided and where possible, minimised through mitigation recommendations associated with the construction phase of the project. Mitigation measures are provided in Section 8 of this report.

Review to **Section 8.1** for further details on VI and direct Impacts.

9.1.1.2 SAII SPECIES

An additional SAII assessment has been undertaken for potential impacts to the Superb Midge Orchid (*Genoplesium superbum*) as the species has been assumed present within areas of shrubland associated with PCT 3746 within the Road Resurfacing Development Footprint. The SAII Assessment has been undertaken in accordance with Section 9.1.1 of the BAM and presented in Table 9-3.

TABLE 9-3 SAII ASSESSMENT – SUPERB MIDGE ORCHID (GENOPLESIUM SUPERBUM)

Response to BAM Section 9.1.2 Criteria
1. What action and measures taken to avoid the direct and indirect impact on the potential entity for an SAII?
Super Midge Orchid (Genoplesium superbum) is associated with 2.81 ha of native vegetation consisting of the following VZs identified with the Road Resurfacing Project Area: • PCT 3746_VZ17_Grassland (2.06 ha); and • PCT 3746_VZ18_Shrubland (0.75 ha) This species has been assumed present within 0.38 ha of the Road Resurfacing Development Footprint due to seasonal survey restrictions and subsequent time constraints to conduct surveys. The extent of suitable habitat for this species within the Road Resurfacing Project Area was identified to be 2.81 ha of low condition native vegetation. The proposed Road Resurfacing activities have the potential to impact on 0.38 ha of suitable potential habitat for this species. impacts to suitably potential habitats for this species within the Road Resurfacing Development Footprint have largely been avoided. No impacts are anticipated within the BESS Development Footprint as no individuals or population extent have been identified through survey efforts in this area. Therefore, no further assessment under SAII criteria is required. Impacts avoided have been further discussed in Section 7 of this report with mitigation recommendations provided in Section 8.
2. The assessor must consult the TBDC and/or other sources to report on the current population of the species including: *a. evidence of rapid decline (Principle 1, clause 6.7(2)(a) BC Regulation) presented by an estimate of the:* *i. decline in population of the species in NSW in the past 10 years or three generations (whichever is longer), or* *ii. decline in population of the species in NSW in the past 10 years or three generations (whichever is longer) as indicated by: an index of abundance appropriate to the species; decline in geographic distribution and/or habitat quality; exploitation; effe ct of introduced species, hybridisation, pathogens, pollutants, competitors or parasites* *b. evidence of small population size (Principle 2, clause 6.7(2)(b) BC Regulation) presented by:* *i. an estimate of the species' current population size in NSW, and* *ii. an estimate of the decline in the species' population size in NSW in three years or one generation (whichever is longer), and* *iii. where such data is available, an estimate of the number of mature individuals in each subpopulation, or the percentage of mature individuals in each subpopulation, or whether the species is likely to undergo extreme fluctuations* *c. evidence of limited geographic range for the threatened species (Principle 3, clause 6.7(2)(c) BC Regulation) presented by:* *i. extent of occurrence* *ii. area of occupancy* *iii. number of threat-defined locations (geographically or ecologically distinct areas in which a single threatening event may rapidly affect all species occurrences), and* *iv. whether the species' population is likely to undergo extreme fluctuations* *d. evidence that the species is unlikely to respond to management (Principle 4, clause 6.7(2)(d) BC Regulation) because:* *i. known reproductive characteristics severely limit the ability to increase the existing population on, or occupy new habitat (e.g. species is clonal) on, a biodiversity stewardship site*

Response to BAM Section 9.1.2 Criteria

ii. the species is reliant on abiotic habitats which cannot be restored or replaced (e.g. karst systems) on a biodiversity stewardship site, or
i. iii. life history traits and/or ecology is known but the ability to control key threatening processes at a biodiversity stewardship site is currently negligible (e.g. frogs severely impacted by chytrid fungus).

The TBDC has been reviewed in relation to information available for this threatened species. The following response has been provided:

a. Principle 1 is not relevant to this species.

b. The TBDC identified that this species is listed as an SAII entity due to the association with Principle 2, that is, it is known from having a total population of < 50 individuals, or < 250 individuals where threats are known.

i. 2.*Genoplesium superbum* is restricted to the southern tablelands of NSW where it has been recorded from 2 locations near Nerriga with both records occurring approximately 20 km apart. In favourable winds, orchid seeds can occasionally disperse widely but generally disperse locally within their population.

ii. The population of *Genoplesium superbum* fluctuates from year to year and is currently estimated to contain fewer than 150 individuals (K. J. McDougall, pers. comm.).

iii. The species' population trend is difficult to assess. Due to its annual fluctuating population size no reliable estimates are available for the number of mature individuals within each subpopulation. Above-ground emergence of the species is irregular, reflective of the fluctuating population. This trait makes detection and counting unreliable. This uncertainty, combined with the species' restricted distribution and specialised life history traits, contributes to its vulnerability and complicates accurate assessment of its conservation status (NSW TSSC 2012; OEH 2020).

c. Principle 3 is not relevant to this species.

d. Principle 4 is not relevant to this species.

3. Where the TBDC indicates data is 'unknown' or 'data deficient' for a species for a criterion listed in Subsection 9.1.2(2.), the assessor must record this in the BDAR or BCAR.

The TBDC does not indicate whether data are 'unknown' or 'data deficient' for this species.

4. In relation to the impacts from the proposal on the species at risk of an SAII, the assessor must include data and information on:
a) the impact on the species' population (Principles 1 and 2) presented by:
i. an estimate of the number of individuals (mature and immature) present in the subpopulation on the subject land (the site may intersect or encompass the subpopulation) and as a percentage of the total NSW population, and
ii. an estimate of the number of individuals (mature and immature) to be impacted by the proposal and as a percentage of the total NSW population, or
iii. if the species' unit of measure is area, provide data on the number of individuals on the site, and the estimated number that will be impacted, along with the area of habitat to be impacted by the proposal.
b) Impact on geographic range (Principles 1 and 3) present by:
i. The area of the species' geographic range to be impacted by the proposal in hectares, and a percentage of the total AOO, or EOO within NSW
ii. the impact on the subpopulation as either: all individuals will be impacted (subpopulation

Response to BAM Section 9.1.2 Criteria

eliminated); OR impact will affect some individuals and habitat; OR impact will affect some habitat, but no individuals of the species will be directly impacted
iii. to determine if the persisting subpopulation that is fragmented will remain viable, estimate (based on published and unpublished sources such as scientific publications, technical reports, databases or documented field observations) the habitat area required to support the remaining population, and habitat available within dispersal distance, and distance over which genetic exchange can occur (e.g. seed dispersal) and pollination distance for the species
iv. to determine changes in threats affecting remaining subpopulations and habitat if the proposed impact proceeds, estimate changes in environmental factors including changes to fire regimes (frequency, severity); hydrology, pollutants; species interactions (increased competition and effects on pollinators or dispersal); fragmentation, increased edge effects, likelihood of disturbance; and disease, pathogens and parasites. Where these factors have been considered elsewhere in relation to the target species, the assessor may refer to the relevant sections of the BDAR or BCAR

a. Principles 1 and 3 are not relevant to this species.

b. Principles 2 is relevant to this species.

i. The Project will impact approximately 0.38 ha of the species' geographic range across PCT 3746_VZ17_Grassland (0.28 ha)and PCT 3746_VZ18_Shrubland (0.10 ha) within the Road Resurfacing Development Footprint, in which it has been assumed present. According to the Office of Environment and Heritage (2020), the species possesses an AOO of about 6,362 km^2 and an EOO of approximately 16,547 km^2 The area of assumed presence within the Subject Land (0.38 ha) is the maximum extent of suitable habitat which will be impacted as a result of the Project. This potential suitable habitat constitutes:

- 0.00006% of the estimated AOO for the species; and
- 0.000023% of the estimated EOO.

ii. Due to insufficient survey effort occurring within the recommended survey period, and the resulting need to assume presence for this species it is not possible to confidently determine whether the potential impact will be restricted to affect some individuals and habitat or impact some habitat but no individuals.

The NSW Scientific Committee's Final Determination (2005) notes that this species has been recorded in wet heathland on shallow soils above a sandstone cap but has also been found in open woodland interspersed with heath. Considering the surrounding agricultural land use, as well as regular disturbance of the road reserve to support vegetation maintenance and management of the transmission easement in sections, it is considered unlikely that *Genoplesium superbum* would persist within the Road Resurfacing Development Footprint under the current land-use disturbances.

iii. The species is known to be highly sensitive, with frequent disturbance leading to negative impacts on germination. Although much of the Subject Land is affected by disturbance through agricultural impacts and the area of assumed presence has a history of plantations; the increase in the intensity of disturbance as a result of the Project may negatively impact the species, if present.

iv. Direct, indirect and prescribed impacts to the species have been assessed in Section 8 of this BDAR. Beyond the direct impacts to habitat from clearing, all other changes in environmental factors including fire regimes, pollutants, fragmentation, increased edge effects, pathogens, invasive plant species, increased competition between species and erosion will be mitigated through management plans outlined in Section 8.5 of the report.

9.2 IMPACT SUMMARY

9.2.1 IMPACTS THAT REQUIRE AN OFFSET

Impacts requiring offset for the development footprint are shown in Figure 9-1 (BESS Development Footprint) and Figure 9-2 (Road Resurfacing Development Footprint). In accordance with Section 9.2.1 of the BAM, offsets are required for all impacts of proposals on PCTs that are associated with a VZ that have a calculated VI score of:

- ≥15, where the PCT is representative of an EEC or a CEEC;
- ≥17, where the PCT is associated with threatened species habitat (as represented by ecosystem credits) or represents a vulnerable ecological community; or
- ≥20, where the PCT does not represent a TEC and is not associated with threatened species habitat.

9.2.1.1 ECOSYSTEM CREDITS

10 of the 15 VZs within the Development Footprint will experience a permanent direct impact that requires offsetting, as these VZs are above the VI score thresholds. Table 9-4 details the impacts to native vegetation that require offset (ecosystem credits).

TABLE 9-4 IMPACTS THAT REQUIRE AN OFFSET – ECOSYSTEM CREDITS

Vegetation Zone	Area of Impact		VI Score	Offsetable Impact
	BESS	Roadworks		
3746_VZ3_Woodland	0.42	-	62.9	Yes
3746_VZ4_Grassland	5.36	-	12.9	No
3746_VZ5_Shrubland	3.14	-	18.9	Yes
3746_VZ6_Planted Natives	0.39	-	64.5	Yes
3746_VZ7_Highly Disturbed	0.64	-	11.5	No
4063_VZ8_Woodland	0.04	-	60.2	Yes
3347_VZ9_Woodland	-	0.09	44.8	Yes
3347_VZ10_Grassland	-	0.16	8.5	No
3347_VZ11_Highly Disturbed	-	0.09	8.5	No
3373_VZ12_Woodland[1]	-	0.13	55.6	Yes
3373_VZ13_Grassland[1]	-	0.43	16.1	Yes
3373_VZ14_Shrubland	-	0.01	33.7	Yes
3746_VZ16_Woodland	-	0.14	60	Yes
3746_VZ17_Grassland	-	0.28	13.1	No
3746_VZ18_Shrubland	-	0.10	24.1	Yes

[1] Associated with the Critically Endangered Ecological Community listing of White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland under the BC Act and EPBC Act.

BAM-C credit reports confirming impacts requiring offset have been provided in Appendix O.

9.2.1.2 SPECIES CREDITS

Section 9.2.2 of the BAM stipulates that the accredited assessor must determine an offset for the impacts of the proposed development on threatened species that require species credits to be offset. Candidate species identified in Table 8-2 of this report and summarised in Table 9-5 below that have had species polygons created will require offset. Further detail on the required offsets are provided in Section 10.

TABLE 9-5 IMPACTS THAT REQUIRE AN OFFSET – SPECIES CREDITS

Species	BC Act	EPBC Act	Record	SAII entity	Associated Impacts	Total area of impact (ha)
Superb Midge Orchid (*Genoplesium superbum*)	E	-	Assumed present	Yes	PCT 3746_VZ17_Grassland (0.28 ha) PCT 3746_VZ18_Shrubland (0.10 ha)	0.38 ha
Gang-gang Cockatoo (*Callocephalon fimbriatum*) (breeding)	E	E	Recorded	No	Impacts to VZs with HBTs: PCT 3746_VZ3_Woodland (0.42 ha) PCT 4063_VZ8_Woodland (0.04 ha) PCT 3373_VZ12_Woodland (0.13 ha) PCT 3746_VZ16_Woodland (0.14 ha)	0.73 ha
Squirrel Glider (*Petaurus norfolcensis*)	V	-	Recorded	No	PCT 3746_VZ3_Woodland (0.42 ha) PCT 3746_VZ4_Grassland (5.36 ha) PCT 3746_VZ5_Shrubland (3.14 ha) PCT 3746_VZ6_Planted Natives (0.39 ha) PCT 3746_VZ7_Highly Disturbed (0.64 ha) PCT 4063_VZ8_Woodland (0.04 ha)	9.99 ha

Species	BC Act	EPBC Act	Record	SAII entity	Associated Impacts	Total area of impact (ha)
Key's Matchstick Grasshopper (*Keyacris scurra*)	E	E	Recorded	No	PCT 3746_VZ3_Woodland (0.42 ha) PCT 3746_VZ4_Grassland (5.36 ha) PCT 3746_VZ5_Shrubland (3.14 ha) PCT 3746_VZ6_Planted Natives (0.39 ha) PCT 3746_VZ7_Highly Disturbed (0.64 ha) PCT 3746_VZ16_Woodland (0.14 ha) PCT 3746_VZ17_Grassland (0.28 ha) PCT 3746_VZ18_Shrubland (0.10 ha)	10.47 ha
Pink-tailed Legless Lizard (*Aprasia parapulchella*)	V	V	Expert Report	No	PCT 3746_VZ3_Woodland (0.42 ha) PCT 3746_VZ4_Grassland (5.36 ha) PCT 3746_VZ5_Shrubland (3.14 ha) PCT 3746_VZ6_Planted Natives (0.39 ha) PCT 3746_VZ7_Highly Disturbed (0.64 ha)	9.95 ha
Striped Legless Lizard (*Delma impar*)	V	V	Expert Report	No	PCT 3347_VZ10_Grassland (0.16 ha) PCT 3373_VZ12_Woodland (0.13 ha) PCT 3373_VZ13_Grassland (0.43 ha)	0.72 ha

9.2.2 IMPACTS THAT DO NOT REQUIRE AN OFFSET

Under Section 9.2.1(3) of the BAM, an offset is not needed for impacts on native vegetation if the VI score is below:

- <15, where the PCT is representative of an EEC or a CEEC b.
- < 17, where the PCT is associated with threatened species habitat (as represented by ecosystem credits) or represents a vulnerable ecological community c.
- < 20, where the PCT does not represent a TEC and is not associated with threatened species habitat.

However, if the entity is at risk of an SAII the assessor must address the relevant criteria in Section 9.1 of the BAM (SAII entities) and include this in the BDAR.

Five VZs identified in Table 9-6 below occur within the Development Footprint however, were identified as having low VI scores and do not meet the minimum offset thresholds as set out above.

TABLE 9-6 IMPACTS THAT DO NOT REQUIRE AN OFFSET – ECOSYSTEM CREDITS

Vegetation Zone	Area of Impact		VI Score
	BESS	Roadworks	
3746_VZ4_Grassland	5.36	-	12.9
3746_VZ7_Highly Disturbed	0.64	-	11.5
3347_VZ10_Grassland	-	0.16	8.5
3347_VZ11_Highly Disturbed	-	0.09	8.5
3746_VZ17_Grassland	-	0.28	13.1

Therefore, impacts to 6.53 ha of low condition native vegetation is not required to be offset. Additionally, impacts to non-native vegetation (PCT 0_VZ20 Planted Non-native vegetation) do not require offset under the BAM. Indirect impacts and prescribed impacts have been considered where threatened species were recorded or associated within the 6.53 ha of VZs not requiring offset and within PCT 0_VZ20 Planted Non-native vegetation (0.70 ha). A number of steps have been taken to mitigate impacts as identified in Section8.5.

Impacts not requiring offset are shown in Figure 9-3 (BESS Development Footprint) and Figure 9-4 (Road Resurfacing Development Footprint).

9.2.2.1 PRESCRIBED IMPACTS

An offset requirement can be proposed for a prescribed impact in accordance with Section 8.6 of the BAM if mitigation and management measures described in adaptive management plans are considered at high risk of failure. Measures to secure offsets can be proposed and justified in the BDAR. These measures may include the retirement of credits and / or other conservation measures that benefit a threatened entity. The consent authority will assess the proposed mitigation measures and determine whether additional biodiversity credits will need to be retired, or alternative measures undertaken to offset high risk impacts.

Conservation measures to offset indirect and prescribed impacts have been discussed in Section 8 of this BDAR with mitigation measures recommended provided in Table 8-6.

It is considered that the mitigation measures recommended within this report will provide appropriate conservation management such that no additional offsets are likely to be required to further mitigate indirect and prescribed impacts associated with the proposed development.

9.2.3 AREAS NOT REQUIRING FURTHER ASSESSMENT

The BAM does not assess biodiversity values for:

- Marine mammals;
- Wandering seabirds;
- Biodiversity that is endemic to Lord Howe Island; and/or
- Native vegetation and loss of habitat on category 1-exempt land (within the meaning of Part 5A of the Local Land Services Act 2013 (LLS Act)), other than the additional biodiversity impacts under clause 6.1 of the BC Regulation (referred to as prescribed impacts in the BAM).

Regardless, the Subject Land does not contain any such suitable habitats identified above. Additionally, areas of the Subject Land that are not proposed to be impacted by the Development Footprint do not require further assessment.

The extent of areas not requiring further assessment are shown in Figure 9-5 (BESS Project Area) and Figure 9-6 (Road Resurfacing Project Area). In this instance, approximately 108.97 ha within the Subject Lands but outside of the Development Footprints have not been comprehensively assessed as no impacts are anticipated.



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Subject Land
- Development Footprint
- Major Watercourse

PCT Mapping (Vegetation Zones)

- PCT_3746_VZ3_Woodland
- PCT_3746_VZ5_Shrubland
- PCT_3746_VZ6_Planted Natives
- PCT_3746_VZ7_Highly Disturbed
- PCT_4063_VZ8_Woodland

Coordinate System:
GDA 1994 MGA Zone 55
Date: 16/01/2026
Created By: NB/AM
Drawing Size: A3
0 120 240m
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F9-1 Impacts Requiring Offset - BESS Development Footprint

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx

WOLLONDILLY RIVER

Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend
- Subject Land
- Development Footprint
- Major Watercourse

PCT Mapping (Vegetation Zones)
- 3746_VZ16_Woodland



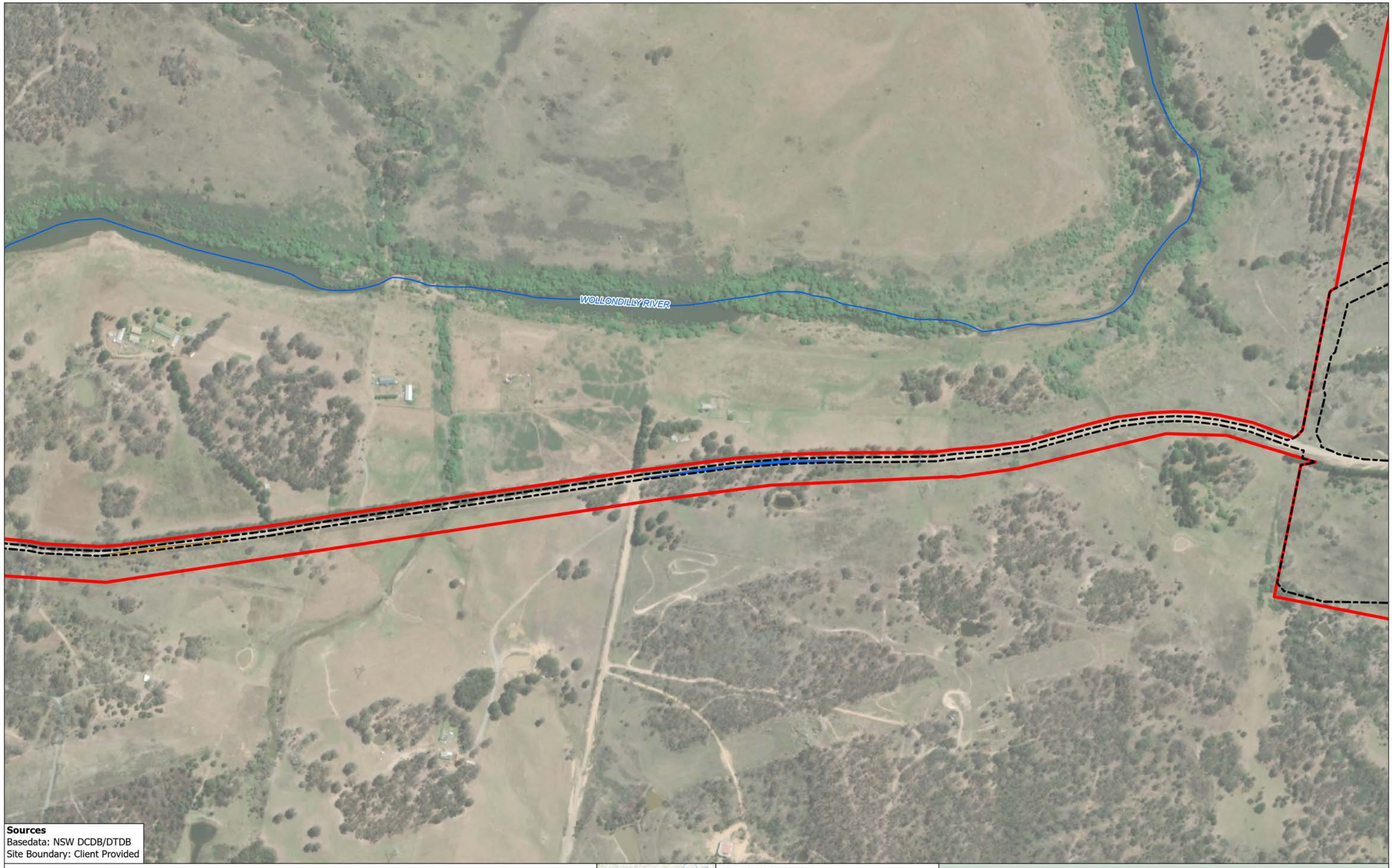
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F9-2 Impacts Requiring Offset - Road Resurfacing Development Footprint
Map 1 of 8

Canyonleigh Battery Energy Storage System BDAR
X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Subject Land
- Development Footprint
- Major Watercourse

PCT Mapping (Vegetation Zones)

- 3746_VZ16_Woodland
- 3746_VZ18_Shrubland

Coordinate System:
GDA 1994 MGA Zone 55
Date: 16/01/2026
Created By: NB/AM
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F9-2 Impacts Requiring Offset - Road Resurfacing Development Footprint
Map 2 of 8

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Subject Land
- Development Footprint
- Major Watercourse

PCT Mapping (Vegetation Zones)

- 3373_VZ12_Woodland
- 3373_VZ14_Shrubland
- 3746_VZ16_Woodland
- 3746_VZ18_Shrubland



Coordinate System:
GDA 1994 MGA Zone 55
Date: 16/01/2026
Created By: NB/AM
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F9-2 Impacts Requiring Offset - Road Resurfacing Development Footprint
Map 3 of 8

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

WOLLONDILLY RIVER

JAORIMIN CREEK

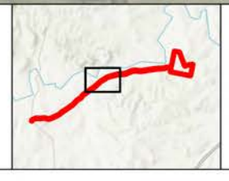
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Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Subject Land
- Development Footprint
- Major Watercourse

PCT Mapping (Vegetation Zones)

- 3373_VZ12_Woodland
- 3373_VZ14_Shrubland
- 3746_VZ16_Woodland
- 3746_VZ18_Shrubland



Coordinate System:
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F9-2 Impacts Requiring Offset - Road Resurfacing Development Footprint
Map 4 of 8

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Subject Land
- Development Footprint
- Major Watercourse

PCT Mapping (Vegetation Zones)

- 3373_VZ12_Woodland
- 3746_VZ16_Woodland



Coordinate System:
GDA 1994 MGA Zone 55
Date: 16/01/2026
Created By: NB/AM
Drawing Size: A3
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F9-2 Impacts Requiring Offset - Road Resurfacing Development Footprint
Map 5 of 8

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend
- Subject Land
- Development Footprint
- Major Watercourse

PCT Mapping (Vegetation Zones)
- 3373_VZ12_Woodland

Coordinate System:
GDA 1994 MGA Zone 55
Date: 16/01/2026
Created By: NB/AM
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F9-2 Impacts Requiring Offset - Road Resurfacing Development Footprint
Map 6 of 8

Canyonleigh Battery Energy Storage System BDAR
X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

Subject Land

Development Footprint

PCT Mapping (Vegetation Zones)

3373_VZ12_Woodland



Coordinate System:
GDA 1994 MGA Zone 55
Date: 16/01/2026
Created By: NB/AM
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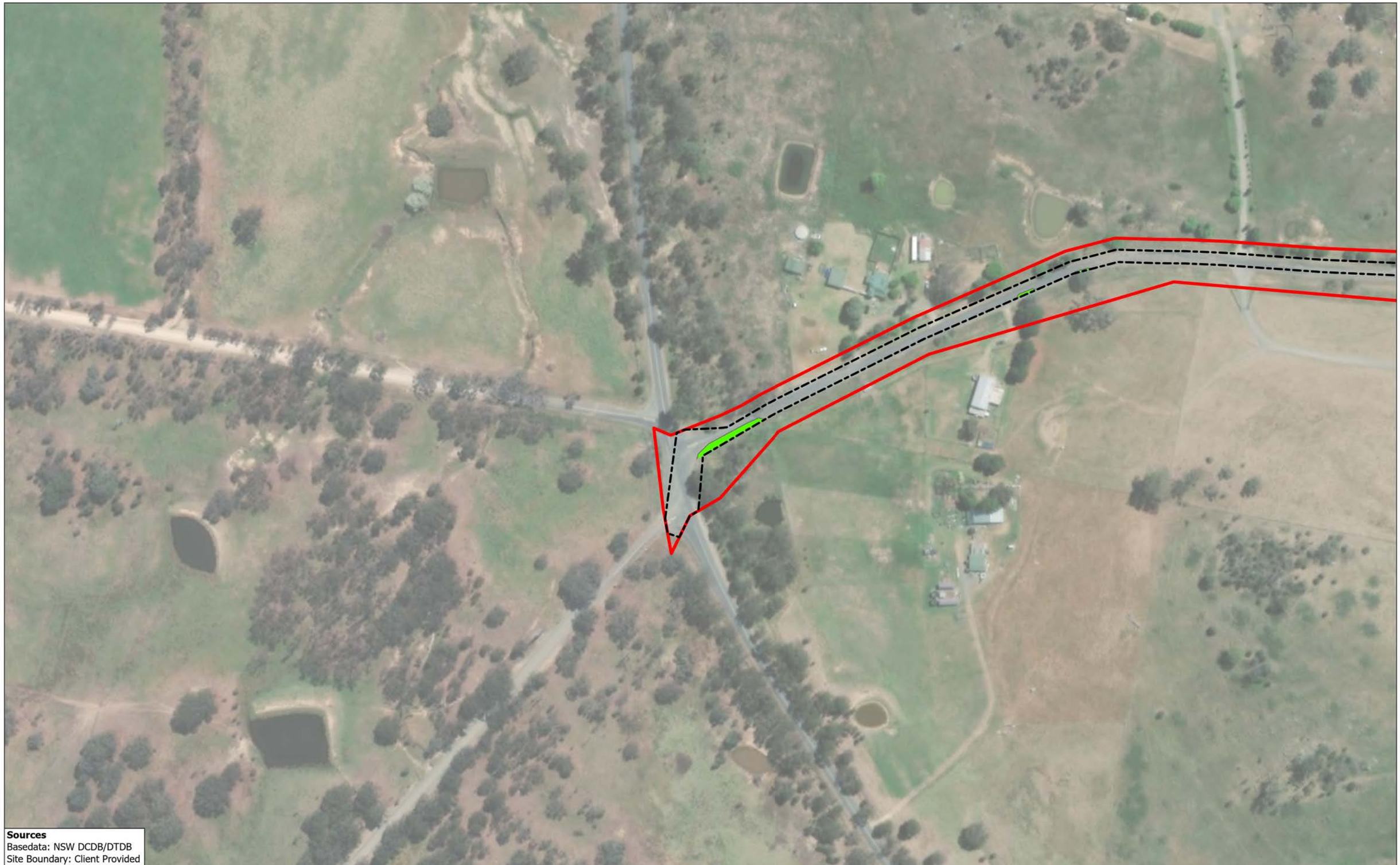
F9-2 Impacts Requiring Offset - Road Resurfacing Development Footprint
Map 7 of 8

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

Subject Land

Development Footprint

PCT Mapping (Vegetation Zones)

3373_VZ12_Woodland

Coordinate System:
GDA 1994 MGA Zone 55

Date: 16/01/2026

Created By: NB/AM

Drawing Size: A3

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F9-2 Impacts Requiring Offset - Road Resurfacing Development Footprint
Map 8 of 8

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx

WOLLONDILLY RIVER

CANYONLEIGH ROAD

Legend

- Subject Land
- Development Footprint
- External Roadworks Study Area
- Rocky Outcrops
- Major Watercourse
- Minor Watercourse
- Vehicle Strikes

PCT Mapping (Vegetation Zones)

- PCT_0_VZ20_Planted non-native woody vegetation
- PCT_3746_VZ4_Grassland
- PCT_3746_VZ7_Highly Disturbed

Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

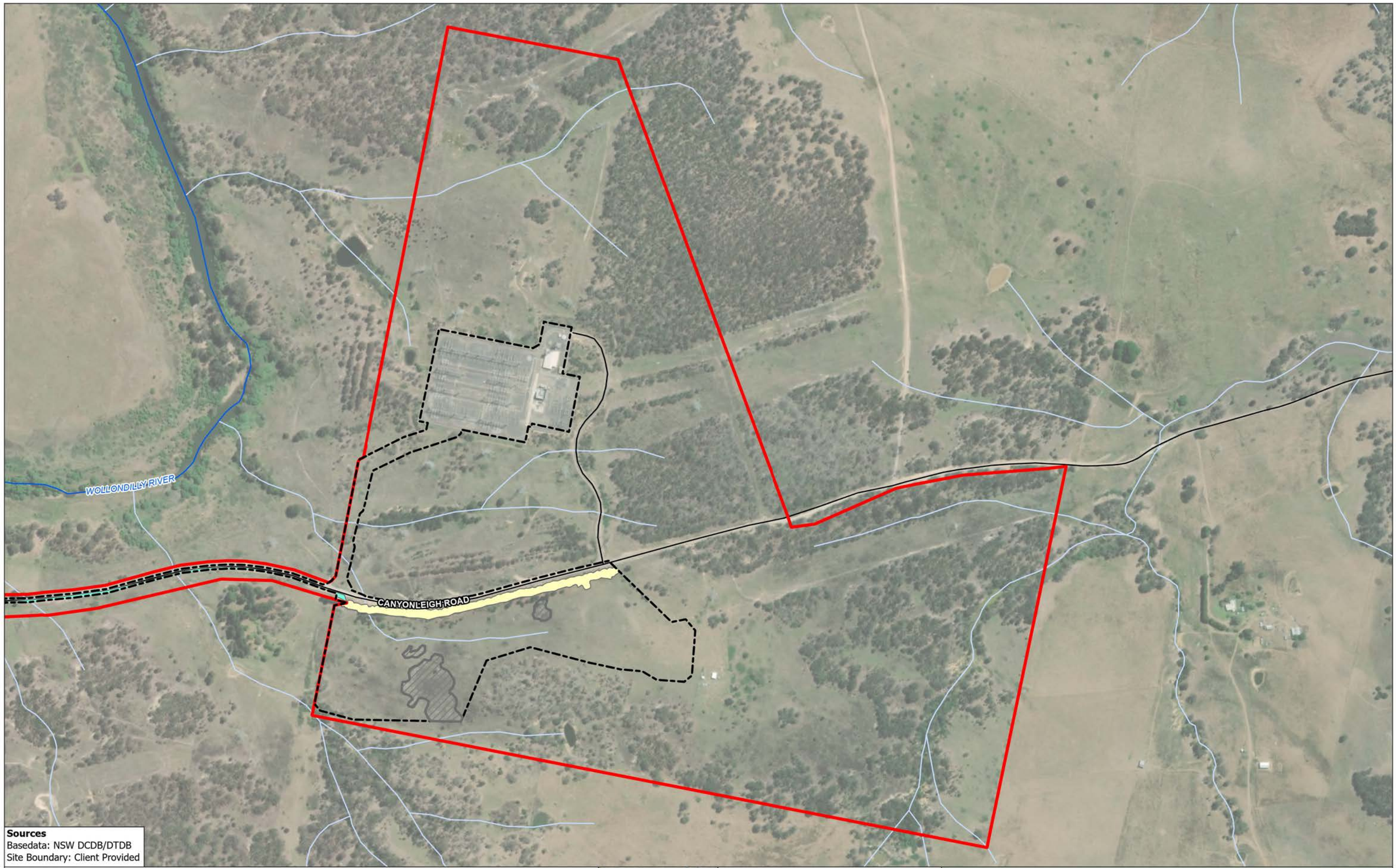
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F9-3 Impacts Not Requiring Offset - BESS Development Footprint

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Subject Land
- Development Footprint
- Rocky Outcrops
- Vehicle Strikes
- Major Watercourse
- Minor Watercourse

PCT Mapping (Vegetation Zones)

- 0_VZ20_Planted non-native woody vegetation
- 3746_VZ17_Grassland



Coordinate System:
GDA 1994 MGA Zone 55
Date: 16/01/2026
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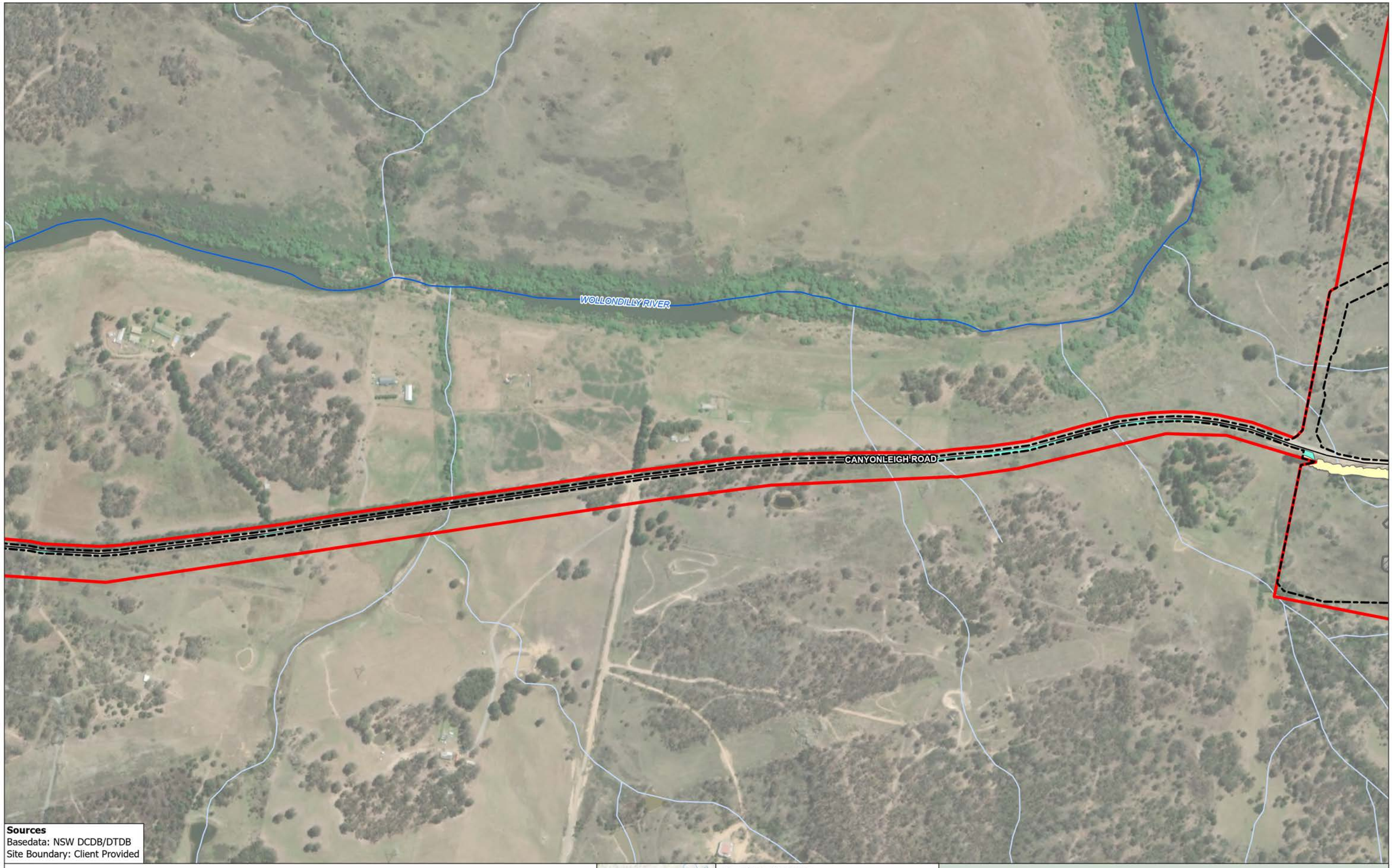
F9-4 Impacts Not Requiring Offset - Road Resurfacing Development Footprint
Map 1 of 8

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Subject Land
- Development Footprint
- Rocky Outcrops
- Vehicle Strikes
- Major Watercourse
- Minor Watercourse

PCT Mapping (Vegetation Zones)

- 0_VZ20_Planted non-native woody vegetation
- 3746_VZ17_Grassland

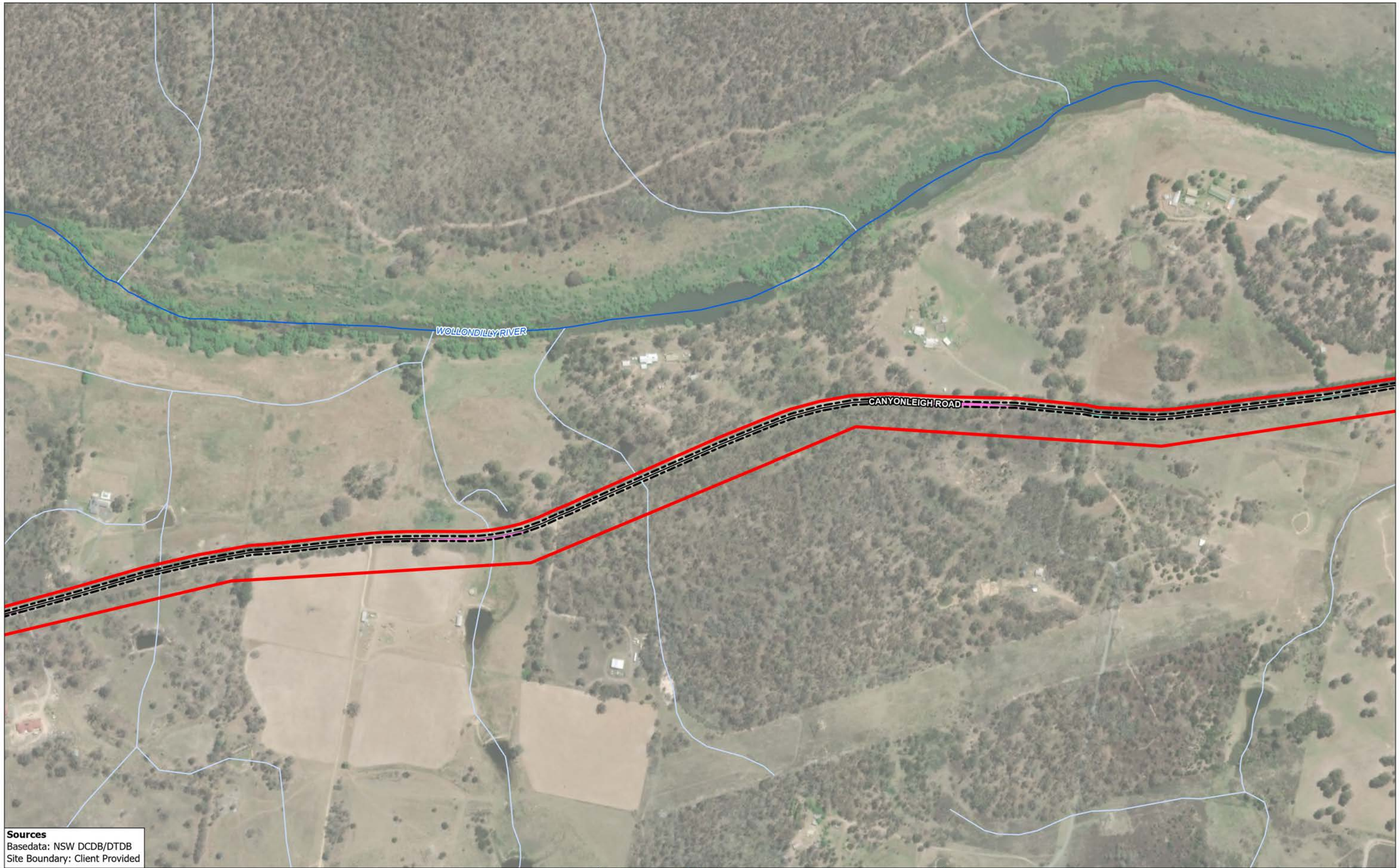
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F9-4 Impacts Not Requiring Offset - Road Resurfacing Development Footprint
Map 2 of 8

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Subject Land
- Development Footprint
- Vehicle Strikes
- Major Watercourse
- Minor Watercourse
- Non-Native Woody Vegetation

PCT Mapping (Vegetation Zones)

- 3347_VZ10_Grassland
- 3746_VZ17_Grassland

Coordinate System:
GDA 1994 MGA Zone 55
Date: 16/01/2026
Created By: NB/AM
Drawing Size: A3
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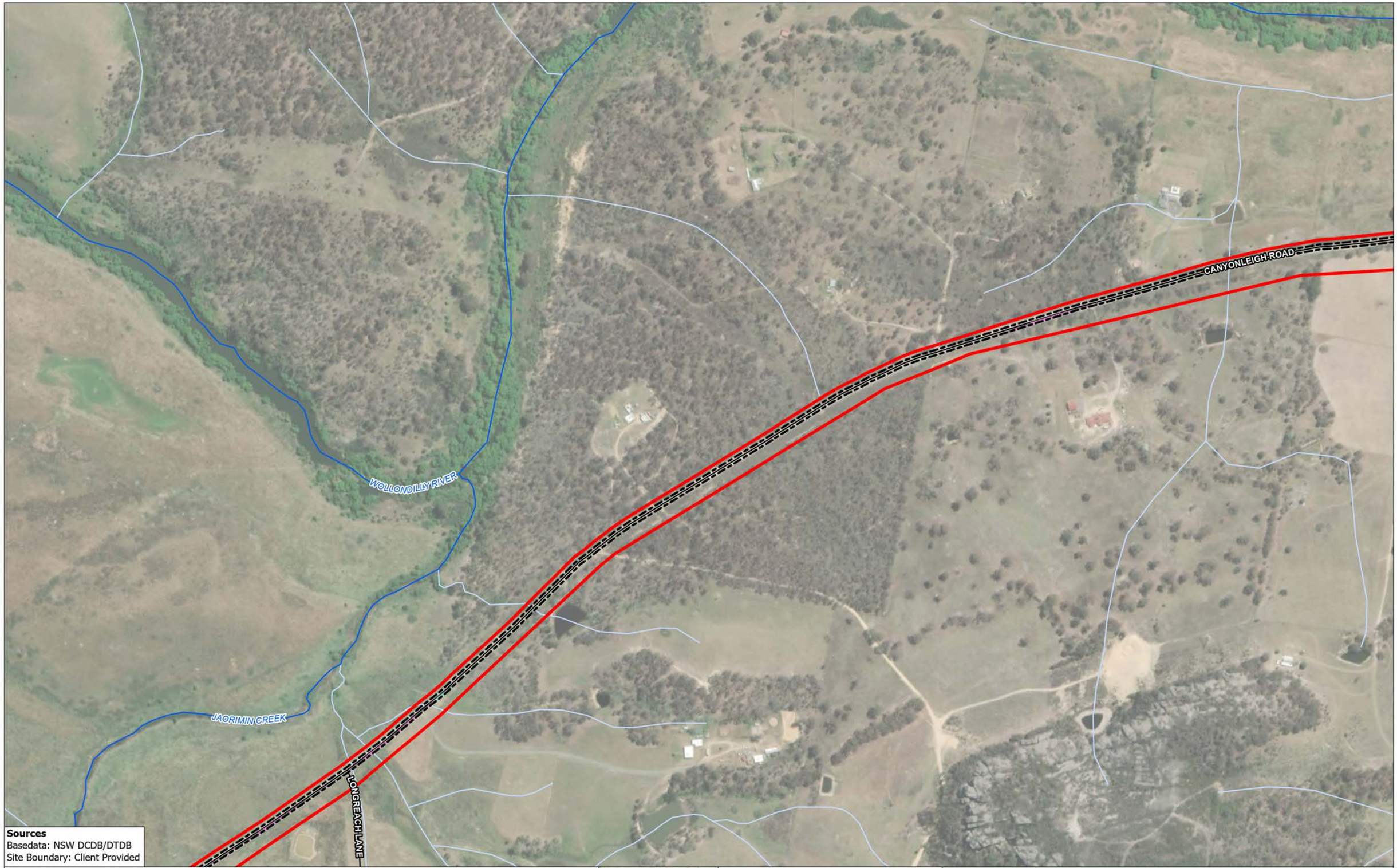
F9-4 Impacts Not Requiring Offset - Road Resurfacing Development Footprint
Map 3 of 8

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Subject Land
- Development Footprint
- Vehicle Strikes
- Major Watercourse
- Minor Watercourse
- Non-Native Woody Vegetation

PCT Mapping (Vegetation Zones)

- 3347_VZ10_Grassland
- 3347_VZ11_Highly Disturbed
- 3746_VZ17_Grassland



Coordinate System:
GDA 1994 MGA Zone 55
Date: 16/01/2026
Created By: NB/AM
Drawing Size: A3
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F9-4 Impacts Not Requiring Offset - Road Resurfacing Development Footprint
Map 4 of 8

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Subject Land
- Development Footprint
- Vehicle Strikes
- Major Watercourse
- Minor Watercourse
- Non-Native Woody Vegetation

PCT Mapping (Vegetation Zones)

- 3347_VZ10_Grassland
- 3347_VZ11_Highly Disturbed
- 3746_VZ17_Grassland

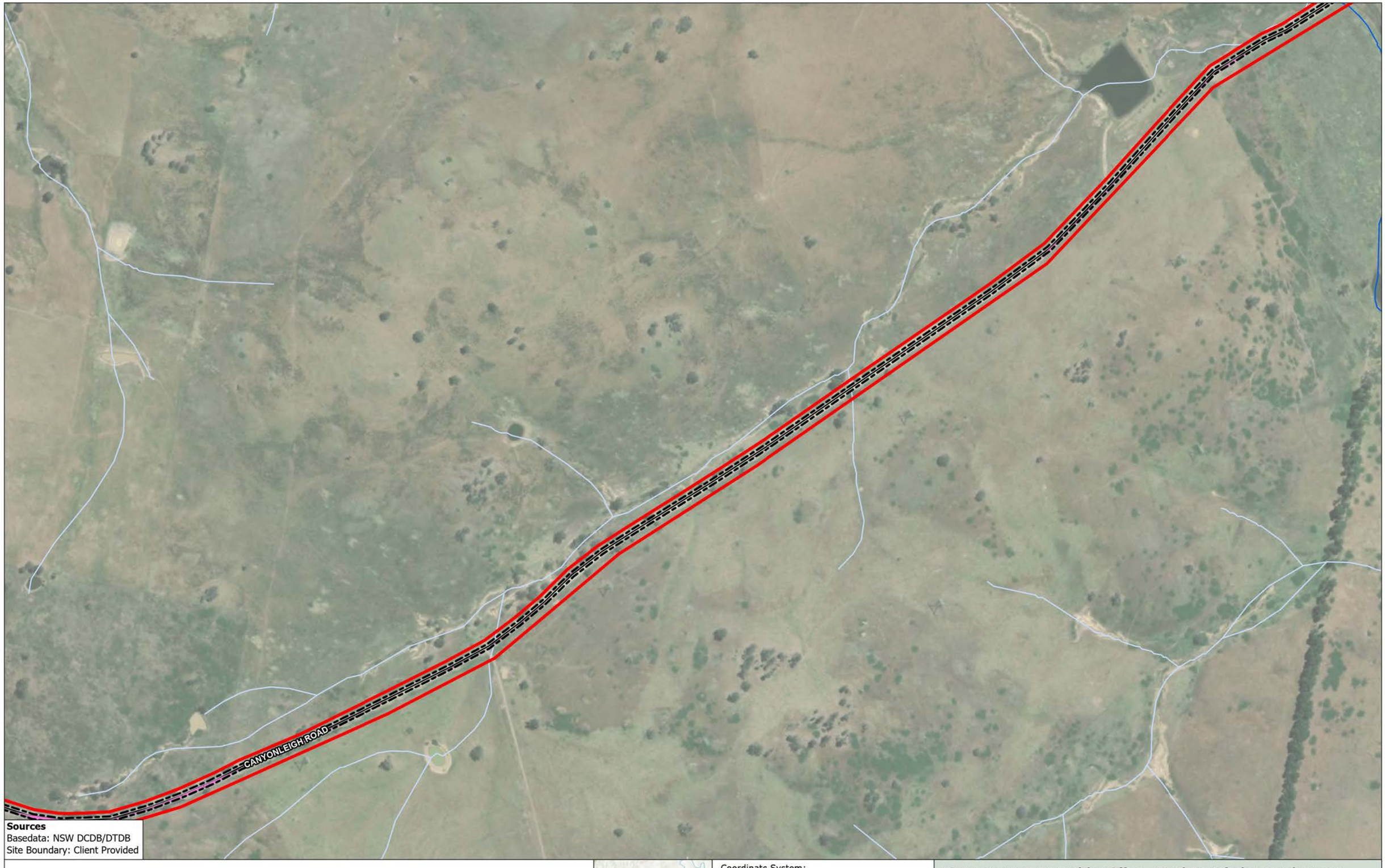
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F9-4 Impacts Not Requiring Offset - Road Resurfacing Development Footprint
Map 5 of 8

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Subject Land
- Development Footprint
- Vehicle Strikes
- Major Watercourse
- Minor Watercourse
- Non-Native Woody Vegetation

PCT Mapping (Vegetation Zones)

- 3347_VZ10_Grassland



Coordinate System:
GDA 1994 MGA Zone 55
Date: 16/01/2026
Created By: NB/AM
Drawing Size: A3
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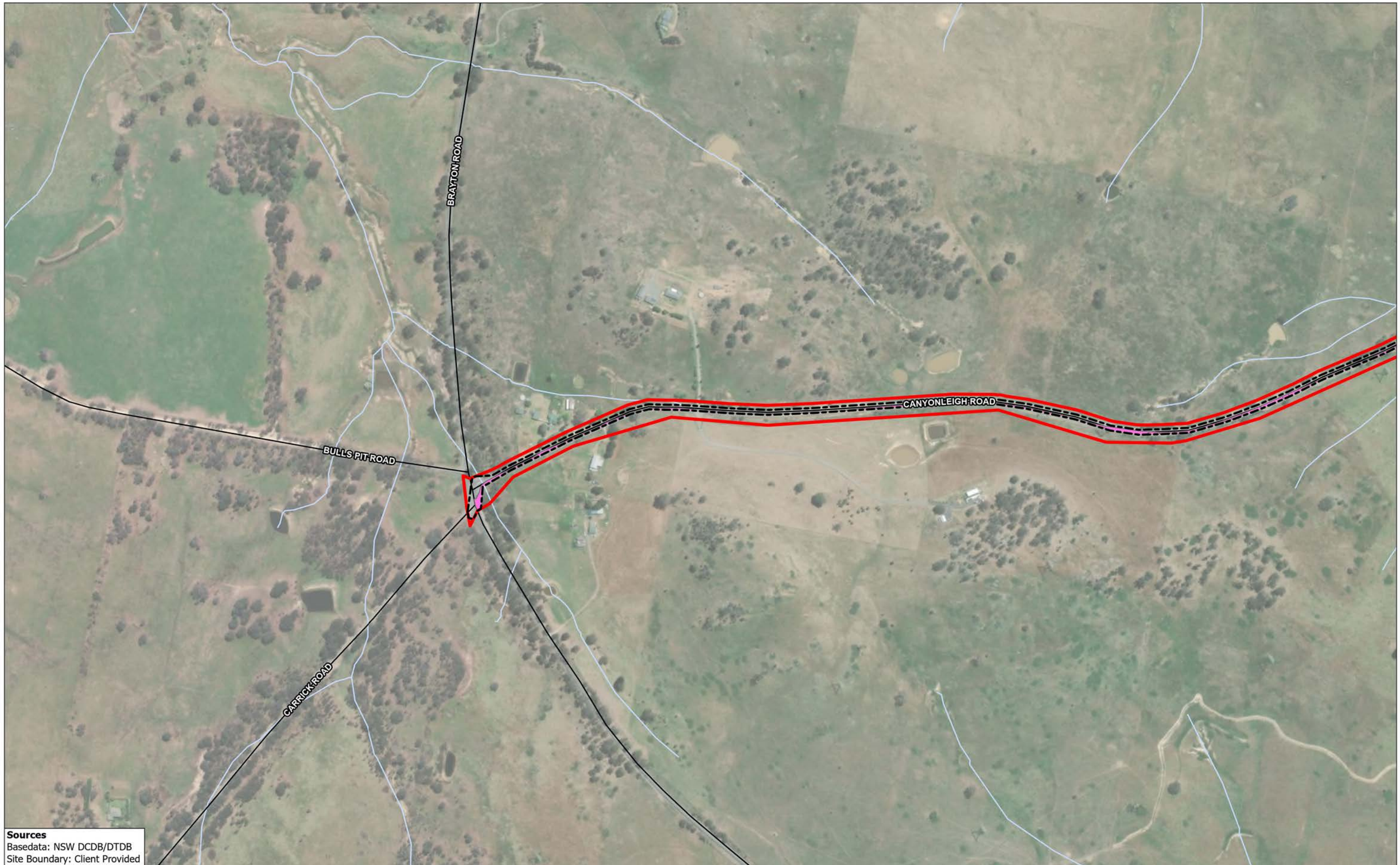
F9-4 Impacts Not Requiring Offset - Road Resurfacing Development Footprint
Map 6 of 8

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Subject Land
- Development Footprint
- Vehicle Strikes
- Minor Watercourse
- Non-Native Woody Vegetation

PCT Mapping (Vegetation Zones)

- 0_VZ20_Planted non-native woody vegetation

Coordinate System:
GDA 1994 MGA Zone 55
Date: 16/01/2026
Created By: NB/AM
Drawing Size: A3
0 90 180m
1:5,000

F9-4 Impacts Not Requiring Offset - Road Resurfacing Development Footprint
Map 7 of 8

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Subject Land
- Development Footprint
- Vehicle Strikes
- Minor Watercourse
- Non-Native Woody Vegetation

PCT Mapping (Vegetation Zones)

- 0_VZ20_Planted non-native woody vegetation

Coordinate System:
GDA 1994 MGA Zone 55
Date: 16/01/2026
Created By: NB/AM
Drawing Size: A3
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F9-4 Impacts Not Requiring Offset - Road Resurfacing Development Footprint
Map 8 of 8

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx

WOLLONDILLY RIVER

Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Subject Land
- Development Footprint
- Major Watercourse

PCTID VegZone Condition

- 0_VZ20_Planted non-native woody vegetation
- 0_VZ21_Infrasctructure
- 0_VZ22_Dam
- 0_VZ23_Stream
- 3373_VZ1_Woodland
- 3373_VZ2_Grassland
- 3746_VZ16_Woodland
- 3746_VZ17_Grassland
- 3746_VZ19_Highly Disturbed
- 3746_VZ3_Woodland
- 3746_VZ4_Grassland
- 3746_VZ5_Shrubland
- 3746_VZ6_Planted Natives
- 3746_VZ7_Highly Disturbed
- 4063_VZ8_Woodland - Moderate to Low

Coordinate System:
GDA 1994 MGA Zone 55
Date: 16/01/2026
Created By: NB/AM
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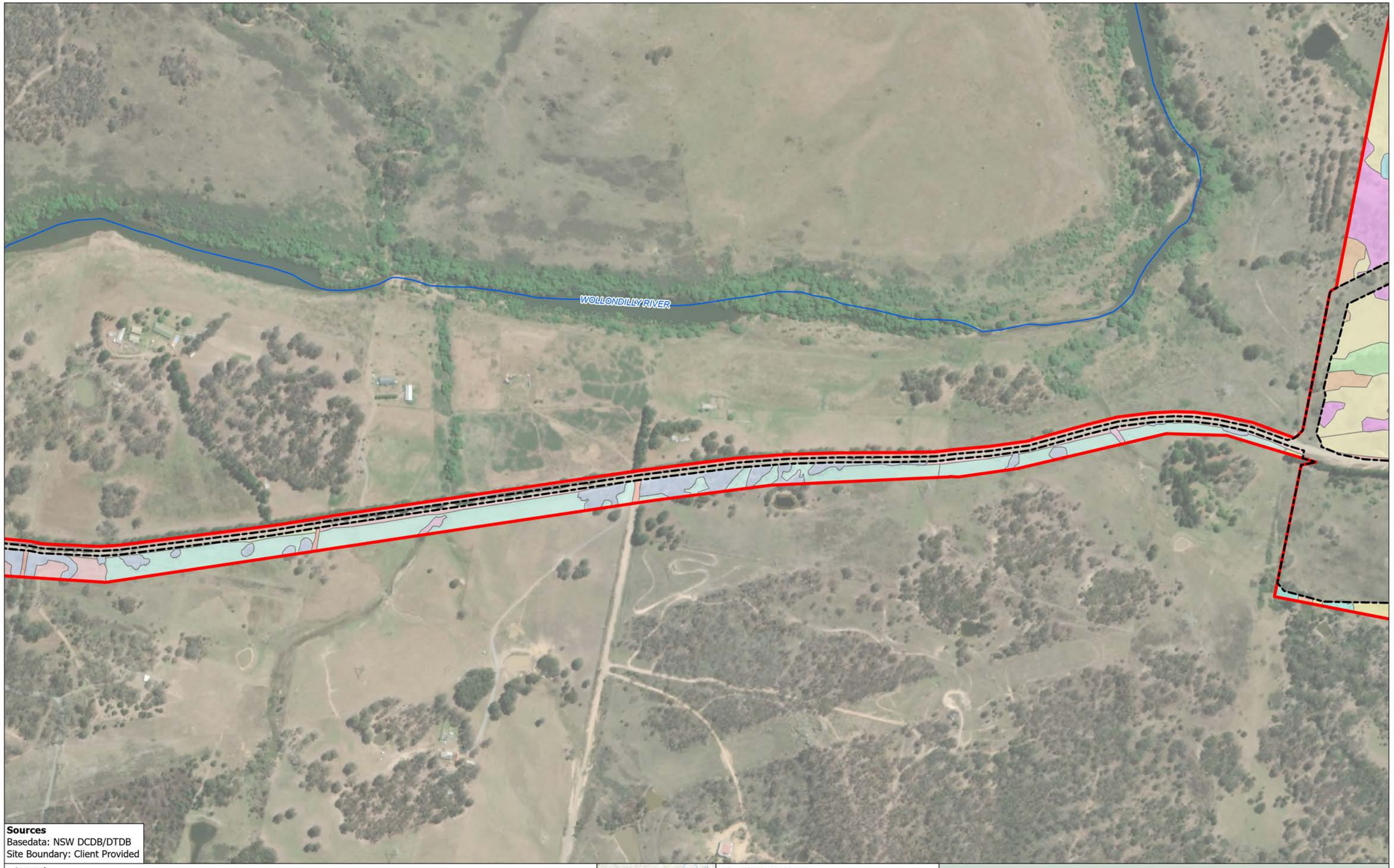
F9-5 Impacts Not Requiring Further Assessment - BESS Project Area

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Subject Land
- Development Footprint
- Major Watercourse

PCTID VegZone Condition

- 0_VZ20_Planted non-native woody vegetation
- 0_VZ21_Infrasctructure
- 0_VZ22_Dam
- 0_VZ23_Stream
- 3746_VZ16_Woodland
- 3746_VZ17_Grassland
- 3746_VZ18_Shrubland
- 3746_VZ19_Highly Disturbed
- 3746_VZ3_Woodland
- 3746_VZ4_Grassland
- 3746_VZ5_Shrubland
- 3746_VZ6_Planted Natives
- 3746_VZ7_Highly Disturbed
- 4063_VZ8_Woodland - Moderate to Low

Coordinate System:
GDA 1994 MGA Zone 55
Date: 16/01/2026
Created By: NB/AM
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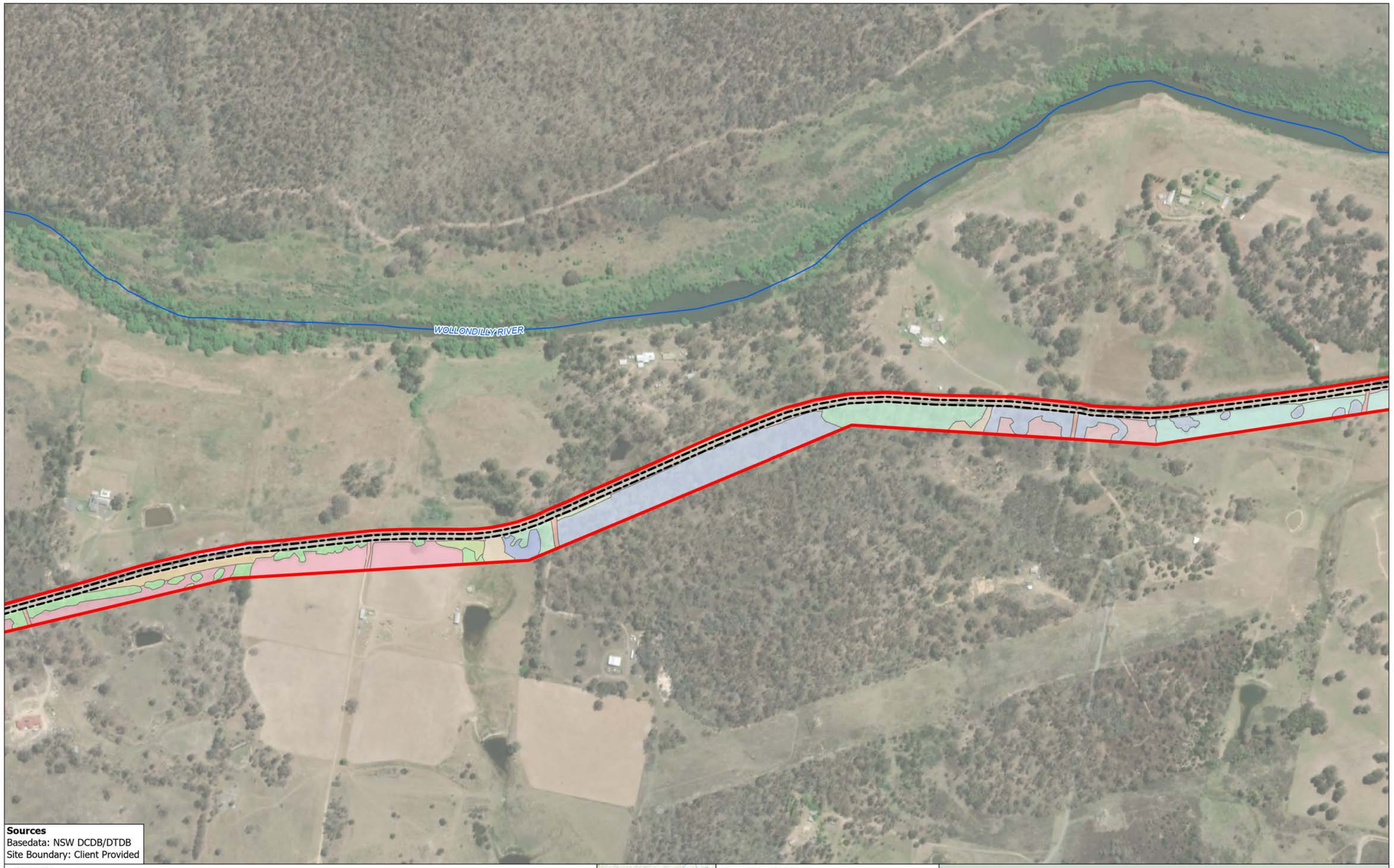
F9-6 Impacts Not Requiring Further Assessment - Road Resurfacing Project Area
Map 1 of 6

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Subject Land
- Development Footprint
- Major Watercourse

PCTID VegZone Condition

- 0_VZ20_Planted non-native woody vegetation
- 0_VZ21_Infrasctructure
- 3347_VZ10_Grassland
- 3347_VZ11_Highly Disturbed
- 3347_VZ9_Woodland
- 3373_VZ12_Woodland
- 3373_VZ13_Grassland
- 3373_VZ14_Shrubland
- 3746_VZ16_Woodland
- 3746_VZ17_Grassland
- 3746_VZ18_Shrubland
- 3746_VZ19_Highly Disturbed



Coordinate System:
GDA 1994 MGA Zone 55
Date: 16/01/2026
Created By: NB/AM
Drawing Size: A3
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F9-6 Impacts Not Requiring Further Assessment - Road Resurfacing Project Area
Map 2 of 6

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx

WOLLONDILLY RIVER

JAORIMIN CREEK

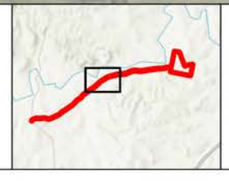
Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Subject Land
- Development Footprint
- Major Watercourse

PCTID VegZone Condition

- 0_VZ21_Infrasctructure
- 0_VZ22_Dam
- 3347_VZ10_Grassland
- 3347_VZ11_Highly Disturbed
- 3373_VZ12_Woodland
- 3373_VZ13_Grassland
- 3373_VZ14_Shrubland
- 3746_VZ16_Woodland
- 3746_VZ17_Grassland
- 3746_VZ18_Shrubland



Coordinate System:
GDA 1994 MGA Zone 55
Date: 16/01/2026
Created By: NB/AM
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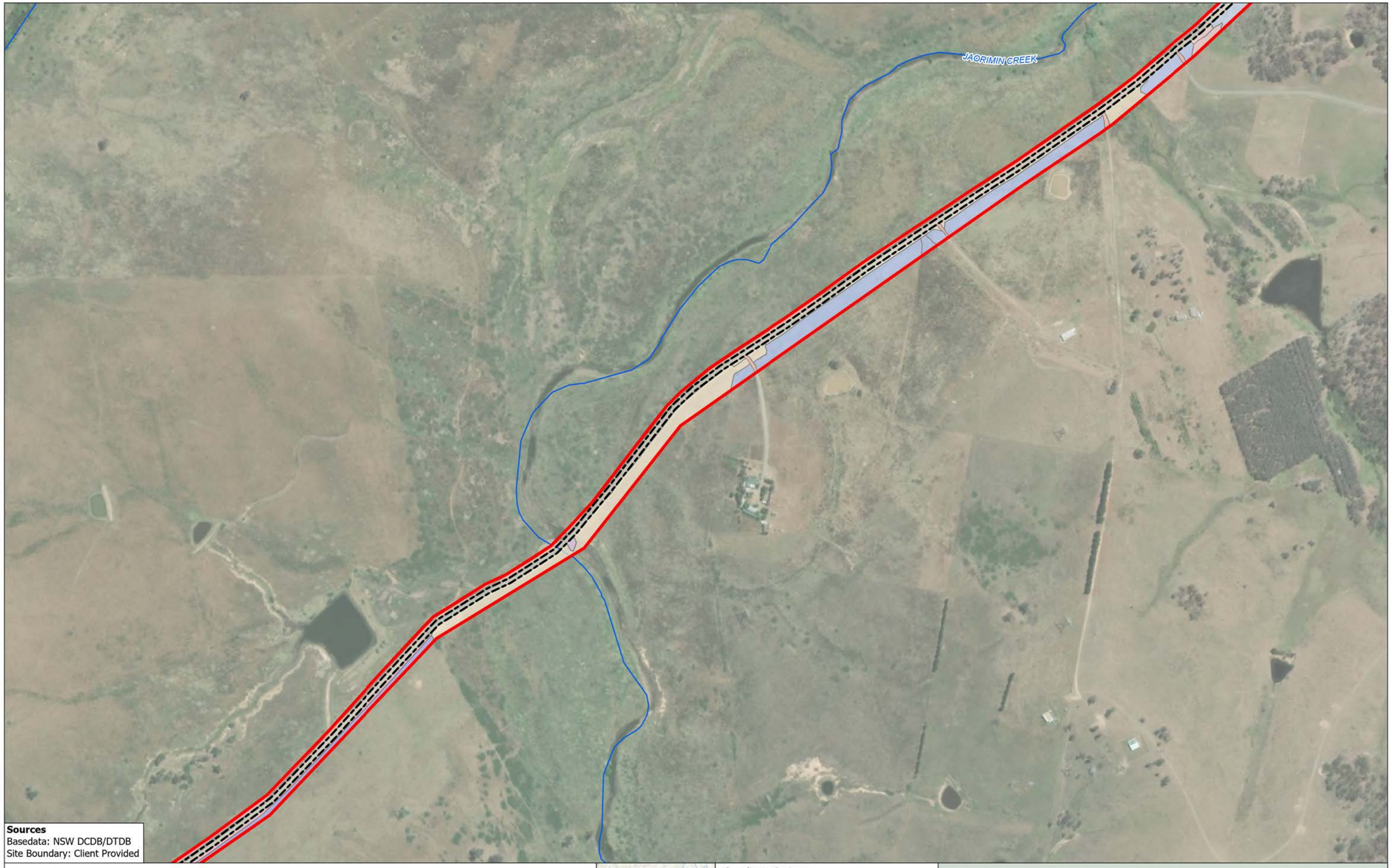
F9-6 Impacts Not Requiring Further Assessment - Road Resurfacing Project Area
Map 3 of 6

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Subject Land
- Development Footprint
- Major Watercourse

PCTID VegZone Condition

- 0_VZ21_Infrasctructure
- 0_VZ23_Stream
- 3347_VZ10_Grassland
- 3347_VZ11_Highly Disturbed
- 3373_VZ12_Woodland
- 3373_VZ13_Grassland
- 3373_VZ15_Highly Disturbed
- 3746_VZ16_Woodland
- 3746_VZ17_Grassland

Coordinate System:
GDA 1994 MGA Zone 55
Date: 16/01/2026
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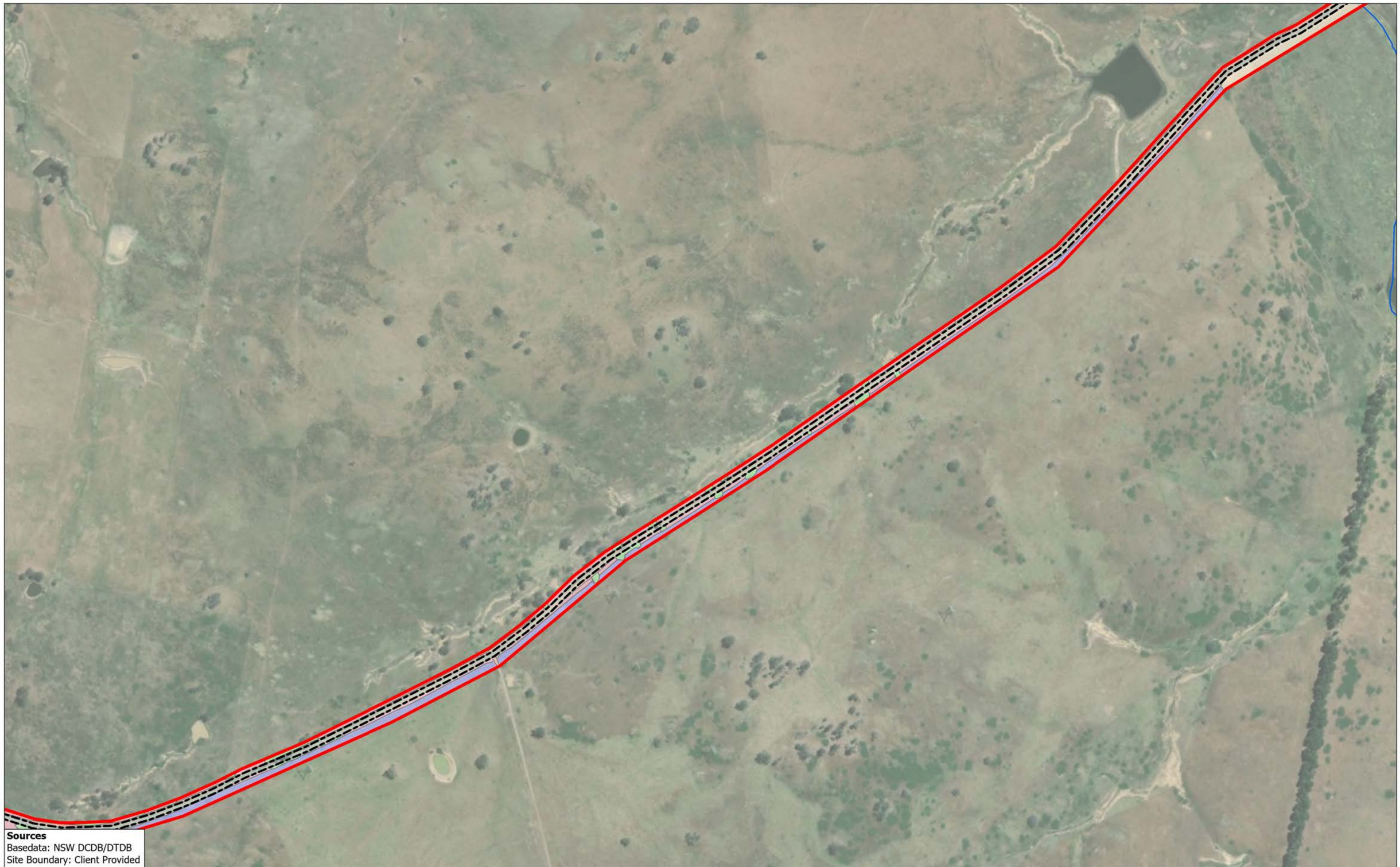
F9-6 Impacts Not Requiring Further Assessment - Road Resurfacing Project Area
Map 4 of 6

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx



Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

- Subject Land
- Development Footprint
- Major Watercourse

PCTID VegZone Condition

- 0_VZ21_Infrasctructure
- 3347_VZ10_Grassland
- 3373_VZ12_Woodland
- 3373_VZ13_Grassland
- 3373_VZ15_Highly Disturbed

Coordinate System:
GDA 1994 MGA Zone 55
Date: 16/01/2026
Created By: NB/AM
Drawing Size: A3
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F9-6 Impacts Not Requiring Further Assessment - Road Resurfacing Project Area
Map 5 of 6

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx

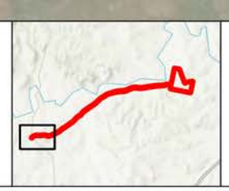
Sources
Basedata: NSW DCDB/DTDB
Site Boundary: Client Provided

Legend

Subject Land
Development Footprint

PCTID VegZone Condition

0_VZ20_Planted non-native woody vegetation
0_VZ21_Infrasctructure
3373_VZ12_Woodland
3373_VZ13_Grassland
3373_VZ15_Highly Disturbed



Coordinate System:
GDA 1994 MGA Zone 55
Date: 16/01/2026
Created By: NB/AM
Drawing Size: A3
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1:5,000

F9-6 Impacts Not Requiring Further Assessment - Road Resurfacing Project Area
Map 6 of 6

Canyonleigh Battery Energy Storage System BDAR

X-Elio Aus2

ERM

0711340_CBESS_BDAR_R2.aprx

9.3 IMPACTS ON MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

The Commonwealth Government's Bilateral Assessment Requirements stipulate that an EIS (through the BDAR) must include the identification of any MNES that have not been offset using the BAM and details of how impacts requiring offset correlate to the MNES impacts.

The Commonwealth Government's Bilateral Assessment Requirements stipulate that an EIS (through the BDAR) must include the identification of any MNES that have not been offset using the BAM and details of how impacts requiring offset correlate to the MNES impacts.

These details are provided in Table 9-7. The entities detailed below are those that have been assessed under the EPBC Referral (EPBC 2025/10233) and required to be assessed as part of the Supplementary SEARs (see Section 5.3).

TABLE 9-7 MNES ENTITIES IMPACTED BY THE PROJECT

EPBC Act listed entity	EPBC Act Status	Record	Impacts	Comments
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	CE	Recorded	Removal and modification of 0.55 ha of vegetation within the Road Resurfacing Development Footprint, including: PCT 3373_VZ12_Woodland (0.13 ha) PCT 3373_VZ13_Grassland (0.42 ha)	The Subject Land will retain 61.05 ha of well-connected CEEC within the Subject Land, representing 99% of the total extent of the CEEC within the Subject Land. Impacts are to be mitigated through: • The retirement of ecosystem credits under the Bilateral Agreement through PCT association; • Management and mitigation measures though various plans, including mitigation measures detailed in Table 8-4and Table 8-6 of this report.
Hoary Sunray (*Leucochrysum albicans subsp. tricolor*)	E	No Impact	The Supplementary SEARs identified this species as potentially having a significant impact as a result of the proposed development. No direct impacts will occur to this species with no individuals recorded during targeted surveys.	Impacts to potential habitats have been avoided and minimised with a loss of 11.34 ha of potential habitat associated with native vegetation clearing proposed for the development. The Subject Land will retain potential habitats across all areas of native vegetation to be retained. Management and mitigation measures though various plans, including mitigation measures detailed in Table 8-4 and Table 8-6 of this report will also support management of habitat for this species.
Gang-gang Cockatoo (*Callocephalon fimbriatum)*	E	Recorded	Impacts likely include the clearing and modification to 11.40 ha of foraging habitat across the Subject Land, including 9.98 ha within the BESS Development Footprint and 1.42ha within the Road Resurfacing Development Footprint. Within this extent of habitat, there is also the	The Subject Land will retain a large, well-connected expanse of native vegetation that will continue to provide suitable habitat for this species. Impacts are to be mitigated through: • The retirement of ecosystem credits under the Bilateral Agreement through PCT association;

EPBC Act listed entity	EPBC Act Status	Record	Impacts	Comments
			potential loss of breeding habitat (i.e. HBTs) through impacts associated VZs where HBTs were recorded, including: PCT 3746_VZ3_Woodland (0.42 ha) PCT 4063_VZ8_Woodland (0.04 ha) PCT 3373_VZ12_Woodland (0.13 ha) PCT 3746_VZ16_Woodland (0.14 ha)	• The retirement of species credits for potential breeding habitat of the species. Management and mitigation measures though various plans, including mitigation measures detailed in Table 8-4 and Table 8-6 of this report.
Key's Matchstick Grasshopper (*Keyacris scurra)*	E	Recorded	Removal and modification of 9.95 ha of suitable and known habitat, including: PCT 3746_VZ3_Woodland (0.42 ha) PCT 3746_VZ4_Grassland (5.36 ha) PCT 3746_VZ5_Shrubland (3.14 ha) PCT 3746_VZ6_Planted Natives (0.39 ha) PCT 3746_VZ7_Highly Disturbed (0.64 ha)	The Subject Land will retain a large, well-connected expanse of native vegetation that will continue to provide suitable habitat for this species. Impacts are to be mitigated through: • The retirement of ecosystem credits under the Bilateral Agreement through PCT association; • The retirement of species credits for the residual impacts to this species habitat. Management and mitigation measures though various plans, including mitigation measures detailed in Table 8-4 and Table 8-6 of this report.
Pink-tailed Legless Lizard (*Aprasia parapulchella)*	V	Expert Report	A total of 9.95 ha of suitable habitat identified through an Expert Report will be impacted by the proposed development within the BESS Development Footprint, including: PCT 3746_VZ3_Woodland (0.42 ha) PCT 3746_VZ4_Grassland (5.36 ha) PCT 3746_VZ5_Shrubland (3.14 ha) PCT 3746_VZ6_Planted Natives (0.39 ha) PCT 3746_VZ7_Highly Disturbed (0.64 ha)	The Subject Land will retain a large, well-connected expanse of native vegetation that will continue to provide suitable habitat for this species. Impacts are to be mitigated through: • The retirement of ecosystem credits under the Bilateral Agreement through PCT association; • The retirement of species credits for the residual impacts to this species habitat associated with the outcomes of the expert report. Management and mitigation measures though various plans, including mitigation measures

EPBC Act listed entity	EPBC Act Status	Record	Impacts	Comments
				detailed in Table 8-4 and Table 8-6 of this report.
Striped Legless Lizard (*Delma impar)*	V	Expert Report	A total of 0.72 ha of suitable habitat identified through an Expert Report will be impacted by the proposed development within the Road Resurfacing Development Footprint, including: PCT 3347_VZ10_Grassland (0.09 ha) PCT 3373_VZ12_Woodland (0.13 ha) PCT 3373_VZ13_Grassland (0.43 ha)	The Subject Land will retain a large, well-connected expanse of native vegetation that will continue to provide suitable habitat for this species. Impacts are to be mitigated through: • The retirement of ecosystem credits under the Bilateral Agreement through PCT association; • The retirement of species credits for the residual impacts to this species habitat associated with the outcomes of the expert report. Management and mitigation measures though various plans, including mitigation measures detailed in Table 8-4 and Table 8-6 of this report.
Diamond firetail (*Stagonopleura guttata*)	V	No Impact	The Supplementary SEARs identified this species as likely having a significant impact as a result of the proposed development. No direct impacts will occur to this species with no individuals recorded during targeted surveys. Impacts likely include the clearing and modification to 11.40 ha of foraging habitat across the Subject Land, including 9.98 ha within the BESS Development Footprint and 1.42 ha within the Road Resurfacing Development Footprint.	Impacts to likely habitats have been avoided and minimised with a loss of 11.34 ha of potential habitat associated with native vegetation clearing proposed for the development. The Subject Land will retain a large, well-connected expanse of native vegetation that will continue to provide suitable habitat for this species. Impacts are to be mitigated through various plans, including mitigation measures detailed in Table 8-4 and Table 8-6of this report.

10. APPLYING THE NO NET LOSS STANDARD

The offset liability for the Project is calculated in the following sections. The Credit Summary Reports associated with impacts to native vegetation within the BESS Development Footprint is and the Road Resurfacing Development Footprint are provided in Appendix O.

10.1 OFFSET REQUIREMENTS FOR DIRECT IMPACTS

10.1.1 ECOSYSTEM CREDITS

Ecosystem credits required to offset the development are summarised in Table 10-1 as per subsection 9.2.1(1) and Appendix B (5) of the BAM. Like-for-like trading options apply to the ecosystem credit classes, as outlined in the Biodiversity Credit Reports in Appendix O. Note: Amendments to the BC Act that came into effect from the 7th March 2025 mean that approval can no longer be granted for proponents to use the variation rules set out in the BC Regulation.

10.1.2 SPECIES CREDITS

The residual impact calculated for candidate species is the extent of known or assumed presence following consideration of survey results, impact avoidance and application of species credit polygon rules.

Candidate species requiring an offset for impacts or assumed impacts within the BESS Development Footprint and/or Road Resurfacing Development Footprint are presented in Table 10-2 below. The Credit Summary Reports are provided in Appendix O. The area from which the species credits can be obtained is limited to the state of NSW.

10.2 OFFSET STRATEGY

The No Net Loss standard involves the retirement of ecosystem and species credits for Project related direct impacts in accordance with the BOS. The BOS requires all biodiversity impacts to be calculated using the BAM-C, which provides an output determining the final Species credit and Ecosystem credit obligations for the Project. Typically, the final credit obligations are to be 'retired' prior to construction or in accordance with an approved staged approach.

The Applicant is currently developing a biodiversity offset strategy. This strategy will detail the offset approach to be undertaken to retire credit obligations and is likely to be achieved by:

- Retiring 'like for like' credits as specified in Table 10-1 and Table 10-2 to the amount and from the regions indicated.
- Entering into a Strategic Offset Delivery Agreement (SODA) with the NSW Government, if eligible, where the Applicant pays NSW DCCEEW to undertake actions to meet their biodiversity offset obligations through the retirement of like-for-like biodiversity credits or the funding of a suitable biodiversity conservation action; or
- Payment into the Biodiversity Conservation Trust (BCT) in lieu of satisfying the offset liability specified in Table 10-1 and Table 10-2.

The fee associated with the latter option is determined through formal consultation with the Biodiversity Conservation Trust (BCT).

TABLE 10-1 IMPACTS THAT REQUIRE AN OFFSET – ECOSYSTEM CREDITS

Formation	Class	PCT Name	TEC Name / Offset Trading Group	Vegetation Zone	HBTs	Impact Area	Current VI Score	Change in VI Score	Number of ecosystem credits required
Dry Sclerophyll Forests (Shrubby sub-formation)	Southern Tableland Dry Sclerophyll Forests	Southern Tableland Snow Gum-Candlebark Shrub Forest	Not a TEC	3746_VZ3_Woodland	Yes	0.42	62.9	- 62.9	13
				3746_VZ4_Grassland	No	5.36	12.9	- 12.9	0
				3746_VZ5_Shrubland	No	3.14	18.9	- 18.9	30
				3746_VZ6_Planted Natives	No	0.39	64.5	- 64.5	13
				3746_VZ7_Highly Disturbed	No	0.64	11.5	- 11.5	0
				3746_VZ16_Woodland	Yes	0.14	60.2	- 60.2	4
				3746_VZ17_Grassland	No	0.28	44.8	- 44.8	0
				3746_VZ18_Shrubland	No	0.10	8.5	- 8.5	1
Forested Wetlands	Eastern Riverine Forests	Central and Southern Tableland River Oak Forest	Not a TEC	4063_VZ8_Woodland	Yes	0.04	8.5	- 8.5	1
Grassy Woodlands	Tableland Clay Grassy Woodlands	Southern Tableland Creekflat	Not a TEC	3347_VZ9_Woodland	No	0.09	55.6	- 55.6	2
			Not a TEC	3347_VZ10_Grassland	No	0.16	16.1	- 16.1	0

Formation	Class	PCT Name	TEC Name / Offset Trading Group	Vegetation Zone	HBTs	Impact Area	Current VI Score	Change in VI Score	Number of ecosystem credits required
		Ribbon Gum Forest	Not a TEC	3347_VZ11_Highly Disturbed	No	0.09	33.7	- 33.7	0
Grassy Woodlands	Southern Tableland Grassy Woodlands	Goulburn Tableland Box-Gum Grassy Forest	White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	3373_VZ12_Woodland	No	0.13	60	- 60	5
				3373_VZ13_Grassland	Yes	0.43	13.1	- 13.1	4
			Not a TEC	3373_VZ14_Shrubland	No	0.01	24.1	- 24.1	1

TABLE 10-2 IMPACTS THAT REQUIRE OFFSET – SPECIES CREDITS

Kingdom	Species	BC Act	EPBC Act	Record	Total impact area (ha)	Number of species credits required	
						BESS	Roadworks
Flora	Superb Midge Orchid (*Genoplesium superbum*)	E	-	Assumed present	0.38 ha	NA	5
Fauna	Gang-gang Cockatoo (*Callocephalon fimbriatum*) (breeding)	E	E	Recorded	0.73 ha	14	8
	Squirrel Glider (*Petaurus norfolcensis*)	V	-	Recorded	9.99 ha	95	NA
	Key's Matchstick Grasshopper (*Keyacris scurra*)	E	E	Recorded	10.47 ha	94	7
	Pink-tailed Legless Lizard (*Aprasia parapulchella*)	V	V	Expert Report	9.95 ha	94	NA
	Striped Legless Lizard (*Delma impar*)	V	V	Expert Report	0.72 ha	NA	7

11. CONCLUSION

This BDAR has been prepared to assess the proposed Battery Energy Storage System (BESS) and associated road resurfacing works against potential and likely impacts to Threatened Ecological Communities (TECs), threatened species and their habitats in accordance with the BC Act 2016 and BAM 2020. This report has also been prepared to address matters raised in public and agency submissions, including Supplementary SEARs provided by DCCEEW.

The Subject Land comprises 130.57 ha and consists of the BESS Project Area (98.40ha) and Road Resurfacing Project Area (32.16 ha), of which the Development Footprint (21.60 ha) occurs within.

The 21.60 ha Development Footprint consists of the BESS Development Footprint (15.20 ha) and Road Resurfacing Development Footprint (6.40 ha) and has been assessed within this BDAR and has included assessment of both direct and indirect impacts associated with the proposed development. The final Development Footprint has been the result of a multi-iterative process to support the principles to avoid and minimise impacts to biodiversity values

The Development Footprint mostly consists of Category 2-Regulated Land under the Draft NVR Map, which has been confirmed through numerous survey events. It contains 11.40 ha of native vegetation that will be impacted by the proposed development, associated with four Plant Community Types (PCTs):

- PCT 3746 - Southern Tableland Snow Gum-Candlebark Shrub Forest (10.47 ha)
- PCT 4063 - Central and Southern Tableland River Oak Forest (0.04 ha)
- PCT 3347 - Southern Tableland Creekflat Ribbon Gum Forest (0.33 ha)
- PCT 3373 - Goulburn Tableland Box-Gum Grassy Forest (0.56 ha)

PCT 3373 - Goulburn Tableland Box-Gum Grassy Forest is associated with the TEC White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland. The proposed development will impact on 0.56 ha of this TEC within the Road Resurfacing Development Footprint, equivalent to 1% of the total extent within the Subject Land with the remaining 61.11 ha (99%) being retained. This TEC is considered to form part of the EPBC listed entity and is considered to be at risk of Serious and Irreversible Impact (SAII).

Impacts to riparian habitats, waterways and key fish habitat have been avoided with the project design aimed at minimising disturbance and impacts to aquatic habitats by utilising existing crossings and tracks. No impacts to these features are likely to occur as a result of the proposed road resurfacing activities along Canyonleigh Road. Additionally, impacts to habitats of several threatened species have been avoided and minimised where possible. A precautionary approach was taken to assess and evaluate impacts and habitats.

6 candidate species were identified as requiring offsets for impacts to areas of suitable habitat and habitats where species were assumed present. Of the candidate species recorded, or assumed present, one species, being the Superb Midge Orchid (*Genoplesium superbum*) is identified as a candidate species at risk of SAII. This report has provided an SAII assessment for SAII entities within Section 9.1 of the BDAR.

Residual impacts associated with impacts to native vegetation and threatened species have been identified through the BAM-C and biodiversity offsets have been identified through the Biodiversity Credit Reports provided in Appendix O.

Given the extensive survey efforts undertaken and the precautionary principle applied where survey was considered deficient, the proposed development is unlikely to cause any significant impact to any TECs, threatened species or their habitats. The Subject Land will continue to support and provide habitats and connectivity to a range of flora and fauna species. To ameliorate impacts, in additional to the offset requirements, a suite of mitigation measures to avoid and further minimise direct, indirect and prescribed impacts will be implemented, such as the development and implementation of project-specific management plans (i.e., the CEMP, CTMP, BMP and ESCP).

The Applicant is currently developing a biodiversity offset strategy. This strategy will detail the offset approach to be undertaken to retire credit obligations.

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APPENDIX A AGENCY ADVICE – BCS

Department of Climate Change, Energy, the Environment and Water

Your ref: SSD-78247462
Our ref: DOC24/

Samantha Oyston
Senior Environmental Assessment Officer
Department of Planning, Housing and Infrastructure
4 Parramatta Square
Parramatta NSW 2150

By email: samantha.oyston@dpie.nsw.gov.au

Subject: Request for Environmental Assessment Requirements – Canyonleigh Battery Energy Storage System (BESS) – SSD-78247462 – Goulburn Mulwaree Council

Dear Ms Oyston

I refer to your request for input into the Secretary's Environmental Assessment Requirements (SEARs) for the proposed Canyonleigh BESS.

Our advice is in **Attachments A** and **B**. In preparing the EIS, the proponent should refer to the relevant guidance material listed in **Attachment C**.

BCS recommends the EIS appropriately address the following:

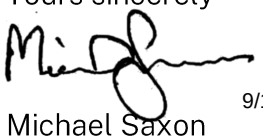
1. Biodiversity and offsetting
2. Water and soils
3. Flooding

To help facilitate the Biodiversity Development Assessment Report (BDAR) process, BCS is available to discuss targeted threatened flora and fauna survey methods prior to their implementation.

To assist us in preparing for a future assessment of this project, we request that you please provide a GIS shapefile of the current project site shown in the scoping report. We note that the current project site may change over time. We are requesting this data due to the high number of projects in this general area.

If you have any questions about this advice, please do not hesitate to contact Nat O'Rourke, Team Leader Planning, South East at *rog.southeast@environment.nsw.gov.au*

Yours sincerely



9/12/2024

Michael Saxon

Director South East

Regional Delivery

Enclosures:

Attachment A – Standard Environmental Assessment Requirements

Attachment B – Project-specific Environmental Assessment Requirements

Attachment C - Guidance Material

Attachment A – Standard Environmental Assessment Requirements for Canyonleigh BESS (SSD-78247462)

Native Vegetation Regulatory Map – land categorisation

For State Significant Development (SSD) proposals that affect rural land as defined under Part 5A of the *Local Land Services Act 2013*, a draft Native Vegetation Regulatory Map is available upon request. This map as it relates to the development site must be requested from BCS during preparation of the Biodiversity Development Assessment Report (BDAR) and prior to the BDAR being submitted to the consent authority. Requests should be made via the Data Broker – *data.broker@environment.nsw.gov.au*.

Where Category 2 – Regulated land mapped as present on a development site, this will be identified on the draft map supplied by BCS and is land where the BAM must be applied.

Where Category 1 – Exempt Land is present on a development site, early engagement with BCS is encouraged. Site-based floristic assessment is required to verify the presence or absence of critically endangered ecological communities (CEECs), critically endangered plants, threatened grasslands and threatened fauna, in order to confirm at the site scale whether the criteria for Category 1 – Exempt Land is met.

Prior to the BDAR being submitted to the consent authority, the accredited assessor should submit a proposed land categorisation method to the BCS South East Planning team at *rog.southeast@environment.nsw.gov.au* for review.

For more information, see *Determining native vegetation land categorisation for application in the Biodiversity Offsets Scheme*

Biodiversity

1. The EIS must assess biodiversity impacts related to the proposed development in accordance with Section 7.9 of the *Biodiversity Conservation Act 2016* using the Biodiversity Assessment Method (BAM) 2020 and documented in a Biodiversity Development Assessment Report (BDAR), unless:
    a) a BDAR waiver is granted, or
    b) the site is on biodiversity certified land.

The BDAR must include information in the form detailed in the *Biodiversity Conservation Act 2016* (s6.12), *Biodiversity Conservation Regulation 2017* (s6.8) and the BAM.
2. The BDAR must apply the avoid, minimise and offset hierarchy including assessing all direct, indirect, uncertain and prescribed impacts in accordance with the BAM.
3. The BDAR must be submitted with all spatial data associated with the survey and assessment as per Appendix K of the BAM.
4. The BDAR must include details of the measures proposed to address the offset obligation as follows: a) The total number and classes of biodiversity credits required to be retired for the development/project; b) The number and classes of like-for-like biodiversity credits proposed to be retired; c) The number and classes of biodiversity credits proposed to be retired in accordance with the variation rules; d) Any proposal to fund a biodiversity conservation action; e) Any proposal to conduct ecological rehabilitation (if a mining project); f) Any proposal to make a payment to the Biodiversity Conservation Fund. If seeking approval to use the variation rules, the BDAR must contain details of the reasonable steps that have been taken to obtain requisite like-for-like biodiversity credits.
5. The BDAR must be prepared by a person accredited in accordance with the *Accreditation Scheme for the Application of the Biodiversity Assessment Method Order 2017* under s6.10 of the *Biodiversity Conservation Act 2016*.
6. The EIS must contain a summary of the commitments set out in the BDAR to avoid, minimise and mitigate the biodiversity impacts of development that are to be implemented, post approval, by their inclusion in a Biodiversity Management Plan (BMP). The preparation of a BMP to fulfil the avoid and minimise requirements of the BDAR must be included as a condition of consent/approval, unless otherwise agreed with BCS. The BMP must include detailed measures to minimise impacts on biodiversity, monitoring and reporting requirements, proposed adaptive management measures, performance criteria recommended to meet states outcomes, remedial actions to be undertaken if actions fail to achieve stated outcomes, and any additional actions relevant to the management of biodiversity.
7. If the development is on biodiversity certified land, provide information to identify the site (using associated mapping) and demonstrate the proposed development is consistent with the relevant biodiversity measure conferred by the biodiversity certification

NOTE – A BDAR template and guidance document has been created to assist accredited assessors to prepare a BDAR. It has been developed in accordance with best practice, minimum information requirements, and to support BDAR reviewers. The BDAR Template can be found here and the Guidance for the BDAR Template can be found here. Supporting digital data as per Appendix K of the BAM is also required to be submitted.

Water and soils

8. The EIS must map the following features relevant to water and soils including:
   a. Acid sulfate soils (Class 1, 2, 3 or 4 on the Acid Sulfate Soil Planning Map)
   b. Rivers, streams, wetlands, estuaries (as described in s4.2 of the Biodiversity Assessment Method)
   c. Wetlands as described in s4.2 of the Biodiversity Assessment Method.
   d. Groundwater
   e. Groundwater dependent ecosystems
   f. Proposed intake and discharge locations

9. The EIS must describe background conditions for any water resource likely to be affected by the development, including:
   a. Existing surface and groundwater
   b. Hydrology, including volume, frequency and quality of discharges at proposed intake and discharge locations
   c. Water Quality Objectives (as endorsed by the NSW Government http://www.environment.nsw.gov.au/ieo/index.htm) including groundwater as appropriate that represent the community's uses and values for the receiving waters.
   d. Where locally derived indicators and guideline values are not available for the relevant Water Quality Objectives, the EIS must refer to the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZG, 2018).

10. The EIS must assess the impacts of the development on water quality, including:
   a. The nature and degree of impact on receiving waters for both surface and groundwater, demonstrating how the development protects the Water Quality Objectives where they are currently being achieved, and contributes towards achievement of the Water Quality Objectives over time where they are currently not being achieved. This should include an assessment of the mitigating effects of proposed stormwater and wastewater management during and after construction, using the *Risk-based framework for considering waterway health outcomes in strategic land use planning decisions*.

b. Identification of proposed monitoring of water quality or required changes to existing monitoring programs
c. How the development meets the objects of the Coastal Management Act 2016 and management objectives of relevant Coastal Management Areas defined under this Act
d. Consistency with any relevant certified Coastal Management Program (or Coastal Zone Management Plan)

11. EIS must assess the impact of the development on hydrology, including:
    a. Water balance including quantity, quality and source
    b. Effects to downstream rivers, wetlands, estuaries, marine waters (including marine protected areas) and floodplain areas
    c. Effects to downstream water-dependent fauna and flora including groundwater dependent ecosystems
    d. Impacts to natural processes and functions within rivers, wetlands, estuaries and floodplains that affect river system and landscape health such as nutrient flow, aquatic connectivity and access to habitat for spawning and refuge (e.g. river benches)
    e. Changes to environmental water availability, both regulated/licensed and unregulated/rules-based sources of such water
    f. Mitigating effects of proposed stormwater and wastewater management during and after construction on hydrological attributes such as volumes, flow rates, management methods and re-use options
    g. Identification of proposed monitoring of hydrological attributes

Flooding

12. The EIS shall include a flood impact and risk assessment (FIRA). As a minimum the FIRA must:
    a. Consider the relevant provisions of the NSW Flood Risk Management Manual (2023) and associated guides, and existing council and government studies, information and requirements
    b. Identify and describe existing flood behaviour on the site and its surrounding areas for the full range of events, including 5% AEP, 1% AEP, PMF and 0.5% AEP or 0.2% AEP and provide an assessment of the compatibility of the development and its users with flood behaviour. This may require flood modelling where existing flood information is not available
    c. Determine and describe changes in post development flood behaviour, impacts of flooding on existing community and on the development and its future community for full

range of events, 5% AEP, 1% AEP, PMF and 0.5% AEP or 0.2% AEP. This will typically require flood modelling

d. Consider impacts of climate change due to both sea level rise and increase in rainfall intensities considering relevant Council and government advice. The 0.5% AEP or 0.2% AEP events can be used to provide an understanding of the scale of change of flood behaviour relative to the 1% AEP event

e. Propose and assess the effectiveness of management measures required to minimise the impacts and risks of flooding to the development and its users and existing community

Note:

- The scope of a FIRA is intended to be consistent with the Draft EHG FIRA Guide, which is being finalised currently.
- The FIRA will need to be tailored to suit the project being considered, whilst maintaining consistency with the FIRA guide.

Note:

- • Flood modelling is to be undertaken by a suitably qualified engineer consistent with Council's requirements and Australian rainfall and Runoff and is to consider the influence of oceanic conditions in coastal areas.
- • Flood behaviour includes flood volume, extent, depth, level, velocity, duration, rate of rise, flood function and flood hazard.
- • Impacts include those on different elements at risk such as the existing community, property, floor levels, access etc due to changes to flood behaviour and risks to the community including emergency management response for the community.

Attachment B – Project Specific Environmental Assessment Requirements for Canyonleigh BESS (SSD-78247462)

Biodiversity

13. The project must address any Serious and Irreversible impacts (SAII) that may be impacted from the development. BCD recommends early engagement between BCD and the proponent where such entities are likely to be impacted.

Note: The '*Guidance to assist a decision-maker to determine a serious and irreversible impact'* provides criteria and supporting information to assist with the application of the SAII principles, including potential entities that meet the SAII principles and criteria.

14. The Cat 1 land must be assessed for additional biodiversity impacts under clause 6.1 of the BC Regulation. These are referred to as Prescribed impacts in accordance with 1(d) of the BAM 2020.
15. The BDAR must include surveys for grassland fauna such as striped legless lizard, and pink tailed legless lizard.
16. The following prescribed impacts in accordance with Clause 6.1 of the BC Act are to be assessed:
    - the impacts of development on the following habitat of threatened species or ecological communities—
        - karst, caves, crevices, cliffs and other geological features of significance,
        - rocks,
        - human made structures,
        - non-native vegetation,
    - the impacts of development on the connectivity of different areas of habitat of threatened species that facilitates the movement of those species across their range,
    - the impacts of development on movement of threatened species that maintains their lifecycle,
    - the impacts of development on water quality, water bodies and hydrological processes that sustain threatened species and threatened ecological communities (including from subsidence or upsidence resulting from underground mining or other development) – refer to Addendum to NSW Biodiversity Offsets Policy for Major Projects: Upland swamps impacted by longwall mining subsidence (OEH, 2016),

- the impacts of wind turbine strikes on protected animals – refer to Wind farms: Turbine Strike Assessment and Adaptive Management Plan: Biodiversity Assessment Method Guide (BCS, 2023)
- the impacts of vehicle strikes on threatened species of animals or on animals that are part of a threatened ecological community.

17. Offsets for prescribed impacts are to be considered if avoidance and mitigation measures are not applicable, or will not result in the complete reduction of prescribed impacts occurring. The assessment and calculation of a predicted offset obligation in accordance with Section 7.14 of the Biodiversity Conservation Act 2016 should be presented in the BDAR.
18. Cumulative impacts should be assessed through application of the Cumulative Impact Assessment for State Significant Projects guidance (DPE, Oct 2022).

Flooding and coastal hazards

19. The EIS must address the following project-specific requirements for flood risk:

a. The EIS must assess the potential impact of flooding for the full range of events up to and including the PMF:

- On the proposed facility.
- On public safety including accesses to the proposed facility and waterway crossings.

b. The EIS must detail:

- The storage levels of any hazardous materials.
- The structural integrity of any proposed storage buildings / structures in events up to and including the PMF.
- An assessment of impacts, risks and controls associated with inundation of the facility or structures containing hazardous materials including any off-site impacts in large to extreme floods up to the PMF.

c. The EIS should:

- Demonstrate how the facility can continue to operate to avoid the potential for shutdown of power supply and/or power storage as a result of flooding.
- Address any flow on effects and risks of shutdown such as impacts to the telecommunications network.

d. The EIS must assess the hydrological impacts of the proposed development on the environment including erosion potential, off-site flooding and how that will be mitigated.

Attachment C – Guidance Material

Title	Web address
Relevant Legislation	
Biodiversity Conservation Act 2016	https://www.legislation.nsw.gov.au/#/view/act/2016/63/full
Coastal Management Act 2016	https://www.legislation.nsw.gov.au/#/view/act/2016/20/full
SEPP (Resilience and Hazards) 2021	https://legislation.nsw.gov.au/view/whole/html/inforce/current/epi-2021-0730
Commonwealth Environment Protection and Biodiversity Conservation Act 1999	https://www.legislation.gov.au/Series/C2004A00485
Environmental Planning and Assessment Act 1979	https://legislation.nsw.gov.au/view/html/inforce/current/act-1979-203
Fisheries Management Act 1994	https://legislation.nsw.gov.au/view/html/inforce/current/act-1979-203
Marine Estate Management Act 2014	https://legislation.nsw.gov.au/view/html/inforce/current/act-2014-072
National Parks and Wildlife Act 1974	https://legislation.nsw.gov.au/view/html/inforce/current/act-1974-080
Protection of the Environment Operations Act 1997	https://legislation.nsw.gov.au/view/html/inforce/current/act-1997-156
Water Management Act 2000	https://legislation.nsw.gov.au/view/html/inforce/current/act-2000-092
Wilderness Act 1987	https://legislation.nsw.gov.au/view/html/inforce/current/act-1987-196

Title	Web address
Biodiversity	
Biodiversity Assessment Method 2020 & assessor resources (including legislation, manuals, BDAR templates, survey guidelines, registers and databases)	https://www.environment.nsw.gov.au/research-and-publications/publications-search/biodiversity-assessment-method-2020 https://www.environment.nsw.gov.au/topics/animals-and-plants/biodiversity/accredited-assessors/assessor-resources
Guidance to assist a decision maker to determine a serious and irreversible impact	https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Animals-and-plants/Biodiversity/guidance-decision-makers-determine-serious-irreversible-impact-190511.pdf
Policy and guidelines for fish habitat conservation and management	https://www.dpi.nsw.gov.au/fishing/habitat/publications/pubs/fish-habitat-conservation
List of national parks	http://www.environment.nsw.gov.au/NationalParks/parksearchatoz.aspx
Revocation, recategorisation and road adjustment policy	https://www.environment.nsw.gov.au/topics/parks-reserves-and-protected-areas/park-policies/revocation-recategorisation-and-road-adjustment
Guidelines for developments adjacent to national parks and other reserves	https://www.environment.nsw.gov.au/topics/parks-reserves-and-protected-areas/development-guidelines
SEED Data Portal (access to online spatial & environmental data)	http://seed.nsw.gov.au/

Title	Web address
Conservation lands	
Guidelines for developments adjacent to NPWS managed lands	https://www.environment.nsw.gov.au/topics/parks-reserves-and-protected-areas/development-guidelines
National parks and other lands managed by NPWS	List *https://www.nationalparks.nsw.gov.au/visit-a-park* Spatial data *https://datasets.seed.nsw.gov.au/dataset/npws-all-managed-land* Recategorisation & adjustments https://www.environment.nsw.gov.au/topics/parks-reserves-and-protected-areas/park-policies/revocation-recategorisation-and-road-adjustment
Water and Soils	
Water	
Water Quality Objectives	http://www.environment.nsw.gov.au/ieo/index.htm
Australian and New Zealand Guidelines for Fresh and Marine Water Quality	https://www.waterquality.gov.au/anz-guidelines
Water Quality Guidelines Mixing zones	https://www.waterquality.gov.au/anz-guidelines/resources/key-concepts/mixing-zones

Title	Web address
Approved methods for the sampling and analysis of water pollutants in NSW (2022)	https://www.epa.nsw.gov.au/licensing-and-regulation/licensing/environment-protection-licences/licensing-under-poeo-act-1997/licensing-to-regulate-water-pollution/approved-methods-for-sampling-and-analysing-water-pollutants
Risk-based Framework for Considering Waterway Health Outcomes in Strategic Land-use Planning Decisions.	https://www.environment.nsw.gov.au/research-and-publications/publications-search/risk-based-framework-for-considering-waterway-health-outcomes-in-strategic-land-use-planning
Soils	
Acid Sulfate Soils Planning Maps via Data.NSW	http://data.nsw.gov.au/data/
Acid Sulfate Soils Manual (Stone et al. 1998)	http://www.environment.nsw.gov.au/resources/epa/Acid-Sulfate-Manual-1998.pdf
National Acid Sulfate Soils Guidance: National acid sulfate soils identification and laboratory methods manual, Department of Agriculture and Water Resources, Canberra, ACT. (Sullivan, L, Ward, N, Toppler, N and Lancaster, G. 2018a).	https://www.waterquality.gov.au/sites/default/files/documents/dewatering-acid-sulfate-soils.pdf

Title	Web address
National Acid Sulfate Soils guidance: National acid sulfate soils sampling and identification methods manual, Department of Agriculture and Water Resources, Canberra ACT. (Sullivan, L, Ward, N, Toppler, N and Lancaster, G. 2018b).	https://www.scu.edu.au/media/scueduau/eal/documents/National-acid-sulfate-soils-sampling-and-indentification-methods-manual.pdf
National Acid Sulfate soils Guidance: Overview and management of monosulfidic black ooze (MBO) accumulations in waterways and wetlands, Department of Agriculture and Water Resources, Canberra ACT. (Sullivan, LA, Ward, NJ, Bush, RT, Toppler, NR, Choppala, G. 2018c)	https://www.scu.edu.au/media/scueduau/eal/documents/Overview-and-management-of-monosulfidic-black-ooze-MBO-accumulations-in-waterways-and-wetlands.pdf

Title	Web address
National Acid sulfate soils guidance: Guidelines for the dredging of acid sulfate soil sediments and associated dredge spoil management, Department of Agriculture and Water Resources, Canberra, ACT (Simpson, SL, Mosley, L, Batley, GE and Shand P. 2018).	https://www.waterquality.gov.au/sites/default/files/documents/dredging-sediments-spoil.pdf
National Acid Sulfate Soils Guidance: Guidance for the dewatering of acid sulfate soils in shallow groundwater environments, Department of Agriculture and Water Resources, Canberra, ACT. (Shand, P, Appleyard, S, Simpson, SL, Degens, B, Mosley, LM 2018)	https://www.waterquality.gov.au/sites/default/files/documents/dewatering-acid-sulfate-soils.pdf
Flooding and Coastal Hazards	
Coastal management	https://www.environment.nsw.gov.au/topics/water/coasts/coastal-management
Floodplain development manual	https://www.environment.nsw.gov.au/topics/water/floodplains/floodplain-manual
Coastal Management Manual	https://www.environment.nsw.gov.au/topics/water/coasts/coastal-management/manual

Title	Web address
NSW Climate Impact Profile	http://climatechange.environment.nsw.gov.au/
Floodplain Risk Management Guidelines	http://www.environment.nsw.gov.au/topics/water/coasts-and-floodplains/floodplains/floodplain-guidelines
Australian Rainfall and Runoff: A Guide to Flood Estimation	http://arr.ga.gov.au/
Marine and Coastal ecology	
Marine Estate Management Strategy	https://www.marine.nsw.gov.au/marine-estate-programs/marine-estate-management-strategy
NSW Marine Estate Threat and Risk Assessment	https://www.marine.nsw.gov.au/marine-estate-programs/threat-and-risk-assessment
National Light Pollution Guidelines for Wildlife including Marine Turtles, Seabirds and Migratory Shorebirds	https://www.dcceew.gov.au/environment/biodiversity/publications/national-light-pollution-guidelines-wildlife
NSW Marine Protected Areas	https://www.marine.nsw.gov.au/your-marine-estate/marine-protected-areas

APPENDIX B CANYONLEIGH BESS LAND CATEGORY ASSESSMENT (ERM, 2024)

Canyonleigh Battery Energy Storage System

Land Category Assessment Report

PREPARED FOR

X-Elio Aus2 Pty Ltd

DATE

06 December 2024

REFERENCE

0711340



DOCUMENT DETAILS

DOCUMENT TITLE	Canyonleigh Battery Energy Storage System
DOCUMENT SUBTITLE	Land Category Assessment Report
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Date	06 December 2024
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Author	Jessarne Palmer, Claire Hewitt
Client name	X-Elio Aus2 Pty Ltd

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SIGNATURE PAGE

Canyonleigh Battery Energy Storage System

Land Category Assessment Report

0711340



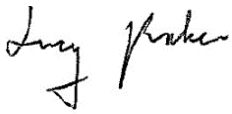
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ACRONYMS AND ABBREVIATIONS

Acronyms	Description
BAM	Biodiversity Assessment Method
BC Act	*Biodiversity Conservation Act 2016* (NSW)
BDAR	Biodiversity Development Assessment Report
DPE	(Former) Department of Planning and Environment (NSW)
EIS	Environmental Impact Statement
ERM	Environmental Resources Management Australia Pty Ltd
ha	hectare
IGGAM	Interim Grasslands and other Groundcover Assessment Method
km	kilometre
LCA	Land Category Assessment
LGA	Local government area
LLS	*Local Land Services Act 2013* (NSW)
LLS Regulation	*Local Land Services Regulation 2014* (NSW)
m	metre
NSW	New South Wales
NSW DCCEEW	Department of Climate Change, Energy, the Environment and Water (NSW)
NV Act	*Native Vegetation Act 2003* (NSW) (repealed)
NVR map	Native Vegetation Regulatory map
PCT	Plant Community Type
PVP	Property Vegetation Plan
SVTM	State Vegetation Type Map

1. INTRODUCTION

Environmental Resources Management Australia Pty Ltd (ERM) has been engaged by X-Elio Aus2 Pty Ltd (X-Elio) (the Proponent) to prepare a Land Category Assessment (LCA) report for the proposed Canyonleigh Battery Energy Storage System (BESS) (the Project). The Project is located in Brayton, New South Wales (NSW) 2579, situated within the Goulburn Mulwaree Local Government Area (LGA). The Project Area covers approximately 98.2 hectares (ha) of land, referred to as the Subject Land.

The development of the Subject Land will require assessment using the NSW Biodiversity Assessment Method (BAM), as well as the preparation of a Biodiversity Development Assessment Report (BDAR) to support the submission of the Project Environmental Impact Statement (EIS). Part 6 Division 2 section 6.8 (3) of the NSW *Biodiversity Conservation Act 2016* (BC Act) determines that the BAM is to exclude the assessment of the impacts of clearing of native vegetation and loss of habitat on Category 1 - exempt land (within the meaning of Part 5A of the NSW *Local Land Services Act 2013* (LLS Act)), other than prescribed impacts (e.g., impacts on the habitat of threatened species). This determination is repeated in section 1.5(1)(d) of the BAM.

Mapped extents of Category 1 – exempt land and Category 2 – regulated land for the Subject Land is not publicly available on the transitional Native Vegetation Regulatory (NVR) map. However, mapped extents of Category 2 – sensitive regulated land (environmentally sensitive land), Category 2 – vulnerable regulated land (steep or highly erodible, protected riparian or special category land) and excluded land (land excluded from Part 5A of the LLS Act) are available, and have legal effect.

All land categorisation layers are visible on the draft NVR map. This draft NVR map does not have legal effect, but it has been published to enable landholders to review the accuracy of the mapped land categorisations on their land before the NVR map is finalised.

During the transitional period or until all layers are publicly available and in force, BAM accredited assessors may establish a reasonable approximation of land categorisation for the Environment Agency Head to consider. An outline of an evidence-based approach to identifying NVR map land categorisation and the biodiversity assessment requirements in relation to Category 1 – exempt land is provided in the guide *Determining native vegetation land categorisation for application in the Biodiversity Offsets Scheme* (State Government of NSW and Department of Planning and Environment (DPE), 2023).

This report outlines the reasonable approximation of land categorisation for the Subject Land of the Project, based on the transitional NVR map and legislation pertaining to land categorisation, and with reference to the draft NVR map.

1.1 LEGISLATIVE PROVISIONS FOR DETERMINING CATEGORY 1 – EXEMPT LAND

The legislative provisions for determining land categorisation are outlined in the sections below.

1.1.1 LAND CATEGORY DEFINITIONS

Part 5A, Division 2, Sections 60H and 60I of the LLS Act define Category 1 – exempt land and Category 2 - regulated land. The definitions are summarised in Table 1-1 below.

TABLE 1-1 LAND CATEGORY DEFINITIONS UNDER THE LOCAL LAND SERVICES ACT 2013

Land Category	Colour on the transitional and / or draft NVR Map	Definition
Category 1 – exempt land	Not visible (transitional NVR map) Blue (draft NVR map)	• Land cleared of native vegetation on 1 January 1990 or lawfully cleared after 1 January 1990; • Low conservation grasslands; • Land containing only low conversation groundcover (not being grasslands); • Native vegetation identified as regrowth in a Property Vegetation Plan (PVP) under the repealed *Native Vegetation Act 2003*, only where the PVP specifies a regrowth date; and/or • Land bio-certified under the BC Act.
Category 2 – regulated land	Not visible (transitional NVR map) Yellow (draft NVR map)	• Land not cleared on 1 January 1990 or unlawfully cleared after 1 January 1990; • Native vegetation growth with the assistance of public funds; • Land that was subject to private native forestry PVP that is no longer in force; • Grasslands that are neither low nor high conservation grasslands (the latter being Category 2 – sensitive regulated land); • Land containing low conservation grasslands beneath the canopy or drip line of woody vegetation; and/or • Travelling stock reserves, apart from travelling stock reserves in the Western Division.
Category 2 – vulnerable regulated land	Orange (transitional and draft NVR maps)	• Steep or highly erodible land; • Protected riparian areas; and/or • Land susceptible to erosion, or land that is otherwise environmentally sensitive.
Category 2 – sensitive regulated land	Pink (transitional and draft NVR maps)	• Rainforest and old-growth forest; • High conservation grasslands; • Coastal wetlands and littoral rainforest (*Coastal Management Act 2016*); • Land mapped as containing critically endangered plants and/or critically endangered ecological communities; • Land that is subject to a private land, property or trust conservation agreement; • Land subject to a bio-certification conservation measure; • A set-aside under the NSW Land Management (Native Vegetation) Code 2018; • Land comprising an offset under a PVP or set-aside under a code under the repealed *Native Vegetation Act 2003;* • Land identified as Koala habitat (of a kind prescribed by the regulations) in a plan of management made under State Environmental Planning Policy (Biodiversity Conservation); • Land subjected to remedial action or conservation measures under the BC Act;

Land Category	Colour on the transitional and / or draft NVR Map	Definition
		• Land recommended for listing as an Area of Outstanding Biodiversity Value; • Conservation Areas under the Southern Mallee Land Use Agreement; • Native vegetation that must be retained under the NSW *Plantation and Reafforestation Act 1999; and/or* • Land subject to a condition of development consent requiring the land to be set aside for conservation purposes under the NSW *Environment Planning and Assessment Act 1979.*
Excluded Land	Grey (transitional and draft NVR maps)	• Land excluded from the LLS Act, such as urban land, national park estate and state forestry land.

1.1.2 SECTION 60F OF THE NSW LOCAL LAND SERVICES ACT 2013

Under Part 5A Division 2 section 60F of the LLS Act, matters are described relating to transitional arrangements in place until the finalisation of the NVR Map.

Section 60F includes a provision that, 'an area is taken, during the transitional period, to be low conservation value grasslands if it comprises only groundcover whose clearing was permitted by section 20 of the NSW *Native Vegetation Act 2003*' (NV Act). It also notes that section 20 of the NV Act 'permitted clearing if the vegetation comprised less than 50% of indigenous species of vegetation'.

1.1.3 SECTION 60J OF THE NSW LOCAL LAND SERVICES ACT 2013

Under Part 5A Division 2 section 60J of the LLS Act, matters relating to the determination of mapped Category 1 - exempt land or Category 2 - regulated land include:

- 60J (2) Native vegetation that comprises grasslands or other non-woody vegetation is taken to have been cleared if the native vegetation was significantly disturbed or modified. The regulations (NSW *Local Land Services Regulation 2014* (LLS Regulation)) may make provision for the purposes of determining whether native vegetation has been significantly disturbed or modified for the purposes of this Division.

The clearing of native vegetation after 1990 must have been done legally, and the vegetation must have been cleared as of 1 January 1990 or between 1 January 1990 and 25 August 2017. Satellite imagery may be used to determine the native vegetation clearing.

1.1.4 SECTION 114 OF THE NSW LOCAL LAND SERVICES REGULATION 2014

Part 14 Division 2 section 114 of the LLS Regulation outlines how to determine whether native vegetation has been significantly disturbed or modified.

1. Native vegetation that comprises grasslands or other non-woody vegetation is taken to have been significantly disturbed or modified (and therefore cleared) only if –
   a) there has been a detectable variation (from information obtained from aerial or satellite imagery) in the structure or composition, or both, of non-woody vegetation; and

b) that variation is consistent with management of pasture or crops for agricultural purposes; and

c) that variation has been sustained for at least 12 months on more than one occasion before the commencement of Part 5A of the Act (the LLS Act); and

d) that variation has not been caused only by grazing on the land; and

e) that variation occurred (from information obtained from aerial or satellite imagery) between 1 January 1990 and the date of commencement of Part 5A of the Act (the LLS Act).

2. METHODOLOGY

The land categorisation assessment detailed in this document followed the guidelines detailed in *Determining Native Land Categorisation for Application in the Biodiversity Offsets Scheme* (DPE, 2023). The steps used in this assessment are summarised in Figure 2-1. Note that reference has been made to Category 1 – exempt land and Category 2 – regulated land layers visible on the draft NVR map in relation to the Subject Land, but the final land categorisation determination made by ERM has been based on legislative provisions and supported by site assessment.

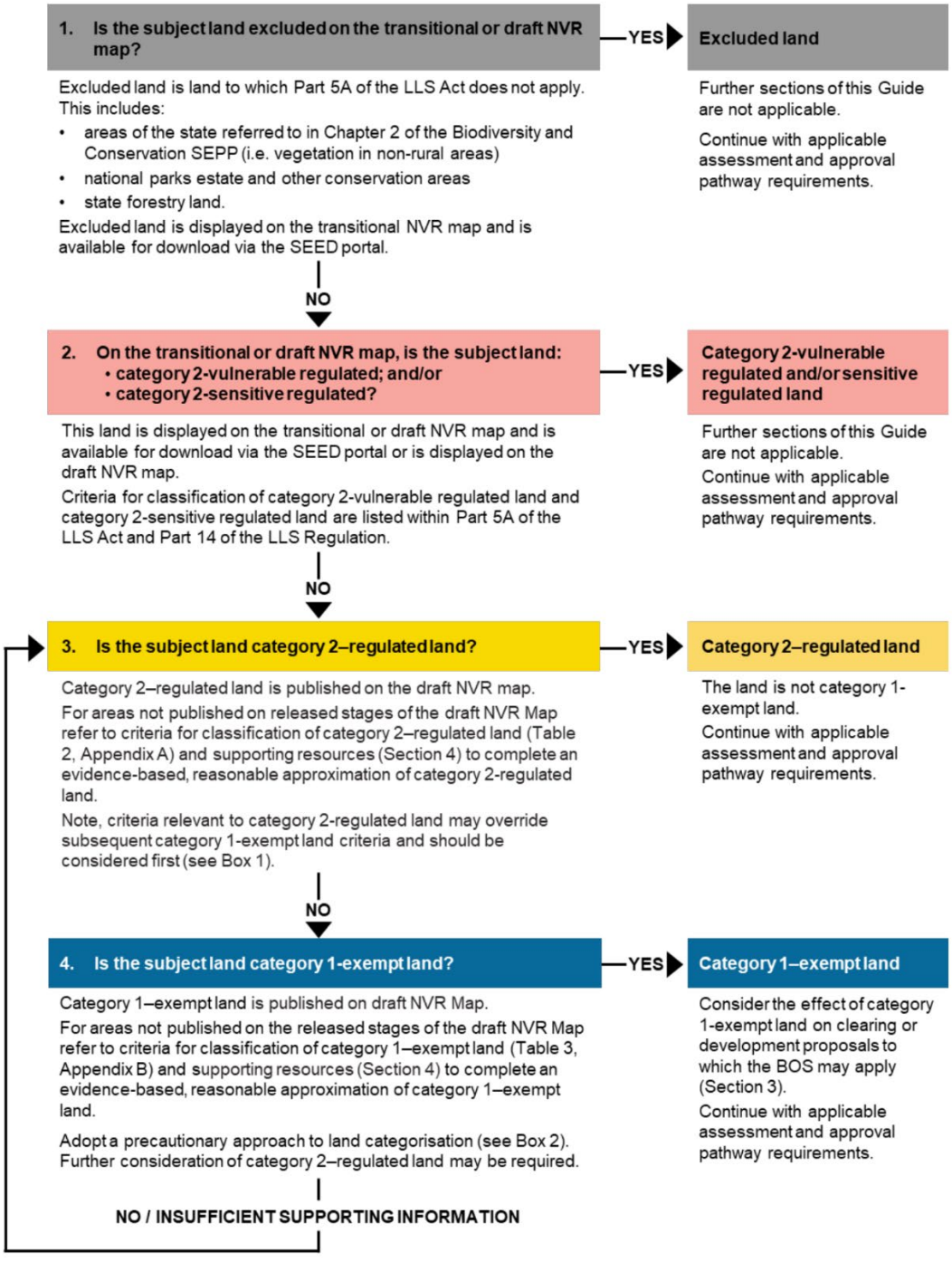


FIGURE 2-1 PROCESS FOR DETERMINING LAND CATEGORISATION IN NSW (DPE, 2023).

2.1 DESKTOP ANALYSIS

A desktop analysis of the Subject Land was performed as part of this assessment. The land categories identified in Table 1-1 were used to make a determination, as well as the following provisions of the LLS Act and LLS Regulation:

- Section 60F;
- Section 60J; and
- Section 114.

2.1.1 SPATIAL DATA

Spatial data used in this assessment included the following:

- The transitional NVR map ((Department of Climate Change, Energy, the Environment and Water) (DCCEEW), 2024a).

  This was used to determine land categorisations on the Subject Land with legal effect, in other words, Category 2 – sensitive regulated land, Category 2 – vulnerable regulated land and Excluded land. (https://www.environment.nsw.gov.au/topics/animals-and-plants/biodiversity/native-vegetation-regulatory-map/transitional-native-vegetation-regulatory-map).

  Refer to Figure 2-2.
- NSW ePlanning Spatial Viewer (DPE, 2022).

  This was used to determine the land zoning of the Subject Land. (https://www.planningportal.nsw.gov.au/spatialviewer).

  Refer to Figure 2-3.
- The Historical Imagery Viewer (Spatial Services, 2021).

  This was used to obtain imagery from 1990, or from years surrounding 1990, for the Subject Land. Imagery was obtained for 1963, 1969, 1974, 1989, 1991 and 1997 as no historical imagery was available for 1990. (https://www.spatial.nsw.gov.au/products_and_services/aerial_and_historical_imagery).

  Refer to Figure 2-4 (1963), Figure 2-5 (1969), Figure 2-6 (1974), Figure 2-7(1989), Figure 2-8 (1991), and Figure 2-9 (1997).
- NSW Landuse 2017 dataset v1.5 (NSW DCCEEW, 2023).

  This spatial layer was used to determine how land is being used on the Subject Land, as mapped by the NSW Department of Climate Change, Energy, the Environment and Water (NSW DCCEEW).

  (https://datasets.seed.nsw.gov.au/dataset/nsw-landuse-2017-v1p5-f0ed-clone-a95d).

  Refer to Figure 2-10.
- NSW Native Vegetation Extent Raster 5 m v1.4 (NSW DCCEEW, 2019).

  This spatial layer was used to delineate native tree cover and woodlands from groundcover vegetation, water and non-native woody vegetation on the Subject Land. (https://datasets.seed.nsw.gov.au/dataset/nsw-native-vegetation-extent-5m-raster-v1-0).

  Refer to Figure 2-11.

- NSW State Vegetation Type Map (SVTM) (release C2.0M2.0, December 2023) (NSW DCCEEW, 2022).

  This spatial layer was used to determine regional-scale mapping of NSW Plant Community Types (PCT), as mapped by NSW DCCEEW.

  (https://datasets.seed.nsw.gov.au/dataset/nsw-state-vegetation-type-map).

  Refer to Figure 2-12.
- The draft NVR map (NSW DCCEEW, 2024b).

  This was used to determine draft land categorisations without legal effect, in other words, Category 1 – exempt land and Category 2 – regulated land. (https://www.environment.nsw.gov.au/topics/animals-and-plants/biodiversity/native-vegetation-regulatory-map/draft-native-vegetation-regulatory-map).

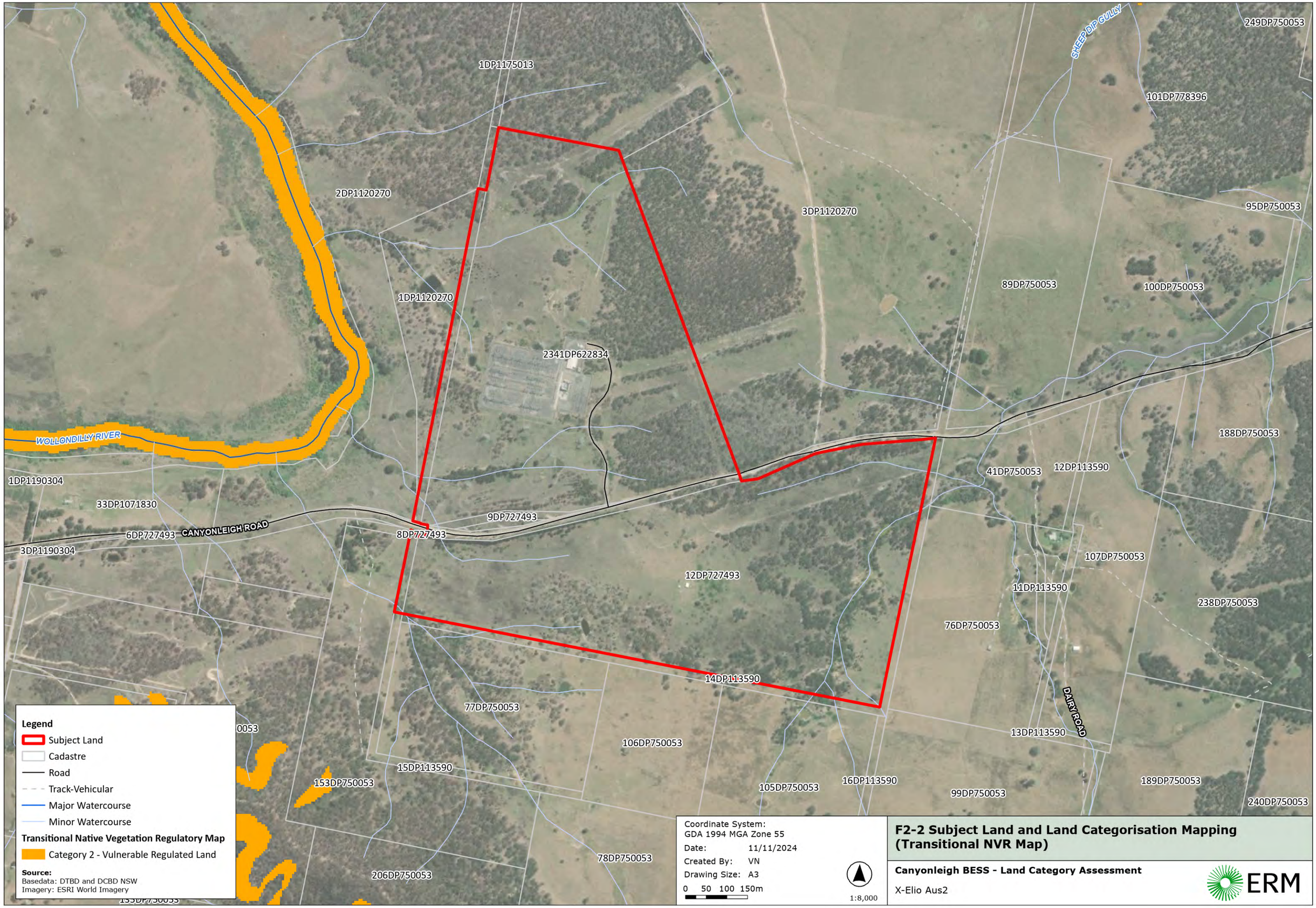
  Refer to Figure 2-13.
- Vegetation mapping developed by ERM through data collected during site assessments undertaken in January 2024 and April 2024.

  Refer to Figure 2-14.

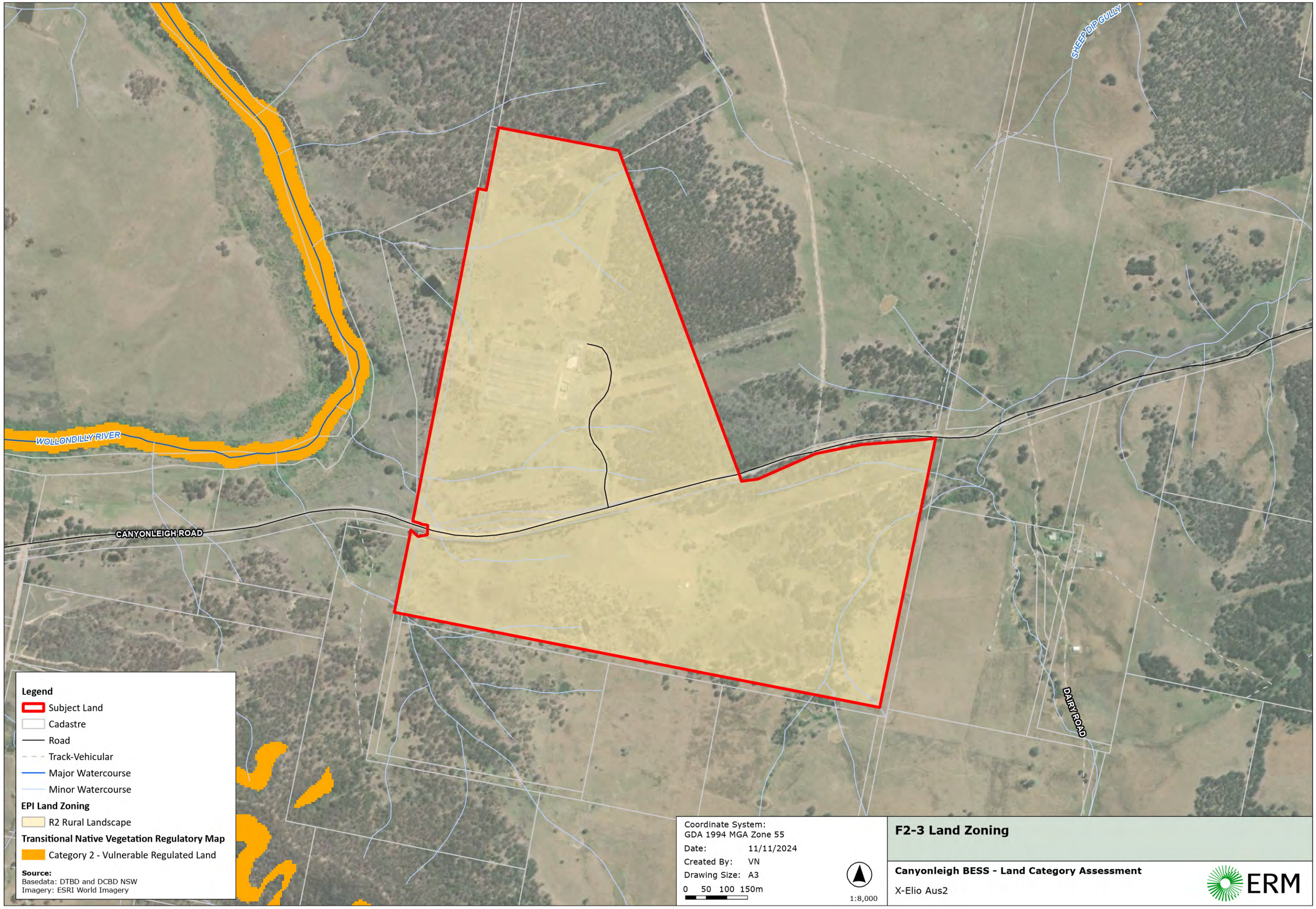
2.1.2 HISTORICAL IMAGERY

Historical aerial imagery was used to determine whether areas of the Subject Land were significantly disturbed or modified in 1990. Images were sourced from the Historical Imagery Viewer, managed by Spatial Services (a division of the NSW Department of Customer Service).

Historic aerial imagery was not available for 1990 from Spatial Services, therefore images from 1963, 1969, 1974, 1989, 1991 and 1997 have been used in this assessment. These images provide a reasonable indication of what the Subject Land may have looked like in 1990. The historical aerial images of the Subject Land were reviewed and analysed for significant disturbance or modification of non-woody vegetation.



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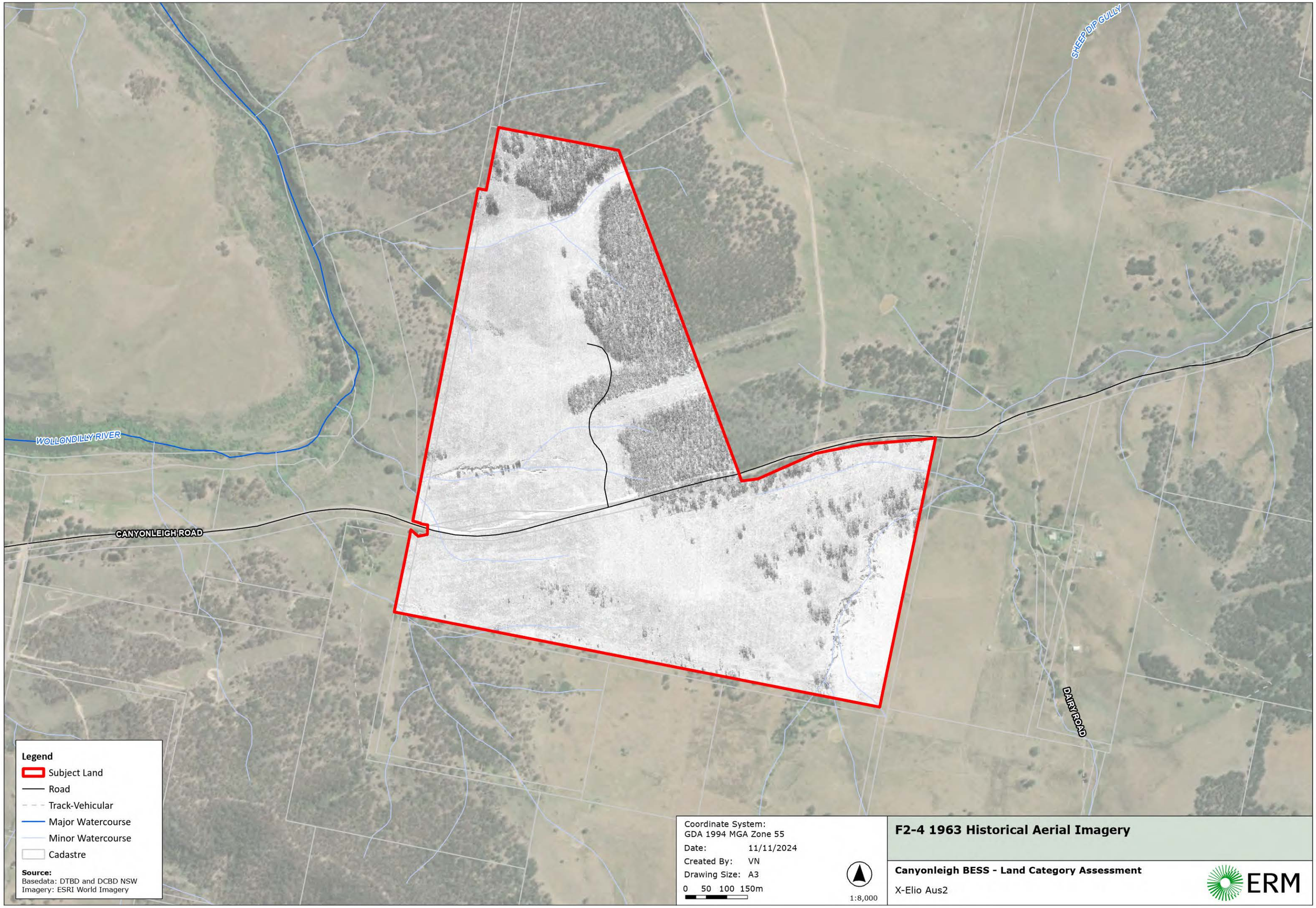
F2-3 Land Zoning

Canyonleigh BESS - Land Category Assessment

X-Elio Aus2

ERM

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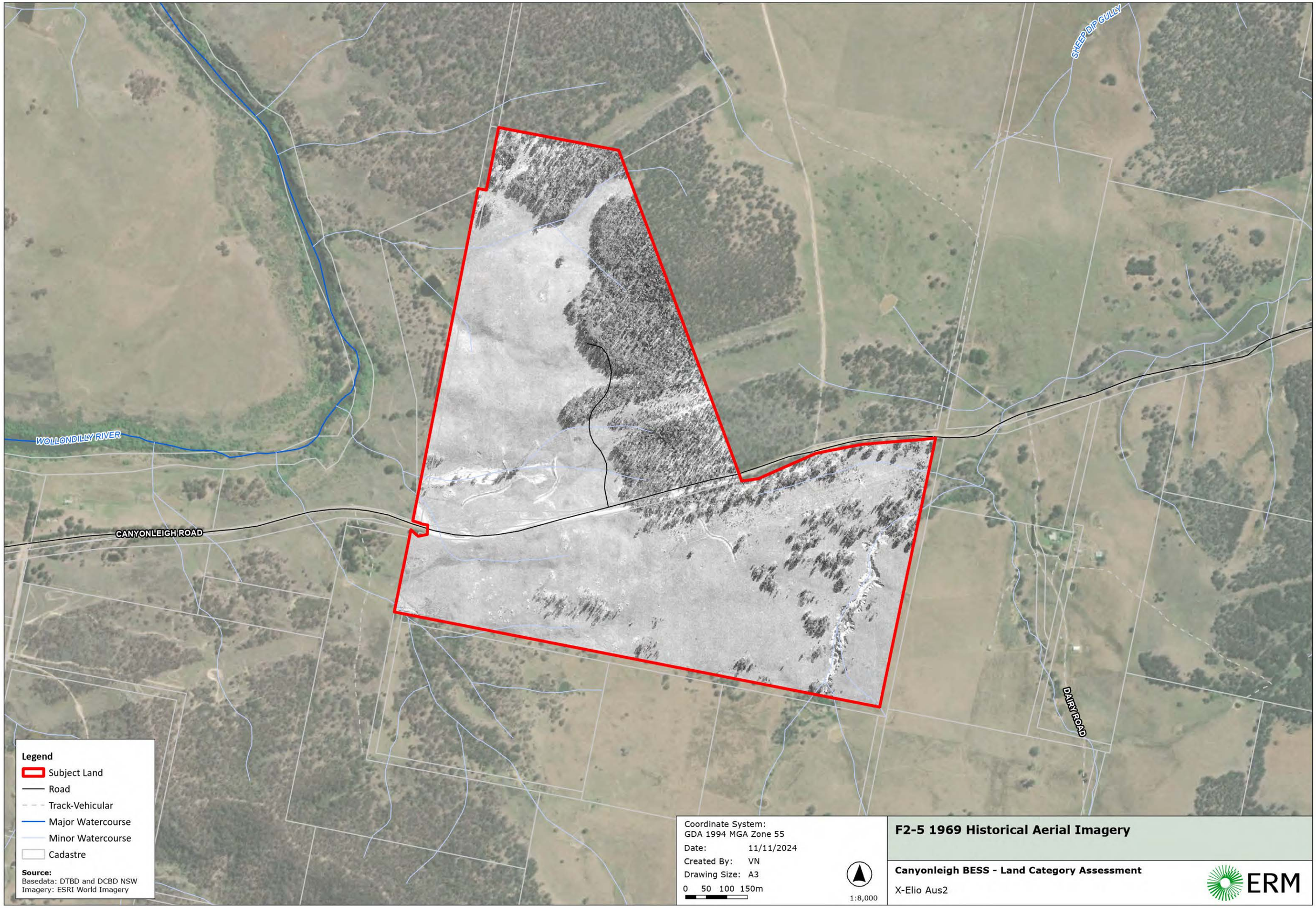
F2-4 1963 Historical Aerial Imagery

Canyonleigh BESS - Land Category Assessment

X-Elio Aus2

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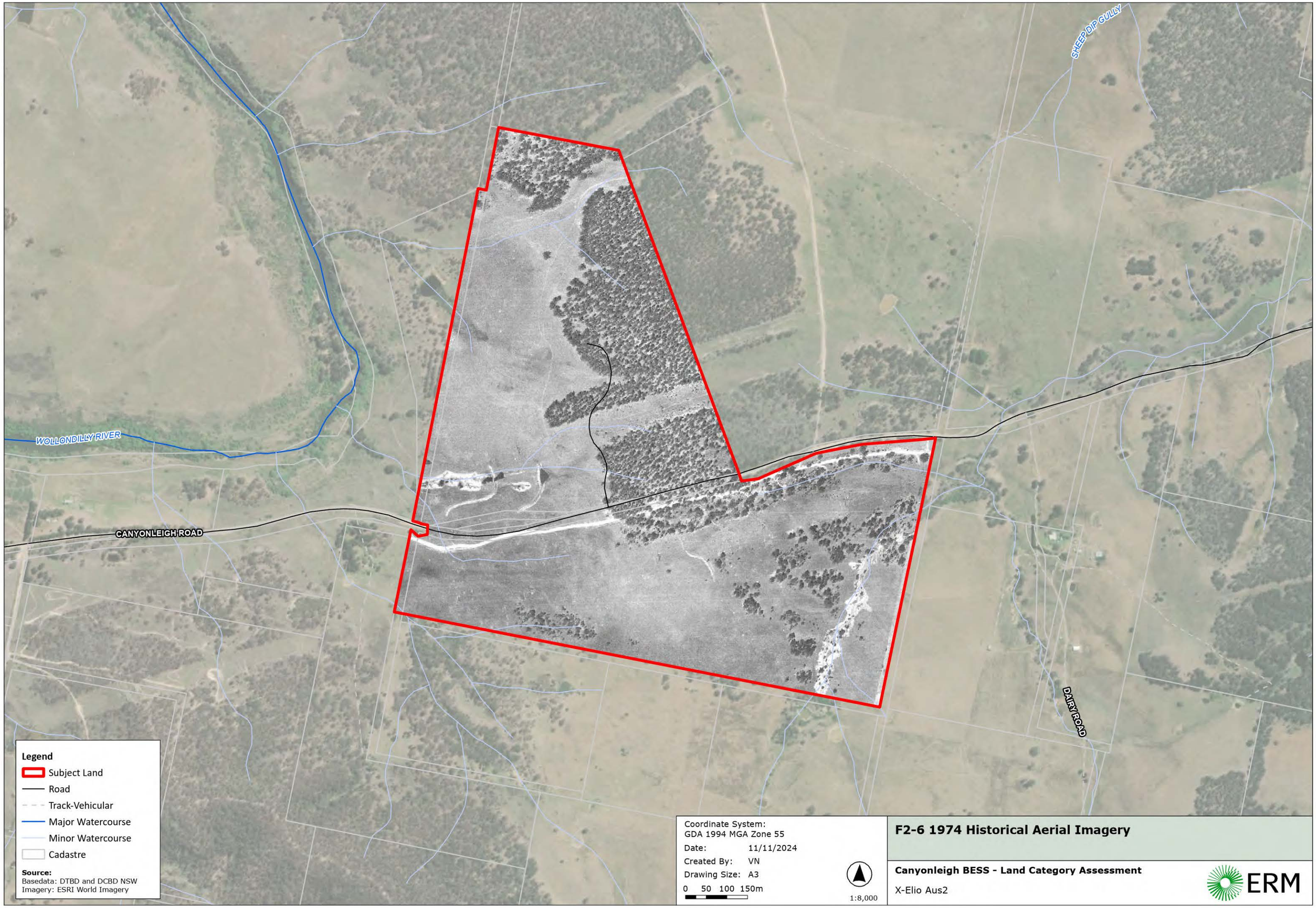
F2-5 1969 Historical Aerial Imagery

Canyonleigh BESS - Land Category Assessment

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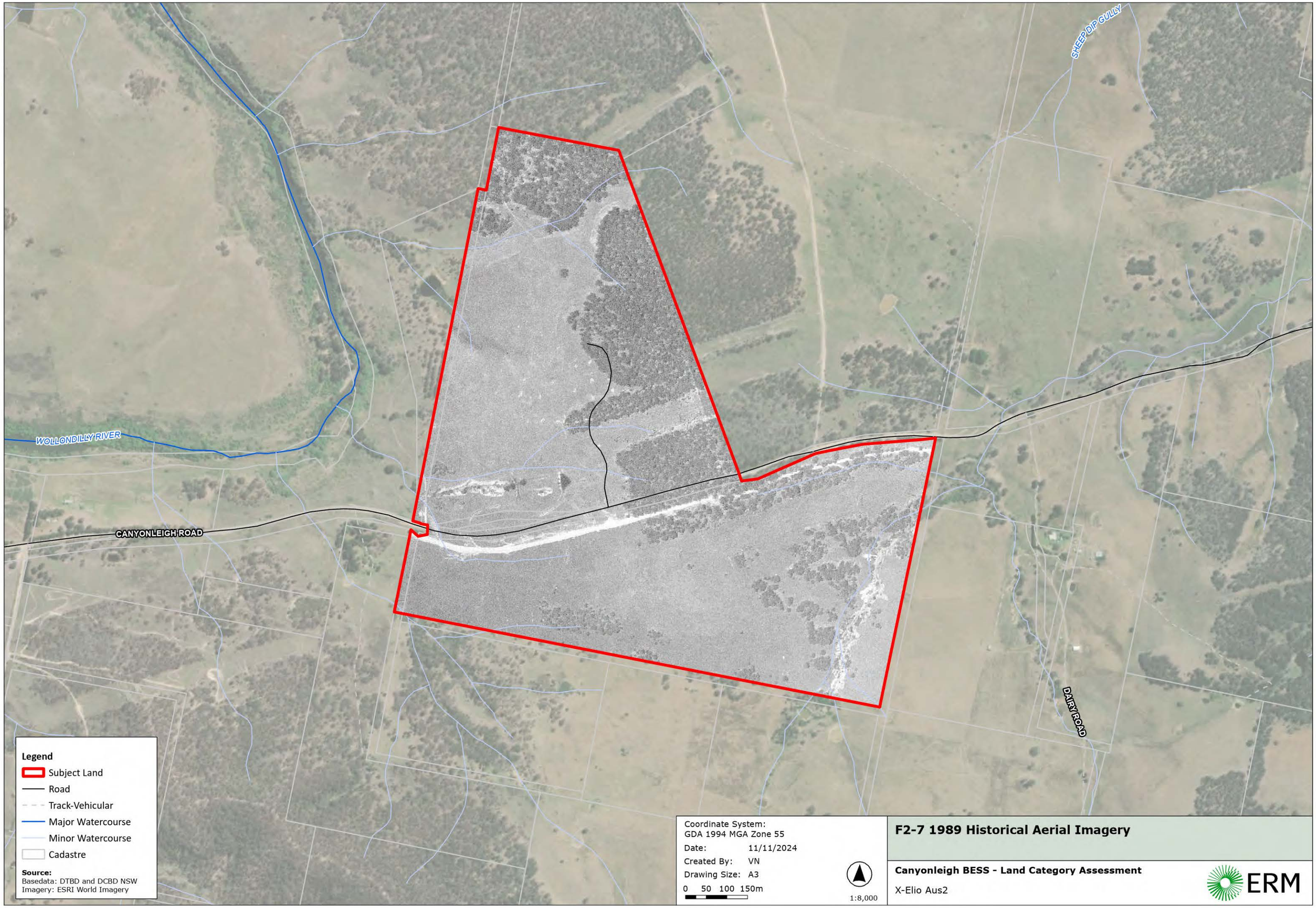
F2-6 1974 Historical Aerial Imagery

Canyonleigh BESS - Land Category Assessment

X-Elio Aus2

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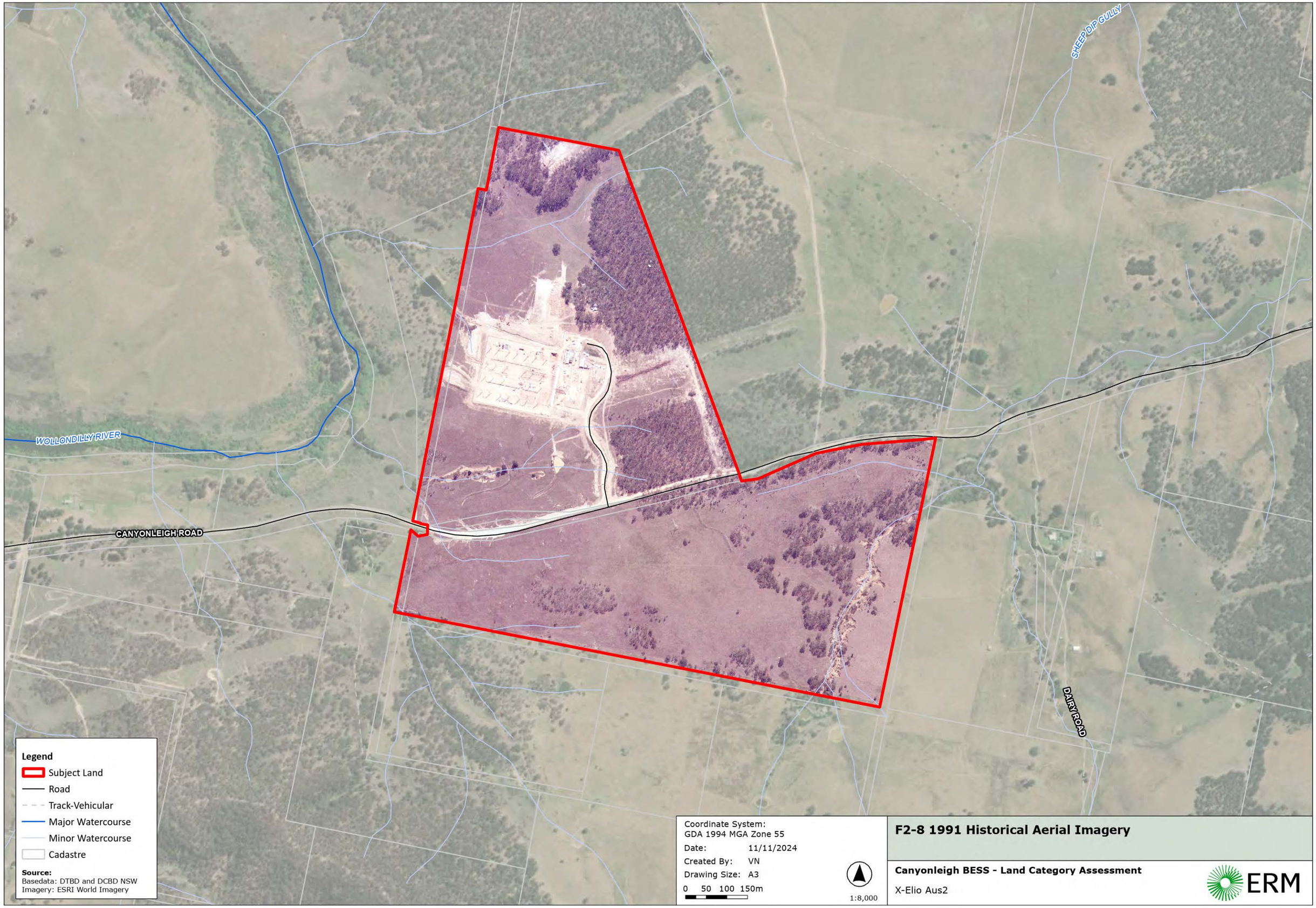
F2-7 1989 Historical Aerial Imagery

Canyonleigh BESS - Land Category Assessment

X-Elio Aus2

ERM

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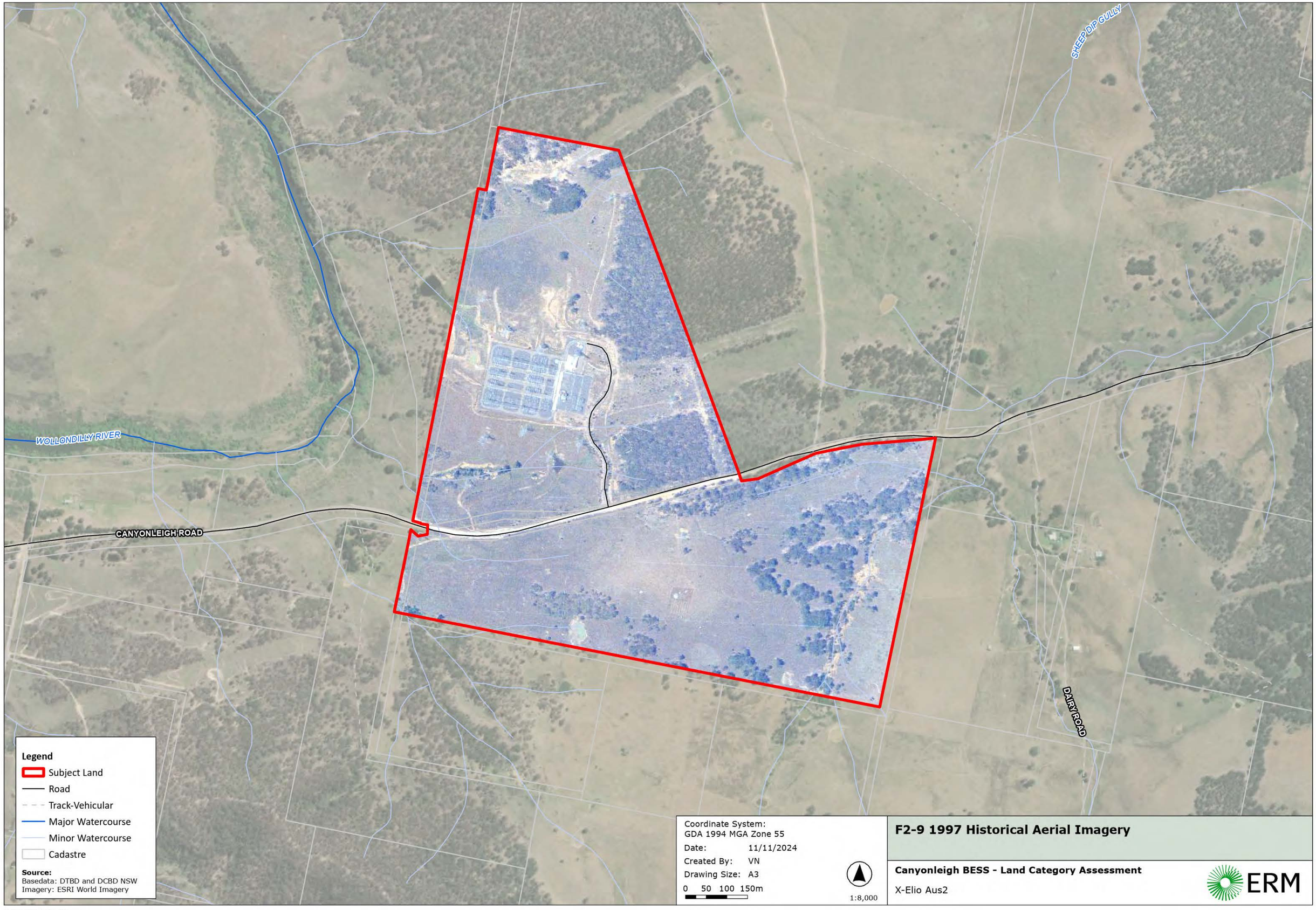
F2-8 1991 Historical Aerial Imagery

Canyonleigh BESS - Land Category Assessment

X-Elio Aus2

ERM

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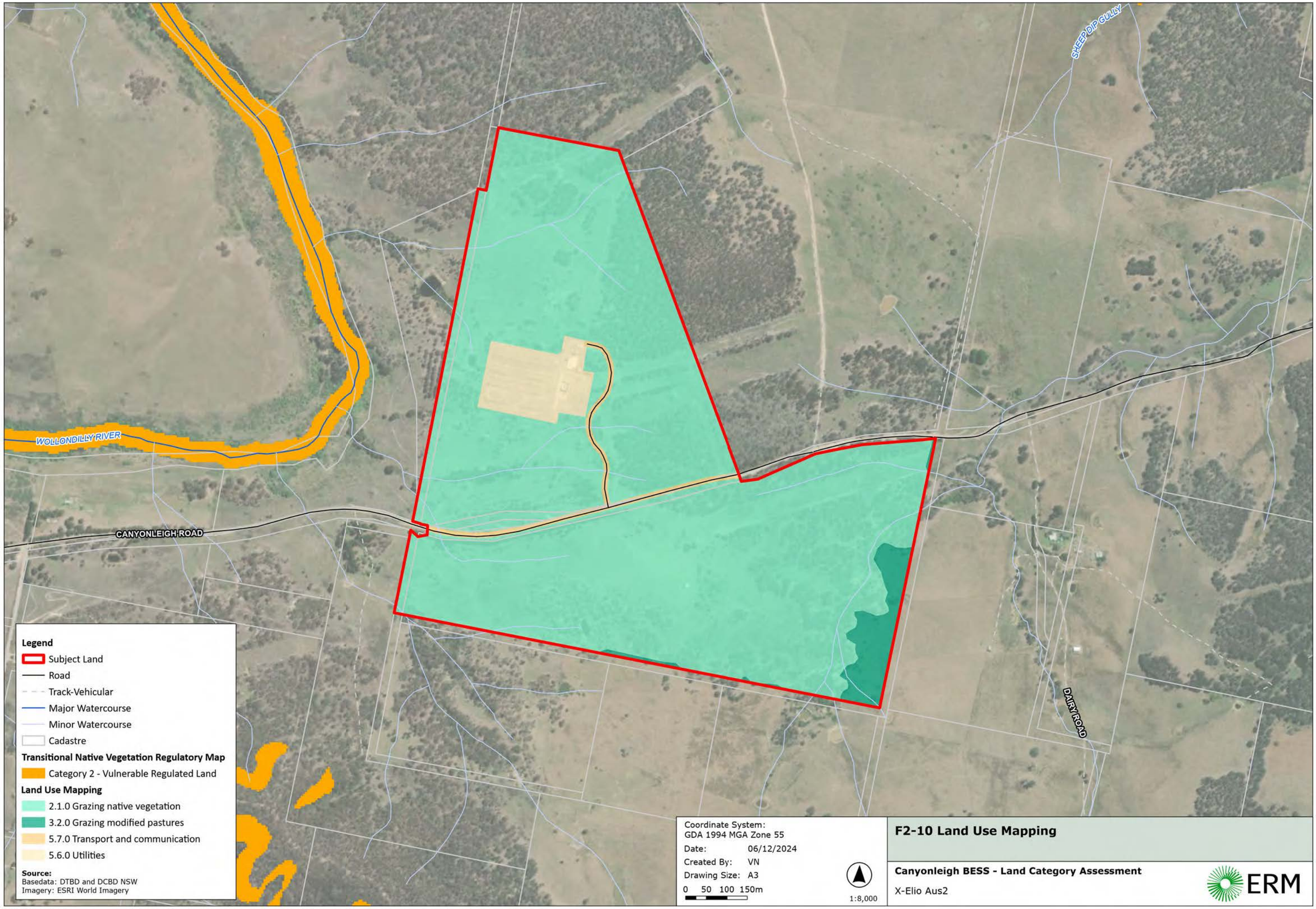
F2-9 1997 Historical Aerial Imagery

Canyonleigh BESS - Land Category Assessment

X-Elio Aus2

ERM

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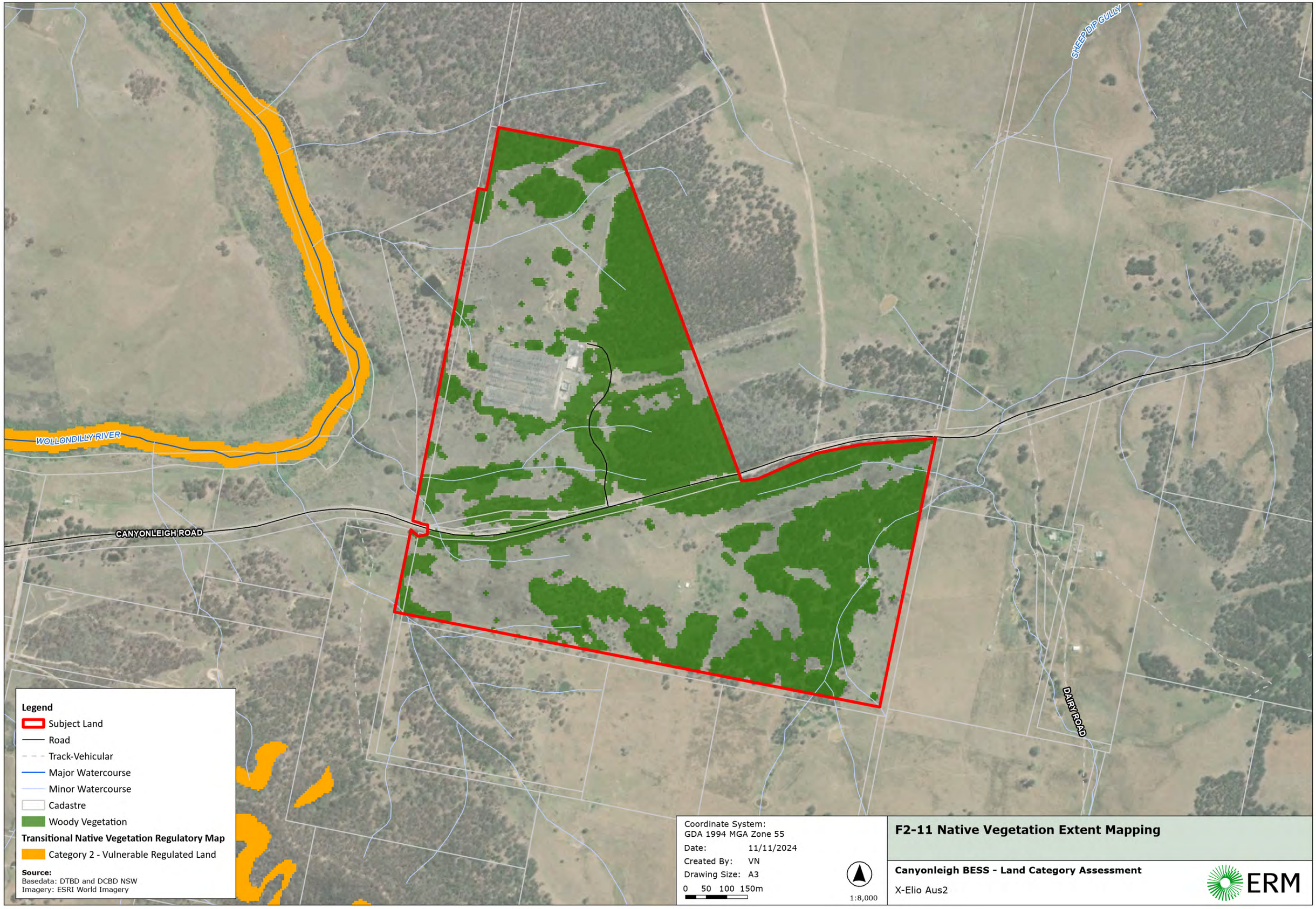
F2-10 Land Use Mapping

Canyonleigh BESS - Land Category Assessment

X-Elio Aus2

ERM

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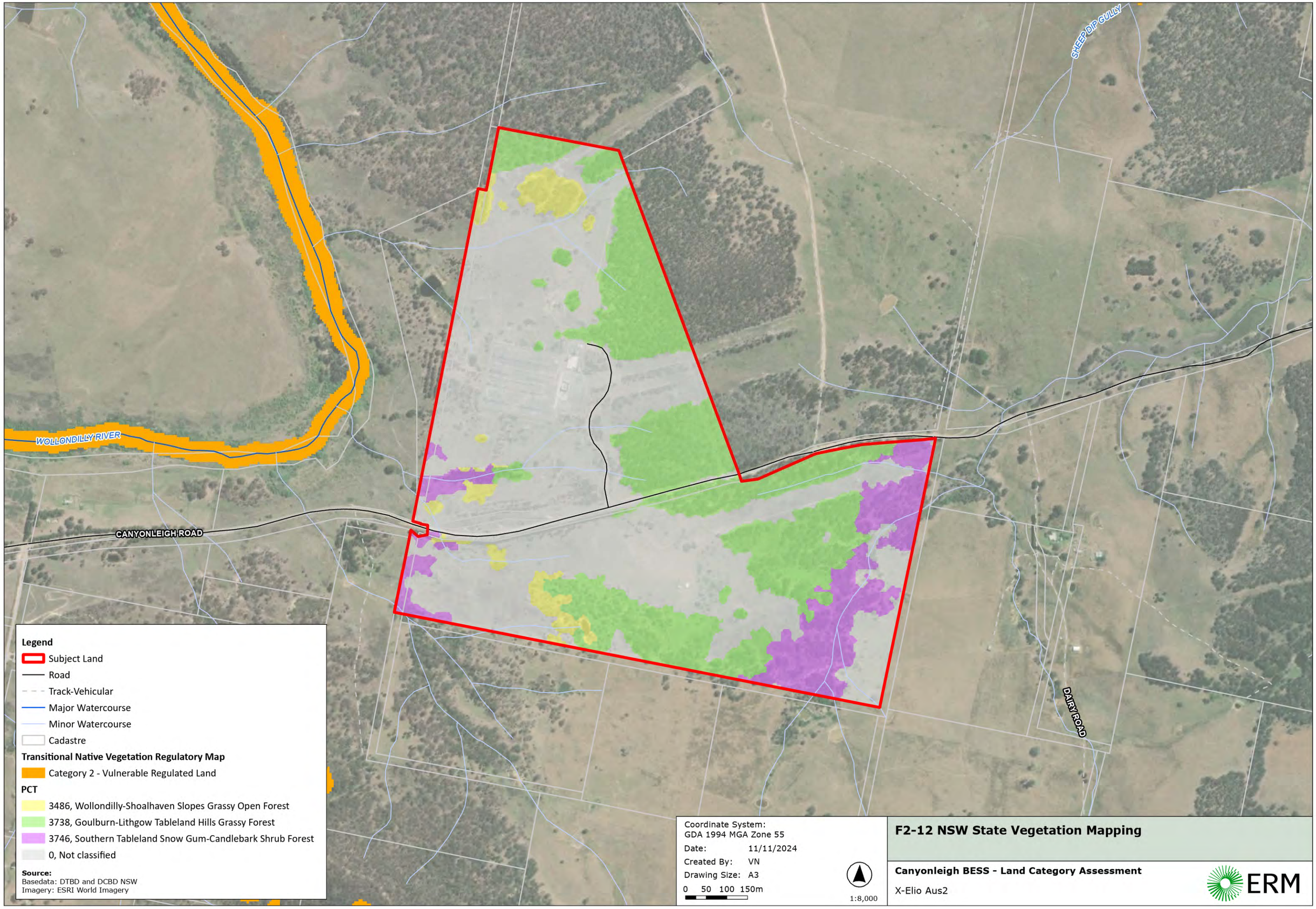
F2-11 Native Vegetation Extent Mapping

Canyonleigh BESS - Land Category Assessment

X-Elio Aus2

ERM

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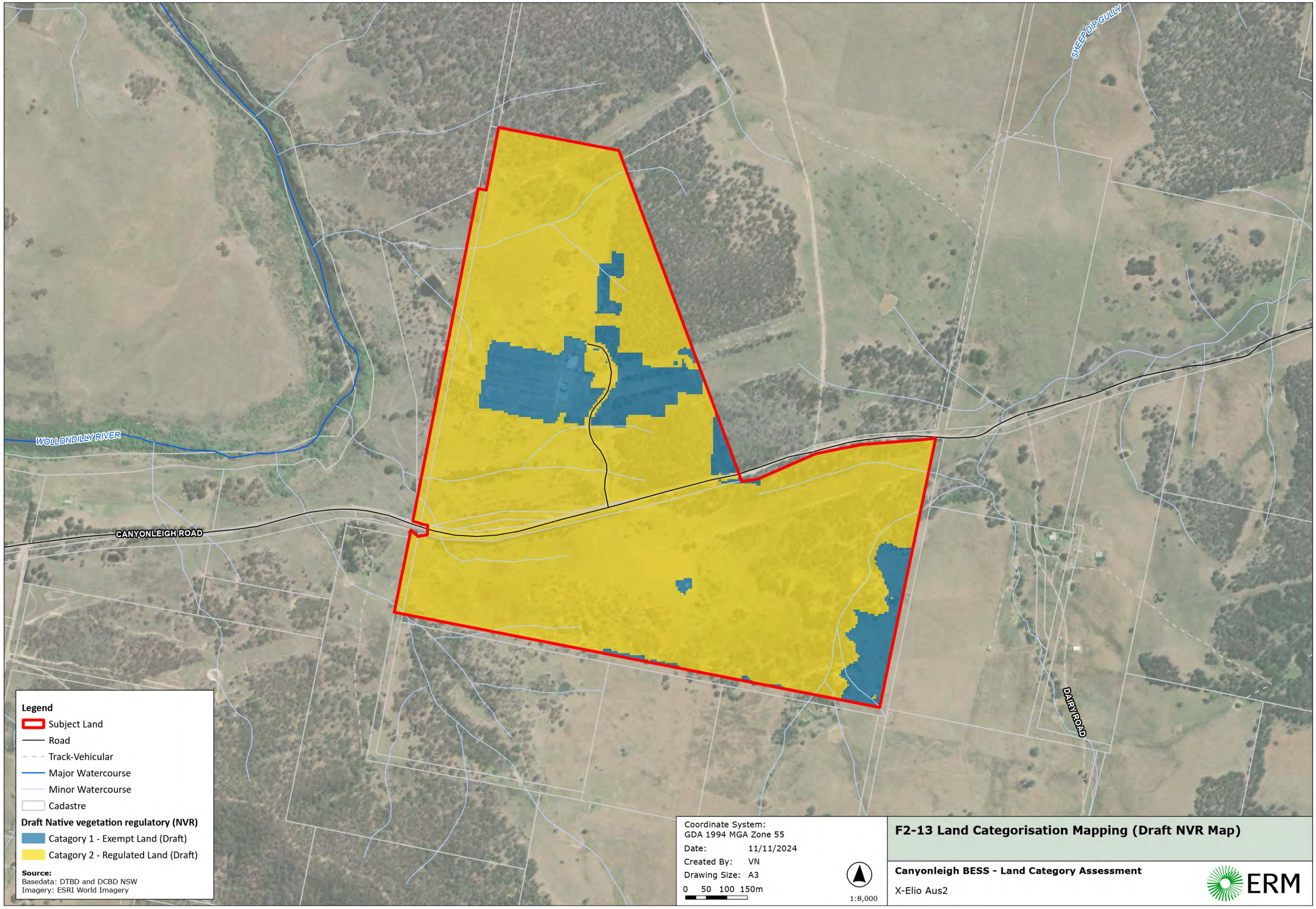
F2-12 NSW State Vegetation Mapping

Canyonleigh BESS - Land Category Assessment

X-Elio Aus2

ERM

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F2-13 Land Categorisation Mapping (Draft NVR Map)

Canyonleigh BESS - Land Category Assessment

X-Elio Aus2

ERM

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2.2 SITE ASSESSMENT

Site assessment on the Subject Land, relevant to land categorisation determination, was conducted by ERM ecologists through field surveys undertaken on the following dates:

- 19 – 23 February 2024; and
- 29 April – 1 May 2024.

Surveys on these dates included rapid assessment, ground truthing of the NSW SVTM through vegetation integrity and classification plots (BAM Plots) and mapping of PCTs within the Subject Land.

Areas of Category 1 – exempt land was suspected on the Subject Land based on desktop analysis, however during site visits were confirmed to contain native vegetation. Where suspected Category 1- exempt land was identified, assessment under the *Interim Grasslands and other Groundcover Assessment Methods: determining conservation value of grasslands and groundcover vegetation in NSW* (IGGAM)(Office of Environment and Heritage, 2018) can be applied. The IGGAM describes assessment methods in Stage 1, Stage 2 and Stage 3. The site was deemed suitable for assessment in grassland areas under Stage 1, however based on the prevalence of native vegetation Stage 2 was not applicable. BAM Plots were completed, which largely aligns with Stage 3.

In total, ERM conducted ten (10) BAM Plots within the Subject Land. Additionally, twenty-two (22) Rapid Vegetation Assessments were completed across the site.

Survey effort completed on the Subject Land relevant to this assessment is summarised in Table 2-1 below.

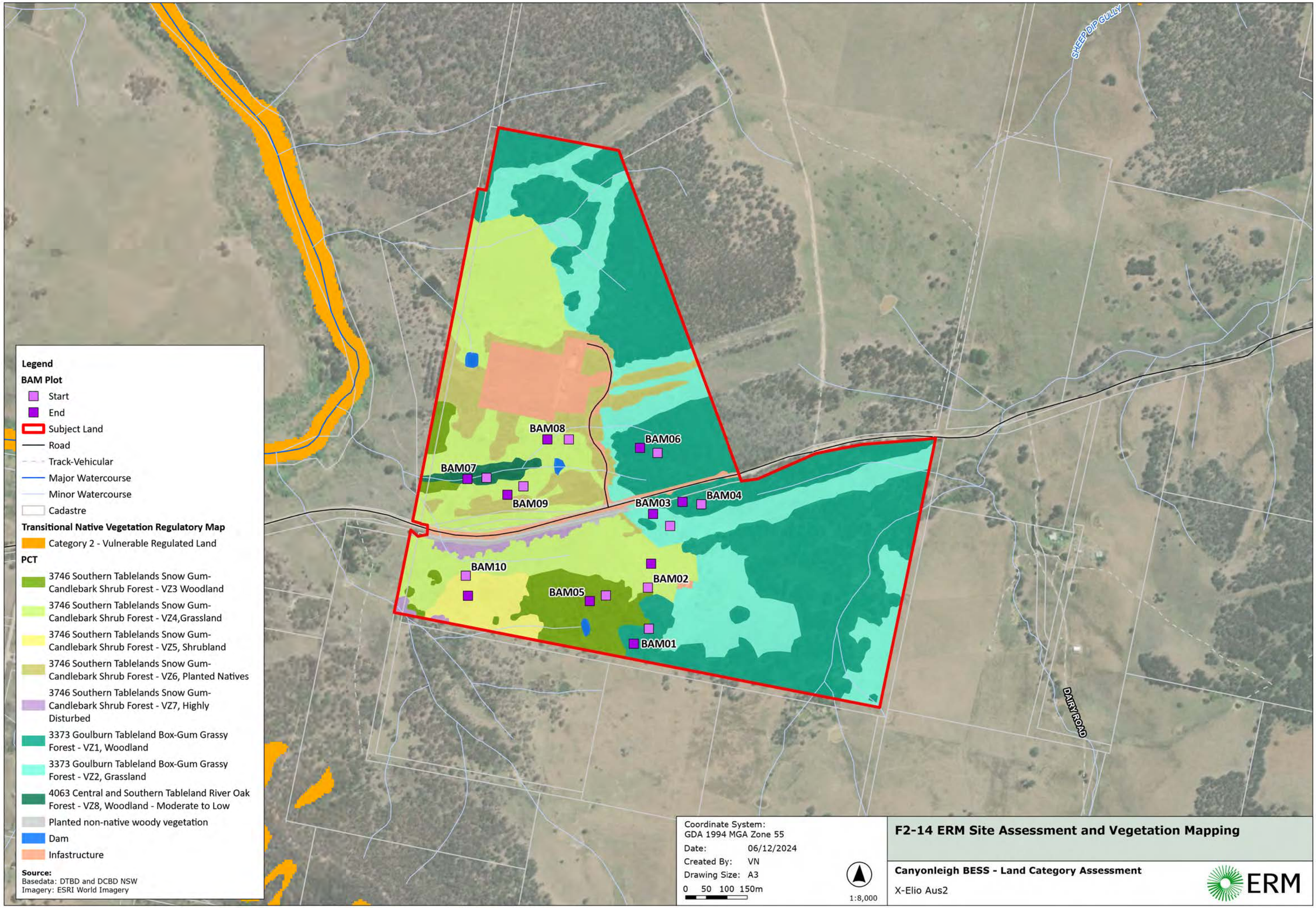
TABLE 2-1 SURVEY EFFORT COMPLETED TO DATE

Survey Method	Quantity	Date	Personnel
BAM Plots	5 5	February 2024 April - May 2024	Jessica Gardner, Ecologist Courtney Whitehead, Ecologist
Rapid Vegetation Assessments	9 13	February 2024 April - May 2024	Jessica Gardner, Ecologist Courtney Whitehead, Ecologist

The vegetation composition, structure, function and condition were recorded in accordance with the relevant guidelines during the survey events listed above. Note that no scattered trees were identified during site assessment.

BAM plot data is included in Appendix 6.1.

Following completion of the site assessment and subsequent data analysis, vegetation mapping was undertaken within the Subject Land. Refer to Figure 2-14.



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3. ANALYSIS AND RESULTS

This section summarises the findings obtained through the desktop analysis and site assessment.

Layers available from the transitional NVR map have been analysed and it was determined that there was no Category 2 – vulnerable regulated land, Category 2 – sensitive regulated land nor Excluded land mapped within the Subject Land. Refer to Figure 2-2.

3.1 IMAGERY

Analysis of the historical aerial imagery from 1963, 1969, 1974, 1989, 1991 and 1997 determined that significant disturbances occurred within the Subject Land since prior to 1990 to the present day. Spatial imagery shows that significant groundcover disturbance has occurred through the site, including clearing for transmission lines and the Marulan substation. The significantly cleared portion of the site in the South-West has been cleared since at least 1963. The transmission line clearing running North-East from the substation was partially cleared before 1963, with further clearing between 1989 to 1991 for the construction of the Marulan substation and transmission lines.

In addition to this, some areas that were cleared of woody vegetation prior to 1990 have experienced partial regrowth or revegetation from 1990 until the present day. This includes areas around the transmission lines in the eastern part of the Subject Land, and potential plantings in the centre of the Subject Land south of the Marulan Substation.

The historical images assisted in understanding historical use of the Subject Land and how those uses have influenced existing vegetation composition and structure. Refer to Figure 2-4, Figure 2-5, Figure 2-6, Figure 2-7, Figure 2-8, and Figure 2-9.

3.2 INTERIM GRASSLANDS AND GROUNDCOVER ASSESSMENT METHOD

During site investigation it was observed that the groundcover consistently presented with greater than 50 per cent (%) native vegetation. Therefore, an assessment of exotic vegetation in accordance with the IGGAM, was deemed unnecessary. The site was assessed using vegetation integrity plots (BAM Plots) and rapid assessments as previously described.

The LLS Act prescribes that land should be designated as category 1 – exempt land if the Chief Executive of OEH reasonably believes that ‘the land contains low conservation value grasslands’. The regulations specify that land contains low conservation value grasslands or other groundcover if the land is determined to contain low conservation value grasslands or other groundcover under the ‘Grasslands and other Groundcover Assessment Method’.

Table 6 in the IGGAM suggest a vegetation integrity score (VIS), obtained from BAM Plot data, of less than 15% can be considered ‘low conservation value grasslands’. Based on surveys undertaken within grassland vegetation across the Subject Land, and assigned PCTs, the VIS is greater than 40%.

The Subject Land is therefore identified as predominantly Category 2 - regulated land.

3.3 PLANTED VEGETATION

The Subject Land was observed to contain patches of planted vegetation. These areas were assessed through rapid vegetation assessment opportunistically during the survey events.

A row of planted non-native *Pinus sp.* are present on the southern side of Canyonleigh Rd, these have subsequently been mapped as Vegetation Zone 7: Non-natives, shown on Figure 2-14.

Planted native vegetation was recorded across the Subject Land, largely in areas surrounding the existing substation. This vegetation was observed to contain a mix of planted native vegetation and natural regrowth, and has therefore been mapped as PCT 3746, Vegetation Zone 6: Planted Native shown on Figure 2-14. This vegetation is considered Category 2 - regulated land.

3.4 DISTURBANCE HISTORY

Signficant disturbances in the Project Area includes the construction of the Marulan substation and associated infrastructure, including transmission lines. The building footprint of the Marulan substation and associated transmission lines caused signficant disturbances, which can be seen in the 1991 and 1997 historical imagery (see Figure 2-8 and Figure 2-9 respectively). During site investigation these areas were identified as consisting of a mix of disturbed native grassland, native regrowth and planted vegetation. No related areas have been assigned as Category 1 – exempt land.

Other disturbances present on site are related to historical clearing and livestock grazing of native vegetation. Historical imagery from 1963 (Figure 2-4) shows that portions of the site cleared of woody vegetation were cleared prior to 1963. No signficant disturbances such as cropping, modified pasture management, or agricultural machinery lines, are visible throughout the historical imagery available. Furthermore, the remnant vegetation consists predominately of native species. Regrowth and potential revegetation of the woody vegetation is present throughout these areas. These areas have been mapped as Category 2 – regulated land.

Section 60F of the LLS Act provide provisions for determining low conservation value grasslands, and 60J of the LLS Act, supported by section 114 of the LLS Regulation, allows for the classification of native vegegation to be taken as cleared if it can be demonstrated that it is significantly disturbed or modified. These provisions are addressed in Table 3-2.

3.5 SUMMARY

Please refer to a summary of the analyses of the data sources in Table 3-2. The proposed land categorisation by ERM has been provided in Section 4. Supporting site assessment data is provided in Appendices 6.1.

TABLE 3-1 SUMMARY OF ANALYSES OF SPATIAL DATA AND OTHER SOURCES

Data Source	Proposed Category 1 – Exempt Land	Proposed Category 2 – Regulated Land	Excluded Land	Notes
Transitional NVR Map (Figure 2-2).	-	Areas mapped as Category 2 – Regulated Land on the NVR Map, which generally consist of woody vegetation.	-	No Category 2 – vulnerable regulated land and no Category 2 – sensitive regulated land occurs within the Subject Land.
Land zoning (Figure 2-3)	-	-	-	The development site is predominantly zoned rural (RU2 – Rural Landscape) therefore Part 5A of the LLS Act applies and land categorisation can be determined.
Historical aerial imagery 1963 (Figure 2-4), 1969 (Figure 2-5), 1974 (Figure 2-6), 1989 (Figure 2-7), 1991 (Figure 2-8), and 1997 (Figure 2-9).	-	Areas of woody vegetation, including scattered trees, present in 1989, 1993 and 1997. Areas of native groundcover vegetation with no or limited evidence of significant disturbance or modification.	-	Historical aerial imagery is not available for 1990 for the Subject Land. Historical aerial imagery from 1963, 1969, 1974, 1989, 1991 and 1997 have been used as surrogates for 1990. There are areas containing evidence of significant groundcover modification and disturbance that was present in 1989 and remained in place in 1991 and 1997. The areas of greatest groundcover disturbance indicate the construction of the Marulan Substation and associated infrastructure, and are demonstrated by clear machinery lines, bare ground and the building itself. Areas of cleared and grazed vegetation is also evident on historical imagery, however based on site assessment not considered Category 1: Exempt Land.

Data Source	Proposed Category 1 – Exempt Land	Proposed Category 2 – Regulated Land	Excluded Land	Notes
NSW Land Use 2017 (Figure 2-10)	-	Land use identified as: • Grazing native vegetation • Grazing modified pastures	-	The Subject Land also contains land use identified as: • Utilities • Transport and communication These unvegetated areas are not categorised as Category 1 nor Category 2 land.
NSW Native Vegetation Extent Raster 5m v1.4 (Figure 2-11)	-	Cover that is: • 'Woody vegetation'	-	-
NSW State Vegetation Type Map (Figure 2-12)	-	Areas containing mapped PCTs, and areas mapped as containing 'Not classified' where site investigation identified there is native vegetation present.	-	No scattered trees were identified during spatial and site assessment. If native trees species occurred on Category 1 – exempt land, then these would be classified as Category 2 – regulated land.
ERM Vegetation Mapping (Figure 2-14)	-	Areas containing mapped PCTs.	-	Site investigation did not identify areas which contained less than 50% native groundcover vegetation, therefore areas have not been mapped as Category 1 – Exempt Land.

3.6 PHOTOGRAPHIC EXAMPLES

This section includes photographic examples of the existing condition of the Project Area.

Images are displayed in Table 3-2 below.

TABLE 3-2 SITE PHOTOGRAPHS AND DESCRIPTIONS

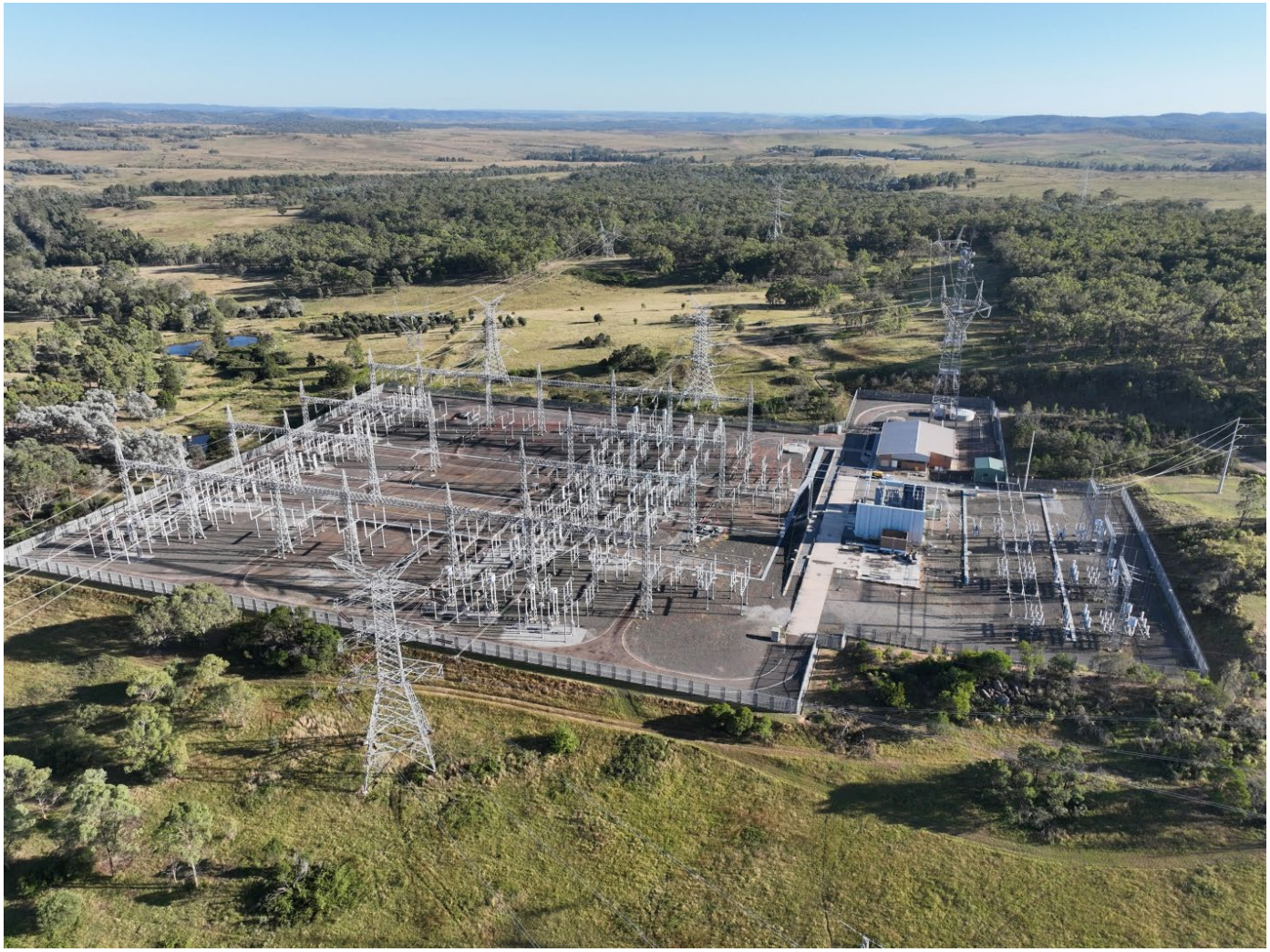
Image	Description
	Example of infrastructure present. Marulan Substation in the centre of the Subject Land. *Note.* From *Marulan Substation* [Photograph], by Amplex, n.d.

Image	Description
	Example of planted Non-native vegetation (Rapid Vegetation Assessment associated with '0 – Non-native vegetation', south of Canyonleigh Road). Surrounding vegetation mapped as Category 2 – regulated land.

Image	Description
	Example of Category 2 – regulated land (BAM plot 03 associated with PCT 3373 in the east of the Subject Land)

Image	Description
	Example of Category 2 – regulated land (BAM plot 06 associated with PCT 3373 in the east of the Subject Land)

Image	Description
	Example of Category 2 – regulated land (BAM plot 08 associated with PCT 3746 in the west of the Subject Land)

Image	Description
	Example of Category 2 – regulated land (BAM plot 05 associated with PCT 3746 in the west of the Subject Land)

Image	Description
	Example of Category 2 – regulated land (BAM plot 07 associated with PCT 4063 in the west of the Subject Land)

4. CONCLUSION

Based on the Subject Land analysis outlined in Sections 2 and 3, vegetation aligning with Category 1 – Exempt Land under the LLS Act has not been identified. Vegetation within the Subject Land is largely considered to align with Category 2 – regulated lands, to which the BAM will apply. Note that the Subject Land does not contain Category 2 – vulnerable regulated land, Category 2 – sensitive regulated land nor Excluded Land.

4.1 CATEGORY 2 - REGULATED LAND

Areas containing patches of woody vegetation, or those areas of groundcover vegetation showing no obvious or limited signs of groundcover disturbance or modification, and which contain more than 50% native groundcover vegetation have been mapped as Category 2 – regulated land.

No scattered trees, which would have been mapped as Category 2 – regulated land if found to be fully surrounded by Category 1 – exempt land, were present in 1989, 1993 and 1997 or the present day.

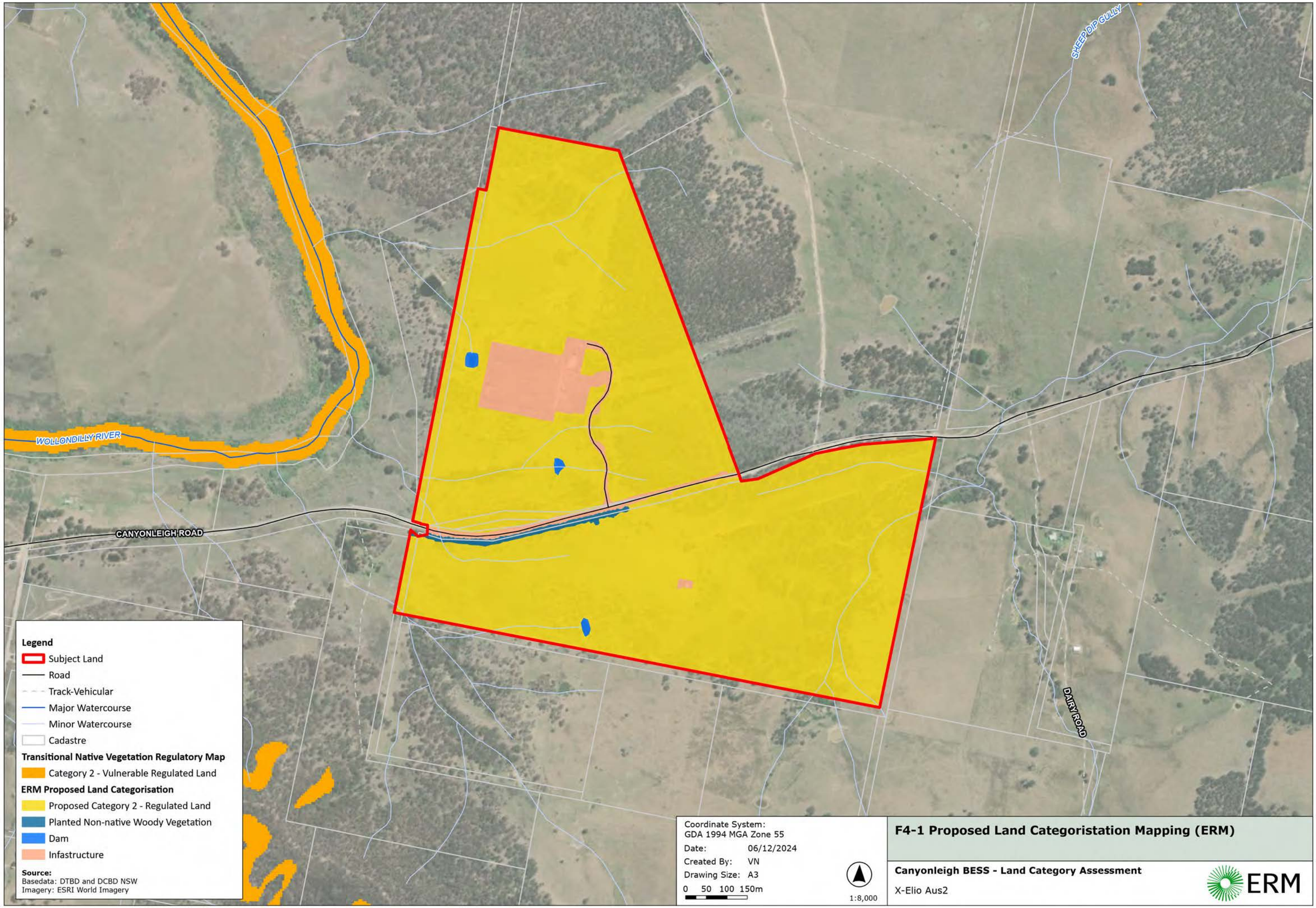
Areas in which ERM site assessment has not occurred have been mapped as Category 2 – regulated land.

4.2 CATEGORY 1 - EXEMPT LAND

Areas of Category 1 – exempt land was suspected to occur on the Subject Land based on desktop analysis results, reflecting historical clearing in 1989, which remained cleared between 1993, 1997 and 2024. This was supported by the draft NVR map (State Government of NSW and NSW DCCEEW 2024b), with similar areas mapped as Category 1 – exempt land.

Site investigation confirmed the absence of Category 1 – Exempt Land across the Subject Land in accordance with the IGGAM. The Subject Land consists of native vegetation in the form of woody, including grassland vegetation with a VIS of greater than 40%. This is with the exception of present infrastructure and planted non-native woody vegetation.

Proposed land categorisation is presented in Figure 4-1.



F4-1 Proposed Land Categoristation Mapping (ERM)

Canyonleigh BESS - Land Category Assessment

X-Elio Aus2

ERM

0711340_LCA_R3.aprx

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APPENDIX A BIODIVERSITY ASSESSMENT METHOD PLOT DATA

BAM01			
Site sheet	BAM01	Recorders	Jess Gardener
Coordinates	230078 E 6165083 N	Orientation of midline	-
Date	21/02/2024	PCT	3373

Vegetation Integrity Function				
Subplots	Litter cover (%)	Bare ground cover (%)	Cryptogram cover (%)	Rock cover (%)
5	60	0	0	0
15	10	0	0	0
25	70	0	0	0
35	20	0	0	30
45	50	0	0	0
Average	42%	0%	0%	6%

Vegetation					
Taxon	Cover	Abundance	OEH live form	Status	High weed threat
Acacia parramattensis	0.1	9	tree (TG)	-	-
Austrostipa scabra	0.5	200	grass & grasslike (GG)	-	-
Brachyloma daphnoides	0.1	4	shrub (SG)	-	-
Cassinia aculeata	0.2	11	shrub (SG)	-	-
Cassinia laevis	0.1	1	shrub (SG)	-	-
Cassinia sifton	0.1	5	shrub (SG)	-	-
Chrysocephalum apiculatum	0.1	30	forb (FG)	-	-
Cirsium vulgare	0.1	5	-	-	-
Eucalyptus bridgesiana	10	15	tree (TG)	-	-
Euchiton sphaericus	0.1	20	forb (FG)	-	-
Fimbristylis dichotoma	0.2	500	grass & grasslike (GG)	-	-
Glycine clandestina	0.1	2	other (OG)	-	-
Gonocarpus tetragynus	50	1,000	forb (FG)	-	-
Goodenia hederacea	0.1	200	forb (FG)	-	-
Hydrocotyle laxiflora	0.5	300	forb (FG)	-	-
Hypericum gramineum	0.1	50	forb (FG)	-	
Hypericum perforatum	0.1	30	-	-	High threat
Kunzea parvifolia	0.2	3	shrub (SG)	-	-
Lomandra filiformis	0.1	5	grass & grasslike (GG)	-	-

BAM01					
Melichrus urceolatus	0.2	8	shrub (SG)	-	-
Microlaena stipoides	10	300	grass & grasslike (GG)	-	-
Olearia viscidula	0.2	1	shrub (SG)	-	-
Oxalis perennans	0.1	50	forb (FG)	-	-
Panicum effusum	0.1	50	grass & grasslike (GG)	-	-
Plantago lanceolata	0.1	30	-	-	-
Poa sieberiana	1	100	grass & grasslike (GG)	-	-
Rubus fruticosus	0.1	2	-	-	High threat
Setaria pumila	0.1	20	-	-	-
Solanum nigrum	0.1	5	-	-	-
Themeda triandra	0.1	20	grass & grasslike (GG)	-	-
Wahlenbergia stricta	0.1	15	forb (FG)	-	-

BAM02			
Site sheet	BAM02	Recorders	Jess Gardner
Coordinates	230070 E 6165182 N	Orientation of midline	345 N
Date	21/02/2024	PCT	3746

Vegetation Integrity Function				
Subplots	Litter cover (%)	Bare ground cover (%)	Cryptogram cover (%)	Rock cover (%)
5	0	0	0	0
15	0	0	0	50
25	0	10	0	0
35	0	2	0	0
45	0	10	0	0
Average	0%	4.4%	0%	10%

Vegetation					
Taxon	Cover	Abundance	OEH live form	Status	High weed threat
Acaena ovina	0.1	30	forb (FG)	-	-
Acetosella vulgaris	0.2	100	-	-	high threat
Bothriochloa spp.	0.1	50	grass & grasslike (GG)	-	-
Cassinia sifton	0.2	2	shrub (SG)	-	-
Cheilanthes sieberi	0.1	50	fern (EG)	-	-
Chrysocephalum apiculatum	0.1	50	forb (FG)	-	-
Conyza bonariensis	0.1	20	-	-	-
Cyperus gracilis	0.1	1	grass & grasslike (GG)	-	-
Eragrostis curvula	1	200	-	-	high threat
Eragrostis trachycarpa	25	600	grass & grasslike (GG)	-	-
Fimbristylis dichotoma	0.2	500	grass & grasslike (GG)	-	-
Gamochaeta calviceps	0.2	100	-	-	-
Glycine tabacina	0.1	1	other (OG)	-	-
Haloragis heterophylla	0.2	50	forb (FG)	-	-
Hypochaeris radicata	10	500	-	-	-
Hypoxis hygrometrica	0.1	1	forb (FG)	-	-

BAM02					
Juncus spp.	0.2	5	grass & grasslike (GG)	-	-
Lysimachia arvensis	0.1	10	-	-	-
Nassella trichotoma	15	200	-	-	high threat
Oxalis perennans	0.1	100	forb (FG)	-	-
Plantago lanceolata	0.1	1	-	-	-
Sporobolus creber	60	800	grass & grasslike (GG)	-	-
Tricoryne elatior	0.1	30	forb (FG)	-	-
Wahlenbergia gracilenta	0.1	20	forb (FG)	-	-

BAM03			
Site sheet	BAM03	Recorders	Jess Gardner
Coordinates	230115 E 6165334 N	Orientation of midline	290 W
Date	21/02/2024	PCT	3373

Vegetation Integrity Function				
Subplots	Litter cover (%)	Bare ground cover (%)	Cryptogram cover (%)	Rock cover (%)
5	0	0	0	0
15	0	5	0	0
25	0	20	0	0
35	0	0	0	0
45	0	10	0	0
Average	0%	3.4%	0%	0%

Vegetation					
Taxon	Cover	Abundance	OEH live form	Status	High weed threat
Acacia parramattensis	0.1	400	grass & grasslike (GG)	-	-
Aristida ramosa	2	300	grass & grasslike (GG)	-	-
Cassinia aculeata	0.1	3	-	-	high threat
Centaurium erythraea	0.1	20	grass & grasslike (GG)	-	-
Cheilanthes sieberi	0.1	20	shrub (SG)	-	-
Chrysocephalum apiculatum	0.2	400	-	-	-
Conyza bonariensis	0.1	30	-	-	-
Eragrostis trachycarpa	0.1	1	tree (TG)	-	-
Euchiton sphaericus	0.1	50	forb (FG)	-	-
Fimbristylis dichotoma	0.1	100	fern (EG)	-	-
Hypericum gramineum	0.1	200	forb (FG)	-	-
Hypochaeris radicata	2	50	forb (FG)	-	-
Kunzea parvifolia	0.3	30	-	-	-
Panicum effusum	30	500	grass & grasslike (GG)	-	-
Poa spp.	0.1	200	grass & grasslike (GG)	-	-

BAM03					
Rubus fruticosus	0.5	50	grass & grasslike (GG)	-	-
Sporobolus creber	20	40	grass & grasslike (GG)	-	-
Themeda triandra	25	1	shrub (SG)	-	-

BAM04			
Site sheet	BAM04	Recorders	Jess Gardner
Coordinates	230187 E 6165391 N	Orientation of midline	255 W
Date	22/02/2024	PCT	3373

Vegetation Integrity Function				
Subplots	Litter cover (%)	Bare ground cover (%)	Cryptogram cover (%)	Rock cover (%)
5	70	10	0	0
15	40	0	0	0
25	30	0	0	0
35	20	0	0	0
45	50	0	0	0
Average	42%	2%	0%	0%

Vegetation					
Taxon	Cover	Abundance	OEH live form	Status	High weed threat
Cassinia aculeata	40	200	shrub (SG)	-	-
Cheilanthes sieberi	0.1	50	fern (EG)	-	-
Echinopogon ovatus	0.1	30	grass & grasslike (GG)	-	-
Eragrostis trachycarpa	0.1	50	grass & grasslike (GG)	-	-
Eucalyptus blakelyi	2	2	tree (TG)	-	-
Eucalyptus dives	1	3	tree (TG)	-	-
Eucalyptus eugenioides	5	8	tree (TG)	-	-
Fimbristylis dichotoma	0.1	20	grass & grasslike (GG)	-	-
Hypericum gramineum	0.1	20	forb (FG)	-	-
Hypochaeris radicata	0.1	100	-	-	-
Microlaena stipoides	60	700	grass & grasslike (GG)	-	-
Nassella trichotoma	20	200	-	-	high threat
Poa spp.	0.1	30	grass & grasslike (GG)	-	-
Solanum chenopodioides	0.1	5	-	-	-
Solanum prinophyllum	0.1	5	forb (FG)	-	-
Wahlenbergia stricta	0.1	30	forb (FG)	-	-

BAM05			
Site sheet	BAM05	Recorders	Jess Gardner
Coordinates	229970 E 6165157 N	Orientation of midline	235 SW
Date	22/02/2024	PCT	3746

Vegetation Integrity Function				
Subplots	Litter cover (%)	Bare ground cover (%)	Cryptogram cover (%)	Rock cover (%)
5	5	0	0	80
15	0	5	0	20
25	20	0	0	70
35	80	0	0	5
45	15	75	0	0
Average	24%	16%	0%	35%

Vegetation					
Taxon	Cover	Abundance	OEH live form	Status	High weed threat
Acacia parramattensis	0.5	7	tree (TG)	-	-
Acaena ovina	0.1	30	forb (FG)	-	-
Acetosella vulgaris	0.1	50	-	-	high threat
Bromus diandrus	0.5	100	-	-	high threat
Cassinia aculeata	0.2	3	shrub (SG)	-	-
Cassinia sifton	2	25	shrub (SG)	-	-
Centaurium erythraea	0.1	50	-	-	-
Cheilanthes sieberi	0.1	200	fern (EG)	-	-
Chrysocephalum apiculatum	0.2	100	forb (FG)	-	-
Cirsium vulgare	0.1	1	-	-	-
Conyza bonariensis	0.1	20	-	-	-
Digitaria ramularis	0.2	50	grass & grasslike (GG)	-	-
Eragrostis trachycarpa	15	400	grass & grasslike (GG)	-	-
Eucalyptus pauciflora	2	6	tree (TG)	-	-
Exocarpos spp.	0.1	1	shrub (SG)	-	-
Fimbristylis dichotoma	0.2	100	grass & grasslike (GG)	-	-

BAM05					
Geranium solanderi	0.1	100	forb (FG)	-	-
Glycine microphylla	0.1	10	other (OG)	-	-
Glycine tabacina	0.1	20	other (OG)	-	-
Gonocarpus tetragynus	20	800	forb (FG)	-	-
Hydrocotyle spp.	0.2	100	forb (FG)	-	-
Hypochaeris radicata	0.2	100	-	-	-
Juncus spp.	0.1	5	grass & grasslike (GG)	-	-
Kunzea parvifolia	0.1	3	shrub (SG)	-	-
Lomandra filiformis	0.1	1	grass & grasslike (GG)	-	-
Lomandra spp.	0.1	5	grass & grasslike (GG)	-	-
Microlaena stipoides	5	200	grass & grasslike (GG)	-	-
Nassella trichotoma	10	300	-	-	high threat
Oxalis perennans	0.1	100	forb (FG)	-	-
Plantago lanceolata	0.1	100	-	-	-
Rubus fruticosus	1	3	-	-	high threat
Solanum chenopodinum	0.1	2	shrub (SG)	-	-
Sporobolus creber	0.2	50	grass & grasslike (GG)	-	-
Themeda triandra	0.1	40	grass & grasslike (GG)	-	-
Veronica plebeia	0.1	20	forb (FG)	-	-
Vittadinia cuneata	0.1	5	forb (FG)	-	-
Wahlenbergia gracilenta	0.1	10	forb (FG)	-	-
Wahlenbergia stricta	0.1	5	forb (FG)	-	-

BAM06			
Site sheet	BAM06	Recorders	Jess Gardner
Coordinates	239246 E 6165772 N	Orientation of midline	265 W
Date	29/04/2024	PCT	3373

Vegetation Integrity Function				
Subplots	Litter cover (%)	Bare ground cover (%)	Cryptogram cover (%)	Rock cover (%)
5	40	1	0	0
15	50	5	0	15
25	50	5	0	0
35	30	2	0	5
45	40	10	0	10
Average	42	4.6	0	6

Vegetation					
Taxon	Cover	Abundance	OEH live form	Status	High weed threat
Acacia parramattensis	0.5	10	tree (TG)	-	-
Aira spp.	0.1	2	-	-	-
Ajuga australis	0.1	30	forb (FG)	-	-
Aristida ramosa	2	300	grass & grasslike (GG)	-	-
Cassinia aculeata	0.2	5	shrub (SG)	-	-
Cassinia laevis	0.2	3	shrub (SG)	-	-
Cassinia sifton	0.3	15	shrub (SG)	-	-
Cassinia uncata	0.1	5	shrub (SG)	-	-
Cirsium vulgare	0.1	1	-	-	-
Conyza bonariensis	0.1	2	-	-	-
Dichelachne spp.	0.1	30	grass & grasslike (GG)	-	-
Dichondra repens	0.2	30	forb (FG)	-	-
Echinopogon spp.	0.1	100	grass & grasslike (GG)	-	-

BAM06					
Eragrostis leptocarpa	0.1	10	grass & grasslike (GG)	-	-
Eucalyptus eugenioides	15	8	tree (TG)	-	-
Eucalyptus melliodora	0.5	2	tree (TG)	-	-
Euchiton japonicus	0.1	10	forb (FG)	-	-
Gonocarpus tetragynus	15	1,000	forb (FG)	-	-
Goodenia hederacea	5	1,000	forb (FG)	-	-
Hibbertia obtusifolia	0.1	2	shrub (SG)	-	-
Hibbertia spp.	0.1	1	shrub (SG)	-	-
Hydrocotyle laxiflora	0.1	50	forb (FG)	-	-
Hydrocotyle spp.	30.1	3	forb (FG)	-	-
Lomandra filiformis	0.5	50	grass & grasslike (GG)	-	-
Lomandra multiflora subsp. multiflora	0.1	5	grass & grasslike (GG)	-	-
Melichrus urceolatus	0.1	2	shrub (SG)	-	-
Nassella trichotoma	0.1	1	-	-	high threat
Olearia viscidula	0.1	3	shrub (SG)	-	-
Rubus fruticosus	0.1	2	-	-	high threat
Rytidosperma spp.	20	600	grass & grasslike (GG)	-	-
Rytidosperma spp.	4	400	grass & grasslike (GG)	-	-
Wahlenbergia stricta	0.1	30	forb (FG)	-	-

BAM07			
Site sheet	BAM07	Recorders	Jess Gardner & Courtney Whitehead
Coordinates	229665 E 6165424 N	Orientation of midline	250 W
Date	30/04/2024	PCT	4063

Vegetation Integrity Function				
Subplots	Litter cover (%)	Bare ground cover (%)	Cryptogram cover (%)	Rock cover (%)
5	25	1	0	0
15	35	5	0	0
25	10	5	0	0
35	25	4	0	0
45	30	3	0	0
Average	25%	36%	0%	0%

Vegetation					
Taxon	Cover	Abundance	OEH live form	Status	High weed threat
Acacia melanoxylon	0.1	2	tree (TG)	-	-
Acacia parramattensis	0.2	2	tree (TG)	-	-
Acaena ovina	0.2	50	forb (FG)	-	-
Carduus spp.	0.1	5	-	-	-
Carex appressa	0.1	1	grass & grasslike (GG)	-	-
Cassinia sifton	-	1	shrub (SG)	-	-
Casuarina cunninghamiana	30	43	tree (TG)	-	-
Centaurium erythraea	0.1	1	-	-	-
Cirsium vulgare	2	50	-	-	-
Crataegus monogyna	0.1	23	-	-	high threat
Dactylis glomerata	5	100	-	-	-
Dichelachne spp.	0.2	30	grass & grasslike (GG)	-	-
Dichondra repens	10	2,000	forb (FG)	-	-
Galium aparine	2	400	-	-	-
Hydrocotyle laxiflora	2	300	forb (FG)	-	-
Hypericum perforatum	0.2	20	-	-	high threat
Hypochaeris radicata	3	200	-	-	-
Juncus spp.	0.1	1	grass & grasslike (GG)	-	-

BAM07					
Lysimachia arvensis	0.3	200		-	-
Microlaena stipoides	15	2,000	grass & grasslike (GG)	-	-
Nassella trichotoma	0.3	15	-	-	high threat
Paspalum dilatatum	0.1	5	-	-	high threat
Plantago lanceolata	1	200	-	-	-
Poa labillardierei	0.1	5	grass & grasslike (GG)	-	-
Poa spp.	0.2	30	grass & grasslike (GG)	-	-
Rosa rubiginosa	0.1	10	-	-	high threat
Rubus fruticosus	20	50	-	-	high threat
Rytidosperma spp.	25	3,000	grass & grasslike (GG)	-	-
Rytidosperma spp.	0.1	1	grass & grasslike (GG)	-	-
Solanum nigrum	0.1	5	-	-	-
Sonchus oleraceus	0.1	30	-	-	-
Taraxacum officinale	0.1	30	-	-	-
Themeda triandra	0.1	1	grass & grasslike (GG)	-	-
Wahlenbergia gracilenta	0.1	1	forb (FG)	-	-

BAM08			
Site sheet	BAM08	Recorders	Jess Gardner & Courtney Whitehead
Coordinates	229858 E 6165528 N	Orientation of midline	253 W
Date	30/04/2024	PCT	3746

Vegetation Integrity Function				
Subplots	Litter cover (%)	Bare ground cover (%)	Cryptogram cover (%)	Rock cover (%)
5	2	5	0	0
15	2	6	0	0
25	3	4	0	0
35	2	3	0	0
45	2	4	2	0
Average	2.2%	4.4%	0.4%	0%

Vegetation					
Taxon	Cover	Abundance	OEH live form	Status	High weed threat
Acacia melanoxylon	0.1	1	tree (TG)	-	-
Acetosella vulgaris	0.1	10	-	-	high threat
Aristida ramosa	5	800	grass & grasslike (GG)	-	-
Bothriochloa spp.	0.3	300	grass & grasslike (GG)	-	-
Chrysocephalum apiculatum	1	350	forb (FG)	-	-
Conyza bonariensis	0.1	20	-	-	-
Crataegus monogyna	0.1	1	-	-	high threat
Eragrostis leptocarpa	1	200	grass & grasslike (GG)	-	-
Eragrostis trachycarpa	0.5	500	grass & grasslike (GG)	-	-
Gamochaeta calviceps	0.2	200	-	-	-
Haloragis heterophylla	0.2	300	forb (FG)	-	-
Hypericum perforatum	0.2	100	-	-	high threat
Hypochaeris radicata	0.5	300	-	-	-

BAM08					
Kunzea parvifolia	0.1	1	shrub (SG)	-	-
Microlaena stipoides	3	200	grass & grasslike (GG)	-	-
Nassella trichotoma	1	150	-	-	high threat
Plantago lanceolata	0.1	30	-	-	-
Rubus fruticosus	0.2	3	-	-	high threat
Setaria pumila	0.1	30	-	-	-
Sida spinosa	0.1	5	-	-	-
Sporobolus creber	20	1000	grass & grasslike (GG)	-	-
Themeda triandra	30	2000	grass & grasslike (GG)	-	-
Trifolium campestre	0.1	1	tree (TG)	-	-

BAM09			
Site sheet	BAM09	Recorders	Jess Gardner & Courtney Whitehead
Coordinates	229755 E 6165408 N	Orientation of midline	220 SW
Date	30/04/2024	PCT	3746

Vegetation Integrity Function				
Subplots	Litter cover (%)	Bare ground cover (%)	Cryptogram cover (%)	Rock cover (%)
5	2	3	0	0
15	2	5	0	0
25	2	3	0	15
35	2	4	5	0
45	2	4	3	0
Average	2%	3.8%	1.6%	3%

Vegetation					
Taxon	Cover	Abundance	OEH live form	Status	High weed threat
Acetosella vulgaris	0.1	10	-	-	high threat
Aristida ramosa	2	500	grass & grasslike (GG)	-	-
Bothriochloa spp.	2	500	grass & grasslike (GG)	-	-
Carex appressa	0.1	1	grass & grasslike (GG)	-	-
Cheilanthes sieberi	0.1	10	fern (EG)	-	-
Conyza bonariensis	0.1	1	-	-	-
Dactylis glomerata	0.5	30	-	-	-
Dichelachne micrantha	0.1	20	grass & grasslike (GG)	-	-
Epilobium billardiereanum subsp. cinereum	0.1	80	forb (FG)	-	-
Eragrostis curvula	0.1	5	-	-	high threat
Eragrostis leptocarpa	20	300	grass & grasslike (GG)	-	-
Fimbristylis dichotoma	0.1	5	grass & grasslike (GG)	-	-
Gonocarpus tetragynus	0.1	10	forb (FG)	-	-
Haloragis heterophylla	30	3000	forb (FG)	-	-
Hypochaeris radicata	0.5	200	-	-	-

BAM09					
Juncus spp.	0.1	1	grass & grasslike (GG)	-	-
Nassella trichotoma	0.1	5	-	-	high threat
Oenothera spp.	0.1	1	-	-	-
Oxalis perennans	0.1	5	forb (FG)	-	-
Panicum effusum	1	300	grass & grasslike (GG)	-	-
Paspalum dilatatum	0.1	10	-	-	high threat
Plantago lanceolata	3	200	-	-	-
Rubus fruticosus	1	20	-	-	high threat
Rytidosperma spp.	0.1	1	grass & grasslike (GG)	-	-
Setaria pumila	0.1	1		-	-
Sporobolus creber	5	800	grass & grasslike (GG)	-	-
Themeda triandra	30	500	grass & grasslike (GG)	-	-
Trifolium arvense	0.1	1	-	-	-
Verbena bonariensis	0.1	5	-	-	high threat

BAM10			
Site sheet	BAM10	Recorders	Jess Gardner & Courtney Whitehead
Coordinates	229629 E 6165184 N	Orientation of midline	160 S
Date	01/05/2024	PCT	3746

Vegetation Integrity Function				
Subplots	Litter cover (%)	Bare ground cover (%)	Cryptogram cover (%)	Rock cover (%)
5	2	5	1	0
15	3	4	0	0
25	3	3	0	0
35	2	5	4	0
45	2	5	1	5
Average	2.4%	4.4%	1.2%	1%

Vegetation					
Taxon	Cover	Abundance	OEH live form	Status	High weed threat
Acacia parramattensis	0.1	1	tree (TG)	-	-
Aristida vagans	2	300	grass & grasslike (GG)	-	-
Carex inversa	0.1	1	grass & grasslike (GG)	-	-
Cheilanthes sieberi	0.1	50	fern (EG)	-	-
Conyza bonariensis	0.1	1	-	-	-
Eragrostis leptocarpa	0.2	50	grass & grasslike (GG)	-	-
Euchiton sphaericus	0.1	10	forb (FG)	-	-
Gamochaeta calviceps	0.1	1	-	-	-
Gonocarpus tetragynus	0.5	300	forb (FG)	-	-
Hypericum gramineum	0.1	2	forb (FG)	-	-
Hypochaeris radicata	0.1	10	-	-	-
Kunzea parvifolia	40	600	shrub (SG)	-	-
Leucopogon spp.	0.1	1	shrub (SG)	-	-
Nassella trichotoma	0.2	5	-	-	high threat
Rosa spp.	0.1	1	-	-	-
Rubus fruticosus	0.1	2	-	-	high threat
Themeda triandra	40	2000	grass & grasslike (GG)	-	-

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APPENDIX C BAM PLOT DATA

BAM Site Field Survey

Project:	Canyonleigh BESS	**Plot Identifier**	BAM01	**Pic 20x20**		**Pic 20x50**		
Survey date:	21/02/2024		**Compass Orientation (head of 20x20 plot)**					
Recorders	JG		**PCT:**	3373	SVTM 3738			
GPS Easting	230078	**GPS Northing**	6165083		**Datum**		**Zone**	56
Landform			**Soils**			**Drainage & Slope**		
Morphology	Hilltop		**Soil Texture**	Fine, sandy/silty loam		**Slope**	gentle	
LandF Element			**Soil Colour**	Light grey/brown		**Aspect**	SW	
LandF Pattern			**Soil Depth**	Patchy, over granite		**Drainage**	Ok	
Microrelief			**Geology**	Granite		**Watercourses**	Nil	

Plot Disturbance

	Severity	Age	Observational Evidence
Clearing	Possible	50-70+ yrs	Only 5 or so large old trees possibly pre-european
Cultivation	Nil		
Soil erosion	Minimal		
Firewood	Minimal		
Grazing	Yes		Cattle observed (5-10)
Fire Damage	Nil		No char observed
Storm Damage	Possible historic		Large tree limb failure, quite rotted
Weediness	Low to unsure		Check grass and herb ID
Other	Junk		Old shed, metal junk/rubbish, abandoned car

Severity: 0 = no evidence, 1=light, 2=moderate, 3=severe **Age:** R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

Additional information

Current land use

Light grazing

Age class of trees (DBH range) , Condition of Vegetation, Hollows

X - x, good cond despite grazing, likelysmall hollows

Disturbances (i.e. fire, grazing,ferals, clearing, logging, soil degradation, pollution, weeds, dieback)

Grazing, ferals, clearing, weed

Significant and threatened species and communities (Note pop. size/area, structure, repro status, habit, habitat, threats, photos)

Dominant Species outside Plot	**Eucalyptus dives**

FUNCTION

Function attributes for BAM01

BAM Attribute (20x20m plot)

	Stratum	Sum
Count of Native Richness	**Tree (TG)**	**2**
	Shrub (SG)	**7**
	Forb (FG)	**8**
	Grass & grasslike (GG)	**7**
	Fern (EG)	**0**
	Other (OG)	**1**
	TOTAL	**25**

BAM Attribute (20x20m plot)

	Stratum	Sum
Count of cover abundance (native vascular plants)	**Tree (TG)**	**10.1**
	Shrub (SG)	**1.1**
	Forb (FG)	**51.1**
	Grass & grasslike (GG)	**12**
	Fern (EG)	**0**
	Other (OG)	**0.1**
	TOTAL Native	**74.4**
	TOTAL 'HTE'	**0.2**

BAM Attributes (1 x 1m Plots)

	Tape length	% cover	Average %	Photos
Litter Cover	5m	60%		
	15m	10%		
	25m	70%	**42.0%**	
	35m	20%		
	45m	50%		
Bare ground cover	5m	0%		
	15m	0%		
	25m	0%	**0.0%**	
	35m	0%		
	45m	0%		
Cryptogam cover	5m	0%		
	15m	0%		
	25m	0%	**0.0%**	
	35m	0%		
	45m	0%		
Rock Cover	5m	0%		
	15m	0%		
	25m	0%	**6.0%**	
	35m	30%		
	45m	0%		

BAM Attribute (20 x 50m plot) Tree Stem Counts

DBH (cm)	Euc	Non Euc	Hollows
>80	2	0	1
50-79	1	0	0
30-49	12	0	0
20-29	9	0	0
10-19	5	0	0
5-9	2	0	0
<5	0	0	N/A
Length of logs (	49	0	

0.1%=63x63cm
0.5%=1.4x1.4m
1%=2×2m
5%=4×5m
25%=10×10m

COMPOSITION & STRUCTURE

Species recorded for BAM01

Abbreviation	Scientific Name	Common Name	Family	% Cover	Abundance	Exotic	Growth Form	High Threat?	EPBC Status	BCA Status
Euca brid	*Eucalyptus bridgesiana*	Apple Box	Myrtaceae	10	15	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
cass acul	*Cassinia aculeata*	Dolly Bush	Asteraceae	0.2	11	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
cass sift	*Cassinia sifton*		Asteraceae	0.1	5	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
Acac parr	*Acacia parramattensis*	Parramatta Wattle	Fabaceae (Mimosoideae)	0.1	9	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
meli urce	*Melichrus urceolatus*	Urn Heath	Ericaceae	0.2	8	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
cass laev	*Cassinia laevis*	Cough Bush	Asteraceae	0.1	1	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
brac daph	*Brachyloma daphnoides*	Daphne Heath	Ericaceae	0.1	4	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
Olea visc	*Olearia viscidula*	Wallaby Weed	Asteraceae	0.2	1	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
rubu frut	*Rubus fruticosus*	Blackberry complex	Rosaceae	0.1	2	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
fimb dich	*Fimbristylis dichotoma*	Common Fringe-sedge	Cyperaceae	0.2	500	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Them tria	*Themeda triandra*		Poaceae	0.1	20	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
poa sieb	*Poa sieberiana*	Snowgrass	Poaceae	1	100	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Sola nigr	*Solanum nigrum*	Black-berry Nightshade	Solanaceae	0.1	5	Introduced			Not Listed	Not Listed
Oxal pere	*Oxalis perennans*		Oxalidaceae	0.1	50	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Hydr laxi	*Hydrocotyle laxiflora*	Stinking Pennywort	Apiaceae	0.5	300	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Cirs vulg	*Cirsium vulgare*	Spear Thistle	Asteraceae	0.1	5	Introduced			Not Listed	Not Listed
kunz parv	*Kunzea parvifolia*	Violet Kunzea	Myrtaceae	0.2	3	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
Wahl stri	*Wahlenbergia stricta*	Tall Bluebell	Campanulaceae	0.1	15	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Micr stip	*Microlaena stipoides*	Weeping Grass	Poaceae	10	300	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Plan lanc	*Plantago lanceolata*	Lamb's Tongues	Plantaginaceae	0.1	30	Introduced			Not Listed	Not Listed
Loma fili	*Lomandra filiformis*	Wattle Matt-rush	Lomandraceae	0.1	5	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Chry apic	*Chrysocephalum apiculatum*	Common Everlasting	Asteraceae	0.1	30	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
hype gram	*Hypericum gramineum*	Small St John's Wort	Clusiaceae	0.1	50	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
euch spha	*Euchiton sphaericus*	Star Cudweed	Asteraceae	0.1	20	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Glyc clan	*Glycine clandestina*	Twining glycine	Fabaceae (Faboideae)	0.1	2	Alive in NSW, Native	Other (OG)		Not Listed	Not Listed
gono tetr	*Gonocarpus tetragynus*	Poverty Raspwort	Haloragaceae	50	1000	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
good hede	*Goodenia hederacea*	Ivy Goodenia	Goodeniaceae	0.1	200	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
hype perf	*Hypericum perforatum*	St. Johns Wort	Clusiaceae	0.1	30	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
seta pumi	*Setaria pumila*	Pale Pigeon Grass	Poaceae	0.1	20	Introduced			Not Listed	Not Listed
aust scab	*Austrostipa scabra*	Speargrass	Poaceae	0.5	200	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
pani effu	*Panicum effusum*	Hairy Panic	Poaceae	0.1	50	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed

BAM Site Field Survey								
Project:	Canyonliegh BESS	**Plot Identifier**	BAM02	**Pic 20x20**		**Pic 20x50**		
Survey date:	21/02/2024		**Compass Orientation (head of 20x20 plot)**				345 N	
Recorders	JG		**PCT:**	3746	SVTM 0			
GPS Easting	230070	**GPS Northing**	6165182		**Datum**		**Zone**	56
Landform			**Soils**			**Drainage & Slope**		
Morphology	Hilltop		**Soil Texture**	Fine clay		**Slope**	Gentle over hiltop	
LandF Element			**Soil Colour**	Chocolate brown		**Aspect**	S	
LandF Pattern			**Soil Depth**	Varied over granite		**Drainage**	Good	
Microrelief			**Geology**	Granite		**Watercourses**	Nil	

Plot Disturbance			
	Severity	**Age**	**Observational Evidence**
Clearing	2	O	Cattle present, likely historically cleared for grazing as no canopy or shrubs
Cultivation	0	Unknown	High native grass presence, no evidence of tine/plough or seeding
Soil erosion	1	O	Granite outcrops
Firewood	0	Nil	
Grazing	1	R	Cattle present, likely cleared for grazing a few decades ago
Fire Damage	0	Nil	
Storm Damage	0	Nil	
Weediness	1	R	Many annuals, 1-2 perennials
Other			

Severity: 0 = no evidence, 1=light, 2=moderate, 3=severe **Age:** R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

Additional information

Current land use

Light cattle grazing

Age class of trees (DBH range) , Condition of Vegetation, Hollows

N/A

Disturbances (i.e. fire, grazing,ferals, clearing, logging, soil degradation, pollution, weeds, dieback)

Clearing, grazing, weeds

Significant and threatened species and communities (Note pop. size/area, structure, repro status, habit, habitat, threats, photos)

Nil observed

Dominant Species outside Plot **Plot close to E. pauciflora**

FUNCTION

Function attributes for	BAM02
BAM Attribute (20x20m plot)	
Stratum	**Sum**
Tree (TG)	**0**
Shrub (SG)	**1**
Forb (FG)	**7**
Grass & grasslike (GG)	**6**
Fern (EG)	**1**
Other (OG)	**1**
TOTAL	**16**

Count of Native Richness

BAM Attribute (20x20m plot)	
Stratum	**Sum**
Tree (TG)	**0**
Shrub (SG)	**0.2**
Forb (FG)	**0.8**
Grass & grasslike (GG)	**85.6**
Fern (EG)	**0.1**
Other (OG)	**0.1**
TOTAL Native	**86.8**
TOTAL 'HTE'	**16.2**

Count of cover abundance (native vascular plants)

BAM Attribute (20 x 50m plot) Tree Stem Counts			
DBH (cm)	**Euc**	**Non Euc**	**Hollows**
>80	0	0	0
50-79	0	0	0
30-49	0	0	0
20-29	0	0	0
10-19	0	0	0
5-9	0	0	0
<5	0	0	N/A
Length of logs (m)		0	

0.1%=63x63cm
0.5%=1.4x1.4m
1%=2×2m
5%=4×5m
25%=10×10m

BAM Attributes (1 x 1m Plots)				
	Tape length	**% cover**	**Average %**	**Photos**
Litter Cover	5m	0%		
	15m	0%		
	25m	0%	**0.0%**	
	35m	0%		
	45m	0%		
Bare ground cover	5m	0%		
	15m	0%		
	25m	10%	**4.4%**	
	35m	2%		
	45m	10%		
Cryptogam cover	5m	0%		
	15m	0%		
	25m	0%	**0.0%**	
	35m	0%		
	45m	0%		
Rock Cover	5m	0%		
	15m	50%		
	25m	0%	**10.0%**	
	35m	0%		
	45m	0%		

COMPOSITION & STRUCTURE

Species recorded for BAM02

Abbreviation	Scientific Name	Common Name	Family	% Cover	Abundance	Exotic	Growth Form	High Threat?	EPBC Status	BCA Status
Spor creb	*Sporobolus creber*	Slender Rat's Tail Grass	Poaceae	60	800	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
cass sift	*Cassinia sifton*		Asteraceae	0.2	2	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
Fimb dich	*Fimbristylis dichotoma*	Common Fringe-sedge	Cyperaceae	0.2	500	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Oxal pere	*Oxalis perennans*		Oxalidaceae	0.1	100	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Plan lanc	*Plantago lanceolata*	Lamb's Tongues	Plantaginaceae	0.1	1	Introduced			Not Listed	Not Listed
Cony bona	*Conyza bonariensis*	Flaxleaf Fleabane	Asteraceae	0.1	20	Introduced			Not Listed	Not Listed
glyc taba	*Glycine tabacina*	Variable Glycine	Fabaceae (Faboideae)	0.1	1	Alive in NSW, Native	Other (OG)		Not Listed	Not Listed
Chei sieb	*Cheilanthes sieberi*	Rock Fern	Pteridaceae	0.1	50	Alive in NSW, Native	Fern (EG)		Not Listed	Not Listed
lysi arve	*Lysimachia arvensis*	Scarlet Pimpernel	Primulaceae	0.1	10	Introduced			Not Listed	Not Listed
Junc	*Juncus spp.*		Juncaceae	0.2	5	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
acet vulg	*Acetosella vulgaris*	Sheep Sorrel	Polygonaceae	0.2	100	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
chry apic	*Chrysocephalum apiculatum*	Common Everlasting	Asteraceae	0.1	50	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
wahl grac	*Wahlenbergia gracilenta*	Annual Bluebell	Campanulaceae	0.1	20	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
tric elat	*Tricoryne elatior*	Yellow Autumn-lily	Anthericaceae	0.1	30	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
erag trac	*Eragrostis trachycarpa*		Poaceae	25	600	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
erag curv	*Eragrostis curvula*	African Lovegrass	Poaceae	1	200	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
both	*Bothriochloa spp.*	Redgrass, Bluegrass	Poaceae	0.1	50	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
gamo calv	*Gamochaeta calviceps*	Cudweed	Asteraceae	0.2	100	Introduced			Not Listed	Not Listed
hypo radi	*Hypochaeris radicata*	Catsear	Asteraceae	10	500	Introduced			Not Listed	Not Listed
Cype grac	*Cyperus gracilis*	Slender Flat-sedge	Cyperaceae	0.1	1	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
acae ovin	*Acaena ovina*	Acaena	Rosaceae	0.1	30	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
nass tric	*Nassella trichotoma*	Serrated Tussock	Poaceae	15	200	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
halo hete	*Haloragis heterophylla*	Variable Raspwort	Haloragaceae	0.2	50	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
hypo hygr	*Hypoxis hygrometrica*	Golden Weather-grass	Hypoxidaceae	0.1	1	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed

BAM Site Field Survey								
Project:	Canyonliegh BESS	**Plot Identifier**	BAM03	**Pic 20x20**		**Pic 20x50**		
Survey date:	21/02/2024		**Compass Orientation (head of 20x20 plot)**				290 W	
Recorders	JG		**PCT:**	3373	SVTM 0			
GPS Easting	230115	**GPS Northing**	6165334		**Datum**		**Zone**	56
Landform			**Soils**			**Drainage & Slope**		
Morphology	Hilltop		**Soil Texture**	Fine silty clay		**Slope**	Gentle	
LandF Element			**Soil Colour**	Chocolate brown		**Aspect**		
LandF Pattern			**Soil Depth**	Varied, over granite		**Drainage**	Good	
Microrelief			**Geology**	Granite		**Watercourses**	Nil	

Plot Disturbance			
	Severity	**Age**	**Observational Evidence**
Clearing	2	O	No canopy, some shrubs, largely native grasses and herbs
Cultivation	0		Doesnt appear to be cropped
Soil erosion	0		Good ground coverage, soil crust in bare patches
Firewood	0		
Grazing	2		Cattle present but not overstocked
Fire Damage	0		
Storm Damage	0		
Weediness	1		Blackberry and weedy herbs, forbs and grasses present
Other			

Severity: 0 = no evidence, 1=light, 2=moderate, 3=severe **Age:** R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

Additional information

Current land use

Grazing

Age class of trees (DBH range) , Condition of Vegetation, Hollows

N/A

Disturbances (i.e. fire, grazing,ferals, clearing, logging, soil degradation, pollution, weeds, dieback)

Clearing, grazing, weeds

Significant and threatened species and communities (Note pop. size/area, structure, repro status, habit, habitat, threats, photos)

N/A

Dominant Species outside Plot

FUNCTION

Function attributes for **BAM03**

BAM Attribute (20x20m plot)

	Stratum	Sum
Count of Native Richness	Tree (TG)	1
	Shrub (SG)	2
	Forb (FG)	3
	Grass & grasslike (GG)	7
	Fern (EG)	1
	Other (OG)	0
	TOTAL	14

BAM Attribute (20x20m plot)

	Stratum	Sum
Count of cover abundance (native vascular plants)	Tree (TG)	0.1
	Shrub (SG)	0.4
	Forb (FG)	0.4
	Grass & grasslike (GG)	77.3
	Fern (EG)	0.1
	Other (OG)	0
	TOTAL Native	78.3
	TOTAL 'HTE'	0.5

BAM Attributes (1 x 1m Plots)

	Tape length	% cover	Average %	Photos
Litter Cover	5m	0%	0.0%	
	15m	0%		
	25m	0%		
	35m	0%		
	45m	0%		
Bare ground cover	5m	0%	3.4%	
	15m	5%		
	25m	2%		
	35m	0%		
	45m	10%		
Cryptogam cover	5m	0%	0.0%	
	15m	0%		
	25m	0%		
	35m	0%		
	45m	0%		
Rock Cover	5m	0%	0.0%	
	15m	0%		
	25m	0%		
	35m	0%		
	45m	0%		

BAM Attribute (20 x 50m plot) Tree Stem Counts

DBH (cm)	Euc	Non Euc	Hollows
>80	0	0	0
50-79	0	0	0
30-49	0	0	0
20-29	0	0	0
10-19	0	0	0
5-9	0	0	0
<5	0	0	N/A
Length of logs (m)		0	

0.1%=63x63cm
0.5%=1.4x1.4m
1%=2×2m
5%=4×5m
25%=10×10m

COMPOSITION & STRUCTURE

Species recorded for BAM03

Abbreviation	Scientific Name	Common Name	Family	% Cover	Abundance	Exotic	Growth Form	High Threat?	EPBC Status	BCA Status
Spor creb	*Sporobolus creber*	Slender Rat's Tail Grass	Poaceae	20	400	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Them tria	*Themeda triandra*		Poaceae	25	300	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
rubu frut	*Rubus fruticosus*	Blackberry complex	Rosaceae	0.5	3	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
Fimb dich	*Fimbristylis dichotoma*	Common Fringe-sedge	Cyperaceae	0.1	20	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
kunz parv	*Kunzea parvifolia*	Violet Kunzea	Myrtaceae	0.3	20	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
hypo radi	*Hypochaeris radicata*	Catsear	Asteraceae	2	400	Introduced			Not Listed	Not Listed
Cony bona	*Conyza bonariensis*	Flaxleaf Fleabane	Asteraceae	0.1	30	Introduced			Not Listed	Not Listed
Acac para	*Acacia parramattensis*	Parramatta Wattle	Fabaceae (Mimosoideae)	0.1	1	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
Euch spha	*Euchiton sphaericus*	Star Cudweed	Asteraceae	0.1	50	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Chei sieb	*Cheilanthes sieberi*	Rock Fern	Pteridaceae	0.1	100	Alive in NSW, Native	Fern (EG)		Not Listed	Not Listed
chry apic	*Chrysocephalum apiculatum*	Common Everlasting	Asteraceae	0.2	200	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
hype gram	*Hypericum gramineum*	Small St John's Wort	Clusiaceae	0.1	50	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Cent eryt	*Centaurium erythraea*	Common Centaury	Gentianaceae	0.1	30	Introduced			Not Listed	Not Listed
pani effu	*Panicum effusum*	Hairy Panic	Poaceae	30	500	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
aris ramo	*Aristida ramosa*	Purple Wiregrass	Poaceae	2	200	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
erag trac	*Eragrostis trachycarpa*		Poaceae	0.1	50	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
poa	*Poa spp.*		Poaceae	0.1	40	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
cass acul	*Cassinia aculeata*	Dolly Bush	Asteraceae	0.1	1	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed

BAM Site Field Survey									
Project:	Canyonleigh BESS	**Plot Identifier**	BAM04	**Pic 20x20**		**Pic 20x50**			
Survey date:	22/02/2024		**Compass Orientation (head of 20x20 plot)**				255 W		
Recorders	JG		**PCT:**	3373	SVTM 3738				
GPS Easting	230187	**GPS Northing**	6165391		**Datum**		**Zone**	56	
Landform			**Soils**			**Drainage & Slope**			
Morphology	Slope		**Soil Texture**	Fine silty and loamy clay		**Slope**	Gentle		
LandF Element			**Soil Colour**	Chocolate brown		**Aspect**	30 NE		
LandF Pattern			**Soil Depth**	Good		**Drainage**	Ok		
Microrelief			**Geology**	Granite		**Watercourses**	Nil		

Plot Disturbance			
	Severity	**Age**	**Observational Evidence**
Clearing	0		Mature canopy
Cultivation	0		Remnant veg
Soil erosion	0		Good groundcover and litter cover
Firewood	2	NR	Large dry fallen branches
Grazing	1	R	Cow manure, light trampling
Fire Damage	0		No charcoal on stringybark
Storm Damage	1	NR	Large fallen branches
Weediness	1		Some occassional weedy herbs
Other			

Severity: 0 = no evidence, 1=light, 2=moderate, 3=severe **Age:** R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

Additional information

Current land use

Grazing

Age class of trees (DBH range) , Condition of Vegetation, Hollows

X to x, moderate, possible few

Disturbances (i.e. fire, grazing,ferals, clearing, logging, soil degradation, pollution, weeds, dieback)

Grazing, weeds, dense cassinia monoculture shrub layer suggests regrowth from disturbance

Significant and threatened species and communities (Note pop. size/area, structure, repro status, habit, habitat, threats, photos)

Nil

Dominant Species outside Plot

FUNCTION

Function attributes for BAM04

BAM Attribute (20x20m plot)

	Stratum	Sum
Count of Native Richness	Tree (TG)	6
	Shrub (SG)	2
	Forb (FG)	3
	Grass & grasslike (GG)	5
	Fern (EG)	1
	Other (OG)	0
	TOTAL	17

BAM Attribute (20x20m plot)

	Stratum	Sum
Count of cover abundance (native vascular plants)	Tree (TG)	16
	Shrub (SG)	80
	Forb (FG)	0.3
	Grass & grasslike (GG)	60.4
	Fern (EG)	0.1
	Other (OG)	0
	TOTAL Native	156.8
	TOTAL 'HTE'	20

BAM Attributes (1 x 1m Plots)

	Tape length	% cover	Average %	Photos
Litter Cover	5m	70%	42.0%	
	15m	40%		
	25m	30%		
	35m	20%		
	45m	50%		
Bare ground cover	5m	10%	2.0%	
	15m	0%		
	25m	0%		
	35m	0%		
	45m	0%		
Cryptogam cover	5m	0%	0.0%	
	15m	0%		
	25m	0%		
	35m	0%		
	45m	0%		
Rock Cover	5m	0%	0.0%	
	15m	0%		
	25m	0%		
	35m	0%		
	45m	0%		

BAM Attribute (20 x 50m plot) Tree Stem Counts

DBH (cm)	Euc	Non Euc	Hollows
>80	0	0	0
50-79	2	0	0
30-49	9	0	0
20-29	9	0	2
10-19	8	0	0
5-9	0	0	0
<5	0	0	N/A
Length of logs (m)		31	

0.1%=63x63cm
0.5%=1.4x1.4m
1%=2×2m
5%=4×5m
25%=10×10m

COMPOSITION & STRUCTURE

Species recorded for BAM04

Abbreviation	Scientific Name	Common Name	Family	% Cover	Abundance	Exotic	Growth Form	High Threat?	EPBC Status	BCA Status
nass tric	*Nassella trichotoma*	Serrated Tussock	Poaceae	20	200	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
hypo radi	*Hypochaeris radicata*	Catsear	Asteraceae	0.1	100	Introduced			Not Listed	Not Listed
sola chen	*Solanum chenopodioides*	Whitetip Nightshade	Solanaceae	0.1	5	Introduced			Not Listed	Not Listed
Chei sieb	*Cheilanthes sieberi*	Rock Fern	Pteridaceae	0.1	50	Alive in NSW, Native	Fern (EG)		Not Listed	Not Listed
Wahl stri	*Wahlenbergia stricta*	Tall Bluebell	Campanulaceae	0.1	30	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Sola prin	*Solanum prinophyllum*	Forest Nightshade	Solanaceae	0.1	5	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
hype gram	*Hypericum gramineum*	Small St John's Wort	Clusiaceae	0.1	20	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Micr stip	*Microlaena stipoides*	Weeping Grass	Poaceae	60	700	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Fimb dich	*Fimbristylis dichotoma*	Common Fringe-sedge	Cyperaceae	0.1	20	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Echi ovat	*Echinopogon ovatus*	Forest Hedgehog Grass	Poaceae	0.1	30	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
erag trac	*Eragrostis trachycarpa*		Poaceae	0.1	50	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
poa	*Poa spp.*		Poaceae	0.1	30	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
cass acul	*Cassinia aculeata*	Dolly Bush	Asteraceae	40	200	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
Euca blak	*Eucalyptus blakelyi*	Blakely's Red Gum	Myrtaceae	2	2	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
euca dive	*Eucalyptus dives*	Broad-leaved Peppermint	Myrtaceae	1	3	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
Euca euge	*Eucalyptus eugenioides*	Thin-leaved Stringybark	Myrtaceae	5	8	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed

BAM Site Field Survey									
Project:	Canyonliegh BESS	**Plot Identifier**	BAM05	**Pic 20x20**		**Pic 20x50**			
Survey date:	22/02/2024		**Compass Orientation (head of 20x20 plot)**				235 SW		
Recorders	JG		**PCT:**	3746	SVTM 3738				
GPS Easting	229970	**GPS Northing**	6165157		**Datum**		**Zone**	56	
Landform			**Soils**			**Drainage & Slope**			
Morphology	Hill arm slope		**Soil Texture**	Fine silty loam		**Slope**	Gentle		
LandF Element			**Soil Colour**	Chocolate brown		**Aspect**	Flat to SW		
LandF Pattern			**Soil Depth**	Good		**Drainage**	Good		
Microrelief			**Geology**	Granite		**Watercourses**	Close to drainage line to dam		

Plot Disturbance			
	Severity	**Age**	**Observational Evidence**
Clearing	0		Mature canopy
Cultivation	0		Remnant vegetation
Soil erosion	0		Good ground coverage
Firewood	3	NR	A lot od dead trees and old logs
Grazing	1	R	Cattle present
Fire Damage	0		Logs are not charred
Storm Damage	2	NR	Potential as many logs/branches, but could be due to drought/stress death
Weediness	2	NR	Medium blackberry canes, a few herbaceous weeds
Other			

Severity: 0 = no evidence, 1=light, 2=moderate, 3=severe **Age:** R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

Additional information

Current land use

Grazing, cattle camp/shelter

Age class of trees (DBH range) , Condition of Vegetation, Hollows

X to x, good, potential in stags

Disturbances (i.e. fire, grazing,ferals, clearing, logging, soil degradation, pollution, weeds, dieback)

Grazing, weeds

Significant and threatened species and communities (Note pop. size/area, structure, repro status, habit, habitat, threats, photos)

Nil

Dominant Species outside Plot

FUNCTION

Function attributes for BAM05

BAM Attribute (20x20m plot)

	Stratum	Sum
Count of Native Richness	**Tree (TG)**	**2**
	Shrub (SG)	**7**
	Forb (FG)	**13**
	Grass & grasslike (GG)	**14**
	Fern (EG)	**2**
	Other (OG)	**2**
	TOTAL	**40**

BAM Attribute (20x20m plot)

	Stratum	Sum
Count of cover abundance (native vascular plants)	**Tree (TG)**	**2.5**
	Shrub (SG)	**2.7**
	Forb (FG)	**21.4**
	Grass & grasslike (GG)	**41.5**
	Fern (EG)	**0.2**
	Other (OG)	**0.2**
	TOTAL Native	**68.5**
	TOTAL 'HTE'	**23.2**

BAM Attributes (1 x 1m Plots)

	Tape length	% cover	Average %	Photos
Litter Cover	5m	5%		
	15m	0%		
	25m	20%	**24.0%**	
	35m	80%		
	45m	15%		
Bare ground cover	5m	0%		
	15m	5%		
	25m	0%	**16.0%**	
	35m	0%		
	45m	75%		
Cryptogam cover	5m	0%		
	15m	0%		
	25m	0%	**0.0%**	
	35m	0%		
	45m	0%		
Rock Cover	5m	80%		
	15m	20%		
	25m	70%	**35.0%**	
	35m	5%		
	45m	0%		

BAM Attribute (20 x 50m plot) Tree Stem Counts

DBH (cm)	Euc	Non Euc	Hollows
>80	1	0	0
50-79	3	0	0
30-49	9	0	0
20-29	6	0	0
10-19	9	0	0
5-9	2	0	0
<5	0	0	N/A
Length of logs (m)		64	

0.1%=63x63cm
0.5%=1.4x1.4m
1%=2×2m
5%=4×5m
25%=10×10m

COMPOSITION & STRUCTURE

Species recorded for BAM05

Abbreviation	Scientific Name	Common Name	Family	% Cover	Abundance	Exotic	Growth Form	High Threat?	EPBC Status	BCA Status
Hydr	*Hydrocotyle spp.*		Apiaceae	0.2	100	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
cass acul	*Cassinia aculeata*	Dolly Bush	Asteraceae	0.2	3	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
cass sift	*Cassinia sifton*		Asteraceae	2	25	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
chry apic	*Chrysocephalum apiculatum*	Common Everlasting	Asteraceae	0.2	100	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Cirs vulg	*Cirsium vulgare*	Spear Thistle	Asteraceae	0.1	1	Introduced			Not Listed	Not Listed
Cony bona	*Conyza bonariensis*	Flaxleaf Fleabane	Asteraceae	0.1	20	Introduced			Not Listed	Not Listed
hypo radi	*Hypochaeris radicata*	Catsear	Asteraceae	0.2	100	Introduced			Not Listed	Not Listed
vitt cune	*Vittadinia cuneata*		Asteraceae	0.1	5	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
wahl grac	*Wahlenbergia gracilenta*	Annual Bluebell	Campanulaceae	0.1	10	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Wahl stri	*Wahlenbergia stricta*	Tall Bluebell	Campanulaceae	0.1	5	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Fimb dich	*Fimbristylis dichotoma*	Common Fringe-sedge	Cyperaceae	0.2	100	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Glyc micr	*Glycine microphylla*	Small-leaf Glycine	Fabaceae (Faboideae)	0.1	10	Alive in NSW, Native	Other (OG)		Not Listed	Not Listed
Glyc taba	*Glycine tabacina*	Variable Glycine	Fabaceae (Faboideae)	0.1	20	Alive in NSW, Native	Other (OG)		Not Listed	Not Listed
Acac parr	*Acacia parramattensis*	Parramatta Wattle	Fabaceae (Mimosoideae)	0.5	7	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
Cent eryt	*Centaurium erythraea*	Common Centaury	Gentianaceae	0.1	50	Introduced			Not Listed	Not Listed
Gera sola	*Geranium solanderi*	Native Geranium	Geraniaceae	0.1	100	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
gono tetr	*Gonocarpus tetragynus*	Poverty Raspwort	Haloragaceae	20	800	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
junc	*Juncus spp.*		Juncaceae	0.1	5	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Loma fili	*Lomandra filiformis*	Wattle Matt-rush	Lomandraceae	0.1	1	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
loma	*Lomandra spp.*	Mat-rush	Lomandraceae	0.1	5	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
euca pauc	*Eucalyptus pauciflora*	White Sally	Myrtaceae	2	6	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
kunz parv	*Kunzea parvifolia*	Violet Kunzea	Myrtaceae	0.1	3	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
Oxal pere	*Oxalis perennans*		Oxalidaceae	0.1	100	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Plan lanc	*Plantago lanceolata*	Lamb's Tongues	Plantaginaceae	0.1	100	Introduced			Not Listed	Not Listed
vero pleb	*Veronica plebeia*	Trailing Speedwell	Plantaginaceae	0.1	20	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
brom dian	*Bromus diandrus*	Great Brome	Poaceae	0.5	100	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
digi ramu	*Digitaria ramularis*	Finger Panic Grass	Poaceae	0.2	50	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
erag trac	*Eragrostis trachycarpa*		Poaceae	15	400	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Micr stip	*Microlaena stipoides*	Weeping Grass	Poaceae	5	200	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
nass tric	*Nassella trichotoma*	Serrated Tussock	Poaceae	10	300	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
spor creb	*Sporobolus creber*	Slender Rat's Tail Grass	Poaceae	0.2	50	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Them tria	*Themeda triandra*		Poaceae	0.1	40	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
acet vulg	*Acetosella vulgaris*	Sheep Sorrel	Polygonaceae	0.1	50	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
Chei sieb	*Cheilanthes sieberi*	Rock Fern	Pteridaceae	0.1	200	Alive in NSW, Native	Fern (EG)		Not Listed	Not Listed
acae ovin	*Acaena ovina*	Acaena	Rosaceae	0.1	30	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
rubu frut	*Rubus fruticosus*	Blackberry complex	Rosaceae	1	3	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
Exoc	*Exocarpos spp.*		Santalaceae	0.1	1	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
Sola chen	*Solanum chenopodinum*		Solanaceae	0.1	2	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
Oxal pere	*Oxalis perennans*		Oxalidaceae	0.1	100	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Plan lanc	*Plantago lanceolata*	Lamb's Tongues	Plantaginaceae	0.1	100	Introduced			Not Listed	Not Listed
vero pleb	*Veronica plebeia*	Trailing Speedwell	Plantaginaceae	0.1	20	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
brom dian	*Bromus diandrus*	Great Brome	Poaceae	0.5	100	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
digi ramu	*Digitaria ramularis*	Finger Panic Grass	Poaceae	0.2	50	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
erag trac	*Eragrostis trachycarpa*		Poaceae	15	400	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Micr stip	*Microlaena stipoides*	Weeping Grass	Poaceae	5	200	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
nass tric	*Nassella trichotoma*	Serrated Tussock	Poaceae	10	300	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
spor creb	*Sporobolus creber*	Slender Rat's Tail Grass	Poaceae	0.2	50	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Them tria	*Themeda triandra*		Poaceae	0.1	40	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
acet vulg	*Acetosella vulgaris*	Sheep Sorrel	Polygonaceae	0.1	50	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
Chei sieb	*Cheilanthes sieberi*	Rock Fern	Pteridaceae	0.1	200	Alive in NSW, Native	Fern (EG)		Not Listed	Not Listed
acae ovin	*Acaena ovina*	Acaena	Rosaceae	0.1	30	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
rubu frut	*Rubus fruticosus*	Blackberry complex	Rosaceae	1	3	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
Exoc	*Exocarpos spp.*		Santalaceae	0.1	1	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
Sola chen	*Solanum chenopodinum*		Solanaceae	0.1	2	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed

BAM Site Field Survey

Project:	Canyonliegh BESS	**Plot Identifier**	BAM06	**Pic 20x20**		**Pic 20x50**		
Survey date:	29/04/2024		**Compass Orientation (head of 20x20 plot)**				265W	
Recorders	JG + CW		**PCT:**	3373	SVTM 3738			
GPS Easting	239246	**GPS Northing**	6165772		**Datum**		**Zone**	56
Landform			**Soils**			**Drainage & Slope**		
Morphology			**Soil Texture**			**Slope**		
LandF Element			**Soil Colour**			**Aspect**		
LandF Pattern			**Soil Depth**			**Drainage**		
Microrelief			**Geology**			**Watercourses**		

Plot Disturbance

	Severity	Age	Observational Evidence
Clearing			
Cultivation			
Soil erosion			
Firewood			
Grazing			
Fire Damage			
Storm Damage			
Weediness			
Other			

Severity: 0 = no evidence, 1=light, 2=moderate, 3=severe **Age:** R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

Additional information

Current land use

Semi-open woodland, moderate mid-shrubs, herbaceous groundcover with moderate litter cover. Dead wood.

Age class of trees (DBH range) , Condition of Vegetation, Hollows

Disturbances (i.e. fire, grazing,ferals, clearing, logging, soil degradation, pollution, weeds, dieback)

Some evidence of fire (10-15 years)

Significant and threatened species and communities (Note pop. size/area, structure, repro status, habit, habitat, threats, photos)

Dominant Species outside Plot

FUNCTION

Function attributes for BAM06

BAM Attribute (20x20m plot)

	Stratum	Sum
Count of Native Richness	Tree (TG)	3
	Shrub (SG)	8
	Forb (FG)	8
	Grass & grasslike (GG)	8
	Fern (EG)	0
	Other (OG)	0
	TOTAL	27

BAM Attribute (20x20m plot)

	Stratum	Sum
Count of cover abundance (native vascular plants)	Tree (TG)	16
	Shrub (SG)	1.2
	Forb (FG)	50.7
	Grass & grasslike (GG)	26.9
	Fern (EG)	0
	Other (OG)	0
	TOTAL Native	94.8
	TOTAL 'HTE'	0.2

BAM Attributes (1 x 1m Plots)

	Tape length	% cover	Average %	Photos
Litter Cover	5m	40%	42.0%	
	15m	50%		
	25m	50%		
	35m	30%		
	45m	40%		
Bare ground cover	5m	1%	4.6%	
	15m	5%		
	25m	5%		
	35m	2%		
	45m	10%		
Cryptogam cover	5m	0%	0.0%	
	15m	0%		
	25m	0%		
	35m	0%		
	45m	0%		
Rock Cover	5m	0%	6.0%	
	15m	15%		
	25m	0%		
	35m	5%		
	45m	10%		

BAM Attribute (20 x 50m plot) Tree Stem Counts

DBH (cm)	Euc	Non Euc	Hollows
>80	0	0	0
50-79	1	0	0
30-49	18	0	0
20-29	7	0	0
10-19	Yes	0	0
5-9	No	0	0
<5	Yes	0	N/A
Length of logs (m)		65	

0.1%=63x63cm
0.5%=1.4x1.4m
1%=2×2m
5%=4×5m
25%=10×10m

COMPOSITION & STRUCTURE

Species recorded for BAM06

Abbreviation	Scientific Name	Common Name	Family	% Cover	Abundance	Exotic	Growth Form	High Threat?	EPBC Status	BCA Status
Cony bona	*Conyza bonariensis*	Flaxleaf Fleabane	Asteraceae	0.1	2	Introduced			Not Listed	Not Listed
Nass tric	*Nassella trichotoma*	Serrated Tussock	Poaceae	0.1	1	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
Cirs vulg	*Cirsium vulgare*	Spear Thistle	Asteraceae	0.1	1	Introduced			Not Listed	Not Listed
Rubu frut	*Rubus fruticosus*	Blackberry complex	Rosaceae	0.1	2	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
Aira	*Aira spp.*		Poaceae	0.1	2	Introduced			Not Listed	Not Listed
Gono tetr	*Gonocarpus tetragynus*	Poverty Raspwort	Haloragaceae	15	1000	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Good hede	*Goodenia hederacea*	Ivy Goodenia	Goodeniaceae	5	1000	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Chei sieb	*Hydrocotyle spp.*		Apiaceae	30.1	3	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Hydr laxi	*Hydrocotyle laxiflora*	Stinking Pennywort	Apiaceae	0.1	50	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Euch japo	*Euchiton japonicus*		Asteraceae	0.1	10	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Wahl stri	*Wahlenbergia stricta*	Tall Bluebell	Campanulaceae	0.1	30	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Dich repe	*Dichondra repens*	Kidney Weed	Convolvulaceae	0.2	30	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Ajug aust	*Ajuga australis*	Austral Bugle	Lamiaceae	0.1	30	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Loma mult mult	*Lomandra multiflora subsp. multiflora*	Many-flowered Mat-rush	Lomandraceae	0.1	5	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Loma fili	*Lomandra filiformis*	Wattle Matt-rush	Lomandraceae	0.5	50	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
erag lept	*Eragrostis leptocarpa*	Drooping Lovegrass	Poaceae	0.1	10	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Aris ramo	*Aristida ramosa*	Purple Wiregrass	Poaceae	2	300	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Ryti	*Rytidosperma spp.*		Poaceae	20	600	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
ryti	*Rytidosperma spp.*		Poaceae	4	400	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
dich	*Dichelachne spp.*		Poaceae	0.1	30	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
echi	*Echinopogon spp.*		Poaceae	0.1	100	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Cass sift	*Cassinia sifton*		Asteraceae	0.3	15	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
Cass acul	*Cassinia aculeata*	Dolly Bush	Asteraceae	0.2	5	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
Cass laev	*Cassinia laevis*	Cough Bush	Asteraceae	0.2	3	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
Cass unca	*Cassinia uncata*	Sticky Cassinia	Asteraceae	0.1	5	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
Olea visc	*Olearia viscidula*	Wallaby Weed	Asteraceae	0.1	3	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
Meli urce	*Melichrus urceolatus*	Urn Heath	Ericaceae	0.1	2	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
Hibb obtu	*Hibbertia obtusifolia*	Hoary Guinea Flower	Dilleniaceae	0.1	2	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
Hibb	*Hibbertia spp.*		Dilleniaceae	0.1	1	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
Euca euge	*Eucalyptus eugenioides*	Thin-leaved Stringybark	Myrtaceae	15	8	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
Acac parr	*Acacia parramattensis*	Parramatta Wattle	Fabaceae (Mimosoideae)	0.5	10	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
Euca mell	*Eucalyptus melliodora*	Yellow Box	Myrtaceae	0.5	2	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed

BAM Site Field Survey

Project:	Canyonliegh BESS	**Plot Identifier**	BAM07	**Pic 20x20**		**Pic 20x50**		
Survey date:	30/04/2024		**Compass Orientation (head of 20x20 plot)**				250 W	
Recorders	JG + CW		**PCT:**	4063	Possibly integrated/mixed with 3746			
GPS Easting	229665	**GPS Northing**	6165424		**Datum**		**Zone**	56
Landform			**Soils**			**Drainage & Slope**		
Morphology			**Soil Texture**			**Slope**	West	
LandF Element			**Soil Colour**			**Aspect**		
LandF Pattern			**Soil Depth**			**Drainage**		
Microrelief			**Geology**			**Watercourses**		

Plot Disturbance

	Severity	Age	Observational Evidence
Clearing			
Cultivation			
Soil erosion			
Firewood			
Grazing			
Fire Damage			
Storm Damage			
Weediness			
Other			

Severity: 0 = no evidence, 1=light, 2=moderate, 3=severe **Age:** R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

Additional information

Current land use

West facing slope gully, with active drainage. Allocasuarina homogenous canopy, and weedy understorey dominated by blackberry, with native shrubs and grasses

Age class of trees (DBH range) , Condition of Vegetation, Hollows

Disturbances (i.e. fire, grazing,ferals, clearing, logging, soil degradation, pollution, weeds, dieback)

Significant and threatened species and communities (Note pop. size/area, structure, repro status, habit, habitat, threats, photos)

Dominant Species outside Plot

FUNCTION

Function attributes for BAM07

BAM Attribute (20x20m plot)

	Stratum	Sum
Count of Native Richness	Tree (TG)	3
	Shrub (SG)	1
	Forb (FG)	4
	Grass & grasslike (GG)	9
	Fern (EG)	0
	Other (OG)	0
	TOTAL	17

BAM Attribute (20x20m plot)

	Stratum	Sum
Count of cover abundance (native vascular plants)	Tree (TG)	30.3
	Shrub (SG)	0
	Forb (FG)	12.3
	Grass & grasslike (GG)	40.9
	Fern (EG)	0
	Other (OG)	0
	TOTAL Native	83.5
	TOTAL 'HTE'	20.8

BAM Attribute (20 x 50m plot) Tree Stem Counts

DBH (cm)	Euc	Non Euc	Hollows
>80	0	0	0
50-79	1	0	0
30-49	8	0	0
20-29	17	0	0
10-19	Yes	0	0
5-9	Yes	0	0
<5	Yes	0	N/A
Length of logs (m)		15	

BAM Attributes (1 x 1m Plots)

	Tape length	% cover	Average %	Photos
Litter Cover	5m	25%	25.0%	
	15m	35%		
	25m	10%		
	35m	25%		
	45m	30%		
Bare ground cover	5m	1%	3.6%	
	15m	5%		
	25m	5%		
	35m	4%		
	45m	3%		
Cryptogam cover	5m	0%	0.0%	
	15m	0%		
	25m	0%		
	35m	0%		
	45m	0%		
Rock Cover	5m	0%	0.0%	
	15m	0%		
	25m	0%		
	35m	0%		
	45m	0%		

0.1%=63x63cm
0.5%=1.4x1.4m
1%=2×2m
5%=4×5m
25%=10×10m

COMPOSITION & STRUCTURE

Species recorded for BAM07

Abbreviation	Scientific Name	Common Name	Family	% Cover	Abundance	Exotic	Growth Form	High Threat?	EPBC Status	BCA Status
casu cunn	*Casuarina cunninghamiana*	River Oak	Casuarinaceae	30	43	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
Acac parr	*Acacia parramattensis*	Parramatta Wattle	Fabaceae (Mimosoideae)	0.2	2	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
Acac mela	*Acacia melanoxylon*	Blackwood	Fabaceae (Mimosoideae)	0.1	2	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
Rubu frut	*Rubus fruticosus*	Blackberry complex	Rosaceae	20	50	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
Rosa rubi	*Rosa rubiginosa*	Sweet Briar	Rosaceae	0.1	10	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
Crat mono	*Crataegus monogyna*	Hawthorn	Malaceae	0.1	23	Introduced		High Threat Weed - manageable	Not Listed	Not Listed
Cirs vulg	*Cirsium vulgare*	Spear Thistle	Asteraceae	2	50	Introduced			Not Listed	Not Listed
Plan lanc	*Plantago lanceolata*	Lamb's Tongues	Plantaginaceae	1	200	Introduced			Not Listed	Not Listed
Sola nigr	*Solanum nigrum*	Black-berry Nightshade	Solanaceae	0.1	5	Introduced			Not Listed	Not Listed
Hypo radi	*Hypochaeris radicata*	Catsear	Asteraceae	3	200	Introduced			Not Listed	Not Listed
Hype perf	*Hypericum perforatum*	St. Johns Wort	Clusiaceae	0.2	20	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
Cass sift	*Cassinia sifton*		Asteraceae		1	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
Dich repe	*Dichondra repens*	Kidney Weed	Convolvulaceae	10	2000	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Hydr laxi	*Hydrocotyle laxiflora*	Stinking Pennywort	Apiaceae	2	300	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Sonc oler	*Sonchus oleraceus*	Common Sowthistle	Asteraceae	0.1	30	Introduced			Not Listed	Not Listed
Card	*Carduus spp.*		Asteraceae	0.1	5	Introduced			Not Listed	Not Listed
Gali apar	*Galium aparine*	Goosegrass	Rubiaceae	2	400	Introduced			Not Listed	Not Listed
Lysi arve	*Lysimachia arvensis*	Scarlet Pimpernel	Primulaceae	0.3	200	Introduced			Not Listed	Not Listed
Tara offi	*Taraxacum officinale*	Dandelion	Asteraceae	0.1	30	Introduced			Not Listed	Not Listed
Ryti	*Rytidosperma spp.*		Poaceae	25	3000	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Nass tric	*Nassella trichotoma*	Serrated Tussock	Poaceae	0.3	15	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
Micr stip	*Microlaena stipoides*	Weeping Grass	Poaceae	15	2000	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Them tria	*Themeda triandra*		Poaceae	0.1	1	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Dich repe	*Dichelachne spp.*		Poaceae	0.2	30	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Acae ovin	*Acaena ovina*	Acaena	Rosaceae	0.2	50	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Wahl grac	*Wahlenbergia gracilenta*	Annual Bluebell	Campanulaceae	0.1	1	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Pasp dila	*Paspalum dilatatum*	Paspalum	Poaceae	0.1	5	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
Cent eryt	*Centaurium erythraea*	Common Centaury	Gentianaceae	0.1	1	Introduced			Not Listed	Not Listed
junc	*Juncus spp.*		Juncaceae	0.1	1	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Poa labi	*Poa labillardierei*	Tussock	Poaceae	0.1	5	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
dact glom	*Dactylis glomerata*	Cocksfoot	Poaceae	5	100	Introduced			Not Listed	Not Listed
Care appr	*Carex appressa*	Tall Sedge	Cyperaceae	0.1	1	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
poa	*Poa spp.*		Poaceae	0.2	30	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
ryti	*Rytidosperma spp.*		Poaceae	0.1	1	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed

BAM Site Field Survey								
Project:	Canyonliegh BESS	**Plot Identifier**	BAM08	**Pic 20x20**		**Pic 20x50**		
Survey date:	30/04/2024		**Compass Orientation (head of 20x20 plot)**				253 W	
Recorders	JG + CW		**PCT:**	3746	SVTM 0			
GPS Easting	229858	**GPS Northing**	6165528		**Datum**		**Zone**	56
Landform			**Soils**			**Drainage & Slope**		
Morphology			**Soil Texture**			**Slope**	West	
LandF Element			**Soil Colour**			**Aspect**		
LandF Pattern			**Soil Depth**			**Drainage**		
Microrelief			**Geology**			**Watercourses**		

Plot Disturbance			
	Severity	**Age**	**Observational Evidence**
Clearing			
Cultivation			
Soil erosion			
Firewood			
Grazing			
Fire Damage			
Storm Damage			
Weediness			
Other			

Severity: 0 = no evidence, 1=light, 2=moderate, 3=severe **Age:** R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

Additional information

Current land use

Native dominated derived grassland

Age class of trees (DBH range) , Condition of Vegetation, Hollows

Disturbances (i.e. fire, grazing,ferals, clearing, logging, soil degradation, pollution, weeds, dieback)

Significant and threatened species and communities (Note pop. size/area, structure, repro status, habit, habitat, threats, photos)

Dominant Species outside Plot

FUNCTION

Function attributes for BAM08

BAM Attribute (20x20m plot)

	Stratum	Sum
Count of Native Richness	Tree (TG)	1
	Shrub (SG)	1
	Forb (FG)	2
	Grass & grasslike (GG)	7
	Fern (EG)	0
	Other (OG)	0
	TOTAL	11

BAM Attribute (20x20m plot)

	Stratum	Sum
Count of cover abundance (native vascular plants)	Tree (TG)	0.1
	Shrub (SG)	0.1
	Forb (FG)	1.2
	Grass & grasslike (GG)	59.8
	Fern (EG)	0
	Other (OG)	0
	TOTAL Native	61.2
	TOTAL 'HTE'	1.6

BAM Attributes (1 x 1m Plots)

	Tape length	% cover	Average %	Photos
Litter Cover	5m	2%	2.2%	
	15m	2%		
	25m	3%		
	35m	2%		
	45m	2%		
Bare ground cover	5m	5%	4.4%	
	15m	6%		
	25m	4%		
	35m	3%		
	45m	4%		
Cryptogam cover	5m	0%	0.4%	
	15m	0%		
	25m	0%		
	35m	0%		
	45m	2%		
Rock Cover	5m	0%	0.0%	
	15m	0%		
	25m	0%		
	35m	0%		
	45m	0%		

BAM Attribute (20 x 50m plot) Tree Stem Counts

DBH (cm)	Euc	Non Euc	Hollows
>80	0	0	0
50-79	0	0	0
30-49	0	0	0
20-29	0	0	0
10-19	0	0	0
5-9	0	0	0
<5	0	0	N/A
Length of logs (m)		0	

0.1%=63x63cm
0.5%=1.4x1.4m
1%=2×2m
5%=4×5m
25%=10×10m

COMPOSITION & STRUCTURE

Species recorded for BAM08

Abbreviation	Scientific Name	Common Name	Family	% Cover	Abundance	Exotic	Growth Form	High Threat?	EPBC Status	BCA Status
kunz parv	*Kunzea parvifolia*	Violet Kunzea	Myrtaceae	0.1	1	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
Rubu frut	*Rubus fruticosus*	Blackberry complex	Rosaceae	0.2	3	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
Spor creb	*Sporobolus creber*	Slender Rat's Tail Grass	Poaceae	20	1000	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Crat mono	*Crataegus monogyna*	Hawthorn	Malaceae	0.1	1	Introduced		High Threat Weed - manageable	Not Listed	Not Listed
Them tria	*Themeda triandra*		Poaceae	30	2000	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
both	*Bothriochloa spp.*	Redgrass, Bluegrass	Poaceae	0.3	300	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
erag trac	*Eragrostis trachycarpa*		Poaceae	0.5	500	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
chry apic	*Chrysocephalum apiculatum*	Common Everlasting	Asteraceae	1	350	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Plan lanc	*Plantago lanceolata*	Lamb's Tongues	Plantaginaceae	0.1	30	Introduced			Not Listed	Not Listed
Aris ramo	*Aristida ramosa*	Purple Wiregrass	Poaceae	5	800	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Erag lept	*Eragrostis leptocarpa*	Drooping Lovegrass	Poaceae	1	200	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Micr stip	*Microlaena stipoides*	Weeping Grass	Poaceae	3	200	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Acac mela	*Acacia melanoxylon*	Blackwood	Fabaceae (Mimosoideae)	0.1	1	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
Hype perf	*Hypericum perforatum*	St. Johns Wort	Clusiaceae	0.2	100	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
Hypo radi	*Hypochaeris radicata*	Catsear	Asteraceae	0.5	300	Introduced			Not Listed	Not Listed
Gamo calv	*Gamochaeta calviceps*	Cudweed	Asteraceae	0.2	200	Introduced			Not Listed	Not Listed
Cony bona	*Conyza bonariensis*	Flaxleaf Fleabane	Asteraceae	0.1	20	Introduced			Not Listed	Not Listed
Seta pumi	*Setaria pumila*	Pale Pigeon Grass	Poaceae	0.1	30	Introduced			Not Listed	Not Listed
Sida spin	*Sida spinosa*		Malvaceae	0.1	5	Introduced			Not Listed	Not Listed
Nass tric	*Nassella trichotoma*	Serrated Tussock	Poaceae	1	150	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
Trif camp	*Trifolium campestre*	Hop Clover	Fabaceae (Faboideae)	0.1	1	Introduced			Not Listed	Not Listed
acet vulg	*Acetosella vulgaris*	Sheep Sorrel	Polygonaceae	0.1	10	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
Halo hete	*Haloragis heterophylla*	Variable Raspwort	Haloragaceae	0.2	300	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed

BAM Site Field Survey								
Project:	Canyonleigh BESS	**Plot Identifier**	BAM09	**Pic 20x20**		**Pic 20x50**		
Survey date:	1/05/2024		**Compass Orientation (head of 20x20 plot)**				220 SW	
Recorders	JG + CW		**PCT:**	3746	SVTM 0			
GPS Easting	229755	**GPS Northing**	6165408		**Datum**		**Zone**	56
Landform			**Soils**			**Drainage & Slope**		
Morphology			**Soil Texture**			**Slope**		
LandF Element			**Soil Colour**			**Aspect**		
LandF Pattern			**Soil Depth**			**Drainage**		
Microrelief			**Geology**			**Watercourses**		

Plot Disturbance			
	Severity	**Age**	**Observational Evidence**
Clearing			
Cultivation			
Soil erosion			
Firewood			
Grazing			
Fire Damage			
Storm Damage			
Weediness			
Other			

Severity: 0 = no evidence, 1=light, 2=moderate, 3=severe **Age:** R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

Additional information

Current land use

Open cleared grassland in the electric tower corridor. Likely derived as had high native component, some weeds.

Age class of trees (DBH range) , Condition of Vegetation, Hollows

Disturbances (i.e. fire, grazing,ferals, clearing, logging, soil degradation, pollution, weeds, dieback)

Significant and threatened species and communities (Note pop. size/area, structure, repro status, habit, habitat, threats, photos)

Dominant Species outside Plot

FUNCTION

Function attributes for	**BAM09**
BAM Attribute (20x20m plot)	
Stratum	**Sum**
Tree (TG)	**0**
Shrub (SG)	**0**
Forb (FG)	**4**
Grass & grasslike (GG)	**11**
Fern (EG)	**1**
Other (OG)	**0**
TOTAL	**16**
BAM Attribute (20x20m plot)	
Stratum	**Sum**
Tree (TG)	**0**
Shrub (SG)	**0**
Forb (FG)	**30.3**
Grass & grasslike (GG)	**60.5**
Fern (EG)	**0.1**
Other (OG)	**0**
TOTAL Native	**90.9**
TOTAL 'HTE'	**1.4**

Count of Native Richness

Count of cover abundance (native vascular plants)

BAM Attribute (20 x 50m plot) Tree Stem Counts

DBH (cm)	Euc	Non Euc	Hollows
>80	0	0	0
50-79	0	0	0
30-49	0	0	0
20-29	0	0	0
10-19	0	0	0
5-9	0	0	0
<5	0	0	N/A
Length of logs (m)		0	

0.1%=63x63cm
0.5%=1.4x1.4m
1%=2×2m
5%=4×5m
25%=10×10m

BAM Attributes (1 x 1m Plots)

	Tape length	% cover	Average %	Photos
Litter Cover	5m	2%		
	15m	2%		
	25m	2%	**2.0%**	
	35m	2%		
	45m	2%		
Bare ground cover	5m	3%		
	15m	5%		
	25m	3%	**3.8%**	
	35m	4%		
	45m	4%		
Cryptogam cover	5m	0%		
	15m	0%		
	25m	0%	**1.6%**	
	35m	5%		
	45m	3%		
Rock Cover	5m	0%		
	15m	0%		
	25m	15%	**3.0%**	
	35m	0%		
	45m	0%		

COMPOSITION & STRUCTURE

Species recorded for BAM09

Abbreviation	Scientific Name	Common Name	Family	% Cover	Abundance	Exotic	Growth Form	High Threat?	EPBC Status	BCA Status
Rubu frut	*Rubus fruticosus*	Blackberry complex	Rosaceae	1	20	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
Spor creb	*Sporobolus creber*	Slender Rat's Tail Grass	Poaceae	5	800	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Plan lanc	*Plantago lanceolata*	Lamb's Tongues	Plantaginaceae	3	200	Introduced			Not Listed	Not Listed
both	*Bothriochloa spp.*	Redgrass, Bluegrass	Poaceae	2	500	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
aris ramo	*Aristida ramosa*	Purple Wiregrass	Poaceae	2	500	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
pani effu	*Panicum effusum*	Hairy Panic	Poaceae	1	300	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
hypo radi	*Hypochaeris radicata*	Catsear	Asteraceae	0.5	200	Introduced			Not Listed	Not Listed
Oxal pere	*Oxalis perennans*		Oxalidaceae	0.1	5	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Seta pumi	*Setaria pumila*	Pale Pigeon Grass	Poaceae	0.1	1	Introduced			Not Listed	Not Listed
Erag lept	*Eragrostis leptocarpa*	Drooping Lovegrass	Poaceae	20	300	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
halo hete	*Haloragis heterophylla*	Variable Raspwort	Haloragaceae	30	3000	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Chei sieb	*Cheilanthes sieberi*	Rock Fern	Pteridaceae	0.1	10	Alive in NSW, Native	Fern (EG)		Not Listed	Not Listed
acet vulg	*Acetosella vulgaris*	Sheep Sorrel	Polygonaceae	0.1	10	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
oeno	*Oenothera spp.*		Onagraceae	0.1	1	Introduced			Not Listed	Not Listed
Them tria	*Themeda triandra*		Poaceae	30	500	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
fimb dich	*Fimbristylis dichotoma*	Common Fringe-sedge	Cyperaceae	0.1	5	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
dact glom	*Dactylis glomerata*	Cocksfoot	Poaceae	0.5	30	Introduced			Not Listed	Not Listed
Verb bona	*Verbena bonariensis*	Purpletop	Verbenaceae	0.1	5	Introduced			Not Listed	Not Listed
dich micr	*Dichelachne micrantha*	Shorthair Plumegrass	Poaceae	0.1	20	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Care appr	*Carex appressa*	Tall Sedge	Cyperaceae	0.1	1	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Pasp dila	*Paspalum dilatatum*	Paspalum	Poaceae	0.1	10	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
epil bill cine	*Epilobium billardiereanum subsp. cinereum*		Onagraceae	0.1	80	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
trif arve	*Trifolium arvense*	Haresfoot Clover	Fabaceae (Faboideae)	0.1	1	Introduced			Not Listed	Not Listed
cony bona	*Conyza bonariensis*	Flaxleaf Fleabane	Asteraceae	0.1	1	Introduced			Not Listed	Not Listed
junc	*Juncus spp.*		Juncaceae	0.1	1	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Nass tric	*Nassella trichotoma*	Serrated Tussock	Poaceae	0.1	5	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
gono tetr	*Gonocarpus tetragynus*	Poverty Raspwort	Haloragaceae	0.1	10	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
ryti	*Rytidosperma spp.*		Poaceae	0.1	1	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
erag curv	*Eragrostis curvula*	African Lovegrass	Poaceae	0.1	5	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed

BAM Site Field Survey								
Project:	Canyonleigh BESS	**Plot Identifier**	BAM10	**Pic 20x20**		**Pic 20x50**		
Survey date:	1/05/2024		**Compass Orientation (head of 20x20 plot)**				160 S	
Recorders	JG + CW		**PCT:**	3746	SVTM 0			
GPS Easting	229629	**GPS Northing**	6165184		**Datum**		**Zone**	56
Landform			**Soils**			**Drainage & Slope**		
Morphology			**Soil Texture**			**Slope**		
LandF Element			**Soil Colour**			**Aspect**		
LandF Pattern			**Soil Depth**			**Drainage**		
Microrelief			**Geology**			**Watercourses**		

Plot Disturbance			
	Severity	**Age**	**Observational Evidence**
Clearing			
Cultivation			
Soil erosion			
Firewood			
Grazing			
Fire Damage			
Storm Damage			
Weediness			
Other			

Severity: 0 = no evidence, 1=light, 2=moderate, 3=severe **Age:** R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

Additional information

Current land use

Cleared open grassland, colonised by shrubs (tea-tree)

Age class of trees (DBH range) , Condition of Vegetation, Hollows

Disturbances (i.e. fire, grazing,ferals, clearing, logging, soil degradation, pollution, weeds, dieback)

Significant and threatened species and communities (Note pop. size/area, structure, repro status, habit, habitat, threats, photos)

Dominant Species outside Plot

FUNCTION

Function attributes for BAM10

BAM Attribute (20x20m plot)

	Stratum	Sum
Count of Native Richness	Tree (TG)	1
	Shrub (SG)	2
	Forb (FG)	3
	Grass & grasslike (GG)	4
	Fern (EG)	1
	Other (OG)	0
	TOTAL	11

BAM Attribute (20x20m plot)

	Stratum	Sum
Count of cover abundance (native vascular plants)	Tree (TG)	0.1
	Shrub (SG)	40.1
	Forb (FG)	0.7
	Grass & grasslike (GG)	42.3
	Fern (EG)	0.1
	Other (OG)	0
	TOTAL Native	83.3
	TOTAL 'HTE'	0.3

BAM Attribute (20 x 50m plot) Tree Stem Counts

DBH (cm)	Euc	Non Euc	Hollows
>80	0	0	0
50-79	0	0	0
30-49	0	0	0
20-29	0	0	0
10-19	0	0	0
5-9	0	0	0
<5	0	0	N/A
Length of logs (m)		0	

BAM Attributes (1 x 1m Plots)

	Tape length	% cover	Average %	Photos
Litter Cover	5m	2%	2.4%	
	15m	3%		
	25m	3%		
	35m	2%		
	45m	2%		
Bare ground cover	5m	5%	4.4%	
	15m	4%		
	25m	3%		
	35m	5%		
	45m	5%		
Cryptogam cover	5m	1%	1.2%	
	15m	0%		
	25m	0%		
	35m	4%		
	45m	1%		
Rock Cover	5m	0%	1.0%	
	15m	0%		
	25m	0%		
	35m	0%		
	45m	5%		

0.1%=63x63cm
0.5%=1.4x1.4m
1%=2×2m
5%=4×5m
25%=10×10m

COMPOSITION & STRUCTURE

Species recorded for BAM10

Abbreviation	Scientific Name	Common Name	Family	% Cover	Abundance	Exotic	Growth Form	High Threat?	EPBC Status	BCA Status
kunz parv	*Kunzea parvifolia*	Violet Kunzea	Myrtaceae	40	600	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
rosa	*Rosa spp.*		Rosaceae	0.1	1	Introduced			Not Listed	Not Listed
Acac parr	*Acacia parramattensis*	Parramatta Wattle	Fabaceae (Mimosoideae)	0.1	1	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
Them tria	*Themeda triandra*		Poaceae	40	2000	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
aris vaga	*Aristida vagans*	Threeawn Speargrass	Poaceae	2	300	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
hypo radi	*Hypochaeris radicata*	Catsear	Asteraceae	0.1	10	Introduced			Not Listed	Not Listed
Euch spha	*Euchiton sphaericus*	Star Cudweed	Asteraceae	0.1	10	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
leuc	*Leucopogon spp.*		Ericaceae	0.1	1	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
Rubu frut	*Rubus fruticosus*	Blackberry complex	Rosaceae	0.1	2	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
gono tetr	*Gonocarpus tetragynus*	Poverty Raspwort	Haloragaceae	0.5	300	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
hype gram	*Hypericum gramineum*	Small St John's Wort	Clusiaceae	0.1	2	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Chei sieb	*Cheilanthes sieberi*	Rock Fern	Pteridaceae	0.1	50	Alive in NSW, Native	Fern (EG)		Not Listed	Not Listed
care inve	*Carex inversa*	Knob Sedge	Cyperaceae	0.1	1	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
nass tric	*Nassella trichotoma*	Serrated Tussock	Poaceae	0.2	5	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
cony bona	*Conyza bonariensis*	Flaxleaf Fleabane	Asteraceae	0.1	1	Introduced			Not Listed	Not Listed
Erag lept	*Eragrostis leptocarpa*	Drooping Lovegrass	Poaceae	0.2	50	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
gamo calv	*Gamochaeta calviceps*	Cudweed	Asteraceae	0.1	1	Introduced			Not Listed	Not Listed

BAM Site Field Survey								
Project:	Canyonleigh	**Plot Identifier**	BAM11	**Pic 20x20**	Y	**Pic 20x50**	Y	
Survey date:	11/11/2024		**Compass Orientation (head of 20x20 plot)**				192	
Recorders	Damian Wall, Stuart Mendham		**PCT:**					
GPS Easting	229480.9	**GPS Northing**	6165149.1		**Datum**	GDA94	**Zone**	56H
Landform			**Soils**			**Drainage & Slope**		
Morphology			**Soil Texture**			**Slope**		
LandF Element			**Soil Colour**			**Aspect**		
LandF Pattern			**Soil Depth**			**Drainage**		
Microrelief			**Geology**			**Watercourses**		

Plot Disturbance			
	Severity	**Age**	**Observational Evidence**
Clearing			
Cultivation			
Soil erosion			
Firewood			
Grazing	Pugged. Cattle present.		
Fire Damage			
Storm Damage			
Weediness			
Other	deer damage extensive in cleared areas		

Severity: 0 = no evidence, 1=light, 2=moderate, 3=severe **Age:** R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

Additional information

Current land use

Age class of trees (DBH range) , Condition of Vegetation, Hollows

Disturbances (i.e. fire, grazing,ferals, clearing, logging, soil degradation, pollution, weeds, dieback)

Significant and threatened species and communities (Note pop. size/area, structure, repro status, habit, habitat, threats, photos)

Booroolong frog suspected to south

Dominant Species outside Plot

FUNCTION

Function attributes for BAM11

BAM Attribute (20x20m plot)

	Stratum	Sum
Count of Native Richness	Tree (TG)	0
	Shrub (SG)	1
	Forb (FG)	8
	Grass & grasslike (GG)	8
	Fern (EG)	0
	Other (OG)	0
	TOTAL	17

BAM Attribute (20x20m plot)

	Stratum	Sum
Count of cover abundance (native vascular plants)	Tree (TG)	0
	Shrub (SG)	3
	Forb (FG)	11.5
	Grass & grasslike (GG)	51.7
	Fern (EG)	0
	Other (OG)	0
	TOTAL Native	66.2
	TOTAL 'HTE'	40

BAM Attributes (1 x 1m Plots)

	Tape length	% cover	Average %	Photos
Litter Cover	5m	5%	15.4%	n
	15m	10%		n
	25m	2%		n
	35m	10%		n
	45m	50%		n
Bare ground cover	5m	5%	8.4%	n
	15m	1%		n
	25m	5%		n
	35m	30%		n
	45m	1%		n
Cryptogam cover	5m	15%	7.0%	n
	15m	5%		n
	25m	10%		n
	35m	5%		n
	45m	0%		n
Rock Cover	5m	0%	0.0%	n
	15m	0%		n
	25m	0%		n
	35m	0%		n
	45m	0%		n

BAM Attribute (20 x 50m plot) Tree Stem Counts

DBH (cm)	Euc	Non Euc	Hollows
>80	0		
50-79	0		
30-49	0		
20-29	0		
10-19	0		
5-9	0		
<5	0		N/A
Length of logs (m)		27	

0.1%=63x63cm
0.5%=1.4x1.4m
1%=2×2m
5%=4×5m
25%=10×10m

COMPOSITION & STRUCTURE

Species recorded for BAM11

Abbreviation	Scientific Name	Common Name	Family	% Cover	Abundance	Exotic	Growth Form	High Threat?	EPBC Status	BCA Status
rubu frut	*Rubus fruticosus*	Blackberry	Rosaceae			Introduced		Yes	Not Listed	Not Listed
lept myrt	*Leptospermum myrtifolium*	Myrtle Tea-tree	Myrtaceae	3	40	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
holc lana	*Holcus lanatus*	Yorkshire Fog	Poaceae			Introduced			Not Listed	Not Listed
them tria	*Themeda triandra*		Poaceae	45	1000	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Euch invo	*Euchiton involucratus*	Star Cudweed	Asteraceae	5	400	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Junc bufo	*Juncus bufonius*	Toad Rush	Juncaceae			Introduced			Not Listed	Not Listed
scho	*Schoenus spp.*		Cyperaceae	1	150	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Junc	*Juncus spp.*	Rush	Juncaceae	1	10	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Halo hete	*Haloragis heterophylla*	Variable Raspwort	Haloragaceae	1	100	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
aira	*Aira spp.*		Poaceae			Introduced			Not Listed	Not Listed
pasp dila	*Paspalum dilatatum*	Paspalum	Poaceae			Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
luzu meri	*Luzula meridionalis*		Juncaceae	1	150	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
briz mino	*Briza minor*	Shivery Grass	Poaceae			Introduced			Not Listed	Not Listed
plan lanc	*Plantago lanceolata*	Lamb's Tongues	Plantaginaceae			Introduced			Not Listed	Not Listed
hypo glab	*Hypochaeris glabra*	Smooth Catsear	Asteraceae			Introduced			Not Listed	Not Listed
hype gram	*Hypericum gramineum*	Small St John's Wort	Clusiaceae	0.5	100	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
tara	*Taraxacum spp.*	Dandelion	Asteraceae			Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
alte nana	*Alternanthera nana*	Hairy Joyweed	Amaranthaceae			Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
acae echi	*Acaena echinata*	Sheep's Burr	Rosaceae	1	40	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
hypo radi	*Hypochaeris radicata*	Catsear	Asteraceae			Introduced			Not Listed	Not Listed
Ranu	*Ranunculus spp.*		Ranunculaceae	1	20	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
anag arve	*Anagallis arvensis*	Scarlet Pimpernel	Primulaceae			Introduced			Not Listed	Not Listed
ryti	*Rytidosperma spp.*		Poaceae	2	50	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
dich crin	*Dichelachne crinita*	Longhair Plumegrass	Poaceae	1	30	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
plan coro	*Plantago coronopus*	Buck's-horn Plaintain	Plantaginaceae			Introduced			Not Listed	Not Listed
rume acet	*Rumex acetosella*	Sheep Sorrel	Polygonaceae			Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
crat mono	*Crataegus monogyna*	Hawthorn	Malaceae			Introduced		High Threat Weed - manageable	Not Listed	Not Listed
rosa rubi	*Rosa rubiginosa*	Sweet Briar	Rosaceae			Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
hype perf	*Hypericum perforatum*	St. Johns Wort	Clusiaceae			Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
sonc aspe	*Sonchus asper*	Prickly Sowthistle	Asteraceae			Introduced			Not Listed	Not Listed
nass tric	*Nassella trichotoma*	Serrated Tussock	Poaceae			Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
vulp	*Vulpia bromoides*	Squirrel Tail Fesque	Poaceae			Introduced			Not Listed	Not Listed
cirs vulg	*Cirsium vulgare*	Spear Thistle	Asteraceae			Introduced			Not Listed	Not Listed
euch spha	*Euchiton sphaericus*	Star Cudweed	Asteraceae	1	200	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
dich micr	*Dichelachne micrantha*	Shorthair Plumegrass	Poaceae	0.2	5	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
impe cyli	*Imperata cylindrica*	Blady Grass	Poaceae	0.5	5	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed

BAM Site Field Survey

Project:	Canyonleigh	**Plot Identifier**	BAM12	**Pic 20x20**	Y	**Pic 20x50**	Y	
Survey date:	11/11/2024		**Compass Orientation (head of 20x20 plot)**				12	
Recorders	Damian Wall, Stuart Mendham		**PCT:**					
GPS Easting	229481.45	**GPS Northing**	6165180.21		**Datum**	GDA94	**Zone**	56H

Landform			**Soils**			**Drainage & Slope**		
Morphology			**Soil Texture**			**Slope**		
LandF Element			**Soil Colour**			**Aspect**		
LandF Pattern			**Soil Depth**			**Drainage**		
Microrelief			**Geology**			**Watercourses**		

Plot Disturbance

	Severity	**Age**	**Observational Evidence**
Clearing			
Cultivation			
Soil erosion			
Firewood			
Grazing	Pugged. Cattle present.		
Fire Damage			
Storm Damage			
Weediness			
Other			

Severity: 0 = no evidence, 1=light, 2=moderate, 3=severe **Age:** R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

Additional information

Current land use

Age class of trees (DBH range) , Condition of Vegetation, Hollows

Disturbances (i.e. fire, grazing,ferals, clearing, logging, soil degradation, pollution, weeds, dieback)

Significant and threatened species and communities (Note pop. size/area, structure, repro status, habit, habitat, threats, photos)

Dominant Species outside Plot

FUNCTION

Function attributes for BAM12

BAM Attribute (20x20m plot)

	Stratum	**Sum**
Count of Native Richness	**Tree (TG)**	**2**
	Shrub (SG)	**3**
	Forb (FG)	**5**
	Grass & grasslike (GG)	**11**
	Fern (EG)	**0**
	Other (OG)	**0**
	TOTAL	**21**

BAM Attribute (20x20m plot)

	Stratum	**Sum**
Count of cover abundance (native vascular plants)	**Tree (TG)**	**4**
	Shrub (SG)	**61**
	Forb (FG)	**11.1**
	Grass & grasslike (GG)	**18.7**
	Fern (EG)	**0**
	Other (OG)	**0**
	TOTAL Native	**94.8**
	TOTAL 'HTE'	**45**

BAM Attribute (20 x 50m plot) Tree Stem Counts

DBH (cm)	**Euc**	**Non Euc**	**Hollows**
>80	0		
50-79	0		
30-49	0		
20-29	0		
10-19	0		
5-9	0		
<5	3		N/A
Length of logs (m)		0	

0.1%=63x63cm
0.5%=1.4x1.4m
1%=2×2m
5%=4×5m
25%=10×10m

BAM Attributes (1 x 1m Plots)

	Tape length	**% cover**	**Average %**	**Photos**
Litter Cover	5m	1%		n
	15m	1%		n
	25m	2%	**2.0%**	n
	35m	1%		n
	45m	5%		n
Bare ground cover	5m	5%		n
	15m	1%		n
	25m	10%	**8.2%**	n
	35m	20%		n
	45m	5%		n
Cryptogam cover	5m	20%		n
	15m	10%		n
	25m	5%	**8.2%**	n
	35m	1%		n
	45m	5%		n
Rock Cover	5m	0%		n
	15m	0%		n
	25m	0%	**0.0%**	n
	35m	0%		n
	45m	0%		n

COMPOSITION & STRUCTURE

Species recorded for BAM12

Abbreviation	**Scientific Name**	**Common Name**	**Family**	**% Cover**	**Abundance**	**Exotic**	**Growth Form**	**High Threat?**	**EPBC Status**	**BCA Status**
rubu frut	*Rubus fruticosus*	Blackberry	Rosaceae			Introduced		Yes	Not Listed	Not Listed
lept myrt	*Leptospermum myrtifolium*	Myrtle Tea-tree	Myrtaceae	60	700	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
holc lana	*Holcus lanatus*	Yorkshire Fog	Poaceae			Introduced			Not Listed	Not Listed
them tria	*Themeda triandra*		Poaceae	2	150	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Euch invo	*Euchiton involucratus*	Star Cudweed	Asteraceae	5	400	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Junc bufo	*Juncus bufonius*	Toad Rush	Juncaceae			Introduced			Not Listed	Not Listed
Erag	*Eragrostis spp.*		Poaceae	1	50	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Junc	*Juncus spp.*	Rush	Juncaceae	1	10	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Halo hete	*Haloragis heterophylla*	Variable Raspwort	Haloragaceae	3	250	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
aira	*Aira spp.*		Poaceae			Introduced			Not Listed	Not Listed
aris vaga	*Aristida vagans*	Threeawn Speargras	Poaceae	0.5	20	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
luzu meri	*Luzula meridionalis*		Juncaceae	1	150	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
briz mino	*Briza minor*	Shivery Grass	Poaceae			Introduced			Not Listed	Not Listed
trif camp	*Trifolium campestre*	Hop Clover	Fabaceae (Faboideae)			Introduced			Not Listed	Not Listed
hypo radi	*Hypochaeris radicata*	Catsear	Asteraceae			Introduced			Not Listed	Not Listed
hype gram	*Hypericum gramineum*	Small St John's Wort	Clusiaceae	2	150	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
acac parr	*Acacia parramattensis*	Parramatta Wattle	Fabaceae (Mimosoideae)	2	10	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
acac	*Acacia spp.*	Wattle	Fabaceae (Mimosoideae)	0.5	1	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
cass sift	*Cassinia sifton*		Asteraceae	0.5	3	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
poa labi	*Poa labillardierei*	Tussock	Poaceae	2	5	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
junc flav	*Juncus flavidus*		Juncaceae	1	15	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
anag arve	*Anagallis arvensis*	Scarlet Pimpernel	Primulaceae			Introduced			Not Listed	Not Listed
micr	*Microtis spp.*		Orchidaceae	0.1	1	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
euca pauc	*Eucalyptus pauciflora*	White Sally	Myrtaceae	2	3	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
care inve	*Carex inversa*	Knob Sedge	Cyperaceae	1	50	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
dich repe	*Dichondra repens*	Kidney Weed	Convolvulaceae	1	200	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
lach fili	*Lachnagrostis filiformis*		Poaceae	0.2	20	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
nass tric	*Nassella trichotoma*	Serrated Tussock	Poaceae			Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
dich micr	*Dichelachne micrantha*	Shorthair Plumegras	Poaceae	1	50	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
impe cyli	*Imperata cylindrica*	Blady Grass	Poaceae	8	500	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed

BAM Site Field Survey								
Project:	Canyonleigh	**Plot Identifier**	BAM13	**Pic 20x20**	Y	**Pic 20x50**	Y	
Survey date:	11/11/2024		**Compass Orientation (head of 20x20 plot)**				28	
Recorders	Damian Wall, Stuart Mendham		**PCT:**					
GPS Easting	229719.48	**GPS Northing**	6165151.97		**Datum**	GDA94	**Zone**	56H
Landform			**Soils**			**Drainage & Slope**		
Morphology			**Soil Texture**			**Slope**		
LandF Element			**Soil Colour**			**Aspect**		
LandF Pattern			**Soil Depth**			**Drainage**		
Microrelief			**Geology**			**Watercourses**		

Plot Disturbance			
	Severity	**Age**	**Observational Evidence**
Clearing			
Cultivation			
Soil erosion			
Firewood			
Grazing	Pugged. Cattle present.		
Fire Damage			
Storm Damage			
Weediness			
Other	deer damage extensive in cleared areas		

Severity: 0 = no evidence, 1=light, 2=moderate, 3=severe **Age:** R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

Additional information

Current land use

Age class of trees (DBH range) , Condition of Vegetation, Hollows

Disturbances (i.e. fire, grazing,ferals, clearing, logging, soil degradation, pollution, weeds, dieback)

Significant and threatened species and communities (Note pop. size/area, structure, repro status, habit, habitat, threats, photos)

Dominant Species outside Plot

FUNCTION

Function attributes for		BAM13
BAM Attribute (20x20m plot)		
Count of Native Richness	**Stratum**	**Sum**
	Tree (TG)	**1**
	Shrub (SG)	**3**
	Forb (FG)	**7**
	Grass & grasslike (GG)	**11**
	Fern (EG)	**0**
	Other (OG)	**1**
	TOTAL	**23**
BAM Attribute (20x20m plot)		
Count of cover abundance (native vascular plants)	**Stratum**	**Sum**
	Tree (TG)	**0.5**
	Shrub (SG)	**10.2**
	Forb (FG)	**7.2**
	Grass & grasslike (GG)	**45.4**
	Fern (EG)	**0**
	Other (OG)	**0.1**
	TOTAL Native	**63.4**
	TOTAL 'HTE'	**35**

BAM Attribute (20 x 50m plot) Tree Stem Counts

DBH (cm)	Euc	Non Euc	Hollows
>80	0		
50-79	0		
30-49	0		
20-29	0		
10-19	0		
5-9	0		
<5	0		N/A
Length of logs (m)		0	

0.1%=63x63cm
0.5%=1.4x1.4m
1%=2×2m
5%=4×5m
25%=10×10m

BAM Attributes (1 x 1m Plots)

	Tape length	% cover	Average %	Photos
Litter Cover	5m	10%		n
	15m	30%		n
	25m	5%	**12.2%**	n
	35m	1%		n
	45m	15%		n
Bare ground cover	5m	1%		n
	15m	0%		n
	25m	1%	**1.0%**	n
	35m	1%		n
	45m	2%		n
Cryptogam cover	5m	0%		n
	15m	0%		n
	25m	0%	**1.2%**	n
	35m	5%		n
	45m	1%		n
Rock Cover	5m	0%		n
	15m	0%		n
	25m	0%	**0.0%**	n
	35m	0%		n
	45m	0%		n

COMPOSITION & STRUCTURE

Species recorded for BAM13

Abbreviation	Scientific Name	Common Name	Family	% Cover	Abundance	Exotic	Growth Form	High Threat?	EPBC Status	BCA Status
spor elon	*Sporobolus elongatus*		Poaceae	0.5	10	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
nass tric	*Nassella trichotoma*	Serrated Tussock	Poaceae			Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
aira	*Aira spp.*		Poaceae			Introduced			Not Listed	Not Listed
hypo radi	*Hypochaeris radicata*	Catsear	Asteraceae			Introduced			Not Listed	Not Listed
briz mino	*Briza minor*	Shivery Grass	Poaceae			Introduced			Not Listed	Not Listed
kunz eric	*Kunzea ericoides*	Rush	Myrtaceae	10	300	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
them tria	*Themeda triandra*		Poaceae	40	1000	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
hype gram	*Hypericum gramineum*	Small St John's Wort	Clusiaceae	1	200	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
luzu meri	*Luzula meridionalis*		Juncaceae	3	400	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
euch invo	*Euchiton involucratus*	Star Cudweed	Asteraceae	2	300	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
tric elat	*Tricoryne elatior*	Yellow Autumn-lily	Anthericaceae	1	100	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
gono tetr	*Gonocarpus tetragynus*	Poverty Raspwort	Haloragaceae	2	200	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
plan lanc	*Plantago lanceolata*	Lamb's Tongues	Plantaginaceae			Introduced			Not Listed	Not Listed
pinu radi	*Pinus radiata*	Radiata Pine	Pinaceae			Introduced		High Threat Weed - manageable	Not Listed	Not Listed
acac parr	*Acacia parramattensis*	Parramatta Wattle	Fabaceae (Mimosoideae)	0.5	2	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
junc flav	*Juncus flavidus*		Juncaceae	0.5	15	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
rosa rubi	*Rosa rubiginosa*	Sweet Briar	Rosaceae			Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
rume acet	*Rumex acetosella*	Sheep Sorrel	Polygonaceae			Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
cass sift	*Cassinia sifton*		Asteraceae	0.1	2	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
cass arcu	*Cassinia arcuata*		Asteraceae	0.1	1	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
rubu frut	*Rubus fruticosus*	Blackberry complex	Rosaceae			Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
chry apic	*Chrysocephalum apiculatum*	Common Everlasting	Asteraceae	0.1	2	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
dich micr	*Dichelachne micrantha*	Shorthair Plumegras	Poaceae	0.1	5	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
briz maxi	*Briza maxima*	Quaking Grass	Poaceae			Introduced			Not Listed	Not Listed
ryti	*Rytidosperma spp.*		Poaceae	0.5	50	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
halo hete	*Haloragis heterophylla*	Variable Raspwort	Haloragaceae	1	100	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
desm vari	*Desmodium varians*		Fabaceae (Faboideae)	0.1	5	Alive in NSW, Native	Other (OG)		Not Listed	Not Listed
loma long	*Lomandra longifolia*	Spiny-headed Mat-r	Lomandraceae	0.1	2	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
pora	*Poranthera spp.*		Phyllanthaceae	0.1	10	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
loma fili	*Lomandra filiformis*	Wattle Matt-rush	Lomandraceae	0.1	5	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
both	*Bothriochloa spp.*	Redgrass, Bluegrass	Poaceae	0.2	20	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
aris vaga	*Aristida vagans*	Threeawn Speargras	Poaceae	0.2	10	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
poa sieb	*Poa sieberiana*	Snowgrass	Poaceae	0.2	5	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
holc lana	*Holcus lanatus*	Yorkshire Fog	Poaceae			Introduced			Not Listed	Not Listed

BAM Site Field Survey

Project:	Canyonleigh	**Plot Identifier**	BAM14	**Pic 20x20**	Y	**Pic 20x50**	Y	
Survey date:	11/11/2024		**Compass Orientation (head of 20x20 plot)**				305	
Recorders	Damian Wall, Stuart Mendham		**PCT:**					
GPS Easting	230019.89	**GPS Northing**	6165272.13		**Datum**	GDA94	**Zone**	56H

Landform			**Soils**			**Drainage & Slope**		
Morphology			**Soil Texture**			**Slope**		
LandF Element			**Soil Colour**			**Aspect**		
LandF Pattern			**Soil Depth**			**Drainage**		
Microrelief			**Geology**			**Watercourses**		

Plot Disturbance

	Severity	**Age**	**Observational Evidence**
Clearing			
Cultivation			
Soil erosion			
Firewood			
Grazing			
Fire Damage			
Storm Damage			
Weediness			
Other			

Severity: 0 = no evidence, 1=light, 2=moderate, 3=severe **Age:** R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

Additional information

Current land use

Age class of trees (DBH range) , Condition of Vegetation, Hollows

Disturbances (i.e. fire, grazing,ferals, clearing, logging, soil degradation, pollution, weeds, dieback)

Significant and threatened species and communities (Note pop. size/area, structure, repro status, habit, habitat, threats, photos)

Dominant Species outside Plot

FUNCTION

Function attributes for BAM14

BAM Attribute (20x20m plot)

	Stratum	**Sum**
Count of Native Richness	**Tree (TG)**	**0**
	Shrub (SG)	**2**
	Forb (FG)	**6**
	Grass & grasslike (GG)	**9**
	Fern (EG)	**0**
	Other (OG)	**2**
	TOTAL	**19**

BAM Attribute (20x20m plot)

	Stratum	**Sum**
Count of cover abundance (native vascular plants)	**Tree (TG)**	**0**
	Shrub (SG)	**1**
	Forb (FG)	**38.2**
	Grass & grasslike (GG)	**44.2**
	Fern (EG)	**0**
	Other (OG)	**0.2**
	TOTAL Native	**83.6**
	TOTAL 'HTE'	**8**

BAM Attribute (20 x 50m plot) Tree Stem Counts

DBH (cm)	**Euc**	**Non Euc**	**Hollows**
>80	0		
50-79	0		
30-49	0		
20-29	0		
10-19	0		
5-9	0		
<5	0		N/A
Length of logs (m)		0	

0.1%=63x63cm
0.5%=1.4x1.4m
1%=2×2m
5%=4×5m
25%=10×10m

BAM Attributes (1 x 1m Plots)

	Tape length	**% cover**	**Average %**	**Photos**
Litter Cover	5m	2%		n
	15m	1%		n
	25m	2%	**1.6%**	n
	35m	1%		n
	45m	2%		n
Bare ground cover	5m	15%		n
	15m	0%		n
	25m	3%	**4.6%**	n
	35m	0%		n
	45m	5%		n
Cryptogam cover	5m	10%		n
	15m	1%		n
	25m	10%	**5.2%**	n
	35m	0%		n
	45m	5%		n
Rock Cover	5m	5%		n
	15m	0%		n
	25m	0%	**1.0%**	n
	35m	0%		n
	45m	0%		n

COMPOSITION & STRUCTURE

Species recorded for BAM14

Abbreviation	**Scientific Name**	**Common Name**	**Family**	**% Cover**	**Abundance**	**Exotic**	**Growth Form**	**High Threat?**	**EPBC Status**	**BCA Status**
chry apic	*Chrysocephalum apiculatum*		Asteraceae	30	5000	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
them tria	*Themeda triandra*		Poaceae	40	3000	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
rubu frut	*Rubus fruticosus*	Blackberry complex	Rosaceae			Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
nass tric	*Nassella trichotoma*	Serrated Tussock	Poaceae			Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
cent eryt	*Centaurium erythraea*	Common Centaury	Gentianaceae			Introduced			Not Listed	Not Listed
hypo radi	*Hypochaeris radicata*	Rush	Asteraceae			Introduced			Not Listed	Not Listed
elym scab	*Elymus scaber*	Wheatgrass, Common Wheatgrass	Poaceae	0.1	5	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
aris vaga	*Aristida vagans*	Threeawn Speargrass	Poaceae	1	80	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
euch invo	*Euchiton involucratus*	Star Cudweed	Asteraceae	5	1000	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
euch spha	*Euchiton sphaericus*	Star Cudweed	Asteraceae	1	100	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
aira	*Aira spp.*		Poaceae			Introduced			Not Listed	Not Listed
kunz parv	*Kunzea parvifolia*	Violet Kunzea	Myrtaceae	0.5	5	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
briz mino	*Briza minor*	Shivery Grass	Poaceae			Introduced			Not Listed	Not Listed
plan lanc	*Plantago lanceolata*	Lamb's Tongues	Plantaginaceae			Introduced			Not Listed	Not Listed
dich micr	*Dichelachne micrantha*	Shorthair Plumegrass	Poaceae	0.5	20	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
acac	*Acacia spp.*	Wattle	Fabaceae (Mimosoideae)	0.5	6	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
rume acet	*Rumex acetosella*	Sheep Sorrel	Polygonaceae			Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
ryti seta	*Rytidosperma setaceum*	Small-flowered Wallaby-grass	Poaceae	1	150	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
holc lana	*Holcus lanatus*	Yorkshire Fog	Poaceae			Introduced			Not Listed	Not Listed
trif arve	*Trifolium arvense*	Haresfoot Clover	Fabaceae (Faboideae)			Introduced			Not Listed	Not Listed
arth stri	*Arthropodium strictum*	Chocolate Lily	Asparagaceae	0.1	2	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
wale	Wahlenbergia spp.	Bluebell	Campanulaceae	0.1	10	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
vitt muel	Vittadinia muelleri		Asteraceae	2	300	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
glyc clan	*Glycine clandestina*	Twining glycine	Fabaceae (Faboideae)	0.1	5	Alive in NSW, Native	Other (OG)		Not Listed	Not Listed
spor elon	*Sporobolus elongatus*	Slender Rat's Tail Grass	Poaceae	0.8	25	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
stip	*Stipa spp.*		Poaceae	0.1	5	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
conv angu	*Convolvulus angustissimus*		Convolvulaceae	0.1	2	Alive in NSW, Native	Other (OG)		Not Listed	Not Listed
loma fili	*Lomandra filiformis*	Wattle Matt-rush	Lomandraceae	0.2	15	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
erag	*Eragrostis spp.*		Poaceae	0.5	2	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
tolp barb	*Tolpis barbata*	Yellow Hawkweed	Asteraceae			Introduced			Not Listed	Not Listed

BAM Site Field Survey

Project:	Canyonleigh	**Plot Identifier**	BAM15	**Pic 20x20**	Y	**Pic 20x50**	Y	
Survey date:	11/11/2024		**Compass Orientation (head of 20x20 plot)**				80	
Recorders	Damian Wall, Stuart Mendham		**PCT:**					
GPS Easting	230231.37	**GPS Northing**	6165231.67		**Datum**	GDA94	**Zone**	56H

Landform		**Soils**			**Drainage & Slope**		
Morphology		**Soil Texture**			**Slope**		
LandF Element		**Soil Colour**			**Aspect**		
LandF Pattern		**Soil Depth**			**Drainage**		
Microrelief		**Geology**			**Watercourses**		

Plot Disturbance

	Severity	**Age**	**Observational Evidence**
Clearing			
Cultivation			
Soil erosion			
Firewood			
Grazing			
Fire Damage			
Storm Damage			
Weediness			
Other			

Severity: 0 = no evidence, 1=light, 2=moderate, 3=severe **Age:** R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

Additional information

Current land use

Age class of trees (DBH range) , Condition of Vegetation, Hollows

Disturbances (i.e. fire, grazing,ferals, clearing, logging, soil degradation, pollution, weeds, dieback)

Significant and threatened species and communities (Note pop. size/area, structure, repro status, habit, habitat, threats, photos)

Dominant Species outside Plot

FUNCTION

Function attributes for **BAM15**

BAM Attribute (20x20m plot)

	Stratum	**Sum**
Count of Native Richness	**Tree (TG)**	**0**
	Shrub (SG)	**5**
	Forb (FG)	**6**
	Grass & grasslike (GG)	**7**
	Fern (EG)	**1**
	Other (OG)	**0**
	TOTAL	**19**

BAM Attribute (20x20m plot)

	Stratum	**Sum**
Count of cover abundance (native vascular plants)	**Tree (TG)**	**0**
	Shrub (SG)	**2.2**
	Forb (FG)	**6.3**
	Grass & grasslike (GG)	**43.3**
	Fern (EG)	**1**
	Other (OG)	**0**
	TOTAL Native	**52.8**
	TOTAL 'HTE'	**25**

BAM Attribute (20 x 50m plot) Tree Stem Counts

DBH (cm)	**Euc**	**Non Euc**	**Hollows**
>80	0		
50-79	0		
30-49	0		
20-29	0		
10-19	0		
5-9	0		
<5	0		N/A
Length of logs (m)		0	

0.1%=63x63cm
0.5%=1.4x1.4m
1%=2×2m
5%=4×5m
25%=10×10m

BAM Attributes (1 x 1m Plots)

	Tape length	**% cover**	**Average %**	**Photos**
Litter Cover	5m	1%		n
	15m	3%		n
	25m	2%	**1.6%**	n
	35m	1%		n
	45m	1%		n
Bare ground cover	5m	10%		n
	15m	5%		n
	25m	2%	**8.4%**	n
	35m	5%		n
	45m	20%		n
Cryptogam cover	5m	5%		n
	15m	10%		n
	25m	10%	**12.0%**	n
	35m	15%		n
	45m	20%		n
Rock Cover	5m	0%		n
	15m	0%		n
	25m	0%	**0.0%**	n
	35m	0%		n
	45m	0%		n

COMPOSITION & STRUCTURE

Species recorded for BAM15

Abbreviation	**Scientific Name**	**Common Name**	**Family**	**% Cover**	**Abundance**	**Exotic**	**Growth Form**	**High Threat?**	**EPBC Status**	**BCA Status**
them tria	*Themeda triandra*		Poaceae	40	3000	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
spor elon	*Sporobolus elongatus*	Slender Rat's Tail Grass	Poaceae	2	100	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
hypo radi	*Hypochaeris radicata*	Catsear	Asteraceae			Introduced			Not Listed	Not Listed
plan lanc	*Plantago lanceolata*	Lamb's Tongues	Plantaginaceae			Introduced			Not Listed	Not Listed
briz mino	*Briza minor*	Rush	Poaceae			Introduced			Not Listed	Not Listed
nass tric	*Nassella trichotoma*	Serrated Tussock	Poaceae			Introduced	Forb (FG)	High Threat Weed - not manageable	Not Listed	Not Listed
rume acet	*Rumex acetosella*	Sheep Sorrel	Polygonaceae			Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
hype gram	*Hypericum gramineum*	Small St John's Wort	Clusiaceae	2	300	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
kunz parv	*Kunzea parvifolia*	Violet Kunzea	Myrtaceae	0.5	5	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
trif camp	*Trifolium campestre*	Hop Clover	Fabaceae (Faboideae)			Introduced			Not Listed	Not Listed
cent eryt	*Centaurium erythraea*	Common Centaury	Gentianaceae			Introduced			Not Listed	Not Listed
rosa rubi	*Rosa rubiginosa*	Sweet Briar	Rosaceae			Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
acro serr	*Acrotriche serrulata*	Honeypots	Ericaceae	0.5	10	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
euch invo	*Euchiton involucratus*	Star Cudweed	Asteraceae	1	150	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
loma fili	*Lomandra filiformis*	Wattle Matt-rush	Lomandraceae	0.5	50	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
chry apic	*Chrysocephalum apiculatum*	Common Everlasting	Asteraceae	1	50	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
trif arve	*Trifolium arvense*	Haresfoot Clover	Fabaceae (Faboideae)			Introduced			Not Listed	Not Listed
erig	*Erigeron spp.*		Asteraceae			Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
cass sift	*Cassinia sifton*		Asteraceae	1	5	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
tric elat	*Tricoryne elatior*	Yellow Autumn-lily	Anthericaceae	0.5	20	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
halo hete	*Haloragis heterophylla*	Variable Raspwort	Haloragaceae	0.8	100	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
rume acet	*Rumex acetosella*	Sheep Sorrel	Polygonaceae			Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
pter escu	*Pteridium esculentum*	Bracken	Dennstaedtiaceae	1	50	Alive in NSW, Native	Fern (EG)		Not Listed	Not Listed
junc	*Juncus spp.*		Juncaceae	0.1	5	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
meli urce	*Melichrus urceolatus*	Urn Heath	Ericaceae	0.1	2	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
acac	*Acacia spp.*	Wattle	Fabaceae (Mimosoideae)	0.1	1	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
aris vaga	*Aristida vagans*	Threeawn Speargrass	Poaceae	0.5	10	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
junc bufo	*Juncus bufonius*	Toad Rush	Juncaceae			Introduced			Not Listed	Not Listed
scho	Schoenus spp.		Cyperaceae	0.1	50	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
luzu meri	*Luzula meridionalis*		Juncaceae	0.1	50	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed

BAM Site Field Survey								
Project:	Canyonleigh	**Plot Identifier**	BAM16	**Pic 20x20**	Y	**Pic 20x50**	Y	
Survey date:	11/11/2024		**Compass Orientation (head of 20x20 plot)**				350	
Recorders	Damian Wall, Stuart Mendham		**PCT:**					
GPS Easting	230098.96	**GPS Northing**	6165292.87		**Datum**	GDA94	**Zone**	56H
Landform			**Soils**			**Drainage & Slope**		
Morphology			**Soil Texture**			**Slope**		
LandF Element			**Soil Colour**			**Aspect**		
LandF Pattern			**Soil Depth**			**Drainage**		
Microrelief			**Geology**			**Watercourses**		

Plot Disturbance			
	Severity	**Age**	**Observational Evidence**
Clearing			
Cultivation			
Soil erosion			
Firewood			
Grazing			
Fire Damage			
Storm Damage			
Weediness			
Other			

Severity: 0 = no evidence, 1=light, 2=moderate, 3=severe **Age:** R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

Additional information
Current land use
Age class of trees (DBH range) , Condition of Vegetation, Hollows
Disturbances (i.e. fire, grazing,ferals, clearing, logging, soil degradation, pollution, weeds, dieback)
Significant and threatened species and communities (Note pop. size/area, structure, repro status, habit, habitat, threats, photos)
Dominant Species outside Plot

FUNCTION

Function attributes for		**BAM16**
BAM Attribute (20x20m plot)		
	Stratum	**Sum**
Count of Native Richness	**Tree (TG)**	**0**
	Shrub (SG)	**3**
	Forb (FG)	**6**
	Grass & grasslike (GG)	**9**
	Fern (EG)	**0**
	Other (OG)	**0**
	TOTAL	**18**
BAM Attribute (20x20m plot)		
	Stratum	**Sum**
Count of cover abundance (native vascular plants)	**Tree (TG)**	**0**
	Shrub (SG)	**2**
	Forb (FG)	**34.2**
	Grass & grasslike (GG)	**36.2**
	Fern (EG)	**0**
	Other (OG)	**0**
	TOTAL Native	**72.4**
	TOTAL 'HTE'	**12**

BAM Attribute (20 x 50m plot) Tree Stem Counts			
DBH (cm)	**Euc**	**Non Euc**	**Hollows**
>80	0		
50-79	0		
30-49	0		
20-29	0		
10-19	0		
5-9	0		
<5	0		N/A
Length of logs (m)		0	

0.1%=63x63cm
0.5%=1.4x1.4m
1%=2×2m
5%=4×5m
25%=10×10m

BAM Attributes (1 x 1m Plots)				
	Tape length	**% cover**	**Average %**	**Photos**
Litter Cover	5m	1%		n
	15m	2%		n
	25m	3%	**4.4%**	n
	35m	1%		n
	45m	15%		n
Bare ground cover	5m	2%		n
	15m	1%		n
	25m	0%	**1.4%**	n
	35m	2%		n
	45m	2%		n
Cryptogam cover	5m	5%		n
	15m	5%		n
	25m	2%	**2.8%**	n
	35m	1%		n
	45m	1%		n
Rock Cover	5m	0%		n
	15m	0%		n
	25m	0%	**0.0%**	n
	35m	0%		n
	45m	0%		n

COMPOSITION & STRUCTURE

Species recorded for		BAM16								
Abbreviation	**Scientific Name**	**Common Name**	**Family**	**% Cover**	**Abundance**	**Exotic**	**Growth Form**	**High Threat?**	**EPBC Status**	**BCA Status**
chry apic	*Chrysocephalum apiculatum*		Asteraceae	30	3000	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
them tria	*Themeda triandra*		Poaceae	25	1500	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
spor elon	*Sporobolus elongatus*	Slender Rat's Tail Grass	Poaceae	5	150	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
nass tric	*Nassella trichotoma*	Serrated Tussock	Poaceae			Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
junc	*Juncus spp.*		Juncaceae	1	20	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
petr dubi	*Petrorhagia dubia*	Rush	Caryophyllaceae			Introduced			Not Listed	Not Listed
aris vaga	*Aristida vagans*	Threeawn Speargrass	Poaceae	2	50	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
acro serr	*Acrotriche serrulata*	Honeypots	Ericaceae	0.5	10	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
hypo radi	*Hypochaeris radicata*	Catsear	Asteraceae			Introduced			Not Listed	Not Listed
tric elat	*Tricoryne elatior*	Yellow Autumn-lily	Anthericaceae	0.5	20	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
euch invo	*Euchiton involucratus*	Star Cudweed	Asteraceae	2	500	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
cent eryt	*Centaurium erythraea*	Common Centaury	Gentianaceae			Introduced			Not Listed	Not Listed
stip	*Stipa spp.*		Poaceae	0.2	10	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
both	*Bothriochloa spp.*	Redgrass, Bluegrass	Poaceae	0.5	30	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
dich micr	*Dichelachne micrantha*	Shorthair Plumegrass	Poaceae	1	300	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
aust	*Austrodanthonia spp.*		Poaceae	1	200	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
cass sift	*Cassinia sifton*		Asteraceae	1	12	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
plan lanc	*Plantago lanceolata*	Lamb's Tongues	Plantaginaceae			Introduced			Not Listed	Not Listed
trif arve	*Trifolium arvense*	Haresfoot Clover	Fabaceae (Faboideae)			Introduced			Not Listed	Not Listed
briz mino	*Briza minor*	Shivery Grass	Poaceae			Introduced			Not Listed	Not Listed
rume acet	*Rumex acetosella*	Sheep Sorrel	Polygonaceae			Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
trif camp	*Trifolium campestre*	Hop Clover	Fabaceae (Faboideae)			Introduced			Not Listed	Not Listed
gono tetr	*Gonocarpus tetragynus*	Poverty Raspwort	Haloragaceae	0.5	50	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
rubu frut	*Rubus fruticosus*	Blackberry complex	Rosaceae			Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
kunz parv	*Kunzea parvifolia*	Violet Kunzea	Myrtaceae	0.5	5	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
erig	*Erigeron spp.*		Asteraceae			Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
vulp	*Vulpia spp.*	Rat's-tail Fescue	Poaceae			Introduced			Not Listed	Not Listed
rosa rubi	*Rosa rubiginosa*	Sweet Briar	Rosaceae			Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
euch spha	*Euchiton sphaericus*	Star Cudweed	Asteraceae	0.2	50	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
loma fili	*Lomandra filiformis*	Wattle Matt-rush	Lomandraceae	0.5	100	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed

BAM Site Field Survey								
Project:	Canyonleigh	**Plot Identifier**	BAM17	**Pic 20x20**	Y	**Pic 20x50**	Y	
Survey date:	11/11/2024		**Compass Orientation (head of 20x20 plot)**				255	
Recorders	Damian Wall, Stuart Mendham		**PCT:**					
GPS Easting	230004.58	**GPS Northing**	6165365.62		**Datum**	GDA94	**Zone**	56H
Landform			**Soils**			**Drainage & Slope**		
Morphology			**Soil Texture**			**Slope**		
LandF Element			**Soil Colour**			**Aspect**		
LandF Pattern			**Soil Depth**			**Drainage**		
Microrelief			**Geology**			**Watercourses**		

Plot Disturbance			
	Severity	**Age**	**Observational Evidence**
Clearing			
Cultivation			
Soil erosion			
Firewood			
Grazing			
Fire Damage			
Storm Damage			
Weediness			
Other	Wind break planting		

Severity: 0 = no evidence, 1=light, 2=moderate, 3=severe **Age:** R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

Additional information
Current land use
Age class of trees (DBH range) , Condition of Vegetation, Hollows
Disturbances (i.e. fire, grazing,ferals, clearing, logging, soil degradation, pollution, weeds, dieback)
Significant and threatened species and communities (Note pop. size/area, structure, repro status, habit, habitat, threats, photos)
Dominant Species outside Plot

FUNCTION

Function attributes for		**BAM17**
BAM Attribute (20x20m plot)		
Count of Native Richness	**Stratum**	**Sum**
	Tree (TG)	**1**
	Shrub (SG)	**3**
	Forb (FG)	**8**
	Grass & grasslike (GG)	**10**
	Fern (EG)	**0**
	Other (OG)	**0**
	TOTAL	**22**
BAM Attribute (20x20m plot)		
Count of cover abundance (native vascular plants)	**Stratum**	**Sum**
	Tree (TG)	**0.1**
	Shrub (SG)	**4.5**
	Forb (FG)	**9.5**
	Grass & grasslike (GG)	**37.2**
	Fern (EG)	**0**
	Other (OG)	**0**
	TOTAL Native	**51.3**
	TOTAL 'HTE'	**20**

BAM Attributes (1 x 1m Plots)				
	Tape length	**% cover**	**Average %**	**Photos**
Litter Cover	5m	1%	**20.2%**	n
	15m	2%		n
	25m	5%		n
	35m	3%		n
	45m	90%		n
Bare ground cover	5m	0%	**1.6%**	n
	15m	2%		n
	25m	1%		n
	35m	5%		n
	45m	0%		n
Cryptogam cover	5m	0%	**1.2%**	n
	15m	5%		n
	25m	0%		n
	35m	1%		n
	45m	0%		n
Rock Cover	5m	0%	**0.0%**	n
	15m	0%		n
	25m	0%		n
	35m	0%		n
	45m	0%		n

BAM Attribute (20 x 50m plot) Tree Stem Counts			
DBH (cm)	**Euc**	**Non Euc**	**Hollows**
>80	0		
50-79	0		
30-49	0		
20-29	0		
10-19	0		
5-9	0		
<5	1		N/A
Length of logs (m)		22	

0.1%=63x63cm
0.5%=1.4x1.4m
1%=2×2m
5%=4×5m
25%=10×10m

COMPOSITION & STRUCTURE

Species recorded for		BAM17								
Abbreviation	**Scientific Name**	**Common Name**	**Family**	**% Cover**	**Abundance**	**Exotic**	**Growth Form**	**High Threat?**	**EPBC Status**	**BCA Status**
pinu radi	*Pinus radiata*		Pinaceae			Introduced		High Threat Weed - manageable	Not Listed	Not Listed
nass tric	*Nassella trichotoma*	Serrated Tussock	Poaceae			Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
wahl	Wahlenbergia spp.	Bluebell	Campanulaceae	0.1	5	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
hypo radi	*Hypochaeris radicata*	Catsear	Asteraceae			Introduced			Not Listed	Not Listed
them tria	*Themeda triandra*		Poaceae	30	2500	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
junc flav	*Juncus flavidus*	Rush	Juncaceae	2	120	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
briz mino	*Briza minor*	Shivery Grass	Poaceae			Introduced	Forb (FG)		Not Listed	Not Listed
briz maxi	*Briza maxima*	Quaking Grass	Poaceae			Introduced			Not Listed	Not Listed
junc bufo	*Juncus bufonius*	Toad Rush	Juncaceae			Introduced			Not Listed	Not Listed
scho	Schoenus spp.		Cyperaceae			Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
dich micr	*Dichelachne micrantha*	Shorthair Plumegrass	Poaceae	0.5	50	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
lobe pedu	*Lobelia pedunculata*	Matted Pratia, Trailing Pratia	Campanulaceae			Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
rubu frut	*Rubus fruticosus*	Blackberry complex	Rosaceae			Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
micr stip	*Microlaena stipoides*	Weeping Grass	Poaceae	1	100	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
aira	*Aira spp.*		Poaceae			Introduced			Not Listed	Not Listed
cent eryt	*Centaurium erythraea*	Common Centaury	Gentianaceae			Introduced			Not Listed	Not Listed
cera	*Cerastium spp.*		Caryophyllaceae			Introduced			Not Listed	Not Listed
lach fili	*Lachnagrostis filiformis*		Poaceae	0.5	15	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
micr	Microtis spp.		Orchidaceae	0.1	5	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
hype gram	*Hypericum gramineum*	Small St John's Wort	Clusiaceae	0.5	50	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
holc lana	*Holcus lanatus*	Yorkshire Fog	Poaceae			Introduced			Not Listed	Not Listed
spor elon	*Sporobolus elongatus*	Slender Rat's Tail Grass	Poaceae	0.8	20	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
plan lanc	*Plantago lanceolata*	Lamb's Tongues	Plantaginaceae			Introduced			Not Listed	Not Listed
oxal	*Oxalis spp.*		Oxalidaceae	0.2	20	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
ranu	*Ranunculus spp.*		Ranunculaceae	0.1	10	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
aris vaga	*Aristida vagans*	Threeawn Speargrass	Poaceae	0.5	10	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
cass sift	*Cassinia sifton*		Asteraceae	1	20	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
chry apic	*Chrysocephalum apiculatum*	Common Everlasting	Asteraceae	7	500	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
acac mear	*Acacia mearnsii*	Black Wattle	Fabaceae (Mimosoideae)	3	25	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
tric elat	*Tricoryne elatior*	Yellow Autumn-lily	Anthericaceae	0.5	20	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
erag brow	*Eragrostis brownii*	Brown's Lovegrass	Poaceae	0.1	10	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
kunz parv	*Kunzea parvifolia*	Violet Kunzea	Myrtaceae	0.5	10	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
hype perf	*Hypericum perforatum*	St. Johns Wort	Clusiaceae			Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
solv sess	*Soliva sessilis*	Bindyi	Asteraceae			Introduced			Not Listed	Not Listed
verb bona	*Verbena bonariensis*	Purpletop	Verbenaceae			Introduced			Not Listed	Not Listed
cirs vulg	*Cirsium vulgare*	Spear Thistle	Asteraceae			Introduced			Not Listed	Not Listed
euca	*Eucalyptus spp.*		Myrtaceae	0.1	1	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
aust	*Austrodanthonia spp.*		Poaceae	0.8	100	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed

BAM Site Field Survey								
Project:	Canyonleigh	**Plot Identifier**	BAM18	**Pic 20x20**	Y	**Pic 20x50**	Y	
Survey date:	18/11/2024		**Compass Orientation (head of 20x20 plot)**				15	
Recorders	Damian Wall, Stuart Mendham		**PCT:**					
GPS Easting	229681.6	**GPS Northing**	6165480.31		**Datum**	GDA94	**Zone**	56H
Landform			**Soils**			**Drainage & Slope**		
Morphology			**Soil Texture**			**Slope**		
LandF Element			**Soil Colour**			**Aspect**		
LandF Pattern			**Soil Depth**			**Drainage**		
Microrelief			**Geology**			**Watercourses**		

Plot Disturbance			
	Severity	**Age**	**Observational Evidence**
Clearing			
Cultivation			
Soil erosion			
Firewood			
Grazing			
Fire Damage			
Storm Damage			
Weediness			
Other			

Severity: 0 = no evidence, 1=light, 2=moderate, 3=severe **Age:** R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

Additional information

Current land use

Age class of trees (DBH range) , Condition of Vegetation, Hollows

Disturbances (i.e. fire, grazing,ferals, clearing, logging, soil degradation, pollution, weeds, dieback)

Significant and threatened species and communities (Note pop. size/area, structure, repro status, habit, habitat, threats, photos)

Dominant Species outside Plot

FUNCTION

Function attributes for BAM18

BAM Attribute (20x20m plot)

	Stratum	Sum
Count of Native Richness	Tree (TG)	3
	Shrub (SG)	8
	Forb (FG)	7
	Grass & grasslike (GG)	9
	Fern (EG)	1
	Other (OG)	1
	TOTAL	29

BAM Attribute (20x20m plot)

	Stratum	Sum
Count of cover abundance (native vascular plants)	Tree (TG)	33.6
	Shrub (SG)	5.6
	Forb (FG)	14.8
	Grass & grasslike (GG)	28.3
	Fern (EG)	0.5
	Other (OG)	0.5
	TOTAL Native	83.3
	TOTAL 'HTE'	1

BAM Attribute (20 x 50m plot) Tree Stem Counts

DBH (cm)	Euc	Non Euc	Hollows
>80	0		
50-79	0		
30-49	5		
20-29	16		
10-19	9		
5-9	4		
<5	11		N/A
Length of logs (m)		0	

0.1%=63x63cm
0.5%=1.4x1.4m
1%=2×2m
5%=4×5m
25%=10×10m

BAM Attributes (1 x 1m Plots)

	Tape length	% cover	Average %	Photos
Litter Cover	5m	5%	43.0%	n
	15m	70%		n
	25m	60%		n
	35m	70%		n
	45m	10%		n
Bare ground cover	5m	1%	2.0%	n
	15m	2%		n
	25m	5%		n
	35m	0%		n
	45m	2%		n
Cryptogam cover	5m	5%	13.2%	n
	15m	20%		n
	25m	15%		n
	35m	25%		n
	45m	1%		n
Rock Cover	5m	0%	7.6%	n
	15m	8%		n
	25m	10%		n
	35m	20%		n
	45m	0%		n

COMPOSITION & STRUCTURE

Species recorded for BAM18

Abbreviation	Scientific Name	Common Name	Family	% Cover	Abundance	Exotic	Growth Form	High Threat?	EPBC Status	BCA Status
anth odor	*Anthoxanthum odoratum*		Poaceae			Introduced			Not Listed	Not Listed
chry apic	*Chrysocephalum apiculatum*	Common Everlasting	Asteraceae	10	1500	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
pime curv	*Pimelea curviflora*	Rice Flower	Thymelaeaceae	2	200	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
aris vaga	*Aristida vagans*	Threeawn Speargrass	Poaceae	8	150	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
aira	*Aira spp.*	Rush	Poaceae			Introduced			Not Listed	Not Listed
aust	*Austrodanthonia spp.*		Poaceae	1	200	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
euca pauc	*Eucalyptus pauciflora*	White Sally	Myrtaceae	33	37	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
acro serr	*Acrotriche serrulata*	Honeypots	Ericaceae	2	45	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
gono tetr	*Gonocarpus tetragynus*	Poverty Raspwort	Haloragaceae	2	400	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
hype gram	*Hypericum gramineum*	Small St John's Wort	Clusiaceae	0.5	200	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
them tria	*Themeda triandra*		Poaceae	15	500	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
glyc clan	*Glycine clandestina*	Twining glycine	Fabaceae (Faboideae)	0.5	50	Alive in NSW, Native	Other (OG)		Not Listed	Not Listed
loma fili	*Lomandra filiformis*	Wattle Matt-rush	Lomandraceae	2	500	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
chei sieb	*Cheilanthes sieberi*	Rock Fern	Pteridaceae	0.5	50	Alive in NSW, Native	Fern (EG)		Not Listed	Not Listed
kunz parv	*Kunzea parvifolia*	Violet Kunzea	Myrtaceae	0.2	5	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
halo hete	*Haloragis heterophylla*	Variable Raspwort	Haloragaceae	0.5	100	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
micr	Microtis spp.		Orchidaceae	0.5	30	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
hypo radi	*Hypochaeris radicata*	Catsear	Asteraceae			Introduced			Not Listed	Not Listed
plan lanc	*Plantago lanceolata*	Lamb's Tongues	Plantaginaceae			Introduced			Not Listed	Not Listed
cass sift	*Cassinia sifton*		Asteraceae	0.5	5	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
dich micr	*Dichelachne micrantha*	Shorthair Plumegrass	Poaceae	0.5	50	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
nass tric	*Nassella trichotoma*	Serrated Tussock	Poaceae			Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
luzu meri	*Luzula meridionalis*		Juncaceae	0.5	100	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
rosa rubi	*Rosa rubiginosa*	Sweet Briar	Rosaceae			Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
hydr laxi	*Hydrocotyle laxiflora*	Stinking Pennywort	Apiaceae	0.8	80	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
loma long	*Lomandra longifolia*	Spiny-headed Mat-rush	Lomandraceae	1	15	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
acac parr	*Acacia parramattensis*	Parramatta Wattle	Fabaceae (Mimosoideae)	0.5	5	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
wahl	Wahlenbergia spp.	Bluebell	Campanulaceae	0.5	20	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
cass cunn	*Cassinia cunninghamii*		Asteraceae	0.5	5	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
rubu frut	*Rubus fruticosus*	Blackberry complex	Rosaceae			Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
cass acul	*Cassinia aculeata*	Dolly Bush	Asteraceae	0.1	2	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
casu cunn	*Casuarina cunninghamiana*	River Oak	Casuarinaceae	0.1	1	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
hype perf	*Hypericum perforatum*	St. Johns Wort	Clusiaceae			Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
poa sieb	*Poa sieberiana*	Snowgrass	Poaceae	0.2	10	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
rume acet	*Rumex acetosella*	Sheep Sorrel	Polygonaceae	1	100	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
boss buxi	*Bossiaea buxifolia*		Fabaceae (Faboideae)	0.2	10	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
aust	*Austrodanthonia spp.*		Poaceae	0.1	10	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
meli urce	*Melichrus urceolatus*	Urn Heath	Ericaceae	0.1	2	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed

BAM Site Field Survey								
Project:	Canyonleigh	**Plot Identifier**	BAM19	**Pic 20x20**	Y	**Pic 20x50**	Y	
Survey date:	18/11/2024		**Compass Orientation (head of 20x20 plot)**				260	
Recorders	Damian Wall, Stuart Mendham		**PCT:**					
GPS Easting	229522.12	**GPS Northing**	6165390.26		**Datum**	GDA94	**Zone**	56H
Landform			**Soils**			**Drainage & Slope**		
Morphology			**Soil Texture**			**Slope**		
LandF Element			**Soil Colour**			**Aspect**		
LandF Pattern			**Soil Depth**			**Drainage**		
Microrelief			**Geology**			**Watercourses**		

Plot Disturbance			
	Severity	**Age**	**Observational Evidence**
Clearing			
Cultivation			
Soil erosion			
Firewood			
Grazing			
Fire Damage			
Storm Damage			
Weediness			
Other			

Severity: 0 = no evidence, 1=light, 2=moderate, 3=severe **Age:** R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

Additional information

Current land use

Age class of trees (DBH range) , Condition of Vegetation, Hollows

Disturbances (i.e. fire, grazing,ferals, clearing, logging, soil degradation, pollution, weeds, dieback)

Significant and threatened species and communities (Note pop. size/area, structure, repro status, habit, habitat, threats, photos)

Dominant Species outside Plot

FUNCTION

Function attributes for		**BAM19**
BAM Attribute (20x20m plot)		
	Stratum	**Sum**
Count of Native Richness	**Tree (TG)**	**2**
	Shrub (SG)	**2**
	Forb (FG)	**10**
	Grass & grasslike (GG)	**10**
	Fern (EG)	**1**
	Other (OG)	**2**
	TOTAL	**27**
BAM Attribute (20x20m plot)		
	Stratum	**Sum**
Count of cover abundance (native vascular plants)	**Tree (TG)**	**30.1**
	Shrub (SG)	**5.2**
	Forb (FG)	**6.4**
	Grass & grasslike (GG)	**5**
	Fern (EG)	**0.1**
	Other (OG)	**0.3**
	TOTAL Native	**47.1**
	TOTAL 'HTE'	**30**

BAM Attributes (1 x 1m Plots)				
	Tape length	**% cover**	**Average %**	**Photos**
Litter Cover	5m	10%		n
	15m	20%		n
	25m	25%	**20.2%**	n
	35m	45%		n
	45m	1%		n
Bare ground cover	5m	0%		n
	15m	0%		n
	25m	1%	**0.4%**	n
	35m	1%		n
	45m	0%		n
Cryptogam cover	5m	0%		n
	15m	5%		n
	25m	0%	**1.0%**	n
	35m	0%		n
	45m	0%		n
Rock Cover	5m	0%		n
	15m	0%		n
	25m	0%	**0.0%**	n
	35m	0%		n
	45m	0%		n

BAM Attribute (20 x 50m plot) Tree Stem Counts			
DBH (cm)	**Euc**	**Non Euc**	**Hollows**
>80	0		
50-79	0		
30-49	8		
20-29	8		
10-19	12		
5-9	5		
<5	13		N/A
Length of logs (m)		76	

0.1%=63x63cm
0.5%=1.4x1.4m
1%=2×2m
5%=4×5m
25%=10×10m

COMPOSITION & STRUCTURE

Species recorded for		BAM19								
Abbreviation	**Scientific Name**	**Common Name**	**Family**	**% Cover**	**Abundance**	**Exotic**	**Growth Form**	**High Threat?**	**EPBC Status**	**BCA Status**
euca pauc	*Eucalyptus pauciflora*		Myrtaceae	30	21	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
pinu radi	*Pinus radiata*	Radiata Pine	Pinaceae			Introduced		High Threat Weed - manageable	Not Listed	Not Listed
rubu frut	*Rubus fruticosus*	Blackberry complex	Rosaceae			Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
holc lana	*Holcus lanatus*	Yorkshire Fog	Poaceae			Introduced			Not Listed	Not Listed
ranu	*Ranunculus spp.*	Rush	Ranunculaceae	1	300	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
hypo radi	*Hypochaeris radicata*	Catsear	Asteraceae			Introduced			Not Listed	Not Listed
plan lanc	*Plantago lanceolata*	Lamb's Tongues	Plantaginaceae			Introduced			Not Listed	Not Listed
junc	*Juncus spp.*		Juncaceae	2	30	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
briz mino	*Briza minor*	Shivery Grass	Poaceae			Introduced			Not Listed	Not Listed
luzu meri	*Luzula meridionalis*		Juncaceae	1	80	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
halo hete	*Haloragis heterophylla*	Variable Raspwort	Haloragaceae	0.5	50	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
dich micr	*Dichelachne micrantha*	Shorthair Plumegrass	Poaceae	0.8	30	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
rume acet	*Rumex acetosella*	Sheep Sorrel	Polygonaceae			Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
oxal	*Oxalis spp.*		Oxalidaceae	0.1	20	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
tric elat	*Tricoryne elatior*	Yellow Autumn-lily	Anthericaceae	0.1	10	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
hydr laxi	*Hydrocotyle laxiflora*	Stinking Pennywort	Apiaceae	0.5	50	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
desm vari	*Desmodium varians*		Fabaceae (Faboideae)	0.2	25	Alive in NSW, Native	Other (OG)		Not Listed	Not Listed
gono tetr	*Gonocarpus tetragynus*	Poverty Raspwort	Haloragaceae	2	400	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
hype gram	*Hypericum gramineum*	Small St John's Wort	Clusiaceae	0.5	50	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
micr stip	*Microlaena stipoides*	Weeping Grass	Poaceae	1	250	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
nass tric	*Nassella trichotoma*	Serrated Tussock	Poaceae			Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
them tria	*Themeda triandra*		Poaceae	0.5	50	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
lach fili	*Lachnagrostis filiformis*		Poaceae	0.1	10	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
both	*Bothriochloa spp.*	Redgrass, Bluegrass	Poaceae	0.1	10	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
acac amoe	*Acacia amoena*	Boomerang Wattle	Fabaceae (Mimosoideae)	5	2	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
cass sift	*Cassinia sifton*		Asteraceae	0.2	2	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
poa labi	*Poa labillardierei*	Tussock	Poaceae	0.5	2	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
aust seta	*Austrodanthonia setacea*	Small-flowered Wallaby-grass	Poaceae	0.2	30	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
casu cunn	*Casuarina cunninghamiana*	River Oak	Casuarinaceae	0.1	1	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
euch invo	*Euchiton involucratus*	Star Cudweed	Asteraceae	0.1	50	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
loma fili	*Lomandra filiformis*	Wattle Matt-rush	Lomandraceae	0.2	50	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
glyc clan	*Glycine clandestina*	Twining glycine	Fabaceae (Faboideae)	0.1	20	Alive in NSW, Native	Other (OG)		Not Listed	Not Listed
sonc aspe	*Sonchus asper*	Prickly Sowthistle	Asteraceae			Introduced			Not Listed	Not Listed
gali gaud	*Galium gaudichaudii*	Rough Bedstraw	Rubiaceae	0.1	15	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
rosa rubi	*Rosa rubiginosa*	Sweet Briar	Rosaceae			Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
brac spat	*Brachycome spathulata*		Asteraceae	0.1	1	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
chei sieb	*Cheilanthes sieberi*	Rock Fern	Pteridaceae	0.1	20	Alive in NSW, Native	Fern (EG)		Not Listed	Not Listed

BAM Site Field Survey								
Project:	Canyonleigh	**Plot Identifier**	BAM20	**Pic 20x20**	Y	**Pic 20x50**	Y	
Survey date:	18/11/2024		**Compass Orientation (head of 20x20 plot)**				80	
Recorders	Damian Wall, Stuart Mendham		**PCT:**					
GPS Easting	229705.68	**GPS Northing**	6165435.16		**Datum**	GDA94	**Zone**	56H
Landform			**Soils**			**Drainage & Slope**		
Morphology			**Soil Texture**			**Slope**		
LandF Element			**Soil Colour**			**Aspect**		
LandF Pattern			**Soil Depth**			**Drainage**		
Microrelief			**Geology**			**Watercourses**		

Plot Disturbance			
	Severity	**Age**	**Observational Evidence**
Clearing			
Cultivation			
Soil erosion			
Firewood			
Grazing			
Fire Damage			
Storm Damage			
Weediness			
Other			

Severity: 0 = no evidence, 1=light, 2=moderate, 3=severe **Age:** R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

Additional information

Current land use

Age class of trees (DBH range) , Condition of Vegetation, Hollows

Disturbances (i.e. fire, grazing,ferals, clearing, logging, soil degradation, pollution, weeds, dieback)

Significant and threatened species and communities (Note pop. size/area, structure, repro status, habit, habitat, threats, photos)

Dominant Species outside Plot

FUNCTION

Function attributes for BAM20

BAM Attribute (20x20m plot)

	Stratum	Sum
Count of Native Richness	**Tree (TG)**	**2**
	Shrub (SG)	**2**
	Forb (FG)	**9**
	Grass & grasslike (GG)	**12**
	Fern (EG)	**0**
	Other (OG)	**0**
	TOTAL	**25**

BAM Attribute (20x20m plot)

	Stratum	Sum
Count of cover abundance (native vascular plants)	**Tree (TG)**	**40.1**
	Shrub (SG)	**0.2**
	Forb (FG)	**6.3**
	Grass & grasslike (GG)	**39.4**
	Fern (EG)	**0**
	Other (OG)	**0**
	TOTAL Native	**86**
	TOTAL 'HTE'	**10**

BAM Attributes (1 x 1m Plots)

	Tape length	% cover	Average %	Photos
Litter Cover	5m	40%		n
	15m	10%		n
	25m	15%	**14.4%**	n
	35m	5%		n
	45m	2%		n
Bare ground cover	5m	0%		n
	15m	5%		n
	25m	1%	**4.2%**	n
	35m	10%		n
	45m	5%		n
Cryptogam cover	5m	0%		n
	15m	5%		n
	25m	0%	**1.0%**	n
	35m	0%		n
	45m	0%		n
Rock Cover	5m	0%		n
	15m	0%		n
	25m	0%	**0.0%**	n
	35m	0%		n
	45m	0%		n

BAM Attribute (20 x 50m plot) Tree Stem Counts

DBH (cm)	Euc	Non Euc	Hollows
>80	0		
50-79	0		
30-49	4		
20-29	16		
10-19	5		
5-9	3		
<5	4		N/A
Length of logs (m)		12	

0.1%=63x63cm
0.5%=1.4x1.4m
1%=2×2m
5%=4×5m
25%=10×10m

COMPOSITION & STRUCTURE

Species recorded for BAM20

Abbreviation	Scientific Name	Common Name	Family	% Cover	Abundance	Exotic	Growth Form	High Threat?	EPBC Status	BCA Status
casu cunn	*Casuarina cunninghamiana*		Casuarinaceae	40	26	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
lyth hyss	*Lythrum hyssopifolia*	Hyssop Loosestrife	Lythraceae	0.5	50	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
lach fili	*Lachnagrostis filiformis*		Poaceae	0.2	25	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
cent cord	*Centella cordifolia*		Apiaceae	3	300	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
holc lana	*Holcus lanatus*	Rush	Poaceae			Introduced			Not Listed	Not Listed
rubu frut	*Rubus fruticosus*	Blackberry complex	Rosaceae			Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
plan lanc	*Plantago lanceolata*	Lamb's Tongues	Plantaginaceae			Introduced			Not Listed	Not Listed
acae echi	*Acaena echinata*	Sheep's Burr	Rosaceae	1	50	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
aust seta	*Austrodanthonia setacea*	Small-flowered Wallaby-grass	Poaceae	1	50	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
caus flex	*Caustis flexuosa*	Curly Wig	Cyperaceae	0.2	30	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
micr stip	*Microlaena stipoides*	Weeping Grass	Poaceae	30	2000	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
euch invo	*Euchiton involucratus*	Star Cudweed	Asteraceae	0.5	100	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
junc bufo	*Juncus bufonius*	Toad Rush	Juncaceae			Introduced			Not Listed	Not Listed
hypo radi	*Hypochaeris radicata*	Catsear	Asteraceae			Introduced			Not Listed	Not Listed
briz mino	*Briza minor*	Shivery Grass	Poaceae			Introduced			Not Listed	Not Listed
ranu	*Ranunculus spp.*		Ranunculaceae	0.1	50	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
cype	*Cyperaceae spp.*	Sedges	Cyperaceae	0.1	1	Alive in NSW, Native			Not Listed	Not Listed
echi plan	*Echium plantagineum*	Patterson's Curse	Boraginaceae			Introduced			Not Listed	Not Listed
junc	*Juncus spp.*		Juncaceae	0.1	10	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
pasp	*Paspalidium spp.*		Poaceae	0.1	10	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
rosa rubi	*Rosa rubiginosa*	Sweet Briar	Rosaceae			Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
dich micr	*Dichelachne micrantha*	Shorthair Plumegrass	Poaceae	0.5	30	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
elym scab	*Elymus scaber*	Wheatgrass, Common Wheatgrass	Poaceae	0.1	10	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
poa sieb	*Poa sieberiana*	Snowgrass	Poaceae	1	50	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
hype perf	*Hypericum perforatum*	St. Johns Wort	Clusiaceae			Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
nass tric	*Nassella trichotoma*	Serrated Tussock	Poaceae			Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
chry apic	*Chrysocephalum apiculatum*	Common Everlasting	Asteraceae	0.5	50	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
cirs vulg	*Cirsium vulgare*	Spear Thistle	Asteraceae			Introduced			Not Listed	Not Listed
dich repe	*Dichondra repens*	Kidney Weed	Convolvulaceae	0.5	100	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
aris vaga	*Aristida vagans*	Threeawn Speargrass	Poaceae	0.2	15	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
cent eryt	*Centaurium erythraea*	Common Centaury	Gentianaceae			Introduced			Not Listed	Not Listed
vitt muel	Vittadinia muelleri		Asteraceae	0.1	10	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
sonc aspe	*Sonchus asper*	Prickly Sowthistle	Asteraceae			Introduced			Not Listed	Not Listed
poa sieb cyan	*Poa sieberiana var. cyanophylla*		Poaceae			Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
them tria	*Themeda triandra*		Poaceae	5	200	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
gali gaud	*Galium gaudichaudii*	Rough Bedstraw	Rubiaceae	0.1	10	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
olea visc	*Olearia viscidula*	Wallaby Weed	Asteraceae	0.1	1	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
euca pauc	*Eucalyptus pauciflora*	White Sally	Myrtaceae	0.1	1	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
acac	*Acacia spp.*	Wattle	Fabaceae (Mimosoideae)	0.1	1	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed

BAM Site Field Survey								
Project:	Canyonleigh	**Plot Identifier**	BAM21	**Pic 20x20**	Y	**Pic 20x50**	Y	
Survey date:	12/11/2024		**Compass Orientation (head of 20x20 plot)**				45	
Recorders	Damian Wall, Stuart Mendham		**PCT:**					
GPS Easting	230222.61	**GPS Northing**	6165399.86		**Datum**	GDA94	**Zone**	56H
Landform			**Soils**			**Drainage & Slope**		
Morphology			**Soil Texture**			**Slope**		
LandF Element			**Soil Colour**			**Aspect**		
LandF Pattern			**Soil Depth**			**Drainage**		
Microrelief			**Geology**			**Watercourses**		

Plot Disturbance			
	Severity	**Age**	**Observational Evidence**
Clearing			
Cultivation			
Soil erosion			
Firewood			
Grazing			
Fire Damage			
Storm Damage			
Weediness			
Other			

Severity: 0 = no evidence, 1=light, 2=moderate, 3=severe **Age:** R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

Additional information
Current land use
Age class of trees (DBH range) , Condition of Vegetation, Hollows
Disturbances (i.e. fire, grazing,ferals, clearing, logging, soil degradation, pollution, weeds, dieback)
Significant and threatened species and communities (Note pop. size/area, structure, repro status, habit, habitat, threats, photos)
Dominant Species outside Plot

FUNCTION

Function attributes for		BAM21
BAM Attribute (20x20m plot)		
Count of Native Richness	**Stratum**	**Sum**
	Tree (TG)	**4**
	Shrub (SG)	**6**
	Forb (FG)	**6**
	Grass & grasslike (GG)	**9**
	Fern (EG)	**0**
	Other (OG)	**1**
	TOTAL	**26**
BAM Attribute (20x20m plot)		
Count of cover abundance (native vascular plants)	**Stratum**	**Sum**
	Tree (TG)	**60**
	Shrub (SG)	**27.2**
	Forb (FG)	**19.3**
	Grass & grasslike (GG)	**29.5**
	Fern (EG)	**0**
	Other (OG)	**0.5**
	TOTAL Native	**136.5**
	TOTAL 'HTE'	**1**

BAM Attribute (20 x 50m plot) Tree Stem Counts			
DBH (cm)	**Euc**	**Non Euc**	**Hollows**
>80	1		2
50-79	0		
30-49	7		
20-29	18		
10-19	19		
5-9	16		
<5	17		N/A
Length of logs (m)		67	

0.1%=63x63cm
0.5%=1.4x1.4m
1%=2×2m
5%=4×5m
25%=10×10m

BAM Attributes (1 x 1m Plots)				
	Tape length	**% cover**	**Average %**	**Photos**
Litter Cover	5m	35%		n
	15m	60%		n
	25m	25%	**33.0%**	n
	35m	15%		n
	45m	30%		n
Bare ground cover	5m	1%		n
	15m	0%		n
	25m	2%	**1.6%**	n
	35m	5%		n
	45m	0%		n
Cryptogam cover	5m	0%		n
	15m	0%		n
	25m	5%	**1.6%**	n
	35m	2%		n
	45m	1%		n
Rock Cover	5m	0%		n
	15m	0%		n
	25m	0%	**0.0%**	n
	35m	0%		n
	45m	0%		n

COMPOSITION & STRUCTURE

Species recorded for		BAM21								
Abbreviation	**Scientific Name**	**Common Name**	**Family**	**% Cover**	**Abundance**	**Exotic**	**Growth Form**	**High Threat?**	**EPBC Status**	**BCA Status**
euca euge	*Eucalyptus eugenioides*	Thin-leaved Stringybark	Myrtaceae	40	12	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
euca punc	*Eucalyptus punctata*	Grey Gum	Myrtaceae	5	7	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
euca rubi	*Eucalyptus rubida*	Candlebark	Myrtaceae	5	6	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
euca dive	*Eucalyptus dives*	Rush	Myrtaceae	10	4	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
cass cunn	*Cassinia cunninghamii*		Asteraceae	25	300	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
good hede	*Goodenia hederacea*	Ivy Goodenia	Goodeniaceae	3	200	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
gono tetr	*Gonocarpus tetragynus*	Poverty Raspwort	Haloragaceae	15	1500	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
loma fili	*Lomandra filiformis*	Wattle Matt-rush	Lomandraceae	5	100	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
gono humi	*Gonocarpus humilis*		Haloragaceae	0.5	50	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
exoc cupr	*Exocarpos cupressiformis*	Cherry Ballart	Santalaceae	0.1	5	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
micr stip	*Microlaena stipoides*	Weeping Grass	Poaceae	1	300	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
dich micr	*Dichelachne micrantha*	Shorthair Plumegrass	Poaceae	0.5	30	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
wahl	Wahlenbergia spp.	Bluebell	Campanulaceae	0.2	50	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
cass arcu	*Cassinia arcuata*		Asteraceae	0.5	10	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
nass tric	*Nassella trichotoma*	Serrated Tussock	Poaceae			Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
junc	*Juncus spp.*		Juncaceae	0.2	10	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
halo hete	*Haloragis heterophylla*	Variable Raspwort	Haloragaceae	0.1	20	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
meli urce	*Melichrus urceolatus*	Urn Heath	Ericaceae	0.2	10	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
aris vaga	*Aristida vagans*	Threeawn Speargrass	Poaceae	15	400	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
luzu meri	*Luzula meridionalis*		Juncaceae	1	200	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
hypo radi	*Hypochaeris radicata*	Catsear	Asteraceae			Introduced			Not Listed	Not Listed
hydr laxi	*Hydrocotyle laxiflora*	Stinking Pennywort	Apiaceae	0.5	50	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
aust seta	*Austrodanthonia setacea*	Small-flowered Wallaby-grass	Poaceae	0.8	50	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
rosa rubi	*Rosa rubiginosa*	Sweet Briar	Rosaceae			Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
them tria	*Themeda triandra*		Poaceae	5	100	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
acac mear	*Acacia mearnsii*	Black Wattle	Fabaceae (Mimosoideae)	0.8	10	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
poa	*Poa spp.*		Poaceae	1	10	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
hard viol	*Hardenbergia violacea*	False Sarsaparilla	Fabaceae (Faboideae)	0.5	2	Alive in NSW, Native	Other (OG)		Not Listed	Not Listed
dill brun	*Dillwynia brunioides*		Fabaceae (Faboideae)	0.1	1	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed

BAM Site Field Survey								
Project:	Canyonleigh	**Plot Identifier**	BAM22	**Pic 20x20**	Y	**Pic 20x50**	Y	
Survey date:	12/11/2024		**Compass Orientation (head of 20x20 plot)**				50	
Recorders	Damian Wall, Stuart Mendham		**PCT:**					
GPS Easting	2329692.06	**GPS Northing**	6165106.87		**Datum**	GDA94	**Zone**	56H
Landform			**Soils**			**Drainage & Slope**		
Morphology			**Soil Texture**			**Slope**		
LandF Element			**Soil Colour**			**Aspect**		
LandF Pattern			**Soil Depth**			**Drainage**		
Microrelief			**Geology**			**Watercourses**		

Plot Disturbance			
	Severity	**Age**	**Observational Evidence**
Clearing			
Cultivation			
Soil erosion			
Firewood			
Grazing			
Fire Damage			
Storm Damage			
Weediness			
Other			

Severity: 0 = no evidence, 1=light, 2=moderate, 3=severe **Age:** R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

Additional information
Current land use
Age class of trees (DBH range) , Condition of Vegetation, Hollows
Disturbances (i.e. fire, grazing,ferals, clearing, logging, soil degradation, pollution, weeds, dieback)
Significant and threatened species and communities (Note pop. size/area, structure, repro status, habit, habitat, threats, photos)
Dominant Species outside Plot

FUNCTION

Function attributes for		BAM22
BAM Attribute (20x20m plot)		
	Stratum	**Sum**
Count of Native Richness	**Tree (TG)**	**1**
	Shrub (SG)	**5**
	Forb (FG)	**13**
	Grass & grasslike (GG)	**5**
	Fern (EG)	**1**
	Other (OG)	**0**
	TOTAL	**25**
BAM Attribute (20x20m plot)		
	Stratum	**Sum**
Count of cover abundance (native vascular plants)	**Tree (TG)**	**0.1**
	Shrub (SG)	**64.2**
	Forb (FG)	**4.5**
	Grass & grasslike (GG)	**57.6**
	Fern (EG)	**0.1**
	Other (OG)	**0**
	TOTAL Native	**126.5**
	TOTAL 'HTE'	**1**

BAM Attribute (20 x 50m plot) Tree Stem Counts			
DBH (cm)	**Euc**	**Non Euc**	**Hollows**
>80	0		0
50-79	0		
30-49	0		
20-29	0		
10-19	0		
5-9	0		
<5	0		N/A
Length of logs (m)		0	

0.1%=63x63cm
0.5%=1.4x1.4m
1%=2×2m
5%=4×5m
25%=10×10m

BAM Attributes (1 x 1m Plots)				
	Tape length	**% cover**	**Average %**	**Photos**
Litter Cover	5m	1%		n
	15m	1%		n
	25m	2%	**1.2%**	n
	35m	1%		n
	45m	1%		n
Bare ground cover	5m	2%		n
	15m	5%		n
	25m	10%	**4.4%**	n
	35m	0%		n
	45m	5%		n
Cryptogam cover	5m	15%		n
	15m	15%		n
	25m	10%	**9.0%**	n
	35m	5%		n
	45m	0%		n
Rock Cover	5m	20%		n
	15m	0%		n
	25m	0%	**4.0%**	n
	35m	0%		n
	45m	0%		n

COMPOSITION & STRUCTURE

Species recorded for		BAM22								
Abbreviation	**Scientific Name**	**Common Name**	**Family**	**% Cover**	**Abundance**	**Exotic**	**Growth Form**	**High Threat?**	**EPBC Status**	**BCA Status**
kunz parv	*Kunzea parvifolia*	Violet Kunzea	Myrtaceae	60	5000	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
them tria	*Themeda triandra*		Poaceae	50	4000	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
aris vaga	*Aristida vagans*	Threeawn Speargrass	Poaceae	5	300	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
euch invo	*Euchiton involucratus*	Rush	Asteraceae	1	150	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
rume acet	*Rumex acetosella*	Sheep Sorrel	Polygonaceae			Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
gono tetr	*Gonocarpus tetragynus*	Poverty Raspwort	Haloragaceae	0.5	200	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
epil	*Epilobium spp.*		Onagraceae	0.1	10	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
hype gram	*Hypericum gramineum*	Small St John's Wort	Clusiaceae	0.2	200	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
loma fili	*Lomandra filiformis*	Wattle Matt-rush	Lomandraceae	2	500	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
pime curv	*Pimelea curviflora*	Rice Flower	Thymelaeaceae	3	200	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
good hede	*Goodenia hederacea*	Ivy Goodenia	Goodeniaceae	1	400	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
hypo radi	*Hypochaeris radicata*	Catsear	Asteraceae			Introduced			Not Listed	Not Listed
wahl	Wahlenbergia spp.	Bluebell	Campanulaceae	0.5	50	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
dich micr	*Dichelachne micrantha*	Shorthair Plumegrass	Poaceae	0.5	30	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
acro serr	*Acrotriche serrulata*	Honeypots	Ericaceae	0.8	10	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
meli urce	*Melichrus urceolatus*	Urn Heath	Ericaceae	0.2	5	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
briz mino	*Briza minor*	Shivery Grass	Poaceae			Introduced			Not Listed	Not Listed
rosa rubi	*Rosa rubiginosa*	Sweet Briar	Rosaceae			Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
bank marg	*Banksia marginata*	Silver Banksia	Proteaceae	0.2	1	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
erig cana	*Erigeron canadensis*	Canadian Fleabane	Asteraceae			Introduced			Not Listed	Not Listed
sorg leio	*Sorghum leiocladum*	Wild Sorghum	Poaceae	0.1	3	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
styl gram	*Stylidium graminifolium*	Grass Triggerplant	Stylidiaceae	0.5	50	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
micr	*Microtis spp.*		Orchidaceae	0.2	65	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
hove line	*Hovea linearis*		Fabaceae (Faboideae)	0.1	5	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
rubu frut	*Rubus fruticosus*	Blackberry complex	Rosaceae			Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
acac parr	*Acacia parramattensis*	Parramatta Wattle	Fabaceae (Mimosoideae)	0.1	1	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
diur	*Diuris spp.*		Orchidaceae	0.1	20	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
tric elat	*Tricoryne elatior*	Yellow Autumn-lily	Anthericaceae	0.1	30	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
lept squa	*Leptorhynchos squamatus*	Scaly Buttons	Asteraceae	0.1	5	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
thel	*Thelymitra spp.*		Orchidaceae	0.1	15	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
pter escu	*Pteridium esculentum*	Bracken	Dennstaedtiaceae	0.1	15	Alive in NSW, Native	Fern (EG)		Not Listed	Not Listed

BAM Site Field Survey								
Project:	Canyonleigh_ Road Upgrade	Plot Identifier	BAM23	Pic 20x20	y	Pic 20x50	y	
Survey date:	25/08/2025		Compass Orientation (head of 20x20 plot)				58 E	
Recorders	JC + NS		PCT:	3746				
GPS Easting		GPS Northing			Datum		Zone	
Landform			**Soils**			**Drainage & Slope**		
Morphology			Soil Texture			Slope	2	
LandF Element			Soil Colour			Aspect	W	
LandF Pattern			Soil Depth			Drainage		
Microrelief			Geology			Watercourses		

Plot Disturbance			
	Severity	Age	Observational Evidence
Clearing			
Cultivation			
Soil erosion			
Firewood	1	R	Fallen branches
Grazing	1	R	Hoof prints
Fire Damage			
Storm Damage			
Weediness	1	R	Some bramble
Other			

Severity: 0 = no evidence, 1=light, 2=moderate, 3=severe Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

Additional information	
Current land use	
Power station/ grazing	
Age class of trees (DBH range) , Condition of Vegetation, Hollows	
Young/ plnated/ no hollows	
Disturbances (i.e. fire, grazing,ferals, clearing, logging, soil degradation, pollution, weeds, dieback)	
Grazing/ weeds	
Significant and threatened species and communities (Note pop. size/area, structure, repro status, habit, habitat, threats, photos)	
Dominant Species outside Plot	Euc/grass

FUNCTION

Function attributes for	BAM23
BAM Attribute (20x20m plot)	
Stratum	Sum
Tree (TG)	3
Shrub (SG)	5
Forb (FG)	3
Grass & grasslike (GG)	4
Fern (EG)	1
Other (OG)	0
TOTAL	16
BAM Attribute (20x20m plot)	
Stratum	Sum
Tree (TG)	32
Shrub (SG)	2.7
Forb (FG)	2.1
Grass & grasslike (GG)	40
Fern (EG)	1
Other (OG)	0
TOTAL Native	77.8
TOTAL 'HTE'	12.1

Count of Native Richness

Count of cover abundance (native vascular plants)

BAM Attributes (1 x 1m Plots)				
	Tape length	% cover	Average %	Photos
Litter Cover	5m	30%	22.0%	
	15m	30%		
	25m	20%		
	35m	10%		
	45m	20%		
Bare ground cover	5m	0%	0.0%	
	15m	0%		
	25m	0%		
	35m	0%		
	45m	0%		
Cryptogam cover	5m	0%	0.0%	
	15m	0%		
	25m	0%		
	35m	0%		
	45m	0%		
Rock Cover	5m	0%	0.0%	
	15m	0%		
	25m	0%		
	35m	0%		
	45m	0%		

BAM Attribute (20 x 50m plot) Tree Stem Counts			
DBH (cm)	Euc	Non Euc	Hollows
>80	1		
50-79	3		
30-49	9		
20-29	1		
10-19	3		
5-9			
<5	22	8	N/A
Length of logs (m)			

0.1%=63x63cm
0.5%=1.4x1.4m
1%=2×2m
5%=4×5m
25%=10×10m

COMPOSITION & STRUCTURE

Species recorded for BAM23

Abbreviation	Scientific Name	Common Name	Family	% Cover	Abundance	Exotic	Growth Form	High Threat?	EPBC Status	BCA Status
anth odor	*Anthoxanthum odoratum*	Sweet Vernal Grass	Poaceae	10	1500	Introduced			Not Listed	Not Listed
aris vaga	*Aristida vagans*	Threeawn Speargrass	Poaceae	10	1500	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
euca pauc	*Eucalyptus pauciflora*	White Sally	Myrtaceae	30	25	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
them tria	*Themeda triandra*		Poaceae	15	2000	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
chei sieb	*Cheilanthes sieberi*	Rock Fern	Pteridaceae	1	30	Alive in NSW, Native	Fern (EG)		Not Listed	Not Listed
halo hete	*Haloragis heterophylla*	Variable Raspwort	Haloragaceae	1	5	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
hypo radi	*Hypochaeris radicata*	Catsear	Asteraceae	1	15	Introduced			Not Listed	Not Listed
plan lanc	*Plantago lanceolata*	Lamb's Tongues	Plantaginaceae	1	15	Introduced			Not Listed	Not Listed
meli urce	*Melichrus urceolatus*	Urn Heath	Ericaceae	0.5	5	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
rume acet	*Rumex acetosella*	Sheep Sorrel	Polygonaceae	1	10	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
poa sieb	*Poa sieberiana*	Snowgrass	Poaceae	5	500	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
hype perf	*Hypericum perforatum*	St. Johns Wort	Clusiaceae	0.5	5	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
cass acul	*Cassinia aculeata*	Dolly Bush	Asteraceae	1	2	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
Euca macr	*Eucalyptus macrorhyncha*	Red Stringybark	Myrtaceae	1	10	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
rubu frut	*Rubus fruticosus*	Blackberry complex	Rosaceae	0.5	1	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
acac parr	*Acacia parramattensis*	Parramatta Wattle	Fabaceae (Mimosoideae)	1	1	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
hydr laxi	*Hydrocotyle laxiflora*	Stinking Pennywort	Apiaceae	1	25	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
rosa rubi	*Rosa rubiginosa*	Sweet Briar	Rosaceae	0.1	1	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
dich micr	*Dichelachne micrantha*	Shorthair Plumegrass	Poaceae	10	1000	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
nass tric	*Nassella trichotoma*	Serrated Tussock	Poaceae	10	750	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
pime curv	*Pimelea curviflora*	Rice Flower	Thymelaeaceae	0.1	1	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
kunz parv	*Kunzea parvifolia*	Violet Kunzea	Myrtaceae	1	10	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
boss buxi	*Bossiaea buxifolia*		Fabaceae (Faboideae)	0.1	1	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
chry apic	*Chrysocephalum apiculatum*	Common Everlasting	Asteraceae	0.1	1	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed

BAM Site Field Survey								
Project:	Canyonleigh_ Road Upgrade	Plot Identifier	BAM24	Pic 20x20	y	Pic 20x50	y	
Survey date:	16/08/2025		Compass Orientation (head of 20x20 plot)				228 SW	
Recorders	JC + NS		PCT:	3746				
GPS Easting		GPS Northing			Datum		Zone	
Landform			**Soils**			**Drainage & Slope**		
Morphology			Soil Texture			Slope	3	
LandF Element			Soil Colour			Aspect	SW	
LandF Pattern			Soil Depth			Drainage		
Microrelief			Geology			Watercourses		

Plot Disturbance			
	Severity	Age	Observational Evidence
Clearing	2		Chopped down trees
Cultivation			
Soil erosion			
Firewood	2		Chopped logs
Grazing	1		Some hoof prints
Fire Damage			
Storm Damage			
Weediness	1		Bramble
Other			

Severity: 0 = no evidence, 1=light, 2=moderate, 3=severe Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

Additional information

Current land use

Pwer station, some grazing

Age class of trees (DBH range) , Condition of Vegetation, Hollows

Young/ Planted natives/ no hollows

Disturbances (i.e. fire, grazing,ferals, clearing, logging, soil degradation, pollution, weeds, dieback)

Grazing/weeds

Significant and threatened species and communities (Note pop. size/area, structure, repro status, habit, habitat, threats, photos)

Dominant Species outside Plot

FUNCTION

Function attributes for	BAM24
BAM Attribute (20x20m plot)	
Stratum	Sum
Tree (TG)	2
Shrub (SG)	5
Forb (FG)	5
Grass & grasslike (GG)	6
Fern (EG)	1
Other (OG)	0
TOTAL	19
BAM Attribute (20x20m plot)	
Stratum	Sum
Tree (TG)	31
Shrub (SG)	7.2
Forb (FG)	2.4
Grass & grasslike (GG)	43
Fern (EG)	0.1
Other (OG)	0
TOTAL Native	83.7
TOTAL 'HTE'	4.1

Count of Native Richness

Count of cover abundance (native vascular plants)

BAM Attributes (1 x 1m Plots)

	Tape length	% cover	Average %	Photos
Litter Cover	5m	5%		
	15m	40%		
	25m	50%	20.9%	
	35m	8%		
	45m	2%		
Bare ground cover	5m	5%		
	15m	8%		
	25m	5%	10.5%	
	35m	25%		
	45m	10%		
Cryptogam cover	5m	0%		
	15m	0%		
	25m	0%	0.0%	
	35m	0%		
	45m	0%		
Rock Cover	5m	0%		
	15m	0%		
	25m	0%	0.0%	
	35m	0%		
	45m	0%		

BAM Attribute (20 x 50m plot) Tree Stem Counts

DBH (cm)	Euc	Non Euc	Hollows
>80	6		
50-79	6		
30-49	4		
20-29		1	
10-19		10	
5-9			
<5			N/A
Length of logs (m)		52	

0.1%=63x63cm
0.5%=1.4x1.4m
1%=2×2m
5%=4×5m
25%=10×10m

COMPOSITION & STRUCTURE

Species recorded for BAM24

Abbreviation	Scientific Name	Common Name	Family	% Cover	Abundance	Exotic	Growth Form	High Threat?	EPBC Status	BCA Status
anth odor	*Anthoxanthum odoratum*	Sweet Vernal Grass	Poaceae	1	100	Introduced			Not Listed	Not Listed
aris vaga	*Aristida vagans*	Threeawn Speargrass	Poaceae	5	400	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
euca pauc	*Eucalyptus pauciflora*	White Sally	Myrtaceae	30	30	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
them tria	*Themeda triandra*		Poaceae	25	4000	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
chei sieb	*Cheilanthes sieberi*	Rock Fern	Pteridaceae	0.1	5	Alive in NSW, Native	Fern (EG)		Not Listed	Not Listed
halo hete	*Haloragis heterophylla*	Variable Raspwort	Haloragaceae	0.1	1	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
hypo radi	*Hypochaeris radicata*	Catsear	Asteraceae	2	30	Introduced			Not Listed	Not Listed
plan lanc	*Plantago lanceolata*	Lamb's Tongues	Plantaginaceae	1	15	Introduced			Not Listed	Not Listed
meli urce	*Melichrus urceolatus*	Urn Heath	Ericaceae	0.1	1	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
rume acet	*Rumex acetosella*	Sheep Sorrel	Polygonaceae	0.1	2	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
poa sieb	*Poa sieberiana*	Snowgrass	Poaceae	10	1000	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
hype perf	*Hypericum perforatum*	St. Johns Wort	Clusiaceae	1	10	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
cass acul	*Cassinia aculeata*	Dolly Bush	Asteraceae	5	10	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
loma fili	*Lomandra filiformis*	Wattle Matt-rush	Lomandraceae	1	75	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
rubu frut	*Rubus fruticosus*	Blackberry complex	Rosaceae	2	5	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
acac parr	*Acacia parramattensis*	Parramatta Wattle	Fabaceae (Mimosoideae)	1	1	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
hydr laxi	*Hydrocotyle laxiflora*	Stinking Pennywort	Apiaceae	0.1	3	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
dich micr	*Dichelachne micrantha*	Shorthair Plumegrass	Poaceae	1	70	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
nass tric	*Nassella trichotoma*	Serrated Tussock	Poaceae	1	95	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
pime curv	*Pimelea curviflora*	Rice Flower	Thymelaeaceae	0.1	13	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
cirs vulg	*Cirsium vulgare*	Spear Thistle	Asteraceae	0.5	5	Introduced			Not Listed	Not Listed
kunz parv	*Kunzea parvifolia*	Violet Kunzea	Myrtaceae	1	2	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
boss buxi	*Bossiaea buxifolia*		Fabaceae (Faboideae)	1	2	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
chry apic	*Chrysocephalum apiculatum*	Common Everlasting	Asteraceae	2	16	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
briz mino	*Briza minor*	Shivery Grass	Poaceae	2	100	Introduced			Not Listed	Not Listed
briz maxi	*Briza maxima*	Quaking Grass	Poaceae	1	75	Introduced			Not Listed	Not Listed
micr stip	*Microlaena stipoides*	Weeping Grass	Poaceae	1	80	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
holc lana	*Holcus lanatus*	Yorkshire Fog	Poaceae	1	80	Introduced			Not Listed	Not Listed
oxal	*Oxalis spp.*		Oxalidaceae	0.1	1	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
ranu	*Ranunculus spp.*		Ranunculaceae	0.1	1	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed

BAM Site Field Survey

Project:	Canyonleigh_ Road Upgrade	Plot Identifier	BAM25	Pic 20x20	y	Pic 20x50	y	
Survey date:	16/08/2025		Compass Orientation (head of 20x20 plot)				15 N	
Recorders	JC + NS		PCT:	3746				
GPS Easting		GPS Northing			Datum		Zone	
Landform			**Soils**			**Drainage & Slope**		
Morphology			Soil Texture			Slope	4	
LandF Element			Soil Colour			Aspect	s	
LandF Pattern			Soil Depth			Drainage		
Microrelief			Geology			Watercourses		

Plot Disturbance

	Severity	Age	Observational Evidence
Clearing	2	NR	Lots of chopped down trees
Cultivation			
Soil erosion			
Firewood	2	NR	Chopped logs
Grazing	1	R	Feral pigs and livestock grazing
Fire Damage			
Storm Damage	2	NR	Fallen trees
Weediness	2	R	Bramble
Other			

Severity: 0 = no evidence, 1=light, 2=moderate, 3=severe Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

Additional information

Current land use

Power station/ livestock grazing

Age class of trees (DBH range) , Condition of Vegetation, Hollows

Young/ planted natives/ no hollows

Disturbances (i.e. fire, grazing,ferals, clearing, logging, soil degradation, pollution, weeds, dieback)

Grazing, weeds, feral pigs

Significant and threatened species and communities (Note pop. size/area, structure, repro status, habit, habitat, threats, photos)

Dominant Species outside Plot

FUNCTION

Function attributes for BAM25

BAM Attribute (20x20m plot)

	Stratum	Sum
Count of Native Richness	Tree (TG)	2
	Shrub (SG)	1
	Forb (FG)	3
	Grass & grasslike (GG)	10
	Fern (EG)	1
	Other (OG)	0
	TOTAL	17

BAM Attribute (20x20m plot)

	Stratum	Sum
Count of cover abundance (native vascular plants)	Tree (TG)	12
	Shrub (SG)	2
	Forb (FG)	5.2
	Grass & grasslike (GG)	55.5
	Fern (EG)	0.1
	Other (OG)	0
	TOTAL Native	74.8
	TOTAL 'HTE'	1.3

BAM Attributes (1 x 1m Plots)

	Tape length	% cover	Average %	Photos
Litter Cover	5m	20%	17.0%	
	15m	10%		
	25m	15%		
	35m	30%		
	45m	10%		
Bare ground cover	5m	2%	2.4%	
	15m	0%		
	25m	0%		
	35m	0%		
	45m	10%		
Cryptogam cover	5m	0%	6.0%	
	15m	0%		
	25m	0%		
	35m	5%		
	45m	25%		
Rock Cover	5m	0%	7.0%	
	15m	0%		
	25m	35%		
	35m	0%		
	45m	0%		

BAM Attribute (20 x 50m plot) Tree Stem Counts

DBH (cm)	Euc	Non Euc	Hollows
>80	3		
50-79	2		
30-49	2		
20-29	4		
10-19	2		
5-9			
<5			N/A
Length of logs (m)			

0.1%=63x63cm
0.5%=1.4x1.4m
1%=2×2m
5%=4×5m
25%=10×10m

COMPOSITION & STRUCTURE

Species recorded for BAM25

Abbreviation	Scientific Name	Common Name	Family	% Cover	Abundance	Exotic	Growth Form	High Threat?	EPBC Status	BCA Status
Rubu frut	*Rubus fruticosus*	Blackberry complex	Rosaceae	1	5	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
Spor creb	*Sporobolus creber*	Slender Rat's Tail Grass	Poaceae	20	800	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Plan lanc	*Plantago lanceolata*	Lamb's Tongues	Plantaginaceae	2	50	Introduced			Not Listed	Not Listed
both	*Bothriochloa spp.*	Redgrass, Bluegrass	Poaceae	2	500	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
aris ramo	*Aristida ramosa*	Purple Wiregrass	Poaceae	2	500	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
pani effu	*Panicum effusum*	Hairy Panic	Poaceae	1	300	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
hypo radi	*Hypochaeris radicata*	Catsear	Asteraceae	0.5	200	Introduced			Not Listed	Not Listed
Oxal pere	*Oxalis perennans*		Oxalidaceae	0.1	2	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Seta pumi	*Setaria pumila*	Pale Pigeon Grass	Poaceae	0.1	1	Introduced			Not Listed	Not Listed
halo hete	*Haloragis heterophylla*	Variable Raspwort	Haloragaceae	5	100	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Chei sieb	*Cheilanthes sieberi*	Rock Fern	Pteridaceae	0.1	10	Alive in NSW, Native	Fern (EG)		Not Listed	Not Listed
acet vulg	*Acetosella vulgaris*	Sheep Sorrel	Polygonaceae	0.1	10	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
oeno	*Oenothera spp.*		Onagraceae	0.1	1	Introduced			Not Listed	Not Listed
Them tria	*Themeda triandra*		Poaceae	30	1000	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
fimb dich	*Fimbristylis dichotoma*	Common Fringe-sedge	Cyperaceae	0.1	5	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
dact glom	*Dactylis glomerata*	Cocksfoot	Poaceae	0.5	30	Introduced			Not Listed	Not Listed
Verb bona	*Verbena bonariensis*	Purpletop	Verbenaceae	0.1	5	Introduced			Not Listed	Not Listed
dich micr	*Dichelachne micrantha*	Shorthair Plumegrass	Poaceae	0.1	20	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Care appr	*Carex appressa*	Tall Sedge	Cyperaceae	0.1	15	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Trif subt	*Trifolium subterraneum*	Subterranean Clover	Fabaceae (Faboideae)	0.1	50	Introduced			Not Listed	Not Listed
cony bona	*Conyza bonariensis*	Flaxleaf Fleabane	Asteraceae	0.1	10	Introduced			Not Listed	Not Listed
junc	*Juncus spp.*		Juncaceae	0.1	25	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Nass tric	*Nassella trichotoma*	Serrated Tussock	Poaceae	0.1	5	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
gono tetr	*Gonocarpus tetragynus*	Poverty Raspwort	Haloragaceae	0.1	10	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
ryti	*Rytidosperma spp.*		Poaceae	0.1	1	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
erag curv	*Eragrostis curvula*	African Lovegrass	Poaceae	0.1	5	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
euca pauc	*Eucalyptus pauciflora*	White Sally	Myrtaceae	10	15	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
acac parr	*Acacia parramattensis*	Parramatta Wattle	Fabaceae (Mimosoideae)	2	4	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
Cass sift	*Cassinia sifton*		Asteraceae	2	8	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed

BAM Site Field Survey

Project:	Canyonleigh_ Road Upgrade	Plot Identifier	CTR_001	Pic 20x20	Y	Pic 20x50	Y	
Survey date:	13/08/2025		Compass Orientation (head of 20x20 plot)				330	
Recorders	JB + JC		PCT:	3373				
GPS Easting	771718.4059	GPS Northing	6162086.489		Datum		Zone	

Landform		Soils		Drainage & Slope	
Morphology		Soil Texture	Fine, sandy/silty loam	Slope	1
LandF Element		Soil Colour	Light grey/brown	Aspect	NE
LandF Pattern		Soil Depth	Kurosols	Drainage	Drainage ditches next to road
Microrelief		Geology	Saprolite	Watercourses	

Plot Disturbance

	Severity	Age	Observational Evidence
Clearing	1	NR	Road clearance
Cultivation	0	O	
Soil erosion	1	NR	Erosion from the creation and use of the road
Firewood	2	R	Plenty of logs and brash
Grazing	0	NR	Some native wildlife grazing, no evidence of livestock grazing
Fire Damage	0		
Storm Damage	1	NR	Fallen trees and branches
Weediness	1	NR	
Other			

Severity: 0 = no evidence, 1=light, 2=moderate, 3=severe Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

Additional information

Current land use

Woodland along road verge

Age class of trees (DBH range) , Condition of Vegetation, Hollows

Young - mature (5-80+), Moderate condition. 3 HBT

Disturbances (i.e. fire, grazing,ferals, clearing, logging, soil degradation, pollution, weeds, dieback)

Road pollution and weeds

Significant and threatened species and communities (Note pop. size/area, structure, repro status, habit, habitat, threats, photos)

Eucalyptus blakelyi

Dominant Species outside Plot	Eucalyptus blakelyi and agricultural fields

FUNCTION

Function attributes for CTR_001

BAM Attribute (20x20m plot)

	Stratum	Sum
Count of Native Richness	Tree (TG)	4
	Shrub (SG)	0
	Forb (FG)	7
	Grass & grasslike (GG)	9
	Fern (EG)	0
	Other (OG)	0
	TOTAL	20

BAM Attribute (20x20m plot)

	Stratum	Sum
Count of cover abundance (native vascular plants)	Tree (TG)	37
	Shrub (SG)	0
	Forb (FG)	0.7
	Grass & grasslike (GG)	46.1
	Fern (EG)	0
	Other (OG)	0
	TOTAL Native	83.8
	TOTAL 'HTE'	0.2

BAM Attributes (1 x 1m Plots)

	Tape length	% cover	Average %	Photos
Litter Cover	5m	20%		
	15m	15%		
	25m	10%	13.0%	
	35m	10%		
	45m	10%		
Bare ground cover	5m	0%		
	15m	0%		
	25m	0%	0.0%	
	35m	0%		
	45m	0%		
Cryptogam cover	5m	0%		
	15m	0%		
	25m	0%	0.0%	
	35m	0%		
	45m	0%		
Rock Cover	5m	0%		
	15m	0%		
	25m	0%	0.0%	
	35m	0%		
	45m	0%		

BAM Attribute (20 x 50m plot) Tree Stem Counts

DBH (cm)	Euc	Non Euc	Hollows
>80	10		3
50-79	3		
30-49	10		
20-29	25		
10-19	17		
5-9	16		
<5	7	1	N/A
Length of logs (m)		3.5	

0.1%=63x63cm
0.5%=1.4x1.4m
1%=2×2m
5%=4×5m
25%=10×10m

COMPOSITION & STRUCTURE

Species recorded for CTR_001

Abbreviation	Scientific Name	Common Name	Family	% Cover	Abundance	Exotic	Growth Form	High Threat?	EPBC Status	BCA Status
Dact glom	*Dactylis glomerata*	Cocksfoot	Poaceae	5	500	Introduced			Not Listed	Not Listed
Foen vulg	*Foeniculum vulgare*	Fennel	Apiaceae	0.2	10	Introduced			Not Listed	Not Listed
Them tria	*Themeda triandra*		Poaceae	30	2000	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Plan lanc	*Plantago lanceolata*	Lamb's Tongues	Plantaginaceae	2	20	Introduced			Not Listed	Not Listed
poa sieb	*Poa sieberiana*	Snowgrass	Poaceae	2	100	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Junc fili	*Juncus filicaulis*		Juncaceae	2	200	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Gera sola	*Geranium solanderi*	Native Geranium	Geraniaceae	0.1	5	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Loma long long	*Lomandra longifolia var. longifolia*	Spiny-headed Mat-rush	Lomandraceae	2	50	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Hypo radi	*Hypochaeris radicata*	Catsear	Asteraceae	0.3	10	Introduced			Not Listed	Not Listed
Hydr laxi	*Hydrocotyle laxiflora*	Stinking Pennywort	Apiaceae	0.1	10	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Aspe conf	*Asperula conferta*	Common Woodruff	Rubiaceae	0.1	1	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Cirs vulg	*Cirsium vulgare*	Spear Thistle	Asteraceae	0.1	1	Introduced			Not Listed	Not Listed
Verb inco	*Verbena incompta*		Verbenaceae	0.2	1	Introduced			Not Listed	Not Listed
Viol odor	*Viola odorata*	Sweet Violet	Violaceae	0.1	1	Introduced			Not Listed	Not Listed
Phal aqua	*Phalaris aquatica*	Phalaris	Poaceae	0.5	100	Introduced			Not Listed	Not Listed
Briz mino	*Briza minor*	Shivery Grass	Poaceae	0.1	5	Introduced			Not Listed	Not Listed
Cype erag	*Cyperus eragrostis*	Umbrella Sedge	Cyperaceae	0.1	5	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
Rubu frut	*Rubus fruticosus*	Blackberry complex	Rosaceae	0.1	2	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
Dich micr	*Dichelachne micrantha*	Shorthair Plumegrass	Poaceae	2	500	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Micr stip	*Microlaena stipoides*	Weeping Grass	Poaceae	2	500	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
pani effu	*Panicum effusum*	Hairy Panic	Poaceae	0.1	100	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
aust scab	*Austrostipa scabra*	Speargrass	Poaceae	1	150	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
euch spha	*Euchiton sphaericus*	Star Cudweed	Asteraceae	0.1	1	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
hype gram	*Hypericum gramineum*	Small St John's Wort	Clusiaceae	0.1	1	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Euca brid	*Eucalyptus bridgesiana*	Apple Box	Myrtaceae	2	3	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
Euca rubi	*Eucalyptus rubida*	Candlebark	Myrtaceae	15	10	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
Euca blak	*Eucalyptus blakelyi*	Blakely's Red Gum	Myrtaceae	15	15	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
Euca macr	*Eucalyptus macrorhyncha*	Red Stringybark	Myrtaceae	5	10	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
Acae agni	*Acaena agnipila*	Hairy Sheep's Burr	Rosaceae	0.1	10	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Acae echi	*Acaena echinata*	Sheep's Burr	Rosaceae	0.1	1	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Elym scab	*Elymus scaber*	Wheatgrass, Common Wheatgrass	Poaceae	5	500	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed

BAM Site Field Survey								
Project:	Canyonleigh_ Road Upgrade	Plot Identifier	CTR_002	Pic 20x20	10x50	Pic 20x50	10x100	
Survey date:	13/08/2025		Compass Orientation (head of 20x20 plot)				72	
Recorders	JB + JC		PCT:	3373				
GPS Easting	772290.3515	GPS Northing	6162158.474		Datum		Zone	
Landform			**Soils**			**Drainage & Slope**		
Morphology			Soil Texture			Slope	1	
LandF Element			Soil Colour	Dark		Aspect	E	
LandF Pattern			Soil Depth	Kurosols (KU)		Drainage	Drainage ditches next to road	
Microrelief			Geology	Pyroclastic rock		Watercourses		

Plot Disturbance			
	Severity	Age	Observational Evidence
Clearing	1	NR	Road verge has been managed
Cultivation	0		
Soil erosion	2	R	Erosion from the creation and use of the road
Firewood	1	NR	Logs throughout plot
Grazing	0		No livestock
Fire Damage	0		
Storm Damage	0		
Weediness	2	R	Some introduced and high threat weeds
Other	0		

Severity: 0 = no evidence, 1=light, 2=moderate, 3=severe Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

Additional information
Current land use
Road verge
Age class of trees (DBH range) , Condition of Vegetation, Hollows
Young (<5-29). No hollows
Disturbances (i.e. fire, grazing,ferals, clearing, logging, soil degradation, pollution, weeds, dieback)
Significant and threatened species and communities (Note pop. size/area, structure, repro status, habit, habitat, threats, photos)
Dominant Species outside Plot

FUNCTION

Function attributes for	CTR_002
BAM Attribute (20x20m plot)	
Stratum	Sum
Tree (TG)	1
Shrub (SG)	1
Forb (FG)	5
Grass & grasslike (GG)	6
Fern (EG)	0
Other (OG)	0
TOTAL	13
BAM Attribute (20x20m plot)	
Stratum	Sum
Tree (TG)	10
Shrub (SG)	1
Forb (FG)	1.7
Grass & grasslike (GG)	60
Fern (EG)	0
Other (OG)	0
TOTAL Native	72.7
TOTAL 'HTE'	1.3

Count of Native Richness

Count of cover abundance (native vascular plants)

BAM Attribute (20 x 50m plot) Tree Stem Counts			
DBH (cm)	Euc	Non Euc	Hollows
>80			
50-79			
30-49			
20-29		3	
10-19			
5-9		1	
<5		18	N/A
Length of logs (m)		6.5	

0.1%=63x63cm
0.5%=1.4x1.4m
1%=2×2m
5%=4×5m
25%=10×10m

BAM Attributes (1 x 1m Plots)				
	Tape length	% cover	Average %	Photos
Litter Cover	5m	5%	13.0%	
	15m	10%		
	25m	20%		
	35m	20%		
	45m	10%		
Bare ground cover	5m	1%	3.4%	
	15m	5%		
	25m	1%		
	35m	5%		
	45m	5%		
Cryptogam cover	5m	0%	0.0%	
	15m	0%		
	25m	0%		
	35m	0%		
	45m	0%		
Rock Cover	5m	1%	0.2%	
	15m	0%		
	25m	0%		
	35m	0%		
	45m	0%		

COMPOSITION & STRUCTURE

Species recorded for		CTR_002								
Abbreviation	Scientific Name	Common Name	Family	% Cover	Abundance	Exotic	Growth Form	High Threat?	EPBC Status	BCA Status
Anth odor	*Anthoxanthum odoratum*	Sweet Vernal Grass	Poaceae	0.5	50	Introduced			Not Listed	Not Listed
Dact glom	*Dactylis glomerata*	Cocksfoot	Poaceae	5	1000	Introduced			Not Listed	Not Listed
Rubu frut	*Rubus fruticosus*	Blackberry complex	Rosaceae	0.5	5	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
Phal aqua	*Phalaris aquatica*	Phalaris	Poaceae	1	500	Introduced			Not Listed	Not Listed
Both macr	*Bothriochloa macra*	Red Grass	Poaceae	10	2000	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Them tria	*Themeda triandra*		Poaceae	10	2000	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Pasp dila	*Paspalum dilatatum*	Paspalum	Poaceae	0.1	100	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
Junc fili	*Juncus filicaulis*		Juncaceae	5	1000	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Plan lanc	*Plantago lanceolata*	Lamb's Tongues	Plantaginaceae	1	100	Introduced			Not Listed	Not Listed
Cirs vulg	*Cirsium vulgare*	Spear Thistle	Asteraceae	0.2	10	Introduced			Not Listed	Not Listed
Cart lana	*Carthamus lanatus*	Saffron Thistle	Asteraceae	0.2	10	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
Acae ovin	*Acaena ovina*	Acaena	Rosaceae	0.5	50	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Acae echi	*Acaena echinata*	Sheep's Burr	Rosaceae	0.5	50	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Acac parr	*Acacia parramattensis*	Parramatta Wattle	Fabaceae (Mimosoideae)	10	10	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
Euch spha	*Euchiton sphaericus*	Star Cudweed	Asteraceae	0.5	10	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Cype erag	*Cyperus eragrostis*	Umbrella Sedge	Cyperaceae	0.5	20	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
Briz maxi	*Briza maxima*	Quaking Grass	Poaceae	1	50	Introduced			Not Listed	Not Listed
Pani effu	*Panicum effusum*	Hairy Panic	Poaceae	10	200	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Trif repe	*Trifolium repens*	White Clover	Fabaceae (Faboideae)	0.1	10	Introduced			Not Listed	Not Listed
Gera sola	*Geranium solanderi*	Native Geranium	Geraniaceae	0.1	5	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Halo hete	*Haloragis heterophylla*	Variable Raspwort	Haloragaceae	0.1	5	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Rume cris	*Rumex crispus*	Curled Dock	Polygonaceae	0.1	1	Introduced			Not Listed	Not Listed
poa sieb	*Poa siberiana*	Snowgrass	Poaceae	20	2000	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Cyno dact	*Cynodon dactylon*	Common Couch	Poaceae	5	200	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Pime curv	*Pimelea curviflora*	Rice Flower	Thymelaeaceae	1	15	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed

BAM Site Field Survey

Project:	Canyonleigh_ Road Upgrade	Plot Identifier	CTR_003	Pic 20x20	10x50	Pic 20x50	10x100	
Survey date:	13/08/2025		Compass Orientation (head of 20x20 plot)				78	
Recorders	JB + JC		PCT:	3373				
GPS Easting	772635.7981	GPS Northing	6162140.547		Datum		Zone	

Landform		Soils		Drainage & Slope	
Morphology		Soil Texture		Slope	1
LandF Element		Soil Colour	Dark	Aspect	E
LandF Pattern		Soil Depth	Kurosols (KU)	Drainage	Drainage ditches next to road
Microrelief		Geology	Pyroclastic rock	Watercourses	

Plot Disturbance

	Severity	Age	Observational Evidence
Clearing	1	NR	Road verge has been managed
Cultivation	0		
Soil erosion	2	R	Erosion from the creation and use of the road
Firewood	1	NR	Logs throughout plot
Grazing	0		No livestock
Fire Damage	0		
Storm Damage	0		
Weediness	1	R	Some introduced and high threat weeds
Other	0		

Severity: 0 = no evidence, 1=light, 2=moderate, 3=severe Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

Additional information

Current land use

Road verge

Age class of trees (DBH range) , Condition of Vegetation, Hollows

Young (<5-29). No hollows

Disturbances (i.e. fire, grazing,ferals, clearing, logging, soil degradation, pollution, weeds, dieback)

Ditches dug into the verge recently

Significant and threatened species and communities (Note pop. size/area, structure, repro status, habit, habitat, threats, photos)

Dominant Species outside Plot

FUNCTION

Function attributes for CTR_003

BAM Attribute (20x20m plot)

	Stratum	Sum
Count of Native Richness	Tree (TG)	3
	Shrub (SG)	2
	Forb (FG)	6
	Grass & grasslike (GG)	7
	Fern (EG)	0
	Other (OG)	1
	TOTAL	19

BAM Attribute (20x20m plot)

	Stratum	Sum
Count of cover abundance (native vascular plants)	Tree (TG)	17
	Shrub (SG)	1.2
	Forb (FG)	3.3
	Grass & grasslike (GG)	50.2
	Fern (EG)	0
	Other (OG)	5
	TOTAL Native	76.7
	TOTAL 'HTE'	16.2

BAM Attribute (20 x 50m plot) Tree Stem Counts

DBH (cm)	Euc	Non Euc	Hollows
>80	1		
50-79	2		
30-49	3		
20-29	15		
10-19	18		
5-9	40		
<5	19		N/A
Length of logs (m)		7	

0.1%=63x63cm

0.5%=1.4x1.4m

1%=2×2m 98

5%=4×5m

25%=10×10m

BAM Attributes (1 x 1m Plots)

	Tape length	% cover	Average %	Photos
Litter Cover	5m	20%	14.0%	
	15m	15%		
	25m	25%		
	35m	5%		
	45m	5%		
Bare ground cover	5m	0%	1.2%	
	15m	0%		
	25m	0%		
	35m	1%		
	45m	5%		
Cryptogam cover	5m	0%	0.0%	
	15m	0%		
	25m	0%		
	35m	0%		
	45m	0%		
Rock Cover	5m	1%	14.4%	
	15m	0%		
	25m	1%		
	35m	40%		
	45m	30%		

COMPOSITION & STRUCTURE

Species recorded for CTR_003

Abbreviation	Scientific Name	Common Name	Family	% Cover	Abundance	Exotic	Growth Form	High Threat?	EPBC Status	BCA Status
Micr stip	*Microlaena stipoides*	Weeping Grass	Poaceae	20	1000	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Romu rose	*Romulea rosea*	Onion Grass	Iridaceae	10	150	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
Desm vari	*Desmodium varians*		Fabaceae (Faboideae)	5	75	Alive in NSW, Native	Other (OG)		Not Listed	Not Listed
Hype perf	*Hypericum perforatum*	St. Johns Wort	Clusiaceae	1	5	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
Poa sieb	*Poa sieberiana*	Snowgrass	Poaceae	10	500	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Anth odor	*Anthoxanthum odoratum*	Sweet Vernal Grass	Poaceae	5	150	Introduced			Not Listed	Not Listed
Both macr	*Bothriochloa macra*	Red Grass	Poaceae	5	80	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Them tria	*Themeda triandra*		Poaceae	10	150	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Acac parr	*Acacia parramattensis*	Parramatta Wattle	Fabaceae (Mimosoideae)	5	10	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
Erag curv	*Eragrostis curvula*	African Lovegrass	Poaceae	5	100	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
Acae echi	*Acaena echinata*	Sheep's Burr	Rosaceae	1	100	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Cony suma	*Conyza sumatrensis*	Tall fleabane	Asteraceae	1	100	Introduced			Not Listed	Not Listed
Dact glom	*Dactylis glomerata*	Cocksfoot	Poaceae	5	50	Introduced			Not Listed	Not Listed
Dich repe	*Dichondra repens*	Kidney Weed	Convolvulaceae	0.2	5	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Seta pumi	*Setaria pumila*	Pale Pigeon Grass	Poaceae	0.1	1	Introduced			Not Listed	Not Listed
Pasp dila	*Paspalum dilatatum*	Paspalum	Poaceae	0.2	5	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
Cass sift	*Cassinia sifton*		Asteraceae	1	2	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
Euca euge	*Eucalyptus eugenioides*	Thin-leaved Stringybark	Myrtaceae	2	10	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
Euca macr	*Eucalyptus macrorhyncha*	Red Stringybark	Myrtaceae	10	80	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
Plan lanc	*Plantago lanceolata*	Lamb's Tongues	Plantaginaceae	1	20	Introduced			Not Listed	Not Listed
Euch invo	*Euchiton involucratus*	Star Cudweed	Asteraceae	1	20	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
dich crin	*Dichelachne crinita*	Longhair Plumegrass	Poaceae	0.1	5	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
euch spha	*Euchiton sphaericus*	Star Cudweed	Asteraceae	0.5	10	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
hype gram	*Hypericum gramineum*	Small St John's Wort	Clusiaceae	0.5	10	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Halo hete	*Haloragis heterophylla*	Variable Raspwort	Haloragaceae	0.1	1	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
care inve	*Carex inversa*	Knob Sedge	Cyperaceae	0.1	1	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Cyno dact	*Cynodon dactylon*	Common Couch	Poaceae	5	100	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Pime curv	*Pimelea curviflora*	Rice Flower	Thymelaeaceae	0.2	5	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed

BAM Site Field Survey

Project:	Canyonleigh_ Road Upgrade	Plot Identifier	CTR_004	Pic 20x20	10x50	Pic 20x50	10x100	
Survey date:	13/08/2025		Compass Orientation (head of 20x20 plot)				50	
Recorders	JB + JC		PCT:	3373				
GPS Easting	772920.7468	GPS Northing	6162229.715		Datum		Zone	

Landform		Soils		Drainage & Slope	
Morphology		Soil Texture	Soft	Slope	1
LandF Element		Soil Colour	Brown	Aspect	E
LandF Pattern		Soil Depth	Kurosols - natric (KUn)	Drainage	Drainage channels
Microrelief		Geology	Pyroclastic rock	Watercourses	

Plot Disturbance

	Severity	Age	Observational Evidence
Clearing	2	R	Drainage gullies cleared and dug
Cultivation	0		
Soil erosion	3	R	Drainage gullies cleared and dug
Firewood	1	R	Logs and branches from clearing
Grazing	0		No livestock
Fire Damage	0		
Storm Damage	0		
Weediness	0		
Other			

Severity: 0 = no evidence, 1=light, 2=moderate, 3=severe Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

Additional information

Current land use

Highly disturbed woodland patch

Age class of trees (DBH range) , Condition of Vegetation, Hollows

Young (<5-9) four trees over 80. No hollows, low condtion

Disturbances (i.e. fire, grazing,ferals, clearing, logging, soil degradation, pollution, weeds, dieback)

Several drainage gullies have beend dug into the road verge

Significant and threatened species and communities (Note pop. size/area, structure, repro status, habit, habitat, threats, photos)

Dominant Species outside Plot

FUNCTION

Function attributes for CTR_004

BAM Attribute (20x20m plot)

	Stratum	Sum
Count of Native Richness	Tree (TG)	3
	Shrub (SG)	2
	Forb (FG)	7
	Grass & grasslike (GG)	6
	Fern (EG)	0
	Other (OG)	1
	TOTAL	19

BAM Attribute (20x20m plot)

	Stratum	Sum
Count of cover abundance (native vascular plants)	Tree (TG)	22
	Shrub (SG)	0.2
	Forb (FG)	2.6
	Grass & grasslike (GG)	34
	Fern (EG)	0
	Other (OG)	0.1
	TOTAL Native	58.9
	TOTAL 'HTE'	3.2

BAM Attributes (1 x 1m Plots)

	Tape length	% cover	Average %	Photos
Litter Cover	5m	10%	5.4%	
	15m	10%		
	25m	5%		
	35m	1%		
	45m	1%		
Bare ground cover	5m	1%	5.2%	
	15m	0%		
	25m	20%		
	35m	5%		
	45m	0%		
Cryptogam cover	5m	5%	1.0%	
	15m	0%		
	25m	0%		
	35m	0%		
	45m	0%		
Rock Cover	5m	1%	26.4%	
	15m	0%		
	25m	1%		
	35m	50%		
	45m	80%		

BAM Attribute (20 x 50m plot) Tree Stem Counts

DBH (cm)	Euc	Non Euc	Hollows
>80	4		
50-79			
30-49			
20-29	3		
10-19	3	4	
5-9	3	11	
<5	6	4	N/A
Length of logs (m)		3	

0.1%=63x63cm
0.5%=1.4x1.4m
1%=2×2m
5%=4×5m
25%=10×10m

COMPOSITION & STRUCTURE

Species recorded for CTR_004

Abbreviation	Scientific Name	Common Name	Family	% Cover	Abundance	Exotic	Growth Form	High Threat?	EPBC Status	BCA Status
Acae echi	*Acaena echinata*	Sheep's Burr	Rosaceae	2	100	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Plan lanc	*Plantago lanceolata*	Lamb's Tongues	Plantaginaceae	2	100	Introduced			Not Listed	Not Listed
Plan coro	*Plantago coronopus*	Buck's-horn Plaintain	Plantaginaceae	2	100	Introduced			Not Listed	Not Listed
Hype perf	*Hypericum perforatum*	St. Johns Wort	Clusiaceae	0.2	10	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
Trif repe	*Trifolium repens*	White Clover	Fabaceae (Faboideae)	1	100	Introduced			Not Listed	Not Listed
Gera sola	*Geranium solanderi*	Native Geranium	Geraniaceae	0.1	10	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Them tria	*Themeda triandra*		Poaceae	20	1000	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
euch spha	*Euchiton sphaericus*	Star Cudweed	Asteraceae	0.1	5	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
hype gram	*Hypericum gramineum*	Small St John's Wort	Clusiaceae	0.1	5	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Halo hete	*Haloragis heterophylla*	Variable Raspwort	Haloragaceae	0.1	2	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Dact glom	*Dactylis glomerata*	Cocksfoot	Poaceae	10	1000	Introduced			Not Listed	Not Listed
Erag curv	*Eragrostis curvula*	African Lovegrass	Poaceae	2	200	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
Pani effu	*Panicum effusum*	Hairy Panic	Poaceae	1	100	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Aust scab	*Austrostipa scabra*	Speargrass	Poaceae	1	100	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Spor creb	*Sporobolus creber*	Slender Rat's Tail Grass	Poaceae	1	100	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Dich crin	*Dichelachne crinita*	Longhair Plumegrass	Poaceae	1	100	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Acac parr	*Acacia parramattensis*	Parramatta Wattle	Fabaceae (Mimosoideae)	2	20	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
Cirs vulg	*Cirsium vulgare*	Spear Thistle	Asteraceae	0.5	4	Introduced			Not Listed	Not Listed
Rubu frut	*Rubus fruticosus*	Blackberry complex	Rosaceae	1	2	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
Dich repe	*Dichondra repens*	Kidney Weed	Convolvulaceae	0.1	4	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Poa sieb	*Poa sieberiana*	Snowgrass	Poaceae	10	500	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Anth odor	*Anthoxanthum odoratum*	Sweet Vernal Grass	Poaceae	1	1	Introduced			Not Listed	Not Listed
Chry apic	*Chrysocephalum apiculatum*	Common Everlasting	Asteraceae	0.1	5	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Leuc micr	*Leucopogon microphyllus*		Ericaceae	0.1	5	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
Clem glyc	*Clematis glycinoides*	Headache Vine	Ranunculaceae	0.1	1	Alive in NSW, Native	Other (OG)		Not Listed	Not Listed
Euca dive	*Eucalyptus dives*	Broad-leaved Peppermint	Myrtaceae	15	10	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
Pime curv	*Pimelea curviflora*	Rice Flower	Thymelaeaceae	0.1	1	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
Euca ampl	*Eucalyptus amplifolia*	Cabbage Gum	Myrtaceae	5	5	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed

BAM Site Field Survey								
Project:	Canyonleigh_ Road Upgr	Plot Identifier	CTR_005	Pic 20x20	10x50	Pic 20x50	10x100	
Survey date:	13/08/2025		Compass Orientation (head of 20x20 plot)				39	
Recorders	JB + JC		PCT:	3373				
GPS Easting	773649.9432	GPS Northing	6162673.6		Datum		Zone	
Landform			**Soils**			**Drainage & Slope**		
Morphology			Soil Texture	Soft		Slope	1	
LandF Element			Soil Colour	Brown		Aspect	E	
LandF Pattern			Soil Depth	Kurosols - natric (KUn)		Drainage	Drainage gullies	
Microrelief			Geology	Pyroclastic rock		Watercourses		

Plot Disturbance			
	Severity	Age	Observational Evidence
Clearing	1	NR	Verge managed with road culverts
Cultivation			
Soil erosion	1	NR	Erosion from the creation and use of the road
Firewood			
Grazing			
Fire Damage			
Storm Damage			
Weediness	1	NR	Invasives present throughout
Other			

Severity: 0 = no evidence, 1=light, 2=moderate, 3=severe Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

Additional information	
Current land use	
Grassy road verge	
Age class of trees (DBH range) , Condition of Vegetation, Hollows	
No trees	
Disturbances (i.e. fire, grazing,ferals, clearing, logging, soil degradation, pollution, weeds, dieback)	
Drainage culvert cut into verge	
Significant and threatened species and communities (Note pop. size/area, structure, repro status, habit, habitat, threats, photos)	
Dominant Species outside Plot	E. meliodora present to the north

FUNCTION

Function attributes for	CTR_005
BAM Attribute (20x20m plot)	
Stratum	Sum
Tree (TG)	0
Shrub (SG)	1
Forb (FG)	2
Grass & grasslike (GG)	5
Fern (EG)	0
Other (OG)	0
TOTAL	8
BAM Attribute (20x20m plot)	
Stratum	Sum
Tree (TG)	0
Shrub (SG)	0.1
Forb (FG)	0.2
Grass & grasslike (GG)	54
Fern (EG)	0
Other (OG)	0
TOTAL Native	54.3
TOTAL 'HTE'	27

Count of Native Richness

Count of cover abundance (native vascular plants)

BAM Attribute (20 x 50m plot) Tree Stem Counts			
DBH (cm)	Euc	Non Euc	Hollows
>80			
50-79			
30-49			
20-29			
10-19			
5-9			
<5			N/A
Length of logs (m)			

0.1%=63x63cm
0.5%=1.4x1.4m
1%=2×2m
5%=4×5m
25%=10×10m

BAM Attributes (1 x 1m Plots)				
	Tape length	% cover	Average %	Photos
Litter Cover	5m	5%		
	15m	5%		
	25m	10%	7.0%	
	35m	5%		
	45m	10%		
Bare ground cover	5m	10%		
	15m	15%		
	25m	10%	7.0%	
	35m	0%		
	45m	0%		
Cryptogam cover	5m	0%		
	15m	0%		
	25m	0%	0.0%	
	35m	0%		
	45m	0%		
Rock Cover	5m	0%		
	15m	0%		
	25m	0%	0.0%	
	35m	0%		
	45m	0%		

COMPOSITION & STRUCTURE

Species recorded for	CTR_005									
Abbreviation	Scientific Name	Common Name	Family	% Cover	Abundance	Exotic	Growth Form	High Threat?	EPBC Status	BCA Status
Hype perf	*Hypericum perforatum*	St. Johns Wort	Clusiaceae	1	10	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
Them tria	*Themeda triandra*		Poaceae	30	2000	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Cyno dact	*Cynodon dactylon*	Common Couch	Poaceae	20	1000	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Rubu frut	*Rubus fruticosus*	Blackberry complex	Rosaceae	5	15	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
Junc aust	*Juncus australis*	Rush	Juncaceae	2	50	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Dact glom	*Dactylis glomerata*	Cocksfoot	Poaceae	20	1000	Introduced			Not Listed	Not Listed
Cart lana	*Carthamus lanatus*	Saffron Thistle	Asteraceae	1	20	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
Pime glau	*Pimelea glauca*	Smooth Rice-flower	Thymelaeaceae	0.1	5	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
Hypo radi	*Hypochaeris radicata*	Catsear	Asteraceae	0.5	50	Introduced			Not Listed	Not Listed
Plan lanc	*Plantago lanceolata*	Lamb's Tongues	Plantaginaceae	0.5	50	Introduced			Not Listed	Not Listed
Gera sola	*Geranium solanderi*	Native Geranium	Geraniaceae	0.1	1	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Dich crin	*Dichelachne crinita*	Longhair Plumegrass	Poaceae	1	100	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Halo hete	*Haloragis heterophylla*	Variable Raspwort	Haloragaceae	0.1	5	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Aust scab	*Austrostipa scabra*	Speargrass	Poaceae	1	100	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Cype cong	*Cyperus congestus*		Cyperaceae	1	10	Introduced			Not Listed	Not Listed
Erag curv	*Eragrostis curvula*	African Lovegrass	Poaceae	10	500	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
Pasp dila	*Paspalum dilatatum*	Paspalum	Poaceae	10	500	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed

BAM Site Field Survey

Project:	Canyonleigh_ Road Upgrade	Plot Identifier	CTR_006	Pic 20x20	Y	Pic 20x50	Y	
Survey date:	14/08/2025		Compass Orientation (head of 20x20 plot)				45 (N-NE)	
Recorders	JC + NS		PCT:	3347				
GPS Easting	775261.004	GPS Northing	6163911.515		Datum		Zone	

Landform		Soils		Drainage & Slope	
Morphology		Soil Texture		Slope	1
LandF Element		Soil Colour		Aspect	N
LandF Pattern		Soil Depth	Sodosols (SO)	Drainage	Yes
Microrelief		Geology	Clastic sediment	Watercourses	Culvert and farm dam

Plot Disturbance

	Severity	Age	Observational Evidence
Clearing	3	O	Cleared fro agricultrual use
Cultivation			
Soil erosion	2	R	Evidence of pugging and erosion from road
Firewood			
Grazing	1	R	Patches of short swards/ cow pats
Fire Damage			
Storm Damage			
Weediness	2	R	Exotic species present
Other			

Severity: 0 = no evidence, 1=light, 2=moderate, 3=severe Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

Additional information

Current land use

Livestock grazing

Age class of trees (DBH range) , Condition of Vegetation, Hollows

Disturbances (i.e. fire, grazing,ferals, clearing, logging, soil degradation, pollution, weeds, dieback)

Grazing, weeds, pollution from road

Significant and threatened species and communities (Note pop. size/area, structure, repro status, habit, habitat, threats, photos)

Dominant Species outside Plot	Tufted grass and Juncus

FUNCTION

Function attributes for CTR_006

BAM Attribute (20x20m plot)

	Stratum	Sum
Count of Native Richness	Tree (TG)	0
	Shrub (SG)	0
	Forb (FG)	5
	Grass & grasslike (GG)	10
	Fern (EG)	0
	Other (OG)	0
	TOTAL	15

BAM Attribute (20x20m plot)

	Stratum	Sum
Count of cover abundance (native vascular plants)	Tree (TG)	0
	Shrub (SG)	0
	Forb (FG)	1.3
	Grass & grasslike (GG)	85.1
	Fern (EG)	0
	Other (OG)	0
	TOTAL Native	86.4
	TOTAL 'HTE'	2.3

BAM Attributes (1 x 1m Plots)

	Tape length	% cover	Average %	Photos
Litter Cover	5m	5%	6.0%	
	15m	5%		
	25m	5%		
	35m	10%		
	45m	5%		
Bare ground cover	5m	0%	0.2%	
	15m	0%		
	25m	0%		
	35m	1%		
	45m	0%		
Cryptogam cover	5m	0%	0.0%	
	15m	0%		
	25m	0%		
	35m	0%		
	45m	0%		
Rock Cover	5m	0%	0.0%	
	15m	0%		
	25m	0%		
	35m	0%		
	45m	0%		

BAM Attribute (20 x 50m plot) Tree Stem Counts

DBH (cm)	Euc	Non Euc	Hollows
>80			
50-79			
30-49			
20-29			
10-19			
5-9			
<5			N/A
Length of logs (m)			

0.1%=63x63cm
0.5%=1.4x1.4m
1%=2×2m
5%=4×5m
25%=10×10m

COMPOSITION & STRUCTURE

Species recorded for CTR_006

Abbreviation	Scientific Name	Common Name	Family	% Cover	Abundance	Exotic	Growth Form	High Threat?	EPBC Status	BCA Status
Poa sieb	*Poa sieberiana*	Snowgrass	Poaceae	25	1000	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
hype gram	*Hypericum gramineum*	Small St John's Wort	Clusiaceae	0.5	15	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Junc aust	*Juncus australis*	Rush	Juncaceae	20	500	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Junc subs	*Juncus subsecundus*	Finger Rush	Juncaceae	20	500	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Rosa rubi	*Rosa rubiginosa*	Sweet Briar	Rosaceae	0.1	1	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
Cirs vulg	*Cirsium vulgare*	Spear Thistle	Asteraceae	0.5	10	Introduced			Not Listed	Not Listed
Care appr	*Carex appressa*	Tall Sedge	Cyperaceae	15	100	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Gera sola	*Geranium solanderi*	Native Geranium	Geraniaceae	0.1	5	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Pasp dila	*Paspalum dilatatum*	Paspalum	Poaceae	1	10	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
Cyno dact	*Cynodon dactylon*	Common Couch	Poaceae	0.5	50	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Phal aqua	*Phalaris aquatica*	Phalaris	Poaceae	0.2	20	Introduced			Not Listed	Not Listed
Pers hydr	*Persicaria hydropiper*	Water Pepper	Polygonaceae	0.1	10	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Ryti race	*Rytidosperma racemosum*	Wallaby Grass	Poaceae	1	10	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Brom dian	*Bromus diandrus*	Great Brome	Poaceae	0.2	20	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
Rubu frut	*Rubus fruticosus*	Blackberry complex	Rosaceae	1	2	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
Trif subt	*Trifolium subterraneum*	Subterranean Clover	Fabaceae (Faboideae)	0.5	15	Introduced			Not Listed	Not Listed
Verb bona	*Verbena bonariensis*	Purpletop	Verbenaceae	0.1	5	Introduced			Not Listed	Not Listed
Elym scab	*Elymus scaber*	Wheatgrass, Common Wheatgrass	Poaceae	0.1	10	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Oxal corn	*Oxalis corniculata*	Creeping Oxalis	Oxalidaceae	0.1	1	Introduced			Not Listed	Not Listed
Camp clav	*Campylopus clavatus*		Leucobryaceae	0.1	1	Alive in NSW, Native			Not Listed	Not Listed
Poa labi labi	*Poa labillardierei var. labillardierei*	Tussock	Poaceae	1	100	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Micr stip	*Microlaena stipoides*	Weeping Grass	Poaceae	2	35	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Dich repe	*Dichondra repens*	Kidney Weed	Convolvulaceae	0.5	50	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Hydr laxi	*Hydrocotyle laxiflora*	Stinking Pennywort	Apiaceae	0.1	2	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Loma long	*Lomandra longifolia*	Spiny-headed Mat-rush	Lomandraceae	0.5	100	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed

BAM Site Field Survey								
Project:	Canyonleigh_Road Upgrade	Plot Identifier	CTR_007	Pic 20x20	Y	Pic 20x50	Y	
Survey date:	14/08/2025		Compass Orientation (head of 20x20 plot)				38	
Recorders	JC + NS		PCT:	3746				
GPS Easting	775453.0496	GPS Northing	6164128.013		Datum		Zone	
Landform			**Soils**			**Drainage & Slope**		
Morphology			Soil Texture	Soft		Slope	2	
LandF Element			Soil Colour	Brown		Aspect	NE	
LandF Pattern			Soil Depth	Sodosols		Drainage	Yes	
Microrelief			Geology	Saporlite		Watercourses	Culvert	

Plot Disturbance			
	Severity	Age	Observational Evidence
Clearing	2	R	Cut trees stumps and new tree growth
Cultivation			
Soil erosion	2	R	Erosion from road
Firewood	2	R	Some branches/logs
Grazing	1	R	Some pugging and droppings
Fire Damage			
Storm Damage	1	R	Fallen branches
Weediness	1	R	Several exotics
Other			

Severity: 0 = no evidence, 1=light, 2=moderate, 3=severe Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

Additional information	
Current land use	
Road verge/ cleared for power lines overhead	
Age class of trees (DBH range) , Condition of Vegetation, Hollows	
Young trees (saplings) - low condition, moderatley disturbed. No hollows	
Disturbances (i.e. fire, grazing,ferals, clearing, logging, soil degradation, pollution, weeds, dieback)	
Clearing, feral pigs	
Significant and threatened species and communities (Note pop. size/area, structure, repro status, habit, habitat, threats, photos)	
Dominant Species outside Plot	Eucalyptus rossi, E. pauliflora (Woodland adjacent)

FUNCTION

Function attributes for	CTR_007
BAM Attribute (20x20m plot)	
Stratum	Sum
Tree (TG)	4
Shrub (SG)	6
Forb (FG)	4
Grass & grasslike (GG)	6
Fern (EG)	1
Other (OG)	0
TOTAL	21
BAM Attribute (20x20m plot)	
Stratum	Sum
Tree (TG)	2.7
Shrub (SG)	8.6
Forb (FG)	3.1
Grass & grasslike (GG)	66
Fern (EG)	1
Other (OG)	0
TOTAL Native	81.4
TOTAL 'HTE'	1

Count of Native Richness

Count of cover abundance (native vascular plants)

BAM Attribute (20 x 50m plot) Tree Stem Counts			
DBH (cm)	Euc	Non Euc	Hollows
>80			
50-79			
30-49			
20-29			
10-19			
5-9	2	3	
<5			N/A
Length of logs (m)		5	

0.1%=63x63cm
0.5%=1.4x1.4m
1%=2×2m
5%=4×5m
25%=10×10m

BAM Attributes (1 x 1m Plots)				
	Tape length	% cover	Average %	Photos
Litter Cover	5m	30%	30.0%	
	15m	15%		
	25m	35%		
	35m	30%		
	45m	40%		
Bare ground cover	5m	5%	7.0%	
	15m	10%		
	25m	5%		
	35m	10%		
	45m	5%		
Cryptogam cover	5m	10%	3.0%	
	15m	5%		
	25m	0%		
	35m	0%		
	45m	0%		
Rock Cover	5m	0%	0.0%	
	15m	0%		
	25m	0%		
	35m	0%		
	45m	0%		

COMPOSITION & STRUCTURE

Species recorded for	CTR_007									
Abbreviation	Scientific Name	Common Name	Family	% Cover	Abundance	Exotic	Growth Form	High Threat?	EPBC Status	BCA Status
Cass sift	*Cassinia sifton*		Asteraceae	5	100	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
Cass laev	*Cassinia laevis*	Cough Bush	Asteraceae	1	15	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
Cass acul	*Cassinia aculeata*	Dolly Bush	Asteraceae	0.1	5	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
Them tria	*Themeda triandra*		Poaceae	20	2000	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Euca ross	*Eucalyptus rossii*	Inland Scribbly Gum	Myrtaceae	1	2	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
Brac deci	*Brachycome decipiens*	Field Daisy	Asteraceae	1	12	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Hypo radi	*Hypochaeris radicata*	Catsear	Asteraceae	1	20	Introduced			Not Listed	Not Listed
Pime curv	*Pimelea curviflora*	Rice Flower	Thymelaeaceae	0.5	1	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
Acac parr	*Acacia parramattensis*	Parramatta Wattle	Fabaceae (Mimosoideae)	1	9	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
Hake seri	*Hakea sericea*	Needlebush	Proteaceae	1	2	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
Sonc aspe	*Sonchus asper*	Prickly Sowthistle	Asteraceae	0.5	5	Introduced			Not Listed	Not Listed
Cirs vulg	*Cirsium vulgare*	Spear Thistle	Asteraceae	1	25	Introduced			Not Listed	Not Listed
Hype gram	*Hypericum gramineum*	Small St John's Wort	Clusiaceae	1	30	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Loma long	*Lomandra longifolia*	Spiny-headed Mat-rush	Lomandraceae	10	500	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Gono tetr	*Gonocarpus tetragynus*	Poverty Raspwort	Haloragaceae	1	20	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Micr stip	*Microlaena stipoides*	Weeping Grass	Poaceae	20	1000	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Chei sieb	*Cheilanthes sieberi*	Rock Fern	Pteridaceae	1	5	Alive in NSW, Native	Fern (EG)		Not Listed	Not Listed
Cype erag	*Cyperus eragrostis*	Umbrella Sedge	Cyperaceae	1	30	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
Care appr	*Carex appressa*	Tall Sedge	Cyperaceae	1	50	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Briz maxi	*Briza maxima*	Quaking Grass	Poaceae	1	100	Introduced			Not Listed	Not Listed
poa sieb	*Poa sieberiana*	Snowgrass	Poaceae	10	750	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
pani effu	*Panicum effusum*	Hairy Panic	Poaceae	5	150	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Euca pauc	*Eucalyptus pauciflora*	White Sally	Myrtaceae	0.5	5	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
Euca rubi	*Eucalyptus rubida*	Candlebark	Myrtaceae	0.2	3	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
Hydr laxi	*Hydrocotyle laxiflora*	Stinking Pennywort	Apiaceae	0.1	12	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Kunz parv	*Kunzea parvifolia*	Violet Kunzea	Myrtaceae	1	10	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed

BAM Site Field Survey								
Project:	Canyonleigh_ Road Upgrade	Plot Identifier	CTR_008	Pic 20x20	10X50	Pic 20x50	10X100	
Survey date:	15/08/2025		Compass Orientation (head of 20x20 plot)				226 (SW)	
Recorders	JC+NS		PCT:	3746				
GPS Easting	776051.2446	GPS Northing	6164503.211		Datum		Zone	
Landform			Soils			Drainage & Slope		
Morphology			Soil Texture	Soft		Slope	0	
LandF Element			Soil Colour	Brown		Aspect	SW	
LandF Pattern			Soil Depth	Sodosols		Drainage	Along road	
Microrelief			Geology	Saporlite		Watercourses	Ditches	

Plot Disturbance			
	Severity	Age	Observational Evidence
Clearing	2	NR	Cleared for overhead transmission line
Cultivation			
Soil erosion	2	R	Erosion from road
Firewood	1	R	Some dead wood
Grazing			
Fire Damage			
Storm Damage			
Weediness	1	R	Exotics present
Other			

Severity: 0 = no evidence, 1=light, 2=moderate, 3=severe Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

Additional information
Current land use
Road verge, overhead transmission line
Age class of trees (DBH range) , Condition of Vegetation, Hollows
No trees - shrubland - moderate
Disturbances (i.e. fire, grazing,ferals, clearing, logging, soil degradation, pollution, weeds, dieback)
Clearing/erosion
Significant and threatened species and communities (Note pop. size/area, structure, repro status, habit, habitat, threats, photos)

Dominant Species outside Plot	Candlebark

FUNCTION

Function attributes for	CTR_008
BAM Attribute (20x20m plot)	
Stratum	Sum
Tree (TG)	3
Shrub (SG)	4
Forb (FG)	3
Grass & grasslike (GG)	9
Fern (EG)	0
Other (OG)	0
TOTAL	19
BAM Attribute (20x20m plot)	
Stratum	Sum
Tree (TG)	3
Shrub (SG)	51.5
Forb (FG)	0.3
Grass & grasslike (GG)	23.3
Fern (EG)	0
Other (OG)	0
TOTAL Native	78.1
TOTAL 'HTE'	1.1

Count of Native Richness

Count of cover abundance (native vascular plants)

BAM Attributes (1 x 1m Plots)				
	Tape length	% cover	Average %	Photos
Litter Cover	5m	30%		
	15m	30%		
	25m	30%	29.0%	
	35m	25%		
	45m	30%		
Bare ground cover	5m	0%		
	15m	5%		
	25m	2%	2.6%	
	35m	5%		
	45m	1%		
Cryptogam cover	5m	0%		
	15m	1%		
	25m	2%	1.8%	
	35m	5%		
	45m	1%		
Rock Cover	5m	0%		
	15m	0%		
	25m	0%	0.0%	
	35m	0%		
	45m	0%		

BAM Attribute (20 x 50m plot) Tree Stem Counts			
DBH (cm)	Euc	Non Euc	Hollows
>80			
50-79			
30-49			
20-29			
10-19			
5-9		2	
<5	5	1	N/A
Length of logs (m)			

0.1%=63x63cm
0.5%=1.4x1.4m
1%=2×2m
5%=4×5m
25%=10×10m

COMPOSITION & STRUCTURE

Species recorded for	CTR_008									
Abbreviation	Scientific Name	Common Name	Family	% Cover	Abundance	Exotic	Growth Form	High Threat?	EPBC Status	BCA Status
Cass sift	*Cassinia sifton*		Asteraceae	30	100	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
Cass laev	*Cassinia laevis*	Cough Bush	Asteraceae	20	50	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
Them tria	*Themeda triandra*		Poaceae	10	500	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
both	*Bothriochloa spp.*	Redgrass, Bluegrass	Poaceae	2	250	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Junc aust	*Juncus australis*	Rush	Juncaceae	2	250	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Junc subs	*Juncus subsecundus*	Finger Rush	Juncaceae	2	250	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Euca rubi	*Eucalyptus rubida*	Candlebark	Myrtaceae	1	10	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
Hypo radi	*Hypochaeris radicata*	Catsear	Asteraceae	0.5	15	Introduced			Not Listed	Not Listed
Acac parr	*Acacia parramattensis*	Parramatta Wattle	Fabaceae (Mimosoideae)	1	10	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
Chry semi	*Chrysocephalum semiamplexicaule*	Common Everlasting	Asteraceae	0.1	10	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Hydr laxi	*Hydrocotyle laxiflora*	Stinking Pennywort	Apiaceae	0.1	5	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Oper aspe	*Opercularia aspera*	Coarse Stinkweed	Rubiaceae	0.1	5	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Erag curv	*Eragrostis curvula*	African Lovegrass	Poaceae	1	50	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
Pani effu	*Panicum effusum*	Hairy Panic	Poaceae	1	50	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Ryti mont	*Rytidosperma monticola*	Mountain Wallaby Grass	Poaceae	0.2	20	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Pasp dila	*Paspalum dilatatum*	Paspalum	Poaceae	0.1	20	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
Lepi limi	*Lepidosperma limicola*		Cyperaceae	0.1	20	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Hake seri	*Hakea sericea*	Needlebush	Proteaceae	1	1	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
Allo litt	*Allocasuarina littoralis*	Black She-Oak	Casuarinaceae	1	1	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
Phal aqua	*Phalaris aquatica*	Phalaris	Poaceae	1	50	Introduced			Not Listed	Not Listed
Aust scab	*Austrostipa scabra*	Speargrass	Poaceae	5	100	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Plan lanc	*Plantago lanceolata*	Lamb's Tongues	Plantaginaceae	1	10	Introduced			Not Listed	Not Listed
Plan coro	*Plantago coronopus*	Buck's-horn Plaintain	Plantaginaceae	1	10	Introduced			Not Listed	Not Listed
Ryti	*Rytidosperma spp.*		Poaceae	1	10	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Kunz parv	*Kunzea parvifolia*	Violet Kunzea	Myrtaceae	0.5	5	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
Dact glom	*Dactylis glomerata*	Cocksfoot	Poaceae	0.5	65	Introduced			Not Listed	Not Listed

BAM Site Field Survey								
Project:	Canyonleigh_Road Upgrade	Plot Identifier	CTR_009	Pic 20x20		Pic 20x50	10x100	
Survey date:	15/08/2025		Compass Orientation (head of 20x20 plot)				60 NE	
Recorders	JC + NS		PCT:	3373				
GPS Easting	776481.4909	GPS Northing	6164638.936		Datum		Zone	
Landform			**Soils**			**Drainage & Slope**		
Morphology			Soil Texture	Soft		Slope	0	
LandF Element			Soil Colour	Brown		Aspect	NE	
LandF Pattern			Soil Depth	Sodosols (SO)		Drainage	Drainage along road	
Microrelief			Geology	Saprolite		Watercourses	Ditches and culvert	

Plot Disturbance			
	Severity	Age	Observational Evidence
Clearing	2	NR	No new growth/ some stumps
Cultivation			
Soil erosion	2	R	Erosion from road
Firewood	1	NR	Some fallend branches/ logs/ dead wood
Grazing			
Fire Damage			
Storm Damage	1	R	Some bramble and thistles
Weediness			
Other			

Severity: 0 = no evidence, 1=light, 2=moderate, 3=severe Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

Additional information	
Current land use	
Road verge/ clearing overhead transmission lines	
Age class of trees (DBH range) , Condition of Vegetation, Hollows	
No tree is plot. Shrubland - moderate	
Disturbances (i.e. fire, grazing,ferals, clearing, logging, soil degradation, pollution, weeds, dieback)	
Clearing/ erosion from road	
Significant and threatened species and communities (Note pop. size/area, structure, repro status, habit, habitat, threats, photos)	
Dominant Species outside Plot	E. rubidia / E. pauliflora

FUNCTION

Function attributes for	CTR_009	
BAM Attribute (20x20m plot)		
Count of Native Richness	Stratum	Sum
	Tree (TG)	2
	Shrub (SG)	3
	Forb (FG)	5
	Grass & grasslike (GG)	11
	Fern (EG)	0
	Other (OG)	0
	TOTAL	21
BAM Attribute (20x20m plot)		
Count of cover abundance (native vascular plants)	Stratum	Sum
	Tree (TG)	4
	Shrub (SG)	35
	Forb (FG)	0.5
	Grass & grasslike (GG)	18.2
	Fern (EG)	0
	Other (OG)	0
	TOTAL Native	57.7
	TOTAL 'HTE'	1

BAM Attributes (1 x 1m Plots)				
	Tape length	% cover	Average %	Photos
Litter Cover	5m	30%		
	15m	35%		
	25m	40%	34.0%	
	35m	30%		
	45m	35%		
Bare ground cover	5m	5%		
	15m	0%		
	25m	5%	3.0%	
	35m	0%		
	45m	5%		
Cryptogam cover	5m	0%		
	15m	0%		
	25m	0%	0.0%	
	35m	0%		
	45m	0%		
Rock Cover	5m	0%		
	15m	0%		
	25m	0%	0.0%	
	35m	0%		
	45m	0%		

BAM Attribute (20 x 50m plot) Tree Stem Counts			
DBH (cm)	Euc	Non Euc	Hollows
>80			
50-79			
30-49			
20-29			
10-19			
5-9			
<5	10		N/A
Length of logs (m)			

0.1%=63x63cm
0.5%=1.4x1.4m
1%=2×2m
5%=4×5m
25%=10×10m

COMPOSITION & STRUCTURE

Species recorded for CTR_009

Abbreviation	Scientific Name	Common Name	Family	% Cover	Abundance	Exotic	Growth Form	High Threat?	EPBC Status	BCA Status
Cass sift	*Cassinia sifton*		Asteraceae	5	20	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
Cass laev	*Cassinia laevis*	Cough Bush	Asteraceae	10	40	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
Lept myrt	*Leptospermum myrtifolium*		Myrtaceae	20	10	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
Euca rubi	*Eucalyptus rubida*	Candlebark	Myrtaceae	2	5	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
Euca pauc	*Eucalyptus pauciflora*	White Sally	Myrtaceae	2	5	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
Them tria	*Themeda triandra*		Poaceae	10	500	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Aris ramo	*Aristida ramosa*	Purple Wiregrass	Poaceae	1	50	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Ryti	*Rytidosperma spp.*		Poaceae	1	50	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Junc fili	*Juncus filicaulis*		Juncaceae	1	100	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Junc aust	*Juncus australis*	Rush	Juncaceae	1	100	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
pani effu	*Panicum effusum*	Hairy Panic	Poaceae	0.5	20	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Erag brow	*Eragrostis brownii*	Brown's Lovegrass	Poaceae	0.5	20	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Hydr laxi	*Hydrocotyle laxiflora*	Stinking Pennywort	Apiaceae	0.1	5	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Phal aqua	*Phalaris aquatica*	Phalaris	Poaceae	1	100	Introduced			Not Listed	Not Listed
Spor creb	*Sporobolus creber*	Slender Rat's Tail Grass	Poaceae	0.1	5	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Oper aspe	*Opercularia aspera*	Coarse Stinkweed	Rubiaceae	0.1	1	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Gono tetr	*Gonocarpus tetragynus*	Poverty Raspwort	Haloragaceae	0.1	1	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Halo hete	*Haloragis heterophylla*	Variable Raspwort	Haloragaceae	0.1	1	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Loma long	*Lomandra longifolia*	Spiny-headed Mat-rush	Lomandraceae	2	30	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Gono micr	*Gonocarpus micranthus*		Haloragaceae	0.1	1	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Plan lanc	*Plantago lanceolata*	Lamb's Tongues	Plantaginaceae	0.5	30	Introduced			Not Listed	Not Listed
Junc subs	*Juncus subsecundus*	Finger Rush	Juncaceae	1	20	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Cirs vulg	*Cirsium vulgare*	Spear Thistle	Asteraceae	1	10	Introduced			Not Listed	Not Listed
Rubu frut	*Rubus fruticosus*	Blackberry complex	Rosaceae	1	5	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
Lepi limi	*Lepidosperma limicola*		Cyperaceae	0.1	1	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed

BAM Site Field Survey								
Project:	Canyonleigh_ Road Upgrade	Plot Identifier	CTR_010	Pic 20x20		Pic 20x50	10X100	
Survey date:	15/08/2025		Compass Orientation (head of 20x20 plot)				67 NE	
Recorders			PCT:	3746				
GPS Easting		GPS Northing	776568.9461		Datum	6164678.372	Zone	
Landform			**Soils**			**Drainage & Slope**		
Morphology			Soil Texture	Soft		Slope	0	
LandF Element			Soil Colour	Brown		Aspect	NE	
LandF Pattern			Soil Depth	Sodosols (SO)		Drainage	Ditch along road	
Microrelief			Geology	Saprolite		Watercourses	Ditches and culvert	

Plot Disturbance			
	Severity	Age	Observational Evidence
Clearing	2	NR	About half cleared. Some fresh, some old
Cultivation			
Soil erosion	1	R	A little from culvert and road
Firewood	2	R	Fair amount of fallen branches, logs, dead wood
Grazing			
Fire Damage			
Storm Damage	1	R	
Weediness	1	R	
Other			

Severity: 0 = no evidence, 1=light, 2=moderate, 3=severe Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

Additional information

Current land use

Woodland patch on road verge, indicative of the woodaland present in the road corridor

Age class of trees (DBH range) , Condition of Vegetation, Hollows

Young to semi-mature. Low condition - islandised. No hollows

Disturbances (i.e. fire, grazing,ferals, clearing, logging, soil degradation, pollution, weeds, dieback)

Clearing, erosion, storm

Significant and threatened species and communities (Note pop. size/area, structure, repro status, habit, habitat, threats, photos)

Dominant Species outside Plot	Grassland (paddock adjacent)

FUNCTION

Function attributes for	CTR_010
BAM Attribute (20x20m plot)	
Stratum	Sum
Tree (TG)	6
Shrub (SG)	2
Forb (FG)	4
Grass & grasslike (GG)	6
Fern (EG)	0
Other (OG)	0
TOTAL	18
BAM Attribute (20x20m plot)	
Stratum	Sum
Tree (TG)	50
Shrub (SG)	3
Forb (FG)	1.3
Grass & grasslike (GG)	17.6
Fern (EG)	0
Other (OG)	0
TOTAL Native	71.9
TOTAL 'HTE'	1

Count of Native Richness

Count of cover abundance (native vascular plants)

BAM Attribute (20 x 50m plot) Tree Stem Counts

DBH (cm)	Euc	Non Euc	Hollows
>80	32		
50-79	13		
30-49	11		
20-29	3		
10-19	1	3	
5-9			
<5			N/A
Length of logs (m)		45.5	

0.1%=63x63cm
0.5%=1.4x1.4m
1%=2×2m
5%=4×5m
25%=10×10m

BAM Attributes (1 x 1m Plots)

	Tape length	% cover	Average %	Photos
Litter Cover	5m	30%		
	15m	50%		
	25m	15%	42.0%	
	35m	45%		
	45m	70%		
Bare ground cover	5m	5%		
	15m	0%		
	25m	0%	3.0%	
	35m	0%		
	45m	10%		
Cryptogam cover	5m	0%		
	15m	0%		
	25m	0%	0.0%	
	35m	0%		
	45m	0%		
Rock Cover	5m	25%		
	15m	0%		
	25m	0%	5.0%	
	35m	0%		
	45m	0%		

COMPOSITION & STRUCTURE

Species recorded for CTR_010

Abbreviation	Scientific Name	Common Name	Family	% Cover	Abundance	Exotic	Growth Form	High Threat?	EPBC Status	BCA Status
Euca rubi	*Eucalyptus rubida*	Candlebark	Myrtaceae	40	30	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
Euca pauc	*Eucalyptus pauciflora*	White Sally	Myrtaceae	5	20	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
Euca mann	*Eucalyptus mannifera*	Brittle Gum	Myrtaceae	2	2	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
Euca macr	*Eucalyptus macrorhyncha*	Red Stringybark	Myrtaceae	1	1	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
Gono tetr	*Gonocarpus tetragynus*	Poverty Raspwort	Haloragaceae	1	10	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Seta pumi	*Setaria pumila*	Pale Pigeon Grass	Poaceae	1	50	Introduced			Not Listed	Not Listed
Cype erag	*Cyperus eragrostis*	Umbrella Sedge	Cyperaceae	0.5	50	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
Poa sieb	*Poa sieberiana*	Snowgrass	Poaceae	0.5	50	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Cass sift	*Cassinia sifton*		Asteraceae	2	10	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
Them tria	*Themeda triandra*		Poaceae	5	500	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Lepi limi	*Lepidosperma limicola*		Cyperaceae	1	10	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Aust scab	*Austrostipa scabra*	Speargrass	Poaceae	1	60	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Trif subt	*Trifolium subterraneum*	Subterranean Clover	Fabaceae (Faboideae)	1	125	Introduced			Not Listed	Not Listed
Erag brow	*Eragrostis brownii*	Brown's Lovegrass	Poaceae	0.1	10	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Loma long	*Lomandra longifolia*	Spiny-headed Mat-rush	Lomandraceae	10	500	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Hype perf	*Hypericum perforatum*	St. Johns Wort	Clusiaceae	0.5	10	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
Acac parr	*Acacia parramattensis*	Parramatta Wattle	Fabaceae (Mimosoideae)	1	5	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
Oper aspe	*Opercularia aspera*	Coarse Stinkweed	Rubiaceae	0.1	5	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Allo litt	*Allocasuarina littoralis*	Black She-Oak	Casuarinaceae	1	2	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
Lept myrt	*Leptospermum myrtifolium*		Myrtaceae	1	5	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
hype gram	*Hypericum gramineum*	Small St John's Wort	Clusiaceae	0.1	1	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
halo hete	*Haloragis heterophylla*	Variable Raspwort	Haloragaceae	0.1	4	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed

BAM Site Field Survey								
Project:	Canyonleigh_ Road Upgrade	Plot Identifier	CTR_011	Pic 20x20	y	Pic 20x50	y	
Survey date:	16/08/2025		Compass Orientation (head of 20x20 plot)				60 NE	
Recorders	JC + NS		PCT:	3746				
GPS Easting	777253.7395	GPS Northing	6164795.626		Datum		Zone	
Landform			Soils			Drainage & Slope		
Morphology			Soil Texture	Soft		Slope	0	
LandF Element			Soil Colour	Brown		Aspect	NE	
LandF Pattern			Soil Depth	Sodosols (SO)		Drainage	Small ditch on road edge	
Microrelief			Geology	Saprolite		Watercourses	Near farm dam	

Plot Disturbance			
	Severity	Age	Observational Evidence
Clearing	2	NR	Some cut trees/ few older trees/ mostly regrowth further from road
Cultivation			
Soil erosion	1	R	large road banking
Firewood	2	R	Lots of deadwood/ fallen trees/ branches
Grazing			
Fire Damage			
Storm Damage	2	R	Some fallen trees
Weediness	1	R	Mostly along roadside - not much in woodland patch
Other			

Severity: 0 = no evidence, 1=light, 2=moderate, 3=severe Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

Additional information	
Current land use	
Woodland	
Age class of trees (DBH range) , Condition of Vegetation, Hollows	
Mostly new growth, some old trees - moderate condition - no hollows	
Disturbances (i.e. fire, grazing,ferals, clearing, logging, soil degradation, pollution, weeds, dieback)	
Clearing, erosion, storm	
Significant and threatened species and communities (Note pop. size/area, structure, repro status, habit, habitat, threats, photos)	
Dominant Species outside Plot	E.viminalis

FUNCTION

Function attributes for	CTR_011
BAM Attribute (20x20m plot)	
Stratum	Sum
Tree (TG)	5
Shrub (SG)	2
Forb (FG)	2
Grass & grasslike (GG)	8
Fern (EG)	1
Other (OG)	0
TOTAL	18
BAM Attribute (20x20m plot)	
Stratum	Sum
Tree (TG)	15
Shrub (SG)	3
Forb (FG)	0.2
Grass & grasslike (GG)	47.5
Fern (EG)	20
Other (OG)	0
TOTAL Native	85.7
TOTAL 'HTE'	1.5

Count of Native Richness

Count of cover abundance (native vascular plants)

BAM Attributes (1 x 1m Plots)				
	Tape length	% cover	Average %	Photos
Litter Cover	5m	85%		
	15m	90%		
	25m	80%	90.0%	
	35m	90%		
	45m	60%		
Bare ground cover	5m	5%		
	15m	1%		
	25m	10%	4.0%	
	35m	2%		
	45m	2%		
Cryptogam cover	5m	0%		
	15m	0%		
	25m	2%	0.8%	
	35m	2%		
	45m	0%		
Rock Cover	5m	0%		
	15m	0%		
	25m	0%	0.0%	
	35m	0%		
	45m	0%		

BAM Attribute (20 x 50m plot) Tree Stem Counts			
DBH (cm)	Euc	Non Euc	Hollows
>80	11		
50-79	19	2	
30-49	17	2	
20-29	15	1	
10-19	4	1	
5-9			
<5		11	N/A
Length of logs (m)		106	

0.1%=63x63cm
0.5%=1.4x1.4m 66
1%=2×2m
5%=4×5m
25%=10×10m

COMPOSITION & STRUCTURE

Species recorded for CTR_011

Abbreviation	Scientific Name	Common Name	Family	% Cover	Abundance	Exotic	Growth Form	High Threat?	EPBC Status	BCA Status
Euca rubi	*Eucalyptus rubida*	Candlebark	Myrtaceae	5	15	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
Euca macr	*Eucalyptus macrorhyncha*	Red Stringybark	Myrtaceae	5	30	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
Euca dive	*Eucalyptus dives*	Broad-leaved Peppermint	Myrtaceae	1	2	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
Euca vimi	*Eucalyptus viminalis*	Ribbon Gum	Myrtaceae	2	4	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
Acac parr	*Acacia parramattensis*	Parramatta Wattle	Fabaceae (Mimosoideae)	2	5	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
Cass sift	*Cassinia sifton*		Asteraceae	1	2	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
Loma long	*Lomandra longifolia*	Spiny-headed Mat-rush	Lomandraceae	40	2000	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Pter escu	*Pteridium esculentum*	Bracken	Dennstaedtiaceae	20	500	Alive in NSW, Native	Fern (EG)		Not Listed	Not Listed
Aris vaga	*Aristida vagans*	Threeawn Speargrass	Poaceae	1	100	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Hydr laxi	*Hydrocotyle laxiflora*	Stinking Pennywort	Apiaceae	0.1	1	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Them tria	*Themeda triandra*		Poaceae	5	100	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Lept myrt	*Leptospermum myrtifolium*		Myrtaceae	2	5	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
Erag curv	*Eragrostis curvula*	African Lovegrass	Poaceae	1	100	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
Cype erag	*Cyperus eragrostis*	Umbrella Sedge	Cyperaceae	0.5	30	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
Seta	*Setaria spp.*		Poaceae	0.1	15	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Poa sieb	*Poa sieberiana*	Snowgrass	Poaceae	1	75	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Erag brow	*Eragrostis brownii*	Brown's Lovegrass	Poaceae	0.2	80	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Junc aust	*Juncus australis*	Rush	Juncaceae	0.1	20	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Dian long	*Dianella longifolia*	Blueberry Lily	Asphodelaceae	0.1	1	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Hypo radi	*Hypochaeris radicata*	Catsear	Asteraceae	0.5	45	Introduced			Not Listed	Not Listed
Phal aqua	*Phalaris aquatica*	Phalaris	Poaceae	0.1	35	Introduced			Not Listed	Not Listed
Dich micr	*Dichelachne micrantha*	Shorthair Plumegrass	Poaceae	0.1	20	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed

BAM Site Field Survey

Project:	Canyonleigh_ Road Upgrade	Plot Identifier	CTR_012	Pic 20x20	y	Pic 20x50	y	
Survey date:	16/08/2025		Compass Orientation (head of 20x20 plot)				60 E	
Recorders	JC + NS		PCT:	3347				
GPS Easting	777495.3054	GPS Northing	6164886.481		Datum		Zone	

Landform			Soils			Drainage & Slope		
Morphology			Soil Texture	Soft		Slope	0	
LandF Element			Soil Colour	brown		Aspect	E	
LandF Pattern			Soil Depth	Sodosols (SO)		Drainage	Culvert	
Microrelief			Geology	Saprolite		Watercourses		

Plot Disturbance

	Severity	Age	Observational Evidence
Clearing	1	NR	Some stumps but not many and not fresh
Cultivation			
Soil erosion	2	R	Some near road and the culvert
Firewood	1	R	Fallen branches
Grazing			
Fire Damage			
Storm Damage	1	R	Fallen branches
Weediness	1	R	Bramble
Other			

Severity: 0 = no evidence, 1=light, 2=moderate, 3=severe Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

Additional information

Current land use

Woodland

Age class of trees (DBH range) , Condition of Vegetation, Hollows

Mature woodland - moderate conditon - no hollows

Disturbances (i.e. fire, grazing,ferals, clearing, logging, soil degradation, pollution, weeds, dieback)

Clearing, soil erosion

Significant and threatened species and communities (Note pop. size/area, structure, repro status, habit, habitat, threats, photos)

N/a

Dominant Species outside Plot	E.viminalis

FUNCTION

Function attributes for	CTR_012

BAM Attribute (20x20m plot)

	Stratum	Sum
Count of Native Richness	Tree (TG)	2
	Shrub (SG)	1
	Forb (FG)	3
	Grass & grasslike (GG)	10
	Fern (EG)	1
	Other (OG)	0
	TOTAL	17

BAM Attribute (20x20m plot)

	Stratum	Sum
Count of cover abundance (native vascular plants)	Tree (TG)	31
	Shrub (SG)	1
	Forb (FG)	0.4
	Grass & grasslike (GG)	28.4
	Fern (EG)	20
	Other (OG)	0
	TOTAL Native	80.8
	TOTAL 'HTE'	1

BAM Attributes (1 x 1m Plots)

	Tape length	% cover	Average %	Photos
Litter Cover	5m	80%		
	15m	90%		
	25m	25%	45.0%	
	35m	15%		
	45m	15%		
Bare ground cover	5m	10%		
	15m	2%		
	25m	1%	6.6%	
	35m	5%		
	45m	15%		
Cryptogam cover	5m	0%		
	15m	0%		
	25m	0%	0.0%	
	35m	0%		
	45m	0%		
Rock Cover	5m	0%		
	15m	0%		
	25m	0%	0.0%	
	35m	0%		
	45m	0%		

BAM Attribute (20 x 50m plot) Tree Stem Counts

DBH (cm)	Euc	Non Euc	Hollows
>80	12		
50-79	5		
30-49	5		
20-29			
10-19			
5-9			
<5			N/A
Length of logs (m)		14	

0.1%=63x63cm
0.5%=1.4x1.4m
1%=2×2m
5%=4×5m
25%=10×10m

COMPOSITION & STRUCTURE

Species recorded for CTR_012

Abbreviation	Scientific Name	Common Name	Family	% Cover	Abundance	Exotic	Growth Form	High Threat?	EPBC Status	BCA Status
Euca vimi	*Eucalyptus viminalis*	Ribbon Gum	Myrtaceae	30	22	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
Pter escu	*Pteridium esculentum*	Bracken	Dennstaedtiaceae	20	200	Alive in NSW, Native	Fern (EG)		Not Listed	Not Listed
Junc subs	*Juncus subsecundus*	Finger Rush	Juncaceae	10	100	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Them tria	*Themeda triandra*		Poaceae	5	500	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Tolp barb	*Tolpis barbata*	Yellow Hawkweed	Asteraceae	1	5	Introduced			Not Listed	Not Listed
Loma long	*Lomandra longifolia*	Spiny-headed Mat-rush	Lomandraceae	5	30	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Hypo radi	*Hypochaeris radicata*	Catsear	Asteraceae	1	25	Introduced			Not Listed	Not Listed
Lept myrt	*Leptospermum myrtifolium*		Myrtaceae	1	4	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
Rubu frut	*Rubus fruticosus*	Blackberry complex	Rosaceae	1	4	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
halo hete	*Haloragis heterophylla*	Variable Raspwort	Haloragaceae	0.1	2	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Allo litt	*Allocasuarina littoralis*	Black She-Oak	Casuarinaceae	1	3	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
Plan lanc	*Plantago lanceolata*	Lamb's Tongues	Plantaginaceae	0.5	15	Introduced			Not Listed	Not Listed
Aust scab	*Austrostipa scabra*	Speargrass	Poaceae	0.5	40	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Pani effu	*Panicum effusum*	Hairy Panic	Poaceae	0.5	65	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Cirs vulg	*Cirsium vulgare*	Spear Thistle	Asteraceae	0.1	25	Introduced			Not Listed	Not Listed
Seta	*Setaria spp.*		Poaceae	0.1	20	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Micr stip	*Microlaena stipoides*	Weeping Grass	Poaceae	5	100	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Elym scab	*Elymus scaber*	Wheatgrass, Common Wheatgrass	Poaceae	0.1	20	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Ryti race	*Rytidosperma racemosum*	Wallaby Grass	Poaceae	0.2	10	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Dich repe	*Dichondra repens*	Kidney Weed	Convolvulaceae	0.1	5	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Gera sola	*Geranium solanderi*	Native Geranium	Geraniaceae	0.2	7	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Phal aqua	*Phalaris aquatica*	Phalaris	Poaceae	0.1	20	Introduced			Not Listed	Not Listed
Poa labi labi	*Poa labillardierei var. labillardierei*	Tussock	Poaceae	2	75	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed

BAM Site Field Survey								
Project:	Canyonleigh_ Road Upgrade	Plot Identifier	CTR_013	Pic 20x20		Pic 20x50	10X100	
Survey date:	15/08/2025		Compass Orientation (head of 20x20 plot)				254 W	
Recorders	JC + NS		PCT:	3746				
GPS Easting	778076.5633	GPS Northing	6164889.36		Datum		Zone	
Landform			Soils			Drainage & Slope		
Morphology			Soil Texture			Slope		
LandF Element			Soil Colour			Aspect		
LandF Pattern			Soil Depth			Drainage		
Microrelief			Geology			Watercourses		

Plot Disturbance			
	Severity	Age	Observational Evidence
Clearing	2	NR	New growth after clearing for overhead lines
Cultivation			
Soil erosion	1	R	Some erosion from road
Firewood	1	R	Some ded woody shrubs
Grazing			
Fire Damage			
Storm Damage			
Weediness	1	R	Non-native grasses/ brambles
Other			Lots of pine needles from adjacent pines along road

Severity: 0 = no evidence, 1=light, 2=moderate, 3=severe Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

Additional information	
Current land use	
Road verge transmisson line	
Age class of trees (DBH range) , Condition of Vegetation, Hollows	
No trees/ low condition	
Disturbances (i.e. fire, grazing,ferals, clearing, logging, soil degradation, pollution, weeds, dieback)	
Clearing, weeds	
Significant and threatened species and communities (Note pop. size/area, structure, repro status, habit, habitat, threats, photos)	
Dominant Species outside Plot	Pinus sp.

FUNCTION

Function attributes for	CTR_013
BAM Attribute (20x20m plot)	
Stratum	Sum
Tree (TG)	1
Shrub (SG)	2
Forb (FG)	2
Grass & grasslike (GG)	5
Fern (EG)	0
Other (OG)	0
TOTAL	10
BAM Attribute (20x20m plot)	
Stratum	Sum
Tree (TG)	0.5
Shrub (SG)	85
Forb (FG)	0.2
Grass & grasslike (GG)	4.2
Fern (EG)	0
Other (OG)	0
TOTAL Native	89.9
TOTAL 'HTE'	5.1

Count of Native Richness

Count of cover abundance (native vascular plants)

BAM Attributes (1 x 1m Plots)				
	Tape length	% cover	Average %	Photos
Litter Cover	5m	20%		
	15m	40%		
	25m	30%	26.0%	
	35m	30%		
	45m	10%		
Bare ground cover	5m	15%		
	15m	8%		
	25m	10%	9.5%	
	35m	10%		
	45m	5%		
Cryptogam cover	5m	0%		
	15m	0%		
	25m	0%	0.0%	
	35m	0%		
	45m	0%		
Rock Cover	5m	0%		
	15m	0%		
	25m	0%	0.0%	
	35m	0%		
	45m	0%		

BAM Attribute (20 x 50m plot) Tree Stem Counts			
DBH (cm)	Euc	Non Euc	Hollows
>80			
50-79			
30-49			
20-29			
10-19			
5-9			
<5			N/A
Length of logs (m)			

0.1%=63x63cm
0.5%=1.4x1.4m
1%=2×2m
5%=4×5m
25%=10×10m

COMPOSITION & STRUCTURE

Species recorded for CTR_013

Abbreviation	Scientific Name	Common Name	Family	% Cover	Abundance	Exotic	Growth Form	High Threat?	EPBC Status	BCA Status
Briz mino	*Briza minor*	Shivery Grass	Poaceae	1	100	Introduced			Not Listed	Not Listed
Lept myrt	*Leptospermum myrtifolium*		Myrtaceae	80	200	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
halo hete	*Haloragis heterophylla*	Variable Raspwort	Haloragaceae	0.1	1	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Cass sift	*Cassinia sifton*		Asteraceae	5	5	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
Rubu frut	*Rubus fruticosus*	Blackberry complex	Rosaceae	5	5	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
Loma long	*Lomandra longifolia*	Spiny-headed Mat-rush	Lomandraceae	2	10	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Tolp barb	*Tolpis barbata*	Yellow Hawkweed	Asteraceae	0.1	1	Introduced			Not Listed	Not Listed
Seta	*Setaria spp.*		Poaceae	0.1	25	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Micr stip	*Microlaena stipoides*	Weeping Grass	Poaceae	1	30	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Them tria	*Themeda triandra*		Poaceae	1	50	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Euca vimi	*Eucalyptus viminalis*	Ribbon Gum	Myrtaceae	0.5	2	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
Dact glom	*Dactylis glomerata*	Cocksfoot	Poaceae	0.2	60	Introduced			Not Listed	Not Listed
Plan lanc	*Plantago lanceolata*	Lamb's Tongues	Plantaginaceae	0.5	20	Introduced			Not Listed	Not Listed
euch spha	*Euchiton sphaericus*	Star Cudweed	Asteraceae	0.1	1	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Erag curv	*Eragrostis curvula*	African Lovegrass	Poaceae	0.1	10	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
Dich crin	*Dichelachne crinita*	Longhair Plumegrass	Poaceae	0.1	10	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed

BAM Site Field Survey								
Project:	Canyonleigh_ Road Upgrade	Plot Identifier	CTR_014	Pic 20x20		Pic 20x50	10X100	
Survey date:	16/08/2025		Compass Orientation (head of 20x20 plot)				259 W	
Recorders	JC + NS		PCT:	3746				
GPS Easting	778865.4236	GPS Northing	6164994.22		Datum		Zone	
Landform			Soils			Drainage & Slope		
Morphology			Soil Texture	Soft		Slope	0	
LandF Element			Soil Colour	brown		Aspect	NE	
LandF Pattern			Soil Depth	Sodosols (SO)		Drainage	Ditch along road	
Microrelief			Geology	Saprolite		Watercourses		

Plot Disturbance			
	Severity	Age	Observational Evidence
Clearing	1	NR	Young - regrowth
Cultivation			
Soil erosion	2	R	Spoil heaps from road
Firewood	1	R	Some fallen branches
Grazing			
Fire Damage			
Storm Damage	1	R	Some fallen branches
Weediness	1	R	Millwort and St Johns
Other			

Severity: 0 = no evidence, 1=light, 2=moderate, 3=severe Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

Additional information	
Current land use	
Woodland on road verge - next to field with cows	
Age class of trees (DBH range) , Condition of Vegetation, Hollows	
Young - low condition	
Disturbances (i.e. fire, grazing,ferals, clearing, logging, soil degradation, pollution, weeds, dieback)	
Litter	
Significant and threatened species and communities (Note pop. size/area, structure, repro status, habit, habitat, threats, photos)	
Dominant Species outside Plot	Pinus sp. across the road

FUNCTION

Function attributes for	CTR_014
BAM Attribute (20x20m plot)	
Stratum	Sum
Tree (TG)	2
Shrub (SG)	4
Forb (FG)	2
Grass & grasslike (GG)	7
Fern (EG)	1
Other (OG)	0
TOTAL	16

(Count of Native Richness)

BAM Attribute (20x20m plot)	
Stratum	Sum
Tree (TG)	41
Shrub (SG)	6.6
Forb (FG)	2
Grass & grasslike (GG)	17.2
Fern (EG)	0.1
Other (OG)	0
TOTAL Native	66.9
TOTAL 'HTE'	1.5

(Count of cover abundance (native vascular plants))

BAM Attribute (20 x 50m plot) Tree Stem Counts			
DBH (cm)	Euc	Non Euc	Hollows
>80	16		
50-79	12	1	
30-49	7		
20-29	5	3	
10-19		8	
5-9		1	
<5			N/A
Length of logs (m)		8	

0.1%=63x63cm
0.5%=1.4x1.4m
1%=2×2m
5%=4×5m
25%=10×10m

BAM Attributes (1 x 1m Plots)				
	Tape length	% cover	Average %	Photos
Litter Cover	5m	50%		
	15m	60%		
	25m	74%	74.8%	
	35m	100%		
	45m	90%		
Bare ground cover	5m	20%		
	15m	0%		
	25m	5%	5.2%	
	35m	0%		
	45m	1%		
Cryptogam cover	5m	5%		
	15m	0%		
	25m	0%	1.0%	
	35m	0%		
	45m	0%		
Rock Cover	5m	0%		
	15m	0%		
	25m	0%	0.0%	
	35m	0%		
	45m	0%		

COMPOSITION & STRUCTURE

Species recorded for CTR_014

Abbreviation	Scientific Name	Common Name	Family	% Cover	Abundance	Exotic	Growth Form	High Threat?	EPBC Status	BCA Status
Euca pauc	*Eucalyptus pauciflora*	White Sally	Myrtaceae	40	40	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
Them tria	*Themeda triandra*		Poaceae	10	1000	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Cass acul	*Cassinia aculeata*	Dolly Bush	Asteraceae	5	10	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
Loma mult	*Lomandra multiflora*	Many-flowered Mat-rush	Lomandraceae	5	100	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Acac long	*Acacia longifolia*		Fabaceae (Mimosoideae)	1	1	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
Vero pleb	*Veronica plebeia*	Trailing Speedwell	Plantaginaceae	1	10	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Plan lanc	*Plantago lanceolata*	Lamb's Tongues	Plantaginaceae	0.5	25	Introduced			Not Listed	Not Listed
Pime curv	*Pimelea curviflora*	Rice Flower	Thymelaeaceae	0.1	1	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
Hype perf	*Hypericum perforatum*	St. Johns Wort	Clusiaceae	0.5	13	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
Acac parr	*Acacia parramattensis*	Parramatta Wattle	Fabaceae (Mimosoideae)	1	4	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed
Acae echi	*Acaena echinata*	Sheep's Burr	Rosaceae	1	18	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
Seta	*Setaria spp.*		Poaceae	0.1	5	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Junc aust	*Juncus australis*	Rush	Juncaceae	1	30	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Ryti	*Rytidosperma spp.*		Poaceae	0.2	25	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Micr stip	*Microlaena stipoides*	Weeping Grass	Poaceae	0.4	50	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Cass laev	*Cassinia laevis*	Cough Bush	Asteraceae	0.5	6	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
Poa sieb	*Poa sieberiana*	Snowgrass	Poaceae	0.5	75	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Chei sieb	*Cheilanthes sieberi*	Rock Fern	Pteridaceae	0.1	1	Alive in NSW, Native	Fern (EG)		Not Listed	Not Listed
Briz maxi	*Briza maxima*	Quaking Grass	Poaceae	1	50	Introduced			Not Listed	Not Listed
Cype erag	*Cyperus eragrostis*	Umbrella Sedge	Cyperaceae	1	50	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
Trif subt	*Trifolium subterraneum*	Subterranean Clover	Fabaceae (Faboideae)	1	100	Introduced			Not Listed	Not Listed
Tolp barb	*Tolpis barbata*	Yellow Hawkweed	Asteraceae	1	15	Introduced			Not Listed	Not Listed

BAM Site Field Survey								
Project:	Canyonleigh_ Road Upgrade	Plot Identifier	CTR_015	Pic 20x20		Pic 20x50	10X100	
Survey date:	16/08/2025		Compass Orientation (head of 20x20 plot)				240 SW	
Recorders	JC + NS		PCT:	3746				
GPS Easting	779358.5346	GPS Northing	6165063.682		Datum		Zone	
Landform			Soils			Drainage & Slope		
Morphology			Soil Texture	Soft		Slope	2	
LandF Element			Soil Colour	brown		Aspect	NE	
LandF Pattern			Soil Depth	Sodosols (SO)		Drainage	ditch along road	
Microrelief			Geology	Saprolite		Watercourses	Adjacent to culvert	
Plot Disturbance								
	Severity	Age	Observational Evidence					
Clearing	2	O	Historically cleared					
Cultivation								
Soil erosion	2	R	Erosion along road					
Firewood								
Grazing	2	R	Cow pats and tracks					
Fire Damage								
Storm Damage								
Weediness	2	R	Bramble and briar rose					
Other								
Severity: 0 = no evidence, 1=light, 2=moderate, 3=severe Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)								
Additional information								
Current land use								
Road verge/ grazing								
Age class of trees (DBH range) , Condition of Vegetation, Hollows								
Young trees/ low condition/ no hollows								
Disturbances (i.e. fire, grazing,ferals, clearing, logging, soil degradation, pollution, weeds, dieback)								
Grazing, feral pigs, weeds, soild degradation								
Significant and threatened species and communities (Note pop. size/area, structure, repro status, habit, habitat, threats, photos)								
Dominant Species outside Plot		Grassland						

FUNCTION

Function attributes for		CTR_015
BAM Attribute (20x20m plot)		
Count of Native Richness	Stratum	Sum
	Tree (TG)	1
	Shrub (SG)	1
	Forb (FG)	1
	Grass & grasslike (GG)	6
	Fern (EG)	0
	Other (OG)	0
	TOTAL	9
BAM Attribute (20x20m plot)		
Count of cover abundance (native vascular plants)	Stratum	Sum
	Tree (TG)	5
	Shrub (SG)	10
	Forb (FG)	1
	Grass & grasslike (GG)	56.2
	Fern (EG)	0
	Other (OG)	0
	TOTAL Native	72.2
	TOTAL 'HTE'	15.2

BAM Attribute (20 x 50m plot) Tree Stem Counts			
DBH (cm)	Euc	Non Euc	Hollows
>80			
50-79		2	
30-49		7	
20-29		4	
10-19		3	
5-9		3	
<5			N/A
Length of logs (m)		0	

0.1%=63x63cm
0.5%=1.4x1.4m
1%=2×2m
5%=4×5m
25%=10×10m

BAM Attributes (1 x 1m Plots)				
	Tape length	% cover	Average %	Photos
Litter Cover	5m	5%		
	15m	5%		
	25m	5%	8.0%	
	35m	15%		
	45m	10%		
Bare ground cover	5m	15%		
	15m	10%		
	25m	10%	9.4%	
	35m	10%		
	45m	2%		
Cryptogam cover	5m	10%		
	15m	8%		
	25m	15%	7.3%	
	35m	2%		
	45m	2%		
Rock Cover	5m	1%		
	15m	0%		
	25m	0%	0.2%	
	35m	0%		
	45m	0%		

COMPOSITION & STRUCTURE

Species recorded for		CTR_015								
Abbreviation	Scientific Name	Common Name	Family	% Cover	Abundance	Exotic	Growth Form	High Threat?	EPBC Status	BCA Status
Poa sieb	*Poa sieberiana*	Snowgrass	Poaceae	15	2000	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Them tria	*Themeda triandra*		Poaceae	10	1000	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Hype perf	*Hypericum perforatum*	St. Johns Wort	Clusiaceae	5	40	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
Junc aust	*Juncus australis*	Rush	Juncaceae	1	30	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Verb thap	*Verbascum thapsus*	Great Mullein	Scrophulariaceae	1	4	Introduced			Not Listed	Not Listed
Verb bona	*Verbena bonariensis*	Purpletop	Verbenaceae	5	10	Introduced			Not Listed	Not Listed
Plan lanc	*Plantago lanceolata*	Lamb's Tongues	Plantaginaceae	5	20	Introduced			Not Listed	Not Listed
Plan coro	*Plantago coronopus*	Buck's-horn Plaintain	Plantaginaceae	0.1	2	Introduced			Not Listed	Not Listed
Poa labi	*Poa labillardierei*	Tussock	Poaceae	30	4000	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
rume acet	*Rumex acetosella*	Sheep Sorrel	Polygonaceae	0.1	10	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
acae echi	*Acaena echinata*	Sheep's Burr	Rosaceae	1	50	Alive in NSW, Native	Forb (FG)		Not Listed	Not Listed
cirs vulg	*Cirsium vulgare*	Spear Thistle	Asteraceae	0.5	10	Introduced			Not Listed	Not Listed
rosa rubi	*Rosa rubiginosa*	Sweet Briar	Rosaceae	0.1	2	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
dich micr	*Dichelachne micrantha*	Shorthair Plumegrass	Poaceae	0.1	7	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
pasp dila	*Paspalum dilatatum*	Paspalum	Poaceae	10	800	Introduced		High Threat Weed - not manageable	Not Listed	Not Listed
briz mino	*Briza minor*	Shivery Grass	Poaceae	10	800	Introduced			Not Listed	Not Listed
Chlo trun	*Chloris truncata*	Windmill Grass	Poaceae	0.1	9	Alive in NSW, Native	Grass & grasslike (GG)		Not Listed	Not Listed
Bank marg	*Banksia marginata*	Silver Banksia	Proteaceae	10	4	Alive in NSW, Native	Shrub (SG)		Not Listed	Not Listed
acac parr	*Acacia parramattensis*	Parramatta Wattle	Fabaceae (Mimosoideae)	5	15	Alive in NSW, Native	Tree (TG)		Not Listed	Not Listed

APPENDIX D STREAMLINED ASSESSMENT – PLANTED NATIVE VEGETATION

PLANTED NATIVE VEGETATION ASSESSMENT

The Subject Land contains one Vegetation Zone (VZ) identified as potentially meeting the requirements to be considered Planted Native Vegetation (PNV) in accordance with Appendix D of the BAM. This VZ is identified in Table 1 below.

TABLE 1: AREAS OF PLANTED NATIVE VEGETATION ON THE SUBJECT LAND

Landcover Character	Draft NVM Land Category	Area on Subject Land (ha)	Area of impact (ha)
Planted Natives	Category 2	6.71	0.39

Approximately 6.71 ha of planted native vegetation consisting of a mosaic of planted natives and remnant native vegetation was identified within the northern section of the BESS Development Footprint. Figure 1 illustrates the location of the PNV on the Subject Land and in relation to the BESS Development Footprint.

The floristic assemblage within this area was dominated by XXXXXXX.

The extent of this vegetation occurs on Category 2 regulated lands and has been recognised in the Biodiversity Development Assessment Report (BDAR) as VZ6_Planted Natives.

Assessment of this VZ using the PNV Decision-Key, as per Appendix D of the BAM is provided in Table 2.

TABLE 2: DECISION-KEY FOR VZ6_PLANTED NATIVES

Decision		Outcome	Justification
1	Does the planted native vegetation occur within an area that contains a mosaic of planted and remnant native vegetation and which can be reasonably assigned to a PCT known to occur in the same IBRA subregion as the proposal?	Yes. The planted native vegetation must be allocated to the best-fit PCT and the BAM must be applied.	The vegetation consists of a mosaic of planted native and remnant native vegetation. As such, it has been assigned to the best-fit PCT.

Assessment under the PNV decision-key determined that this vegetation is able to be associated with PCT 3746 due to existing remnant canopy vegetation. Therefore, the use of the Planted Native Vegetation Streamlined Assessment module of the BAM has not been applied for the area of planted native vegetation that forms part of PCT 3746.

The extent of 06.71 7 ha of mixed planted vegetation has been assigned to PCT 3746 and further assessed within the BDAR. Nonetheless, this patch has been avoided where possible and impacts minimised by the Development Footprint.

FIGURE 1: LOCATION OF VZ6_PLANTED NATIVES IN RELATION TO THE BESS DEVELOPMENT FOOTPRINT AND SUBJECT LAND

APPENDIX E EXPERT REPORT (*APRASIA PARAPULCHELLA*) (CAPITAL ECOLOGY, 2025)

Natasha Smith

From: Robert Speirs <rob@capitalecology.com.au>
Sent: Monday, 11 August 2025 4:44 PM
To: Joe Clement
Cc: Lucy Baker; Sophie Butcher; Jarmin Thornberry; Claire Hewitt; Sam Reid
Subject: RE: 3391 ERM - Canyonleigh BESS - PTLL Expert Report - Draft 01

Follow Up Flag: Follow up
Flag Status: Completed

EXTERNAL MESSAGE

Hi Joe,

Yes, Jarmin and I did have a look along that section of the road when we were up there last week. There is almost no surface rock in the road reserve (only a couple of tiny outcrops in at a couple of points), so I don't believe that you should flag *Aprasia parapulchella* as a candidate species. I believe that there is potential habitat for *Delma impar* in the road reserve, and therefore it would be worth getting an expert report to assess and map the extent of the suitable habitat for that species. Please send me the findings of your vegetation mapping (PCTs and zones as GIS shapefiles if possible) when you have it ready, then we'll go from there.

Cheers,

Rob

Robert Speirs
BAppSc (Ecology), DipPM, MEIANZ, CEnvP-E, BAM Assessor

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We acknowledge the Traditional Custodians of the land on which we work. We pay our respects to Elders past and present.

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Please consider the environment before printing this email.

From: Joe Clement <joe.clement@erm.com>
Sent: Monday, 11 August 2025 2:10 PM
To: Robert Speirs <rob@capitalecology.com.au>

15 July 2025

Lucy Baker
Partner
ERM Australia
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Expert report on the presence of Pink-tailed Legless Lizard *Aprasia parapulchella* habitat in the subject land for the Canyonleigh Battery Energy Storage System project

Capital Ecology project no. 3391

Dear Lucy Baker,

Prepared in accordance with Section 5.3 of the NSW Biodiversity Assessment Method 2020 (BAM), Attachment 1 to this letter provides my expert report on the presence of the Pink-tailed Legless Lizard *Aprasia parapulchella* habitat in the subject land for the Canyonleigh Battery Energy Storage System project.

As outlined in my report, the conclusion of my assessment is that the subject land supports 6.65 ha of likely habitat for *A. parapulchella*.

I trust that this report provides the advice and assessment required. If, however, you should have any questions, please do not hesitate to contact me.

Yours sincerely,



Robert Speirs
Director / Principal Ecologist
BAppSc (Ecology), DipPM, MEIANZ, CEnvP-E, BAM Assessor (No: BAAS17089)
Approved BAM Expert – Striped Legless Lizard, Pink-tailed Legless Lizard, and Golden Sun Moth

Attachments:

Attachment 1. Expert report on the presence of Pink-tailed Legless Lizard *Aprasia parapulchella* habitat in the subject land for the Canyonleigh Battery Energy Storage System project.

Attachment 1. Expert report on the presence of Pink-tailed Legless Lizard *Aprasia parapulchella* habitat in the subject land for the Canyonleigh Battery Energy Storage System project

Citation: Capital Ecology (2025). *Expert report on the presence of Pink-tailed Legless Lizard Aprasia parapulchella habitat in the subject land for the Canyonleigh Battery Energy Storage System project.* Final 01 – 15 July 2025. Prepared for Environmental Resources Management Australia Pty Ltd Authors: R. Speirs and J. Thornberry. Project no. 3391.

1. Overview of the project and relevance of the Pink-tailed Legless-lizard

The Canyonleigh Battery Energy Storage System project (the 'proposed development') involves the construction, operation, and decommissioning of a Battery Energy Storage System (BESS) and associated infrastructure at Brayton, NSW (Lot 2341 DP622834, Lot 12 and Lot 9 DP727493) (the 'project area'). The development footprint (the 'subject land', area = 10.18 ha) (Figure 1 and Figure 2) for the proposed development is situated in the south-west of the aforementioned lots. The subject land is bisected by Canyonleigh Road and is located within the Goulburn Mulwaree Council Local Government Area (LGA) in NSW.

The specifications of the proposed development are outlined in the Scoping Report prepared by Environmental Resources Management Australia (ERM) (2024[1]) on behalf of X-Elio Aus2 Pty Ltd (X-Elio Australia Pty Ltd).

The Pink-tailed Legless-lizard *Aprasia parapulchella* (Kluge 1974) (Pygopodidae) is listed as 'vulnerable' pursuant to both the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and the NSW BC Act. As illustrated in Figure 3, the subject land is located within the area identified as 'Species or species habitat likely to occur' on the layers sourced from the Distribution Map provided on the EPBC Act SPRAT Profile for *A. parapulchella* (Commonwealth of Australia 2025[2]). As summarised in Table 3 and illustrated in Figure 4, the records of the species within 100 km of the subject land are located:

- north-east of Hillcrest Road, Taralga, NSW, located approximately 24 km north-west of the subject land (three records, collected 15/10/2017 and 16/10/2017);
- west of Lake George, NSW, located approximately 83 km south-west of the subject land (two records, collected 27/05/2018 and 07/11/2019);
- east of Bango Lane, Bango, NSW, located approximately 99 km west of the subject land (six records, collected between 09/11/2021 and 11/12/2023).

The species is also identified under the BAM as a 'candidate species' for one NSW Plant Community Type (PCT) identified and mapped by ERM as occurring in the subject land (NSW Government 2025[3]) (Figure 5):

- PCT 3746 – Southern Tableland Snow Gum-Candlebark Shrub Forest = approx. 9.57 ha.

[1] Environmental Resources Management Pty Ltd (2024). *Canyonleigh Battery Energy Storage System – Scoping Report*. Prepared for X-Elio Aus2 Pty Ltd.
[2] Commonwealth of Australian (2025). *Species Profile and Threats Database. Aprasia parapulchella – Pink-tailed Worm-lizard* https://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=1665
[3] NSW Government (2025). As listed on the BioNet Threatened Biodiversity Data Collection (TBDC) profile for Pink-tailed Legless Lizard *Aprasia parapulchella*.

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Personal communications with ERM indicate that a number of areas supporting surface rock within the above candidate PCT were identified as potential habitat for threatened reptiles, including *A. parapulchella*. However, targeted surveys for *A. parapulchella* have not been undertaken within the subject land to date due to targeted survey being removed from the BAM Calculator (BAM-C) as an option for assessing presence/absence for this species.

2. Requirement for expert report

In accordance with section 5.2.5 of the BAM, the BAM Assessor must establish and document in the BDAR whether each candidate 'species credit species[4]' is present on the subject land (or specific vegetation zone). A 'species polygon' must be prepared for each species credit species determined as occurring in the subject land, and this is used to calculate the quantum of offsets required for impacts on the species.

In accordance with section 5.2.4 of the BAM, to determine presence for a development proposal (such as the proposed development), the BAM Assessor must apply one of the following options.

a. *assume the species is present, or*
b. *conduct a threatened species survey, as per Section 5.3, or*
c. *obtain an expert report, as per Box 3, or*
d. *for candidate species including dual credit species, where the TBDC indicates that an important habitat map identifies the species credit component, the assessor must confirm whether the subject land is within an area identified on the important habitat map[5].*

Notwithstanding the above, as noted in Section 1, following an update to the *BioNet Threatened Biodiversity Data Collection* (TBDC) (NSW Government 2025) in October 2024, the NSW Department of Climate Change, Energy, the Environment and Water (NSW DCCEEW) now *'recommends that this species is assessed by expert report due to difficulty in detecting with confidence via survey'*.

In light of the above, ERM have determined that obtaining an expert report prepared in accordance with Box 3 under section 5.3 of the BAM is the most appropriate of the above options. I have prepared this report to address this requirement.

As outlined in Box 3 –

An expert report must set out whether:

a. *the species is unlikely to be present on or use habitat on the subject land, in which case, no further assessment of the species is required, or*
b. *the species is likely to be present on or use habitat on the subject land.*

If the species is likely to be present on or use the subject land, the expert report must:

a. *identify the species or population*
b. *justify the use of an expert report*

[4] Species credit species are threatened species for which vegetation surrogates and/or landscape features cannot reliably predict the likelihood of their occurrence or components of their suitable habitat.
[5] The TBDC does not indicate that an important habitat map identifies the species credit component for *A. parapulchella*.

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c. *justify the likelihood of occurrence of the species or population and prepare a species polygon as per Subsection 5.2.5*

d. *estimate the area of habitat (if the species is assessed by area) or the maximum number of individuals (if the species is assessed by count of individuals) on the subject land. Evidence such as a population estimate from a reference site could be used to justify this estimation*

e. *include the information considered in making this determination*

f. *state the expert's credentials.*

3. Outline of experience in the ecological research, habitat assessment, and survey methods for *A. Parapulchella* (the expert's credentials)

I have worked as a full-time ecological consultant since January 2008. Since July 2010, I have been based in Canberra and specialised on the temperate woodlands and grasslands of the South Eastern Highlands bioregion (NSW and Australian Capital Territory [ACT]). *Aprasia parapulchella* has been a key focus species for my work and research each season since spring 2010, and I have completed more than 100 projects across this region involving *A. parapulchella* habitat assessment, targeted surveys, and/or species/habitat conservation plans. I have undertaken many of the large-scale *A. parapulchella* surveys, habitat mapping, and monitoring projects commissioned by the ACT Government since spring 2010. I have also completed targeted surveys and/or habitat assessments at many sites in the Queanbeyan-Palerang, Yass Valley, Goulburn Mulwaree, and Snowy Monaro LGAs.

I have been an active member of numerous working groups and advisory panels convened by the Commonwealth Government and the ACT Government regarding threatened grassland and woodland fauna, notably including for threatened grassland reptiles. I am currently a member of the ACT Government's Expert Working Group established to explore the functional connectivity requirements for grassland reptiles in the ACT.

I have been engaged by the Commonwealth Department of Climate Change, Energy, the Environment and Water (Cwth DCCEEW) to run field classes for the department's EPBC Act assessment officers on the recognition and assessment of EPBC Act listed species and communities, including for *A. parapulchella*. I have also presented on *A. parapulchella* at professional forums and am regularly sought by many of the prominent government and private development projects in the region to provide survey and assessment services, peer review, and/or an advisory role relating to *A. parapulchella* and other threatened species. As part of my studies at Googong Township since 2010, I have led several springtime community engagement walks in the 54 ha Googong Township Pink-tailed Worm-lizard Conservation Area.

In recognition of the above, I was approved on 3 September 2024 by the NSW DCCEEW as a species expert for *A. parapulchella* in accordance with section 5.3 of the BAM.

4. Pink-tailed Legless Lizard – species overview

The Pink-tailed Legless Lizard *Aprasia parapulchella* (Kluge, 1974) is listed as 'vulnerable' pursuant to both the Commonwealth EPBC Act and the NSW BC Act. *Aprasia parapulchella* is a member of the family Pygopodidae, a group of lizards that lack forelimbs and have hind limbs reduced to small vestigial flaps (Cogger 2014[6]). *Aprasia parapulchella* is a small, fossorial (living primarily, but not exclusively,

[6] Cogger H.G. (2014). *Reptiles and amphibians of Australia, 7th Edition*. CSIRO Publishing.

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underground) reptile, characterised by its grey-brown to pale grey body coloration and pink to reddish-brown tail (Wong et al. 2011[7]).

4.1 Distribution

Aprasia parapulchella occurs over a broad but fragmented distribution west of the great diving range throughout NSW, Victoria, and the Australian Capital Territory (ACT). In NSW, the species' distribution is particularly patchy with apparently isolated populations occurring in the Central Tablelands, Southern Tablelands, Northern Tablelands, and South Western Slopes (Commonwealth of Australia 2015[8]) (refer to Figure 3). *Aprasia parapulchella* occurs within a broad elevation range, with populations recorded from 180 m ASL (above sea level) near Bendigo, Victoria to 815 m ASL in South Canberra, ACT (Wong et al. 2011).

In the ACT and the Southern Tablelands of NSW, the distribution of *A. parapulchella* appears to be restricted to areas of suitable lithology and rock cover, where substantial vegetation disturbance (e.g. pasture improvement, urban development etc.) has not occurred, likely owing somewhat to the presence of these protective landscape features. Due to a substantially lower degree of survey effort and research undertaken into the distribution of *A. parapulchella* in the Central Tablelands of NSW, there is less known about the factors influencing the distribution of the species in this region (Wong et al. 2011). However, given the broad climatic, geologic, and vegetation similarities between eastern portions of the Central Tablelands of NSW and the ACT, it is likely that the habitat requirements influencing the distribution of the species in these areas are relatively similar.

The habitat requirements influencing the distribution of *A. parapulchella* are not necessarily consistent across its known range, however, with populations known to occur in areas on the Hay Plain in south west NSW where there is little to no surface rock (Michael 2013[9]) and populations occurring near West Wyalong in western NSW within mallee shrubland vegetation communities (Jones 1999[10]).

4.2 Habitat

As above, the habitat requirements of *A. parapulchella* are highly variable across its range. In the ACT and NSW Southern Tablelands, the primary habitat of the species is broadly described as treeless or sparsely treed vegetation communities associated with well-drained mid-slopes or hilltops characterised by a high cover of scattered (e.g. lightly or non-embedded) rocks, usually of volcanic origin (Commonwealth of Australia 2015). Sites within which *A. parapulchella* is most abundant are usually dominated by native, disturbance-sensitive grass species such as Kangaroo Grass *Themeda triandra*, and to a lesser extent Purple Wiregrass *Aristida ramosa* and Barbed-wire Grass *Cymbopogon refractus* (Wong et al. 2011, Jones 1999), likely owing to dominance of this species assemblage indicating a low degree of past vegetation disturbance within the given site. The species is unlikely to be found in areas in which a high degree of past vegetation/soil disturbance is evident, such as pasture improved areas or stock camps (Osborne 1993, Wong et al. 2011). As a specialist predator of ant brood, *A. parapulchella* is strongly associated with a number of ant species, often being detected under rocks also occupied by ants or in close proximity to active ant burrows (Wong et al. 2011).

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[7] Wong, D., Jones, S., Osborne, W., Brown, G., Robertson, P., Michael, D., & Kay, G. (2011). *The life history and ecology of the Pink-tailed Worm-lizard Aprasia parapulchella Kluge–a review*. Australian Zoologist, *35*(4), 927-940.
[8] Commonwealth of Australia (2015). *Conservation Advice – Aprasia parapulchella – Pink-tailed Worm-lizard*. Commonwealth Department of Climate Change, Energy, the Environment, and Water.
[9] Michael, D. and Herring, M. (2013). *Unexpected records of the pink-tailed worm lizard Aprasia parapulchella (Pygopodidae) in chenopod shrubland, Hay region, NSW*. Herpetofauna 43(1):14-17.
[10] Jones, S. R. (1999). *Conservation biology of the Pink-tailed Legless Lizard Aprasia parapulchella* (Doctoral dissertation, University of Canberra).

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5. Methods

With regard to the *A. parapulchella* distribution and habitat characteristics, the 'key elements' that define the likelihood that *A. parapulchella* occurs in a given site[11] (i.e. the subject land) are as follows.

1. Element 1 – Is the subject land located within the known geographical distribution of *A. parapulchella* (i.e. does it occur in an Interim Biogeographic Regionalisation for Australia [IBRA] subregion that the species is known to occur in)?

   If yes, proceed to Element 2.

2. Element 2 – Does the subject land support one or more of the PCTs within which *A. parapulchella* is known/predicted to occur in (i.e. a PCT for which the species is listed as a 'candidate species' under the BAM)?

   If yes, proceed to Element 3.

3. Element 3 – Does the subject land support appropriate lithology? That is, rock type/s consistent with those known or predicted to support *A. parapulchella* in the subject region.

If the answer to Element 3 is in the affirmative, then the key elements that define the likelihood that *A. parapulchella* occurs in a given area (polygon) of the subject land are as follows.

4. Element 4 – Does the area have ≥ 1% cover of suitable habitat rocks[12] of appropriate lithology?

   If yes, proceed to Element 5.

5. Element 5 – Does the area currently[13] have ≤ 50% opaque crown cover (roughly equal to 25% projected foliage cover [PFC])?

   If yes, proceed to Element 6.

6. Element 6 – Does the area have a ≥ 1% cover of a low/moderate disturbance-sensitive C4 grass species in the understorey? (e.g. *Themeda triandra*, *Bothriochloa macra*, *Cymbopogon refractus*, *Sorghum leiocladum*)

   If yes, proceed to Element 7.

7. Element 7 – Does the area have a composition score (determined via the BAM Calculator) ≥ the nominal threshold[14] for the Vegetation Class.

[11] Armstrong, R., O'Rourke, N., Speirs, R., Terry, W., Simpson, S., Michael, D. (in preparation). *Developing habitat descriptors for a threatened cryptic pygopod to determine potential habitat under the NSW Biodiversity Offset Scheme in Australia*.

[12] Suitable habitat rocks are generally between 10 centimetres (cm) and 30 cm in width and 5 cm to 15 cm thick. There is often a preference for flat, plate-like rocks, rather than spherical boulder-like rocks. The strong preference for rocks of volcanic origin is well documented in some areas of the distribution of *A. parapulchella*, however it is not known whether this is so across the species' entire distribution.

[13] Assessed based on the current crown cover rather than the likely crown cover of the relevant PCT in an intact, remnant form. This is necessary to capture areas of 'derived' forms of the PCT which have a crown cover less than typical of the PCT and which are thereby characteristically suitable as *A. parapulchella* habitat (e.g. derived native grassland resulting from past clearance of the remnant canopy of woodland or forest).

[14] Nominal thresholds relate to the composition score generated by the BAM-C for a particular mapped vegetation zone. Specific thresholds for vegetation classes are not provided in this instance as the source literature (Armstrong et al. [*in preparation*]) is currently in preparation and is therefore subject to change.

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If the answer to Element 7 is in the affirmative, draw a polygon based on this area, apply a 50 m buffer[15] (constricted to the mapped extent of candidate PCTs), and allocate this combined area as the species polygon for *A. parapulchella* in the subject land as per Subsection 5.2.5 of the BAM (note that there may be one or numerous species polygons mapped within a given subject land).

In accordance with the above, this assessment has followed the below two-step process. Note, it is only necessary to proceed to Step 2 if the answer to Step 1 is in the affirmative.

5.1 Step 1 – Determine whether the subject land supports the key geographic elements necessary for *A. parapulchella* to occur (Elements 1 to 3).

5.1.1 Desktop assessment

The desktop assessment involved compiling and reviewing the technical documents and other resources relevant to the potential for *A. parapulchella* to occur in the subject land. This involved my review of project-specific information and other relevant literature resources, together with the development of a Geographic Information System (GIS) platform to collate, analyse, assess, and display each of the key geographic elements relevant to the potential for *A. parapulchella* occurrence, including the:

- available current aerial imagery;
- PCT and vegetation zone mapping prepared by ERM (2024);
- geology mapping layers from the NSW Seamless Geology Project (NSW Government 2024a[16]);
- geological mapping from the Moss Vale 1:100,000 Geological Sheet 8928 (Trigg, S.G. et al. 2016[17]);
- *A. parapulchella* (and all other Pygopodid species) point data from NSW BioNet; and
- *A. parapulchella* Distribution Map provided on the EPBC Act SPRAT Profile.

5.1.2 Reference site review

Capital Ecology undertook a reference site review of a location of confirmed habitat for *A. parapulchella* in the NSW Southern Tablelands. Reference site reviews are undertaken as a field-based exercise as a first preference, however, where a reference site is inaccessible or it is otherwise considered unnecessary to access the site, the reference site review is undertaken in a 'desktop' capacity using publicly accessible databases and other resources.

As the climatic characteristics and typical vegetation assemblages present within the subject land and those areas of the Southern Tablelands within which I have reliably identified populations of *A. parapulchella* (e.g. Googong, NSW) are broadly similar (e.g. cooler lowland areas characterised by deep soils are generally dominated by a grassy woodland vegetation class dominated by various box and red gum Eucalypt species, grading into a shrubby dry sclerophyll forest vegetation class with increasing

[15] As outlined in the TBDC, the species polygon is to be mapped as the extent of suitable habitat which is defined as rocky areas (or within 50 metres [m] of rocky areas) located within PCTs associated with the species in the TBDC.
[16] NSW Government (2024a). *NSW Seamless Geology Project (version 2.4)*. Department of Primary Industries and Regional Development, May 2024.
[17] Trigg S.J. & Campbell L.M. (2016) *Moss Vale 1:100 000 Geological Sheet 8928*. Geological Survey of New South Wales, Maitland.

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elevation and decreasing soil depth), it was not considered essential to this assessment that a local reference site be inspected in-person prior to undertaking the site visit.

The reference site review is detailed in Section 6.3.

5.1.3 Site inspection

With consideration of the above, on 11 April 2025 and 29 May 2025, I undertook a site inspection of those areas of the subject land identified during the desktop assessment as having the potential to support habitat for *A. parapulchella* (e.g. those areas mapped by ERM as a PCT associated with the species per the NSW TBDC). Each polygon identified as having the potential to support habitat for *A. parapulchella* was inspected on foot.

During this inspection, I conducted a brief assessment of the habitat characteristics relevant to *A. parapulchella* within each inspected polygon and the broader landscape where appropriate. Where potential habitat was identified within the subject land, an estimated habitat polygon was recorded via markup of an orthorectified aerial image and a short description of the following landscape and vegetation attributes relevant to *A. parapulchella* were taken:

- observed, or apparent, lithology;
- landscape position;
- vegetation condition, including potential historic land use (where relevant);
- dominant lower stratum flora species; and
- vegetation structure.

The overall habitat quality was estimated for each habitat polygon recorded based on the above attributes.

5.2 Step 2 – Assess the subject land to determine and map the portions of the subject land that are likely *A. parapulchella* habitat (Elements 4 to 7).

As described above, on 11 April 2025 and 29 May 2025 I inspected the subject land. During this inspection, I assessed the habitat characteristics relevant to *A. parapulchella* within each inspected area and the broader subject land.

6. Results

6.1 Literature review

As outlined in Section 5.1, I undertook a review of a selection of relevant literature regarding the known habitat requirements of *A. parapulchella* prior to attending the subject land. A brief summary of the resources reviewed is included below as Table 1.

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Table 1. Literature review summary

Author(s) (year)	Study title	Key findings of relevance to habitat requirements of *A. parapulchella*
Osborne, W.S. et al. (1991)	*Distribution and conservation status of the endangered Pink-tailed Legless Lizard Aprasia parapulchella (Kluge) – Research report 5*	- *A. parapulchella* is fossorial species and there is a strong correlation between the habitation of a number of ant species and *A. parapulchella* within microhabitat features. - Within the ACT, the species typically inhabits moderate to steep slopes ranging from 3° to 15° and is apparently less abundant on slopes with a southern aspect. - The species is usually found underneath small rocks (<500cm^2 basal area), and occasionally beneath logs. - The species appears to be strongly associated with sites supporting a high cover of Kangaroo Grass, and to a lesser extent, other native tussock-forming grasses. However, exotic tussock-forming grasses were found to dominate the groundstorey at some sites at which the species persists. - The species appears to be absent from sites subject to intensive stock grazing and soil nutrification (e.g. stock camps).
Jones, S.R. (1999)	*Conservation biology of the Pink-tailed Legless Lizard Aprasia parapulchella* (Doctoral dissertation)	- Vegetation associations differ substantially across the range of the species. However, *A. parapulchella* is a specialist of grassy areas supporting scattered rock. - The species usually does not occur in areas supporting a cover of trees and/or tall shrubs. - Rocks utilised by the species are generally between 100 mm – 150 mm wide, 120 mm – 220 mm long, and 50 mm to 150 mm thick.
Wong, D. et al. (2011)	*The life history and ecology of the Pink-tailed Worm-lizard Aprasia parapulchella Kluge–a review*	- The species is strongly associated with landscapes supporting numerous lightly embedded surface rocks and open native vegetation dominated by grasses and shrubs, with some regional variation. - The species is unlikely to occur in areas that have undergone substantial historical groundstorey disturbance, such as pasture improved sites and stock camp areas. - Geological and soil type associations vary across the species' range, and includes volcanics, quartz sandstone, and metasediments.
Osborne, W.S. and Wong, D. (2013)	*The Extent and Habitat of the Vulnerable Pink-tailed Worm Lizard (Aprasia Parapulchella) in the West Belconnen-Ginninderra Creek Investigation Area: Confirmatory Distribution Surveys and Mapping*	- Potential habitat is defined as those areas supporting a cover of partially embedded rocks of appropriate size and volcanic origin, sparse tree cover, and native groundstorey supporting predominately native graminoids, particularly Kangaroo Grass, Red-leg Grass *Bothriochloa macra*, Mat-rush *Lomandra filiformis*, Purple Wire Grass, and Barbed-wire Grass. Areas supporting appropriate rock cover over a groundstorey dominated by more disturbance tolerant native grass species such as Speargrasses *Austrostipa spp*. and/or Wallaby Grasses *Rytidosperma spp*. may also constitute potential habitat. - Low quality potential habitat is defined as those areas supporting a cover of partially embedded rocks of appropriate size and volcanic origin that have undergone substantial disturbance such as intensive stock grazing, soil erosion, soil nitrification etc. This includes areas identified as former sheep camps etc.

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6.2 Desktop assessment of the subject land

As described in Section 5.1, I undertook a detailed desktop assessment of a number of resources relevant to the subject land prior to completing my site visit. The results of this assessment are detailed below.

Analysis of recent aerial imagery

As described in Section 1, and illustrated in Figure 1 and Figure 2, the subject land occupies approximately 10.18 ha and is bisected by Canyonleigh Road, with the northern boundary of the subject land being positioned directly south of the Marulan 330kV substation. It is evident through analysis of recent and historical aerial imagery that much of the subject land has undergone substantial canopy and midstorey vegetation clearance; however, no obvious indicators of recent substantial disturbance of the groundstorey (e.g. through cultivation, ploughing, cropping etc.) were observed. It is also evident through analysis of landscape position and elevation that parts of the subject land are likely to have been occupied by a dry sclerophyll forest and/or grassy woodland vegetation formation prior to European occupation.

Analysis of PCT and vegetation zone mapping

As illustrated in Figure 5, ERM has undertaken detailed PCT and vegetation zone mapping consistent with the requirements of the BAM throughout the subject land and wider project area. In the context of an expert report prepared under the BAM, the PCT and vegetation zone mapping is primarily used to refine the area of potential habitat for *A. parapulchella* within the subject land by identifying those PCTs and IBRA subregions within which the species is identified as a candidate species as per the BAM-C and the NSW TBDC[18]. This step of the desktop assessment aligns with Element 1 and Element 2 of the assessment process described in Section 4. The results of this analysis are displayed in Table 2.

Table 2. Plant community type association with *A. parapulchella* (NSW TBDC)

PCT ID	PCT Name	PCT identified in the subject land	*A. parapulchella* identified as a candidate species
			IBRA Subregion = Bungonia
3373	Goulburn Tableland Box-Gum Grassy Forest	**No – project area only**	
3746	Southern Tableland Snow Gum-Candlebark Shrub Forest	**Yes**	**Yes**
4063	Central and Southern Tableland River Oak Forest	**Yes**	**No**

Analysis of geological mapping relevant to the subject land

As illustrated in Figure 6, a polygon depicting the subject land was overlaid on the NSW Seamless Geology Map (NSW Government, 2024a) to determine the dominant geological formations represented within the subject land. This exercise, although not directly used to refine the area of potential habitat for *A. parapulchella* within the subject land, provides a broad insight into the potential habitat value of the subject land and wider locality by identifying those lithologies known to be compatible with the lifecycle of the species in the relevant IBRA region/subregion. The results of this analysis were largely as expected, with much of the site being mapped within rock units characterised by granite and

[18] NSW Government (2025). *Threatened Biodiversity Data Collection – Aprasia parapulchella – Ecological Data*. NSW Department of Climate Change, Energy, the Environment, and Water.

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granodiorite. A small area in the west of the subject land is mapped as an additional rock unit characterised by residual sedimentary deposits.

Analysis of NSW BioNet point data for *A. parapulchella*

The nearest records of *A. parapulchella* to the subject land (within 100 km) are summarised below in Table 3 and illustrated in Figure 4.

Table 3. Summary of nearby records of *A. parapulchella*

Sighting Key	Common name *Scientific name*	Date	Location description	Easting	Northing	Accuracy
SJJSI0974395	Pink-tailed Legless Lizard *Aprasia parapulchella*	16/10/2017	Taralga, NSW	764637	6183932	10 m
SJJSI0974396		15/10/2017		764346	6183669	10 m
SJJSI0974397		16/10/2017		764569	6183655	10 m
SJJSI0677825		27/05/2018	West of Lake George, NSW (Lake George Escarpment)	714145	6113064	10 m
SPJGI6178948		07/11/2019		714131	6113083	10 m
SDFKI0039981		09/11/2021	Bango Lane, Bango, NSW	682644	6150358	10 m
SDFKI0039982				682658	6150364	10 m
SDFKI0039983				682644	6150361	10 m
SDFKI0039984		10/11/2021		682175	6150617	10 m
SDFKI0290667		11/12/2023		682148	6150591	20 m
SDFKI0290669			Cooks Hill Road, Bango, NSW	682030	6150942	20 m

Analysis of the EPBC Act distribution map for *A. parapulchella*

As illustrated in Figure 3, a polygon depicting the subject land was overlaid on the *A. parapulchella* distribution map provided within the EPBC Act SPRAT Profile[19] to determine whether the subject land is located within the known distribution area of the species. As shown in Figure 3, the subject land is located within the 'likely' distribution area for *A. parapulchella*.

6.3 Reference site review

The purpose of reviewing a local reference site for *A. parapulchella* is to assess the relevant characteristics of the habitat where the species has been confirmed to occur in the region, thereby providing a reference to which any potential habitat in the subject land may be compared.

Preliminary investigations of public databases and relevant publically accessible consultant reports (EcoLogical, 2016[20]) indicate that the nearest reference site to the subject land, located at Taralga, NSW, supports vegetative and lithological features (e.g. shrubby wet sclerophyll forest vegetation over basaltic lithology) that are not broadly comparable to those observed within the subject land.

[19] Commonwealth of Australia (2025). *Aprasia parapulchella* – Pink-tailed Legless Lizard SPRAT profile. Commonwealth Department of Climate Change, Energy, the Environment, and Water.
[20] EcoLogical Australia (2016). *Grassland Reptile Survey – Taralga Wind Farm*. Prepared for Taralga Wind Farm Pty Ltd and CWP Renewables.

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Additionally, only limited information is available via standard database searches for the next two nearest reference sites at Lake George, NSW and Bango, NSW. As such, completion of a reference site review of either site would be of limited use for the purpose of this assessment.

With regard to the above, it is considered appropriate that a surrogate reference site known to support similar vegetative and lithological attributes to those observed within the subject land is investigated for the purpose of this assessment. The reference site selected for this review is located at Googong, NSW, situated approximately 115 km south-west of the subject land. A description of this reference site is included below as Section 6.3.1.

6.3.1 Googong, NSW reference site

The Googong, NSW reference site is located approx. 115 km south-west of the subject land within an established conservation area at the eastern edge of the Googong Township. Habitat features of relevance to this reference site are described in detail in the Googong Township Pink-tailed Worm-lizard Protection and Management Plan (Capital Ecology, 2019[21]), and are summarised below.

1. The area within which extensive *A. parapulchella* habitat occurs at the Googong, NSW reference site has been identified by Capital Ecology (2019) as supporting a largely native understorey dominated by Kangaroo Grass and other disturbance sensitive native grass species (Plate 1). This area is also characterised by a moderate – high forb diversity, owing to limited historical grazing pressure and the exclusion of pasture improvement activities such as application of fertilisers and sowing of exotic pasture grasses.

2. The geology of the area primarily consists of Silurian volcanics, and includes tuffs with minor occurrences of siltstone, shale, sandstone, and limestone, and visible outcropping of granite/granodiorite (Plate 2).

3. The above information provides a broad description of confirmed habitat for the species in an area of the Southern Tablelands characterised by similar vegetation assemblages, historic land management practices and lithology to that observed within the subject land, and sets out an appropriate reference to which potential *A. parapulchella* habitat within the subject land may be compared.

[21] Capital Ecology (2019). *Pink-tailed Worm-lizard Protection and Management Plan – Version 6*. October 2019. Prepared for Googong Township Pty Ltd. Authors: A. Vincent and R. Speirs. Project no. 2832.

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Plate 1. Example photograph of high quality A. parapulchella habitat at the Googong, NSW reference site.



Plate 2. Example photograph of typical lithology observed at the Googong, NSW reference site.

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6.4 Classification of potential *A. parapulchella* habitat within the subject land

As described in Section 5.1, I undertook a site inspection of those areas of the subject land identified through the desktop assessment as having the potential to support likely habitat for *A. parapulchella*. With reference to the habitat requirements of *A. parapulchella* identified and discussed in Section 6.1 and Section 6.2, per the standard habitat classification methodology employed by Capital Ecology for the species, I classified potential habitat as being of very low, low, low – moderate, moderate, or high quality. The factors considered in assessing the quality of potential habitat for *A. parapulchella* within the subject land included:

- mapped Plant Community Type;
- presence of loose surface rock;
- type, predominate size, and estimated cover of surface rock;
- vegetation structure (including climax [pre-1788] structure of derived grasslands and shrublands) and landscape connectivity of relevance to *A. parapulchella*; and
- vegetation condition, including evidence of substantial recent understorey disturbance incompatible with the life cycle of *A. parapulchella* (e.g. nutrification from stock camps, heavily grazed areas, soil erosion, and recent/historic pasture improvement).

The results of the habitat assessment are illustrated in Figure 7 and summarised below in Table 4.

Table 4. Classification of potential *A. parapulchella* habitat within the subject land

Habitat class	Habitat description	Example photograph
High	Patches identified as 'high' quality potential habitat are broadly comparable to the *A. parapulchella* habitat described by Capital Ecology (2019) at Googong, NSW. Patches are characterised by extensive scattered (i.e. not embedded) rock of volcanic origin (e.g. granite) over a predominately native groundstorey dominated by disturbance sensitive native grass species such as Kangaroo Grass and Red-leg Grass. These areas support a moderate to high diversity of native non-grass understorey species including Clustered Everlasting *Chrysocephalum apiculatum*, Rock Fern *Cheilanthes sieberi*, and Small St Johns Wort *Hypericum gramineum*. Canopy and midstorey cover is typically sparse to absent.	
Moderate	N/A – Not identified in subject land	N/A – Not identified in subject land
Low - Moderate		
Low		
Very low		

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6.5 Step 1 – Determine whether the subject land supports the key geographic elements necessary for *A. parapulchella* to occur (Elements 1 to 3).

Table 5. Assessment of whether the subject land supports the key geographic elements necessary for *A. parapulchella* to occur (Elements 1 to 3)

Canyonleigh BESS Subject Land	
Element 1 – Is the subject land located within the known geographical distribution of *A. parapulchella* (i.e. does it occur in an IBRA subregion that the species is known to occur in)?	**Yes**, the subject land is located: 1. in the area mapped as 'Species or species habitat likely to occur' on the EPBC Act Protected Matter Search Tool (PMST) (Commonwealth of Australia 2025) Distribution map for *A. parapulchella*; 2. in the Bungonia IBRA subregion, a subregion within which *A. parapulchella* is known to occur; and 3. approximately 24 km south-east of the nearest record of *A. parapulchella*.
If yes, proceed to Element 2.	
Element 2 – Does the subject land support one or more of the PCTs within which *A. parapulchella* is known/predicted to occur in (i.e. a PCT for which the species is listed as a 'candidate species' under the BAM)?	**Yes**, *A. parapulchella* is identified as a 'candidate species' under the BAM for one NSW PCT which has been identified and mapped by ERM as occurring in the subject land (Figure 5). • PCT 3746 – Southern Tableland Snow Gum-Candlebark Shrub Forest = approx. 9.57 ha.
If yes, proceed to Element 3.	
Element 3 – Does the subject land support appropriate lithology? i.e. rock type/s consistent with those known or predicted to support *A. parapulchella* in the subject region.	**Yes**. During my site inspection, I found the subject land to primarily support igneous rock types such as granite. As illustrated in Figure 6, the observed lithology is broadly consistent with the rock units mapped within the subject land by the NSW Seamless Geology Map (NSW Government 2024a) as: • Pleasant Hill Granite - described as '*Coarse to very coarse-grained holocrystalline equigranular biotite-hornblende granite to granodiorite.'* • Residual deposits – described as '*A weakly-consolidated regolithic residuum such as soil or saprolite mostly developed in-situ as a result of advanced weathering and/or pedogenesis.'* Those areas identified as potential *A. parapulchella* habitat within the subject land closely align with the 'Pleasant Hill Granite' rock unit mapped by the NSW Seamless Geology Map within and surrounding the subject land. This lithology type is broadly known to support *A. parapulchella* habitat in the South-eastern Highlands IBRA Bioregion.
If yes, proceed to Element 4. Otherwise, no further assessment required.	

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6.6 Step 2 – Assess the subject land to determine and map the portions of the subject land that are likely *A. parapulchella* habitat (Elements 4 to 7).

Table 6. Assess the subject land to determine and map the portions of the subject land that are likely *A. parapulchella* habitat (Elements 4 to 7).

Canyonleigh BESS Subject Land	
Element 4 – Does the area have ≥ 1% cover of suitable habitat rocks of appropriate lithology?	**Yes** – areas identified as likely habitat have ≥ 1% cover of suitable habitat rocks of lithology identified as being suitable for *A. parapulchella* within the South-eastern Highlands bioregion (Granite).
If yes, proceed to Element 5.	
Element 5 – Does the area currently have ≤ 50% opaque crown cover (roughly equal to 25% projected foliage cover)?	**Yes** – areas identified as likely habitat have ≤ 50% opaque crown cover.
If yes, proceed to Element 6.	
Element 6 – Does the area have a ≥ 1% cover of a low/moderate disturbance-sensitive C4 grass species in the understorey? (e.g. Themeda, Bothriochloa, Cymbopogon, Sorghum).	**Yes** – areas identified as likely habitat have ≥ 1% cover of a low/moderate disturbance-sensitive C4 grass species in the understorey, namely Kangaroo Grass and Red-leg Grass.
If yes, proceed to Element 7.	
Element 7 – Does the area have a composition score (determined via the BAM Calculator) ≥ the nominal threshold for the Vegetation Class (Armstrong, [*in preparation*]). If the answer to Element 7 is in the affirmative, draw a polygon based on this area, apply a 50 m buffer (constricted to the mapped extent of candidate PCTs), and allocate this combined area as the species polygon for *A. parapulchella* in the subject land as per Subsection 5.2.5 of the BAM (note that there may be one or numerous species polygons mapped within a given subject land).	**Yes** – the following vegetation zones mapped by ERM (refer to Figure 5) have a composition score ≥ the nominal threshold[11,14] for the Dry Sclerophyll Forest vegetation class: • PCT3746 VZ3 (Woodland) • PCT3746 VZ5 (Shrubland) • PCT3746 VZ6 (Planted Natives) • PCT3746 VZ7 (Highly Disturbed) Although VZ4 (Grassland) returned a composition score lower than the nominal threshold for the Dry Sclerophyll Forest vegetation class, I observed that those areas of PCT3746 VZ4 that support a suitable cover of surface rock for *A. parapulchella* do support a level of floristic diversity beyond that reflected by the composition score generated by the BAM plot data collected within this vegetation zone. As such, for the purpose of this assessment, it is my assessment that PCT3746 VZ4 does support likely habitat for *A. parapulchella* despite having a composition score lower than the nominal threshold for the Dry Sclerophyll Forest vegetation class.

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7. Conclusion

Following the seven element assessment process detailed in Section 6.5 and Section 6.6, I have prepared the *A. parapulchella* species polygon layer for the subject land. I have determined that the subject land supports a total area of 6.65 ha of likely habitat for *A. parapulchella*, as illustrated in Figure 7 and as provided to ERM as a GIS shapefile.

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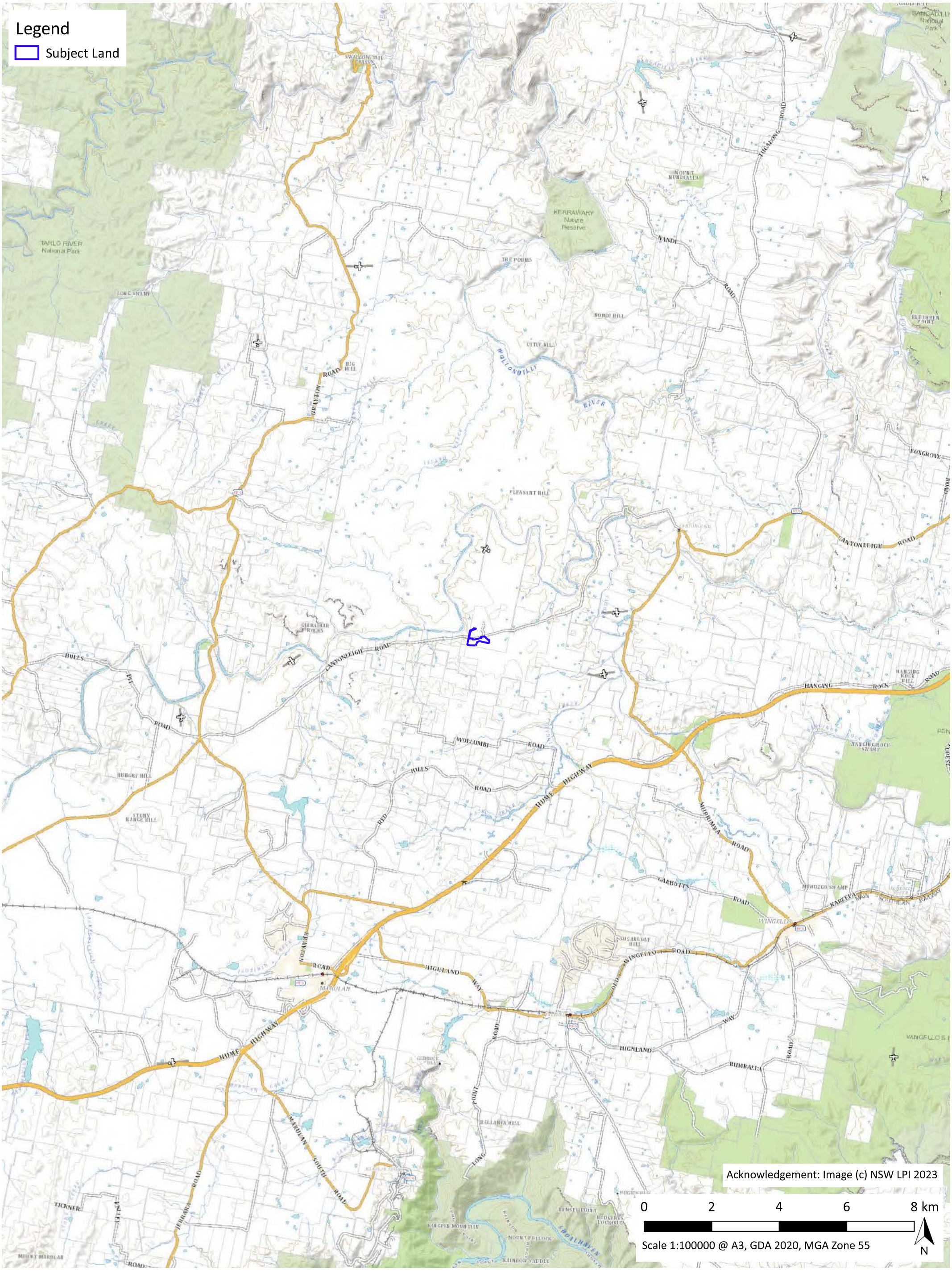


Figure 1. Locality Plan

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Drawn by: Jarmin Thornberry
Date: 03/07/2025



Figure 2. The Subject Land on Recent Aerial Imagery

Capital Ecology Project No: 3391
Drawn by: Jarmin Thornberry
Date: 03/07/2025

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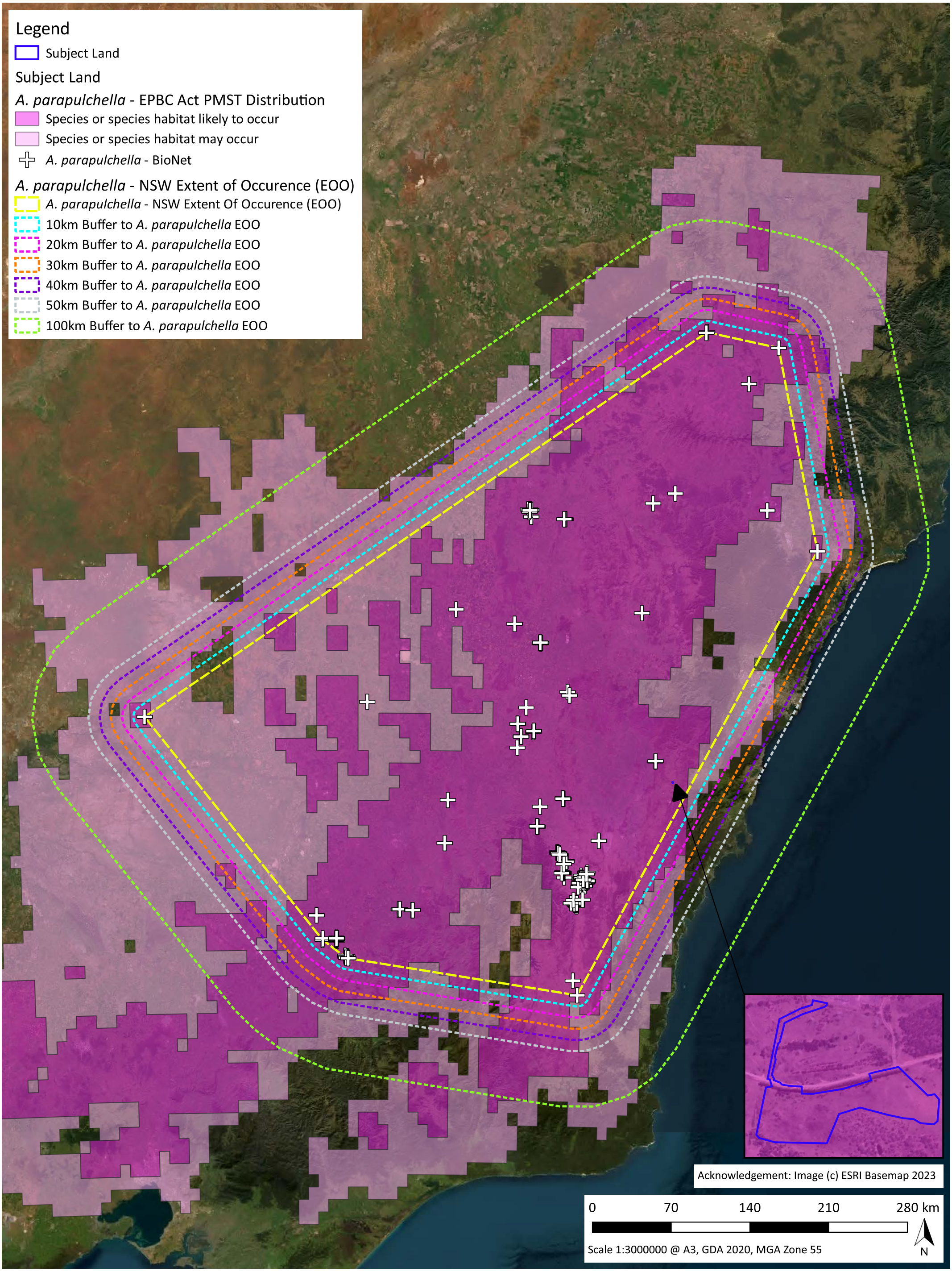


Figure 3. Pink-tailed Legless Lizard - NSW Records and Extent of Occurrence

Capital Ecology Project No: 3391
Drawn by: Jarmin Thornberry
Date: 03/07/2025

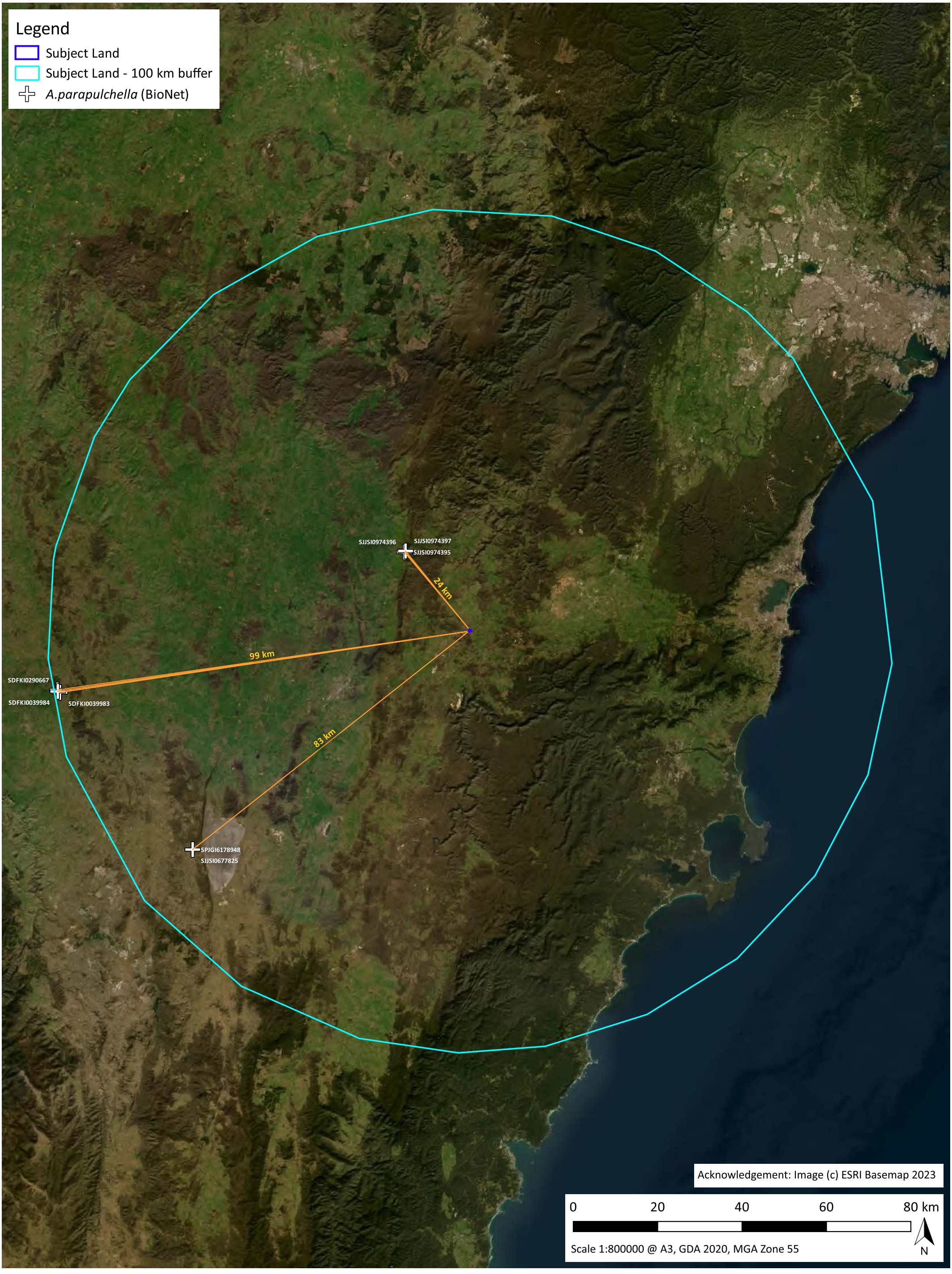


Figure 4. Pink-tailed Legless Lizard - NSW Records within 100 km of the Subject Land

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Drawn by: Jarmin Thornberry
Date: 03/07/2025

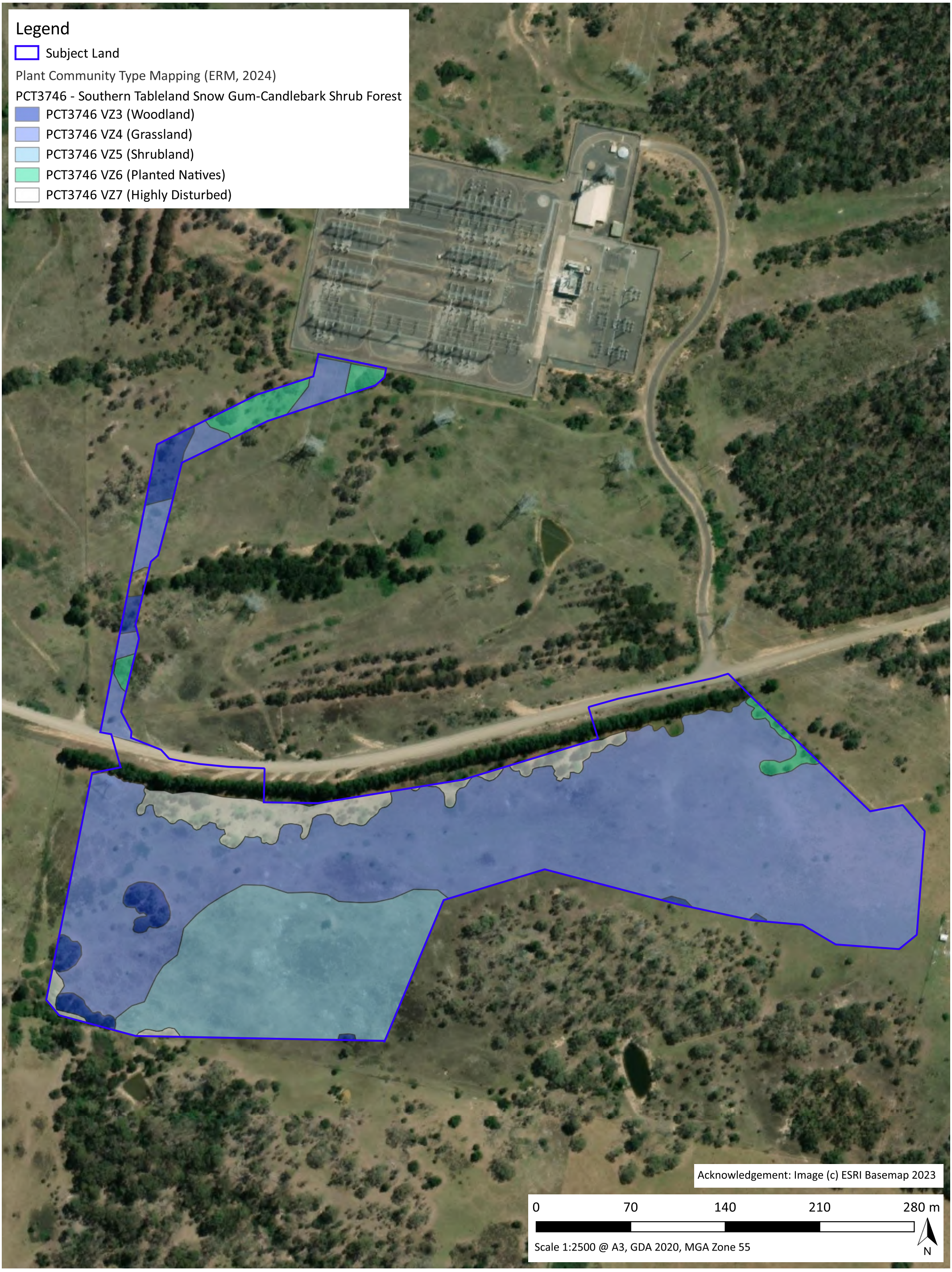


Figure 5. Candidate Plant Community Type for Pink-tailed Legless Lizard and Associated Vegetation Zone Mapping

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Figure 6. Dominant Lithology Mapping

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Date: 03/07/2025

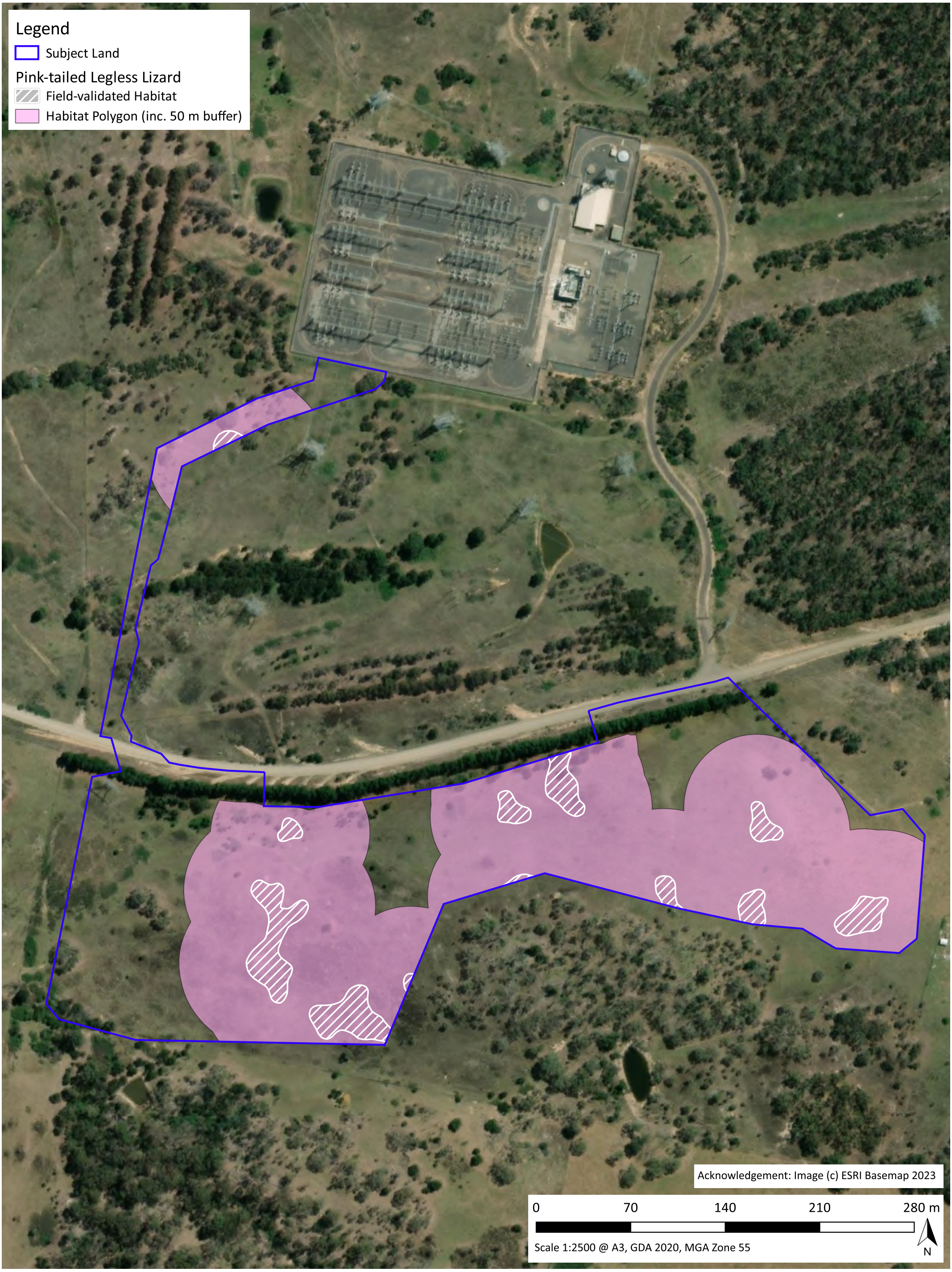


Figure 7. Pink-tailed Legless Lizard Habitat Assessment

Capital Ecology Project No: 3391
Drawn by: Jarmin Thornberry
Date: 03/07/2025

APPENDIX F EXPERT REPORT (*PHASCOGALE TAPOATAFA*) (E&II, 2025)

Natasha Smith

From: Rodney van der Ree <rvdr@unimelb.edu.au>
Sent: Saturday, 6 September 2025 5:36 PM
To: Joe Clement; Lucy Baker; Mark Shepherd
Cc: Sophie Butcher; Claire Hewitt; Matt Davis; Natasha Smith
Subject: Re: Canyonleigh BESS preliminary project layout

You don't often get email from rvdr@unimelb.edu.au. Learn why this is important

EXTERNAL MESSAGE

Hi Joe,

I have skimmed the road using google earth street view and looked at your photos and the HBT data and it is my opinion that none of the area along the road is likely to be phascogale habitat or support the species.

Regards

Rod

Dr Rodney van der Ree

Director and Principal Ecologist



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School of BioSciences

The University of Melbourne

Species Expert Report
Brush-tailed Phascogale
Canyonleigh BESS



8 July 2025

Prepared for
ERM

By Rodney van der Ree
Ecology & Infrastructure
International Pty Ltd.

ECOLOGY &
INFRASTRUCTURE
INTERNATIONAL

Rodney van der Ree (8 July 2025).
Species Expert Report. Brush-tailed Phascogale. Canyonleigh BESS
Report for ERM.
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Version Control

Date	Version	Reviewed by	Approved by	Issued to	Notes
5 April 2025	RevA	C. van der Ree	R. van der Ree	Sophie Butcher	
19 May 2025	RevB	C. van der Ree	R. van der Ree	Sophie Butcher	
19 June 2025	RevC	C. van der Ree	R. van der Ree	Sophie Butcher	
8 July 2025	RevD	C. van der Ree	R. van der Ree	Sophie Butcher	

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1 Introduction

1.1. Project location and description

X-Elio Aus2 Pty Ltd (X-Elio) is constructing a Battery Energy Storage System (BESS) (the Project) in Canyonleigh, NSW (Figure 1). The Project will Involve the construction and operation of a BESS with a targeted electricity generating capacity of up to 300 MW and 1,200 MWh storage capacity.

ERM Australia are preparing the Biodiversity Development Assessment Report (BDAR) for the proposed BESS for X-Elio.

The proposed BESS occurs within the geographic range of the Brush-tailed Phascogale (*Phascogale tapoatafa)* and comprehensive surveys for the species according to the Biodiversity Assessment Method (BAM) were not able to be completed due to timing constraints as well as the large area of subject land and the intensive survey requirements specified in the BAM.

ERM Australia engaged Ecology and Infrastructure International Pty Ltd to prepare a species expert report for the Brush-tailed Phascogale for the site of the proposed BESS.

The Project sits within a 98.11 hectare site as shown by the Project Boundary in Figure 2. The actual impact location is a much smaller area within the south-east corner of the Project Boundary, termed the Development Footprint (i.e. subject land), which is approximately 10.18 ha in size. The subject land includes two areas on opposite sides of Canyonleigh Rd (referred to as the northern and southern blocks) and has been positioned to largely encompass already-cleared areas.

The subject land for this Expert Report is restricted to the Development Footprint, as this is the area where the impacts are limited to.

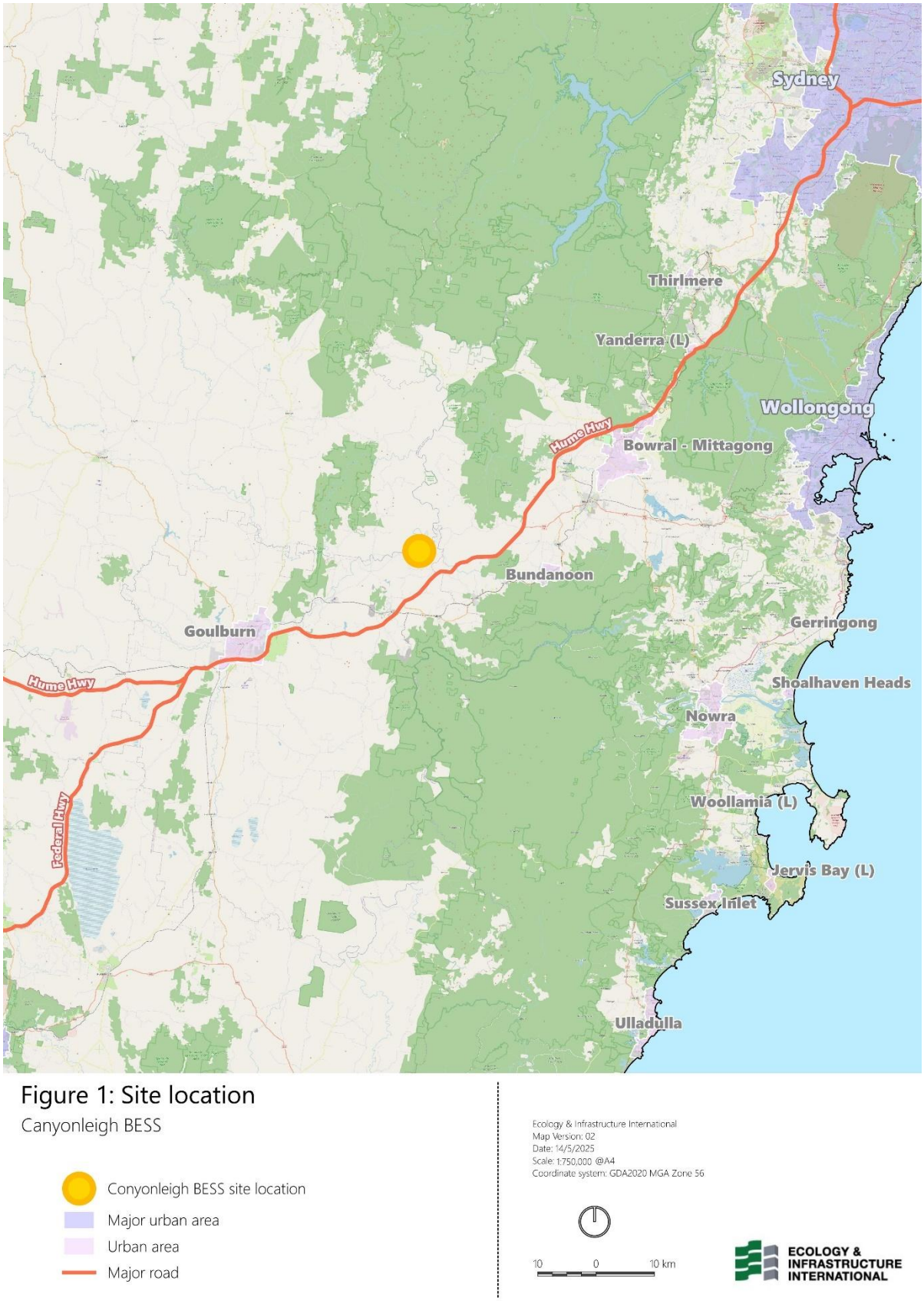


Figure 1. Location of the proposed BESS in Canyonleigh, NSW.

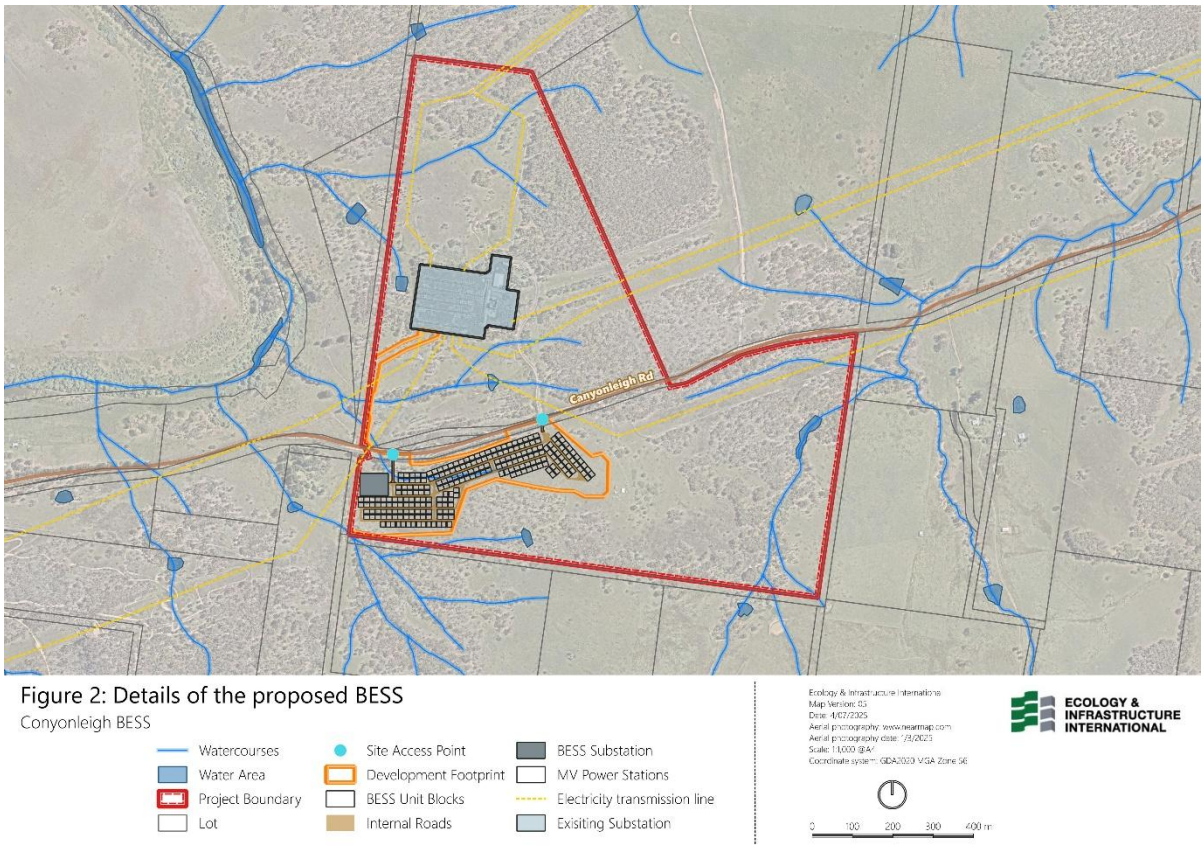


Figure 2. Details of the proposed BESS in Canyonleigh, NSW.

1.2 Justification of use of an Expert Report

The Biodiversity Assessment Method (BAM) in Box 3 (DPIE, 2020) states that 'An expert report can be used instead of a species survey for all proposals to determine whether a species is present or not present on the subject land. Where an assessor assumes the species is present (except for a proposed biodiversity stewardship site), an expert report may be used to determine the location and area of fauna/flora habitat for the species polygon, and the estimated number of individuals of the flora species.'

An expert report was commissioned to assess the likely presence of the Brush-tailed Phascogale within the subject land. Limited targeted surveys were undertaken for the Brush-tailed Phascogale in January and February 2025, however it was insufficient to confidently determine presence or absence. An expert report was undertaken to address gaps in the targeted fauna survey effort and conclude the presence or absence of the Brush-tailed Phascogale from the subject land.

1.3 Species expert credentials

The Biodiversity Assessment Method (BAM) in Box 3 (DPIE 2020) states that 'an expert report can only be prepared by a person who, in the opinion of the Secretary

of the Department or anyone authorised by the Secretary, has specialised knowledge, which may be based on training, study or experience, to provide an expert opinion regarding the threatened species to which the report relates.

Dr Rodney van der Ree is an approved Species Expert for the Brush-tailed Phascogale and is registered as such under the BAM, with the following qualifications:

- Bachelor of Science (1st Class Hons), Deakin University (1994).
- Doctor of Philosophy, Deakin University (2000).

The breadth of his relevant experience in relevant ecological research and survey methods includes, but is not limited to:

- Surveyed for Brush-tailed Phascogales and undertook detailed studies of their ecology as a central part of PhD in central Victoria, 1995 – 2000.
- Surveyed for Brush-tailed Phascogales as part of arboreal marsupial studies about the impacts of roads and traffic on wildlife in northern Victoria and SW slopes of NSW, 2005 – 2015.
- Developed and tested the effectiveness of different mitigation treatments to ameliorate the impacts of roads and traffic on both species, including the use of rope bridges and glider poles, 2005 – ongoing.
- Radio-tracked Brush-tailed Phascogales in central Victoria during PhD, 1998 – 2000.
- Targeted surveys for Brush-tailed Phascogales for VicRoads/MRPV 2013 – 15, 2019, and Hume City Council 2018.
- Targeted surveys for Brush-tailed Phascogales using spotlighting, cage and Elliot traps and infra-red remotely triggered camera traps for VicRoads/MRPV and NSW RMS/TfNSW between 2000 and present on numerous projects.

His involvement in relevant projects over the past 10 years include but are not limited to the following:

- Echuca-Moama 2nd bridge crossing, Victoria and NSW, Australia (2015 – current): VicRoads/MRPV and TfNSW Biodiversity Specialist.
- Project Energy Connect, Wagga Wagga to Hay Plains, NSW, Australia 2020 – 2022.
- Shepparton Bypass, Shepparton, Victoria, Australia (2017 – 2019): VicRoads, Biodiversity Specialist.
- Western Highway Duplication Project, Sages 1, 2 and 3, western Victoria, Australia (2014 – 2019): VicRoads and Major Roads Project Authority, Biodiversity Specialist.
- Jumping Creek Road Upgrade Project, Victoria, Australia (2021 to present): City of Manningham.

- Surveys for Northern Phascogale, Mornington Wildlife Sanctuary, Kimberley, W.A. (2018 – 2019): Australian Wildlife Conservancy.
- Yan Yean Road Stage 1 widening, Yan Yean, Victoria, Australia (2017 – 2019): VicRoads and MRPA, Biodiversity Specialist.

1.4 BAM assessment requirements

The requirements of a Species Expert Report are outlined in Box 3 of the BAM (DPIE 2020) and the location of each component in this expert report are summarised in Table 1.

Table 1. BAM requirements for the Species Expert Report

Box 3 Requirement for expert report	Section of expert report
Identify the species or population	Section 1.5
Justify the use of an expert report	Section 1.2
Justify the likelihood of occurrence of the species or population and prepare a species polygon as per Subsection 5.2.5 of BAM.	Section 3
Estimate the area of habitat (if the species is assessed by area) or the maximum number of individuals (if the species is assessed by count of individuals) on the subject land. Evidence such as a population estimate from a reference site could be used to justify this estimation	Not applicable
Include the information considered in making this determination	Sections 1.5 and Section 3
State the expert's credentials	Section 1.3

1.5 Target species

The Brush-tailed Phascogale is a small (~110 – 310 gm), semi-arboreal marsupial carnivore with a broad but highly fragmented distribution around the periphery of Australia (Aplin et al., 2015). A recent reconsideration of the species has concluded there are indeed two species, with *P. pirata* endemic to the top end in the Northern Territory and *P. tapoatafa* elsewhere. *P. tapoatafa* is made of three geographically disjunct subspecies:

- *P. tapoatafa tapoatafa* – southeast Australia from south Australia to mid-coastal Queensland.
- *P. tapoatafa wambenger* – southwest Western Australia.
- *P. tapoatafa kimberleyensis* – Kimberley region of western Australia.

P. tapoatafa tapoatafa is the only sub-species to occur in NSW and unless otherwise explicitly stated, all references to the Brush-tailed Phascogale refers to this sub-species.

The Brush-tailed Phascogale is threatened with extinction by the loss and fragmentation of habitat for agricultural and urban development, habitat degradation primarily through the decline in hollow-bearing trees, mortality through predation by foxes and cats, and wildlife-vehicle collision (Terry, 2020). Consequently, the Brush-tailed Phascogale is listed as:

- Vulnerable in NSW under the *Biodiversity Conservation Act 2016.*
- Vulnerable in Victoria under the *Flora and Fauna Guarantee Act 1988* (FFG Act).
- Least concern in Queensland under the Nature Conservation Act 1992 (NC Act).

The species is not listed nationally under the EPBC Act.

Brush-tailed Phascogales are rat-sized dasyurids, with a head and body length of ~20 centimetres and bottle-brush shaped tail of similar length (Soderquist & Rhind, 2008). Brush-tailed Phascogales mainly feed on large insects, spiders and nectar, and given the opportunity, will take small vertebrates such as skinks (Scarff et al., 1998; Soderquist & Rhind, 2008; Traill & Coates, 1993). Most foraging occurs on trees with rough bark because they are easier to climb and contain more food items under the peeling bark than smooth-barked trees (Soderquist & Rhind, 2008; Traill & Coates, 1993). Larger-diameter trees are also preferred for foraging (including for *P. pirata* Geyle et al., 2020), likely because they contain more microhabitats and food resources than smaller trees. Despite these preferences, Brush-tailed Phascogales can still utilise smooth-barked trees, particularly when they are in flower and provide an abundant source of nectar. Large fallen logs and branches are also used for foraging (Scarff et al., 1998) and providing shelter for the species as they move between trees at ground level.

Brush-tailed Phascogales are generally associated with box, ironbark, and stringybark eucalypt species in dry sclerophyll forests with sparse ground cover of grasses, herbs, shrubs and leaf litter (BIOSIS Research, 2001; Cuttle, 1982). The species can also be found in a wide range of other habitat types, including heath, swamps, rainforest and wet sclerophyll forest (Soderquist & Rhind, 2008).

Brush-tailed Phascogales are hollow-dependent, utilising multiple habitat trees within their territories, and appear to preferentially use hollows with small entrance sizes (2.5 – 4 centimetres across) in standing trees, tree stumps and fallen logs for

denning and raising young (Rhind, 1996; Soderquist, 1993; Traill & Coates, 1993; van der Ree et al., 2006). Phascogales prefer to utilise hollows in large-diameter trees, with average diameter at breast height (DBH) of den trees in central Victoria > 80 centimetres (van der Ree et al., 2006), although hollows in very small trees (e.g. down to 25 centimetres DBH), in coppice stumps and tree stumps will also be used. Multiple hollows are used by individuals, with seven females in central Victoria using an average of 11 hollow-bearing trees over an average er of 25 tracking days (van der Ree et al., 2006). However, preliminary results of a radiotracking program of 16 female and 13 male Brush-tailed Phascogales in regrowth forest in central Victoria found them using smaller trees, with standing dead trees providing a significant proportion of selected den trees (Terry, 2022).

Brush-tailed Phascogales normally den alone, although some records of communal denning have been observed (Rhind, 2003). Maternity dens are particularly important because females will deposit their young at an early age (approx. 48 days old) while they forage nearby, frequently returning to the den to feed their young (Soderquist, 1993). Maternity dens are preferentially located in large tree hollows with tight entrance holes to prevent access by potential predators.

Brush-tailed Phascogales have relatively large home ranges for their body size, with females traversing 20 – 40 hectares, and males occupying 100 hectares or more (Soderquist, 1995; van der Ree et al., 2001). However, in high-quality habitats, their home ranges can be much smaller, even down to 5 hectares in size (Terry, 2022; van der Ree et al., 2001). Female home ranges do not overlap with each other, while the home ranges of males overlap extensively with both females and other males (Soderquist, 1995; van der Ree et al., 2001). Importantly, Phascogales will traverse cleared farmland up to distances of a few hundred metres (Terry, 2022; van der Ree et al., 2001).

2. Methods

2.1 Desktop assessment

Areas of forest within the subject land were identified from satellite imagery and selected for on-site investigation. Brush-tailed Phascogales can traverse gaps of cleared farmland and hence all areas of potential habitat were identified for investigation to be conservative.

Records of Brush-tailed Phascogales from NSW were downloaded from BioNet and the Atlas of Living Australia (ALA) for this Expert Report. Records from ALA were included in the search, despite some being unverified, as a conservative approach was being taken. Duplicate records from overlapping databases were excluded.

The following desktop parameters were assessed when considering the potential presence of the target species:

- Distribution and age of records of the species within relevant databases.
- Extent of overlap between species records and habitat types in the study area.
- Size of patches of forest habitat.
- Degree of connectivity among patches of forest within the subject land and adjacent areas.
- Results of surveys conducted by the project team.

2.2. Field assessment

The proposed BESS site was inspected to inform the Expert Report on the 27th and 28th February 2025. All areas of forest within the subject land were carefully inspected. Areas of forest outside and adjacent to the subject land were less intensively inspected.

During the site visits, the following aspects were assessed and noted:

- The species composition of the overstorey.
- The presence and abundance of large old trees and trees with hollows suitable for denning by Brush-tailed Phascogales.
- The degree of connectivity among patches of forest within the site and from the site to adjacent areas.

2.3 Species polygons

If considered likely to occur within the subject land, a species polygon would be mapped at locations where sufficient suitable habitat for the Brush-tailed Phascogale existed. The polygon would be based on:

- The composition of the overstorey and mid-storey tree and shrub species to provide food resources and suitable climbing substrate for Brush-tailed Phascogales.
- The size of the patch of forest.
- The presence and abundance of suitably-sized tree hollows.
- Proximity to other patches of forest, the size of the gap between the patches of forest and the presence of significant barriers to movement, such as farmland, roads and urban areas.

3. Results

3.1 Geographic range of the Brush-tailed Phascogale

The Brush-tailed Phascogale occurs along the coast and on the inland slopes of the Great Dividing Range in NSW and Victoria (Figure 3). The closest record of a Brush-tailed Phascogale to the subject land is 41 km to the north-east, on the outskirts of

the town of Bowral, NSW. This record is from 18/1/2020 and was sourced from BioNet (Figure 4).

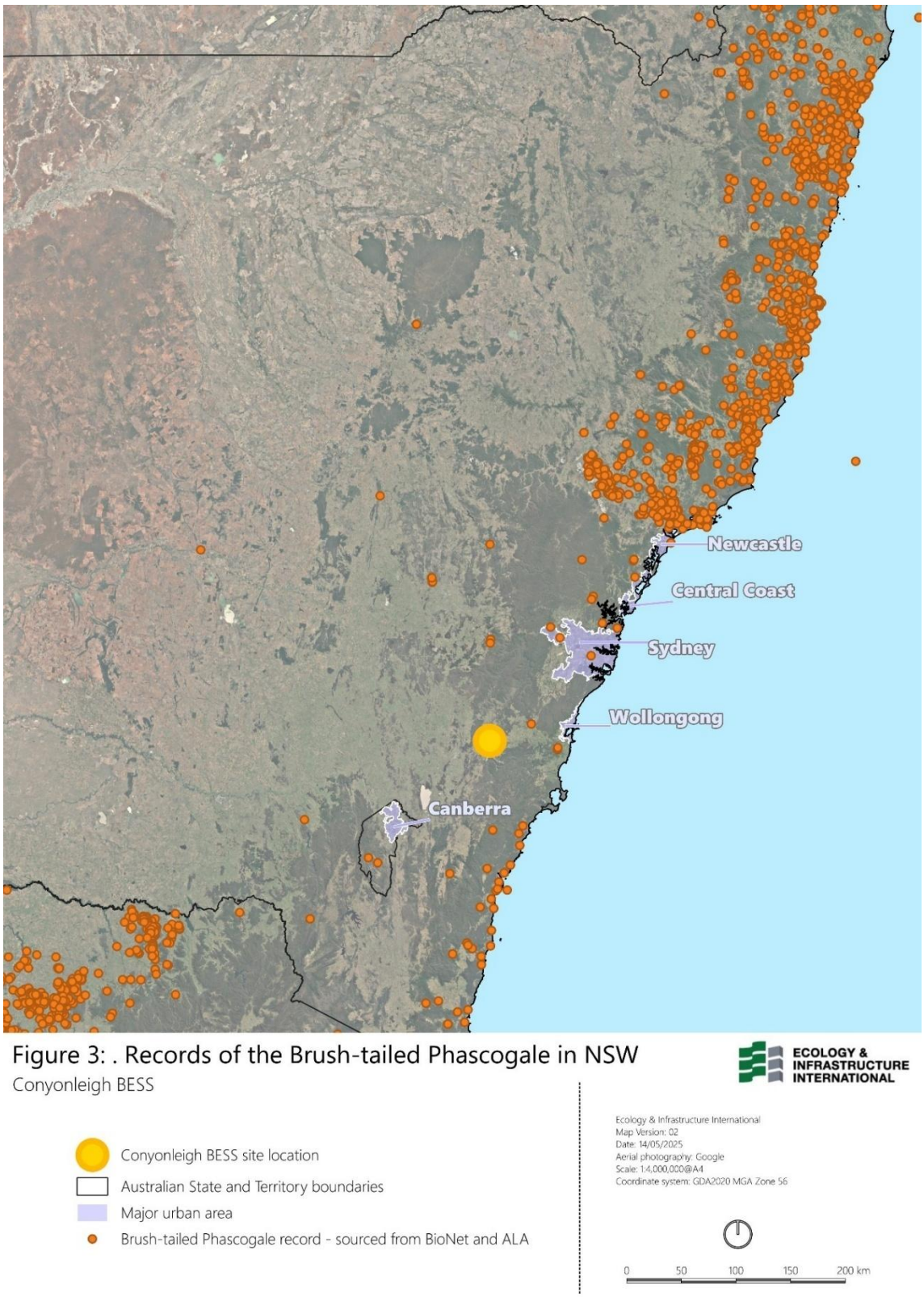


Figure 3. Records of the Brush-tailed Phascogale in NSW.

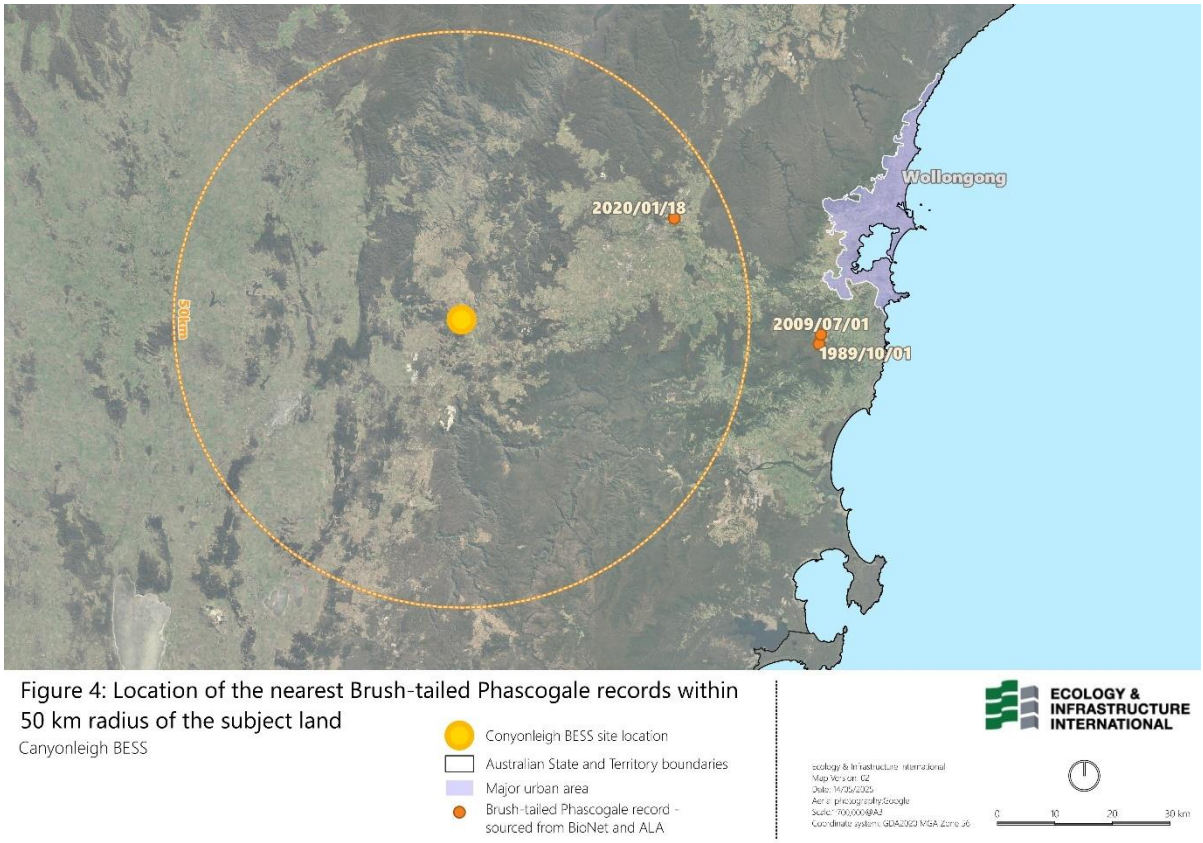


Figure 4. Location of the nearest Brush-tailed Phascogale records within 50 km radius of the subject land.

3.2 Suitability of habitat structure for shelter and movement

The primary feature of the structure of the habitat for Brush-tailed Phascogales is sufficient suitably-sized tree hollows for denning and raising young. Lactating females show a preference for large tree cavities with small entrances (2.5 – 4 cm across) and construct nests with bark, feathers and fur (OEH 2021).

The majority of the forest within the subject land appears to be relatively young regrowth forest that was regenerating from clearing in the past few decades. Consequently, the density of tree hollows is very low, with just two hollow-bearing trees detected within the development footprint, two just outside the development footprint and one to the north and one to the east of the subject land (Figure 5). The tree hollows may be suitable for diurnal denning by Brush-tailed Phascogales, but most appear too small to support a maternity den, which are characterised by small entrances that open into larger cavities. Consequently, the subject land is unlikely to support a resident population of Brushtailed Phascogales due to a lack of sufficient suitably-sized hollows.

Areas mapped as Goulburn-Lithgow Tableland Hills Grassy Forest, located to the north and west of the subject land, included many large-diameter and hollow-bearing trees and extensive fallen logs and branches.

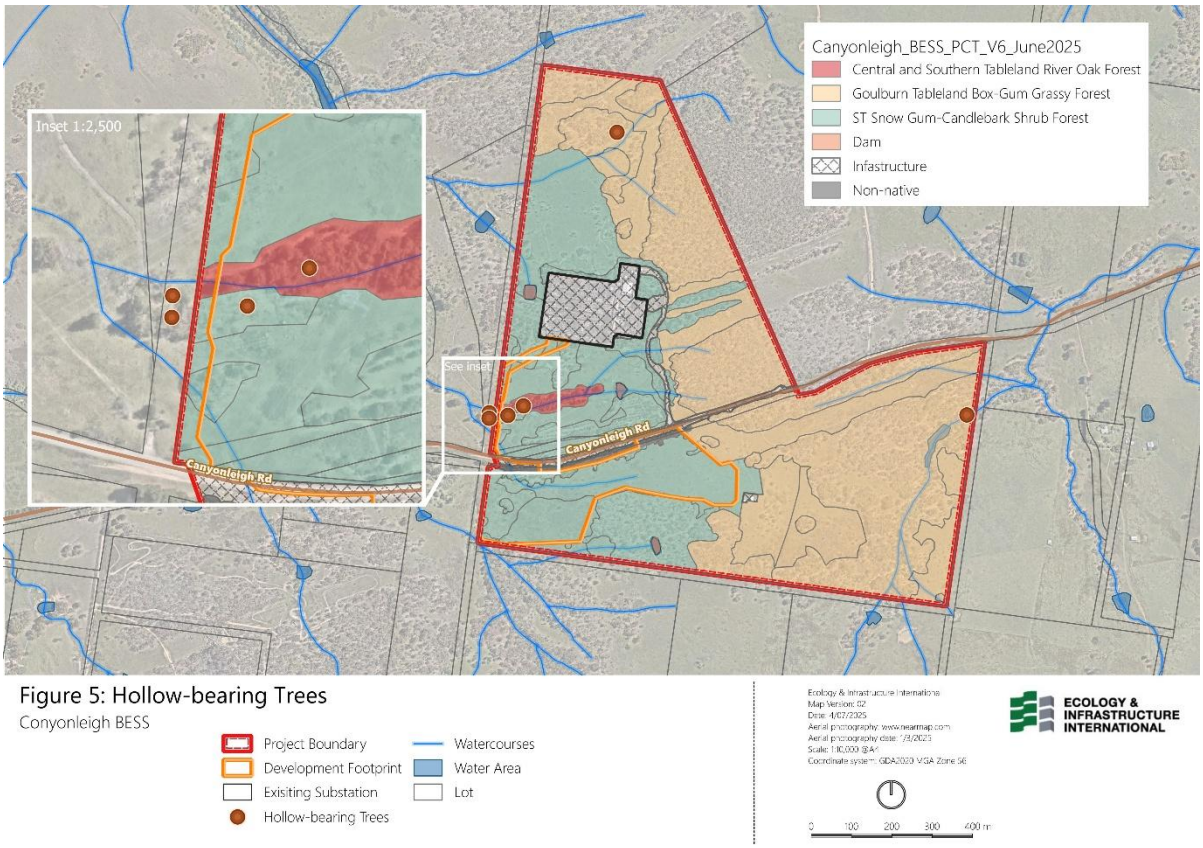


Figure 5. Location of hollow-bearing trees and PCTs in the subject land.

A second important consideration for the species is the presence of rough-barked trees which they prefer over smooth-barked trees for climbing and foraging under bark for invertebrates and small vertebrates. The majority of the tree species within the Development Footprint were smooth-barked species, which are less suited for climbing and foraging by Brush-tailed Phascogales than rough-barked species. As noted above, the areas of more extensive forest to the north and west, which are outside the subject land, contained rough-barked stringybark species, that are suitable for the species.

In summary, the forest habitat within the subject land contained a very low density of observable tree hollows and were not the preferred species for climbing and foraging by Brush-tailed Phascogales.

3.3 Suitability of the habitat for feeding

The Brush-tailed Phascogale feeds on invertebrates and vertebrates found under

peeling bark and rotting branches and logs on the ground.

The areas of forest occurring within the subject land that are expected to be cleared have been mapped as:

- Southern Tableland Snow Gum-Candlebark Shrub Forest.
- Wollondilly-Shoalhaven Slopes Grassy Open Forest.
- Small areas of scattered trees that were not assigned to a PCT.

These two mapped PCTs are dominated by smooth-barked species that do not form extensive peeling ribbons or large flakes that invertebrates and small vertebrates can shelter under. In addition, because the patches of forest in the impact areas is largely single-species, it would only provide limited seasonal availability of nectar and pollen. Therefore, the areas of forest that are likely to be cleared are unlikely to provide sufficient food resources for Brush-tailed Phascogales to occupy permanently.

3.4 Patch sizes and connectivity

There is no published data on the minimum sizes of habitat patches and extent of habitat connectivity required for the persistence of Brush-tailed Phascogales in NSW. The home range size of Brush-tailed Phascogales in high quality woodland on fertile soils near Euroa Victoria was between 2.3 and 8.0 ha for females and at least 20 ha for a single male (van der Ree et al. 2001) compared to home ranges that were 50 – 100 ha in areas of poorer-quality regrowth forest on rockier soils (Traill and Coates 1993, Soderquist 1995). Therefore, the home range size of Brush-tailed Phascogales in low-quality habitat is up to approximately 100 ha for individual animals, and at least 500 ha of connected forest habitat is likely required to support multiple adjacent territories. Therefore, the small patches of forest habitat within the proposed BESS Development Footprint are unlikely to be able to support viable populations of Brush-tailed Phascogale.

3.5 Field survey results

Spotlighting and arboreal camera trapping was undertaken by Red Gum Environmental for ERM within and adjacent to the proposed BESS footprint as part of general and targeted surveys for the Project BDAR (Table 2). No Brush-tailed Phascogales were detected during these surveys.

Table 2. Summary of field surveys that were capable of detecting Brush-tailed Phascogales within the Subject Land. Further details of the surveys are available in the Project BDAR.

Survey method	Effort	Timing	Brush-tailed Phascogales detected?
Baited arboreal camera traps	6 cameras for 14 days	January 2025	No
	6 cameras for 12 days	February 2025	No
Spotlighting	4 nights at 4 locations on southern block	January 2025	No
	4 nights at 3 locations on northern block	February 2025	No

4. Conclusion

The subject land for the proposed BESS project at Canyonleigh is within the geographic range of the Brush-tailed Phascogale and occurs within a broader landscape or region that may provide suitable habitat for the species. However, the forest habitat within the subject land is not suitable habitat for the species for the following reasons:

- The subject land is dominated by smooth-barked species of trees.
- There were very few hollows detected within the subject land and those that were found do not appear suitable to act as a maternity den.
- The patches of forest within the subject land are primarily single-species stands, resulting in limited seasonal availability of food.
- Large logs and fallen branches on the ground were scarce within the subject land, providing limited foraging opportunities.
- The nearest record of the species was > 40 km from the subject land.

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APPENDIX G EXPERT REPORT – STRIPED LEGLESS LIZARD (DELMA IMPAR)

14 November 2025

Lucy Baker
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Expert report on the presence of Striped Legless Lizard *Delma impar* habitat in the subject land for the Canyonleigh Battery Energy Storage System project.

Capital Ecology project no. 3476

Dear Lucy Baker,

Prepared in accordance with Section 5.3 of the NSW Biodiversity Assessment Method 2020 (BAM), Attachment 1 to this letter provides my expert report on the presence of Striped Legless Lizard *Delma impar* habitat in the subject land for the Canyonleigh Battery Energy Storage System project.

As detailed in my report, the conclusion of my assessment is that the subject land supports 3.26 ha of likely habitat for *D. impar*.

I trust that this report provides the advice and assessment required. If, however, you should have any questions, please do not hesitate to contact me.

Yours sincerely,



Robert Speirs
Director / Principal Ecologist
BAppSc (Ecology), DipPM, MEIANZ, CEnvP-E, BAM Assessor (No: BAAS17089)

Attachments:

Attachment 1. Expert report on the presence of Striped Legless Lizard *Delma impar* habitat in the subject land for the Canyonleigh Battery Energy Storage System project.

Attachment 1. Expert report on the presence of Striped Legless Lizard *Delma impar* habitat in the subject land for the Canyonleigh Battery Energy Storage System project

Citation: Capital Ecology (2025). *Expert report on the presence of Striped Legless Lizard Delma impar habitat in the subject land for the Canyonleigh Battery Energy Storage System project*. Final 01 – 14 November 2025. Prepared for Environmental Resources Management Australia Pty Ltd. Authors: R. Speirs and J. Thornberry. Project no. 3476.

1. Overview of the project and relevance of Striped Legless Lizard

The Canyonleigh Battery Energy Storage System project (the 'proposed development') involves the construction, operation, and decommissioning of a Battery Energy Storage System (BESS) and associated infrastructure at Brayton, New South Wales (NSW) (Lot 2341 DP622834, Lot 12 and Lot 9 DP727493), and the upgrade of Canyonleigh Road between Brayton Road and the proposed site entrance (the 'subject land', area = 31.87 hectares [ha]) (Figure 1 and Figure 2). The subject land is located within the Goulburn Mulwaree Council Local Government Area (LGA) in NSW.

The specifications of the proposed development are outlined in the Scoping Report prepared by Environmental Resources Management Australia (ERM) (2024[1]) on behalf of X-Elio Aus2 Pty Ltd (X-Elio Australia Pty Ltd).

The Striped Legless Lizard *Delma impar* is listed as 'vulnerable' pursuant to both the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and the NSW *Biodiversity Conservation Act 2016* (BC Act). As shown in Figure 3, the subject land is not situated within the area identified as 'species or species habitat may occur' or 'species or species habitat likely to occur' on the layers sourced from the Distribution Map provided on the EPBC Act SPRAT Profile for *D. impar*[2], however *D. impar* is identified as a 'candidate species' under the Biodiversity Assessment Method (BAM) (NSW Government 2025[3]) for two NSW Plant Community Types (PCTs) identified and mapped by ERM as occurring within the subject land:

- PCT3373 – Goulburn Tableland Box-Gum Grassy Forest = approx. 3.66 ha.
- PCT3347 – Southern Tableland Creekflat Ribbon Gum Forest = approx. 1.76 ha.

As discussed in Section 4.1, summarised in Table 3, and illustrated in Figure 4, the records of *D. impar* within 100 kilometres (km) of the subject land are located:

- adjacent to Windellama Road, Gundary, NSW, south of the Hume Highway – 26 km east of the subject land (one individual, recorded 08/11/1994);
- at Gundary Travelling Stock Reserve, adjacent to Windellama Road, Gundary NSW – 27 km east of the subject land (one individual, recorded 21/10/1997);

[1] Environmental Resources Management Pty Ltd (2024). *Canyonleigh Battery Energy Storage System – Scoping Report*. Prepared for X-Elio Aus2 Pty Ltd.
[2] Commonwealth of Australia (2022). *Species Profile and Threats Database. Delma impar – Striped Legless Lizard, Striped Snake-lizard* http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=1649
[3] NSW Government (2025). As listed on the BioNet Threatened Biodiversity Data Collection (TBDC) profile for Pink-tailed Legless Lizard *Aprasia parapulchella*.

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- southern Yass, NSW – approximately 98 km west of the subject land (multiple records, various dates); and
- northern Canberra, Australian Capital Territory (ACT) – approximately 98 km south west of the subject land (multiple records, various dates).

As above, *D. impar* was identified by ERM as a candidate species for the subject land per the BAM Calculator (BAM-C). Consequently, ERM has opted to engage me to prepare an expert report for *D. impar* in accordance with Section 5.2.4 of the BAM.

2. Requirement for expert report

In accordance with Section 5.2.5 of the BAM, the BAM Assessor must establish and document in the Biodiversity Development Assessment Report (BDAR) whether each candidate 'species credit species[4]' is present in the subject land (or specific vegetation zone). A 'species polygon' must be prepared for each species credit species determined as occurring in the subject land, and this is used to calculate the quantum of offsets required for impacts on the species.

In accordance with Section 5.2.4 of the BAM, to determine presence for a development proposal (such as the project), the BAM Assessor must apply one of the following options.

a. *assume the species is present, or*
b. *conduct a threatened species survey, as per Section 5.3, or*
c. *obtain an expert report, as per Box 3, or*
d. *for candidate species including dual credit species, where the TBDC indicates that an important habitat map identifies the species credit component, the assessor must confirm whether the subject land is within an area identified on the important habitat map.*[5]

Section 5.2.4 of the BAM requires that where a species is listed as a candidate species under the BAM for the PCTs in the subject land, but a full program of surveys is impracticable or cost-prohibitive, an expert report is required to determine the likelihood that the species is present on or uses habitat in the subject land.

As outlined in Box 3 –

An expert report must set out whether:

a. *the species is unlikely to be present on or use habitat on the subject land, in which case, no further assessment of the species is required, or*
b. *the species is likely to be present on or use habitat on the subject land.*

If the species is likely to be present on or use the subject land, the expert report must:

a. *identify the species or population*
b. *justify the use of an expert report*
c. *justify the likelihood of occurrence of the species or population and prepare a species polygon as per Subsection 5.2.5*

[4] Species credit species are threatened species for which vegetation surrogates and/or landscape features cannot reliably predict the likelihood of their occurrence or components of their suitable habitat.
[5] The TBDC does not indicate that an important habitat map identifies the species credit component for *D. impar*.

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d. *estimate the area of habitat (if the species is assessed by area) or the maximum number of individuals (if the species is assessed by count of individuals) on the subject land. Evidence such as a population estimate from a reference site could be used to justify this estimation*

e. *include the information considered in making this determination*

f. *state the expert's credentials.*

3. Outline of experience in the ecological research, habitat assessment, and survey methods for Striped Legless Lizard (the expert's credentials)

I have worked as an ecological consultant on a full-time basis since January 2008. Since July 2010, I have been based in Canberra and specialised in the temperate woodlands and grasslands of the South Eastern Highlands bioregion (NSW and ACT). *Delma impar* has been a key focus species for my work and research each season since spring 2010, and I have completed more than eighty projects across this region involving *D. impar* habitat assessment, targeted surveys, population modelling, and species/habitat conservation plans. I have undertaken many of the large-scale *D. impar* surveys, habitat mapping, and monitoring projects commissioned by the ACT Government since spring 2010, including those informing the ACT Government's accelerated land release programs in Gungahlin, Majura Valley, and Jerrabomberra Valley. I have also completed targeted surveys and/or habitat assessments at many sites in the Queanbeyan-Palerang, Yass Valley, Goulburn Mulwaree, and Snowy Monaro local government areas (LGAs).

I have been an active member of numerous working groups and advisory panels convened by the Commonwealth Government and ACT Government regarding threatened grassland and woodland fauna, notably including threatened grassland reptiles. I was a member of the technical working group which advised the Commonwealth's development of the Conservation Advice for the Striped Legless Lizard[6] in 2016, which was formally approved by the Minister's delegate and is now in place under the EPBC Act. I am a member of the ACT Government's Expert Working Group established to explore the functional connectivity requirements for grassland reptiles in the ACT.

I have been engaged by the Commonwealth Government to run field classes for EPBC Act assessment officers on the recognition and assessment of EPBC Act listed species and communities, including for *D. impar*. I have also presented on *D. impar* at professional forums and am regularly sought by many of the prominent government and private development projects in the region to provide survey and assessment services, peer review, and/or an advisory role relating to *D. impar* and other threatened species.

In recognition of the above, I was approved on 25 February 2022 by the then NSW Department of Planning and Environment (DPE) as a species expert for *D. impar* in accordance with s.5.3 of the BAM (DPE Ref: SF22/8496).

4. Striped Legless Lizard – species overview

The Striped Legless Lizard *Delma impar* (Fischer 1882) is listed as 'vulnerable' pursuant to both the Commonwealth EPBC Act and the NSW BC Act. *Delma impar* is a member of the family Pygopodidae, a group of lizards that lack forelimbs and have hind limbs reduced to small vestigial flaps (Cogger 2014[7]). Legless lizards can be readily distinguished from small snakes by having a visible ear opening, fleshy

[6] Commonwealth of Australia (2016a). *Conservation Advice - Delma impar striped legless lizard.* Established under the EPBC Act 1999. Threatened Species Scientific Committee. 16/12/2016.
[7] Cogger H.G. (2014). *Reptiles and Amphibians of Australia, 7th Edition*. CSIRO Publishing.

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broad tongue, the presence of remnant hind limbs (reduced to two small flaps near the vent), and a long tail that can be voluntarily shed (ACT Government 2017a[8]).

4.1 Distribution

Historically, *D. impar* may have occurred across extensive areas of south-eastern Australia in areas supporting, or occurring near, lowland natural temperate grassland, this vegetation formation being the primary known habitat of the species (Commonwealth of Australia 2016). The lowland natural temperate grasslands of eastern Australian have been extensively and intensively modified since European occupation, the result being that only approximately 2% to 10% of the estimated 1750 extent remains in at least moderately intact form (ACT Government 2017b[9]; Commonwealth of Australia 2016b[10]). The lack of woody vegetation, together with relatively high soil fertility, made the broad grassland valleys attractive for crop cultivation and stock grazing, the productivity of the latter being greatly enhanced by pasture improvement (notably the application of superphosphate and sowing of Phalaris *Phalaris aquatica*, Cocksfoot *Dactylis glomerata*, Ryegrasses *Lolium* spp., and various Clovers *Trifolium* spp.).

Whilst *D. impar* is known to occur at numerous locations across the central and western plains of Victoria, the species has been recorded at only a few locations in NSW, all of which are located within approx. 100 km of the ACT border (NSW BioNet; Atlas of Living Australia [ALA]) (refer Figure 3).

Extensive areas of confirmed *D. impar* habitat occur in the ACT, specifically in the Gungahlin Valley, Majura Valley, and Jerrabomberra Valley. The ACT's leasehold tenure for rural lands, together with a proactive approach to grassland conservation in early planning processes, has led to the establishment of large reserves facilitating the conservation of extensive areas of *D. impar* habitat. Indeed, the results of extensive programs *of D. impar* survey and population monitoring commissioned by the ACT Government indicate that the ACT's grassland reserve network is now the stronghold for the species in NSW-ACT region.

As shown in Figure 3, based on confirmed credible records[11], there are four locations where *D. impar* has been recorded on the southern edge of Yass (Capital Ecology 2018[12]; Capital Ecology 2022a[13]; Capital Ecology unpub. data 2023), two records on Windellama Road south of Goulburn (Rowell *et al*. 2000[14]; Daly *et al*. 2008[15]), several records located around Cooma and south to the Snowy River, records

[8] ACT Government (2017a). *Striped Legless Lizard Delma impar action plan*. Environment, Planning and Sustainable Development, Canberra.
[9] ACT Government (2017b). *ACT native grassland conservation strategy and action plans*. Environment, Planning and Sustainable Development.
[10] Commonwealth of Australia (2016b). *Approved Conservation Advice (including listing advice) for Natural Temperate Grassland of the South Eastern Highlands* (EC 152). Department of the Environment.
[11] Based on R. Speirs' review and scrutiny of all available records, including consultation with Snr Threatened Species Officers of the NSW-DCCEEW-BCD, Feb 2024.
[12] Capital Ecology (2018). *Lot 2 DP1166247, Yass – Striped Legless Lizard D. impar habitat assessment and targeted surveys*. Capital Ecology Project No. 2767.
[13] Capital Ecology (2022a). *Subdivision of 7 Iceton Place, Yass, NSW – Biodiversity Development Assessment Report*. Final 01 – 29 March 2022. Prepared for Iceton Investments Pty Ltd. Authors: S. Reid, S. Thompson, C. Ross, and R. Speirs. Project no. 2909.
[14] Rowell A.M, Crawford I.L, and Kurrajong M. (2000). *Surveys for the Striped Legless Lizard Delma impar and Grassland Earless Dragon Tympanocryptis pinguicolla in the Queanbeyan – Goulburn district, 1999-2000*. Report prepared for the NSW NPWS, threatened Species Unit, Southern Zone, Queanbeyan.
[15] Daly G., Virtue B., and Stone G. (2008). *Results of a survey for the Striped Legless Lizard Delma impar near Goulburn, New South Wales.* Herpetofauna 38 (1) 2008, pgs. 51-58.

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from two recent surveys on the eastern edge of Michelago (Capital Ecology 2022b[16]; BioNet 2023), a few records in the Adelong to Tumut region (confirmed via pers. comm. with S. Sass [EnviroKey, Sept 2022], and via pers. comm. with Rob Armstrong and Dave Hunter [NSW-DCCEEW-BCD, Feb 2024]), and a recent record at Cavan south of Burrinjuck Dam (Niche, Feb 2024 [R. Speirs confirmed March 2024]).

It is unknown whether the scarcity of records between those in the Yass Valley and Goulburn-Mulwaree LGAs indicates absence across much of this locality or is simply a reflection of a lack of targeted survey (noting that *D. impar* are rarely encountered in the absence of targeted survey). The existence of these few records of what is a very cryptic species does suggest that the species likely occurs in sites supporting lowland natural temperate grassland or adjoining grassy woodland more broadly across the NSW Southern Tablelands than current records indicate.

The EPBC Act Conservation Advice (Commonwealth of Australia 2016a) refers to "*recently discovered populations north of Gilgandra and near Muswellbrook*" (pg. 3). I note however that a recent taxonomic review (Mahony *et al*. 2022[17]) has distinguished the population from the Hunter Valley / Liverpool Plains region (i.e. the Muswellbrook records) as a unique taxon and described the species as *D. vescolineata*. I have not to date been able to obtain photographs or other evidence of the specimen recorded north of Gilgandra, and therefore given that it is approximately 400 km from the closest confirmed records at Yass and a long distance from the historical extent of lowland natural temperate grassland, at this time I do not consider this to be a credible *D. impar* record.

I note that *D. impar* are generally not known to occupy small, thin, isolated patches of natural temperate grassland, such as those which occur along creeks and in other sheltered locations. Rather, the broad treeless lowland grassland plains and the immediately adjoining areas of open grassy woodland of the South Eastern Highlands bioregion are the primary habitat of the species in NSW.

Notwithstanding the above, the records in the Adelong to Tumut region, together with the recent record at Cavan, occur in locations that at least 10 km from any area that supports, or is likely to have once supported, a broad treeless grassland plain. Such a distance is beyond that which any current or historical connection to this habitat type can be deemed to be determinate for the occurrence of the species in those localities. Indeed, my observations from my inspections of the locations of these records (Adelong-Tumut locality Nov 2023; Cavan Feb 2024) suggest that the White Box *Eucalyptus albens* – Yellow Box *E. melliodora* – Blakely's Red Gum *E. blakelyi* open grassy woodlands within which they occur are likely the primary habitat for *D. impar* in these localities. Accordingly, whilst there is a strong body of evidence suggesting that east of the Murrumbidgee River the occurrence of *D. impar* is limited to approximately 1 km into grassy woodland from the ecotone with a broad treeless grassland plain, this limiting association with natural grassland does not appear to exist in the western portions of the species' distribution.

Based on the above, I have estimated the NSW *D. impar* Extent Of Occurrence (EOO) applying the method outlined in the International Union for Conservation of Nature (IUCN) Standards and Petitions Subcommittee (2017[18]), being the area that represents "*the area contained within the shortest continuous imaginary boundary which can be drawn to encompass all the known, inferred or projected*

[16] Capital Ecology (2022b). *Lot 1 DP713198, Karinya Plains Road, Michelago, NSW – Biodiversity Development Assessment Report. Final 02 – 10 August 2022.* Prepared for Projects JSA. Authors: C. Ross, S. Thompson, and R. Speirs. Project no. 3123.

[17] Mahony S.V., Cutajari. T., and Rowley J.J.L. (2022). *A new species of Delma Gray 1831 (Squamata: Pygopodidae) from the Hunter Valley and Liverpool Plains of New South Wales*. Zootaxa 5162 (5): 541–556.

[18] IUCN Standards and Petitions Subcommittee (2017). *Guidelines for Using the IUCN Red List Categories and Criteria. Version 13.* Prepared by the Standards and Petitions Subcommittee. Available at: http://cmsdocs.s3.amazonaws.com/RedListGuidelines.pdf

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sites of present occurrence of a taxon". Based on this, the NSW EOO for *D. impar* is estimated to be 1,654,631 ha or 16,546 km^2 (refer Figure 3).

It is important to note that the EOO does not define the geographical area within which the species has the potential to occur, rather it defines the geographical area within which the species has been reliably found to occur. With reference to Figure 3, the distance from the EOO, in this example being shown in 10 km increments, provides a useful measure by which to weigh the diminishing likelihood of *D. impar* occurrence with increasing distance from the EOO. Whilst I note that there is a valid argument with a cryptic species such as *D. impar* that the lack of records beyond the EOO may simply reflect a lack of sufficient targeted survey, the strength of this argument decreases with increasing distance from the EOO, especially when similarly cryptic species (such as other Pygopodid species, especially Olive Legless Lizard *D. inornata*) have been recorded in substantial numbers.

In light of the above, for the purposes of assessing the potential for occurrence of *D. impar* at sites in NSW, and thereby for the purposes of assessing under the BAM the potential for a proposed development to impact upon the species, I believe that the 'distribution' for *D. impar* (being the area within which the potential for impacts should be considered) should be set as the EOO plus a 30 km buffer (refer Figure 3). I am aware that this distribution captures a large area beyond the EOO, most of which has no or very low potential for occurrence, and thus it is very conservative. However, given the general lack of targeted survey across most of the 30 km buffer, and in light of the recent record of the species on a site at Cavan which would previously not have been considered potential habitat, I believe that the precautionary principle must be followed, and a conservative approach taken.

It is very difficult to accurately estimate the extent of habitat currently occupied by *D. impar* in the NSW EOO. This is because:

- the species' occurrence across most of the EOO is largely restricted to the historical extent of lowland natural temperate grassland (and limited areas of grassy woodlands), and the lowland natural temperate grassland vegetation formation historically occurred across only a small proportion of the EOO;
- only a proportion of the historical extent of lowland natural temperate grassland would ever have been occupied by *D. impar*, and this proportion is likely to be an even lower for grassy woodlands; and
- most of the historical extent of lowland natural temperate grassland and grassy woodlands has been cleared or subjected to various forms of modification since European occupation, and the degree to which each form of modification excludes *D. impar* persistence differs markedly (i.e. ploughing and sowing to crops will remove *D. impar*, but pasture improvement via top seeding etc. may destroy the natural temperate grassland but maintain habitat suitability for *D. impar*).

4.2 Habitat

The primary habitat of *D. impar* has been broadly described as naturally treeless lowland grassland dominated by native, perennial, tussock-forming grass, particularly Kangaroo Grass *Themeda triandra*, Wallaby Grasses *Rytidosperma* spp., and Speargrasses *Austrostipa* spp. (Coulson 1990[19]; Osborne *et al*.

[19] Coulson G. (1990). *Conservation biology of the Striped Legless Lizard (Delma impar): an initial investigation*. Arthur Rylah Institute for Environmental Research Technical Report Series No. 106. Department of Conservation and Environment, Melbourne.

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1993[20]; Hadden 1995[21]; ACT Government 2017a). Although *D. impar* is largely restricted to areas that are (or were) lowland natural temperate grassland, the species has also been recorded in derived/secondary grassland (that derived from clearing of woodland or dry forest) (Coulson 1990; Williams and Kukolic 1991[22]; Osborne *et al*. 1993; Dorrough 1995[23]; Hadden 1995; Howland *et al*. 2014[24]; ACT Government 2017a; R. Speirs pers. obs.). However, all records of *D. impar* in derived/secondary grasslands in the ACT and east of the Murrumbidgee River in NSW are within 1 km of the estimated 1750 natural grassland extent (ACT Wildlife Atlas), and this has been my observation across all of the sites where I have recorded, or not recorded, *D. impar* in NSW (notable examples include sites at Sutton, Gundaroo, Goulburn, Yass, Murrumbateman, Williamsdale, and Googong). Thus, while *D. impar* may occupy open grassy woodland PCTs, and in particular derived grasslands of such PCTs, the substantial available evidence strongly suggests that in the eastern portion of the species' EOO (i.e. east of the Murrumbidgee River), the occurrence beyond the 1750 grassland-woodland ecotone is limited to a conservative maximum of 2 km.

As discussed above, the confirmed records in the Adelong to Tumut region, together with the recent record at Cavan, occur in locations at least 10 km from any area that supports, or is likely to have once supported, a broad treeless grassland plain. Such a distance is beyond that which any current or historical connection to this habitat type can be deemed to be determinate for the occurrence of the species in those localities. Accordingly, it is reasonable to consider the open grassy woodlands in the localities where *D. impar* has been recorded west of the Murrumbidgee River to be the primary habitat for the species in these localities.

In light of the above, it is this potential for occurrence in woodland PCTs in the west of species' geographical distribution, and in woodland PCTs where they adjoin grasslands in the east, that is the basis for *D. impar* being identified as a 'candidate species' under the BAM for many of the woodland PCTs that occur in this area.

Whilst lowland natural temperate grasslands and open grassy woodlands are considered the primary habitat of *D. impar*, the species has also been recorded in many former grassland sites that are now dominated by exotic grasses, notably the tussock forming species Phalaris, Cocksfoot, and Serrated Tussock *Nassella trichotoma* (Rauhala *et al*. 1995[25]; Biosis Research 2012[26]; Howland *et al*. 2016[27];

[20] Osborne W.S., Kukolic K. and Williams K.D. (1993). *Conservation of reptiles in lowland native grasslands in the Southern Tablelands of New South Wales and the Australian Capital Territory*. Herpetology in Australia: A diverse discipline. pp. 151-158.
[21] Hadden S. (1995). *Distribution, population habitat estimates and habitat requirements for the Striped Legless Lizard Delma impar (Kluge)*. Report to the Australian Nature Conservation Agency, Department of Conservation & Natural Resources, Melbourne.
[22] Williams K.D. and Kukolic K. (1991). *Fauna of the ACT's Native Grasslands: Report on the vertebrate fauna surveys at Gungahlin*.
[23] Dorrough J. (1995). *Past and present habitat of the Striped Legless Lizard (Delma impar, Pygopodidae) in the Australian Capital Territory*. Honours thesis, Department of Botany and Zoology, ANU, Canberra.
[24] Howland B., Stojanovic D., Gordon I.J., Manning A.D., Fletcher D. and Lindenmayer D.B. (2014). *Eaten Out of House and Home: Impacts of Grazing on Ground- Dwelling Reptiles in Australian Grasslands and Grassy Woodlands*. PLoS ONE 9(12): e105966.
[25] Rauhala M.A., Shorthouse D.J. and Ingwersen F. (1995). *The Striped Legless Lizard (Delma impar) in the Gungahlin, Majura and Jerrabomberra Valleys*. Internal Report 95/2. Wildlife Research Unit, ACT Parks and Conservation Service, Canberra.
[26] Biosis Research (2012). *Striped Legless Lizard (Delma impar) Survey and Vegetation Assessment Report.* Report to the ACT Government. Biosis Research Pty Ltd, Canberra. Author: R. Speirs.
[27] Howland B., Stojanovic D., Gordon I.J., Stirenmann I., Fletcher D., Snape M. and Lindenmayer D. (2016). *Habitat preferences of the threatened striped legless lizard: implications for the management of grazing in grasslands*. Austral Ecology 41(4): 455-464.

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R. Speirs pers. obs.). Most of the largescale *D. impar* surveys completed in the ACT have found the species to occur at highest population density in areas with "*extensive and intact swards of well-developed grass thatch*" (Williams and Kukolic 1991), many of these areas being described as exotic pasture dominated by Phalaris and other pasture grasses (Moore *et al*. 2010[28]; Biosis Research 2012; EcoLogical 2013[29]; R. Speirs pers. obs). These observations suggest that the presence of a defined tussock structure with sufficient herbage mass may be more important to the species' persistence at a site than floristic composition and diversity. However, more recent research (Howland *et al*. 2014, 2016) modelled the habitat preferences for *D. impar* and concluded that the species prefers grass swards of intermediate herbage mass (rather than very low or very high herbage mass) and a structurally complex sward. Nevertheless, a defined tussock structure is generally agreed to be a key limiting element in habitat suitability for *D. impar*. This is reflected in the fact that *D. impar* has not been recorded where the tussock structure (of native and/or exotic grasses) has been lost, such as in sites that have undergone past cultivation/ploughing, and those where the tussock structure has been lost due to prolonged high stocking rates. In addition to extinguishing the *D. impar* population at the time, cultivation destroys the natural structure of the topsoil which appears to render the land unsuitable for *D. impar* for extended periods (i.e. the species has generally not been found to re-occupy recently cultivated land).

5. Methods

With regard to the above-described *D. impar* distribution and habitat characteristics, the key elements that define the likelihood that a given patch of grassland/pasture supports an extant population of *D. impar* are as follows.

1. Element 1. Does the subject land support one or more of the PCTs within which *D. impar* is known/predicted to occur in (i.e. a PCT for which the species is listed as a 'candidate species' under the BAM)?

   If yes, proceed to Element 2.

2. Element 2. Is the site located within the known geographical distribution of the species (set as the EOO + 30 km)?

   If yes, proceed to Element 3.

3. Element 3. Does the subject land support one or more patches of vegetation within which the canopy and middle strata are relatively sparse to entirely absent (e.g. primary grassland/derived native grassland/exotic grassland)?

   If yes, the subject land supports 'potential habitat' for *D.* impar. Proceed to Element 4 for assessment of the individual patch of vegetation.

4. Element 4. Has the subject patch of vegetation undergone cultivation/ploughing in the last approx. 20 years, either for cropping or pasture improvement? Note: many sites have been pasture improved via the spreading of superphosphate and/or exotic pasture species seed

[28] Moore D, Nash K and Hogg D (2010). *Block 799 Gungahlin Striped Legless Lizard survey.* Report to the ACT Government (David Hogg Pty Ltd, Canberra).
[29] Eco Logical Australia (2013). *Striped Legless Lizard surveys 2012: Gungahlin Grassland Nature Reserves – Crace, Mullangari and Gungaderra*. Report for the ACT Government (EcoLogical Australia Pty Ltd, Canberra).

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without cultivation; it is the soil profile modification from cultivation that appears to be the important deleterious element.

If no, proceed to Element 5.

5. Element 5. Does the subject patch of vegetation support a defined tussock structure and moderate to high herbage mass of native and/or exotic grass species?

If yes, the subject patch is identified as 'likely habitat' for *D. impar.*

This assessment has followed the two-step assessment process detailed below to determine whether the subject land and individual patches of vegetation align with each of the above five elements. It is only necessary to proceed to each subsequent element if the response to the previous element is in the affirmative.

5.1 Step 1 – Desktop Assessment (Elements 1 and 2)

The desktop assessment involved compiling and reviewing the technical documents and other resources relevant to the potential for *D. impar* to occur in the subject land. This involved my review of project-specific information and other relevant literature resources, together with the development of a Geographic Information System (GIS) platform to collate, analyse, assess, and display each of the key geographic elements relevant to the potential for *D. impar* occurrence, including the:

- available current satellite imagery;
- historical aerial photography (Commonwealth of Australia, 2025[30]);
- NSW State Vegetation Type Mapping (SVTM) (NSW Government, 2025a[31]);
- NSW topographic and elevation data (NSW Government, 2025b[32]);
- site-specific PCT and vegetation zone mapping (ERM, 2025);
- *D. impar* (and all other Pygopodid species) point data (NSW Government, 2025c[33]; Atlas of Living Australia, 2025[34]);
- *D. impar* Distribution Map (Commonwealth of Australia, 2025[35]); and
- *D. impar* Extent of Occurrence (EOO) prepared by Capital Ecology (2025).

5.2 Step 2 – Site Inspection (Elements 3 to 5)

With consideration of the above, on 11 April 2025, 29 May 2025, and 8 October 2025, Jarmin Thornberry (Consultant Ecologist, Capital Ecology) and I undertook a number of site inspections of the

[30] Commonwealth of Australia (2025). *Historical Aerial Photography Collection*. Geoscience Australia.
[31] NSW Government (2025a). *NSW State Vegetation Type Mapping C2.0.M2.1*. NSW Department of Climate Change, Energy, the Environment, and Water.
[32] NSW Government (2025b). *NSW Spatial Information Exchange Web Platform*. NSW Department of Customer Service.
[33] NSW Government (2025c). *BioNet Atlas Species Sightings Search Tool*. NSW Department of Climate Change, Energy, the Environment, and Water.
[34] Atlas of Living Australia (2025d). *Atlas of Living Australia Spatial Search Tool*.
[35] Commonwealth of Australia (2025). *Species Profile and Threats Database – Delma impar – Striped Legless Lizard*. Commonwealth Department of Climate Change, Energy, the Environment, and Water.

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subject land. During these inspections, we assessed the key habitat elements relevant to *D. impar* within the subject land and parts of the broader landscape. A short description of the following landscape and vegetation attributes relevant to *D. impar* within the subject land were taken:

- understorey vegetation composition, with particular focus on predominance of tussock-forming native or exotic grasses;
- understorey vegetation structure, with particular focus on apparent herbage mass, and inter-tussock space;
- vegetation condition, including evidence of substantial recent understorey disturbance incompatible with persistence of *D. impar* (e.g. nutrification from stock camps, heavily grazed areas, soil erosion, and cropping/pasture improvement); and
- landscape connectivity of relevance to *D. impar*.

6. Results

6.1 Step 1 – Desktop assessment

As described in Section 5.1, I undertook a detailed desktop assessment of a number of resources relevant to the subject land prior to completing my site visit. The results of this assessment are detailed below.

Analysis of recent and historical aerial imagery

As described in Section 1, and illustrated in Figure 1 and Figure 2, the subject land occupies approximately 21.53 ha and is located approximately 25 km east of Goulburn, NSW. It is evident through analysis of recent and historical aerial imagery that substantial areas of the subject land have undergone extensive historic vegetation clearance, likely for the purpose of livestock grazing. It is also evident through analysis of landscape position and elevation that prior to European occupation the subject land is likely to have been historically occupied by a dry sclerophyll forest vegetation formation in higher, drier areas, and a mosaic of grassy woodland and/or grassland in lower areas.

Analysis of PCT and vegetation zone mapping

As illustrated in Figure 5, ERM has undertaken PCT and vegetation zone mapping throughout the project area, including the subject land. In the context of an expert report prepared under the BAM, the PCT and vegetation zone mapping is primarily used to refine the area of potential habitat for *D. impar* within the subject land by identifying those PCTs and Interim Biogeographic Regionalisation for Australia (IBRA) subregions within which the species is identified as a candidate species as per the BAM-C and the NSW TBDC[36]. This part of the desktop assessment aligns with Element 1 and Element 2 of the assessment process described in Section 4. The results of this analysis are shown in Table 1.

[36] NSW Government (2025d). *Threatened Biodiversity Data Collection – Delma impar – Ecological Data*. NSW Department of Climate Change, Energy, the Environment, and Water.

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Table 1. Plant community type association with *D. impar* within the subject land (NSW TBDC)

PCT ID	PCT Name	*D. impar* identified as a candidate species
		IBRA Subregion = Bungonia
3373	Goulburn Tableland Box-Gum Grassy Forest	**Yes**
3347	Southern Tableland Creekflat Ribbon Gum Forest	**Yes**
3746	Southern Tableland Snow Gum-Candlebark Shrub Forest	**No**
4063	Central and Southern Tableland River Oak Forest	**No**

Analysis of NSW BioNet and ALA point data for *D. impar*

The nearest records of *D. impar* within 100 km of the subject land are summarised below in Table 2 and illustrated in Figure 4.

Table 2. Summary of nearby records of *D. impar*

Sighting Key / Catalogue No.	Common name *Scientific name*	Date	Location description	Easting	Northing	Accuracy	Distance from subject land
R.166394	Striped Legless Lizard *Delma impar*	08/11/1994	Windellama Road, Gundary, NSW	750081	6147618	Unknown	26 km
SLRF97112001		21/10/1997	Gundary Travelling Stock Reserve, Gundary, NSW	750463	6145434	100	27 km
Various		Various	Southern Yass, NSW	Various			Approx. 98 km
Various		Various	Northern Canberra, ACT	Various			Approx. 98 km

Analysis of the known distribution of *D. impar*

EPBC Act distribution map for *D. impar*

As illustrated in Figure 3, a polygon depicting the subject land was overlaid on the *D. impar* distribution map provided within the EPBC Act SPRAT Profile[37] to determine whether the subject land is located within the known distribution area of the species. As shown in Figure 3, the subject land is **not** located within either the "species or species habitat likely to occur" or "species or species habitat may occur" distribution area for *D. impar*. This part of the desktop assessment partially informs Element 2 of the assessment process described in Section 4.

NSW estimated distribution of *D. impar*

As discussed in Section 4.1, the estimated distribution for *D. impar* in NSW is defined as the EOO plus a 30 km buffer. As illustrated in Figure 3, the subject land is located within the estimated distribution for *D. impar* in NSW. This part of the desktop assessment aligns with Element 2 of the assessment process described in Section 4.

[37] Commonwealth of Australia (2025b). *Delma impar* – Striped Legless Lizard SPRAT profile. Commonwealth Department of Climate Change, Energy, the Environment, and Water.

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6.2 Step 2 – Site inspection

As described in Section 5.2, on 29 May 2025, 11 April 2025, and 8 October 2025, we undertook a number of site inspections of the subject land. During the site inspections, the following habitat characteristics for *D. impar* were assessed:

- understorey vegetation composition, with particular focus on predominance of tussock-forming native or exotic grasses;
- understorey vegetation structure, with particular focus on herbage mass and inter-tussock space;
- vegetation condition, including evidence of substantial recent understorey disturbance incompatible with persistence of *D. impar* (e.g. nutrification from stock camps, heavily grazed areas, soil erosion, and cropping/pasture improvement); and
- landscape connectivity of relevance to *D. impar*, including proximity to primary grasslands.

The findings of our site inspection aligns with Elements 3 – 5 as defined in Section 5.2, and are described below in Table 3.

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Table 3. Site inspection findings

Habitat Component		Description	Suitability for *D. impar*
1	Vegetation composition	With the exception of a number of patches of dense canopy vegetation within the Canyonleigh Road road corridor, the native canopy is generally sparse to absent, and depending on landscape position, is typically dominated by Snow Gum *Eucalyptus pauciflora*, Candlebark *Eucalyptus rubida*, Ribbon Gum *Eucalyptus viminalis*, or Yellow Box *Eucalyptus melliodora*. The midstorey is typically very sparse to absent, with the exception of a number of dense patches of Burgan *Kunzea ericoides* and Small-leaved Kunzea *K. parvifolia*, primarily occurring in the east of the subject land. The understorey vegetation composition is highly variable, with the species assemblage being heavily influenced by landscape position and recent/historic management regimes. In higher, drier areas, the understorey is typically dominated by native perennial grasses including Kangaroo Grass *Themeda triandra*, Red-leg Grass *Bothriochloa macra*, and Weeping Grass *Microlaena stipoides*, and occasionally includes a sparse to moderate cover of Serrated Tussock *Nassella trichotoma*. Lower, drier areas that have been subject to a high level of disturbance through agriculture and/or civil earthworks are typically dominated by exotic perennial grasses including Phalaris *Phalaris aquatica*, Cocksfoot *Dactylis glomerata*, Dallis Grass *Paspalum dilatatum*, and Serrated Tussock. Those lower areas that are subject to frequent inundation are typically dominated by a combination of River Tussock *Poa labillardierei* and Tall Sedge *Carex appressa*.	As a grassland specialist species, tussock-forming grasses such as Kangaroo Grass, River Tussock, Red-Leg Grass, Phalaris, Serrated Tussock, and Cocksfoot provide important habitat for *D. impar* in areas where the species persists. However, the suitability of such areas for *D. impar* is heavily dependent on suitable vegetation structure (Component 2) and vegetation condition and management regime (Component 3).

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Habitat Component		Description	Suitability for *D. impar*
2	Vegetation structure/biomass	The vegetation structure/biomass throughout the subject land is generally complex, and is characterised by variable sward heights, moderate to high herbage mass, and inter-tussock gaps. A number of disjoint patches of vegetation within the subject land are heavily shaded due to the presence of remnant and/or planted trees and shrubs. Portions of the subject land within the Canyonleigh Road reserve are fenced into adjoining paddocks that have been subject to long-term livestock grazing/cultivation. A number of patches of vegetation in the west of the Canyonleigh Road road reserve were observed to be dominated by low-growing metropolitan grass species such as Couch *Cynodon dactylon,* likely as a result of long-term management for amenity/road visibility.	*Delma impar* is dependent on open, grassy areas supporting suitable vegetation structure (e.g. intermediate herbage mass, adequate inter-tussock spaces, and a structurally complex sward). A substantial proportion of the subject land supports suitably complex vegetation structure and appropriate herbage mass for *D. impar*. Areas within the subject land that are characterised by: • heavy shading from remnant and/or planted trees and shrubs; • recent cultivation or intensive livestock grazing; and/or • long-term and ongoing management for amenity values and/or road visibility (e.g. frequently mown verge areas) typically lack the vegetation structure / herbage mass features required by *D. impar*, and are therefore considered unlikely to support suitable habitat for the species.
3	Vegetation condition and management regime	The native canopy is generally absent to sparse and occurs throughout the subject land as a number of disjoint patches. The understorey throughout the subject land is highly variable, and vegetation condition and historic/current management regimes are generally dependent on land tenure (e.g. position within the Canyonleigh Road road corridor vs. privately managed livestock pasture). The understorey structure throughout the subject land is generally complex (Plate 1), with those areas that are subject to ongoing management for agriculture or amenity supporting a substantially more homogenous structure (Plate 2) due to dominance of low-growing metropolitan grass species such as Couch, and annual exotic understorey species such as Oats *Avena spp*. and Clover *Trifolium spp*.	As described in Section 4.2, *D. impar* is typically not recorded where the tussock structure of native and/or exotic grasses has been lost due to past/ongoing cultivation. In addition to extinguishing the *D. impar* population at the time, cultivation destroys the natural structure of the topsoil which appears to render the land unsuitable for *D. impar* for extended periods. Additionally, *D. impar* is typically not recorded where the tussock structure has been lost due to prolonged grazing of livestock or management for amenity (e.g. through frequent and sustained low-level mowing). The observed vegetation condition throughout much of the subject land is generally compatible with the persistence of *D. impar*. A number of small patches of vegetation within the cadastral boundaries of the Canyonleigh Road road reserve have been subject to substantial recent and/or sustained historic disturbance through intensive grazing of livestock, management for amenity, and/or recent road infrastructure works, and are therefore considered currently incompatible with the persistence of *D. impar*.
4	Landscape connectivity	Landscape connectivity between the subject land and surrounding areas of derived native grassland and exotic pasture is generally adequate, and with the exception of Canyonleigh Road and areas characterised by a dense canopy cover, no substantial barriers to landscape movement of the species (e.g. dense canopy, waterways, roads etc.) were observed.	The subject land possesses some degree of landscape connectivity with surrounding areas of derived native grassland and exotic pasture in all directions, however, Canyonleigh Road serves as a substantial barrier to landscape movement of the species within the subject land.

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Plate 1. Example photograph of an area of derived native grassland within the subject land observed to support suitable vegetation structure/composition for *D. impar*.



Plate 2. Example photograph of an area of exotic grassland within the subject land determined to be unlikely to support suitable vegetation structure/composition for *D. impar*.

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6.3 Assessment of findings against the key geographic and habitat elements for *D. impar*

The findings of my assessment against the key geographic and habitat elements for *D. impar*, as presented in Section 6.1 and Section 6.2, are summarised below in Table 4.

Table 4. Assessment of findings against the key geographic and habitat elements for *D. impar*

Canyonleigh BESS project Subject Land	
Element 1 – Does the subject land support one or more of the PCTs within which *D. impar* is known/predicted to occur in (i.e. a PCT for which the species is listed as a 'candidate species' under the BAM)?	**Yes**. The subject land was assessed by ERM (2025) as supporting the following two PCTs for which *D. impar* is identified as a 'candidate species' under the BAM: • PCT3373 – Goulburn Tableland Box-Gum Grassy Forest • PCT3347 – Southern Tableland Creekflat Ribbon Gum Forest The following PCTs for which *D. impar* is **not** identified as a 'candidate species' under the BAM were identified by ERM within the subject land: • PCT3746 – Southern Tableland Snow Gum-Candlebark Shrub Forest • PCT4063 – Central and Southern Tableland River Oak Forest As *D. impar* is not identified as a 'candidate species' for either PCT3746 or PCT4063, these PCTs are not considered to support potential habitat for the species for the purpose of this assessment.
If yes, proceed to Element 2. Otherwise, no further assessment is required.	
geographical distribution of *D. impar* (i.e. does it occur within, or within 30 km of, the known extent of occurrence	**Yes**. The subject land is located: 1. within 30 km of the NSW EOO (Capital Ecology, 2024) for *D. impar*; 2. in the Bungonia IBRA subregion, which is a subregion within which *D. impar* is known to occur; and 3. approximately 26 km west of the nearest record of *D. impar*.
If yes, proceed to Element 3. Otherwise, no further assessment is required.	
	Yes. A substantial proportion of the subject land is characterised by a matrix of derived native grassland and exotic grassland.
If yes, proceed to Element 4 for assessment of the individual patch of vegetation. Otherwise, no further assessment is required.	
Element 4 – Has the subject patch of vegetation undergone cultivation/ploughing in the last approx. 20 years, either for cropping or pasture improvement?	**No**. There is no evidence to support that an assertion that a substantial proportion of the subject land has undergone cultivation/ploughing in the last approx. 20 years.

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If no, proceed to Element 5. Otherwise, no further assessment required.	
Element 5 – Does the subject patch of vegetation support a defined tussock structure and moderate to high herbage mass of native and/or exotic grass species?	**Yes**. A substantial proportion of the subject land has been identified as supporting a defined tussock structure and moderate to high herbage mass of native and/or exotic grass species. A number of small patches of vegetation within the cadastral boundaries of the Canyonleigh Road road reserve have been subject to substantial recent and/or sustained historic disturbance through intensive grazing of livestock, management for amenity, and/or recent road infrastructure works, and are therefore considered currently incompatible with the persistence of *D. impar*. The total area of likely habitat for *D. impar* identified within each vegetation zone mapped by ERM (2025) in the subject land is provided below. • PCT3347 (VZ11 – Grassland) – 1.15 ha • PCT3373 (VZ12 – Woodland) – 0.18 ha • PCT3373 (VZ13 – Grassland) – 1.93 ha

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7. Conclusion

As detailed in this report (summarised in Section 6.3), based on the findings of the desktop and field investigations I have undertaken for this assessment, I have determined that *D. impar* is likely to be present on or use habitat within the subject land. The subject land supports a total area of 3.26 ha of likely habitat for *D. impar*, as illustrated in Figure 6 and made available to ERM as a GIS shapefile.

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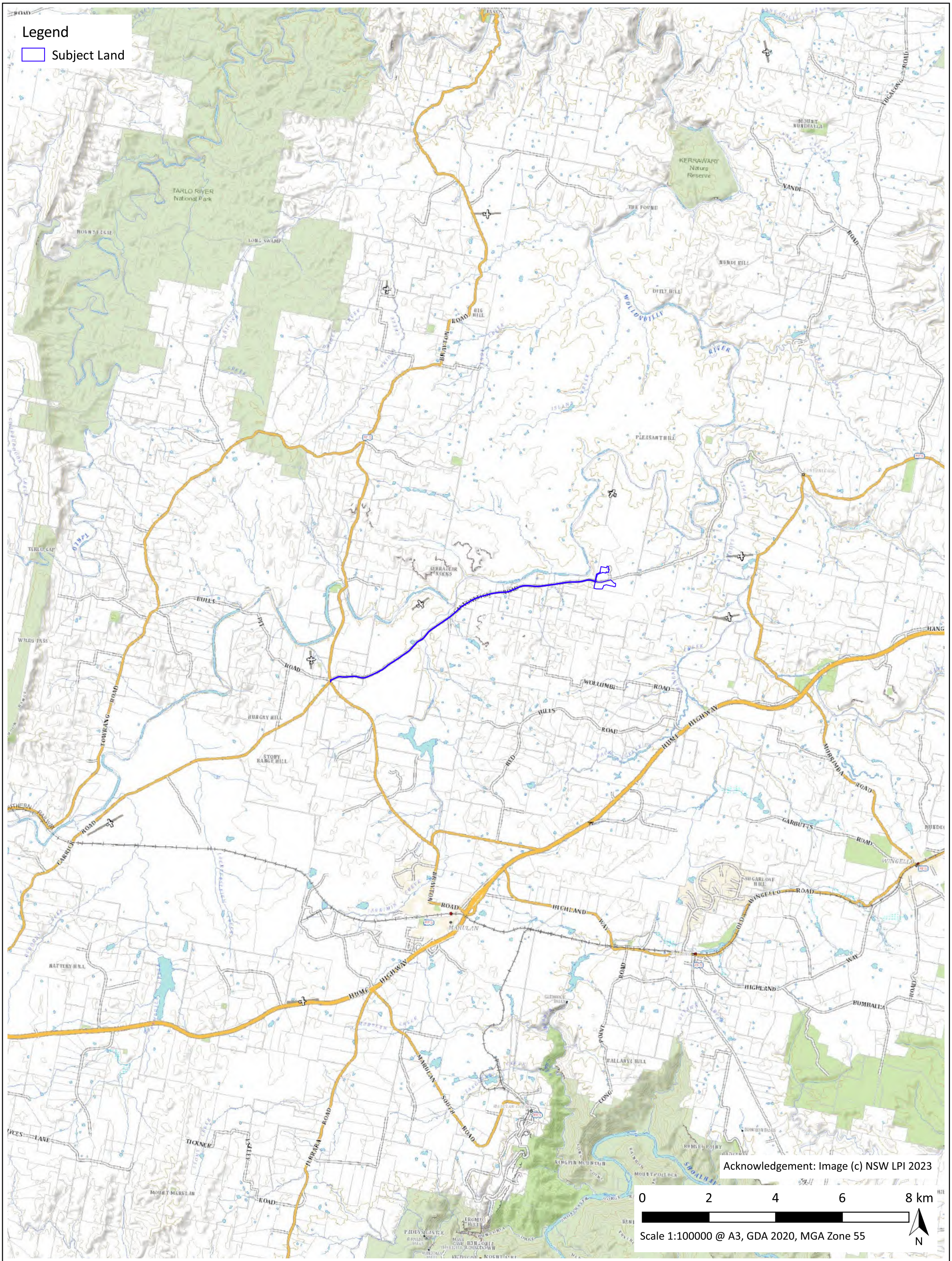


Figure 1. Locality Plan

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Date: 05/11/2025

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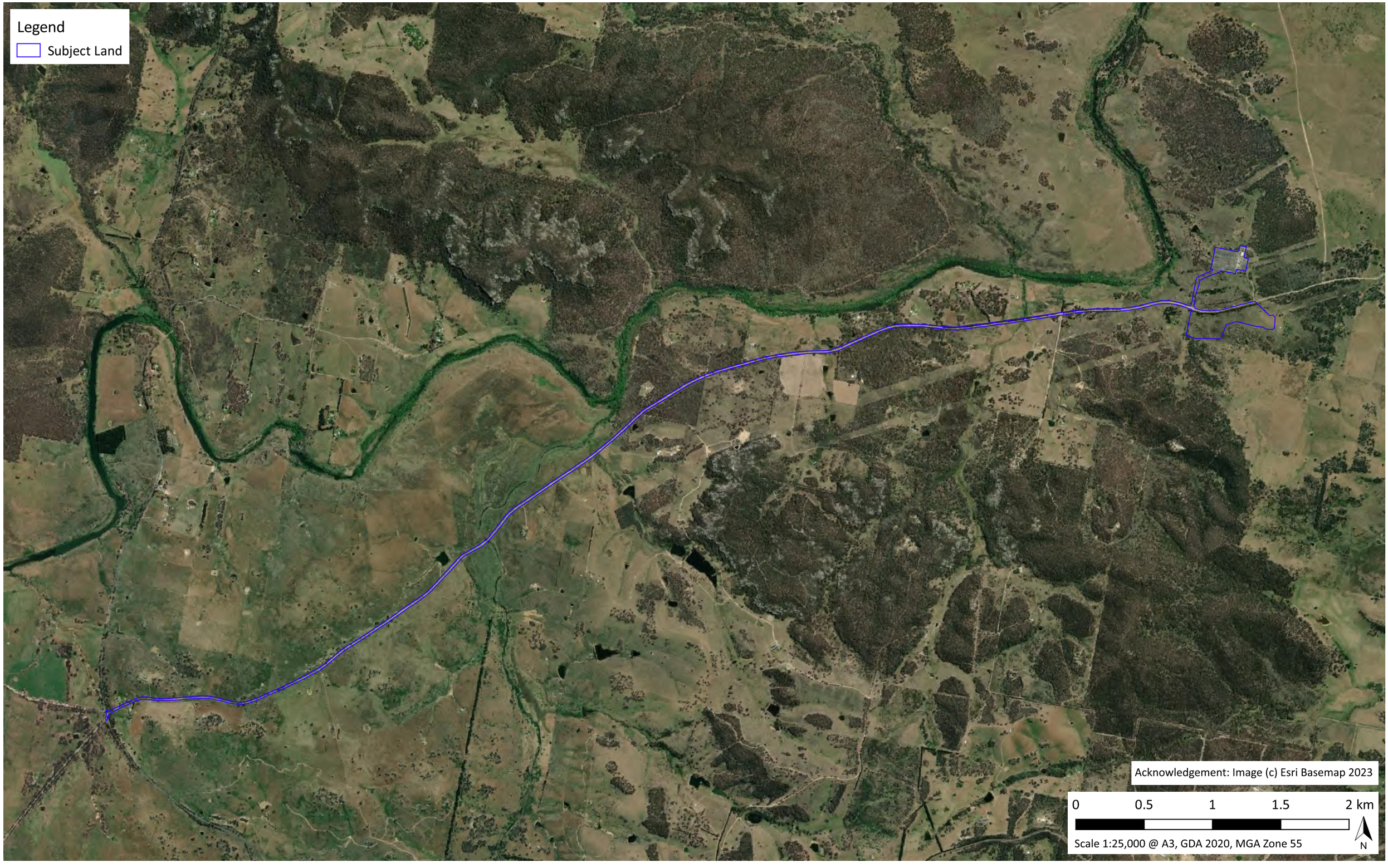


Figure 2. The Subject Land on Aerial Imagery

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Legend

Subject Land

D. impar - EPBC Act PMST Distribution

Species or species habitat likely to occur

Species or species habitat may occur

Filtered Species Records (credible records only)

D. impar - Atlas of Living Australia

D. impar - BioNet

D. impar - NSW Extent of Occurence (EOO)

D. impar - NSW EOO

10km Buffer to *D. impar* EOO

20km Buffer to *D. impar* EOO

30km Buffer to *D. impar* EOO

40km Buffer to *D. impar* EOO

50km Buffer to *D. impar* EOO

100km Buffer to *D. impar* EOO

Acknowledgement: Image (c) ESRI Basemap 2023

0 30 60 90 120 km

Scale 1:1,500,000 @ A3, GDA 2020, MGA Zone 55

N

Figure 3. Striped Legless Lizard - NSW Records and Extent of Occurrence

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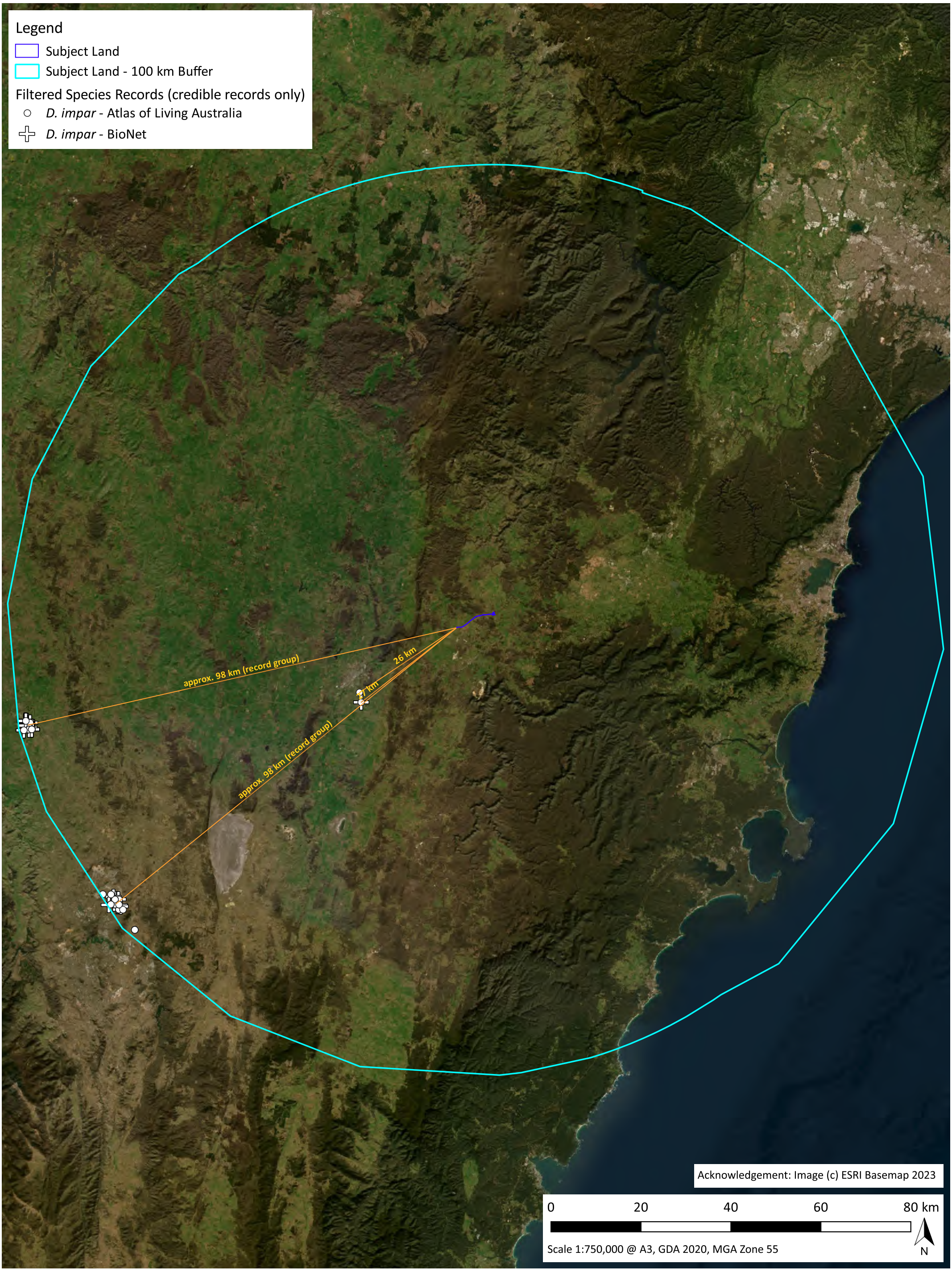


Figure 4. Striped Legless Lizard - NSW Records within 100 km of the Subject Land

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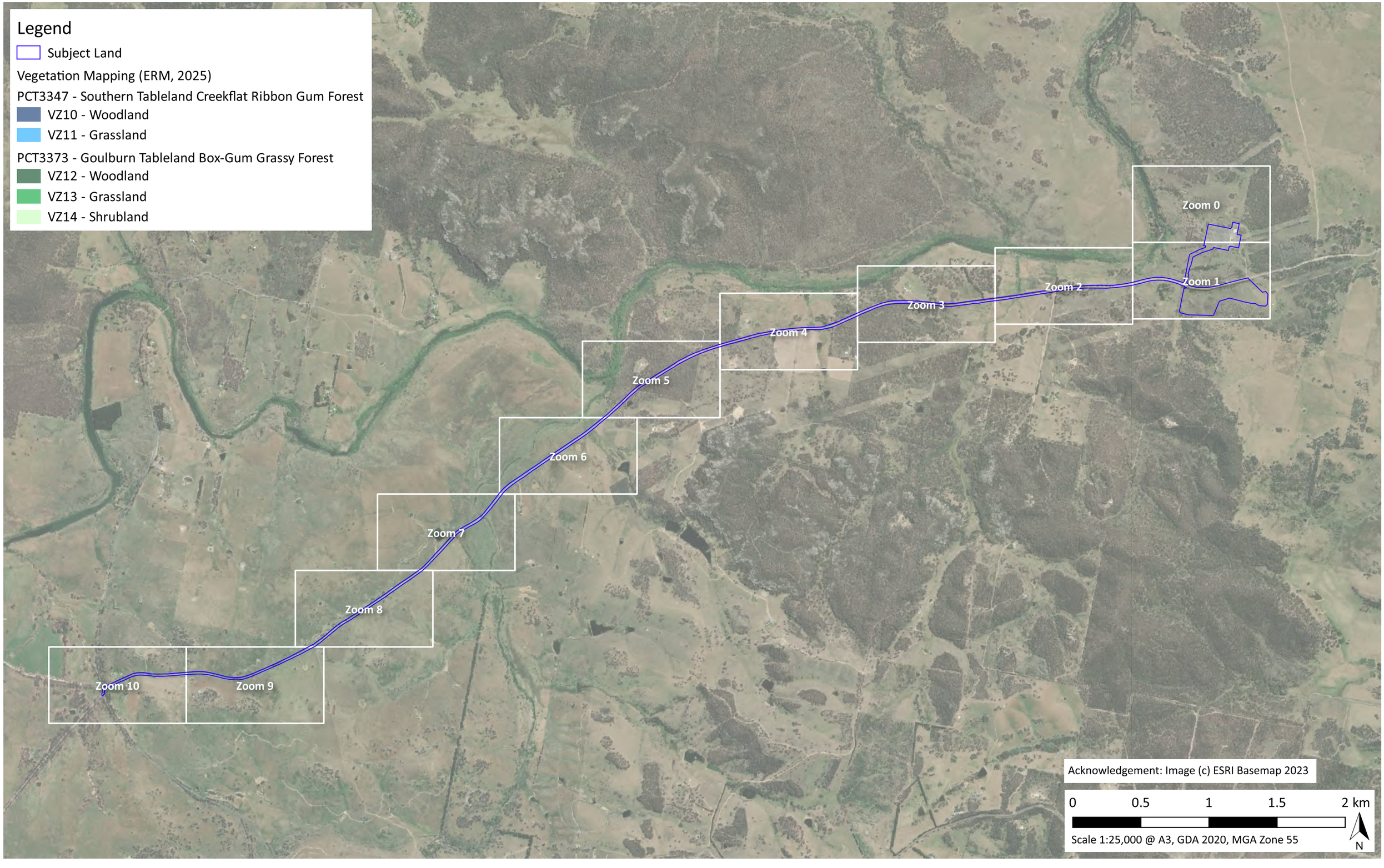


Figure 5. Candidate Plant Community Types for Striped Legless Lizard (Overview)

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Figure 5. Candidate Plant Community Types for Striped Legless Lizard - Zoom 0

Legend

Subject Land

Vegetation Mapping (ERM, 2025)

PCT3347 - Southern Tableland Creekflat Ribbon Gum Forest
- VZ10 - Woodland
- VZ11 - Grassland

PCT3373 - Goulburn Tableland Box-Gum Grassy Forest
- VZ12 - Woodland
- VZ13 - Grassland
- VZ14 - Shrubland

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0 50 100 150 200 m

Scale 1:2,500 @ A3, GDA 2020, MGA Zone 55

N

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Figure 5. Candidate Plant Community Types for Striped Legless Lizard - Zoom 1

Legend

Subject Land

Vegetation Mapping (ERM, 2025)

PCT3347 - Southern Tableland Creekflat Ribbon Gum Forest
- VZ10 - Woodland
- VZ11 - Grassland

PCT3373 - Goulburn Tableland Box-Gum Grassy Forest
- VZ12 - Woodland
- VZ13 - Grassland
- VZ14 - Shrubland

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0 50 100 150 200 m

Scale 1:2,500 @ A3, GDA 2020, MGA Zone 55

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Figure 5. Candidate Plant Community Types for Striped Legless Lizard - Zoom 2

Legend

Subject Land

Vegetation Mapping (ERM, 2025)

PCT3347 - Southern Tableland Creekflat Ribbon Gum Forest
- VZ10 - Woodland
- VZ11 - Grassland

PCT3373 - Goulburn Tableland Box-Gum Grassy Forest
- VZ12 - Woodland
- VZ13 - Grassland
- VZ14 - Shrubland

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0 50 100 150 200 m

Scale 1:2,500 @ A3, GDA 2020, MGA Zone 55

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Figure 5. Candidate Plant Community Types for Striped Legless Lizard - Zoom 3

Legend

Subject Land

Vegetation Mapping (ERM, 2025)

PCT3347 - Southern Tableland Creekflat Ribbon Gum Forest
- VZ10 - Woodland
- VZ11 - Grassland

PCT3373 - Goulburn Tableland Box-Gum Grassy Forest
- VZ12 - Woodland
- VZ13 - Grassland
- VZ14 - Shrubland

Acknowledgement: Image (c) ESRI Basemap 2023

0 50 100 150 200 m

Scale 1:2,500 @ A3, GDA 2020, MGA Zone 55

N

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Figure 5. Candidate Plant Community Types for Striped Legless Lizard - Zoom 4

Legend

Subject Land

Vegetation Mapping (ERM, 2025)

PCT3347 - Southern Tableland Creekflat Ribbon Gum Forest
- VZ10 - Woodland
- VZ11 - Grassland

PCT3373 - Goulburn Tableland Box-Gum Grassy Forest
- VZ12 - Woodland
- VZ13 - Grassland
- VZ14 - Shrubland

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0 50 100 150 200 m

Scale 1:2,500 @ A3, GDA 2020, MGA Zone 55

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Figure 5. Candidate Plant Community Types for Striped Legless Lizard - Zoom 5

Legend

Subject Land

Vegetation Mapping (ERM, 2025)

PCT3347 - Southern Tableland Creekflat Ribbon Gum Forest
- VZ10 - Woodland
- VZ11 - Grassland

PCT3373 - Goulburn Tableland Box-Gum Grassy Forest
- VZ12 - Woodland
- VZ13 - Grassland
- VZ14 - Shrubland

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0 50 100 150 200 m

Scale 1:2,500 @ A3, GDA 2020, MGA Zone 55

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Figure 5. Candidate Plant Community Types for Striped Legless Lizard - Zoom 6

Legend

Subject Land

Vegetation Mapping (ERM, 2025)

PCT3347 - Southern Tableland Creekflat Ribbon Gum Forest
- VZ10 - Woodland
- VZ11 - Grassland

PCT3373 - Goulburn Tableland Box-Gum Grassy Forest
- VZ12 - Woodland
- VZ13 - Grassland
- VZ14 - Shrubland

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0 50 100 150 200 m

Scale 1:2,500 @ A3, GDA 2020, MGA Zone 55

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Figure 5. Candidate Plant Community Types for Striped Legless Lizard - Zoom 7

Legend

Subject Land

Vegetation Mapping (ERM, 2025)

PCT3347 - Southern Tableland Creekflat Ribbon Gum Forest
- VZ10 - Woodland
- VZ11 - Grassland

PCT3373 - Goulburn Tableland Box-Gum Grassy Forest
- VZ12 - Woodland
- VZ13 - Grassland
- VZ14 - Shrubland

Acknowledgement: Image (c) ESRI Basemap 2023

0 50 100 150 200 m

Scale 1:2,500 @ A3, GDA 2020, MGA Zone 55

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Figure 5. Candidate Plant Community Types for Striped Legless Lizard - Zoom 8

Legend

Subject Land

Vegetation Mapping (ERM, 2025)

PCT3347 - Southern Tableland Creekflat Ribbon Gum Forest
- VZ10 - Woodland
- VZ11 - Grassland

PCT3373 - Goulburn Tableland Box-Gum Grassy Forest
- VZ12 - Woodland
- VZ13 - Grassland
- VZ14 - Shrubland

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0 50 100 150 200 m

Scale 1:2,500 @ A3, GDA 2020, MGA Zone 55

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Figure 5. Candidate Plant Community Types for Striped Legless Lizard - Zoom 9

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0 50 100 150 200 m

Scale 1:2,500 @ A3, GDA 2020, MGA Zone 55

N

Legend

Subject Land

Vegetation Mapping (ERM, 2025)

PCT3347 - Southern Tableland Creekflat Ribbon Gum Forest
- VZ10 - Woodland
- VZ11 - Grassland

PCT3373 - Goulburn Tableland Box-Gum Grassy Forest
- VZ12 - Woodland
- VZ13 - Grassland
- VZ14 - Shrubland

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Figure 5. Candidate Plant Community Types for Striped Legless Lizard - Zoom 10

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0 50 100 150 200 m

Scale 1:2,500 @ A3, GDA 2020, MGA Zone 55

N

Legend

Subject Land

Vegetation Mapping (ERM, 2025)

PCT3347 - Southern Tableland Creekflat Ribbon Gum Forest
- VZ10 - Woodland
- VZ11 - Grassland

PCT3373 - Goulburn Tableland Box-Gum Grassy Forest
- VZ12 - Woodland
- VZ13 - Grassland
- VZ14 - Shrubland

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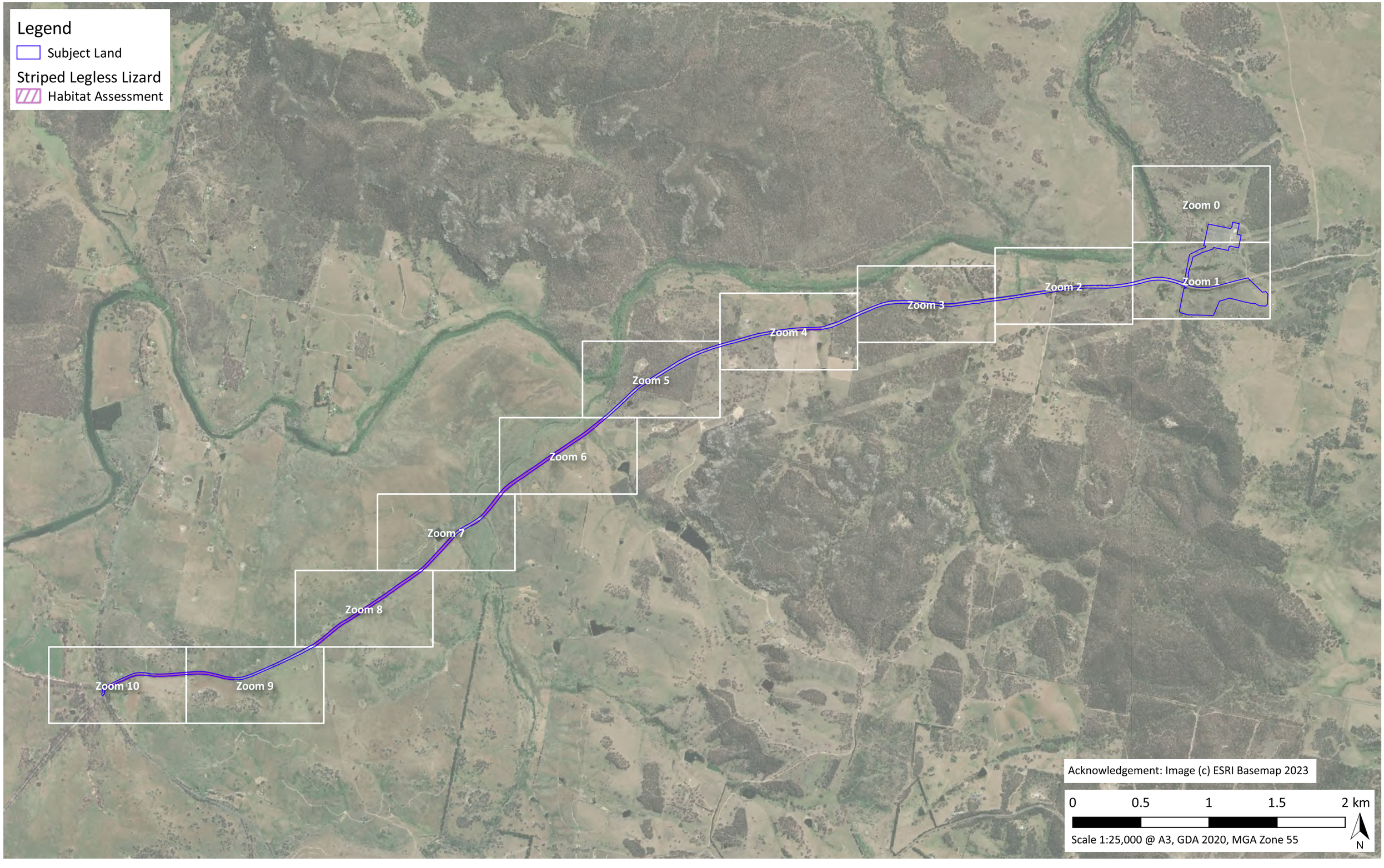


Figure 6. Striped Legless Lizard Habitat Assessment (Overview)

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Date: 5 November 2025

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Figure 6. Striped Legless Lizard Habitat Assessment - Zoom 0

Legend

Subject Land

Striped Legless Lizard

Habitat Polygon

Acknowledgement: Image (c) ESRI Basemap 2023

0 50 100 150 200 m

Scale 1:2,500 @ A3, GDA 2020, MGA Zone 55

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Figure 6. Striped Legless Lizard Habitat Assessment - Zoom 1

Legend

Subject Land

Striped Legless Lizard
Habitat Polygon

Acknowledgement: Image (c) ESRI Basemap 2023

0 50 100 150 200 m

Scale 1:2,500 @ A3, GDA 2020, MGA Zone 55

N

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Date: 5 November 2025



Figure 6. Striped Legless Lizard Habitat Assessment - Zoom 2

Legend

Subject Land

Striped Legless Lizard
Habitat Polygon

Acknowledgement: Image (c) ESRI Basemap 2023

0 50 100 150 200 m

Scale 1:2,500 @ A3, GDA 2020, MGA Zone 55

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Figure 6. Striped Legless Lizard Habitat Assessment - Zoom 3

Legend

Subject Land

Striped Legless Lizard

Habitat Polygon

Acknowledgement: Image (c) ESRI Basemap 2023

0 50 100 150 200 m

Scale 1:2,500 @ A3, GDA 2020, MGA Zone 55

N

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Drawn by: J. Thornberry
Date: 5 November 2025



Figure 6. Striped Legless Lizard Habitat Assessment - Zoom 4

Legend

Subject Land

Striped Legless Lizard

Habitat Polygon

Acknowledgement: Image (c) ESRI Basemap 2023

0 50 100 150 200 m

Scale 1:2,500 @ A3, GDA 2020, MGA Zone 55

N

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Date: 5 November 2025



Figure 6. Striped Legless Lizard Habitat Assessment - Zoom 5

Legend

Subject Land

Striped Legless Lizard

Habitat Polygon

Acknowledgement: Image (c) ESRI Basemap 2023

0 50 100 150 200 m

Scale 1:2,500 @ A3, GDA 2020, MGA Zone 55

N

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Figure 6. Striped Legless Lizard Habitat Assessment - Zoom 6

Legend

Subject Land

Striped Legless Lizard
Habitat Polygon

Acknowledgement: Image (c) ESRI Basemap 2023

0 50 100 150 200 m

Scale 1:2,500 @ A3, GDA 2020, MGA Zone 55

N

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Figure 6. Striped Legless Lizard Habitat Assessment - Zoom 7

Legend

Subject Land

Striped Legless Lizard

Habitat Polygon

Acknowledgement: Image (c) ESRI Basemap 2023

0 50 100 150 200 m

Scale 1:2,500 @ A3, GDA 2020, MGA Zone 55

N

capital ecology

Capital Ecology Project No: 3476
Drawn by: J. Thornberry
Date: 5 November 2025



Figure 6. Striped Legless Lizard Habitat Assessment - Zoom 8

Legend

Subject Land

Striped Legless Lizard
Habitat Polygon

Acknowledgement: Image (c) ESRI Basemap 2023

0 50 100 150 200 m

Scale 1:2,500 @ A3, GDA 2020, MGA Zone 55

N

capital ecology

Capital Ecology Project No: 3476
Drawn by: J. Thornberry
Date: 5 November 2025

APPENDIX H PMST REPORT

EPBC Act Protected Matters Report

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

Report created: 23-Apr-2025

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

Caveat
Acknowledgements

Summary

Matters of National Environment Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	5
Listed Threatened Species:	64
Listed Migratory Species:	9

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Lands:	4
Commonwealth Heritage Places:	None
Listed Marine Species:	21
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

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

State and Territory Reserves:	2
Regional Forest Agreements:	1
Nationally Important Wetlands:	1
EPBC Act Referrals:	8
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	1
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.
Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text	Buffer Status
Natural Temperate Grassland of the South Eastern Highlands	Critically Endangered	Community likely to occur within area	In feature area
Southern Highlands Shale Forest and Woodland in the Sydney Basin Bioregion	Critically Endangered	Community may occur within area	In buffer area only
Temperate Highland Peat Swamps on Sandstone	Endangered	Community may occur within area	In buffer area only
Upland Basalt Eucalypt Forests of the Sydney Basin Bioregion	Endangered	Community may occur within area	In buffer area only
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community likely to occur within area	In feature area

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Anthochaera phrygia			
Regent Honeyeater [82338]	Critically Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area
Aphelocephala leucopsis			
Southern Whiteface [529]	Vulnerable	Species or species habitat known to occur within area	In feature area
Botaurus poiciloptilus			
Australasian Bittern [1001]	Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Callocephalon fimbriatum Gang-gang Cockatoo [768]	Endangered	Species or species habitat known to occur within area	In feature area
Calyptorhynchus lathami lathami South-eastern Glossy Black-Cockatoo [67036]	Vulnerable	Species or species habitat known to occur within area	In feature area
Climacteris picumnus victoriae Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat known to occur within area	In feature area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Melanodryas cucullata cucullata South-eastern Hooded Robin, Hooded Robin (south-eastern) [67093]	Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Neophema chrysostoma](#) Blue-winged Parrot [726]	Vulnerable	Species or species habitat may occur within area	In feature area
[Polytelis swainsonii](#) Superb Parrot [738]	Vulnerable	Species or species habitat may occur within area	In feature area
[Pycnoptilus floccosus](#) Pilotbird [525]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Rostratula australis](#) Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area	In feature area
[Stagonopleura guttata](#) Diamond Firetail [59398]	Vulnerable	Species or species habitat known to occur within area	In feature area
FISH			
[Macquaria australasica](#) Macquarie Perch [66632]	Endangered	Species or species habitat known to occur within area	In feature area
[Prototroctes maraena](#) Australian Grayling [26179]	Vulnerable	Species or species habitat may occur within area	In buffer area only
FROG			
[Litoria watsoni](#) Southern Heath Frog, Watson's Tree Frog [91509]	Endangered	Species or species habitat may occur within area	In buffer area only
INSECT			
[Keyacris scurra](#) Key's Matchstick Grasshopper [89739]	Endangered	Species or species habitat may occur within area	In buffer area only
MAMMAL			
[Chalinolobus dwyeri](#) Large-eared Pied Bat, Large Pied Bat [183]	Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Dasyurus maculatus maculatus (SE mainland population)			
Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat known to occur within area	In feature area
Petauroides volans			
Greater Glider (southern and central) [254]	Endangered	Species or species habitat known to occur within area	In feature area
Petaurus australis australis			
Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat known to occur within area	In feature area
Petrogale penicillata			
Brush-tailed Rock-wallaby [225]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)			
Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat known to occur within area	In feature area
Pseudomys novaehollandiae			
New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat may occur within area	In feature area
Pteropus poliocephalus			
Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
PLANT			
Acacia bynoeana			
Bynoe's Wattle, Tiny Wattle [8575]	Vulnerable	Species or species habitat may occur within area	In feature area
Baloskion longipes			
Dense Cord-rush [68511]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Caladenia tessellata			
Thick-lipped Spider-orchid, Daddy Long-legs [2119]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Commersonia prostrata			
Dwarf Kerrawang [87152]	Endangered	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Corunastylis plumosa listed as Genoplesium plumosum			
Plumed Midge-orchid, Tallong Midge Orchid [78695]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Dodonaea procumbens			
Trailing Hop-bush [12149]	Vulnerable	Species or species habitat may occur within area	In feature area
Eucalyptus aggregata			
Black Gum [20890]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Eucalyptus aquatica			
Mountain Swamp Gum, Broad-leaved Sallee, Broad-leaved Sally [56173]	Critically Endangered	Species or species habitat known to occur within area	In buffer area only
Eucalyptus macarthurii			
Camden Woollybutt, Paddys River Box [7827]	Endangered	Species or species habitat known to occur within area	In buffer area only
Genoplesium baueri			
Yellow Gnat-orchid, Bauer's Midge Orchid, Brittle Midge Orchid [7528]	Endangered	Species or species habitat may occur within area	In feature area
Gentiana wingecarribiensis			
Wingecarribee Gentian [18033]	Endangered	Species or species habitat known to occur within area	In buffer area only
Grevillea molyneuxii			
[22052]	Endangered	Species or species habitat may occur within area	In buffer area only
Grevillea raybrownii			
[65665]	Vulnerable	Species or species habitat may occur within area	In feature area
Haloragis exalata subsp. exalata			
Wingless Raspwort, Square Raspwort [24636]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Helichrysum calvertianum			
[5702]	Vulnerable	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Hibbertia acaulothrix [87409]	Endangered	Species or species habitat may occur within area	In feature area
Kunzea cambagei [11420]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Leucochrysum albicans subsp. tricolor Hoary Sunray, Grassland Paper-daisy [89104]	Endangered	Species or species habitat known to occur within area	In feature area
Persicaria elatior Knotweed, Tall Knotweed [5831]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Persoonia mollis subsp. revoluta [56094]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Persoonia oxycoccoides [16114]	Endangered	Species or species habitat known to occur within area	In feature area
Phyllota humifusa Dwarf Phyllota [10133]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Pomaderris brunnea Rufous Pomaderris, Brown Pomaderris [16845]	Vulnerable	Species or species habitat known to occur within area	In feature area
Pomaderris cotoneaster Cotoneaster Pomaderris [2043]	Endangered	Species or species habitat likely to occur within area	In feature area
Pomaderris pallida Pale Pomaderris [13684]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Rhizanthella slateri Eastern Underground Orchid [11768]	Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Thelymitra kangaloonica Kangaloon Sun Orchid [81861]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat may occur within area	In feature area
Xerochrysum palustre Swamp Everlasting, Swamp Paper Daisy [76215]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Zieria murphyi Velvet Zieria [4634]	Vulnerable	Species or species habitat may occur within area	In buffer area only
REPTILE			
Aprasia parapulchella Pink-tailed Worm-lizard, Pink-tailed Legless Lizard [1665]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Delma impar Striped Legless Lizard, Striped Snake-lizard [1649]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Hoplocephalus bungaroides Broad-headed Snake [1182]	Endangered	Species or species habitat may occur within area	In buffer area only

Listed Migratory Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Migratory Terrestrial Species			
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area	In feature area
Migratory Wetlands Species			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Pandion haliaetus Osprey [952]		Species or species habitat likely to occur within area	In buffer area only

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State	Buffer Status
Communications, Information Technology and the Arts - Telstra Corporation Limited		
Commonwealth Land - Australian Telecommunications Commission [11834]	NSW	In buffer area only
Commonwealth Land - Telstra Corporation Limited [11833]	NSW	In buffer area only
Commonwealth Land - Telstra Corporation Limited [11835]	NSW	In buffer area only
Transport and Regional Services - Airservices Australia		
Commonwealth Land - Airservices Australia [11832]	NSW	In buffer area only

Listed Marine Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat likely to occur within area overfly marine area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat likely to occur within area overfly marine area	In feature area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Lathamus discolor](#) Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
[Merops ornatus](#) Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
[Monarcha melanopsis](#) Black-faced Monarch [609]		Species or species habitat known to occur within area overfly marine area	In feature area
[Motacilla flava](#) Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area	In feature area
[Myiagra cyanoleuca](#) Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area	In feature area
[Neophema chrysostoma](#) Blue-winged Parrot [726]	Vulnerable	Species or species habitat may occur within area overfly marine area	In feature area
[Pandion haliaetus](#) Osprey [952]		Species or species habitat likely to occur within area	In buffer area only
[Pterodroma cervicalis](#) White-necked Petrel [59642]		Species or species habitat may occur within area	In feature area
[Rhipidura rufifrons](#) Rufous Fantail [592]		Species or species habitat likely to occur within area overfly marine area	In feature area
[Rostratula australis as Rostratula benghalensis (sensu lato)](#) Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Sterna striata White-fronted Tern [799]		Migration route may occur within area	In buffer area only

Extra Information

State and Territory Reserves [Resource Information]

Protected Area Name	Reserve Type	State	Buffer Status
Kerrawary	Nature Reserve	NSW	In buffer area only
Tarlo River	National Park	NSW	In buffer area only

Regional Forest Agreements [Resource Information]

Note that all areas with completed RFAs have been included. Please see the associated resource information for specific caveats and use limitations associated with RFA boundary information.

RFA Name	State	Buffer Status
Southern RFA	New South Wales	In buffer area only

Nationally Important Wetlands [Resource Information]

Wetland Name	State	Buffer Status
Long Swamp	NSW	In buffer area only

EPBC Act Referrals [Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Wattle Creek Energy Hub Battery Energy Storage System Project	2024/09970		Assessment	In feature area
Wattle Creek Energy Hub Solar Farm Project	2024/09969		Assessment	In feature area
Controlled action				
Gunlake Extension Project, Brayton NSW	2015/7557	Controlled Action	Post-Approval	In buffer area only
Lynwood Quarry Project, Marulan, NSW	2012/6560	Controlled Action	Post-Approval	In buffer area only
Not controlled action				
Highland Source Project	2010/5697	Not Controlled Action	Completed	In buffer area only
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed	In feature area
Not controlled action (particular manner)				
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval	In feature area

Bioregional Assessments			[Resource Information]
SubRegion	BioRegion	Website	Buffer Status
Sydney	Sydney Basin	BA website	In feature area

Caveat

1 PURPOSE

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

The report contains the mapped locations of:

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

2 DISCLAIMER

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

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

3 DATA SOURCES

Threatened ecological communities

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

Threatened, migratory and marine species

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

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

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

4 LIMITATIONS

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

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

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

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

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

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

Acknowledgements

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

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

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

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

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APPENDIX I PREDICTED SPECIES BAM-C REPORTS

BAM Predicted Species Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00049779/BAAS20009/24/00049780	Canyonleigh BESS Development Footprint	05/08/2025
Assessor Name	**Report Created**	**BAM Data version ***
Claire Hewitt	13/01/2026	Current classification (live - default) (82)
Assessor Number	**Assessment Type**	**BAM Case Status**
BAAS20009	Major Projects	Finalised
Assessment Revision	**BOS entry trigger**	**Date Finalised**
4		13/01/2026

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Threatened species reliably predicted to utilise the site. No surveys are required for these species. Ecosystem credits apply to these species.

Common Name	Scientific Name	Vegetation Types(s)
Australasian Bittern	Botaurus poiciloptilus	4063-Central and Southern Tableland River Oak Forest
Black Falcon	Falco subniger	3746-Southern Tableland Snow Gum-Candlebark Shrub Forest
		4063-Central and Southern Tableland River Oak Forest
Black-chinned Honeyeater (eastern subspecies)	Melithreptus gularis gularis	4063-Central and Southern Tableland River Oak Forest
Brown Treecreeper (eastern subspecies)	Climacteris picumnus victoriae	3746-Southern Tableland Snow Gum-Candlebark Shrub Forest
		4063-Central and Southern Tableland River Oak Forest
Diamond Firetail	Stagonopleura guttata	3746-Southern Tableland Snow Gum-Candlebark Shrub Forest
		4063-Central and Southern Tableland River Oak Forest
Dusky Woodswallow	Artamus cyanopterus cyanopterus	3746-Southern Tableland Snow Gum-Candlebark Shrub Forest
		4063-Central and Southern Tableland River Oak Forest
Eastern False Pipistrelle	Falsistrellus tasmaniensis	3746-Southern Tableland Snow Gum-Candlebark Shrub Forest
		4063-Central and Southern Tableland River Oak Forest
Flame Robin	Petroica phoenicea	3746-Southern Tableland Snow Gum-Candlebark Shrub Forest

Flame Robin	Petroica phoenicea	4063-Central and Southern Tableland River Oak Forest
Gang-gang Cockatoo	Callocephalon fimbriatum	3746-Southern Tableland Snow Gum-Candlebark Shrub Forest
		4063-Central and Southern Tableland River Oak Forest
Greater Broad-nosed Bat	Scoteanax rueppellii	4063-Central and Southern Tableland River Oak Forest
Grey-headed Flying-fox	Pteropus poliocephalus	3746-Southern Tableland Snow Gum-Candlebark Shrub Forest
		4063-Central and Southern Tableland River Oak Forest
Large Bent-winged Bat	Miniopterus orianae oceanensis	4063-Central and Southern Tableland River Oak Forest
Little Eagle	Hieraaetus morphnoides	3746-Southern Tableland Snow Gum-Candlebark Shrub Forest
		4063-Central and Southern Tableland River Oak Forest
Little Lorikeet	Glossopsitta pusilla	3746-Southern Tableland Snow Gum-Candlebark Shrub Forest
		4063-Central and Southern Tableland River Oak Forest
Olive Whistler	Pachycephala olivacea	3746-Southern Tableland Snow Gum-Candlebark Shrub Forest
Painted Honeyeater	Grantiella picta	3746-Southern Tableland Snow Gum-Candlebark Shrub Forest
		4063-Central and Southern Tableland River Oak Forest
Pilotbird	Pycnoptilus floccosus	3746-Southern Tableland Snow Gum-Candlebark Shrub Forest
Regent Honeyeater	Anthochaera phrygia	4063-Central and Southern Tableland River Oak Forest
Rosenberg's Goanna	Varanus rosenbergi	3746-Southern Tableland Snow Gum-Candlebark Shrub Forest
		4063-Central and Southern Tableland River Oak Forest
Scarlet Robin	Petroica boodang	3746-Southern Tableland Snow Gum-Candlebark Shrub Forest
		4063-Central and Southern Tableland River Oak Forest
South-eastern Glossy Black-Cockatoo	Calyptorhynchus lathami lathami	3746-Southern Tableland Snow Gum-Candlebark Shrub Forest
		4063-Central and Southern Tableland River Oak Forest
South-eastern Hooded Robin	Melanodryas cucullata cucullata	3746-Southern Tableland Snow Gum-Candlebark Shrub Forest
		4063-Central and Southern Tableland River Oak Forest
Southern Whiteface	Aphelocephala leucopsis	4063-Central and Southern Tableland River Oak Forest
Speckled Warbler	Chthonicola sagittata	3746-Southern Tableland Snow Gum-Candlebark Shrub Forest
		4063-Central and Southern Tableland River Oak Forest
Spotted Harrier	Circus assimilis	4063-Central and Southern Tableland River Oak Forest
Spotted-tailed Quoll	Dasyurus maculatus	3746-Southern Tableland Snow Gum-Candlebark Shrub Forest
		4063-Central and Southern Tableland River Oak Forest
Swift Parrot	Lathamus discolor	4063-Central and Southern Tableland River Oak Forest

Turquoise Parrot	Neophema pulchella	4063-Central and Southern Tableland River Oak Forest
Varied Sittella	Daphoenositta chrysoptera	3746-Southern Tableland Snow Gum-Candlebark Shrub Forest
		4063-Central and Southern Tableland River Oak Forest
White-bellied Sea-Eagle	Haliaeetus leucogaster	3746-Southern Tableland Snow Gum-Candlebark Shrub Forest
		4063-Central and Southern Tableland River Oak Forest
White-throated Needletail	Hirundapus caudacutus	3746-Southern Tableland Snow Gum-Candlebark Shrub Forest
		4063-Central and Southern Tableland River Oak Forest

Threatened species Manually Added

None added

Threatened species assessed as not within the vegetation zone(s) for the PCT(s)

Refer to BAR for detailed justification

Common Name	Scientific Name	Justification in the BAM-C

BAM Predicted Species Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00049779/BAAS20009/25/00060283	Canyonleigh BESS - Road Resurfacing Development Footprint	05/08/2025
Assessor Name	**Report Created**	**BAM Data version ***
Claire Hewitt	13/01/2026	Current classification (live - default) (82)
Assessor Number	**Assessment Type**	**BAM Case Status**
BAAS20009	Major Projects	Finalised
Assessment Revision	**BOS entry trigger**	**Date Finalised**
2		13/01/2026

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Threatened species reliably predicted to utilise the site. No surveys are required for these species. Ecosystem credits apply to these species.

Common Name	Scientific Name	Vegetation Types(s)
Black Falcon	Falco subniger	3347-Southern Tableland Creekflat Ribbon Gum Forest
		3373-Goulburn Tableland Box-Gum Grassy Forest
		3746-Southern Tableland Snow Gum-Candlebark Shrub Forest
Black-chinned Honeyeater (eastern subspecies)	Melithreptus gularis gularis	3373-Goulburn Tableland Box-Gum Grassy Forest
Brown Treecreeper (eastern subspecies)	Climacteris picumnus victoriae	3347-Southern Tableland Creekflat Ribbon Gum Forest
		3373-Goulburn Tableland Box-Gum Grassy Forest
		3746-Southern Tableland Snow Gum-Candlebark Shrub Forest
Diamond Firetail	Stagonopleura guttata	3347-Southern Tableland Creekflat Ribbon Gum Forest
		3373-Goulburn Tableland Box-Gum Grassy Forest
		3746-Southern Tableland Snow Gum-Candlebark Shrub Forest
Dusky Woodswallow	Artamus cyanopterus cyanopterus	3347-Southern Tableland Creekflat Ribbon Gum Forest
		3373-Goulburn Tableland Box-Gum Grassy Forest
		3746-Southern Tableland Snow Gum-Candlebark Shrub Forest
Eastern False Pipistrelle	Falsistrellus tasmaniensis	3347-Southern Tableland Creekflat Ribbon Gum Forest
		3746-Southern Tableland Snow Gum-Candlebark Shrub Forest

Flame Robin	Petroica phoenicea	3347-Southern Tableland Creekflat Ribbon Gum Forest
		3373-Goulburn Tableland Box-Gum Grassy Forest
		3746-Southern Tableland Snow Gum-Candlebark Shrub Forest
Gang-gang Cockatoo	Callocephalon fimbriatum	3347-Southern Tableland Creekflat Ribbon Gum Forest
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Grey-headed Flying-fox	Pteropus poliocephalus	3347-Southern Tableland Creekflat Ribbon Gum Forest
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Large Bent-winged Bat	Miniopterus orianae oceanensis	3347-Southern Tableland Creekflat Ribbon Gum Forest
Little Eagle	Hieraaetus morphnoides	3347-Southern Tableland Creekflat Ribbon Gum Forest
		3373-Goulburn Tableland Box-Gum Grassy Forest
		3746-Southern Tableland Snow Gum-Candlebark Shrub Forest
Little Lorikeet	Glossopsitta pusilla	3347-Southern Tableland Creekflat Ribbon Gum Forest
		3373-Goulburn Tableland Box-Gum Grassy Forest
		3746-Southern Tableland Snow Gum-Candlebark Shrub Forest
Little Whip Snake	Suta flagellum	3373-Goulburn Tableland Box-Gum Grassy Forest
Olive Whistler	Pachycephala olivacea	3347-Southern Tableland Creekflat Ribbon Gum Forest
		3373-Goulburn Tableland Box-Gum Grassy Forest
		3746-Southern Tableland Snow Gum-Candlebark Shrub Forest
Painted Honeyeater	Grantiella picta	3373-Goulburn Tableland Box-Gum Grassy Forest
		3746-Southern Tableland Snow Gum-Candlebark Shrub Forest
Pilotbird	Pycnoptilus floccosus	3347-Southern Tableland Creekflat Ribbon Gum Forest
		3746-Southern Tableland Snow Gum-Candlebark Shrub Forest
Regent Honeyeater	Anthochaera phrygia	3373-Goulburn Tableland Box-Gum Grassy Forest
Rosenberg's Goanna	Varanus rosenbergi	3347-Southern Tableland Creekflat Ribbon Gum Forest
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South-eastern Glossy Black-Cockatoo	Calyptorhynchus lathami lathami	3347-Southern Tableland Creekflat Ribbon Gum Forest
		3373-Goulburn Tableland Box-Gum Grassy Forest
		3746-Southern Tableland Snow Gum-Candlebark Shrub Forest

South-eastern Hooded Robin	Melanodryas cucullata cucullata	3373-Goulburn Tableland Box-Gum Grassy Forest
		3746-Southern Tableland Snow Gum-Candlebark Shrub Forest
Southern Whiteface	Aphelocephala leucopsis	3347-Southern Tableland Creekflat Ribbon Gum Forest
Speckled Warbler	Chthonicola sagittata	3347-Southern Tableland Creekflat Ribbon Gum Forest
		3373-Goulburn Tableland Box-Gum Grassy Forest
		3746-Southern Tableland Snow Gum-Candlebark Shrub Forest
Spotted Harrier	Circus assimilis	3347-Southern Tableland Creekflat Ribbon Gum Forest
		3373-Goulburn Tableland Box-Gum Grassy Forest
Spotted-tailed Quoll	Dasyurus maculatus	3347-Southern Tableland Creekflat Ribbon Gum Forest
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		3373-Goulburn Tableland Box-Gum Grassy Forest
		3746-Southern Tableland Snow Gum-Candlebark Shrub Forest

Threatened species Manually Added

None added

Threatened species assessed as not within the vegetation zone(s) for the PCT(s)

Refer to BAR for detailed justification

Common Name	Scientific Name	Justification in the BAM-C

APPENDIX J ULTRASONIC CALL ANALYSIS (GREEN TAPE SOLUTIONS, 2025A)

Green Tape SOLUTIONS
ENVIRONMENTAL CONSULTING

Bat Call Analysis Report

Canyonleigh Project

Prepared for Red Gum Environmental Consulting Pty Ltd

Prepared by:

Green Tape SOLUTIONS

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Document Records - Quality

TITLE	Bat Analysis for the site at Canyonleigh
FILED AS	ME25005_Canyonleigh

Revision	Date	Description	Prepared by	Reviewed by
Version A	6/5/2025	First draft	KM	Client

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1.0 Introduction

1.1 Background

Green Tape Solutions was commissioned to undertake bat call analysis for the Canyonleigh project located near Canyonleigh in New South Wales.

1.2 Scope of Work

The specific scope of works for this report includes the following:

- Outline the methodology used to analyse the microbat call within the subject site; and,
- Present the findings of all of the bat call surveys conducted at the project site.

2.0 Methodology

2.1 Capture Technique

Microbat calls were sampled using two detectors. Passive monitoring was undertaken from 21st January to 28th February 2025. The original call files display Australian Eastern Standard Time. The data was analysed using Anabat Insight.

Monitoring commenced at dusk (approximately 1800 hours) and continued until dawn (approximately 0530 hours). Ultrasonic call monitoring surveys on anabat detectors were conducted using full-spectrum fitted with omnidirectional ultrasonic microphone.

2.2 Call Identification

Anabat recordings were analysed using Anabat software (Anabat Insight). Identifications were made by categorising call shape and frequency, with a species match given in consideration to region, known bat distributions, and habitats present. The focus of the bat surveys was to assess the presence of bat species found within the Project Area, and to assess the potential for rare and threatened species to occur.

Call identification for this dataset was based on call keys and descriptions published for Queensland (Reinhold *et al.*, 2001) and New South Wales (Pennay *et al.*, 2004).

Species' identification was further refined using the probability of occurrence of each species based on their geographic distribution (Churchill, 2008, Van Dyck and Strahan, 2008). Species nomenclature used in this report follows Churchill (2008).

The reliability of identification is as follows:

- **Definite** - one or more calls where there is no doubt about the identification of the species;
- **Probable** - most likely to be the species named, low probability of confusion with species that use similar calls; and,
- **Possible -** call is comparable with the named species, with a moderate to high probability of confusion with species of similar calls.

2.3 National Standard

The format and content of this report complies with the nationally accepted standards for the interpretation and reporting of Anabat and Songmeter data (Reardon, 2003), which is currently available from the Australasian Bat Society at www.ausbats.org.au.

3.0 Results

3.1 Total Species Recorded

The location of each detector, including both the locality and GPS coordinates, is included in **Table 1.**

Table 1: Detector Locations

Detector	Coordinates	Locality
2MU03893	Varies depending on the date	Canyonleigh, NSW
2MU03950	Varies depending on the date	Canyonleigh, NSW

A summary of the species identified through bat call analysis is provided in **Table 2**. The total number of calls per detector is also given in **Table 2**. This number is indicative of bat activity but may still include some background noise or poor-quality calls that were not identifiable. While some call sequences were recognised as bat calls, the quality was not sufficient to assign species identification.

Table 2: Summary of bat call analysis

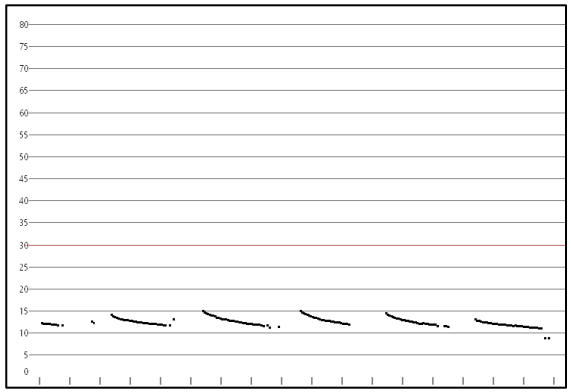
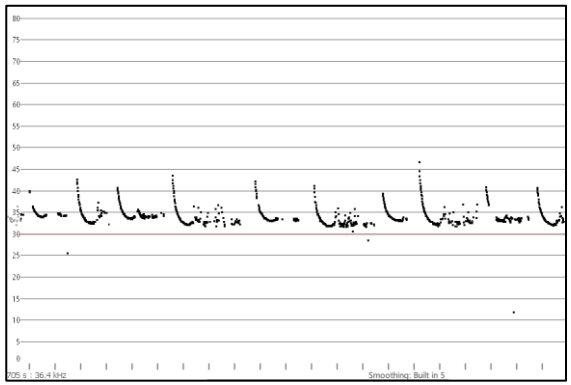
Species	BC Act	EPBC Act	2MU03893	2MU03950
Total Calls (Noise or poor quality calls)			1,662 (44)	1,414 (26)
Austronomus australis	LC	NOC	Definite	Definite
Chalinolobus gouldi	LC	NOC	Definite	Definite
Chalinolobus morio	LC	NOC	Definite	Definite
Falsistrellus tasmaniensis	V	NOC	Probable	Possible
Miniopterus orianae oceanensis	V	NOC	Possible	Possible
Nyctophilus geoffroyi	LC	NOC	Possible	
Nyctophilus gouldii	LC	NOC	Possible	
Ozimops ridei	LC	NOC	Definite	Definite
Rhinolophus megaphyllus	LC	NOC	Definite	
Saccolaimus flaviventris	V	NOC	Definite	Definite
Scotorepens orion	LC	NOC	Possible	Possible
Vespadelus darlingtoni	LC	NOC	Definite	Definite

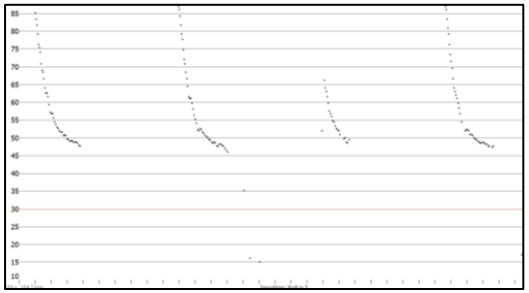
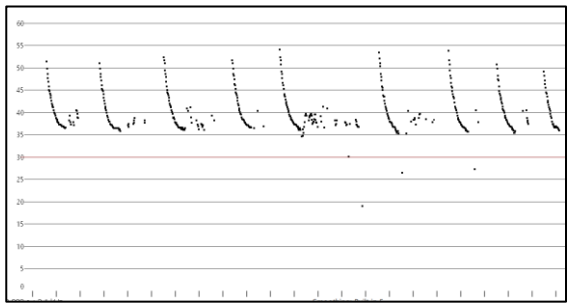
Species	BC Act	EPBC Act	2MU03893	2MU03950
Vespadelus regulus	LC	NOC	Possible	Possible
Vespadelus vulturnus	LC	NOC	Possible	Possible

LC: Least Concern, NOC: Not of Concern, V: Vulnerable

3.2 Samples of Calls / Sequences Files

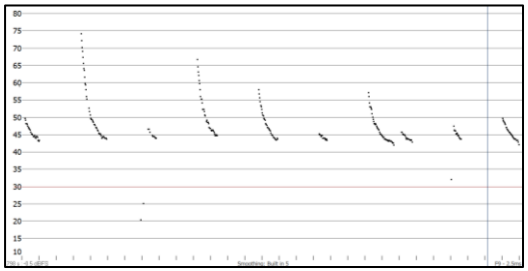
Samples of call extracted from the dataset for each species identified is provided in the following figures.

Species	Calls	Known distribution (Extract from Ausbats maps from Australian Bat Society)
Figure 1: *Austronomus australis* Definite call. This bat is easily recognised by its constant frequency calls range in bandwidth from 10.5 to 15 kHz (Pennay *et al.*, 2004).		
Figure 2: *Chalinolobus gouldi* Definite call. This species has a curved shape call with characteristic frequency 28 to 34kHz. Pulse alternates in frequency and mostly down-sweeping tail or no tail.		

Species	Calls	Known distribution (Extract from Ausbats maps from Australian Bat Society)
Figure 3: *Chalinolobus morio* Definite call. *C. morio* has a down-sweeping tail curved pulse with characteristic frequency 47.5 to 53 kHz. It has often a very brief characteristic section. Species that overlap in frequency (*. vulturnus*) but all have up-sweeping tails.		
Figure 4: *Falsistrellus tasmaniensis* Possible call. Curved and usually steep, but can be variable in shape, most pulses do not have an up-sweeping tail. Characteristic frequency 35 to 39.5 kHz (n = 14). Also, most of the time the pre-characteristic section of *F. tasmaniensis* is longer than the characteristic section + tail. Except for when the drop in frequency of the pre-characteristic section is greater than 3 kHz or the characteristic frequency is 38 to 39.5 kHz, cannot be distinguished from *S. orion*. *S. orion* has a longer pre-characteristic section (can be up to 70kHz).		

Species	Calls	Known distribution (Extract from Ausbats maps from Australian Bat Society)

Figure 5: *Miniopterus orianae oceanensis*





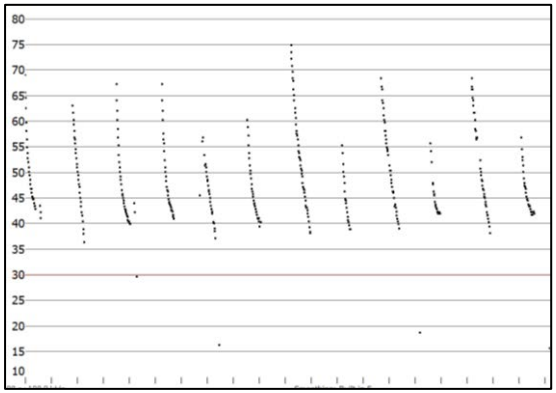
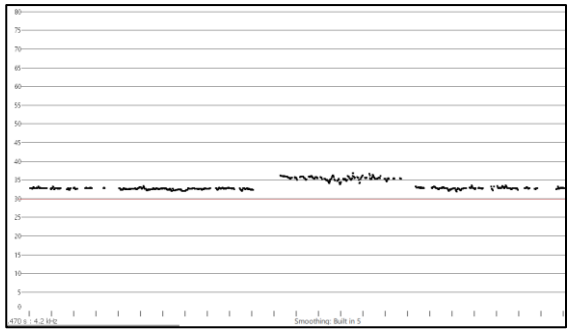
Possible call.

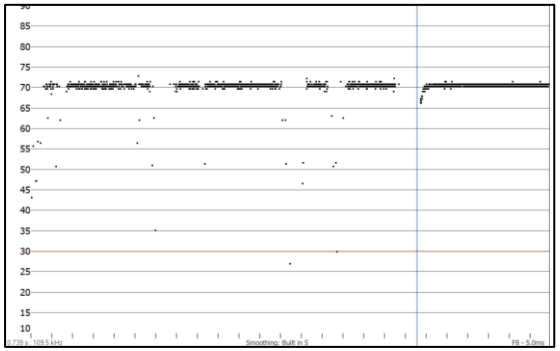
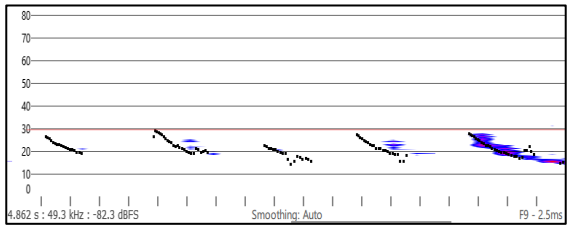
The species call is characterised by its long curved pulse with a small down-sweeping tail and its frequency between 43-47kHz (Reinhold, 2001).

Pulse shape and time between calls usually variable within a sequence.

Longer duration with no tail or relatively short up-sweeping tail, cannot be distinguished from *Vespadelus darlingtoni* at the same frequency (Reinhold, 2001).

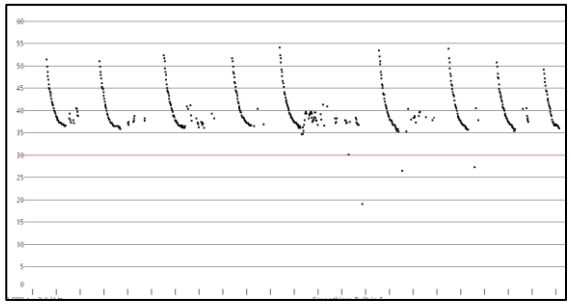
Shorter duration, can be distinguished from *V. darlingtoni, V. regulus* and *V. vulturnus* by having a longer pre-characteristic section (drop in frequency usually greater than 2 kHz) and most pulses do not have an up-sweeping tail (Reinhold, 2001). Pulse shape and time between calls can be quite variable within a sequence (Reinhold, 2001).

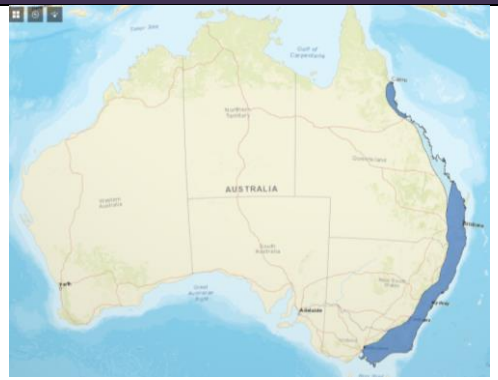
Species	Calls	Known distribution (Extract from Ausbats maps from Australian Bat Society)
Figure 6: *Nyctophilus spp*		 *N. geoffroyi*  *N. gouldi*
Possible call. This species displays a near-vertical pulse, characteristic frequency between 80 and 35KHz (Pennay *et al*, 2004). The species from this genus cannot be distinguished from each other. There are 2 species that are known to occur in the project area.		
Figure 7: *Ozimops ridei*		
Definite call. *O. ridei* calls are flat and sometimes a bit curved with frequency a bit lower than 30kHz. Characteristic frequency of this species is between 28 to 36 kHz.		

Species	Calls	Known distribution (Extract from Ausbats maps from Australian Bat Society)
Figure 8: *Rhinolophus megaphyllus* Definite call. The species call cannot be misidentified with any other species. Pulses have an up-sweeping initial section a perfectly flat, relatively long characteristic section and a down sweeping tail (Reinhold, 2001). Characteristic frequency ranges from 66 to 72 k**Hz.**		
Figure 9: *Saccolaimus flaviventris* Definite call. Curved, characteristic frequency 18 to 21.5 kHz. The characteristic frequency does not go above 22 kHz. Other species that could overlap do not occur in this area.		

Species	Calls	Known distribution (Extract from Ausbats maps from Australian Bat Society)

Figure 10: *Scotorepens orion*

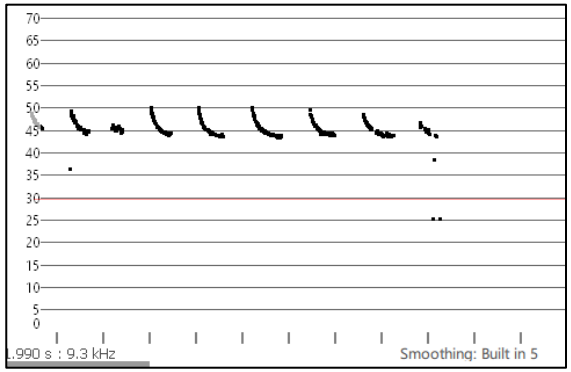




Possible call.

Characteristic frequency between 34.5 and 37.5 kHz with curved, absent tail sometime down-sweeping tail (Reinhold *et al,* 2001). Knee of the pulse is usually lower than 38 kHz.

Figure 11: *Vespadelus darlingtoni*





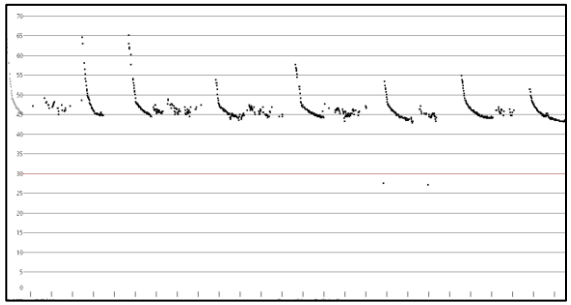
Possible call.

This species call has a curved call with no tail or sometime an up-sweeping tail. The call's characteristic frequency is between 42.5 to 48.5 kHz. Characteristic section is often, but not always, relatively long.

Shorter duration with up-sweeping tails and higher frequencies, cannot be distinguished from *V. regulus* or *V. vulturnus*.

Species	Calls	Known distribution (Extract from Ausbats maps from Australian Bat Society)

Figure 12: *Vespadelus regulus*

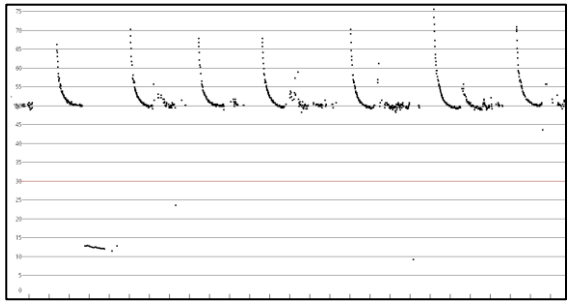




Possible call.

Characteristic frequency varies significantly over distribution from 40 to 55 kHz. Call shape also varies between regions. Characteristic frequency 45 to 47 kHz. Curved with up-sweeping tail. Tail may also vary.

Figure 13: *Vespadelus vulturnus*





Possible call.

Curved and up-sweeping tail calls with characteristic frequency between 45 to 53 kHz. It cannot be distinguished from *V. regulus*, or some *V. darlingtoni* when up-sweeping tail.

4.0 Conclusion

A total of 14 microbat species were either confirmed ‘definite’, ‘probable’ or ‘possible’ within the Project area. All bats identified on the site were expected to be present within the region. Three species are listed as threatened under the State or Federal legislation:

- *Miniopterus orianae oceanensis;*
- *Falsistrellus tasmaniensi;* and,
- *Saccolaimus flaviventris.*

5.0 References

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APPENDIX K PASSIVE AUDIO CALL ANALYSIS (GREEN TAPE SOLUTIONS, 2025B)

Green Tape SOLUTIONS
ENVIRONMENTAL CONSULTING

Our Ref: PR25005

Date: 7 May 2025

Damian Wall
Red-Gum Environmental Consulting Pty Ltd
94 Kirby Flat Road
Yackandandah, VIC 3749

Dear Damian,

RE: ACOUSTIC ANALYSIS – CANYONLEIGH

Green Tape Solutions was to undertake acoustic call analysis for the Canyonleigh Project located in New South Wales. The calls were sampled using two passive detectors, and monitoring was conducted from 21st January to 12th February 2025. The original call files are recorded in Australian Eastern Standard Time.

The data was analysed using the Kaleidoscope software. A total of 11,712 WAV files were assessed, with no threatened owl species calls detected during the survey period.

Please do not hesitate to contact me on 0423 081 428, should you require any further information.

Kind regards,



Kelly Matthews

Director / Principal Ecologist

Green Tape SOLUTIONS

APPENDIX L CANDIDATE SPECIES BAM-C REPORTS

BAM Candidate Species Report

Proposal Details

Assessment Id 00049779/BAAS20009/24/00049780	Proposal Name Canyonleigh BESS Development Footprint	BAM data last updated * 05/08/2025
Assessor Name Claire Hewitt	Report Created 13/01/2026	BAM Data version * Current classification (live - default) (82)
Assessor Number BAAS20009	Assessment Type Major Projects	BAM Case Status Finalised
Assessment Revision 4	BOS entry trigger	Date Finalised 13/01/2026

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

List of Species Requiring Survey

Name	Presence	Survey Months
Acacia clunies-rossiae Kanangra Wattle	No (surveyed)	☑ Jan ☑ Feb ☐ Mar ☐ Apr ☑ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☑ Nov ☐ Dec ☐ Survey month outside the specified months?
Aprasia parapulchella Pink-tailed Legless Lizard	Yes (expert report)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Bossiaea bombayensis Bombay Bossiaea	No (surveyed)	☑ Jan ☑ Feb ☐ Mar ☐ Apr ☑ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☑ Nov ☐ Dec ☐ Survey month outside the specified months?

Callocephalon fimbriatum Gang-gang Cockatoo	Yes (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☑ Nov ☐ Dec ☐ Survey month outside the specified months?
Calyptorhynchus lathami lathami South-eastern Glossy Black-Cockatoo	No (surveyed) *Survey months are outside of the months specified in Bionet.	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☐ Nov ☐ Dec ☑ Survey month outside the specified months?
Cercartetus nanus Eastern Pygmy-possum	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Chalinolobus dwyeri Large-eared Pied Bat	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☑ Nov ☐ Dec ☐ Survey month outside the specified months?
Commersonia prostrata Dwarf Kerrawang	No (surveyed)	☑ Jan ☑ Feb ☐ Mar ☐ Apr ☑ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☑ Nov ☐ Dec ☐ Survey month outside the specified months?
Dillwynia glaucula Michelago Parrot-pea	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☑ Nov ☐ Dec ☐ Survey month outside the specified months?

Eucalyptus aggregata Black Gum	No (surveyed)	☑ Jan ☑ Feb ☐ Mar ☐ Apr ☑ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☑ Nov ☐ Dec ☐ Survey month outside the specified months?
Eucalyptus macarthurii Paddys River Box, Camden Woollybutt	No (surveyed)	☑ Jan ☑ Feb ☐ Mar ☐ Apr ☑ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☑ Nov ☐ Dec ☐ Survey month outside the specified months?
Eucalyptus recurva Mongarlowe Mallee	No (surveyed)	☑ Jan ☑ Feb ☐ Mar ☐ Apr ☑ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☑ Nov ☐ Dec ☐ Survey month outside the specified months?
Genoplesium superbum Superb Midge Orchid	No (surveyed) *Survey months are outside of the months specified in Bionet.	☑ Jan ☑ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☑ Survey month outside the specified months?
Grevillea renwickiana Nerriga Grevillea	No (surveyed)	☑ Jan ☑ Feb ☐ Mar ☐ Apr ☑ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☑ Nov ☐ Dec ☐ Survey month outside the specified months?
Haliaeetus leucogaster White-bellied Sea-Eagle	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☑ Nov ☐ Dec ☐ Survey month outside the specified months?

Heleioporus australiacus Giant Burrowing Frog	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Hieraaetus morphnoides Little Eagle	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Keyacris scurra Key's Matchstick Grasshopper	Yes (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Leucochrysum albicans subsp. tricolor Hoary Sunray	No (surveyed)	☑ Jan ☑ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☑ Nov ☐ Dec ☐ Survey month outside the specified months?
Litoria booroolongensis Booroolong Frog	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Miniopterus orianae oceanensis Large Bent-winged Bat	No (surveyed)	☐ Jan ☑ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?

Mixophyes balbus Stuttering Frog	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Ninox connivens Barking Owl	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Ninox strenua Powerful Owl	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Petauroides volans Southern Greater Glider	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Petaurus norfolcensis Squirrel Glider	Yes (surveyed)	☐ Jan ☑ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Petrogale penicillata Brush-tailed Rock-wallaby	No (surveyed)	☐ Jan ☑ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☑ Nov ☐ Dec ☐ Survey month outside the specified months?

Phascogale tapoatafa Brush-tailed Phascogale	No (expert report)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Phascolarctos cinereus Koala	No (surveyed)	☐ Jan ☑ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☑ Nov ☐ Dec ☐ Survey month outside the specified months?
Pomaderris cotoneaster Cotoneaster Pomaderris	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☑ Nov ☐ Dec ☐ Survey month outside the specified months?
Pteropus poliocephalus Grey-headed Flying-fox	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☑ Nov ☐ Dec ☐ Survey month outside the specified months?
Solanum armourense Solanum armourense	No (surveyed)	☑ Jan ☑ Feb ☐ Mar ☐ Apr ☑ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☑ Nov ☐ Dec ☐ Survey month outside the specified months?
Tyto novaehollandiae Masked Owl	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?

Threatened species Manually Added

Common Name	Scientific Name
Key's Matchstick Grasshopper	Keyacris scurra

Threatened species assessed as not on site

Refer to BAR for detailed justification

Common name	Scientific name	Justification in the BAM-C
Callitris oblonga subsp. parva	Callitris oblonga subsp. parva	Refer to BAR
Matted Bush-pea	Pultenaea pedunculata	Refer to BAR
Regent Honeyeater	Anthochaera phrygia	Habitat constraints
Southern Myotis	Myotis macropus	Habitat constraints
Swift Parrot	Lathamus discolor	Habitat constraints

BAM Candidate Species Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00049779/BAAS20009/25/00060283	Canyonleigh BESS - Road Resurfacing Development Footprint	05/08/2025
Assessor Name	**Report Created**	**BAM Data version ***
Claire Hewitt	13/01/2026	Current classification (live - default) (82)
Assessor Number	**Assessment Type**	**BAM Case Status**
BAAS20009	Major Projects	Finalised
Assessment Revision	**BOS entry trigger**	**Date Finalised**
2		13/01/2026

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

List of Species Requiring Survey

Name	Presence	Survey Months
Bossiaea bombayensis Bombay Bossiaea	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☑ Aug ☐ Sep ☑ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Callocephalon fimbriatum Gang-gang Cockatoo	Yes (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Calyptorhynchus lathami lathami South-eastern Glossy Black-Cockatoo	No (surveyed) *Survey months are outside of the months specified in Bionet.	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☑ Aug ☐ Sep ☑ Oct ☐ Nov ☐ Dec ☑ Survey month outside the specified months?

Cercartetus nanus Eastern Pygmy-possum	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Chalinolobus dwyeri Large-eared Pied Bat	No (surveyed) *Survey months are outside of the months specified in Bionet.	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☐ Nov ☐ Dec ☑ Survey month outside the specified months?
Commersonia prostrata Dwarf Kerrawang	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☑ Aug ☐ Sep ☑ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Delma impar Striped Legless Lizard	Yes (expert report)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Dillwynia glaucula Michelago Parrot-pea	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Diuris aequalis Buttercup Doubletail	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?

Eucalyptus aggregata Black Gum	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☑ Aug ☐ Sep ☑ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Eucalyptus macarthurii Paddys River Box, Camden Woollybutt	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☑ Aug ☐ Sep ☑ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Genoplesium superbum Superb Midge Orchid	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Haliaeetus leucogaster White-bellied Sea-Eagle	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☑ Aug ☐ Sep ☑ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Heleioporus australiacus Giant Burrowing Frog	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Hieraaetus morphnoides Little Eagle	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☑ Aug ☐ Sep ☑ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?

Keyacris scurra Key's Matchstick Grasshopper	Yes (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Leucochrysum albicans subsp. tricolor Hoary Sunray	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Litoria aurea Green and Golden Bell Frog	No (surveyed) *Survey months are outside of the months specified in Bionet.	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☑ Aug ☐ Sep ☑ Oct ☐ Nov ☐ Dec ☑ Survey month outside the specified months?
Myotis macropus Southern Myotis	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Ninox connivens Barking Owl	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☑ Aug ☐ Sep ☑ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Ninox strenua Powerful Owl	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☑ Aug ☐ Sep ☑ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?

Petauroides volans Southern Greater Glider	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☑ Aug ☐ Sep ☑ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Petaurus norfolcensis Squirrel Glider	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☑ Aug ☐ Sep ☑ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Petrogale penicillata Brush-tailed Rock-wallaby	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Petroica rodinogaster Pink Robin	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☑ Aug ☐ Sep ☑ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Phascolarctos cinereus Koala	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☑ Aug ☐ Sep ☑ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Pomaderris cotoneaster Cotoneaster Pomaderris	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?

Swainsona sericea Silky Swainson-pea	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Tyto novaehollandiae Masked Owl	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☑ Aug ☐ Sep ☑ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?

Threatened species Manually Added

None added

Threatened species assessed as not on site

Refer to BAR for detailed justification

Common name	Scientific name	Justification in the BAM-C
Booroolong Frog	Litoria booroolongensis	Habitat degraded Species is vagrant
Brush-tailed Phascogale	Phascogale tapoatafa	Habitat degraded
Callitris oblonga subsp. parva	Callitris oblonga subsp. parva	Habitat degraded
Grey-headed Flying-fox	Pteropus poliocephalus	Habitat constraints
Large Bent-winged Bat	Miniopterus orianae oceanensis	Habitat degraded
Matted Bush-pea	Pultenaea pedunculata	Refer to BAR
Mongarlowe Mallee	Eucalyptus recurva	Refer to BAR
Nerriga Grevillea	Grevillea renwickiana	Refer to BAR
Pink-tailed Legless Lizard	Aprasia parapulchella	Habitat degraded
Regent Honeyeater	Anthochaera phrygia	Habitat constraints
Stuttering Frog	Mixophyes balbus	Habitat degraded Species is vagrant
Swift Parrot	Lathamus discolor	Habitat constraints

APPENDIX M EPBC SUPPLEMENTARY SEARS

Guidelines for preparing assessment documentation relevant to the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) for proposals being assessed under the NSW Assessment Bilateral

Canyonleigh Battery Energy Storage System (EPBC 2025/10233)

Introduction

1. On 8 August 2025, a delegate of the Federal Minister for the Environment determined Canyonleigh Battery Energy Storage System (BESS) was a controlled action under section 75 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The EPBC Act controlling provisions for the proposed actions are:

    i. listed threatened species and communities (sections 18 and 18A)

2. The proposed action will be assessed in accordance with the bilateral assessment agreement Amending Agreement No. 1, and as such, is required to be assessed in the manner specified in Schedule 1 to that Agreement, including, addressing the matters outlined in Schedule 4 of the *Environment Protection and Biodiversity Conservation Regulations 2000* (EPBC Regulations).

3. The proponent must undertake an assessment of all protected matters that may be impacted by the development under the controlling provision identified in paragraph 1. The Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) considers that the proposed action is likely to have a significant impact on threatened species and communities listed in **Appendix A**.

4. The proponent must consider each of the protected matters under the triggered controlling provisions that may be impacted by the action. Note that this may not be a complete list and it is the responsibility of the proponent to undertake an analysis of the relevant impacts and ensure all protected matters that are likely to be impacted are assessed for the Commonwealth Minister's consideration.

General Requirements

Relevant Regulations

5. The Environmental Impact Statement (EIS) must address all matters outlined in Schedule 4 of the EPBC Regulations and all matters outlined below in relation to the controlling provisions.

Project Description

6. The title of the action, background to the action and current status.

7. The precise location and description of all works to be undertaken (including associated offsite works and infrastructure), structures to be built or elements of the action that may have impacts on matters of national environmental significance (MNES).

8. How the action relates to any other actions that have been, or are being taken in the region affected by the action.

9. How the works are to be undertaken and design parameters for those aspects of the structures or elements of the action that may have relevant impacts on MNES.

Impacts

10. The EIS must include an assessment of the relevant impacts of the action on the matters protected by the controlling provisions, including:

    i. a description and detailed assessment of the nature and extent of the likely direct, indirect and consequential impacts, including short term and long term relevant impacts;

    ii. a statement whether any relevant impacts are likely to be unknown, unpredictable or irreversible;

    iii. analysis of the significance of the relevant impacts; and

    iv. any technical data and other information used or needed to make a detailed assessment of the relevant impacts.

Avoidance, mitigation and offsetting

11. For each of the relevant matters protected that are likely to be significantly impacted by the action, the EIS must provide information on proposed avoidance and mitigation measures to manage the relevant impacts of the action including:

    i. a description, and an assessment of the expected or predicted effectiveness of the mitigation measures,

    ii. any statutory policy basis for the mitigation measures;

    iii. the cost of the mitigation measures;

    iv. an outline of an environmental management plan that sets out the framework for continuing management, mitigation and monitoring programs for the relevant impacts of the action, including any provisions for independent environmental auditing;

    v. the name of the agency responsible for endorsing or approving each mitigation measure or monitoring program.

12. Where a significant residual adverse impact to a relevant protected matter is considered likely, the EIS must provide information on the proposed offset strategy, including discussion of the conservation benefit associated with the proposed offset strategy.

13. For each of the relevant matters likely to be impacted by the action the EIS must provide reference to, and consideration of, relevant Commonwealth guidelines and policy statements including any:

    i. conservation advice or recovery plan for the species or community;

    ii. relevant threat abatement plan for the species or community;

    iii. wildlife conservation plan for the species; and

    iv. any strategic assessment.

Note: the relevant guidelines and policy statements for each species and community are available from the Department of the Environment Species Profiles and Threats Database. http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl]

14. In addition to the general requirements described above, specific information is required with respect to each of the determined controlling provisions. These requirements are outlined in paragraphs 15-18.

Key Issues

Biodiversity (threatened species and communities)

Assessment Requirements

15. The EIS must identify each EPBC Act listed threatened species and community likely to be impacted by the action. For any species and communities that are likely to be impacted, the proponent must provide a description of the nature, quantum and consequences of the impacts. For species and communities potentially located in the project area or in the vicinity that are not likely to be impacted, provide evidence why they are not likely to be impacted.
16. For each of the EPBC Act listed threatened species and communities likely to be impacted by the action the EIS must provide a separate:

    i. description of the habitat (including identification and mapping of suitable breeding habitat, suitable foraging habitat, important populations and habitat critical for survival), with consideration of, and reference to, any relevant Commonwealth guidelines and policy statements including listing advice, conservation advice and recovery plans;

    ii. details of the scope, timing and methodology for studies or surveys used and how they are consistent with (or justification for divergence from) published Australian Government guidelines and policy statements;

    iii. description of the relevant impacts of the action having regard to the full national extent of the species or community's range; and

    iv. description of the specific proposed avoidance and mitigation measures to deal with relevant impacts of the action;

    v. identification of significant residual adverse impacts likely to occur after the proposed activities to avoid and mitigate all impacts are taken into account;

    vi. a description of any offsets proposed to address residual adverse significant impacts and how these offsets will be established.

    vii. details of how the current published NSW Biodiversity Assessment Method (BAM) has been applied in accordance with the objects of the EPBC Act to offset significant residual adverse impacts; and

    viii. details of the offset package to compensate for significant residual impacts including details of the credit profiles required to offset the action in accordance with the BAM and/or mapping and descriptions of the extent and condition of the relevant habitat and/or threatened communities occurring on proposed offset sites.

Note: For the purposes of approval under the EPBC Act, it is a requirement that offsets directly contribute to the ongoing viability of the specific protected matter impacted by a proposed action and deliver an overall conservation outcome that improves or maintains the viability of the MNES i.e. 'like for like'. Like-for-like includes protection of native vegetation that is the same ecological community or habitat being impacted (preferably in the same region where the impact occurs), or funding to provide a direct benefit to the matter being impacted e.g. a threat abatement, breeding and propagation programs or other relevant conservation matters.

17. Any significant residual impacts not addressed by the BAM may need to be addressed in accordance with the EPBC Act 1999 Environmental Offset Policy. http://www.environment.gov.au/epbc/publications/epbc-act-environmental-offsets-policy.

Other approvals and conditions

18. Information in relation to any other approvals or conditions required must include the information prescribed in Schedule 4 Clause 5 (a) (b) (c) and (d) of the EPBC Regulations.

Environmental Record of person proposing to take the action

19. Information in relation to the environmental record of a person proposing to take the action must include details as prescribed in Schedule 4 Clause 6 of the EPBC Regulations.

Information Sources

20. For information given in an EIS, the EIS must state the source of the information, how recent the information is, how the reliability of the information was tested; and what uncertainties (if any) are in the information.

REFERENCES

- *Environment Protection and Biodiversity Conservation Act 1999* - section 51-55, section 96A(3)(a)(b), 101A(3)(a)(b), section 136, section 527E
- *Environment Protection and Biodiversity Conservation Regulations 2000* Schedule 4
- Amending Agreement No. 1 (2020) - Item 18.1, Item 18.5, Schedule 1
- *Matters of National Environmental Significance - Significant impact guidelines 1.1* (2013) EPBC Act
- *Environment Protection and Biodiversity Conservation Act 1999* Environmental Offsets Policy October 2012

The international conventions, management plans and principles that must be considered in relation to this proposal include:

- Listed threatened species and communities
    - Australia's obligations under the:
        - Convention on Biological Diversity
        - Convention on Conservation of Nature in the South Pacific (Apia Convention)
        - Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).
    - Any relevant recovery plans or threat abatement plans.
- Relevant conservation advice/s: http://www.environment.gov.au/cgi-bin/sprat/public/sprat.p
- Relevant strategic assessment reports

Appendix A

Protected matters relevant to the Canyonleigh Battery Energy Storage System (EPBC 2025/10233) project

Specific Risks

Key risks associated with the proposed action from the Commonwealth perspective include direct threats to listed species through the clearing of critical habitat and reducing the area of occupancy.

Threatened species and communities

Based on the information in the referral documentation, the location of the action, species records and likely habitat present in the area, there are likely to be significant impacts to:

- Key's Matchstick Grasshopper (*Keyacris scurra*) – Endangered
- Diamond Firetail (*Stagonopleura guttata*) – Vulnerable
- Pink-tailed Legless Lizard (*Aprasia parapulchella*) – Vulnerable

Additionally, there is some risk that there may be significant impacts on the following matters and further assessment to determine if the communities and species listed below are present in the proposed action area and, if so, the extent to which they may be impacted by the proposed action, is required:

- Gang-gang Cockatoo (*Callocephalon fimbriatum*) – Endangered
- Hoary Sunray (*Leucochrysum albicans subsp. Tricolor*) – Endangered
- Striped Legless Lizard (*Delmar impar*) – Vulnerable

Further assessment to determine if the communities and species listed above are present in the proposed action area, and if so, the extent to which they may be impacted by the proposed action is required.

Note: uncertainty around the extent and number of protected matters that may be impacted will need to be resolved through the assessment process once final alignment and construction plans have been completed.

Note: this may not be a complete list and it is the responsibility of the proponent to ensure any protected matters under these controlling provisions are assessed for the Commonwealth decision-maker's consideration.

APPENDIX N EPBC REFERRAL DECISION

Australian Government
Department of Climate Change, Energy, the Environment and Water

Notification of referral decision and designated proponent – controlled action

Canyonleigh Battery Energy Storage System (EPBC 2025/10233)

This decision is made under section 75 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Proposed Action

designated proponent	X-ELIO AUS2 PTY LTD ACN: 678 801 315
proposed Action	The proposed action is to construct, operate and decommission a Battery Energy Storage System (BESS) facility and associated infrastructure in Brayton NSW (see EPBC Act referral 2025/10233).

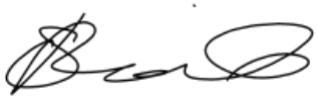
Referral decision: controlled action

status of proposed Action	The proposed Action is a controlled action. The project will require assessment and approval under the EPBC Act before it can proceed.
relevant controlling provisions	Listed threatened species and communities (sections 18 and 18A)

Assessment approach

assessment approach	The project will be assessed under the assessment bilateral agreement with New South Wales.

Person authorised to make decision

name and position	Sarah Reachill Acting Branch Head Environment Assessments (NSW, ACT)
signature	
date of decision	8 August 2025

APPENDIX O BAM-C CREDIT SUMMARY REPORTS

BAM Credit Summary Report

Proposal Details

Assessment Id
00049779/BAAS20009/25/00060283

Proposal Name
Canyonleigh BESS - Road Resurfacing Development Footprint

BAM data last updated *
05/08/2025

Assessor Name
Claire Hewitt

Report Created
13/01/2026

BAM Data version *
Current classification (live - default) (82)

Assessor Number
BAAS20009

BAM Case Status
Finalised

Date Finalised
13/01/2026

Assessment Revision
2

BOS entry trigger

Assessment Type
Major Projects

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Ecosystem credits for plant communities types (PCT), ecological communities & threatened species habitat

Zone	Vegetation zone name	TEC name	Current Vegetation integrity score	Change in Vegetation integrity (loss / gain)	Area (ha)	Sensitivity to loss (Justification)	Species sensitivity to gain class	BC Act Listing status	EPBC Act listing status	Biodiversity risk weighting	Potential SAII	Ecosystem credits

Goulburn Tableland Box-Gum Grassy Forest												
4	3373_VZ12_Woodland	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	55.6	55.6	0.13	Population size	High Sensitivity to Gain	Critically Endangered Ecological Community	Not Listed	2.50	True	5

5	3373_VZ13_Grassland	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	16.1	16.1	0.43	Population size	High Sensitivity to Gain	Critically Endangered Ecological Community	Not Listed	2.50	True	4
											Subtotal	**9**
Goulburn Tableland Box-Gum Grassy Forest												
6	3373_VZ14_Shrubland	Not a TEC	33.7	33.7	0.01	PCT Cleared - 92%	High Sensitivity to Gain			2.50		1
											Subtotal	**1**
Southern Tableland Creekflat Ribbon Gum Forest												
1	3347_VZ9_Woodland	Not a TEC	44.8	44.8	0.09	PCT Cleared - 65%	High Sensitivity to Gain			1.75		2

2	3347_VZ10_Grassland	Not a TEC	8.5	8.5	0.16	PCT Cleared - 65%	High Sensitivity to Gain			1.75		0
3	3347_VZ11_Highly_Disturbe	Not a TEC	8.5	8.5	0.09	PCT Cleared - 65%	High Sensitivity to Gain			1.75		0
											Subtotal	**2**
Southern Tableland Snow Gum-Candlebark Shrub Forest												
7	3746_VZ16_Woodland	Not a TEC	60	60.0	0.14	PCT Cleared - 75%	High Sensitivity to Gain			2.00		4
8	3746_VZ17_Grassland	Not a TEC	13.1	13.1	0.28	PCT Cleared - 75%	High Sensitivity to Gain			2.00		0
9	3746_VZ18_Shrubland	Not a TEC	24.1	24.1	0.1	PCT Cleared - 75%	High Sensitivity to Gain			2.00		1
											Subtotal	**5**
											Total	**17**

Species credits for threatened species

Vegetation zone name	Habitat condition (Vegetation Integrity)	Change in habitat condition	Area (ha)/Count (no. individuals)	Sensitivity to loss (Justification)	Sensitivity to gain (Justification)	BC Act Listing status	EPBC Act listing status	Potential SAII	Species credits

Callocephalon fimbriatum / Gang-gang Cockatoo (Fauna)									
3373_VZ12_Woodland	55.6	55.6	0.13	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Endangered	Endangered	False	4
3746_VZ16_Woodland	60.0	60.0	0.14	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Endangered	Endangered	False	4
								Subtotal	**8**
Delma impar / Striped Legless Lizard (Fauna)									
3347_VZ10_Grassland	8.5	8.5	0.16	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Vulnerable	Vulnerable	False	1
3373_VZ12_Woodland	55.6	55.6	0.13	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Vulnerable	Vulnerable	False	3
3373_VZ13_Grassland	16.1	16.1	0.43	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Vulnerable	Vulnerable	False	3
								Subtotal	**7**

Genoplesium superbum / Superb Midge Orchid (Flora)									
3746_VZ17_Grassland	13.1	13.1	0.28	Population size	Effectiveness of management in controlling threats	Endangered	Not Listed	True	3
3746_VZ18_Shrubland	24.1	24.1	0.1	Population size	Effectiveness of management in controlling threats	Endangered	Not Listed	True	2
								Subtotal	**5**
Keyacris scurra / Key's Matchstick Grasshopper (Fauna)									
3746_VZ16_Woodland	60.0	60.0	0.14	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Endangered	Endangered	False	4
3746_VZ17_Grassland	13.1	13.1	0.28	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Endangered	Endangered	False	2
3746_VZ18_Shrubland	24.1	24.1	0.1	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Endangered	Endangered	False	1
								Subtotal	**7**

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