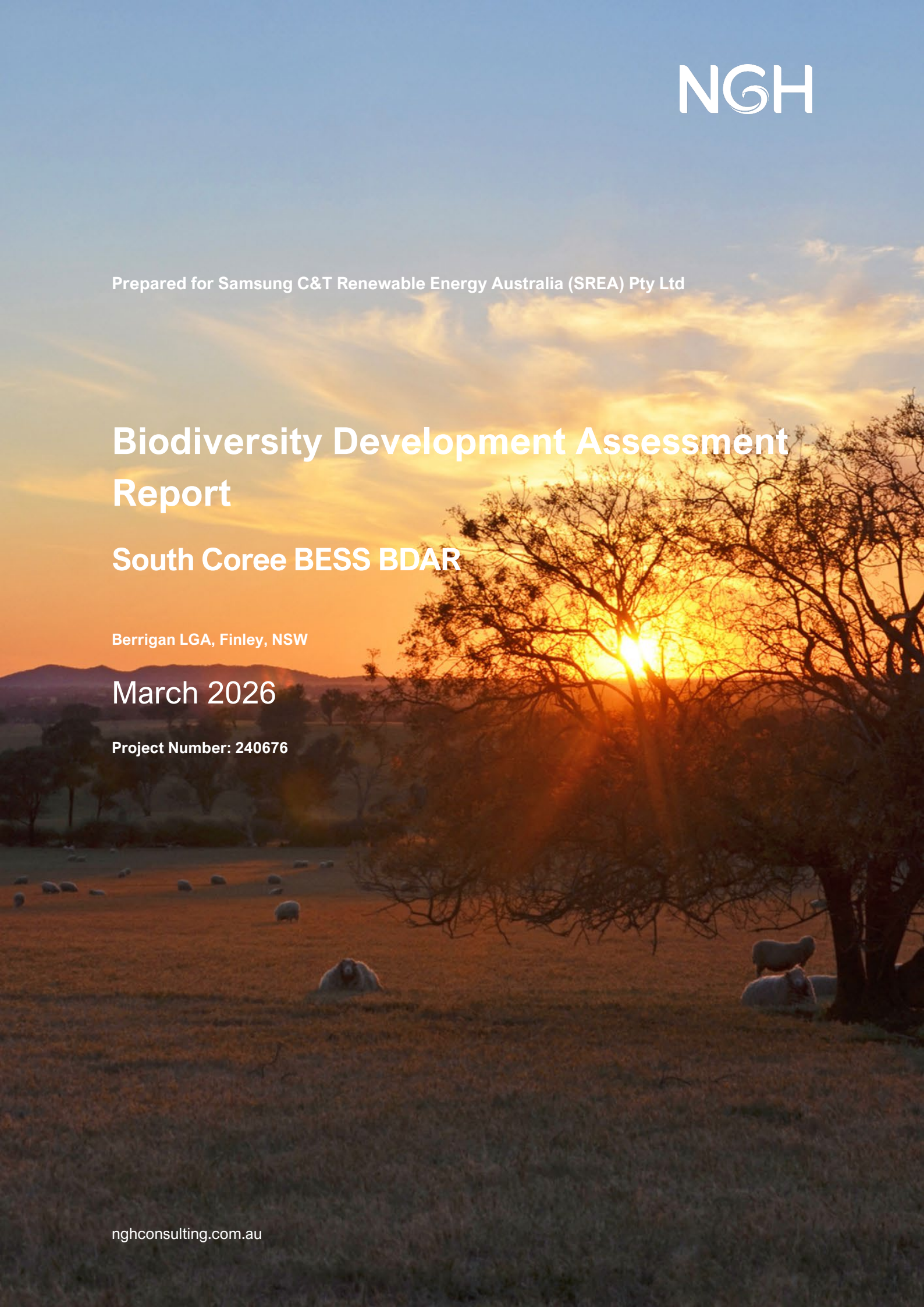


Prepared for Samsung C&T Renewable Energy Australia (SREA) Pty Ltd

Biodiversity Development Assessment Report

South Coree BESS BDAR

Berrigan LGA, Finley, NSW

March 2026

Project Number: 240676

nghconsulting.com.au

Document verification

Project Title:	South Coree BESS BDAR
Project Number:	240676
Project File Name:	240676 South Coree BESS BDAR Final V2.0

Revision	Date	Prepared by	Approved by
Draft V1.0	22/04/2025	Julia Chabros Justin Solomons Julie Gooding (BAAS18074) - reviewer	Julie Gooding (BAAS 18074)
Draft V1.1	20/06/2025	Julie Gooding (BAAS 18074) Clare Vincent - reviewer	Julie Gooding (BAAS 18074)
Draft V1.2	25/07/2025	Julie Gooding (BAAS18074)	Julie Gooding (BAAS18074)
Final V1.0	22/10/2025	Michael Cleland	Julie Gooding (BAAS18074)
Final V2.0	31/03/2026	Michael Cleland Julie Gooding (BAAS18074)	Julie Gooding (BAAS18074)

Executive summary

Samsung C&T Renewable Energy Australia (SREA) Pty Ltd is proposing to develop a Battery Energy Storage System (BESS) in Berrigan Shire Local Government Area (LGA), approximately 5 kilometres (km) west of the township of Finley, New South Wales (NSW) (the Project). The Project would involve the construction, operation and decommissioning of a BESS with a nominal capacity of approximately 80 Megawatts (MW)/320MWh (4hr).

The Project is considered a State Significant Development (SSD) and will be assessed under Part 4 of the *NSW Environmental Planning and Assessment Act 1979* (EP&A Act). SSDs are subject to the requirements of Biodiversity Offsets Scheme (BOS), and an assessment is required in accordance with the NSW Biodiversity Assessment Method 2020 (BAM) and the *Biodiversity Conservation Act 2016* (BC Act).

This BDAR version 2.0 addresses agency comments raised by NSW Conservation Programs, Heritage and Regulation (CPHR) group following exhibition of the development application and BDAR on 5th November 2025. It also includes an update to the development footprint to include the southern section of the substation and an intersection upgrade off the Riverina Highway for the transport route to the Subject Land.

This Biodiversity Development Assessment Report (BDAR) has been prepared by an accredited BAM Assessor employed by NGH to accompany the SSD application. This report follows the field work methodologies and assessment format required by the BAM. Comprehensive mapping and field surveys were completed in accordance with the requirements of the BAM 2020.

Site biodiversity

One Plant Community Type (PCT), one Threatened Ecological Community (TEC) and three threatened species were identified or assumed present within the Subject Land. These are;

- PCT *76 Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions* in a low condition derived grassland form,
- *Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions* TEC, listed as Endangered under the BC Act,
- Microbats
    - Corben's Long-eared Bat (*Nyctophilus corbeni*), listed as Vulnerable under the BC Act and Vulnerable under the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act)
    - Southern Myotis (*Myotis macropus*) – listed as Vulnerable under the BC Act
    - Yellow-bellied Sheathtail-bat (*Saccolaimus flaviventris*) – listed as Vulnerable under the BC Act

Avoid and minimise

Avoidance and minimisation of impacts has been achieved via the following steps:

1. **Site selection:** by choosing a historically cleared and fragmented site, significant biodiversity was avoided, thereby reducing potential impacts on native ecosystems
2. **Proximity to existing transmission line:** developing close to the existing Finely Solar Farm and Finley substation minimises the need for new infrastructure, which reduces potential biodiversity and visual impacts
3. **Utilisation of existing access road:** avoiding the need to construct a new road minimises additional habitat disturbance, protecting vegetation, and maintaining habitat connectivity

Impact Summary

Where impacts could not be avoided, the proposal involves the removal of approximately 8.30 ha of PCT 76 *Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and*

Riverina Bioregions, and the associated *Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions* TEC.

Table E1 Impacts that require an offset - ecosystem credits

Vegetation zone	Plant Community Type	Vegetation Integrity Score	Threatened Ecological Community	Impact area (ha)	Number of ecosystem credits required
Zone 1	76_DG_poor	14.6	*Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions*	3.55	0
Zone 2	76_DG_roadside_Broockmanns Road	12.8	As above	0.74	0
Zone 3	76_DG_low	22.8	As above	2.90	31
Zone 4	Exotic	14.4	None	0.70	0
Zone 5	76_DG_roadside_Riverina Highway	15.3	*Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions*	1.11	9

Table E2 Impacts that require an offset – species credits

Common name	Scientific name	Loss of habitat (ha)	Number of species credits required
Southern Myotis	*Myotis macropus*	4.2	40

Common name	Scientific name	Loss of habitat (ha)	Number of species credits required
A spear grass	*Austrostipa wakoolica*	2.2 (Assumed present)	21
Sloane's Froglet	*Crinia sloanei*	1.1 (Assumed present)	13
Slender Darling Pea	*Swainsona murrayana*	1.1 (Assumed present)	9
Silky Swainson-pea	*Swainsona sericea*	1.1 (Assumed present)	9

Entities known or considered likely to occur have been included in the impact assessment, and Assessments of Significance have been prepared where there is the potential for impacts to determine the significance of impacts to these entities. No species listed under the EPBC Act have been identified as having the potential to be significantly impacted by the development (Appendix C (C.7)). The EPBC Act referral (EPBC 2025/10152) determined the proposal is not a controlled action and no further assessment is required. As such, the proposal is not considered to require offsets in accordance with the EPBC Offsets Policy.

Mitigation of residual impacts

Recommended mitigation measures include;

- A trained wildlife handler or ecologist to be on site during clearing events to mitigate potential impacts to displacement, injury of death of resident fauna
- Installation of temporary frog exclusion fencing prior to construction
- Inadvertent impacts of adjacent habitat or vegetation to be mitigated through clear physical demarcation of the boundary between areas to be retained and areas slated for clearing
- Reduced viability to adjacent habitat to be mitigation through avoiding clearing / construction during night-time hours
- Risk of introduced weeds and pathogens to be mitigated through weed control and vehicle and machinery hygiene protocols
- Rubbish dumping during the construction phase to be mitigated through standard high quality construction practices including maintaining a clean site and depositing rubbish at suitable facilities
- Mobilisation of sediments to be mitigated through application of erosion and sediment control practices.
- Increased risk of fire to be mitigated through built in hazard reduction planning
- Impacts to water quality mitigated through application of erosion and sediment control practices.
- Vehicle speed limits implemented across the site during construction and operation.

Table of Contents

Figures

Table

Acronyms and Abbreviations

APZ	Asset Protection Zone
BAM	Biodiversity Assessment Method
BAM-C	BAM Calculator
BC Act	*Biodiversity Conservation Act 2016* (NSW)
BCD	Biodiversity and Conservation Division
BCS	Biodiversity, Conservation and Science Group
BDAR	Biodiversity Development Assessment Report
BESS	Battery Energy Storage System
Biosecurity Act	*Biosecurity Act 2015* (NSW)
BMP	Biodiversity Management Plan
BOS	Biodiversity Offset Scheme
CE	Critically endangered
CEMP	Construction environmental management plan
CPHR	Conservation Programs, Heritage and Regulation (NSW)
Cth	Commonwealth
DCCEEW (Cth)	Department of Climate Change, Energy, the Environment and Water (Cth)
DCCEEW (NSW)	Department of Climate Change, Energy, the Environment and Water (NSW)
EIS	Environmental impact statement
EP&A Act	*Environmental Planning and Assessment Act 1979* (NSW)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cth)
FR NSW	Fire and Rescue NSW
GPS	Geographical positioning system
ha	hectares
IBRA	Interim biogeographic regionalisation for Australia
km	kilometres

kV	kilovolt
LEP	Local Environmental Plan
LLS Act	*Local Land Services Act 2013*
LGA	Local government area
m	metres
MNES	Matters of national environmental significance
MW	Megawatt
NSW	New South Wales
NSW RFS	New South Wales Rural Fire Service
NVR	Native Vegetation Regulatory
OEH	(Former) Office of Environment and Heritage (NSW) (now EES)
PCT	Plant community type
SAII	Serious and irreversible impact
SEARs	Secretary's Environmental Assessment Requirements
Sp/spp	Species/multiple species
SSD	State Significant Development
SVTM	State Vegetation Type Map
TBDC	Threatened biodiversity data collection
TEC	Threatened ecological community – a general term given to both Commonwealth and NSW listed ecological communities
VI	Vegetation Integrity

Accredited assessor declaration

Certification under clause 6.15 Biodiversity Conservation Act 2016

I certify that this report has been prepared on the basis of the requirements of, and information provided under the Biodiversity Assessment Method and s6.15 of the BC Act. It has been assessed in accordance with BAM 2020. A full list of staff qualifications and experience can be found in Appendix E of this report.

In preparing this assessment I have acted in accordance with the Accredited BAM Assessor Code of Conduct.

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

Signature: 

Name: Julie Gooding

Date: 31/03/2025

BAM Assessor Accreditation No.: BAAS18074

The associated development case 00050419/BAAS18074/24/00050420 within the BAM Calculator has been finalised as of 31/03/2026 with the associated credit report reflected in Revision 7. Please notify NGH when you submit the report and we will submit the BAM-C case to the appropriate regulator.

Details and experience of author/s and contributors

Details of the persons responsible for preparing the BDAR and conducting site investigations on which the BDAR relies are provided below.

Name	BAM assessor accreditation No. (if relevant)	Position/role	Tasks performed	Relevant qualifications
Julie Gooding	BAAS18074	Accredited Assessor	Supervision, BAM-C, technical review, site assessment, targeted flora surveys, targeted fauna surveys, VI plots surveys	B. Sci (Biology)
Gillian Young	-	Senior Ecologist	Threatened flora surveys	B. Natural Resources (Hons 2)
Julia Chabros	-	Ecologist	Report preparation Figure preparation	B. EnvMgmt (Ecology), B. Sci (Hons 1)

Name	BAM assessor accreditation No. (if relevant)	Position/role	Tasks performed	Relevant qualifications
Justin Solomons	-	Ecologist	Report preparation	B. EnvSc (ConsEcol)
Benjamin Sloggett	-	Ecologist	Assessments of Significance	B. Sci (Zoology), MRes (Animal physiology)
Madeleine Robertson	-	Ecologist	Targeted fauna surveys, VI plots surveys	BSc (Bio & Con), BEnv
Michael Cleland	-	Ecologist	Targeted flora surveys, VI plots surveys, Targeted fauna survey, report preparation, figure preparation	BEnvSc and Mgt (Hons)
Evan Creek	-	Graduate Ecologist	Site assessment, VI plots surveys	BSc
Dominic DeLorenzo	-	Graduate Ecologist	Targeted fauna survey Reporting	B. Science (Environmental Sciences)

Conflict of interest

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

Signature: 
Date: 31/03/2025
BAM Assessor Accreditation No.: BAAS18074

Stage 1: Biodiversity assessment

1. Introduction

This Biodiversity Development Assessment Report (BDAR) assesses the biodiversity impacts of the proposed South Coree Battery Energy Storage System (BESS) (the proposal) according to the New South Wales (NSW) Biodiversity Assessment Methodology 2020 (BAM). NGH Pty Ltd has prepared this report on behalf of the proponent, Samsung C&T Renewable Energy Australia Pty Ltd. The proposed South Coree BESS is classified as a State Significant Development (SSD) under the *State Environmental Planning Policy (Planning Systems) 2021* (Planning Systems SEPP).

This BDAR version 2.0 addresses agency comments raised by NSW Conservation Programs, Heritage and Regulation (CPHR) group following exhibition of the development application and BDAR on 5th November 2025. It also includes an update to the development footprint to include the southern section of the substation and road upgrades at the intersection of Riverina Highway and Canalla Road for the transport route to the Subject Land. Table 1-1 summarises the changes in this BDAR in response to each of the CPHR comments. Table 1-2 summarises the changes in this BDAR resulting from the change in the development footprint.

Table 1-1 Summary of CPHR comments and how addressed in BDAR V2.0

No.	CPHR Comment	BDAR V2.0 Update
3.1	Revise all predicted credit species removed from further assessment in accordance with Section 5.2.2(2) of the BAM. Update relevant sections of the BDAR, including Table 10, and BAM-C to include any species identified as requiring assessment.	Consultation undertaken with BOS help desk on 14th May 2025 confirmed appropriate to exclude ecosystem species lacking habitat. Consultation included in Section 5.1.1 and Appendix F.1
4.1	Provide additional evidence to demonstrate how the presence of Sloane's Froglet was excluded.	Detailed frog survey results provided in Appendix D.3 and summarised in section 5.3.2
5.1	Revise the mitigation measures outlined in Table 8.5 of the BDAR.	Mitigation measures updated in Table 8-5. SMART principles and unique identifiers have been applied to each mitigation measure. Recommended mitigation measures from CPHR have been incorporated.
6.1	Amend the BDAR to include an assessment of indirect and prescribed impacts for the proposed 132 kV transmission line and appropriate mitigation measures	Assessment of impacts updated in Section 8.3

Table 1-2 Summary of development footprint changes and implications to BDAR V2.0

Development Footprint changes	BDAR V2.0 Update
Inclusion of land south of substation for transmission line connection	Increased impacts to PCT 76 - (0.74 ha), within Zone 3: 76_DG_Low Increased credit obligation to PCT 76 (7 credits) Increased credit obligation for Southern Myotis (5 credits) Assumed presence for threatened flora – *Austrostipa wakoolica* (12 credits)
Inclusion of road upgrades at intersection of Riverina Highway and Canalla Road	New vegetation zone for PCT 76 (Zone 5: PCT 76 Roadside – Riverina Highway) Increased impacts and credit obligation to PCT 76 (9 credits) Assumed presence for; • Southern Myotis (9 credits) • *Austrostipa wakoolica* (21 credits), • Sloane's Froglet (13 credits), • Silky Swainson-pea (9 credits), • Slender Darling Pea (9 credits)

Report terminology

The following terms are used in this document:

a) **The Proposal –** the proposed construction and operation of South Coree BESS

b) **Development Footprint**– all areas of land which may be directly impacted by the proposal, either during construction, operation or decommissioning. The Development Footprint has been defined as the area which would be impacted through clearing, including stockpiles, compounds and transmission line easements, and accounts for all direct impacts required to allow for construction activities. Development Footprint areas are used in the BAM Calculator (BAM C) to generate ecosystem and species credits where relevant. The Development Footprint is larger than will likely be developed to allow for flexibility in the final detailed design. The Development Footprint covers an area of 11.43 ha.

c) **Subject Land** – the land proposed for development plus buffers around the Development Footprint to consider indirect impacts and to consider some flexibility during the detailed design. The Subject Land is the area where Stage 1 of the BAM has been applied, and vegetation surveys and targeted threatened species surveys have been undertaken. The Subject Land covers an area of 16.21 ha.

d) **Assessment Area** – the assessment area includes the Subject Land plus the area of land within the 1500m buffer zone surrounding the Subject land.

e) **Involved Lands** – all lots and easements that are intersected by the Development Footprint.

1.1. Proposed development

1.1.1. Development overview

Samsung C&T Renewable Energy Australia is proposing the development of the South Coree Battery Energy Storage System. This involves the construction, operation and decommissioning of a Battery Energy Storage System (BESS) with a capacity of up to approximately 80 Megawatts (MW)/320MWh (4 hr), which would supply electricity to the National Electricity Market (NEM) during peak periods.

Samsung C&T Renewable Energy Australia are proposing to develop the South Coree BESS across an approximately land size of 11.43 ha. The project would include the installation of:

a) BESS including battery enclosures, inverters, transformers, switchgear and control room
b) Onsite substation including transformer switch bays and switchgear housed in portable substation containers
c) Underground or overhead 132 kV transmission lines to connect the BESS to the Finley substation
d) Finley substation upgrade works to facilitate connection with the BESS
e) Permanent office, operation and maintenance (O&M) buildings, hardstands and Project signage
f) Site access to the BESS from Broockmanns Road, internal site access tracks and parking
g) Landscaping
h) Stormwater management infrastructure, lighting, fencing and security.
i) Road upgrades at the intersection of Riverina Highway and Canalla Road to allow for safe turning and access for heavy weight vehicles.

1.1.2. Location

The Subject Land is located within the Berrigan Shire Local Government Area (LGA), approximately 5 kilometres (km) west of the township of Finley, New South Wales (NSW) and approximately 26 km west of Berrigan and 52 km southeast of Deniliquin. The site address is 384 Broockmanns Road, Finley NSW 2713. Tocumwal is located 20 km southeast, and Jerilderie 36 km northeast. The location of the Project is shown in Figure 1-1.

The Subject Land occurs on land that is primarily used for agricultural purposes. The Finley Substation is located in the southwestern corner of the Subject Land. The Project intersects with two lots within the Development Footprint:

- Lot 4, DP 470920
- Lot B DP 961693

Key features of the Subject Land include:

- Finley Substation

The Project site is zoned as Primary Production (RU1) under the *Berrigan Shire Local Environmental Plan 2013* (Berrigan LEP). The objectives of this zone are:

- To encourage sustainable primary industry production by maintain and enhancing the natural resource base
- To encourage diversity in primary industry enterprises and systems appropriate for the area
- To minimise the fragmentation and alienation of resource lands
- To minimise conflict between land uses within this zone and land uses within adjoining zones

- To permit development that enhances the agricultural and horticultural production potential of land in the locality
- To permit low-key tourist and visitor accommodation that is compatible with the scenic amenity, and promotes the character, of the area
- To enable function centres to be developed in conjunction with agricultural uses.

1.1.3. Subject land

The Subject Land is located on agricultural land. The BESS site is located approximately 1 km northeast of Finley Solar Farm, which connects to the Finley substation (Figure 1-1). A range of canals and channels are within close proximity to the Subject Land. The channel in closest proximity to the Subject Land is the Mulwala no. 19 Channel, that runs along the northern boundary of the northern subject lot. Finley township is approximately 5 km east of the Subject Land. Broockmanns Road intersects through the middle of the Subject Land, separating the proposed BESS site from the Finley substation.

The Subject Land is topographically quite flat staying between approximately 108 – 111m Above Sea Level. (ASL), comprising a flat plain with clay to clay-loam soils. The Subject Land has been extensively cleared in the past with no remnant trees or shrubs remaining. Planted trees are evident along fence lines.

The Subject Land consists of paddocks dominated by exotic groundcover vegetation and low-quality native grasses and forbs (*Rytidosperma* spp. and *Vittadinia* spp.) that are not a representative of a Plant Community Type (PCT). However, *PCT 76 Western Grey Box tall grassy woodland on alluvial loam and play soils in the NSW South Western Slopes and Riverina Bioregion* was assigned to the grassland within the Subject Land due to the presence of remnant Grey Box (*Eucalyptus microcarpa*) in the locality. Most of the Subject land appeared to be disturbed by past clearing and grazing.

The proposal will connect to the Finley substation southwest of the site, via an underground or overhead 132 kV transmission line. This line will run along the south side of Broockmanns Road reserve as well as Canalla Road reserve.

1.1.4. Other documentation

Other documentation relevant to the potential impacts on biodiversity from this proposal includes the South Coree BESS EPBC Act Referral (EPBC Number 2025/10152) (Appendix C.8). The referral decision determined that the proposed development is not a controlled action. This decision was made on 13/05/25.

1.2. Biodiversity Offsets Scheme entry

The proposed South Coree BESS is classified as a State Significant Development (SSD) under the Planning Systems SEPP. Under the *Environmental Planning and Assessment Act 1979* (EP&A Act), the Biodiversity Offset Scheme (BOS) applies to all developments classified as SSD.

1.2.1. Study aims

The aim of this BDAR is to assess the Proposal using the BAM, including:

- The biodiversity values of the Subject Land (BAM Stage 1) and impact of the Proposal (BAM Stage 2)
- The avoid and minimise measures undertaken by the Proponent
- The offset requirements under the *Biodiversity Conservation Act 2016* (BC Act)

1.3. Excluded impacts

The Draft Native Vegetation Regulatory (NVR) Map shows the Subject Land is mapped predominantly as Category 1 – Exempt land. Clause 6.8(3) of the BC Act states that prescribed impacts are still required to be assessed on Category 1 – Exempt land. However, site inspections revealed that the Subject Land is comprised of native grasslands, including the BC Act listed *Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions*.

Therefore, there are no excluded impacts for this project.

1.4. Matters of national environmental significance

This BDAR includes an assessment of impacts to protected matters listed under the federal *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act). This assessment includes use of the Protected Matters Search Tool (PMST) to determine potential species and communities occurring within the locality, and targeted surveys across the site to detect the presence of these entities or their habitats. Entities known or considered likely to occur have been included in the impact assessment, and Assessments of Significance have been prepared where there is the potential for impacts to determine the significance of impacts to these entities. These are reported in Section 10.1.4 and Appendix C.

An EPBC Act referral was prepared for the Project (Application number 02787) to determine potential impacts on Commonwealth-listed MNES. The EPBC Act referral decision (EPBC 2025/10152) determined the proposal is not a controlled action and no further assessment is required.

1.5. Information sources

Table 1-3 Information sources used in the preparation of this report

Information	Source
Australia's Interim Biogeographic Regionalisation for Australia (IBRA) bioregions and subregions (DAWE, 2020)	https://www.dcceew.gov.au/environment/land/nrs/science/ibra
Mitchell Landscapes (DECCW, 2002)	Department of Environment and Climate Change NSW (DECC, 2002). Descriptions for NSW (Mitchell) Landscapes, Version 3
NSW Biodiversity Assessment Method (BAM) calculator (BAM C)	DPIE, NSW Biodiversity Accredited Assessor System https://customer.lmbc.nsw.gov.au/assessment/s/userlogin?startURL=%2Fassessment%2Fs%2F
NSW BioNet Threatened Biodiversity Database	OEH 2021 Accessed online via login at www.bionet.nsw.gov.au

Information	Source
Bionet vegetation classification database (DPE, 2021)	Accessed online via login at: www.environment.nsw.gov.au/NSWVCA20PRapp/default.aspx
Concept design and project information	Samsung C&T Renewable Energy Australia Pty Ltd
Biodiversity Assessment Method 2020 (DPE, 2020)	https://www.environment.nsw.gov.au/publications/biodiversity-assessment-method-2020
Biodiversity Assessment Method Calculator (NSW Gov, 2021)	www.lmbc.nsw.gov.au/bamcalc
Department of Primary Industries (DPI) profiles of threatened species, populations, ecological communities and key threatening processes (DPI, n.d.)	www.dpi.nsw.gov.au/fishing/threatened-species/what-current
Directory of Important Wetlands (DCCEEW, 2021)	www.environment.gov.au/water/wetlands/australian-wetlands-database/directory-important-wetlands
Transitional Native Vegetation Regulatory Mapping	https://www.lmbc.nsw.gov.au/Maps/index.html?viewer=NVRMap
NSW Biodiversity Values Map and Threshold Tool (NSW Gov, n.d.)	www.lmbc.nsw.gov.au/Maps/index.html?viewer=BOSETMap
NSW BioNet Atlas (DPE, 2021)	www.bionet.nsw.gov.au
NSW BioNet Vegetation Classification (DPE, 2021)	www.bionet.nsw.gov.au
NSW Flora Online (PlantNET, n.d.)	https://plantnet.rbgsyd.nsw.gov.au
NSW Government SEED mapping (SEED, 2021)	https://geo.seed.nsw.gov.au/Public_Viewer/index.html?viewer=Public_Viewer&locale=en-AU

Information	Source
NSW SEED Mapping Portal (SEED, 2022)	www.seed.nsw.gov.au
NSW Soil and Land Information (eSpade, n.d.)	www.environment.nsw.gov.au/eSpade2WebApp#
NSW Threatened Species Profiles (NSW Government) (OEH, n.d.)	https://www.environment.nsw.gov.au/threatenedSpeciesApp/
NSW Threatened Species Scientific Committee final determinations (DPE, n.d.)	www.environment.nsw.gov.au/topics/animals-and-plants/threatened-species/nsw-threatened-species-scientific-committee/determinations/nsw-threatened-species-scientific-committee-final-determinations
Protected Matters Search Tool (Commonwealth Government) (DCCEEW, n.d.)	www.environment.gov.au/epbc/protected-matters-search-tool
Species Profiles and Threats (SPRAT) Database (Commonwealth Government) (DCCEEW, n.d.)	http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl
Strahler Stream Order	https://water.dpie.nsw.gov.au/our-work/licensing-and-trade/controlled-activity-approvals/waterfront-land-e-tool/hydro-line-spatial-data
Aerial imagery of historical land use	Sourced from Google Earth and NSW Spatial Services Delivery

Figure 1-1 Subject Land

2. Methods

2.1. Site context methods

2.1.1. Landscape features

Background searches were undertaken using the information sources listed above for Interim Biogeographic Regionalisation for Australia (IBRA) sub-region, NSW Mitchell landscapes, waterbodies and other features. Habitat connectivity was assessed using aerial imagery along with field surveys. Relevant landscape features (e.g. habitat connectivity) within the Subject Land were verified during field surveys in August 2024, September 2024, November 2024, December 2024 and August 2025.

2.1.2. Native vegetation cover

Native vegetation cover in the assessment area was estimated on a desktop level using the State Vegetation Type Map (SVTM). Plant Community Type (PCT) mapping was further refined using rapid assessment points during a preliminary site assessment in August 2024. Native vegetation cover within the Subject Land was ground-truthed through targeted VI plots surveys in August, December 2024.and August 2025.

The first step in calculating native vegetation cover was to use GIS processing tools to buffer a 1500 m radius around the Subject Land. Native vegetation cover inside the Subject Land was determined through vegetation stratification and field survey according to the BAM 2020. Native vegetation outside the Subject Land was determined using NSW SVTM with adjustments made for local observations made during field work. Satellite imagery was used to map paddock trees as native vegetation. Native vegetation cover calculations were determined using GIS processing tools.

2.2. Native vegetation, threatened ecological communities and vegetation integrity methods

2.2.1. Existing information

To assist with gaining knowledge of the existing native vegetation and Threatened Ecological Communities (TECs) within the assessment area, a desktop investigation was undertaken for the proposed development footprint in August 2024 and April 2025 to review existing information.

The following searches were conducted:

- Biodiversity Values Mapping and areas of outstanding biodiversity value were conducted. The search was conducted on 16/04/2025
- BioNet species sightings records of threatened flora, fauna and ecological communities listed under the BC Act. The search was conducted on 2/08/2024 within a 10 km radius surrounding the Subject Land
- PMST for threatened species and populations listed under the EPBC Act. The search was conducted on 16/04/2025 within a 10 km radius surrounding the Subject Land

Following field surveys, the following resources were utilised to determine native vegetation extent and PCTs present onsite:

- State Vegetation Type Mapping

- BioNet Vegetation Classification database.

2.2.2. Mapping native vegetation extent

Native vegetation cover within the Subject Land was reviewed at a desktop level using desktop mapping. These resources included the SVTM, BioNet vegetation classification database and vegetation data collected during a preliminary site assessment.

Initial field surveys were undertaken by BAM Accredited Assessors in August 2024 to ground truth the native vegetation extent within the Subject Land using rapid assessment points, step point transects and vegetation integrity plots (VI plots). Fifteen rapid assessment points, three step point transects and two VI plots were undertaken during the initial field survey. Only the BESS site and roadside vegetation were surveyed in the initial field survey as site access was not yet available to the land around the Finley Substation.

Rapid Assessment Points (RAP) were undertaken across multiple areas within the Subject Land, capturing the range of condition classes present. Additional RAPs were recorded incidentally at observed areas of interest during the field investigation. Each RAP site was recorded on a GPS enabled Android tablet using data collection software. The following information was collected (based on observing a 100m radius around the point):

- The three most dominant flora species in the upper, middle and lower stratum of vegetation (where present).
- The percent native cover of all endemic species (%) for each vegetation stratum was also estimated.
- Landscape features such as landform and soil type were also observed and recorded.
- A photo was taken of each RAP site to provide a visual representation of the data recorded at each point.

In addition to RAPs, 100m step point transects were also conducted within the subject land noting;

- The percentage of native groundcovers compared to exotic groundcover and bare ground or rock over 100 meters (step point at every 1m tape interval), expressed as a percentile.

Step point transects were undertaken to determine the percentage of native groundcover consistent with the transect-intercept method outlined in the NSW Government Interim Grassland and other Groundcover Assessment Method document (OEH, 2017).

Following field surveys, vegetation mapping was refined, including confirming areas of native vegetation and PCTs present within the Subject Land to create a more accurate and comprehensive map. Field data was analysed to determine preliminary vegetation condition classes and presence of any threatened ecological communities (TEC).

PCT Identification was based on:

- Most dominant native species present inside 20 x 20m plots
- Tree species observed in similar and adjoining landforms to the Development Site (where absent in plots); and
- Location in the IBRA subregion and distribution using the BioNet Vegetation Classification Database.

2.2.3. Plot-based vegetation survey

Further field surveys were conducted by BAM accredited ecologists in December 2024 and August 2025 to complete the number of VI plots required by the BAM. Surveys included VI plots data collection in

accordance with the BAM (DPIE, 2020) and the use of VI plots data to stratify vegetation across the site. Two VI plots were conducted during the initial field surveys in August 2024, with a further four VI plots undertaken across the Subject Land in December 2024. An additional two VI plots were completed August 2025 at the road intersection of Riverina Highway and Canalla Road. The aim of this field work was to assess the vegetation visually and conduct an acceptable number of VI plots in the representative PCTs observed. Sampling locations were selected randomly within the vegetation zone, ensuring the VI plots captured a representative assessment of the vegetation zone and not located in ecotones, tracks or disturbed edges.

VI plots, consisted of 1m x 1m litter cover plots, 20 x 20 m floristic plots (composition, structure) and 20 x 50 m function plots, and were replicated across the Subject Land within each vegetation zone, as detailed in the BAM. Data was collected utilising the methodology presented in the BAM by an accredited BAM assessor. All plot surveys, impact assessment and credit calculations were directed by and certified by an accredited BAM assessor. Details of personnel involved in field surveys is provided in Appendix G.

2.2.4. Vegetation integrity survey

VI plots were used to further delineate PCTs into specific zones based on condition, which was determined using the vegetation integrity score (VI score) calculated in the BAM Calculator (BAM-C) and extrapolated out in combination with on-site vegetation stratification and aerial imagery. Vegetation was classified as poor condition for VI scores lower than 15 and low condition for scores 15-30. Vegetation zones were further stratified by the current land management where VI scores were similar, but floristics or structure were vastly different.

The number of VI plots undertaken per zone was based on Table 3 & Section 4.3.4 of the BAM (DPE, 2020). As VI plots were used to inform planning to avoid and minimise impacts, VI plots undertaken by NGH met the minimum required by the BAM in all zones.

2.3. Threatened flora survey methods

2.3.1. Review of existing information

IBRA regions and subregions, PCTs and VI Plot data were entered into the BAM-C to determine the threatened flora species which had the potential to occur within the Subject Land. Further databases were reviewed to determine if any additional threatened flora species may be present, which included:

- BioNet species sightings records of threatened flora listed under the BC Act. The search was conducted on 02/08/2024 and again on 15/05/2025 within a 10 km radius surrounding the Subject Land
- PMST for threatened species and populations listed under the EPBC Act. The search was conducted on 16/04/2025 within a 10 km radius surrounding the Subject Land (Appendix B).

Existing information was reviewed through researching individual habitat constraints of the identified targeted flora species. This was completed using the NSW BioNet Threatened Biodiversity Database (OEH, 2025) and the NSW Threatened Species Profiles (OEH, 2025) to determine habitat constraints, microhabitats and the species associated with the mapped PCTs. This was compared against the vegetation and habitat available within the Subject Land to determine the likely areas of potential habitat for each species.

2.3.2. Habitat constraints assessment

A habitat constraints assessment was undertaken in August 2024, during a preliminary site assessment. Habitat features were recorded using rapid assessment points. The points included coordinates, photographs, and details which may be relevant to various threatened flora species local to the Subject Land.

2.3.3. Field surveys

Surveys were undertaken by qualified ecologists in accordance with the *Surveying threatened plants and their habitats: NSW survey guide for the Biodiversity Assessment Method* (DPIE, 2020). The following species, which were identified in the BAM-C, were targeted:

- A spear grass (*Austrostipa wakoolica*),
- Silky Swainson-pea (*Swainsona sericea*) and
- Slender Darling Pea (*Swainsona murrayana*)

These species were surveyed over two survey periods. *S. sericea* and *S. murrayana* were surveyed on 30th September 2024 and *A. wakoolica* was surveyed on 19th November 2024.

Flora surveys were conducted by parallel walking transects spaced 10 m apart. The vegetation was inspected over a maximum distance of 5 m either side of each transect. The total length of walked transects was around 20 km, which were undertaken over the two days, with an average speed of 1.9 km/h. The GPS tracks of the flora surveys were recorded on a Garmin 64 GPS unit.

The additional areas, south of the Finley substation and the road intersection at the Riverina Highway and Canalla Road was added to the footprint in February 2026, and targeted surveys were unable to be undertaken here in the correct time period. These species have been assumed present in this area.

2.4. Threatened fauna survey methods

2.4.1. Review of existing information

IBRA regions and subregions, PCTs and VI plot data were input into the BAM-C, to determine the threatened fauna species which had the potential to occur within the Subject Land. Further databases were reviewed to determine if any additional threatened fauna species may be present, which included:

- BioNet species sightings records of threatened fauna listed under the BC Act. The search was conducted on 02/08/202 and again on 15/05/2025 within a 10 km radius surrounding the Subject Land
- PMST for threatened species and populations listed under the EPBC Act. The search was conducted on 15/05/2025 within a 10 km radius surrounding the Subject Land.

Existing information was reviewed by researching individual habitat constraints of the identified targeted fauna species. This was completed using the NSW BioNet threatened biodiversity database (OEH, 2025) and the NSW Threatened Species Profiles (OEH, 2025) to determine habitat constrains, microhabitats and the species associated with the mapped PCTs. This was compared against the vegetation and habitat available within the Subject Land to determine the likely areas of potential habitat for each species.

2.4.2. Habitat constraints assessment

Initial field surveys and rapid assessment points were undertaken across the Subject Land to identify any habitat constraints (e.g. waterbodies, rocky areas, tree hollows) and microhabitats associated with threatened fauna species.

Observations were entered into a GIS-enabled field tablet including information such as habitat type, dominant vegetation, soil type, foliage cover, presence/absence of water, and photographs were also collected for later reference.

2.4.3. Field surveys

Targeted field surveys were undertaken in December 2024 and August 2025 for species returned in the BAM-C that had suitable habitat within the Subject Land. This was;

- Southern Myotis (*Myotis macropus*) (December 2024)
- Sloane's Froglet (*Crinia sloanei*) (August 2025)

Methods for surveys are detailed below.

Southern Myotis

Surveys were conducted in accordance with *'Species credit' threatened bats and their habitats: NSW guide for the Biodiversity Assessment Method* (DPIE, 2021).

Two Anabat Swift detectors were deployed between the 3rd and 8th of December 2024, for a total of seven survey nights. Each detector was set to record call data from dusk to dawn, to capture bat activity during the entire night.

Anabat 1 was deployed at a farm dam for six nights. The dam was surrounded by low and dense vegetation, including grasses, rushes, forbs, shrubs, and riparian vegetation, and contained water during the Anabat deployment period. The Anabat was fastened to a corner fencepost.

Anabat 2 was deployed at an irrigation channel near the substation for six nights. Vegetation surrounding the irrigation channel was disturbed due to the adjacent road and was dominated by exotic grasses. The irrigation channel contained water during the Anabat deployment, and the Anabat was fastened to a metal stake. Anabat 2 had exceeded its data storage after one night and no further calls were recorded on the unit, however positive calls were recorded in the first night, so no further deployment was needed.

An additional area was added to the footprint in February 2026. Suitable habitat occurs in the form of a waterbody along the canal. Targeted surveys were unable to be undertaken here in the correct time period. This species has been assumed present in this area.

Sloane's Froglet

Surveys were conducted in accordance with *NSW Survey Guide for Threatened Frogs: A guide for the survey of threatened frogs and their habitats for the Biodiversity Assessment Method* (DPI, 2020).

Targeted Sloane's Froglet Surveys were completed over four survey efforts (three nocturnal surveys, one diurnal survey) across approximately 650 m of suitable habitat. This included one farm dam and one earthen irrigation channel near Finley Substation. Each survey point was surveyed over four days, from 4th-7th August 2025 between the hours of 6:30 pm and 9:30 pm for nocturnal surveys, and 2:30 pm and 5:30 pm for diurnal survey. Aural surveys (active listening and recording of frog calls), call playback and visual survey (active searching, or spotlighting) were undertake around the farm dam and along the length of the irrigation

channel in the Subject Land. Sloane's Froglet call playback was conducted every 50 m. Conditions across the four survey efforts were good, with low wind, mostly clear skies, and no rain.

The farm dam was almost full and contained exotic and native vegetative structure including fringing vegetation of *Juncus sp., Typha spp*. and Couch (*Cynodon dactylon*) and exotic grasses such as Kikuyu (Cenchrus clandestinus). Geese were present at the beginning of each survey, with the water having high turbidity and algal content.

The irrigation channels at the time of survey were filled with slow-moving water and dominated by dense exotic vegetation.

The table drains along Canalla Road and Broockmans Road were dry, and no surveys were undertaken there as there was no suitable habitat.

An additional area was added to the footprint in February 2026. Suitable habitat occurs in the form of a waterbody along the canal. Targeted surveys were unable to be undertaken here in the correct time period. These species have been assumed present in this area.

2.5. Weather conditions

Weather conditions recorded during the threatened species surveys are shown in Table 2-1.

Table 2-1 Environmental conditions recorded at Deniliquin NSW, 50 km west of the Subject Land (station number 074258)

Survey undertaken	Date	Temperature (°C)		Max wind gust (km/h)	Rainfall (mm)
		Min	Max		
September threatened flora (*Swainsona sericea* & *Swainsona murrayana*)	30/09/2024	4.2	21.3	37	4.6
November threatened flora (*Austrostipa wakoolica*)	19/11/2024	7.6	27.3	41	0
Southern Myotis Anabat deployment	03/12/2024	20.5	32.4	48	14
Sloane's Froglet targeted surveys	04/07/2025	4.0	15.0	28	0
Sloane's Froglet targeted surveys	05/07/2025	3.0	16.0	14	0

Survey undertaken	Date	Temperature (°C)		Max wind gust (km/h)	Rainfall (mm)
		Min	Max		
Sloane's Froglet targeted surveys	06/08/2025	5.0	16.0	20	0
Sloane's Froglet targeted surveys	07/08/2025	3.0	17.0	16	0

2.6. Limitations

Low and poor condition areas within the development site have been highly modified and subjected to past clearing and grazing, resulting in the presence of the groundcover stratum only, with an absence of trees and tall shrubs. As key indicator species in the upper stratum are required for classifying the PCT, notes were taken in the field of adjoining tree species, especially those with similar landscape attributes, to assist in PCT assignment.

Groundcover assessment floristics can vary greatly depending on climatic influences and season at time of survey. Paddocks inspected had grazing pressure by sheep or horses, and native cover abundance could change over time following variation in climate and grazing regimes.

Local conditions were considered optimal for flora and fauna detectability at the time of field surveys by NGH. Despite this, there is potential for inconspicuous or geophytic species to be missed during surveys, given their low detectability.

3. Site context

3.1. Assessment area

The proposed development is a site-based development; therefore, the Assessment Area has been calculated by buffering the Subject Land by 1500 m (Figure 3-2).

3.2. Landscape features

The Subject Land is situated in the Berrigan Shire LGA, approximately 5 kilometres (km) west of the township of Finley. The region is characterised by a gently undulating topography with a mixture of land use including grazing, cropping, and residential. The site is located North of the Finley Solar Farm, which connects to the Finley substation. The closest natural waterways are the Murray River and its tributaries, located approximately 17 km south of the Subject Land. The geology of the region is characterised by chromosols, vertosols and rudosols. Landscape features within the Assessment Area are shown on Figure 3-2.

3.2.1. IBRA bioregions and IBRA subregions

Interim Biogeographical Regionalisation for Australia (IBRA) bioregions are geographically distinct bioregions based on common climates, geology, landforms and native vegetation (Thackway & Cresswell, 1995). There are 89 bioregions within Australia. The Subject Land falls within the Riverina IBRA region and the Murray Fans subregion, and this was entered into the BAM-C (Figure 3-2).

The Riverina Bioregion is an extensive area extending from the Murray River along the Victorian and New South Wales (NSW) border to south of Ivanhoe in NSW. The region is characterised by extensive riverine floodplains with low relief. Vegetation commonly consists of chenopod shrublands and associated grasslands, as well as box-gum woodlands, mallee woodlands, native grasslands and wetlands (NSW National Parks and Wildlife Service, 2003).

The climate of the Riverina bioregion is semiarid, with cool winters and hot summers. Rainfall in winter-dominated, with an annual median of 272 mm (NSW National Parks and Wildlife Service, 2003).

3.2.2. Rivers, streams, estuaries and wetlands

Due to the semiarid climate of the region and land use history, there are no rivers within Assessment Area. Several irrigation channels occur in the Assessment Area. The Mulwala no. 19 Channel runs through the south-east of the Subject Land, near the Finley substation (Figure 3-1). The channel is located along Broockmanns Road, and the vegetation surrounding it is dominated by exotic grasses. The Mulwala Canal also runs perpendicular to the Riverina Highway, approximately 15m from the development footprint at the road intersection of Riverina Highway and Canalla Road. There is one farm dam present in the Involved Lands, and it is located east of the proposed BESS site within a residential garden outside the Subject Land. The dam has limited native vegetation and is surrounded primarily by exotic grasses and forbs; however, it contains some riparian vegetation and does form an isolated water source for fauna (Figure 3-1).

The Murray River, a 10th order Strahler waterway, resides approximately 17 km south of the Subject Land. Tuppal Creek, a 1st – 2nd order Strahler waterway and tributary to the Murray River, is located approximately 9 km south of the Subject Land.

An EPBC Act PMST search completed on the 16th of April 2025 identified five wetlands of international importance. The closest of these to the Subject Land are the NSW Central Murray Forests, located 10 – 20 km downstream from the Subject Land. This is followed by the Hattah-kulkyne Lakes, located 200 – 300 km downstream from the Subject Land.

Figure 3-1 Aquatic habitat consists of an irrigation channel (left) and a farm dam (right)

3.2.3. Habitat connectivity

No state or regionally significant biodiversity links occur within the Development Site nor within 1500 m of the Assessment Area. The Subject Land lies within a predominantly cleared and fragmented landscape used for agriculture, limiting habitat connectivity. Roadside vegetation is cleared of trees and shrubs and does not contain any remnant vegetation. There are a few small (~1-2ha) isolated patches of remnant Grey Box Woodland that are surrounded by cleared agricultural land and lack connectivity to other areas of native vegetation.

The SVTM and satellite imagery show linear tree corridors of 10-15m wide in the Assessment Area. However, the highly modified nature of the Assessment Area suggests that these patches do not contribute substantially to local or regional connectivity.

Aquatic habitat connectivity in the Assessment Area consists of farm dams and irrigation channels. These features provide a measure of aquatic habitat connectivity, however, mostly form isolated and low-quality refuges.

3.2.4. Karst, caves, crevices, cliffs, rocks or other features of geological significance

There are no caves, crevices, cliffs or other areas of geological significance within or adjacent to the Subject Land. This was determined through multiple site visits undertaken in 2024, in conjunction with aerial imagery.

3.2.5. Areas of outstanding biodiversity value

Areas of outstanding biodiversity value are special areas with irreplaceable biodiversity values that are important to the whole of New South Wales, Australia or globally. No areas of outstanding biodiversity value occur within the Subject Land.

3.2.6. NSW (Mitchell) landscapes

The Subject Land falls across two Mitchell Landscapes. These are:

- Murray Depression Plains and
- Murray Scalded Plains

Murray Depression Plains are described as Quaternary alluvial plains with numerous circular depressions interpreted as high floodplains or low terraces beyond the reach of average floodwaters. The landscape usually contains grey and brown cracking and noncracking clays, sandy rises and levees, sands and red or brown texture-contrast soils. Vegetation typically consists of Black Box (*Eucalyptus largiflorens*), Myall (*Acacia pendula*) and Prickly Wattle (*Acacia victoriae*) with annual Saltbushes (Atriplex sp.) and grasses, as well as scattered White Cypress Pine (*Callitris glaucophylla*), Rosewood (*Alectryon oleifolius*), Belah (*Casuarina cristata*), Wilga (*Geijera parviflora*), and Narrow-leaf Hopbush (*Dodonaea attenuata*). The landscape is predominantly cleared, used for cropping and grazing (DECCW, 2002).

Murray Scalded Plains are described as Quaternary alluvial plains with extensive scalding interpreted as relic floodplains, terraces or part of the Cadell tilt block. The are characterised by red brown texture-contrast soils with extensive scalds, as well as coarse sands with sandy levees and grey, brown and red cracking clays in depressions. Vegetation of this landscape is characterised by open woodland and grasslands of White Cypress Pine (*Callitris glaucophylla*), Grey Box (*Eucalyptus microcarpa*), Bull Oak (*Allocasuarina luehmannii*), and Myall (*Acacia pendula*), with annual grasses and herbs. This landscape is also mostly cleared and used for cropping and grazing (DECCW, 2002).

The dominant Mitchell Landscape within the Subject Land is the Murray Scalded Plains. This was entered into the BAM Calculator.

3.2.7. Additional landscape features identified in SEARs

No additional landscape features were identified in the SEARs.

3.2.8. Soil hazard features

The *NSW Acid Sulfate Soils Risk* mapping (eSpade, 2024) and *Environmental Protection Authority contaminated lands records* (eSpade, 2024) were reviewed, and no mapped areas or records were identified within the Subject Land.

3.3. Native vegetation cover

The native vegetation cover within the Assessment Area was estimated to be 121.93 ha out of a total area of 1595.79 ha, which equates to 7.64% (Table 3-1). This number was entered into the BAM Calculator for this assessment. Native vegetation cover is shown in Figure 3-2. A description of native vegetation is described below in Section 4.1.

Table 3-1 Native vegetation cover in the assessment area

Assessment area (ha)	1595.79
Total area of native vegetation cover (ha)	121.93
Percentage of native vegetation cover (%)	7.64
Class (0-10, >10-30, >30-70 or >70%)	0-10

3.4. Additional site context components

The existing Finely substation is located in the west of the Subject Land. The substation infrastructure has an area of approximately 1.2 ha and is surrounded by low-condition derived grassland. Surrounding the substation on the west and south is the Finley Solar Farm, consisting of approximately 360 ha of solar arrays. Finley Solar Farm is situated outside of the Subject Land, but partially within the Assessment Area.

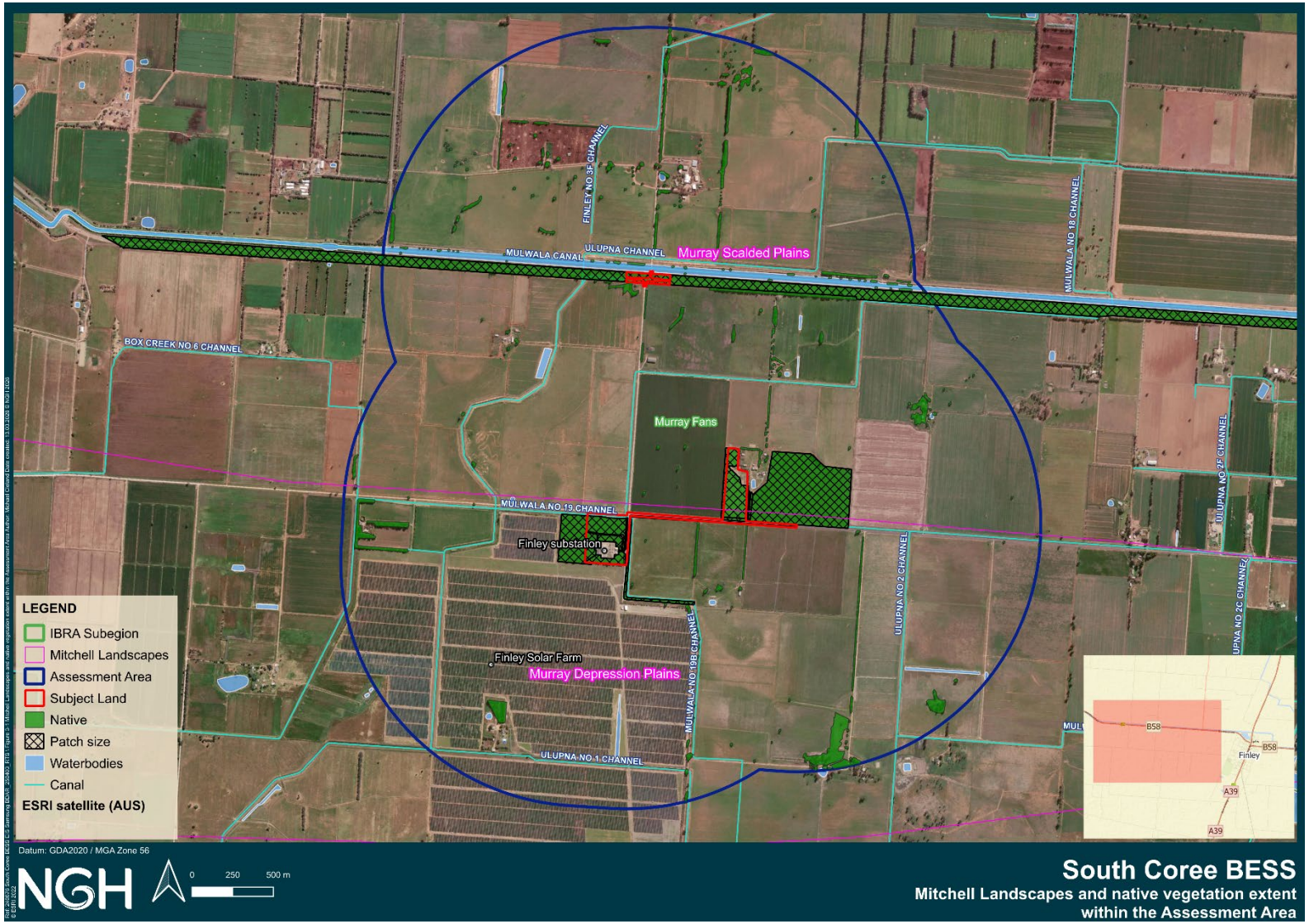


Figure 3-2 Landscape features within the Assessment Area

4. Native vegetation

4.1. Native vegetation extent

Native vegetation extent refers to areas of vegetation assessed under the BAM. The Subject Land has been predominantly cleared and disturbed by agricultural activities including grazing by horses in the northern paddocks. Adjacent areas to the Subject Land have also been extensively cleared for agricultural use in the past with a portion of the cleared land now used as the Finley Solar Farm and substation, as evidenced by recent aerial imagery and verification from site visits.

The road intersection at Riverina Highway and Canalla Road includes patches of derived partially native grassland, impacted by disturbance and edge effects from the roads. Outside the road corridor there is a mix of exotic vegetation; some cropped and grazed paddocks, derived native grasslands and scattered remnant Grey box (*Eucalyptus microcarpa*).

4.1.1. Changes to the existing native vegetation mapping

A search was undertaken of the DCCEEW BioNet Vegetation Classification Tool (BioNet) database and the NSW SEED Mapping Portal to assess existing vegetation mapping information within the Subject Land. Relevant mapping of the Subject Land included NSW State Vegetation Type mapping (SVTM).

No PCTs were identified on the SVTM as occurring within the Subject Land, with all areas mapped as 'PCT 0 – not classified'.

Only one PCT was mapped within the extent of the Assessment Area, outside the Subject Land. This being;

- PCT 76 *Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions.*

Field surveys identified the presence of low-poor condition native grasslands within the Subject Land comprised of a mix of native and exotic grasses and forbs. These areas were subsequently assigned to a PCT as they contained native vegetation. Overall, there is a greater extent of native vegetation within the subject land than what is represented on the SVTM.

4.1.2. Areas that are not native vegetation

Developed areas such as roads (dirt, gravel and asphalt), dams and the Finley substation were excluded from the native vegetation extent mapping. A patch in the north of the Subject Land was mapped as exotic vegetation due to a high cover of exotic species, and a thick infestation of Bathurst Burr (*Xanthium spinosum*).

Cleared areas and Category 1-exempt land

Draft Native vegetation regulatory mapping (NVR) identifies parts of the Subject Land as Category 1-exempt land. This includes the paddock north of Broockmanns Road and the paddock surrounding the Finley substation. While the NVR is in draft form, assessors must make their own assessment of land categorisation with supporting evidence. A precautionary approach is required to be taken for Land categorisation. During the initial field surveys, paddocks displayed a moderate cover of native grasses and forbs in proportion to exotic perennial species. Thus, the area is unlikely to meet the low conservation groundcover criteria within the Interim Grasslands and Groundcover Assessment Method (OEH, 2017). As the grasslands were unlikely to meet the criteria for Category 1-exempt land according to the "*Determining native vegetation land*

categorisation for application in the Biodiversity Offsets Scheme" guidelines (DPE, 2023), a land category assessment was not undertaken. All land within the Subject Land was included for assessment under the BOS.

4.2. Plant community types (PCTs)

4.2.1. PCT overview

Vegetation within the subject land has been assessed as aligning with the BioNet Vegetation Classification PCTs identified within Table 4-1 and their extent is shown Figure 4-5. One PCT was identified with the Subject Land; a detailed descriptions of the PCT is provided in the following subsections.

Table 4-1 PCTs identified within the subject land

PCT ID	PCT name	Subject Land area (ha)	Development Footprint area (ha)
76	*Western Grey Box tall grassy woodland on alluvial loam and play soils in the NSW South Western Slopes and Riverina Bioregions*	11.68	8.30
	Total area of native vegetation	11.68	8.30

4.2.2. PCT 76 Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions

4.2.2.1 PCT overview

A general description of PCT 76 is given in Table 4-2.

Table 4-2 PCT 76 Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions

PCT ID	76
PCT name	*Western Grey Box tall grassy woodland on alluvial loam and play soils in the NSW South Western Slopes and Riverina Bioregions*
Vegetation formation	Grassy Woodlands
Vegetation class	Floodplain Transition Woodlands
Per cent cleared in NSW (%)	92
Extent within Subject Land (ha)	11.68

Typically, this community is a tall woodland (to 25 m high) dominated by Western Grey Box (*Eucalyptus microcarpa*). The shrub layer is typically absent or sparse and includes *Dodonaea viscosa* subsp. *cuneata*,

Acacia buxifolia, Acacia acinacea, Acacia hakeoides, and *Bursaria spinosa*. A mid-dense or dense grass ground cover is typically composed of *Austrodanthonia caespitosa, Austrodanthonia setacea, Austrostipa scabra* subsp. *falcata, Paspalidium constrictum, Themeda triandra, Austrostipa aristiglumis*, *Aristida behriana* and *Elymus scaber* var. *scaber*, as well as a range of forbs. The community occurs on texture contrast red or brown earths or grey clay soils on undulating alluvial plains in the predominantly winter rainfall belt of south-central western NSW (OEH, 2025).

In the Subject Land, the community lacks a canopy or shrub layer, is dominated by exotic groundcover vegetation, and has a low diversity of native groundcover species.

4.2.2.2 Condition states

PCT 76 occurred as four condition states within the Subject Land. These are;

- Low condition derived grassland
- Poor condition derived grassland
- Roadside derived grassland – Broockmanns Road
- Roadside derived grassland – Riverina Highway

Low condition derived grassland

The low condition derived grassland community occurred in the paddocks south of Broockmanns Road, surrounding Finley substation. The area has likely been historically cleared and did not contain a canopy or shrub layer. It was currently being grazed by sheep and is regularly mowed for fire management. Native vegetation consisted primarily of forbs and grasses of *Oxalis perennans*, *Carex* spp., *Cynodon dactylon, Enteropogon acicularis, Rytidosperma setaceum*, and *Rytidosperma caespitosum*. Exotic grasses were typically annual species such as Rye Grass (*Lolium spp.*), Barley Grass (*Hordeum spp.*) and Brome Grass (*Bromus spp.*) as well as exotic forbs such as *Lactuca serriola, Hypochaeris radicata* and *Helminthotheca echioides.* This zone had a boosted function condition score due to the presence of dead rye grass forming high leaf litter cover.

Figure 4-1 PCT 76 Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions – low condition derived grassland

Poor condition derived grassland

The poor condition derived grassland community occurred in the paddocks north of Broockmanns Road in the location of the proposed BESS site. This area has been historically cleared and recently heavily grazed by horses. It did not contain a canopy or shrub layer. The zone was currently resting from grazing pressure and native vegetation consisting primarily of *Vittadinia gracilis* and *Rytidosperma setaceum* had regenerated. Exotic annual species were also regenerating comprised of a high cover of the exotic *Erodium cicutarium* as well as *Arctotheca calendula, Hypochaeris glabra, Lolium sp* and *Romula sp.*

Figure 4-2 PCT 76 Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions – poor condition derived grassland

Roadside derived grassland – Broockmanns Road

The roadside derived grassland occurred along the table drains on both sides of Broockmanns Road and Canalla Road. This area was characterised by heavily disturbed vegetation with some native groundcover species including *Paspalidium jubiflorum, Chloris truncata* and *Cynodon dactylon*.

Figure 4-3 Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions – roadside derived grassland (Broockmanns Road).

Roadside derived grassland – Riverina Highway

The roadside derived grassland at the intersection of Riverina Highway and Canalla Road occurred along the table drains and road reserve on both sides of Riverina Highway and Canalla Road. This area was characterised by disturbed vegetation (previously slashed/mown) with some native groundcover species including Austrostipa bigeniculata, Enteropogon ramosus, Einadia nutans and Enchylaena tomentosa.

Figure 4-4 PCT 76 Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions – roadside derived grassland (Riverina Highway).

4.2.2.3 Justification of PCT selection

Due to the absence of a shrub and canopy layer and the low diversity of native species in the ground layer, the PCT could not be determined based on the vegetation in the Subject Land alone. PCT 76 was determined using the following information:

- Grey Box (*Eucalyptus microcarpa*) is present as scattered remnant trees in the adjacent paddock (west of the proposed BESS site) and surrounding locality.

- The landform conforms to the attributes described in the BioNet Classification database for PCT 76, as the site is located on undulating alluvial plains with clay loam soils. No changes in landforms or soils were observed across the Subject Land.
- PCT 76 was mapped in the Assessment Area on the SVTM.

4.2.2.4 Alignment with TECs

The PCT is associated with the BC Act listed *Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions* (Endangered) and the EPBC Act listed *Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia* (Endangered).

A comparison between the final determination of both TECs and VI plot data for each zone was undertaken to determine whether vegetation recorded within the Subject Land is consistent with the criterion for each TEC. This is discussed in section 4.3.

4.3. Threatened ecological communities

The vegetation zones within the Subject Land have been assessed against the TECs that are associated with PCT 76. The assessment found that PCT 76 within the Subject Land meets the following criteria for the BC Act listed *Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions* TEC:

- Grey Box (*Eucalyptus microcarpa*) was likely the previous dominant tree species
- Remnants of the community survive with trees absent as a result of past clearing, leaving only an understorey
- Remnants can be highly degraded with weedy understoreys
- The understorey, under appropriate management, would likely respond to assisted natural regeneration from the soil seed bank, based on current understory regeneration observed.

Therefore all four vegetation zones of PCT 76 in the Subject Land classifies as the BC Act listed *Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions* TEC.

PCT 76 in the Subject Land was also assessed against the criteria for the EPBC Act listed *Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived native Grasslands of south-eastern Australia* (DSEWPC, 2012). The assessment found that:

- The Subject Land occurs within the area mapped as *Grey Box – 'may occur'* (DSEWPC, 2012) and it is likely that the previously most common tree species was Grey Box
- The patch is at least 0.5 ha in size
- Trees do NOT cover more than 10% of the patch
- There are NOT more than 12 native species in the ground and mid layer.

Therefore, PCT 76 in the Subject Land does **not** classify as the EPBC Act listed *Grey Box Grassy Woodland and Derived Native Grassland in South Eastern Australia* TEC.

The TEC identified within the Subject Land is listed in Table 4-3, and its extent is shown on Figure 4-5.

Table 4-3 TECs within the Subject Land

TEC name	Profile ID (from TBDC)	Listing	Associated vegetation zones	Area within Subject Land (ha)
Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	20072	Endangered under the NSW BC Act	Zone 1 76_DG_poor Zone 2 76_DG_roadside – Broockmanns Rd Zone 3 76_DG_low Zone 5 76_DG_roadisde – Riverina Hwy	11.68 ha

4.4. Vegetation zones

Publicly available vegetation mapping, collection of rapid assessment points, and detailed floristic plots have been used to assist the delineation of vegetation zones. One PCT was identified in the Subject Land. The PCT was stratified into four vegetation zones representing a similar broad condition state. These zones were based on the understorey condition, vegetation integrity scores generated by the BAM-C, and observed land management practices. Additionally, one zone was classified as Exotic vegetation due to the low cover of native species as well as the heavy infestation of Bathurst Burr (*Xanthium spinosum*) (Figure 4-4). The following describes how each vegetation zone was delineated within the Subject Land:

- Poor condition: no canopy cover with a low diversity of understorey species and heavily grazed
- Low condition: no canopy cover with a low diversity of understorey species
- Roadside: no canopy cover with a low diversity of understorey species and high disturbance (split into two locations)
- Exotic: very low cover of native species and high cover of Bathurst Burr.

All vegetation zones within the Subject Land were considered one continuous patch of native vegetation due to the majority of vegetation within the Subject Land being determined a grassland. The roads and small areas mapped as non-native vegetation did not separate existing native vegetation by more than 30 m (for non-woody ecosystems). As such, the total patch occurring across the Subject Land and into native vegetation outside the Subject Land is 40.74 ha. A patch size class of 25-100 ha has been assigned to all vegetation zones.

The size of each of the vegetation zones and vegetation integrity plots undertaken is shown in Table 4-4.

Figure 4-5 Exotic vegetation in Vegetation Zone 4, captured on 06/08/2024

Table 4-4 Vegetation zones and patch sizes within the development footprint and subject land

Zone ID	PCT ID number and name	Condition/other defining feature	Area (ha) in Subject Land	Area (ha) in Development Footprint	Patch size class	No. vegetation integrity plots (required under the BAM)	No. vegetation integrity plots completed	No. vegetation integrity plots used in assessment	Plot IDs of vegetation integrity plots used in assessment
1	76 *Western Grey Box tall grassy woodland on alluvial loam and play soils in the NSW South Western Slopes and Riverina Bioregions*	Poor	4.29	3.55	☐ <5 ha ☐ 5–24 ha ☒ 25–100 ha ☐ >100 ha	2	2	2	BP01 BP06
2	76 *Western Grey Box tall grassy woodland on alluvial loam and play soils in the NSW South Western Slopes and Riverina Bioregions*	Roadside – Broockmanns Road	0.99	0.74	☐ <5 ha ☐ 5–24 ha ☒ 25–100 ha ☐ >100 ha	1	1	1	BP02
3	76 *Western Grey Box tall grassy woodland on alluvial loam and play soils in the NSW South Western Slopes and Riverina Bioregions*	Low	5.29	2.90	☐ <5 ha ☐ 5–24 ha ☒ 25–100 ha ☐ >100 ha	2	2	2	BP03 BP04
4	Exotic vegetation	Exotic	0.79	0.70	☐ <5 ha ☐ 5–24 ha ☒ 25–100 ha ☐ >100 ha	1	1	1	BP05

Zone ID	PCT ID number and name	Condition/other defining feature	Area (ha) in Subject Land	Area (ha) in Development Footprint	Patch size class	No. vegetation integrity plots (required under the BAM)	No. vegetation integrity plots completed	No. vegetation integrity plots used in assessment	Plot IDs of vegetation integrity plots used in assessment
5	76 *Western Grey Box tall grassy woodland on alluvial loam and play soils in the NSW South Western Slopes and Riverina Bioregions*	Roadside – Riverina Highway	1.11	1.11	☐ <5 ha ☐ 5–24 ha ☒ 25–100 ha ☐ >100 ha	1	2	2	BP07 BP08

4.5. Vegetation integrity (vegetation condition)

Vegetation integrity survey plots (VI plots)

A total of eight VI plots were undertaken following section 4.3.3 of the BAM 2020. This number of plots meets the plot requirements outlined in Table 3 of the BAM 2020. The results of the plot field data and photos of each plot can be found in Appendix D.

Scores

The plot data from the VI plots was entered into the BAM-C by an accredited assessor. The vegetation integrity score (VI score) for each of the vegetation zones are shown in Table 4-5.

The VI score of Zone 1 had a high structure score due to the prolific presence of *Vittadinia* germinating providing a high forb cover, despite being a heavily grazed paddock. The VI score of Zone 3 has a boosted function condition score by the presence of dead rye grass, forming high leaf litter cover. Zone 4 contained mostly juvenile as well as dead Bathurst Burr (*Xanthium spinosum*), which had been sprayed with herbicide prior to the VI plots surveys, however, the heavy infestation was noted during a previous site visit (Figure 4-4). The VI score in this zone was boosted by the presence of hay, acting as leaf litter.

The VI score of Zone 5 had a moderate to high structure score due to high percentage of perennial native grass cover; Yanganbil (*Austrostipa bigeniculata*), Curly Windmill Grass (*Enteropogon ramosus*) however had a low forb diversity. The low vegetation integrity score was due to the lack of canopy species

Table 4-5 Current vegetation integrity scores for each vegetation zone within the Subject Land

Vegetation zone ID	PCT/Zone	Composition condition score	Structure condition score	Function condition score	Vegetation Integrity Score	Hollow bearing trees present?
1	76_DG_poor	55.4	55.6	0.6	**14.6**	No
2	76_DG_Broockmanns Road	68.2	31.1	0	**12.8**	No
3	76_DG_low	73.1	9.1	14.9	**21.4**	No
4	Exotic	65.1	4.9	9.4	**14.4**	No
5	76_DG_Riverina Highway	56.4	64	0.4	**15.3**	No

Use of benchmark data

The vegetation integrity scores above were calculated against the default benchmark data provided in the BAM-C. The VI score for Zone 44 (exotic) was generated against PCT 76.

4.6. Planted Vegetation

Planted vegetation was observed outside but adjacent to the Subject Land, present along access tracks and farm buildings in the northern property. The planted vegetation would not be impacted by the proposal but was assessed for consideration of indirect impacts. This vegetation was observed to be a row of exotic Pepper Trees (*Schinus molle*) with a Diameter at Breast Height (DBH) range of 60 – 80cm (Figure 4-5) and a row of younger native Eucalypt species such as Yellow Box (*Eucalyptus melliodora*) with a DBH range of 10 – 30cm (Figure 4-6). There were no hollows present or any noticeable habitat features within the planted vegetation. The understory was exotic dominated and comprised of exotic grasses, annual weeds or bare ground. The planted vegetation would not be disturbed by the proposed development. Considering these factors, these areas are deemed as having low habitat value for threatened species.

Figure 4-6 Planted exotic vegetation East of the Subject Land

Figure 4-7 Planted native vegetation North of the Subject Land

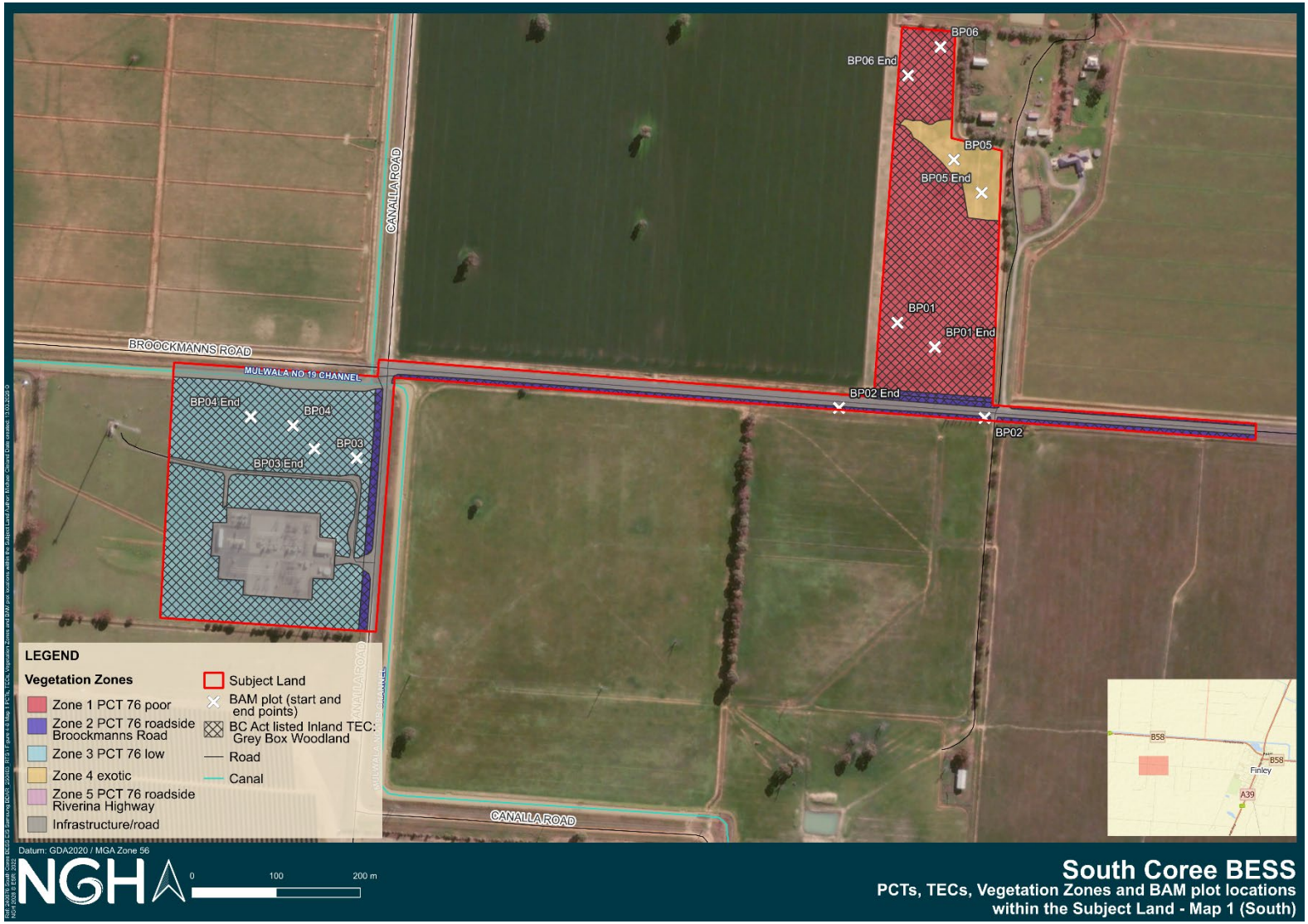


Figure 4-8 PCTs, TECs, Vegetation Zones and VI plots locations within the Subject Land – Map 1 (South)

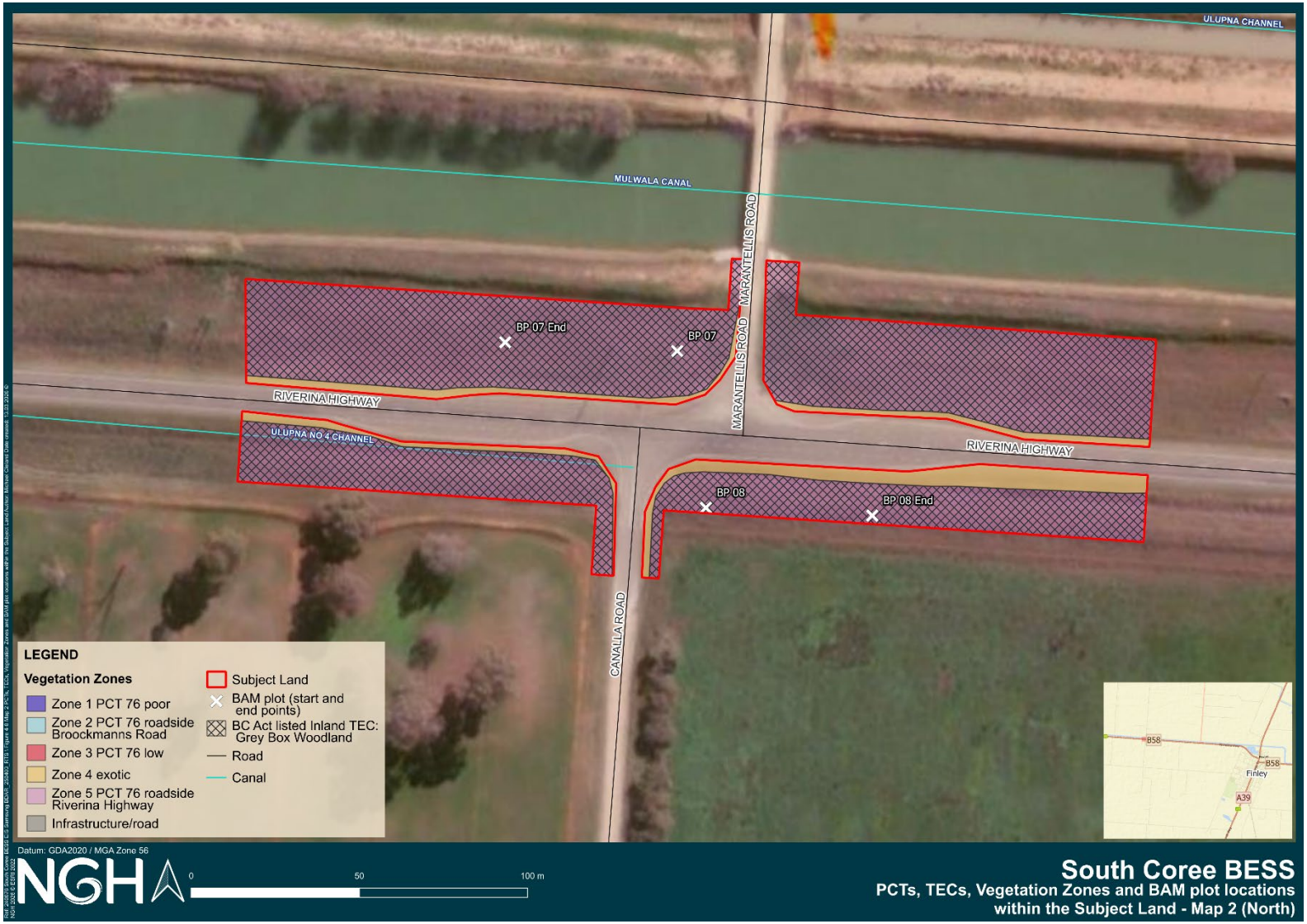


Figure 4-9 PCTs, TECs, Vegetation Zones and VI plots locations within the Subject Land – Map 2 (North)

5. Habitat suitability for threatened species

5.1. Identification of threatened species for assessment

5.1.1. Ecosystem credit species

The habitat in the Subject Land consists of derived grasslands. No woodlands or scattered trees occur in the Subject Land. Aquatic habitat recorded in or close to the Subject Land consists of a farm dam and irrigation channels.

The following ecosystem credit species were returned by the BAM calculator as being associated with the PCT present inside the development footprint (Table 5-1). These species were excluded or assumed to occur depending on geographic limitations, habitat constraints and the vagrancy of species. Four species were excluded based on the lack of suitable habitat within the Subject Land.

Additionally, the following species are not associated with PCT 76 but were potentially recorded on site through placement of Anabat detectors. These species have been added to the BAM-C as ecosystem species:

- Corben's Long-eared Bat (*Nyctophilus corbeni*)
- Yellow-bellied Sheathtail Bat (*Saccolaimus flaviventris*)

Ecosystem species excluded from BAM-C

The following species have been excluded from the BAM-C Ecosystem credit species:

- Brown Treecreeper (*Climacteris picumnus victoriae*)
- Grey-Crowned Babbler (eastern subspecies) (*Pomatostomus temporalis temporalis)*
- South-eastern Hooded Robin (*Melanodryas cucullata cucullata*)
- Swift Parrot (*Lathamus discolor*)

Confirmation from the BOS helpdesk was received on 14th May 2025 (Appendix F.1), confirming ecosystem species may be removed if habitat constraints are absent based on ecological information sourced from the Threatened Biodiversity Database Collection (TBDC) (DCCEEW, 2025) or threatened species profiles.

The following information was sourced from the TBDC (DCCEEW, 2025) in consideration of their habitats present within the Subject Land.

Brown Treecreeper is found in eucalypt woodlands and dry open forest. It is a sedentary species and considered to be resident in its locations throughout its range. It is dependent on hollows in standing dead or live trees and tree stumps (DCCEEW, 2025). The TBDC identifies Brown Treecreepers as occurring in degraded habitat only if within 100 metres of moderate to good condition vegetation of suitable type.

Grey Crowned Babbler inhabits open Box-Gum Woodlands and Box-cypress Pine Woodlands. Territories are generally one to fifty hectares in size. Birds are generally unable to cross large open areas, and paddock trees are important for this species to link remnant foraging habitat. Nests are built in shrubs, or young eucalypts (DCCEEW, 2025).

South-eastern Hooded Robin inhabits lightly wooded country, usually open eucalypt woodland, acacia scrub and mallee, often in or near clearings or open areas. It requires structurally diverse habitats featuring mature eucalypts, saplings, some small shrubs and a ground layer of moderately tall native grasses. Paddock trees can also be important for this species to link to remnant foraging habitat. Nests are built in tree forks or tree crevices (DCCEEW, 2025).

Swift Parrots do not breed in NSW, migrating to NSW between February and October. They occur in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations (DCCEEW, 2025)

These species have been excluded due to a lack of habitat within the Subject Land of the proposed development. No trees or shrubs are present within the Subject Land. No good condition vegetation were identified within 100m of the Subject Land. The surrounding locality is heavily cleared, and the species are unlikely to use the Subject Land for traversing between better quality habitat. As these particular species rely on tree species for foraging and/or breeding habitat, they have been removed from the Ecosystem credit species calculations as they would not be present within the Subject Land.

Table 5-1 Ecosystem credit species associated with the Project

Common Name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Associated PCT & veg zones	Vegetation zone ID species retained within, including PCT ID	Sensitivity to gain
		BC Act	EPBC Act							
Black Falcon	*Falco subniger*	V	Not listed	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	Included	Zone 1 PCT 76 Poor Zone 2 PCT 76 Roadside – Broockmanns Road Zone 3 PCT 76 Low Zone 5 PCT 76 Roadside – Riverina Highway	Zone 1 PCT 76 Poor Zone 2 PCT 76 Roadside – Broockmanns Road Zone 3 PCT 76 Low Zone 5 PCT 76 Roadside – Riverina Highway	Moderate
Brown Treecreeper (eastern subspecies)	*Climacteris picumnus victoriae*	V	V	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	Excluded – habitat constraints. No trees, low overall native vegetation cover	None	None	High
Corben's Long-eared Bat	*Nyctophilus corbeni*	V	V	No	☐ BAM-C ☐ TBDC ☐ Previous survey ☒ Current survey	Yes	Included	Zone 1 PCT 76 Poor Zone 2 PCT 76 Roadside – Broockmanns Road Zone 3 PCT 76 Low	Zone 1 PCT 76 Poor Zone 2 PCT 76 Roadside – Broockmanns Road Zone 3 PCT 76 Low	High

Common Name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Associated PCT & veg zones	Vegetation zone ID species retained within, including PCT ID	Sensitivity to gain
		BC Act	EPBC Act							
								Zone 5 PCT 76 Roadside – Riverina Highway	Zone 5 PCT 76 Roadside – Riverina Highway	
Diamond Firetail	*Stagonopleura guttata*	V	V	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	Included	Zone 1 PCT 76 Poor Zone 2 PCT 76 Roadside – Broockmanns Road Zone 3 PCT 76 Low Zone 5 PCT 76 Roadside – Riverina Highway	Zone 1 PCT 76 Poor Zone 2 PCT 76 Roadside – Broockmanns Road Zone 3 PCT 76 Low Zone 5 PCT 76 Roadside – Riverina Highway	Moderate
Dusky Woodswallow	*Artamus cyanopterus cyanopterus*	V	Not listed	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	Included	Zone 1 PCT 76 Poor Zone 2 PCT 76 Roadside – Broockmanns Road Zone 3 PCT 76 Low Zone 5 PCT 76 Roadside – Riverina Highway	Zone 1 PCT 76 Poor Zone 2 PCT 76 Roadside – Broockmanns Road Zone 3 PCT 76 Low Zone 5 PCT 76 Roadside – Riverina Highway	Moderate
Flame Robin	*Petroica phoenicea*	V	Not listed	No	☒ BAM-C ☐ TBDC	Yes	Included	Zone 1 PCT 76 Poor	Zone 1 PCT 76 Poor	Moderate

Common Name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Associated PCT & veg zones	Vegetation zone ID species retained within, including PCT ID	Sensitivity to gain
		BC Act	EPBC Act							
					☐ Previous survey ☐ Current survey			Zone 2 PCT 76 Roadside – Broockmanns Road Zone 3 PCT 76 Low Zone 5 PCT 76 Roadside – Riverina Highway	Zone 2 PCT 76 Roadside – Broockmanns Road Zone 3 PCT 76 Low Zone 5 PCT 76 Roadside – Riverina Highway	
Grey Falcon	*Falco hypoleucos*	V	V	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	Included	Zone 1 PCT 76 Poor Zone 2 PCT 76 Roadside – Broockmanns Road Zone 3 PCT 76 Low Zone 5 PCT 76 Roadside – Riverina Highway	Zone 1 PCT 76 Poor Zone 2 PCT 76 Roadside – Broockmanns Road Zone 3 PCT 76 Low Zone 5 PCT 76 Roadside – Riverina Highway	Moderate
Grey-crowned Babbler (eastern subspecies)	*Pomatostomus temporalis temporalis*	V	Not listed	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	Excluded - habitat constraints. No trees, low overall native vegetation cover	None	None	Moderate

Common Name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Associated PCT & veg zones	Vegetation zone ID species retained within, including PCT ID	Sensitivity to gain
		BC Act	EPBC Act							
Pink Cockatoo	*Lophochroa leadbeateri*	V	E	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	Included	Zone 1 PCT 76 Poor Zone 2 PCT 76 Roadside – Broockmanns Road Zone 3 PCT 76 Low Zone 5 PCT 76 Roadside – Riverina Highway	Zone 1 PCT 76 Poor Zone 2 PCT 76 Roadside – Broockmanns Road Zone 3 PCT 76 Low Zone 5 PCT 76 Roadside – Riverina Highway	Moderate
Scarlet Robin	*Petroica boodang*	V	Not listed	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	Included	Zone 1 PCT 76 Poor Zone 2 PCT 76 Roadside – Broockmanns Road Zone 3 PCT 76 Low Zone 5 PCT 76 Roadside – Riverina Highway	Zone 1 PCT 76 Poor Zone 2 PCT 76 Roadside – Broockmanns Road Zone 3 PCT 76 Low Zone 5 PCT 76 Roadside – Riverina Highway	Moderate
South-eastern Hooded Robin	*Melanodryas cucullata cucullata*	E	E	No	☒ BAM-C ☐ TBDC ☐ Previous survey	Yes	Excluded – habitat constraints. No trees, low overall native vegetation cover	None	None	Moderate

Common Name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Associated PCT & veg zones	Vegetation zone ID species retained within, including PCT ID	Sensitivity to gain
		BC Act	EPBC Act							
					☐ Current survey					
Speckled Warbler	*Pyrrholaemus sagittatus*	V	Not listed	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	Included	Zone 1 PCT 76 Poor Zone 2 PCT 76 Roadside – Broockmanns Road Zone 3 PCT 76 Low Zone 5 PCT 76 Roadside – Riverina Highway	Zone 1 PCT 76 Poor Zone 2 PCT 76 Roadside – Broockmanns Road Zone 3 PCT 76 Low Zone 5 PCT 76 Roadside – Riverina Highway	High
Superb Parrot	*Polytelis swainsonii*	V	V	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	Included	Zone 1 PCT 76 Poor Zone 2 PCT 76 Roadside – Broockmanns Road Zone 3 PCT 76 Low Zone 5 PCT 76 Roadside – Riverina Highway	Zone 1 PCT 76 Poor Zone 2 PCT 76 Roadside – Broockmanns Road Zone 3 PCT 76 Low Zone 5 PCT 76 Roadside – Riverina Highway	Moderate
Swift Parrot	*Lathamus discolor*	E	CE	Yes	☒ BAM-C ☐ TBDC	Yes	Excluded – habitat constraints. No trees, low	None	None	Moderate

Common Name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Associated PCT & veg zones	Vegetation zone ID species retained within, including PCT ID	Sensitivity to gain
		BC Act	EPBC Act							
					☐ Previous survey ☐ Current survey		overall native vegetation cover			
White-bellied Sea Eagle	*Haliaeetus leucogaster*	V	Not listed	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	Included	Zone 1 PCT 76 Poor Zone 2 PCT 76 Roadside – Broockmanns Road Zone 3 PCT 76 Low Zone 5 PCT 76 Roadside – Riverina Highway	Zone 1 PCT 76 Poor Zone 2 PCT 76 Roadside – Broockmanns Road Zone 3 PCT 76 Low Zone 5 PCT 76 Roadside – Riverina Highway	High
White-throated Needletail	*Hirundapus caudacutus*	V	V	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	Included	Zone 1 PCT 76 Poor Zone 2 PCT 76 Roadside – Broockmanns Road Zone 3 PCT 76 Low Zone 5 PCT 76 Roadside – Riverina Highway	Zone 1 PCT 76 Poor Zone 2 PCT 76 Roadside – Broockmanns Road Zone 3 PCT 76 Low Zone 5 PCT 76 Roadside – Riverina Highway	High

Common Name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Associated PCT & veg zones	Vegetation zone ID species retained within, including PCT ID	Sensitivity to gain
		BC Act	EPBC Act							
Yellow-bellied Sheathtail-bat	*Saccolaimus flaviventris*	V	Not listed	No	BAM-C ☐ TBDC ☐ Previous survey Current survey	Yes	Included	Zone 1 PCT 76 Poor Zone 2 PCT 76 Roadside – Broockmanns Road Zone 3 PCT 76 Low	Zone 1 PCT 76 Poor Zone 2 PCT 76 Roadside – Broockmanns Road Zone 3 PCT 76 Low	High

5.1.2. Species credit species

Table 5-2 (flora) and Table 5-3 (fauna) list candidate flora and fauna species identified in the BAM-C as being associated with the PCT present within the Development Footprint and requiring targeted survey. An assessment was undertaken to determine if habitat constraints were present and candidate species could be excluded from targeted surveys.

Table 5-2 Candidate flora species identified in BAM-C

Common name	Scientific name	Listing status		Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act				
A spear-grass	*Austrostipa wakoolica*	E	E	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	Included	Zone 1 PCT 76 Poor Zone 2 PCT 76 Roadside – Broockmanns Road Zone 3 PCT 76 Low Zone 5 PCT 76 Roadside – Riverina Highway
Silky Swainson-pea	*Swainsona sericea*	V	Not listed	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	Included	Zone 1 PCT 76 Poor Zone 2 PCT 76 Roadside – Broockmanns Road Zone 3 PCT 76 Low Zone 5 PCT 76 Roadside – Riverina Highway
Slender Darling Pea	*Swainsona murrayana*	V	V	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	Included	Zone 1 PCT 76 Poor Zone 2 PCT 76 Roadside – Broockmanns Road Zone 3 PCT 76 Low

Table 5-3 Candidate fauna species identified in BAM-C and included/excluded from assessment

Common name	Scientific name	Listing status		Dual Credit Species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act					
Barking Owl	*Ninox connivens*	V	Not listed	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No	Habitat constraints: no living, dead or hollow-bearing trees	N/A – species excluded from further assessment
Brush-tailed Phascogale	*Phascogale tapoatafa*	V	Not listed	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No	Habitat constraints. No living, dead or hollow-bearing trees. No canopy cover or shrubs for foraging.	N/A – species excluded from further assessment
Bush Stone-curlew	*Burhinus grallarius*	E	Not listed	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No	Habitat constraints: no falling/standing dead timber or logs	N/A – species excluded from further assessment
Koala	*Phascolarctos cinereus*	E	E	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No	Habitat constraints: no koala use trees	N/A – species excluded from further assessment
Little Eagle	*Hieraaetus morphnoides*	V	Not listed	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No	Habitat constraints: no nest trees	N/A – species excluded from further assessment

Common name	Scientific name	Listing status		Dual Credit Species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act					
Masked Owl	*Tyto novaehollandiae*	V	Not listed	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No	Habitat constraints: no living, dead or hollow-bearing trees	N/A – species excluded from further assessment
Pink Cockatoo	*Lophochroa leadbeateri*	V	E	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No	Habitat constraints: no living, dead or hollow-bearing trees	N/A – species excluded from further assessment
Sloane's Froglet	*Crinia sloanei*	E	E	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	Included – Waterbodies present and waterbodies (farm dam) within 500m of Subject Land.	Zone 1 PCT 76 Poor Zone 2 PCT 76 Roadside – Broockmanns Road Zone 3 PCT 76 Low Zone 5 PCT 76 Roadside – Riverina Highway
Southern Myotis	*Myotis macropus*	V	Not listed	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	Included – Waterbodies greater than 3m wide present	Zone 1 PCT 76 Poor Zone 2 PCT 76 Roadside – Broockmanns Road Zone 3 PCT 76 Low Zone 5 PCT 76 Roadside – Riverina Highway

Common name	Scientific name	Listing status		Dual Credit Species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act					
Square-tailed Kite	*Lophoictinia isura*	V	Not listed	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No	Habitat constraints: no nest trees	N/A – species excluded from further assessment
Squirrel Glider	*Petaurus norfolcensis*	V	Not listed	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No	Habitat constraints. No living, dead or hollow-bearing trees. No canopy cover or shrubs for foraging.	N/A – species excluded from further assessment
Superb Parrot	*Polytelis swainsonii*	V	V	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No	Habitat constraints: no living, dead or hollow-bearing trees	N/A – species excluded from further assessment
Swift Parrot	*Lathamus discolor*	E	CE	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No	Habitat constraints: Subject Land not within Important Habitat Map	N/A – species excluded from further assessment
White-bellied Sea-Eagle	*Haliaeetus leucogaster*	V	Not listed	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No	Habitat constraints: No living or dead mature trees	N/A – species excluded from further assessment

5.2. Presence of candidate species credit species

Table 5-4 and Table 5-5 show the method used to determine presence or absence of candidate flora and fauna species (respectively), whether the species were recorded in the Subject Land, and whether the species qualify as a candidate species credit species.

Table 5-4 Determining the presence of candidate flora species credit species on the Subject Land

Common name	Scientific name	Associated zones	Listing status		Method used to determine presence	Present?	Further assessment required? (BAM Subsections 5.2.5 and 5.2.6)
			BC Act	EPBC Act			
A spear-grass	*Austrostipa wakoolica*	Zone 1 PCT 76 Poor Zone 2 PCT 76 Roadside – Broockmanns Road Zone 3 PCT 76 Low	E	E	Targeted threatened species survey	Assumed present (in part of Zone 2 and Zone 3)	No
		Zone 5 PCT 76 Roadside – Riverina Highway			Assumed present	Assumed present	Yes
Silky Swainson-pea	*Swainsona sericea*	Zone 1 PCT 76 Poor Zone 2 PCT 76 Roadside – Broockmanns Road Zone 3 PCT 76 Low	V	Not listed	Targeted threatened species survey	No	No
		Zone 5 PCT 76 Roadside – Riverina Highway			Assumed present	Assumed present	Yes

Common name	Scientific name	Associated zones	Listing status		Method used to determine presence	Present?	Further assessment required? (BAM Subsections 5.2.5 and 5.2.6)
			BC Act	EPBC Act			
Slender Darling Pea	*Swainsona murrayana*	Zone 1 PCT 76 Poor Zone 2 PCT 76 Roadside – Broockmanns Road Zone 3 PCT 76 Low	V	V	Targeted threatened species survey	No	No
		Zone 5 PCT 76 Roadside – Riverina Highway			Assumed present	Assumed present	Yes

Table 5-5 Determining the presence of candidate fauna species credit species on the Subject Land

Common name	Scientific name	Associated zones	Listing status		Method used to determine presence	Present?	Further assessment required? (BAM Subsections 5.2.5 and 5.2.6)
			BC Act	EPBC Act			
Sloane's Froglet	*Crinia sloanei*	Zone 1 PCT 76 Poor Zone 2 PCT 76 Roadside – Broockmanns Road Zone 3 PCT 76 Low	E	E	Targeted threatened species survey	No	No
		Zone 5 PCT 76 Roadside – Riverina Highway	E	E	Assumed present	Assumed present	Yes
Southern Myotis	*Myotis macropus*	Zone 1 PCT 76 Poor Zone 2 PCT 76 Roadside – Broockmanns Road Zone 3 PCT 76 Low	V	Not listed	Targeted threatened species survey	Yes	Yes
		Zone 5 PCT 76 Roadside – Riverina Highway	V	Not listed	Assumed present	Assumed present	Yes

5.3. Threatened species surveys

5.3.1. Threatened Flora

The following guidelines and notes were followed for the threatened flora surveys (Table 5-6):

- NSW Government DPIE Surveying threatened plants and their habitats (DPIE, 2020)
- NSW BioNet Threatened Biodiversity Profile Data Collection (OEH, 2025)

As stated in section 2.3, parallel field traverses were undertaken at 10 m distances across the Subject Land during the recommended survey periods, in habitat where the targeted species may occur for;

- *Austrostipa wakoolica*
- Silky Swainson-pea
- Slender Darling Pea.

No threatened flora were detected during the targeted flora surveys.

Surveys were not undertaken for the above species within Zone 5 (PCT 76 Roadside – Riverina Highway) as this area was added to the development footprint after the spring survey period. Species have been assumed present in this area.

Table 5-6 details the threatened survey methodology, timing and effort for threatened flora surveys. Targeted surveys were undertaken in the vegetation zones with suitable habitat for the species, as per Table 5-2.

Table 5-6 Threatened species surveys for candidate flora species credit species on the subject land

Common name	Scientific name	Threatened flora species surveys				Present?	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)
		Survey method	Timing of survey – within recommended period? (BAM-C / TBDC)		Effort (hours & no. people)		
Flora							
Spear Grass	*Austropstipa wakoolica*	Parallel walking transects 10 m apart	☒ Yes 19/11/2024	☐ No	One person per transect, 4.75 h total survey effort per person, 8.4 km total transect distance. Surveys for this species have not been undertaken within the southern section of Zone 3 PCT 76 Low and all of Zone 5 PCT 76 Roadside – Riverina Highway.	Assumed Present (Zone 2, 3 & 5)	Yes
Silky Swainson-pea	*Swainsona sericea*	Parallel walking transects 10 m apart	☒ Yes 30/09/24	☐ No	One person per transect, 5.5 h total survey effort per person, 11.6 km total transect distance. Surveys for this species have not been undertaken within Zone 5 PCT 76 Roadside – Riverina Highway.	Assumed Present (Zone 5)	Yes

Common name	Scientific name	Threatened flora species surveys				Present?	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)
		Survey method	Timing of survey – within recommended period? (BAM-C / TBDC)		Effort (hours & no. people)		
Slender Darling Pea	*Swainsona murrayana*	Parallel walking transects 10 m apart	☒ Yes 30/09/24	☐ No	One person per transect, 5.5 h total survey effort per person, 11.6 km total transect distance. Surveys for this species have not been undertaken within Zone 5 PCT 76 Roadside – Riverina Highway.	Assumed Present (Zone 5)	Yes

5.3.2. Threatened Fauna

The following guidelines and notes were followed for the threatened fauna surveys (Table 5-7):

- NSW Government DPIE 'Species credit' threatened bats and their habitats (DPIE, 2021)
- NSW BioNet Threatened Biodiversity Profile Data Collection (OEH, 2025)
- NSW Government Survey Guide for Threatened Frogs (DPI, 2020) – for July/August 2025 surveys

Targeted surveys were undertaken in associated habitat as per Table 5-3 for;

- Sloane's Froglet
- Southern Myotis

A summary of the targeted fauna surveys is given in Table 5-7.

Sloane's Froglet

The suitable habitat present on site included slow flowing irrigation channels, with predominantly exotic grasses fringing aquatic areas. One farm dam also provided potential habitat. This dam was highly disturbed by ducks and geese and polluted by their excrement, reducing the water quality. Part of the dam was vegetated with Cumbungi providing some dense vegetative cover.

No Sloane's froglet were observed visually or aurally across the four survey efforts. Two common species; the Eastern sign-bearing froglet (*Crinia parinsignifera*) and the Spotted Marsh Frog (*Limnodynastes tasmanianiensis*) were both detected in sparse numbers. Eastern Sign-bearing froglet was heard from a distance at the irrigation channels and the farm dam, on different nights. Spotted Marsh Frog (SMF) was seen visually as a few individuals on the banks of the irrigation channels, usually in more open areas. Distant calls also confirmed SMF presence within the channel. SMF was also observed aurally at the farm dam.

The Frog ID app was used on several attempts to analyse call recordings for species confirmation. On each occasion the calls were too faint to be picked up by the app and could not be analysed.

Eastern Sign-bearing froglet (ESBF) and Sloane's froglet have similar calls. ESBF has a more drawn out and higher-pitched call in comparison to Sloane's froglet. ESBF also has fewer intervals of calls in its call sequence. In comparison Sloane's froglet can have a long call sequence. The call sequences heard during the targeted surveys matched ESBF calls.

No targeted surveys for Sloane's Froglet were undertaken at Mulwala Canal along the Riverina Highway due to a change in footprint and the species has been assumed present in this location.

Spotted Marsh Frog (*Limnodynastes tasmaniensis*) and Eastern Sign-bearing froglet (*Crinia parinsignifera*) are not threatened under the BC Act or EPBC Act, and do not require further assessment. A full description of the field survey results is provided in Appendix D.3.

Southern Myotis

Southern Myotis was detected within the call analysis of the ANABAT detector. The ANABAT analysis identified ten microbat species as being present within the Subject Land and a further five species to be potentially present. Three of these species, are listed as Vulnerable under the BC Act; Southern Myotis (*Myotis macropus*), Corben's Long-eared Bat (*Nyctophilus corbeni*) and Yellow-bellied Sheath-tailed Bat (*Saccolaimus flaviventris*). Corben's Long-eared Bat could only be confirmed as potentially present based on it call overlap with other microbat species. Full results of the ANABAT analysis are provided in Appendix D.4

Table 5-7 Threatened species surveys for candidate fauna species credit species on the subject land

Common name	Scientific name	Threatened fauna species surveys				Present	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)
		Survey method	Timing of survey – within recommended period? (BAM-C / TBDC)		Effort (hours & no. people)		
Fauna							
Sloane's Froglet	*Crinia sloanei*	Aural visual surveys and call playback	☒ Yes August 2025	☐ No	Two ecologists, approximately 650 m of habitat surveyed, over four survey efforts (three nocturnal, one diurnal), 3 hours per survey effort. Surveys for this species have not been undertaken within Zone 5 PCT 76 Roadside – Riverina Highway.	Assumed present	No
Southern Myotis	*Myotis macropus*	Passive acoustic detection	☒ Yes December 2024	☐ No	One Anabat recorder x1 night at irrigation channel (card reader failed), one Anabat recorder x6 nights at farm dam = 7 survey nights. Surveys for this species have not been undertaken within Zone 5 PCT 76 Roadside – Riverina Highway.	Yes Recorded at both Anabats (refer to Appendix D.3)	No

5.4. Expert reports

No expert reports were sought.

5.5. Use of more appropriate local data

Not applicable.

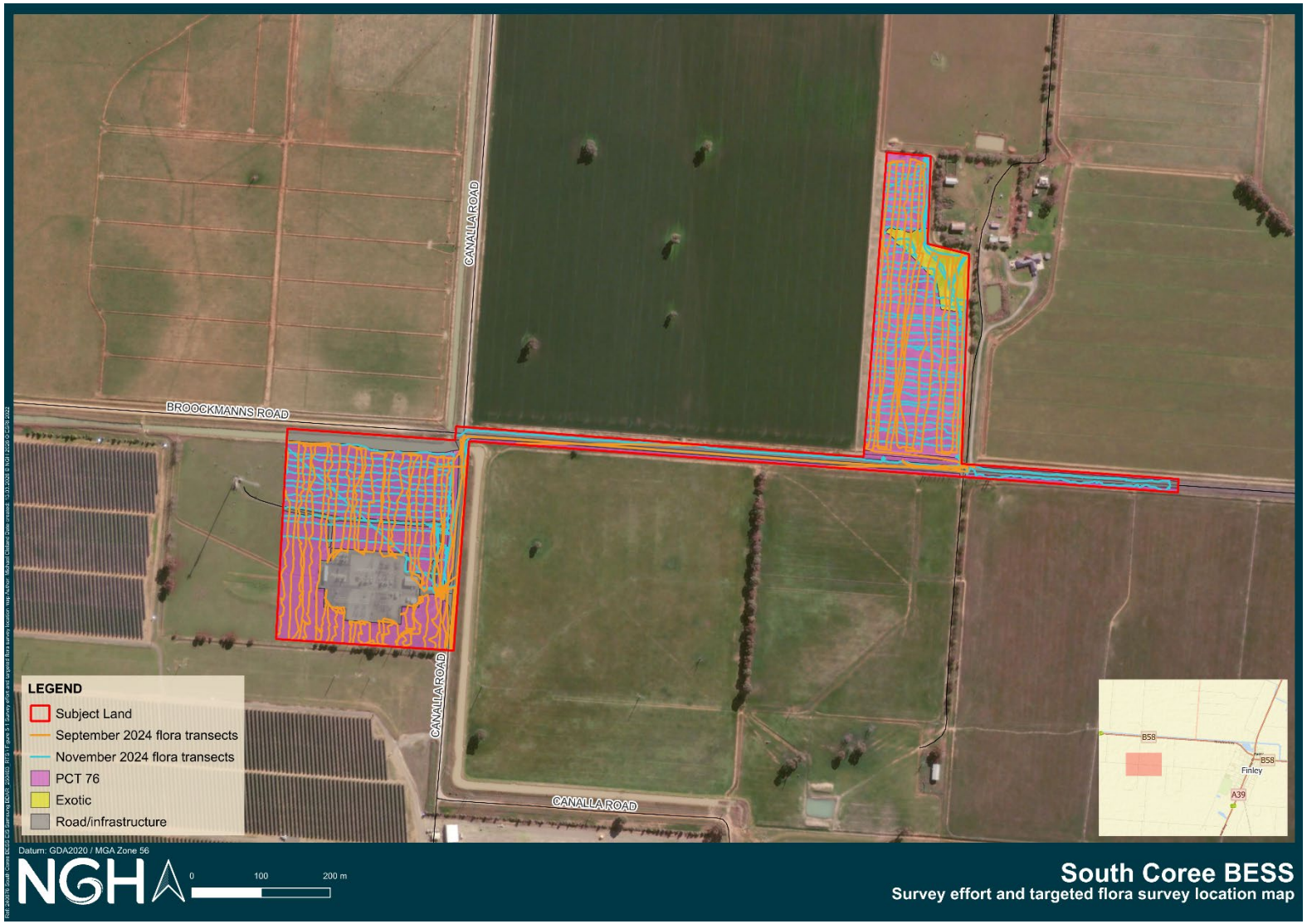


Figure 5-1 Survey effort and targeted flora survey location map

Figure 5-2 Survey effort and targeted fauna survey location map

5.5.1. Area and location of suitable habitat for a species credit species (a species polygon)

One species credit species was determined to be present on the Subject Land; Southern Myotis (*Myotis macropus*).

Four other species (*Austrostipa wakoolica*, Sloane's froglet, Silky Swainson-pea and Slender Darling Pea) have been assumed present in Zone 5 and part of Zone 3 due to a change of development footprint in February 2025.

Species polygons for these species have been prepared as follows (a summary of information is provided in Table 5-8 below).

Southern Myotis

Species polygons were created in accordance with the guidance in the document - "*Species credit' threatened bats and their habitats – NSW Guide for the Biodiversity Assessment Method*" (DPIE, 2021) and the TBDC (OEH, 2025). Southern Myotis (*Myotis macropus*) is a fauna species assessed by area.

Positive identification of calls was recorded at both Anabat locations at the irrigation channel and farm dam. Aerial imagery was used to map the high bank mark of these waterbodies within 200m of the Subject Land. A 200m buffer was created around these waterbodies.

Associated PCTS, listed in the TBDC, and occurring in the Subject Land are PCT 76. Southern Myotis forage over waterbodies and are associated with most habitat types near water. They are usually found in areas that are vegetated rather than cleared (Churchill, 2008). Areas of poor condition PCT 76 and exotic areas (Zone 1 and Zone 4) were considered too degraded to support habitat for Southern Myotis. These areas had a VI score of less than 15. Following the VI plot surveys, these areas were more intensively grazed, and vegetation structure was significantly degraded (Figure 5-2).

Figure 5-3 Areas (Zone 1 and Zone 4) considered too degraded for Southern Myotis habitat

Remaining areas of PCT 76 (Zone 2, Zone 3 and Zone 5) were retained as suitable habitat for Southern Myotis. Although these areas were also in low condition, they contained some suitable foraging habitat in their grassland vegetation structure and proximity to irrigation channels.

Areas of Zone 2, Zone 3 and Zone 5 that that intersect with the 200m buffers of the waterbodies were selected as the species polygon. The species polygon was clipped to the development footprint. Southern Myotis species polygon is presented in Figure 5-3.

Sloane's Froglet

Species polygons were created in accordance with the guidance in the NSW Survey Guide for Threatened Frogs (DPI, 2020) and TBDC (OEH, 2025). The species polygon boundary should align with aquatic habitats linked directly to the record and a buffer, incorporating the PCTs with which the species is associated, of 100 metres radius from the top of bank. Where relevant the buffer should also include minimum 50-metre-wide corridors of native or non-native vegetated areas linking the available waterbodies. Sloane's froglet (*Crinia sloanei*) are flora species assessed by area. Due to a change in the development footprint, this species has been assumed present in Zone 5, as targeted surveys were not completed within suitable habitat, within the additional area (within the road intersection at Riverina Highway and Canalla Road).

Austrostipa wakoolica

Species polygons were created in accordance with the guidance in the TBDC (OEH, 2025). The species polygon is to be drawn to encompass contiguous vegetation zones in which the species has association with a given PCT (PCT 76). A spear-grass (*Austrostipa wakoolica*) is a flora species assessed by area. Due to a change in the development footprint, this species has been assumed present in Zone 5 and part of Zone 2 and 3, as targeted surveys were not completed in the additional areas (south of Finley Substation and within the road intersection at Riverina Highway and Canalla Road).

Slender Darling Pea and Silky Swainson-pea

Species polygons were created in accordance with the guidance in the TBDC (OEH, 2025). The species polygon is to be drawn to encompass contiguous vegetation zones in which the species has association with a given PCT (PCT 76). Slender Darling Pea (*Swainsona murrayana*) and Silky Swainson-pea (*Swainsona sericea*) are flora species assessed by area. Due to a change in the development footprint, these species have been assumed present in Zone 5, as targeted surveys were not completed in the additional area (within the road intersection at Riverina Highway and Canalla Road).

Table 5-8 Results for present species (recorded or assumed present within the subject land)

Common name	Scientific name	Biodiversity risk weighting	SAII entity	Habitat constraints present on the Subject Land	Abundance	Extent (ha) of suitable habitat present in Subject Land	TBDC species specific recommendations	Habitat condition
Southern Myotis	*Myotis macropus*	High (2)	No	Waterbodies greater than 3m in width: farm dam and irrigation channel	Unknown	11.82	200 m buffer on waterbodies	Zone 2 VI = 12.8 Zone 3 VI = 21.4 Zone 5 VI = 15.3
A spear-grass	*Austrostipa wakoolica*	High (2)	No	Low condition derived grassland	Assumed present	2.21	Vegetation zones with suitable habitat	Zone 2 VI = 12.8 Zone 3 VI = 21.4 Zone 5 VI = 15.3
Silky Swainson-pea	*Swainsona sericea*	High (2)	No	Low condition derived grassland	Assumed present	1.11	Vegetation zones with suitable habitat	Zone 5 VI = 15.3

Common name	Scientific name	Biodiversity risk weighting	SAII entity	Habitat constraints present on the Subject Land	Abundance	Extent (ha) of suitable habitat present in Subject Land	TBDC species specific recommendations	Habitat condition
Slender Darling Pea	*Swainsona murrayana*	High (2)	No	Low condition derived grassland	Assumed present	1.11	Vegetation zones with suitable habitat	Zone 5 VI = 15.3
Sloane's froglet	*Crinia sloanei*	Very high (3)	Yes	Waterbodies greater than 3m in width: farm dam and irrigation channel	Assumed present	1.11	100 m buffer of suitable aquatic habitat	Zone 5 VI = 15.3

Figure 5-4 Species credit species recorded within Subject Land and associated species polygon - Map 1 (south)

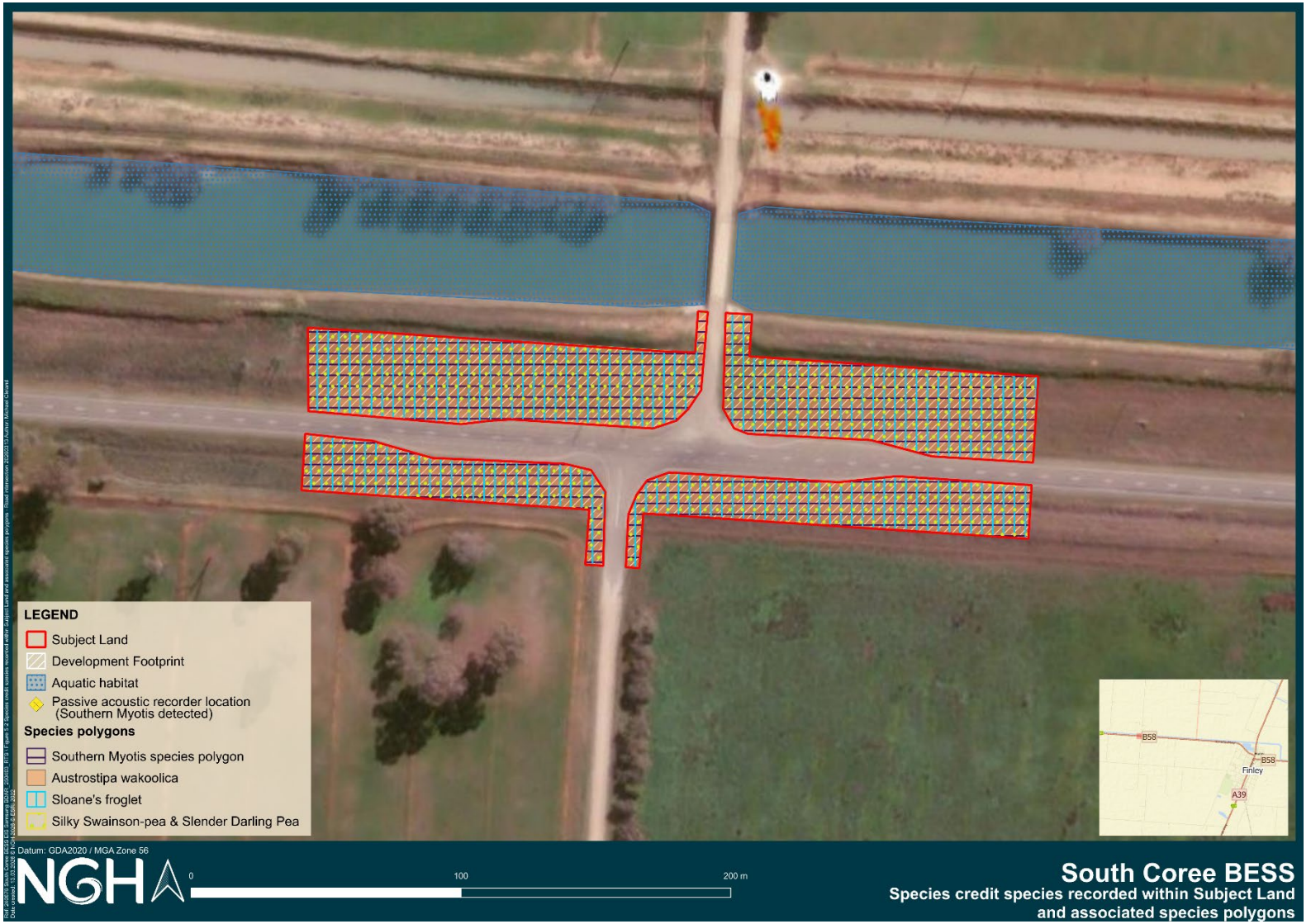


Figure 5-5 Species credit species recorded within Subject Land and associated species polygons – Map 2 (north)

6. Identifying prescribed biodiversity impacts

The following prescribed impacts have been identified within the Subject Land (Table 6-1). Threatened entities listed that use the habitats were identified from Bionet and PMST searches, the BAM-C and targeted survey results. A summary of the potential impacts to each of the threatened species is given in Table 6-2 and a map of these locations is shown in Figure 6-2.

Table 6-1 Prescribed impacts identified

Feature	Present	Description of feature characteristics and location	Threatened entities that use, are likely to use, or are part of the habitat feature.
Karst, caves, crevices, cliffs, rocks or other geological features of significance	☐Yes / ☒ No	No karst, caves, crevices, cliffs, rock or other geological features of significance inside the subject land.	N/A
Human-made structures	☒Yes / ☐ No	Human-made structures were located inside the subject land and consist of Finley substation, and a small brick building near the substation. Following a site investigation and analysis, it was concluded these areas were not suitable for threatened microbats. The substation infrastructure would not allow roosting because of the high voltage, and the brick building was too intact to provide suitable roosting habitat (Figure 6-1).	N/A
Non-native vegetation	☒Yes / ☐ No	There is 0.69 ha of non-native vegetation located within the subject land being Vegetation zone 4. This highly degraded zone is heavily disturbed and intensely grazed and unlikely to support threatened species.	N/A

Feature	Present	Description of feature characteristics and location	Threatened entities that use, are likely to use, or are part of the habitat feature.
Habitat connectivity	☒Yes / ☒ No	The proposed works have the potential to impact on connectivity for threatened species that would utilise grassland areas for traversing across landscapes. Movement of both terrestrial and aerial species is unlikely to be substantially impeded by the proposal given that the habitat removed is a small patch of paddock grassland in the landscape and is highly degraded	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions.
Waterbodies, water quality and hydrological processes	☒Yes / ☐ No	Waterbodies impacted indirectly consist of one dam and two irrigation channels. Waterbodies can be seen on Figure 3-1. No aquatic vegetation was observed onsite in any of the impacted waterbodies. A site inspection found all waterbodies contain pools but were not flowing. All waterbodies are used for agriculture (grazing animals or irrigation).	Threatened species that may use the waterbodies for foraging or drinking include: Southern Myotis (*Myotis macropus*) Yellow-bellied Sheathtail Bat (*Saccolaimus flaviventris*) Corben's Long-eared Bat (*Nyctophilus corbeni*) Black Falcon (*Falco subniger*) Diamond Firetail (*Stagonopleura guttata*) Dusky Woodswallow (*Artamus cyanopterus cyanopterus*) Flame Robin (*Petroica phoenicea*) Grey Falcon (*Falco hypoleucos*) Grey-crowned Babbler (eastern subspecies) (*Pomatostomus temporalis temporalis*) Pink Cockatoo (*Lophochroa leadbeateri*) Scarlet Robin (*Petroica boodang*) Speckled Warbler (*Pyrrholaemus sagittatus*)

Feature	Present	Description of feature characteristics and location	Threatened entities that use, are likely to use, or are part of the habitat feature.
			Superb Parrot (*Polytelis swainsonii*) White-bellied Sea-eagle (*Haliaeetus leucogaster*) White-throated Needletail (*Hirundapus caudacutus*)
Wind turbine strikes (wind farm development only)	☐Yes / ☒ No	Example text: No wind turbines proposed within Subject Land.	N/A
Vehicle strikes	☒Yes / ☐ No	The proposed activity will cause an increase in traffic movements during the assessment and construction phase of the project.	Species which may utilise the Subject Land for foraging, and traverse over Broockmanns road, Canalla road or Riverina Highway include: • Black Falcon (*Falco subniger*) • Diamond Firetail (*Stagonopleura guttata*) • Dusky Woodswallow (*Artamus cyanopterus cyanopterus*) • Flame Robin (*Petroica phoenicea*) • Grey Falcon (*Falco hypoleucos*) • Grey-crowned Babbler (eastern subspecies) (*Pomatostomus temporalis temporalis*) • Pink Cockatoo (*Lophochroa leadbeateri*) • Scarlet Robin (*Petroica boodang*) • Speckled Warbler (*Pyrrholaemus sagittatus*) • Superb Parrot (*Polytelis swainsonii*) • White-bellied Sea-eagle (*Haliaeetus leucogaster*) • White-throated Needletail (*Hirundapus caudacutus*)

Table 6-2 Prescribed impacts identified for proposed development

Threatened entity at risk of prescribed impact	Source of prescribed impact generation	Prescribed impact	Habitat importance
Aerial species			
Black Falcon (*Falco subniger*)	May utilise Subject Land for foraging.	Waterbodies Vehicle strikes	Dams and creeks within the Subject Land likely provide a water source for aerial species. Aquatic and larval invertebrates also likely provide a food source for aerial species. Increased vehicle traffic during construction will likely increase the chance of vehicle strikes within the Subject Land, however aerial species are at less risk of vehicle strikes than other ground dwelling species.
Diamond Firetail (*Stagonopleura guttata*)	May utilise Subject Land for foraging.		
Dusky Woodswallow (*Artamus cyanopterus cyanopterus*)	May utilise Subject Land for foraging.		
Flame Robin (*Petroica phoenicea*)	May utilise Subject Land for foraging.		
Grey Falcon (*Falco hypoleucos*)	May utilise Subject Land for foraging.		
Grey-crowned Babbler (eastern subspecies) (*Pomatostomus temporalis temporalis*)	May utilise Subject Land for foraging.		
Pink Cockatoo (*Lophochroa leadbeateri*)	May utilise Subject Land for foraging.		
Scarlet Robin (*Petroica boodang*)	May utilise Subject Land for foraging.		
Speckled Warbler (*Pyrrholaemus sagittatus*)	May utilise Subject Land for foraging.		
Superb Parrot (*Polytelis swainsonii*)	May utilise Subject Land for foraging.		

Threatened entity at risk of prescribed impact	Source of prescribed impact generation	Prescribed impact	Habitat importance
White-bellied Sea-eagle (*Haliaeetus leucogaster*)	May utilise Subject Land for foraging.		
White-throated Needletail (*Hirundapus caudacutus*)	May utilise Subject Land for foraging.		
Bats			
Corben's Long-eared Bat (*Nyctophilus corbeni*)	Detected within the Subject Land.	Waterbodies	Aquatic and larval invertebrates associated with dams and waterways are likely provide a food source for microbat species.
Southern Myotis (*Myotis macropus*)	Detected within the Subject Land.		
Yellow-bellied Sheathtail Bat (*Saccolaimus flaviventris*)	Detected within the Subject Land.		
Vegetation			
Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions TEC	Detected within the Subject Land.	Habitat connectivity	Fragmentation of TECs, thereby reducing habitat connectivity, can isolate populations.

Figure 6-1 Human-made infrastructure within the Subject Land, not suitable for threatened microbats

Figure 6-2 Location of prescribed Impacts within the Subject Land

Stage 2: Impact assessment (biodiversity values and prescribed impacts

7. Avoid and minimise impacts

7.1. Avoiding and minimising direct/indirect impacts on project location and design)

The design of the proposal is the result of an iterative process. The design has been adapted progressively as information regarding site constraints, potential impacts, and risks associated with the proposal have become available.

The proposed Development Footprint layout has been located and designed to avoid and minimise impacts to native vegetation and biodiversity values as much as possible. There have been multiple iterations of the Development Footprint layout in response to specialist studies and consultation with BCD.

7.1.1. Initial project location and design

The Subject Land has been selected with the goal of balancing the assessed social, environmental and economic aspects associated with the development of a BESS. A focus objective is the establishment of a project that would proceed at a scale that takes these factors into consideration. The Subject Land was selected by the proponent as a site for development due to the following factors:

- Land suitability
    - The existing land zoning is RU1 and the site lies within pasture-improved areas that have been grazed for decades
    - The Subject Land can be accessed from the existing roads, reducing impacts required to construct an entirely new road
    - The site has low biodiversity values, low cultural heritage values, and low hazards
- Connection and capacity
    - The Subject Land has been placed in an area that allows an easy connection to the adjacent transmission line, along with the Finley Solar Farm and Finley substation
    - Proximity to the existing transmission line also minimises the need for new infrastructure, reducing additional biodiversity impacts
- Stakeholder interest
    - There are minimal views to site from nearby residences
    - Very few non-involved dwellings would be impacted by the development.

Key actions taken early in the Project's planning stages in response to environmental constraints included:

- Consultation with Council and the broader community, with confirmed overall support.
- Early biodiversity surveys and consultation with BCD were undertaken to verify:
    - The condition and habitat values onsite
    - The potential for Serious and Irreversible Impacts (SAII)
    - The potential for avoiding and minimising biodiversity impacts through Project design
    - Land Category.

7.1.2. Final design phase

The final design of the proposal is the result of an iterative process. The design has been adapted progressively as information regarding site constraints, potential impacts, and risks associated with the proposal have become available across all factors of environmental assessment.

The proposed Development Footprint has been located and designed to avoid and minimise impacts to native vegetation and biodiversity values. There is little biodiversity value across the Subject Land. The design has avoided direct impacts to waterbodies and planted vegetation that might hold some habitat value. The rest of the Subject Land is low - poor condition native vegetation and was considered suitable for development.

The South Coree BESS:

- **Avoids** impacts to biodiversity through site selection, iterative design, and utilising existing cleared land, and
- **Minimises** impacts through:
    - Utilising areas of poor condition native vegetation,
    - Utilising existing transmission line easements and
    - Applying specific mitigation strategies developed to reduce residual risks to biodiversity.

The final design results in the reduction of impacts to native vegetation and threatened species habitat in the locality. The transmission line easement to the Finley substation has not yet been confirmed due to ongoing discussions with TransGrid. As such, the development footprint proposed in Lot B DP 961693 around the substation is larger than will likely be developed. This is intended to provide a ‘clearing budget’ that will ensure the project’s consented offset liability is flexible enough to allow for minor changes to the substation connection once the agreed connection route is approved by TransGrid.

The final infrastructure layout will be subject to detailed design with appointed contractors.

The indicative infrastructure layout is shown in Figure 7-1

7.2. Avoid and minimise prescribed impacts

7.2.1. Initial project location and design

In addition to the direct and indirect impacts avoided as outlined in Section 7.1, the initial project location and design considered several prescribed impacts. Key considerations included selecting a site that lacked woodlands, hollow-bearing trees and scattered trees, which are a key habitat feature in the locality. This decision was made to avoid disturbing sensitive ecological areas which may also provide habitat for an array of threatened and non-threatened fauna. Instead, the site selected for the BESS infrastructure features heavily disturbed grasslands and exotic vegetation.

Furthermore, the project aimed to utilise an area in close proximity to Finley substation and with existing infrastructure, such as access tracks, to reduce the need for habitat removal, thereby minimizing impacts on habitat connectivity. These measures were implemented to minimize the overall environmental footprint of the project.

7.2.2. Final design

The final design results in the reduction of impacts to native vegetation and threatened species habitat in the locality.

7.3. Summary of measures to avoid and minimise impacts

Mitigation measures and the associated timelines and responsibilities for these measures have been detailed in Table 7-1.

Table 7-1 Avoidance and minimisation measures for direct, indirect and prescribed impacts

Action	Outcome	Timing	Responsibility
Site selection in grazed and cleared paddock area	Reduced disturbance to natural ecosystems by choosing a location in previously grazed, agricultural areas, limiting impacts on native vegetation and wildlife habitat.	Design	Samsung C&T Renewable Energy Australia Pty Ltd
Utilisation of existing access road	Avoided the need to construct a new road, thereby minimising additional habitat disturbance, protecting vegetation, and maintaining habitat connectivity.	Design	Samsung C&T Renewable Energy Australia Pty Ltd
Proximity to existing transmission line, Finely Solar Farm and Finley substation	Minimised need for new infrastructure, which reduced potential biodiversity impacts associated with creating new transmission lines and infrastructure corridors.	Design	Samsung C&T Renewable Energy Australia Pty Ltd
132kV transmission connection to Finley substation	Minimise disturbance area by utilising existing easements reducing clearing limits.	Construction	Samsung C&T Renewable Energy Australia Pty Ltd

Figure 7-1 Final design - Map 1 (South)

Figure 7-2 Final Design – Roadside intersection – Map 2 (North)

8. Impact assessment

Assumptions

The following assumptions underpin this impact assessment:

- All activities associated within the development would be contained wholly within the Development Footprint, including stockpiles, machinery manoeuvring, access tracks and infrastructure.
- Vegetation integrity scores within the Development Footprint would be reduced to zero, despite some impacts to vegetation only being partial impacts i.e. overhead transmission lines.

8.1. Direct impacts

8.1.1. Residual direct impacts

The construction and operational phases of the proposal have the potential to impact biodiversity values at the site that cannot be avoided via impact minimisation and avoidance measures. This would occur through residual direct impacts, such as habitat clearance (and associated noise and disturbance) and ongoing existence of infrastructure (which may create barriers to movement and generate noise and disturbance). These impacts are summarised in Table 8-1.

Table 8-1 Residual direct impacts to biodiversity during the construction and operational phases

Describe impact	BC Act status	EPBC Act Status	SAII entity	Project phase/timing of impact	Extent (Ha)
Clearing for construction: reduction in community extent and integrity					
PCT 76 Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	*Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions*	N/A	N/A	Construction	8.30 ha
Non-native vegetation	N/A	N/A	N/A	Construction	0.70 ha
Habitat loss (including HBT, fallen timber); displacement of resident fauna, injury or death of fauna					
Southern Myotis *Myotis macropus*	V	Not listed	No	Construction	4.2 ha (foraging habitat)
Sloane's Froglet *Crinina sloanei*	E	E	Yes	Construction	1.1 ha (assumed present Zone 5)

Describe impact	BC Act status	EPBC Act Status	SAII entity	Project phase/timing of impact	Extent (Ha)
A spear-grass *Austrostipa wakoolica*	E	E	No	Construction	2.2 ha (assumed present Zone 2, 3 and 5)
Slender Darling Pea *Swainsona murrayana*	V	V	No	Construction	1.1 ha (assumed present Zone 5)
Silky Swainson-pea *Swainsona sericea*	V	Not listed	No	Construction	1.1 ha (assumed present Zone 5)

8.1.2. Changes in vegetation integrity scores

Table 8-2 Change in VI Score for each vegetation zone as a result of identified impacts

Vegetation zone	PCT ID	Area (ha) in Dev. Footprint	Before development				After development				Change in VI score
			Composition	Structure	Function	VI score	Composition	Structure	Function	VI score	
1	76 Poor	3.55	55.4	55.6	0.6	14.6	0	0	0	0	-14.6
2	76 Roadside – Broockmanns Road	0.74	68.2	31.1	0	12.8	0	0	0	0	-12.8
3	76 Low	2.90	73.1	9.1	14.9	21.4	0	0	0	0	-21.4
4	Exotic	0.70	65.1	4.9	9.4	14.4	0	0	0	0	-14.4
5	76 Roadside – Riverina Highway	1.11	56.4	64	0.4	15.3	0	0	0	0	-15.3

8.1.3. Loss of hollow-bearing trees

No hollow-bearing trees will be removed as part of this proposal.

8.2. Indirect impacts

Indirect impacts are those that are not directly related to the clearing of native vegetation. For this proposal, the main indirect impacts include the following:

- Potential for soil erosion and water contamination within the subject land
- Noise and light disturbance within 50 m of the development footprint during construction,
- Creation of barriers to fauna movement
- Invasion of key emerging weeds
- Impacts of shading on retained native vegetation.

Table 8-3 summarises all indirect impacts associated with this proposal.

Table 8-3 Potential indirect impacts to biodiversity during the construction and operational phases

Indirect impact	Impacted entities	Extent	Frequency/ timing	Duration	Likelihood and consequences
Inadvertent impacts on adjacent habitat or vegetation. Accidental clearing or impacts to vegetation can occur where clearing boundaries are not delineated, or where machinery or materials are stockpiled outside the development footprint	PCT 76 *Western Grey Box tall grassy woodland on alluvial loam and play soils in the NSW South Western Slopes and Riverina Bioregion derived grassland*	Subject Land	Irregular during construction phase	Short-term	• Direct loss of native flora and fauna habitat • Potential for injury and mortality of fauna during clearing of fauna habitat • Increased edge effects. Likelihood of inadvertent impacts or clearing is high if boundaries are not clearly delineated. The consequence would be low for fauna habitat and native vegetation due to the low condition of vegetation within Subject Land.
Reduced viability of adjacent habitat due to edge effects. Edge effects can occur where works and/or development occur in close proximity to vegetation, and can include invasion by exotic species, and increase in edge ratios as a result of clearing patches.	• Riparian and aquatic areas • Threatened species which may utilise the Subject Land on occasion, including the: ○ Black Falcon (*Falco subniger*) ○ Diamond Firetail (*Stagonopleura guttata*) ○ Dusky Woodswallow (*Artamus cyanopterus cyanopterus*) ○ Flame Robin (*Petroica phoenicea*) ○ Grey Falcon (*Falco hypoleucos*)	Within 50m of development footprint	Rare	Short-term	• May alter fauna activities and/or movements • Minor loss of foraging habitat The likelihood and consequence would be low due to the lack of breeding habitat and low condition of vegetation within and surrounding the Subject Land.

Indirect impact	Impacted entities	Extent	Frequency/ timing	Duration	Likelihood and consequences
	○ Grey-crowned Babbler (eastern subspecies) (*Pomatostomus temporalis temporalis*) ○ Pink Cockatoo (*Lophochroa leadbeateri*) ○ Scarlet Robin (*Petroica boodang*) ○ Speckled Warbler (*Pyrrholaemus sagittatus*) ○ Superb Parrot (*Polytelis swainsonii*) ○ White-bellied Sea-eagle (*Haliaeetus leucogaster*) ○ White-throated Needletail (*Hirundapus caudacutus*) ○ Southern Myotis (*Myotis macropus*) ○ Corben's Long-eared Bat (*Nyctophilus corbeni*) ○ Yellow-bellied Sheathtail Bat (*Saccolaimus flaviventris*)				
Increased risk of starvation, exposure and loss of shade or shelter	• Threatened Ecosystem species listed in Section 5.1.1 • Southern Myotis (*Myotis macropus*)	Subject Land	Rare - Construction and	Long-term	• Minor loss of foraging habitat

Indirect impact	Impacted entities	Extent	Frequency/ timing	Duration	Likelihood and consequences
Through vegetation removal and edge effects, potential exists for sheltering locations to be impacted	• Sloane's froglet (*Crinia sloanei*)		operation phase		The likelihood and consequence would be low due to the low condition of vegetation within and surrounding the Subject Land.
Reduced viability of adjacent habitat due to increased noise Construction activities and operation of machinery can result in increased noise, causing disturbance to local fauna.	• Threatened Ecosystem species listed in Section 5.1.1 • Southern Myotis (*Myotis macropus*) • Sloane's froglet (*Crinia sloanei*)	Subject Land	Construction	Short-term	• May alter fauna activities and/or movements • Loss of foraging habitat • Interference with calls resulting in communication complications – particularly birds, bats and frogs. The likelihood and consequence would be low due to the low condition of vegetation within and surrounding the Subject Land.
Transport of weeds and pathogens from the site to adjacent vegetation. Construction and operation involve the movement of machinery and personnel which have the potential to transfer weed seed, and soil containing pathogens.	PCT 76 *Western Grey Box tall grassy woodland on alluvial loam and play soils in the NSW South Western Slopes and Riverina Bioregion derived grassland*	Subject Land	Construction and operation phase	Long-term	Unmitigated, the likelihood of the spread of weeds is high, due to the known occurrence of weeds (including Bathurst Burr) within the Subject Land. The consequences would be moderate and would include habitat degradation of low and poor condition derived grasslands.
Trampling of threatened flora species.	• A spear-grass (*Austrostipa wakoolica*)	Within and adjacent to	Construction and	Long-term	The likelihood of impact to threatened flora species through trampling is low. Several

Indirect impact	Impacted entities	Extent	Frequency/ timing	Duration	Likelihood and consequences
	• Slender Darling Pea (*Swainsona murrayana*) • Silky Swainson-pea (*Swainsona sericea*)	the Development Footprint	operational phase		targeted flora surveys were conducted throughout the Development Footprint in 2024, and no threatened flora were detected. The consequence of loss of unknown individuals being trampled is minimal.
Inhibition of nitrogen fixation and increased soil salinity. Increased soil salinity has the potential to occur as a result of vegetation removal impacting groundwater, bringing salt to surface.	• PCT 76 *Western Grey Box tall grassy woodland on alluvial loam and play soils in the NSW South Western Slopes and Riverina Bioregion derived grassland*	Unknown	Construction and operation	Long-term	The likelihood is rare as no trees or shrubs will be cleared. The consequence would be low as, salinity may impact the functioning of ecosystems, however, the Subject Land does not support moderate or good condition ecosystems.
Rubbish dumping Increased accessibility through construction and operational roads, in addition to establishment of public access compounds may allow for access and dumping of rubbish	• PCT 76 *Western Grey Box tall grassy woodland on alluvial loam and play soils in the NSW South Western Slopes and Riverina Bioregion derived grassland* • Aquatic habitat • Corben's Long-eared Bat (*Nyctophilus corbeni*) • Southern Myotis (*Myotis macropus*) • Sloane's froglet (*Crinia sloanei*) • A spear-grass (*Austrostipa wakoolica*)	Subject Land	Construction and operational phase	Long-term	The likelihood of rubbish dumping is moderate during the construction phase if controls are not in place. The likelihood of rubbish dumping during operation are low due to limited public access to the BESS site. The consequence of construction rubbish dumping is moderate as it may lead to degradation of threatened species habitat.

Indirect impact	Impacted entities	Extent	Frequency/ timing	Duration	Likelihood and consequences
	• Slender Darling Pea (*Swainsona murrayana*) • Silky Swainson-pea (*Swainsona sericea*)				
Increase in predatory species populations Increased accessibility in addition to potential food waste storage has potential to increase access for predators.	Threatened fauna species habitat including for the: • Southern Myotis (*Myotis macropus*) • Yellow-bellied Sheathtail Bat (*Saccolaimus flaviventris*) • Corben's Long-eared Bat (*Nyctophilus corbeni*) • Sloane's froglet (*Crinia sloanei*) • Threatened birds	Subject Land and surrounding vegetation	Construction and operation phase	Long-term	The likelihood is low as most areas are already accessible. The consequence is low given the already disturbed nature of the site.
Earthworks and mobilisation of sediments. Increased sediment load within waterways and soil movement have potential to occur as a result of construction works.	• PCT 76 *Western Grey Box tall grassy woodland on alluvial loam and play soils in the NSW South Western Slopes and Riverina Bioregion derived grassland* • Aquatic habitat • Corben's Long-eared Bat (*Nyctophilus corbeni*) • Southern Myotis (*Myotis macropus*) • Sloane's froglet (*Crinia sloanei*)	Subject Land	Construction phase	Short-term	There is a low risk of increased sediment load within waterways and soil movement due to sediment and erosion controls to be implemented during construction. The unmitigated consequence of earthworks and mobilisation of sediments is moderate to high and include erosion and sedimentation and/or pollution of soils, dams and downstream habitats.

Indirect impact	Impacted entities	Extent	Frequency/ timing	Duration	Likelihood and consequences
Increased risk of fire. Fire ignition during construction as per EIS. Intrinsic fire risk of BESS sites.	PCT 76 *Western Grey Box tall grassy woodland on alluvial loam and play soils in the NSW South Western Slopes and Riverina Bioregion derived grassland*. Areas of threatened species' habitat including: • Southern Myotis (*Myotis macropus*) • Yellow-bellied Sheathtail Bat (*Saccolaimus flaviventris*) • Corben's Long-eared Bat (*Nyctophilus corbeni*) • Threatened birds (Ecosystem species listed in section 5.1.1) • Sloane's froglet (*Crinia sloanei*) • A spear-grass (*Austrostipa wakoolica*) • Slender Darling Pea (*Swainsona murrayana*) • Silky Swainson-pea (*Swainsona sericea*)	Subject Land	Construction and operational phase	Long-term	There is a moderate risk of componentry failure resulting in a fire. The biodiversity consequences are likely to be low to moderate, assuming containment to the BESS site. Buffers around the BESS will reduce the likelihood of any fire spreading to surrounding vegetation.

8.3. Prescribed impacts

Prescribed impacts may affect biodiversity values in addition to, or instead of, impacts from clearing native vegetation. They can be direct and/or indirect impacts. These impacts may be difficult to quantify or offset, as they often affect biodiversity values that are irreplaceable; consequently, avoiding or minimising such impacts is critical. Table 8-4 describes potential prescribed impacted in the Subject Land associated with the proposal.

Table 8-4 Prescribed impacts: nature, extent, duration and consequences

Prescribed impact	Nature	Extent	Duration	Consequence
Impacts of development on habitat connectivity	Habitat connectivity in the landscape consists of low condition grasslands, scattered trees and some tree patches (primarily planted). These connectivity features could be suitable for aerial and some terrestrial species.	The removal of grassland vegetation and subsequent installation of fencing, road construction and construction of BESS infrastructure in the north of the Development Footprint.	Impacts to connectivity within the Development Footprint are expected to be permanent. Impacts are likely to reduce in the long term as biodiversity in the area adapts to the presence of the BESS.	Consequences include the slight alteration of fauna movements to avoid cleared areas and BESS infrastructure. Due to the low condition vegetation in the landscape, the proposed works would increase fragmentation and barriers to wildlife movement only negligibly.
Impacts of development on water quality, water bodies and hydrological processes	Water bodies in the Involved Lands include a farm dam east of the proposed BESS location, and approximately 400 m of irrigation channel north of Finley substation and 300 m of the Mulwala Canal north of the road intersection	The farm dam is situated outside of the Development Footprint and would not be impacted. The irrigation channels would be retained.	Impacts to waterbodies will likely be confined to the construction period.	The potential consequences include reduced water quality from runoff or increased sedimentation. The consequence is moderate, as it could impact habitat for threatened species such as Southern Myotis (*Myotis macropus*) however, the waterways in the Involved Lands are already in moderate to low condition.

Prescribed impact	Nature	Extent	Duration	Consequence
	at Riverina Highway and Canalla Road.			
Impacts of vehicle strikes on threatened fauna or fauna part of a TEC	Increased vehicle traffic during the construction phase of the project could result in an increased risk of vehicle strikes to threatened fauna.	The extent of vehicular strike is likely to be minor due to construction being conducted in daylight hours and speed limits being enforced along Broockmanns Road.	Short-term construction phase.	The overall consequence is expected to be negligible due to low fauna activity detected during surveys. As predicted impact is negligible, further analysis has not been undertaken of this prescribed impact.
Impacts for collision of threatened fauna with the proposed 132 kV transmission line	Increased risk of collision particularly from microbats, post construction of the transmission line	The extent of the collision with the proposed transmission line is likely minor because most of the powerline is proposed to be underground. Up to 200 m of new above ground transmission lines are proposed.	Impacts to habitat within the Development Footprint are expected to be permanent. Impacts are likely to reduce in the long term as biodiversity in the area adapts to the presence of the proposed 132 kV transmission line,	Microbat collision risk is low. For the following reason: • There are pre-existing powerlines within the Subject Land that are part of the landscape. Any microbat species present in the Subject Land are currently coexisting with transmission lines. • No canopy tree species need to be removed for the construction of the transmission line. • The area within the Subject Land is not a known key migration route for bats. There is no breeding or roosting habitat within the subject land that bats would be travelling to. • Microbats have a small wing diameter (~28cm for Southern Myotis and Corben's Long-eared Bat) and

Prescribed impact	Nature	Extent	Duration	Consequence
				unlikely to simultaneously touch two wires or conductors at the same time causing electrocution.

8.4. Mitigating residual impacts – management measures and implementation

Impacts that cannot be avoided must be mitigated. Presented here is an identification of mitigation measures to address residual direct and indirect, and prescribed impacts that were identified in the previous section as moderate or above likelihood. Mitigation measures proposed to manage impacts, including proposed techniques, timing, frequency, responsibility for implementing each measure, risk of failure, and an analysis of the consequences of any residual impacts are provided in Table 8-5.

All impacts are restricted to within the development footprint. No clearing will occur outside of the development footprint.

Summary of mitigations for direct impacts include;

- A trained wildlife handler or ecologist to be on site during clearing events to mitigate potential impacts to displacement, injury of death of resident fauna
- Installation of temporary frog exclusion fencing prior to construction

Summary of mitigation for indirect impacts include:

- Inadvertent impacts of adjacent habitat or vegetation to be mitigated through clear physical demarcation of the boundary between areas to be retained and areas slated for clearing
- Reduced viability to adjacent habitat to be mitigation through avoiding clearing / construction during night-time hours
- Risk of introduced weeds and pathogens to be mitigated through weed control and vehicle and machinery hygiene protocols
- Rubbish dumping during the construction phase to be mitigated through standard high quality construction practices including maintaining a clean site and depositing rubbish at suitable facilities
- Mobilisation of sediments to be mitigated through application of erosion and sediment control practices.
- Increased risk of fire to be mitigated through built in hazard reduction planning

Summary of mitigations for prescribed impacts include;

- Impacts to water quality mitigated through application of erosion and sediment control practices.
- Vehicle speed limits implemented across the site during construction and operation.

Table 8-5 Summary of proposed mitigation and management measures for residual impacts (direct, indirect and prescribed)

No.	Impact	Mitigation measure	Methods/technique	Timing	Frequency	Responsibility	Likely efficacy	MNES
Direct impacts								
B1	Habitat loss, displacement of resident fauna, injury or death of fauna	Trained fauna spotter catcher (FSC) and/or ecologist on site during clearing events to native vegetation	• Instigating clearing protocols, to include a trained ecologist or licensed wildlife handler to be present during clearing events of native grasslands • Pre-clearance surveys should be completed in the 48 hours prior to clearing • If threatened fauna is detected during pre-clearance surveys, an incidental finds protocol including comparative habitat assessments should be prepared for clearing sites and proposed release sites provided to ensure that habitat features are available in the released sites • Communication should occur with rescue agencies and local veterinarians prior to the commencement of clearing to confirm the availability of resources for any captured/injured fauna that are unable to be released.	During construction (clearing)	One-off	Operator	High	Grey Falcon White-throated Needletail Pink Cockatoo Corben's Long-eared Bat Superb Parrot Diamond Firetail Sloane's Froglet
B2	Habitat loss, displacement of resident fauna,	Installation of temporary frog	• Installation of temporary frog exclusion fencing prior to construction to exclude	Pre-Construction	Ongoing	Contractor	High	Sloane's Froglet

No.	Impact	Mitigation measure	Methods/technique	Timing	Frequency	Responsibility	Likely efficacy	MNES
	injury or death of fauna	exclusion fencing prior to construction	potential Sloane's Froglet from the construction site. Specifications include: • Non-woven, smooth UV fabric • Installed to a height at least 60cm • Trenched into the ground at least 20cm • Pre-clearance surveys within the exclusion fencing should be completed prior to clearing					
Indirect impacts								
B3	Inadvertent impacts on adjacent habitat or vegetation, including trampling	Clear physical demarcation of boundary between areas to be retained and areas proposed to be cleared	Biodiversity Management Plan (BMP) to include: • Documented clearance protocols to include demarcation (e.g. use of pickets or flagging) of vegetation to be retained • No clearing of woody vegetation • No clearing to occur outside the development footprint • No stockpiling or storage outside of the Development Footprint • Tree Protection Zones (TPZs) for retained woodland	Pre-construction and construction	Ongoing	Contractor	High	Grey Falcon White-throated Needletail Pink Cockatoo Corben's Long-eared Bat Superb Parrot

No.	Impact	Mitigation measure	Methods/technique	Timing	Frequency	Responsibility	Likely efficacy	MNES
			• Clearing limits must be delineated prior to proposed commencement of clearing at each area					Diamond Firetail
B4	Reduced viability of adjacent habitat due to increased noise	Avoid clearing / construction during night-time hours Limited use of light	EMS includes specification of works to be undertaken during the following times: • Monday – Friday: 7am – 6pm • Saturday: 8am – 1pm • Limited use of lighting • Where required, light to be directed downwards, over the work area	Construction	Ongoing	Contractor and operator	High	Sloanes froglet *Austrostipa wakoolica* Slender Darling Pea
B5	Transport of weeds and pathogens from the site to adjacent vegetation	Weed control and hygiene protocols	Biodiversity Management Plan (BMP) to include: • Weed control and Vehicle and machinery hygiene protocols to prevent spread of weeds and pathogens within Subject Land • Weed control should be completed by a suitably qualified person in the identification and management of weed species • Basic hygiene measures to align with NSW DPIE Hygiene guidelines - *Protocols to protect priority biodiversity areas in NSW from Phytophthora cinnamomi, myrtle rust,*	Construction and operation	To be determined in BMP	Contractor and operator	High	Grey Falcon White-throated Needletail Pink Cockatoo Corben's Long-eared Bat Superb Parrot Diamond Firetail

No.	Impact	Mitigation measure	Methods/technique	Timing	Frequency	Responsibility	Likely efficacy	MNES
			amphibian chytrid fungus and invasive plants ((NSW DPIE, 2020) to prevent introduction of Amphibian Chytrid Fungus into the site					Sloane's Froglet
B6	Rubbish dumping	High quality construction practices	EMS to include: List or map of lawful locations for dumping construction rubbish	Construction	Ongoing	Contractor	High	All species listed above
B7	Earthworks and mobilisation of sediments.	Sediment and erosion controls	Preparation of an EMS to include: Erosion and sediment control practices in line with the 'Blue Book' *Managing Urban Stormwater: soils and construction Vol1* (Landcom 2004).	Construction	Ongoing	Contractor	High	All species listed above
B8	Increased risk of fire	Built in hazard reduction planning	Implement a Bushfire Emergency Management and Operations Plan in consultation with NSW RFS and FR NSW. This would include necessary Asset Protection Zones (APZs) included within the Development Footprint.	Planning	Complete	Proponent	High	All species listed above
Prescribed impacts								
B9	Impacts of development on water quality, water	**Sediment and erosion controls**	Preparation of an EMS to include: Erosion and sediment control practices in line with the 'Blue Book' *Managing Urban*	Construction	Ongoing	Contractor	High	Sloane's Froglet

No.	Impact	Mitigation measure	Methods/technique	Timing	Frequency	Responsibility	Likely efficacy	MNES
	bodies and hydrological processes.		*Stormwater: soils and construction Vol1* (Landcom 2004). Auditing report to ensure adherence.					
B10	Vehicle strikes on threatened fauna, or fauna part of a TEC.	Vehicle speed limits implemented across the site during construction and operation.	Vehicle impacts will be reduced by: • Limit vehicle speeds to 40km/h to reduce the risk of vehicle strike. Construction activities are limited to daylight hours to reduce vehicle strikes of nocturnal fauna	Construction and operation	Ongoing	Contractor and operator	High	All species listed above

Further details on the proposed implementation of recommended mitigation measures are provided below (Table 8-6). In summary, most measures would be detailed in a BMP (to be developed post approval and pre-construction).

Table 8-6 Mitigation measures implementation

No.	Impact	Measure/action	Monitoring and evaluation strategy	Performance criteria	Adaptive management threshold	Adaptive management response
Direct impacts						
B1/B2	Habitat loss, displacement of resident fauna, injury or death of fauna	Trained fauna spotter catcher (FSC) and/or ecologist on site during clearing	Prepare BMP within EMS. BMP to include: • Requirement for pre-clearance surveys by suitably trained	Auditing report shows pre-clearance surveys undertaken and provides details of any FSC responses	Clearing limits insufficient to capture all construction activities	Commence project modification process

No.	Impact	Measure/action	Monitoring and evaluation strategy	Performance criteria	Adaptive management threshold	Adaptive management response
		events to native vegetation Installation of temporary frog exclusion fencing prior to construction	person/s during construction phase • Requirement for presence of FSC during removal of important habitat elements (e.g. HBT) during construction phase to relocate or arrange for care of injured individuals • Clearing limits and auditing mechanism to ensure limits are not exceeded Proformas to record details of above actions. Details to be included in audit reports		Unexpected threatened species encountered	Unexpected threatened species find protocol enacted
Indirect impacts						
B3	Inadvertent impacts on adjacent habitat or vegetation, including trampling.	Clear physical demarcation of boundary between retained and cleared areas.	BMP to include: Demarcation (flagging) of no-go zones, vegetation for retention, habitat trees and habitat features. Physical demarcation required; not to rely on operators' GPS.	Audit report shows demarcation undertaken and does not find inadvertent impacts upon adjacent areas.	Trigger 1 If adjacent areas found to be impacted, calculate quantum of impact. Trigger 2 For native vegetation, impact trigger >0.5 ha.	Trigger 1 Check demarcation is in accordance with BMP. Adjust as necessary to avoid future impact. Trigger 2 Consult with BCD.

No.	Impact	Measure/action	Monitoring and evaluation strategy	Performance criteria	Adaptive management threshold	Adaptive management response
B4	Reduced viability of adjacent habitat due to increased noise	Avoid clearing / construction during night-time hours	EMS to include specifications of work hours during the following times: • Monday – Friday: 7am – 6pm • Saturday: 8am – 1pm • Limited use of lighting Auditing report to ensure adherence.	Auditing report finds adherence.	Auditing report does not find adherence.	Consultation with developer and/or construction contractor with reference to the *Protection of the Environment Operations Act 1997*.
B5	Introduced weeds and pathogens	Weed control and hygiene protocol	The BMP will include actions in accordance with DPI (2020): Buffer zones Designated parking areas Standard basic vehicle hygiene protocol (wash-down facilities) in line with NSW Hygiene Guidelines and best practice weed management consistent with guidelines provided by DPI NSW, focusing on priority weeds and Amphibian Chytrid Fungus	Audit report will compile forms from construction company. Vehicles and equipment on site clean and free of weeds and plant materials Vehicle and machinery weed hygiene controls in place and utilised on site	Audit report finds hygiene protocols not implemented Evidence of weed spread or pathogen introduction to adjacent vegetation	Investigate the matter with reference to the *Biosecurity Act 2015*.

No.	Impact	Measure/action	Monitoring and evaluation strategy	Performance criteria	Adaptive management threshold	Adaptive management response
			Hygiene checklist for construction company to fill out to evidence adherence.			
B6	Rubbish dumping	High quality construction practices	EMS to include: List or map of lawful locations for dumping construction rubbish. Auditing report to ensure adherence.	Auditing report finds adherence.	Auditing report does not find adherence.	Consultation with developer and/or construction contractor with reference to the *Protection of the Environment Operations Act 1997*.
B7	Increased mobilisation of sediments and other pollutants	Sediment and erosion controls	EMS to include: Erosion and sediment control practices in line with the 'Blue Book' (Landcom, 2004). • Auditing report to ensure adherence.	Auditing report finds adherence.	Auditing report does not find adherence.	Consultation with developer and/or construction contractor with reference to the *Protection of the Environment Operations Act 1997*.
B8	Increased risk of fire	Built in hazard reduction planning	Planning phase has incorporated separation distances, asset protection zone, emergency egress provision to west of site and water supply for firefighting.	Any fires ignited on site do not spread to adjacent vegetation.	Fires ignited on site have potential to spread to adjacent vegetation or have spread.	Consultation with Rural Fire Service to improve the containment of fires at BESS site.

No.	Impact	Measure/action	Monitoring and evaluation strategy	Performance criteria	Adaptive management threshold	Adaptive management response
Prescribed impacts						
B9	Water quality	Sediment and erosion controls	EMS to include: Erosion and sediments control practices in line with the 'Blue Book' (Landcom, 2004) Auditing report to ensure adherence	Auditing report finds adherence.	Auditing report does not find adherence.	Consultation with developer and/or construction contractor with reference to the *Protection of the Environment Operations Act 1997*.
B10	Vehicle strikes on threatened fauna, or fauna part of a TEC	Implementation of vehicle speed limits and number of vehicles on site to avoid strike	EIS to state vehicle speed limits and limit the number of vehicles on site following vehicle traffic report	Auditing report finds adherence and no strikes occur	Auditing report does not find adherence or a strike occurs	Immediately stop works and report to CPHR.

8.5. Adaptive management strategy for uncertain impacts

Residual indirect or prescribed impacts for which no mitigation measures are proposed require an adaptive management strategy (BAM Section 8.5). Adaptive management during construction and operation will be receptive to any new and relevant data that may arise through ongoing assessment and monitoring and is key to the successful implementation of the relevant management plans. An adaptive management strategy for flora trampling can be seen in Table 8-7. Construction management plans for biodiversity will have an adaptive management component. This includes measures to respond to impacts that are predicted to have a low risk, if they occur at a higher frequency or severity than expected. Other impacts may come to fore during construction and can be dealt with adaptively in real time. The known low risk impact is:

- Trampling of threatened flora.

Increased risk of starvation and exposure due to loss of shade & shelter for fauna is not addressed by this adaptive management strategy. This is due to the difficulty in obtaining quantitative site-specific information, both before and after impact. This impact is theoretical and due to the degraded nature of the habitat locally and being cleared, the proposal's impact is not expected to exacerbate habitat scarcity to the point where it would be detectable.

Table 8-7 Adaptive management strategy for trampling of threatened flora species

Impact type	Description	Likelihood & extent	Baseline data required	Performance indicators	Risk of failure	Management actions
Trampling of threatened flora species	Inadvertent damage or loss of threatened flora individuals, which are not known to occur in the Development Footprint.	Low – the Development Footprint has been thoroughly surveyed for threatened flora over multiple seasons.	Existing baseline data provides evidence of low likelihood of threatened flora presence.	An unexpected plan is found on site by the project ecologist or contractor.	Moderate – not all site personnel may recognise a threatened species.	Implement an Unexpected Threatened Species Finds procedure, which may involve a Stop Work procedure, further surveys to delineate population and assessments of significance or liaison with agencies.

9. Serious and irreversible impacts (SAII)

9.1. Assessment for serious and irreversible impact on biodiversity values

This section addresses Section 10.2 of the BAM and follows the guidance to assist a decision-maker to determine a serious and irreversible impact.

All threatened entities impacted by the proposal have been considered to determine whether they form or have the potential to be Serious and Irreversible Impact (SAII) entities. Criteria for listing as a SAII entity are those species which:

- Are in a rapid rate of decline
- Have a very small population size
- Are severely degraded or disrupted
- Have a very limited geographic distribution
- Are unlikely to respond to measures to improve habitat.

One threatened species has assumed presence within the Development Footprint and classifies as a SAII entity (Table 9-1):

Table 9-1 Entities at risk of an SAII

Common name	Scientific name	Reason for inclusion in assessment
Sloane's Froglet	*Crinia sloanei*	Included in current list of entities at risk of an SAII and is likely to be impacted by the proposal

No TECs at risk of SAII will be impacted by this proposal.

9.1.1. Additional impact assessment provisions for threatened species at risk of an SAII

Sloane's Froglet

Actions to avoid and minimise direct and indirect impacts

The following actions have been undertaken to avoid and minimise direct and indirect impacts (including mitigation measures):

- Clear physical demarcation of clearing extent
- Sediment and erosion controls to reduce mobilisation of sediments and other pollutants
- Weed control and hygiene protocol to prevent the spread of pathogens and aquatic weeds
- Offset clearing impacts.

Current status

Table 9-2 Current status – Sloane's Froglet

Criteria	Information	Data sources	Details of data deficiency, assumptions, reasons for low confidence in information
Evidence of rapid decline (Principle 1)			
Change in population size in NSW in the past 10 years or 3 generations (indicate whether as a direct estimate of the population or if indicated by an index or surrogate)	The Sloane's Froglet has undergone a severe reduction of population size over a 10-year period. The available data on the species do not allow a direct estimate of decline across the species' former range. detailed monitoring for the Albury – Thurgoona population has demonstrated that the Sloane's Froglet is in an ongoing state of decline. The species has become locally extinct from six areas.	*Conservation Advice* – Crinia sloanei *(Sloane's Froglet)* (Threatened Species Scientific Committee, 2019).	-
Evidence of small population size (Principle 2)			
Current population size in NSW	There are no data available to assess population size.	*Conservation Advice* – Crinia sloanei *(Sloane's Froglet)* (Threatened Species Scientific Committee, 2019).	Conservation advice indicates that population data is unknown.
Decline in species' population size in 3 years or one generation	There are no data available to assess population decline.	*Conservation Advice* – Crinia sloanei *(Sloane's Froglet)* (Threatened Species Scientific Committee, 2019).	Conservation advice indicates that population data is unknown.
Number or percentage of mature individuals in each subpopulation or whether the species is	The Committee considers that there is insufficient data to demonstrate that there is a continuing	*Conservation Advice* – Crinia sloanei *(Sloane's Froglet)* (Threatened	Conservation advice indicates that population data is unknown.

Criteria	Information	Data sources	Details of data deficiency, assumptions, reasons for low confidence in information
likely to undergo extreme fluctuations	decline in the population or if the species is eligible for listing under Criterion 3.	Species Scientific Committee, 2019).	
Evidence of limited geographic range (Principle 3)			
Extent of occurrence (ha)	Approximately 700 km^2.	*Conservation Advice* – Crinia sloanei *(Sloane's Froglet)* (Threatened Species Scientific Committee, 2019).	-
Area of occupancy (ha)	Less than 90 km^2.	*Conservation Advice* – Crinia sloanei *(Sloane's Froglet)* (Threatened Species Scientific Committee, 2019).	-
Number of threat-defined locations	A population of the species in Albury (NSW) is subject to significant habitat loss associated with urban and industrial development	*Conservation Advice* – Crinia sloanei *(Sloane's Froglet)* (Threatened Species Scientific Committee, 2019).	-
Whether the species' population is likely to undergo extreme fluctuations	Unknown	N/A	Insufficient data in the Conservation advice and TBDC.

Impact assessment

Table 9-3 Impacts assessment – Sloane's Froglet

Impact	Information	Data sources	Details of data deficiency, assumptions or reasons for low confidence in information
Number of individuals (mature and immature) present in the subpopulation on the subject land	Unknown	N/A	This species is assumed present within the Subject Land along the Riverina Highway/Canalla Road intersection; therefore, the number of individuals is unknown.
Number of individuals (mature and immature) present as a percentage of total NSW population (%)	Unknown	N/A	The percentage of the total NSW population cannot be calculated as the number of individuals in NSW and in the Subject Land is known.
Number of individuals (mature and immature) to be impacted by the proposal	No individuals would be impacted, as aquatic habitat will be retained. Impacts would occur as indirect impacts to aquatic habitat only.	N/A	-
Individuals (mature and immature) to be impacted by the proposal as a percentage of total NSW population (%)	See above.	N/A	-
Area of habitat to be impacted (ha) (for species measured by area only)	No aquatic habitat would be directly impacted by the Development Footprint, 1.1 ha of terrestrial habitat within 100m of aquatic	Calculated by GIS, satellite imagery and data collected during site assessment.	-

Impact	Information	Data sources	Details of data deficiency, assumptions or reasons for low confidence in information
	habitat would be impacted.		
Area of the species' geographic range to be impacted by the proposal (ha)	Extent of occurrence (based on geographic range) is far greater than area of occupancy at any one time. This would not be affected by the proposal.	*Conservation Advice* – Crinia sloanei *(Sloane's Froglet)* (Threatened Species Scientific Committee, 2019).	-
Area of the species' geographic range to be impacted as a percentage of the total area or extent of occupancy (%)	N/A	N/A	-
Individuals impacted	No individuals will be directly impacted, some habitat will be impacted.	N/A	-
Viability of a fragmented population (see below)	The proposal would not fragment existing populations as all aquatic habitat would be retained.	N/A	-

Figure 9-1 Map of threatened entities at risk of SAII

10. Impact summary

10.1. Determine an offset requirement for impacts

10.1.1. Impacts on native vegetation and TECs or ECs (ecosystem credits)

An offset is required for all impacts of development on PCTs that are associated with:

a) A vegetation zone that has a vegetation integrity score ≥15 where the PCT is representative of an endangered or critically endangered ecological community, or
b) A vegetation zone that has a vegetation integrity score of ≥17 where the PCT is associated with threatened species habitat (as represented by ecosystem credits), or is representative of a vulnerable ecological community, or
c) A vegetation zone that has a vegetation integrity score ≥20 where the PCT is not representative of a TEC or associated with threatened species habitat.

Three vegetation zones in the Development Footprint did not require offset due to their low Vegetation Integrity (VI) score. These zones are shown in Table 10-1.

Two vegetation zones required an offset, shown in Table 10-2. The PCTs and vegetation zones requiring offset and not requiring offset are mapped in Figure 10-1. The associated credit classes for ecosystem credits generated are detailed in Table 10-2 below.

Table 10-1 Impacts that **do not** require offsets - ecosystem credits

Vegetation zone	PCT name	Impact area (ha)	TEC association	Entity at risk of SAII?	Current VI score
1	76_DG_poor	3.55	Inland Grey Box Woodland (BC Act)	No	14.6
2	76_DG_roadside – Broockmanns Road	0.74	Inland Grey Box Woodland (BC Act)	No	12.8
4	Exotic	0.70	No	No	14.4

Table 10-2 Impacts that require an offset - ecosystem credits

Vegetation zone	PCT name	TEC	Impact area (ha)	Current VI score	Future VI score	Change in VI score	Biodiversity risk weighting	No. ecosystem credits required
3	76_DG_low	Inland Grey Box Woodland (BC Act)	2.90	21.4	0	-21.4	2	31

Vegetation zone	PCT name	TEC	Impact area (ha)	Current VI score	Future VI score	Change in VI score	Biodiversity risk weighting	No. ecosystem credits required
5	76_DG_roadside – Riverina Highway	Inland Grey Box Woodland (BC Act)	1.11	15.3	0	-15.3	2	9
							Total credits	40

10.1.2. Impacts on threatened species and their habitat (species credits)

The BAM credit calculator generated offset obligations for one candidate species which is listed in Table 10-3.

Table 10-3 Impacts that require an offset - species credits

Common name	Scientific name	BC Act status	EPBC Act status	Loss of habitat (ha)	Biodiversity risk weighting	No. of species credits required	Suitable IBRA subregion for offset
Southern Myotis	*Myotis macropus*	V	Not listed	4.2	2	40	Any in NSW
Sloane's Froglet	*Crinia sloanei*	E	E	1.1	3	13	Any in NSW
A spear-grass	*Austrostipa wakoolica*	E	E	2.2	2	21	Any in NSW
Silky Swainson-pea	*Swainsona sericea*	V	Not listed	1.1	2	9	Any in NSW
Slender Darling Pea	*Swainsona murrayana*	V	V	1.1	2	9	Any in NSW
						Total credits	92

10.1.3. Indirect and prescribed impacts

No indirect or prescribed impacts remain after measures to avoid, minimise and mitigate have been applied.

10.1.4. Offsets required under the EPBC Act

No species listed under the EPBC Act have been identified as having the potential to be significantly impacted by the development (Appendix C (C.7)).

Three species (*Austrostipa wakoolica*, Sloane's froglet, Slender Darling Pea) were assumed present under the BDAR due to targeted surveys unable to be undertaken during the correct survey period at the Road intersection of Riverina Highway and Canalla Road. Impacts were considered not significant, however. species credits obligations under the BAM have been generated for *Austrostipa wakoolica*, Sloane's froglet and Slender Darling Pea

The EPBC Act referral (EPBC 2025/10152) determined the proposal is not a controlled action and no further assessment is required. As such, the proposal is not considered to require offsets in accordance with the EPBC Offsets Policy.

Figure 10-1 Assessment and offset requirements – Map 1 (South)

Figure 10-2 Assessment and offset requirements – Map 2 (North)

10.2. Impacts that do not require further assessment

The identification of areas not requiring assessment was undertaken in accordance with BAM Section 9.3. These areas are outlined in Table 10-4.

Table 10-4 Impacts that do not need further assessment for ecosystem credits

Impact	Location within subject land	Justification why no further assessment is required
Infrastructure (roads)	Broockmanns Road, Canalla Road, unsealed track north and east of Finley substation	No native vegetation
Infrastructure (buildings)	Finley substation	No native vegetation

11. Biodiversity credit report

11.1. Ecosystem credits

Information regarding Ecosystem credit requirements for the proposed development are shown in Table 11-1.

Table 11-1 Ecosystem credit class and matching credit profile

Ecosystem credit	Attributes shared with matching credits							Credits required
	PCT name	PCT vegetation class	PCT vegetation formation	Associated TEC or EC	Offset trading group (BAM Section 10.2, Tables 4 & 5)	Hollow bearing trees present?	IBRA subregion (in which proposal is located)	
Zone 3 76_DG_low	Western Grey Box tall grassy woodland on alluvial loam and play soils in the NSW South Western Slopes and Riverina Bioregions	Floodplain Transition Woodlands	Grassy Woodlands	Inland Grey Box Woodland (BC Act)	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	No	Murray Fans	31

Ecosystem credit	Attributes shared with matching credits							Credits required
	PCT name	PCT vegetation class	PCT vegetation formation	Associated TEC or EC	Offset trading group (BAM Section 10.2, Tables 4 & 5)	Hollow bearing trees present?	IBRA subregion (in which proposal is located)	
Zone 5 76_DG_roadside Riverina Highway	Western Grey Box tall grassy woodland on alluvial loam and play soils in the NSW South Western Slopes and Riverina Bioregions	Floodplain Transition Woodlands	Grassy Woodlands	Inland Grey Box Woodland (BC Act)	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	No	Murray Fans	9

11.2. Species credits

Information regarding Species credit requirements for the proposed development are shown in Table 11-2.

Table 11-2 Species credit class and matching credit profile

Species credit	Attributes shared with matching credits				Species credits required
	Kingdom	BC Act status	EPBC Act status	IBRA region	
A spear-grass (*Austrostipa wakoolica*)	Flora	E	E	Any in NSW	21
Silky Swainson Pea (*Swainsona sericea*)	Flora	V	Not listed	Any in NSW	9

Species credit	Attributes shared with matching credits				Species credits required
	Kingdom	BC Act status	EPBC Act status	IBRA region	
Slender Darling Pea (*Swainsona murrayana*)	Flora	V	V	Any in NSW	9
Sloane's Froglet (*Crinia sloanei*)	Fauna	E	E	Any in NSW	13
Southern Myotis (*Myotis macropus*)	Animalia	V	Not listed	Any in NSW	40

12. Conclusion

NGH has prepared this BDAR on behalf of Samsung C&T Renewable Energy Australia Pty Ltd to assess the biodiversity impacts of the proposal using the BAM (DPE, 2020) as required under the *Biodiversity Conservation Act 2017.* The BESS proposal is classified as a State Significant Development as detailed in the Planning Systems SEPP.

In this BDAR, biodiversity impacts have been assessed through comprehensive mapping and assessment completed in accordance with the BAM. Using state vegetation mapping and on-ground vegetation stratification, one PCT was identified within the Subject Land and Development Footprint being:

- PCT 76 Western Grey Box tall grassy woodland on alluvial loam and play soils in the NSW South Western Slopes and Riverina Bioregion

PCT 76 meets the criteria for listing under the *BC Act (2016)* as a Threatened Ecological Community (TEC): *Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions*. It does not meet the criteria for the EPBC Act listed TEC *Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived native Grasslands of south-eastern Australia.*

Three threatened species were recorded in the Subject Land (species listed in **bold** are ecosystem credit species and do not generate credits):

- **Corben's Long-eared Bat (*Nyctophilus corbeni*)**
- Southern Myotis (*Myotis macropus*)
- **Yellow-bellied Sheathtail Bat (*Saccolaimus flaviventris*)**

The following species have presence assumed in the Road intersection at Riverina Highway and Canalla Road, as targeted surveys were unable to be undertaken in the correct survey period.:

- A spear-grass (*Austrostipa wakoolica*)
- Silky Swainson-pea (*Swainsona sericea*)
- Slender Darling Pea (*Swainsona murrayana*)
- Sloane's Froglet (*Crinia sloanei*)
- Southern Myotis (*Myotis macropus*)

One species has presence assumed; A spear-grass (*Austrostipa wakoolica*), in the southern half of the substation area within the development footprint as threatened flora surveys were not completed for this species within the added area of the development footprint.

Based on the above, the credit requirement has been defined in Table 12-1 and Table 12-2. Mitigation measures have been outlined to reduce the direct, indirect, and prescribed impacts to biodiversity. The credits will be retired in accordance with the Biodiversity Offset Scheme.

No species listed under the EPBC Act have been identified as having the potential to be significantly impacted by the development (Appendix C (C.7)). As such, the proposal is not considered to require offsets in accordance with the EPBC Act Offsets Policy.

Table 12-1 Ecosystem credit requirement

Zone ID	PCT ID	PCT name	Zone area (ha)	Vegetation integrity score	Ecosystem credits required
1	76_DG_poor	Western Grey Box tall grassy woodland on alluvial loam and play soils in the NSW South Western Slopes and Riverina Bioregion	3.55	14.6	0
2	76_DG_roadside_ Broockmanns Road	Western Grey Box tall grassy woodland on alluvial loam and play soils in the NSW South Western Slopes and Riverina Bioregion	0.74	12.8	0
3	76_DG_low	Western Grey Box tall grassy woodland on alluvial loam and play soils in the NSW South Western Slopes and Riverina Bioregion	2.90	21.4	31
4	Exotic	N/A	0.70	14.4	0
5	76_DG_roadside_ Riverina Highway	Western Grey Box tall grassy woodland on alluvial loam and play soils in the NSW South Western Slopes and Riverina Bioregion	1.11	15.3	9

Table 12-2 Species credit requirement

Species credit species	Impact area (ha)	BC Act listing	EPBC Act listing	Species credit required
A spear-grass (*Austrostipa wakoolica*)	2.2	E	E	21
Silky Swainson Pea (*Swainsona sericea*)	1.1	V	Not listed	9
Slender Darling Pea (*Swainsona murrayana*)	1.1	V	V	9
Sloane's Froglet (*Crinia sloanei*)	1.1	E	E	13
Southern Myotis (*Myotis macropus*)	4.2	V	Not listed	40

13. References

Baker-Gabb, D. (2011). *National Recovery Plan for the Superb Parrot Polytelis swainsonii.* Melbourne: Victoria State Government Department of Sustainability and Environment.

BioNet. (2025). Retrieved from BioNet Vegetation Classification: https://vegetation.bionet.nsw.gov.au/search/pctsearch.aspx

BioNet Atlas. (2025). Retrieved from BioNet Atlas: https://atlas.bionet.nsw.gov.au/UI_Modules/ATLAS_/AtlasSearch.aspx?who=a35a5c8c-512f-40e4-ad3f-e37214357799

Churchill, S. (2008). *Australian Bats.* Allen and Unwin.

Commonwealth of Australia. (2023). *Conservation Advice for stagonopleua guttata (Diamond firetail).* Canberra: Australian Government: Department of Climate Change, Energy, the Environment and Water.

DAWE. (2020). *Australia's IBRA bioregions and subregions*. Retrieved from Department of Climate Change, Energy, the Environment and Water: http://environment.gov.au/land/nrs/science/ibra/australias-bioregions-maps

DCCEEW. (2014). *Approved Conservation Advice for Austrostipa wakoolica (a spear grass).* Retrieved from https://www.environment.gov.au/biodiversity/threatened/species/pubs/66623-conservation-advice.pdf

DCCEEW. (2018). *Consultation Document on Listing Eligibility and Conservation Actions - Crinia sloanei (Sloane's froglet).* Retrieved from https://www.dcceew.gov.au/sites/default/files/env/consultations/a684dc2c-426a-4128-a177-5e92274bac20/files/consultation-document-crinia-sloanei.pdf

DCCEEW. (2021). *Directory of important wetlands in Australia*. Retrieved from Department of Climate Change, Energy, the Environment and Water: www.environment.gov.au/water/wetlands/australian-wetlands-database/directory-important-wetlands

DCCEEW. (2025). *Bionet: Threatened Biodiversity Database Collection*. Retrieved from https://atlaseditor.bionet.nsw.gov.au/Default.aspx

DCCEEW. (2025). *Register of Critical Habitat*. Retrieved from Species Profile and Threats Database: https://www.environment.gov.au/cgi-bin/sprat/public/publicregisterofcriticalhabitat.pl

DCCEEW. (2026). *Austrostipa wakoolica - SPRAT profile.* Retrieved from Species Profile and Threats Database: https://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=66623

DCCEEW. (2026). *Register of Critical Habitat.* Retrieved from https://environment.gov.au/cgi-bin/sprat/public/publicregisterofcriticalhabitat.pl

DCCEEW. (2026). *Swainsona murrayana — Slender Darling-pea, Slender Swainson, Murray Swainson-pea - SPRAT Profile.* Retrieved from https://environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=6765

DCCEEW cth. (2023). *Conservation Advice for Lophochroa leadbeateri leadbeateri (eastern Major Mitchell's cockatoo).* Canberra: Department of Climate Change, Energy, the Environment and Water.

DCCEEW cth. (2025, 04 07). *Hirundapus caudacutus - whtie-throated Needletail*. Retrieved from Species Profile and Threats Database: https://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=682

DCCEEW. (n.d.). *Protected matters search tool*. Retrieved from Department of Climate Change, Energy, the Environment and Water: www.environment.gov.au/epbc/protected-matters-search-tool

DCCEEW. (n.d.). *Species profile and threats database*. Retrieved from Department of Climate Change, Energy, the Environment and Water: http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl

DECCW. (2002). *Descriptions for NSW (Mitchell) Landscapes, Version 2*. Retrieved from Descriptions for NSW (Mitchell) Landscapes, Version 2: https://www.environment.nsw.gov.au/resources/conservation/landscapesdescriptions.pdf

Department of the Environment. (2015). *Draft referral guideline for 14 birds listed as migratory species under the EPBC Act.* Australian Government Department of the Environment.

DEWHA. (2008). *Approved Conservation Advice for Swainsona murrayana (Slender Darling-pea).* Retrieved from https://environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=6765

DPE. (2020). *The Biodiversity Assessment Method*. Retrieved from NSW Department of Planning and Environment: www.environment.nsw.gov.au/topics/animals-and-plants/biodiversity-offsets-scheme/accredited-assessors/biodiversity-assessment-method-2020

DPE. (2021). *NSW BioNet*. Retrieved from NSW Department of Planning and Environment: https://www.environment.nsw.gov.au/topics/animals-and-plants/biodiversity/nsw-bionet

DPE. (2023). *Determining native vegetation land categorisation for application in the Biodiversity Offset Scheme.* NSW Government.

DPE. (2025). *Help save Wakoolica grass.* Retrieved from https://savingourspecies.environment.nsw.gov.au/project/1172

DPE. (n.d.). *Search NSW Threatened Species Scientific Committee final determinations*. Retrieved from NSW Department of Planning and Environment: www.environment.nsw.gov.au/topics/animals-and-plants/threatened-species/nsw-threatened-species-scientific-committee/determinations/nsw-threatened-species-scientific-committee-final-determinations

DPI. (2020). *Managing Biosecurity Risks in the Land Use Planning and Development Guide.* Sydney: Biosecurity & Food Safety, NSW Department of Primary Industries.

DPI. (2020). *Managing Biosecurity Risks in the Land Use Planning and Development Guide.* Sydney: NSW Department of Primary Industries.

DPI. (2020). *NSW Survey Guide for Threatened Frogs: A guide for the survey of threatened frogs and their habitats for the Biodiversity Assessment Method .* Sydney: State of NSW and Department of Planning, Industry and Environment.

DPI. (n.d.). *Threatened species lists*. Retrieved from NSW Department of Primary Industries: www.dpi.nsw.gov.au/fishing/threatened-species/what-current

DPIE. (2019). *BioNet Vegetation Information System*. Retrieved from NSW Department of Planning, Industry and Environment: https://www.environment.nsw.gov.au/research/vegetationinformationsystem.htm

DPIE. (2020). *Biodiversity Assessment Method.* Sydney: State of NSW and Department of Planning, Industry and Environment.

DPIE. (2020). *Surveying threatened plants and their habitats.* Sydney: State of NSW Department of Planning, Industry and Environment.

DPIE. (2021). *'Species credit' threatened bats and their habitats .* Sydney: State of NSW and Department of Planning, Industry and Environment.

DPIE. (2021). *'Species credit' threatened bats and their habitats - NSW survey guide for the Biodiversity Assessment Method.* Department of Planning, Industry and Environment.

DSEWPC. (2012). *Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-Eastern Australia: A guide to the identification, assessment and management of a nationally threatened ecological community.* Canberra: Commonwealth of Australia Department of Sustainability, Environment, Water, Population and Communities.

eSpade. (2024). *NSW Soil and Land Information*. Retrieved from www.environment.nsw.gov.au/eSpade2WebApp#

eSpade. (n.d.). *NSW Soil and Land Information*. Retrieved from www.environment.nsw.gov.au/eSpade2WebApp#

Harper, M., McCarthy, A., van der Ree, R., & Fox, J. (2004). Overcoming bias in ground-based surveys of hollow-bearing trees using double-sampling. *Forest Ecology and Management*, 190: 2-3: 291-300.

Knight, A. (2013). *Sloane's Froglet, Crinia sloanei- Fact sheet.* Albury Conservation Company.

Knight, A. (2013). *Sloane's Froglet, Crinia sloanei, Albury Conservation Company, Albury.* Retrieved from https://www.alburyconservationco.org.au/wp-content/uploads/2013/07/Sloanes-Froglet-brochure.pdf

Knight, A. (2014). *Sloane's Froglet interim habitat guide and management recommendations.* Sydney: Office of Environment and Heritage. Retrieved from https://www.alburyconservationco.org.au/wp-content/uploads/2015/02/Sloanes-Froglet_Office-of-Enviroment-Herritage-A5-Booklet-A4_reduced-size.pdf

Knight, A., Watts, R., Allen, C., & McDonald, S. (2024). *Habitat features important for the conservation of the endangered Sloane's Froglet (Crinia sloanei) in peri-urban environments.* Wildlife Research. Retrieved from https://connectsci.au/wr/article/51/7/WR23032/41293/Habitat-features-important-for-the-conservation-of

Landcom. (2004). *Managing Urban Stormwater: Soils and construction - Volume 1.* Sydney: Landcom.

NSW DCCEEW. (2023, 12). NSW State Vegetation Type Map. NSW Government.

NSW DPE. (2008). *Sloane's Froglet (Crinia sloanei): Saving our Species strategy.* Retrieved from https://savingourspecies.environment.nsw.gov.au/project/1300

NSW DPE. (2022). *Corben's Long-eared Bat (Nyctophilus corbeni) Saving our Species strategy.* NSW DPE.

NSW DPE. (2025, 04 17). *Pink Cockatoo (Lophochroa leadbeateri) saving our species strategy*. Retrieved from NSW DPE Saving our Species strategy: https://savingourspecies.environment.nsw.gov.au/project/442

NSW DPIE. (2020). *Hygiene guidelines - Protocols to protect priority biodiversity areas in NSW from Phytophthora cinnamomi, myrtle rust, amphibian chytrid fungus and invasive plants.* NSW Government.

NSW DPIE. (2020). *Hygiene guidelines - Protocols to protect priority biodiversity areas in NSW from Phytophthora cinnamomi, myrtle rust, amphibian chytrid fungus and invasive plants.* Sydney: Environment, Energy and Science Department of Planning, Industry and Environment. Retrieved from https://www.environment.nsw.gov.au/sites/default/files/saving-our-species-hygiene-guidelines-200164.pdf

NSW Gov. (2021). *BAM Calculator*. Retrieved from NSW Government: www.lmbc.nsw.gov.au/bamcalc

NSW Gov. (n.d.). *Biodiversity values map and threshold tool*. Retrieved from NSW Government: www.lmbc.nsw.gov.au/Maps/index.html?viewer=BOSETMap

NSW National Parks and Wildlife Service. (2003). *The Bioregions of NSW, their biodiversity, conservation and history.* Canberra: Australian Government Department of Climate Change, Energy, the Environment and Water.

NSW OEH. (2025, 04 17). *Diamon Firetail - profile*. Retrieved from NSW Government Office of Environment & Heritage: https://threatenedspecies.bionet.nsw.gov.au/profile?id=10768

OEH. (2017). *Interim Grasslands and other Groundcover Assessment Method.* NSW Government.

OEH. (2017). *Interim Grasslands and other Groundcover Assessment Method Determining conservation value of grasslands and grouncover vegetation in NSW.* Office of Environment and Heritage.

OEH. (2025). *BioNet Threatened Biodiversity Database*. Retrieved from www.bionet.nsw.gov.au

OEH. (2025). *BioNet Vegetation Classification*. Retrieved from BioNet Vegetation Classification: https://vegetation.bionet.nsw.gov.au/search/pctsearch.aspx

OEH. (2025). *Threatened biodiversity profile search*. Retrieved from BioNet: https://threatenedspecies.bionet.nsw.gov.au/

OEH. (n.d.). *Threatened biodiversity profile search*. Retrieved from Office of Environment & Heritage: https://www.environment.nsw.gov.au/threatenedSpeciesApp/

PlantNET. (n.d.). *NSW flora online*. Retrieved from PlantNET: https://plantnet.rbgsyd.nsw.gov.au

SEED. (2021). *The central resource for sharing and enabling environmental data in NSW*. Retrieved from NSW Government: https://geo.seed.nsw.gov.au/Public_Viewer/index.html?viewer=Public_Viewer&locale=en-AU

SEED. (2022). *SEED the change: growing knowledge with NSW environmental data*. Retrieved from The central resource for sharing and enabling environmental data in NSW: www.seed.nsw.gov.au

SEED. (2025). *NSW State Vegetation Type Map.* Retrieved from https://datasets.seed.nsw.gov.au/dataset/nsw-state-vegetation-type-map

Thackway, R., & Cresswell, I. (1995). *An interim biogeographic regionalisation for Australia: A framework for establishing the national system of reserves, Version 4.0.* Canberra: Australian Nature Conservation Agency.

Threatened Species Scientific Committee. (2015). *conservation Advice Nyctophilus corben South-eastern Long-eared Bat.* Canberra: Department of the Environment.

Threatened Species Scientific Committee. (2019). *Conservation Advice - Crinia sloanei (Sloane's Froglet).* Canberra: Department of the Environment and Energy.

Threatened Species Scientific Committee. (2019). *Conservation Advice Hirundapus caudacutus White-throaded Needletail.* Canberra: Department of the Environment and Energy.

Threatened Species Scientific Committee. (2019). *Conservation Advice, Crinia sloanei (Sloane's Froglet).* Canberra: Department of the Environment and Energy.

Appendix A BDAR requirements compliance

Table A-1 Assessment of compliance with BDAR minimum information requirements

BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
Introduction	Chapters 2 and 3	Information	
		Introduction to the biodiversity assessment including:	–
		☒ brief description of the proposal	1.1
		☒ identification of subject land boundary, including: ☒ operational footprint ☒ construction footprint indicating clearing associated with temporary/ancillary construction facilities and infrastructure	1.1
		☒ general description of the subject land	1.1.3
		☒ sources of information used in the assessment, including reports and spatial data	1.5
		☒ identification and justification for entering the BOS	1.2
		Maps and tables	
		☒ Map of the subject land boundary showing the final proposal footprint, including the construction footprint for any clearing associated with temporary/ancillary construction facilities and infrastructure	Figure 1-1
Landscape	Sections 3.1 and 3.2, Appendix E	Information	

BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		Identification of site context components and landscape features, including:	–
		☒ general description of subject land topographic and hydrological setting, geology and soils	1.1.3
		☒ per cent native vegetation cover in the assessment area (as described in BAM Section 3.2)	2.1.2
		☒ IBRA bioregions and subregions (as described in BAM Subsection 3.1.3(2.))	3.2.1
		☒ rivers and streams classified according to stream order (as described in BAM Subsection 3.1.3(3.) and Appendix E)	3.2.2
		☒ wetlands within, adjacent to and downstream of the site (as described in BAM Subsection 3.1.3(3.))	3.2.2
		☒ connectivity of different areas of habitat (as described in BAM Subsection 3.1.3(5–6.))	3.2.3
		☒ karst, caves, crevices, cliffs, rocks and other geological features of significance and for vegetation clearing proposals, soil hazard features (as described in BAM Subsections 3.1.3(7.) and 3.1.3(12.))	3.2.4
		☒ areas of outstanding biodiversity value occurring on the subject land and assessment area (as described in BAM Subsection 3.1.3(8–9.))	3.2.5
		☒ any additional landscape features identified in any SEARs for the proposal	3.2.7
		☒ NSW (Mitchell) landscape on which the subject land occurs	3.2.6
		☒ details of field reconnaissance undertaken to confirm the extent and condition of landscape features and native vegetation cover (as described in Operational Manual Stage 1 Section 2.4)	2.1
		Maps and tables	

BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		☒ Site Map ☒ Property boundary ☒ Boundary of subject land ☒ Cadastre of subject land (including labelling of Lot and DP or section plan if relevant) ☒ Landscape features identified in BAM Subsection 3.1.3	Figure 1-1
		☒ Location Map ☒ Digital aerial photography at 1:1,000 scale or finer ☒ Boundary of subject land ☒ Assessment area (i.e. the subject land and either 1500 m buffer area or 500 m buffer for linear development) ☒ Landscape features identified in BAM Subsection 3.1.3 ☒ Additional detail (e.g. local government area boundaries) relevant at this scale	Figure 3-2
		Landscape features identified in BAM Subsection 3.1.3 and to be shown on the Site Map and/or Location Map include:	–
		☒ IBRA bioregions and subregions ☒ rivers, streams and estuaries ☒ wetlands and important wetlands ☒ connectivity of different areas of habitat ☒ karst, caves, crevices, cliffs, rocks and other geological features of significance and if required, soil hazard features ☒ areas of outstanding biodiversity value occurring on the subject land and assessment area	Figure 1-1 Figure 3-2

BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		☒ any additional landscape features identified in any SEARs for the proposal ☒ NSW (Mitchell) landscape on which the subject land occurs	
		Data	
		☐ All report maps as separate jpeg files	–
		Individual digital shape files of:	–
		☐ subject land boundary	–
		☐ assessment area (i.e. subject land and 1500 m buffer area) boundary	–
		☐ cadastral boundary of subject land	–
		☐ areas of native vegetation cover	–
		☐ landscape features	–
Native vegetation	Chapter 4, Appendix A and Appendix H	Information	
		☒ Identify native vegetation extent within the subject land, including cleared areas and evidence to support differences between mapped vegetation extent and aerial imagery (as described in BAM Section 4.1(1–3.) and Subsection 4.1.1)	4.1 Figure 3-2
		☒ Provide justification for all parts of the subject land that do not contain native vegetation (as described in BAM Subsection 4.1.2)	4.1.2

BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		☒ Review of existing information on native vegetation including references to previous vegetation maps of the subject land and assessment area (described in BAM Section 4.1(3.) and Subsection 4.1.1)	2.2.2
		☒ Describe the systematic field-based floristic vegetation survey undertaken in accordance with BAM Section 4.2	2.2.3
		☐ Where relevant, describe the use of more appropriate local data, provide reasons that support the use of more appropriate local data and include the written confirmation from the decision-maker that they support the use of more appropriate local data (as described in BAM Subsection 1.4.2 and Appendix A)	5.5
		For each PCT within the subject land, describe:	–
		☒ PCT name and ID	4.2.2
		☒ vegetation class	4.2.2
		☒ extent (ha) within subject land	4.2.2
		☒ evidence used to identify a PCT including any analyses undertaken, references/sources, existing vegetation maps (BAM Section 4.2(1–3.))	4.2.2
		☒ plant species relied upon for identification of the PCT and relative abundance of each species	4.2.2
		☒ if relevant, TEC status including evidence used to determine vegetation is the TEC (BAM Subsection 4.2.2(1–2.))	4.3
		☒ estimate of per cent cleared value of PCT (BAM Subsection 4.2.1(5.))	4.2
		Describe the vegetation integrity assessment of the subject land, including:	–

BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		☒ identification and mapping of vegetation zones (as described in BAM Subsection 4.3.1)	4.4 Figure 4-5
		☒ description of vegetation zones within the subject land (as described in Operational Manual Stage 1 Table 2 and Subsection 3.3.2)	4.2.2 4.4
		☒ area (ha) of each vegetation zone	4.4
		☒ assessment of patch size (as described in BAM Subsection 4.3.2)	4.4
		☒ survey effort (i.e. number of vegetation integrity survey plots) as described in BAM Subsection 4.3.4(1–2.)	4.5
		☒ use of relevant benchmark data from BioNet Vegetation Classification (as described in BAM Subsection 4.3.3(5.))	4.5
		Where use of more appropriate local benchmark data is proposed (as described in BAM Subsection 1.4.2, BAM Subsection 4.3.3(5.) and BAM Appendix A):	–
		☒ identify the PCT or vegetation class for which local benchmark data will be applied ☒ identify published sources of local benchmark data (if benchmarks obtained from published sources) ☒ describe methods of local benchmark data collection (if reference plots used to determine local benchmark data)	4.5
		☒ provide justification for use of local data rather than BioNet Vegetation Classification benchmark values	4.5
		☒ provide written confirmation from the decision-maker that they support the use of local benchmark data	4.5

BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		Maps and tables	
		☒ Map of native vegetation extent within the subject land at scale not greater than 1:10,000 including identification of all areas of native vegetation including areas that are ground cover only, cleared areas (as described in BAM Section 4.1(1–3.)) and all parts of the subject land that do not contain native vegetation (BAM Subsection 4.1.2)	Figure 4-5
		☒ Map of PCTs within the subject land (as described in BAM Section 4.2(1.))	Figure 4-5
		☒ Map of vegetation zones within the subject land (as described in BAM Subsection 4.3.1)	Figure 4-5
		☒ Map the location of floristic vegetation survey plots and vegetation integrity survey plots relative to PCT boundaries	Figure 4-5
		☒ Map of TEC distribution on the subject land and table of TEC listing, status and area (ha)	Figure 4-5
		☒ Map of patch size locations for each native vegetation zone and table of patch size areas (as described in BAM Subsection 4.3.2)	Figure 4-5 Table 4-4
		Table of current vegetation integrity scores for each vegetation zone within the site and including:	–
		☒ composition condition score ☒ structure condition score ☒ function condition score ☒ presence of hollow bearing trees	Table 4-5
		Data	
		☐ All report maps as separate jpeg files	–

BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		☐ Plot field data (MS Excel format)	
		☐ Plot field datasheets	<Appendix D.1>
		Digital shape files of:	–
		☐ PCT boundaries within subject land	–
		☐ TEC boundaries within subject land	–
		☐ vegetation zone boundaries within subject land	–
		☐ floristic vegetation survey and vegetation integrity plot locations	–
Threatened species	Chapter 5	Information	
		Identify ecosystem credit species likely to occur on the subject land, including:	–
		☒ list of ecosystem credit species derived from the BAM-C (as described in BAM Subsection 5.1.1 and Section 5.2(1.))	5.1.1
		☒ justification and supporting evidence for exclusion of any ecosystem credit species based on geographic limitations, habitat constraints or vagrancy (as described in BAM Subsections 5.2.1 and 5.2.2)	5.1.1
		☒ justification for addition of any ecosystem credit species to the list	5.1.1
		Identify species credit species likely to occur on the subject land, including:	–
		☒ list of species credit species derived from the BAM-C (as described in BAM Subsection 5.1.1)	5.1.2

BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		☒ justification and supporting evidence for exclusions based on geographic limitations, habitat constraints or vagrancy (as described in BAM Subsections 5.2.1 and 5.2.2)	5.1.2
		☒ justification and supporting evidence for exclusions based on degraded habitat constraints and/or microhabitats on which the species depends (as described in BAM Subsection 5.2.2)	5.1.2
		☒ justification for addition of any species credit species to the list	5.1.2
		From the list of candidate species credit species, identify:	–
		☒ species assumed present within the subject land (if relevant) (as described in BAM Subsection 5.2.4(2.a.)) ☒ species present within the subject land on the basis of being identified on an important habitat map for a species (as described in BAM Subsection 5.2.4(2.d.)) ☒ species for which targeted surveys are to be completed to determine species presence (BAM Subsection 5.2.4(2.b.)) ☒ species for which an expert report is to be used to determine species presence (BAM Subsection 5.2.4(2.c.))	Table 5-2 Table 5-3
		Present the outcomes of species credit species assessments from:	–
		☒ threatened species survey (as described in BAM Section 5.2.4)	Table 5-6 Table 5-7
		☒ expert reports (if relevant) including justification for presence of the species and information used to make this determination (as described in BAM Subsection 5.2.4, Section 5.3, Box 3)	5.4
		Where survey has been undertaken include detailed information on:	–
		☒ survey method and effort (as described in BAM Section 5.3)	Table 5-6 Table 5-7

BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		☒ justification of survey method and effort (e.g. citation of peer-reviewed literature) if approach differs from the department's taxa-specific survey guides or where no relevant guideline has been published	5.3
		☒ timing of survey in relation to requirements in the TBDC or the department's taxa-specific survey guides. Where survey was undertaken outside these guides include justification for the timing of surveys	5.3 Table 5-6 Table 5-7
		☒ survey personnel and relevant experience	Page i
		☒ describe any limitations to surveys and how these were addressed/overcome	5.3
		Where an expert report has been used in place of survey (as described in BAM Section 5.3, Box 3), include:	–
		☒ justification of the use of an expert report ☒ identify the expert, provide evidence of their expert credentials and departmental approval of expert status ☒ all requirements of Box 3 have been addressed in the expert report	5.4
		Where use of local data is proposed (BAM Subsection 1.4.2):	–
		☒ identify relevant species ☒ identify data to be amended ☒ identify source of information for local data, e.g. published literature, additional survey data, etc. ☒ justify use of local data in preference to VIS Classification or TBDC data	5.5
		☒ provide written confirmation from the decision-maker that they support the use of local data	5.5

BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		Species polygon completed for species credit species present within the subject land (assumed present or determined on the basis of survey, expert report or important habitat map) ensuring that:	–
		☒ the unit of measure for each species is documented	Table 5-8
		for species assessed by area:	–
		☒ the polygon includes the extent of suitable habitat for the target species within the subject land (as described in BAM Subsection 5.2.5)	Figure 5-3
		☒ a description of, and evidence-based justification for, the habitat constraints, features or microhabitats used to map the species polygon including reference to information in the TBDC for that species and any buffers applied	5.5.1
		for species assessed by counts of individuals:	–
		☒ the number of individual plants present on the subject land (as described in BAM Subsection 5.2.5(3.))	5.5.1
		☒ the method used to derive this number (i.e. threatened species survey or expert report) and evidence-based justification for the approach taken	5.5.1
		☒ the polygon includes all individuals located on the subject land with a buffer of 30 m around the individuals or groups of individuals on the subject land	Figure 5-3
		☒ Identify the biodiversity risk weighting for each species credit species identified as present within the subject land (as described in BAM Section 5.4)	Table 10-3
		Maps and tables	
		☒ Table showing ecosystem credit species in accordance with BAM Subsection 5.1.1, and identifying:	Table 5-1

BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		☒ the ecosystem credit species removed from the list	Table 5-1
		☒ the sensitivity to gain class of each species	Table 5-1
		☒ Table detailing species credit species in accordance with BAM Section 5.2 and identifying:	Table 5-2 Table 5-3
		☒ the species credit species removed from the list of species because the species is considered vagrant, out of geographic range or the habitat or microhabitat features are not present	Table 5-2 Table 5-3
		☒ the candidate species credit species not recorded on the subject land as determined by targeted survey, expert report or important habitat map	Table 5-4 Table 5-5
		☒ Table detailing species credit species recorded or assumed as present within the subject land, habitat constraints or microhabitats associated with the species, counts of individuals (flora)/extent of suitable habitat (flora and fauna) (as described in BAM Subsection 5.2.6) and biodiversity risk weighting (BAM Section 5.4)	Table 5-8
		☒ Map indicating the GPS coordinates of all individuals of each species recorded within the subject land and the species polygon for each species (as described in BAM Subsection 5.2.5)	Figure 5-3
		Data	
		☐ Digital shape files of suitable habitat identified for survey for each candidate species credit species	–
		☐ Survey locations including GPS coordinates of any plots, transects, grids	
		☐ Digital shape files of each species polygon including GPS coordinates of located individuals	–
		☐ Species polygon map in jpeg format	–

BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		☐ Expert reports and any supporting data used to support conclusions of the expert report	
		☐ Field datasheets detailing survey information including prevailing conditions, date, time, equipment used, etc.	
Prescribed impacts	Chapter 6	Information	
		Identify potential prescribed biodiversity impacts on threatened entities, including:	–
		☒ karst, caves, crevices, cliffs, rocks and other geological features of significance (as described in BAM Subsection 6.1.1) ☒ occurrences of human-made structures and non-native vegetation (as described in BAM Subsection 6.1.2) ☒ corridors or other areas of connectivity linking habitat for threatened entities (as described in BAM Subsection 6.1.3) ☒ waterbodies or any hydrological processes that sustain threatened entities (as described in BAM Subsection 6.1.4)	Table 6-1
		☐ protected animals that may use the proposed wind farm development site as a flyway or migration route (as described in BAM Subsection 6.1.5)	N/A
		☒ where the proposed development may result in vehicle strike on threatened fauna or on animals that are part of a threatened ecological community (as described in BAM Subsection 6.1.6)	Table 6-1
		☒ Identify a list of threatened entities that may be dependent upon or may use habitat features associated with any of the prescribed impacts	Table 6-1Table 8-4
		☒ Describe the importance of habitat features to the species including, where relevant, impacts on life cycle or movement patterns (e.g. Subsection 6.1.3)	6Table 8-4

BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		Where the proposed development is for a wind farm:	–
		☐ identify a candidate list of protected animals that may use the development site as a flyway or migration route, including: resident threatened aerial species, resident raptor species and nomadic and migratory species that are likely to fly over the proposal area (as described in BAM Subsection 6.1.5)	N/A
		☐ provide details of targeted survey for candidate species of wind farm developments undertaken in accordance with BAM Subsection 6.1.5(2–3.)	N/A
		☐ predict the habitual flight paths for nomadic and migratory species likely to fly over the subject land and map the likely habitat for resident threatened aerial and raptor species (BAM Subsection 6.1.5(4.))	N/A
		Where the proposal may result in vehicle strike:	–
		☒ identify a list of threatened fauna or protected fauna species that are part of a TEC and at risk of vehicle strike due to the proposal	Table 6-1 Table 6-2
		Maps and tables	
		☐ Map showing location of any prescribed impact features (i.e. karst, caves, crevices, cliffs, rocks, human-made structures, etc.)	N/A
		☐ Map showing location of potential vehicle strike locations	N/A
		☐ Maps of habitual flight paths for nomadic and migratory species likely to fly over the site and maps of likely habitat for threatened aerial species resident on the site (for wind farm developments only)	N/A
		Data	

BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		☐ Digital shape files of prescribed impact feature locations	–
		☐ Prescribed impact features map in jpeg format	–
Avoid and minimise impacts	Chapter 7	Information	
		Demonstration of efforts to avoid and minimise impacts on biodiversity values (including prescribed impacts) associated with the proposal location in accordance with Chapter 7, including an analysis of alternative:	–
		☒ modes or technologies that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed mode or technology	7.1 7.2
		☒ routes that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed route	7.1 7.2
		☒ alternative locations that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed location	7.1 7.2
		☒ alternative sites within a property on which the proposal is located that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed site	7.1 7.2
		☒ Describe efforts to avoid and minimise impacts (including prescribed impacts) to biodiversity values through proposal design (as described in BAM Sections 7.1 and 7.2)	7.1 7.2
		☒ Identification of any other site constraints that the proponent has considered in determining the location and design of the proposal (as described in BAM Subsection 7.2.1(3.))	7
		☒ Detail measures or options considered but not implemented because they are not feasible and/or practical (e.g. due to site constraints)	7.3

BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		Maps and tables	
		☒ Table of measures to be implemented to avoid and minimise the impacts of the proposal, including action, outcome, timing and responsibility	Table 8-6
		☐ Map of alternative footprints considered to avoid or minimise impacts on biodiversity values; and of the final proposal footprint, including construction and operation	N/A
		☐ Maps demonstrating indirect impact zones where applicable	N/A
		Data	
		Digital shape files of:	–
		☐ alternative and final proposal footprint	–
		☐ direct and indirect impact zones	–
		☐ Maps in jpeg format	–
Assessment of impacts	Chapter 8, Sections 8.1 and 8.2	Information	
		☒ Determine the impacts on native vegetation and threatened species habitat, including a description of direct impacts of clearing of native vegetation, threatened ecological communities and threatened species habitat (as described in BAM Section 8.1)	Table 8 1
		Assessment of indirect impacts on vegetation and threatened species and their habitat including (as described in BAM Section 8.2):	–

BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		☒ description of the nature, extent, frequency, duration and timing of indirect impacts of the proposal	Table 8-3
		☒ documenting the consequences to vegetation and threatened species and their habitat including evidence-based justifications	8.2
		☒ reporting any limitations or assumptions, etc. made during the assessment	8.2
		☒ identification of the threatened entities and their habitat likely to be affected	8.2
		Assessment of prescribed biodiversity impacts (as described in BAM Section 8.3) including:	–
		assessment of the nature, extent frequency, duration and timing of impacts on the habitat of threatened species or ecological communities associated with:	–
		☐ karst, caves, crevices, cliffs, rocks and other features of geological significance	N/A
		☐ human-made structures	N/A
		☒ non-native vegetation	8.3
		☒ connectivity of different areas of habitat of threatened species that facilitates the movement of those species across their range	8.3
		☒ movement of threatened species that maintains their life cycle	8.3
		☒ water quality, waterbodies and hydrological processes that sustain threatened species and threatened ecological communities	8.3
		☐ assessment of the impacts of wind turbine strikes on protected animals	N/A

BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		☐ assessment of the impacts of vehicle strikes on threatened species of animals or on animals that are part of a TEC	N/A
		☒ evaluate the consequences of prescribed impacts	8.3
		☒ describe impacts that are uncertain	8.3
		☒ document limitations to data, assumptions and predictions	8.3
		Maps and tables	
		☒ Table showing change in vegetation integrity score for each vegetation zone as a result of identified impacts	Table 8-2
		Data	
		N/A	–
Mitigation and management of impacts	Chapter 8, Sections 8.4 and 8.5	Information	
		Identification of measures to mitigate or manage impacts in accordance with the recommendations in BAM Sections 8.4 and 8.5 including:	–
		☒ techniques, timing, frequency and responsibility ☒ identify measures for which there is risk of failure ☒ evaluate the risk and consequence of any residual impacts	Table 8-5
		☒ document any adaptive management strategy proposed	Table 8-6

BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		Identification of measures for mitigating impacts related to:	–
		☒ displacement of resident fauna (as described in BAM Subsection 8.4.1(2.)) ☒ indirect impacts on native vegetation and habitat (as described in BAM Subsection 8.4.1(3.)) ☒ mitigating prescribed biodiversity impacts (as described in BAM Subsection 8.4.2)	8.4
		☒ Details of the adaptive management strategy proposed to monitor and respond to impacts on biodiversity values that are uncertain (BAM Section 8.5)	Table 8-6
		Maps and tables	
		☒ Table of measures to be implemented before, during and after construction to mitigate and manage impacts of the proposal, including action, outcome, timing and responsibility	Table 8-5
		Data	
		N/A	–
Impact summary	Chapter 9	Information	
		Identification and assessment of impacts on TECs and threatened species that are at risk of a serious and irreversible impacts (SAII, in accordance with BAM Section 9.1) including:	–
		☐ addressing all criteria in Subsection 9.1.1 for each TEC listed as at risk of an SAII present on the subject land	N/A
		☐ for each TEC, report the extent of the TEC in NSW	N/A
		☒ addressing all criteria in Subsection 9.1.2 for each threatened species at risk of an SAII present on the subject land	9.1

BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		☒ for each threatened species, report the population size in NSW	9.1
		☒ documenting assumptions made and/or limitations to information ☒ documenting all sources of data, information, references used or consulted ☒ clearly justifying why any criteria could not be addressed	9.1
		☒ Identification of impacts requiring offset in accordance with BAM Section 9.2	Table 10-2 Table 10-3
		☒ Identification of impacts not requiring offset in accordance with BAM Subsection 9.2.1(3.)	Table 10-1
		☒ Identification of areas not requiring assessment in accordance with BAM Section 9.3	Table 10-4
		Maps and tables	
		☐ Map showing the extent of TECs at risk of an SAII within the subject land	N/A
		☒ Map showing location of threatened species at risk of an SAII within the subject land	Figure 9-1
		Map showing location of:	–
		☒ impacts requiring offset	Figure 5-3 Figure 10-1
		☒ impacts not requiring offset	Figure 5-3 Figure 10-1
		☒ areas not requiring assessment	Figure 5-3 Figure 10-1

BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		Data	
		Digital shape files of:	–
		☐ extent of TECs at risk of an SAII within the subject land	–
		☐ location of threatened species at risk of an SAII within the subject land	–
		☐ boundary of impacts requiring offset	–
		☐ boundary of impacts not requiring offset	–
		☐ boundary of areas not requiring assessment	–
		☐ Maps in jpeg format	–
Impact summary	Chapter 10	Information	
		Ecosystem credits and species credits that measure the impact of the development on biodiversity values, including:	–
		☒ future vegetation integrity score for each vegetation zone within the subject land (Equation 25 and Equation 26 in BAM Appendix H) ☒ change in vegetation integrity score (BAM Subsection 8.1.1) ☒ number of required ecosystem credits for the direct impacts of the proposal on each vegetation zone within the subject land (BAM Subsection 10.1.2)	Table 8-2 Table 11-1
		☒ biodiversity risk weighting for each	Table 10-2 Table 10-3
		☒ number of required species credits for each candidate threatened species that is directly impacted on by the proposal (BAM Subsection 10.1.3)	Table 12-2

BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		Maps and tables	
		☒ Table of PCTs requiring offset and the number of ecosystem credits required	Table 12-1
		☒ Table of threatened species requiring offset and the number of species credits required	Table 12-2
		Data	
		☐ Submitted proposal in the BAM Calculator	–
Biodiversity credit report	Chapter 10	Information	
		☒ Description of credit classes for ecosystem credits and species credits at the development or clearing site or land to be biodiversity certified (BAM Section 10.2)	Table 11-1 Table 11-2
		☒ BAM credit report in pdf format	Appendix E
		Maps and tables	
		☒ Table of credit class and matching credit profile	Table 11-1 Table 11-2
		Data	
		☒ BAM credit report in pdf format	Appendix E

Appendix B 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: 15-May-2025

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	5
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	5
Listed Threatened Species:	37
Listed Migratory Species:	8

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Lands:	5
Commonwealth Heritage Places:	None
Listed Marine Species:	16
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

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

State and Territory Reserves:	None
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	4
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar Wetlands)		[Resource Information]
Ramsar Site Name	Proximity	Buffer Status
Banrock station wetland complex	400 - 500km upstream from Ramsar site	In feature area
Hattah-kulkyne lakes	200 - 300km upstream from Ramsar site	In feature area
Nsw central murray state forests	10 - 20km upstream from Ramsar site	In feature area
Riverland	400 - 500km upstream from Ramsar site	In feature area
The coorong, and lakes alexandrina and albert wetland	500 - 600km upstream from Ramsar site	In feature area

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
Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions	Endangered	Community may occur within area	In feature area
Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	Endangered	Community likely to occur within area	In feature area
Natural Grasslands of the Murray Valley Plains	Critically Endangered	Community likely to occur within area	In feature area
Weeping Myall Woodlands	Endangered	Community may occur within area	In feature area
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 may occur within area	In feature area
Aphelocephala leucopsis Southern Whiteface [529]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Climacteris picumnus victoriae Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat likely 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 may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Lathamus discolor			
Swift Parrot [744]	Critically Endangered	Species or species habitat may occur within area	In feature area
Lophochroa leadbeateri leadbeateri			
Major Mitchell's Cockatoo (eastern), Eastern Major Mitchell's Cockatoo, Pink Cockatoo (eastern) [82926]	Endangered	Species or species habitat may occur within area	In feature area
Melanodryas cucullata cucullata			
South-eastern Hooded Robin, Hooded Robin (south-eastern) [67093]	Endangered	Species or species habitat likely to occur within area	In feature area
Neophema chrysostoma			
Blue-winged Parrot [726]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Pedionomus torquatus			
Plains-wanderer [906]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Polytelis swainsonii			
Superb Parrot [738]	Vulnerable	Species or species habitat known to occur within area	In feature area
Rostratula australis			
Australian Painted Snipe [77037]	Endangered	Species or species habitat known 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
CRUSTACEAN			
Euastacus armatus			
Murray Crayfish [81537]	Vulnerable	Species or species habitat may occur within area	In feature area
FISH			
Galaxias rostratus			
Flathead Galaxias, Beaked Minnow, Flat-headed Galaxias, Flat-headed Jollytail, Flat-headed Minnow [84745]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Macquaria australasica			
Macquarie Perch [66632]	Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
FROG			
Crinia sloanei			
Sloane's Froglet [59151]	Endangered	Species or species habitat may occur within area	In feature area
Litoria raniformis			
Southern Bell Frog, Growling Grass Frog, Green and Golden Frog, Warty Swamp Frog, Golden Bell Frog [1828]	Vulnerable	Species or species habitat may occur within area	In feature area
MAMMAL			
Nyctophilus corbeni			
Corben's Long-eared Bat, South-eastern Long-eared Bat [83395]	Vulnerable	Species or species habitat may occur within area	In feature area
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 likely to occur within area	In feature area
Pteropus poliocephalus			
Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
PLANT			
Amphibromus fluitans			
River Swamp Wallaby-grass, Floating Swamp Wallaby-grass [19215]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Austrostipa wakoolica			
[66623]	Endangered	Species or species habitat known to occur within area	In feature area
Brachyscome muelleroides			
Mueller Daisy [15572]	Vulnerable	Species or species habitat may occur within area	In feature area
Lepidium aschersonii			
Spiny Peppercress [10976]	Vulnerable	Species or species habitat may occur within area	In feature area
Lepidium monoplocoides			
Winged Pepper-cress [9190]	Endangered	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Maireana cheelii			
Chariot Wheels [8008]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Sclerolaena napiformis			
Turnip Copperburr [11742]	Endangered	Species or species habitat likely to occur within area	In feature area
Senecio macrocarpus			
Large-fruit Fireweed, Large-fruit Groundsel [16333]	Vulnerable	Species or species habitat may occur within area	In feature area
Swainsona murrayana			
Slender Darling-pea, Slender Swainson, Murray Swainson-pea [6765]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Swainsona plagiotropis			
Red Darling-pea, Red Swainson-pea [10804]	Vulnerable	Species or species habitat may occur within area	In feature area
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

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 may occur within area	In feature area
Motacilla flava			
Yellow Wagtail [644]		Species or species habitat may occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos			
Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris acuminata			
Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Calidris ferruginea			
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to 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

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
Commonwealth Trading Bank of Australia		
Commonwealth Land - Commonwealth Trading Bank of Australia [15239]	NSW	In buffer area only
Communications, Information Technology and the Arts - Telstra Corporation Limited		
Commonwealth Land - Australian Telecommunications Commission [15241]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [15359]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [15240]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [15358]	NSW	In buffer area only

Listed Marine Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos			
Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
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 likely to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to 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 likely to occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat may occur within area overfly marine area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat may occur within area overfly marine area	In feature area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	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 known to occur within area overfly marine area	In feature area

Extra Information

EPBC Act Referrals				[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed	In feature area
Logie Brae Stormwater Escape Channel	2000/65	Not Controlled Action	Completed	In buffer area only
Not controlled action (particular manner)				
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval	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.

Department of Climate Change, Energy, the Environment and Water
GPO Box 3090
Canberra ACT 2601 Australia
+61 2 6274 1111

Appendix C Matters of national environmental significance

C.1 Protected matters search report

An EPBC Act Protected Matters Report was generated on 16/04/2025 to identify Matters of National Environmental Significance (MNES) that have the potential to occur within 10 km of the Subject Land (Appendix B). Those relevant to this BDAR include:

- Threatened species
- Threatened ecological communities
- Migratory species

The potential for these MNES to occur at the site is discussed below.

C.2 Summary of habitat in the Subject Land

The Subject Land is dominated by paddocks and contains some roadside vegetation, waterways and infrastructure. The paddocks contain some native grasses, forbs and sedges, but mostly a high cover of exotic species. These areas have a history of agricultural use, are degraded, and lack habitat complexity. Aquatic habitat consists of a farm dam and an irrigation channel, both of which lack aquatic vegetation. There is no rocky habitat, shrub layer, canopy layer, deadwood or scattered trees within the Subject Land.

C.3 Ramsar wetlands of international importance

The EPBC Act Protected Matters Report identified the following five Ramsar Wetlands of International Importance downstream of the Subject Land:

- NSW Central Murray State Forests, 10 – 20 km downstream of search area (Subject Land and 10 km buffer)
- Hattah-Kulkyne Lakes, 200 – 300 km downstream
- Banrock Station Wetland Complex, 400 – 500 km downstream
- Riverland, 400 – 500 km downstream
- The Coorong, and Lakes Alexandrina and Albert Wetland, 500 – 600 km downstream

The closest Ramsar Wetland of International Importance is the NSW Central Murray State Forests, approximately 10 – 20 km downstream of the search area, and approximately 30 km south-west downstream of the Subject Land. There is no apparent connectivity between this Ramsar wetland and the Development Footprint, and the remaining four wetlands are considered too far downstream to influence or be influenced by the development.

C.4 Threatened ecological communities (TECs)

The EPBC Act Protected Matters Report identified five Threatened Ecological Communities:

- Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions – Endangered
- Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia – Endangered
- Natural Grasslands of the Murray Valley Plains – Critically Endangered
- Weeping Myall Woodlands – Endangered

- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland – Critically Endangered.

The site assessment and flora surveys determined that none of these EPBC listed TECs occur within the Subject Land.

C.5 Threatened species

The EPBC Act Protected Matters Report identified 37 threatened species with the potential to occur within the search area. The full list of species is provided the PMST report in Appendix B. Of these species, nine were identified by the BAM-C and habitat assessment as having the potential to utilise habitat found within the Development Footprint:

Fauna

- Corben's long-eared Bat – Vulnerable,
- Diamond Firetail – Vulnerable,
- Grey Falcon – Vulnerable,
- Pink Cockatoo – Endangered,
- Sloane's Froglet – Endangered,
- Superb Parrot – Vulnerable,
- White throated Needletail – Vulnerable.

Flora

- *Swainsona murrayana* – Vulnerable
- *Austrostipa wakoolica* - Endangered

Targeted surveys were undertaken for Sloane's Froglet, *Swainsona murrayana* and *Austrostipa wakoolica* and were not detected, however the additional area added to the footprint at the intersection of Canalla Road and Riverina Highway was not surveyed. An Assessment of Significance (AoS) under the EPBC Act was undertaken for consideration of impacts to this area. Detailed assessment in the form of an Assessment of Significance (AoS) under the EPBC Act was also undertaken for the remaining six species (Appendix C.7.) The AoS concluded the proposal is unlikely to have a significant impact on any of these species, due to the low probability of presence, planned mitigation measures and offsetting of potential impacts.

C.6 Migratory species

The EPBC Act Protected Matters Report identified eight listed migratory species with the potential to occur within the search area. The full list of species is provided in the PMST report in Appendix B. None of these species are considered likely to utilise habitat found within the Development Footprint.

C.7 Assessment of Significance

C7.1 Critically endangered and endangered species

A Spear-grass (*Austrostipa wakoolica*) – Endangered
An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility that it will: • **lead to a long-term decrease in the size of a population**
The MNES Significant impact guidelines 1.1 states that an 'population of a species' is defined under the EPBC Act as an occurrence of the species in a particular area. In relation to endangered species, occurrences include but are not limited to: • a geographically distinct regional population, or collection of local populations, or • a population, or collection of local populations, that occurs within a particular bioregion. The presence of *Austrostipa wakoolica* in the subject land has been assumed based on the presence of associated PCTs in the BAM-C. There are no known records within the subject land. Targeted surveys have not yet been undertaken in additional areas. This species has a very limited distribution, confined to floodplains of Murray River tributaries, of central-western and south-western NSW. *Austrostipa wakoolica* grows in open woodland, on grey silty clay or sandy loam soils (DCCEEW, 2014). Despite the presence of potential suitable habitat, there are no known records or existing populations of the species within the project area. The closest documented occurrences (five in total) are located within 10 km of the site, with the closest one being approximately 5.5km south-east of the site (BioNet, 2025). Although no targeted surveys have been undertaken within the additional areas, the area of impact occurs within highly modified and regularly disturbed vegetation. The roadside derived grassland along Riverina Highway consists of slashed and mown table drains and road reserves with disturbed groundcover and scattered native grasses and forbs. The additional area of poor-condition derived grassland south of Broockmanns road has been historically cleared and is heavily grazed by sheep and mown for fire management, resulting in the absence of a canopy or shrub layer, as well as groundcover dominated by regenerating native forbs and grasses mixed with a high cover of exotic annual species. Given the long-term history, reduced structural complexity and degraded habitat condition across both areas, **the proposed project is unlikely to lead to a long-term decrease in the size of an *Austrostipa wakoolica* population.**
• **reduce the area of occupancy of the species**
As part of the proposal, the area of impact containing potential habitat for this species comprises 2.2 ha of PCT 76. This includes both roadside derived grassland and poor-condition derived grassland, characterised by long-term slashing, mowing and heavy grazing, resulting in a highly disturbed groundcover with only scattered native species remaining. In the surrounding locality, State Vegetation Type Mapping (SEED, 2025) indicates that the landscape is predominantly mapped as PCT 0, with only small, scattered patches of PCT 76 occurring throughout the area. Records of the species in the locality are associated with these intact patches of PCT 76, none of

A Spear-grass (*Austrostipa wakoolica*) – Endangered
which are being removed by the proposal. In contrast, the 2.2 ha of PCT 76 within the subject land comprises highly degraded roadside and paddock-based derived grassland that has been repeatedly slashed, mown and grazed, resulting in a simplified structure and dominance of exotic species. Due to the degraded condition of grassland in the development footprint and subject land, it is unlikely that suitable habitat would appropriately support the occupancy of this species. This also considers current land use which includes pastoral development and stock, resulting in grazing pressure and presence of exotic grasses and weeds. This species does not tolerate disturbance, requiring sites that are protected from the impacts of herbivore (DCCEEW, 2014). No individuals or population of this species have been observed in the subject land. Considering these factors, the **proposed project is not likely to significantly reduce the area of occupancy of the species.**
• **fragment an existing population into two or more populations**
There are no known or existing populations of this species within the project area, however there are five records located within 10km, to the southeast of the site. These records are located within small, scattered patches of PCT 76, meaning any population of the species is already highly fragmented. Additionally, due to the degraded condition of vegetation along Riverina Hwy and south of Broockmanns Road, as well as current grazing pressure, it is unlikely that suitable habitat would appropriately support a population of this species. Therefore, **the project is unlikely to cause fragmentation of any populations of this species**.
• **adversely affect habitat critical to the survival of a species**
The MNES Significant impact guidelines 1.1 states 'Habitat critical to the survival of a species or ecological community' refers to areas that are necessary: • for activities such as foraging, breeding, roosting, or dispersal • for the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators) • to maintain genetic diversity and long-term evolutionary development, or • for the reintroduction of populations or recovery of the species or ecological community. Such habitat may be but is not limited to: habitat identified in a recovery plan for the species or ecological community as habitat critical for that species or ecological community; and/or habitat listed on the Register of Critical Habitat maintained by the minister under the EPBC Act. No habitat critical to the survival of this species is listed in its Approved Conservation Advice, or on the Register of Critical Habitat (DCCEEW, 2014). There is no existing recovery plan for this species (DCCEEW, 2026). Due to the degraded and disturbed condition of vegetation along both Riverina Hwy and south of Broockmanns Road, current grazing pressure and general agricultural activities, it is unlikely that the Subject Land would appropriately support the occupancy of this species. This development footprint is not considered critical habitat for this species. Therefore, **the project would not adversely affect habitat critical to the survival of this species.**
• **disrupt the breeding cycle of a population**

A Spear-grass (*Austrostipa wakoolica*) – Endangered
There are no known or existing populations of this species within the subject land. *Austrostipa wakoolica* flowers in response to rain and has been recorded flowering from October to December (DCCEEW, 2014) Dispersal of seed is predominantly via wind, rain and flood events, where the awn and sharp point of the floret enable the seed to be buried into the soil (DCCEEW, 2014). Due to the degraded and disturbed condition of vegetation along both Riverina Hwy and south of Broockmanns Road, current grazing pressure and general agricultural activities, it is unlikely that suitable habitat would appropriately support a population of this species. **The project is unlikely to disrupt the breeding cycle of a population of *Austrostipa wakoolika.***
• **modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline**
The proposed project includes removal of 2.2 ha of potential habitat for this species, which includes PCT 76. This species prefers to inhabit open woodland, on grey silty clay or sandy loam soils (DCCEEW, 2014). This area of potential habitat includes roadside derived grassland (along Riverina Hwy) which consists of slashed vegetation with a disturbed groundcover layer comprising scattered native grasses and forbs. Additionally, south of Broockmanns Road consists of low-condition derived grassland which has been historically cleared and is heavily grazed and mown, resulting in the absence of a canopy or shrub layer, a groundcover dominated by regenerating native forbs and grasses, and a high cover of exotic annual species. Due to the degraded condition of grassland in the development footprint and subject land, in combination with low presence of potential habitat, it is unlikely that this species would colonise the project area. This species does not tolerate disturbance, requiring sites that are protected from the impacts of herbivore grazing (DCCEEW, 2014). Given that the project proposes removal of less than 3.00 ha of potentially suitable habitat that has been modified and disturbed by land use, in combination with lack of records within the Proposal area, **the species is not likely to decline as a result of modifying, destroying, removing or decreasing the availability of habitat.**
• **result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat**
The MNES Significant impact guidelines 1.1 states an 'invasive species' is an introduced species, including an introduced (translocated) native species, which out-competes native species for space and resources or which is a predator of native species. Introducing an invasive species into an area may result in that species becoming established. An invasive species may harm listed threatened species or ecological communities by direct competition, modification of habitat or predation. One of the listed threats to this species in the approved conservation advice is weed invasion and competition, particularly from exotic grasses (DCCEEW, 2014). Due to the absence of BioNet records within the subject land, only partial presence of suitable habitat and degraded condition, it is unlikely this species would colonise in the subject land. The proposed project has the potential to contribute to the spread of invasive species, mainly through the clearing of vegetation, in addition to potential transfer and introduction of both plant material and soil on machinery. Mitigation measures have been recommended in the BDAR to prevent the spread of weeds

A Spear-grass (*Austrostipa wakoolica*) – Endangered
throughout the project area. **The proposed action would therefore be unlikely to result in invasive species that are harmful to this species becoming established in its potential habitat.**
• **introduce disease that may cause the species to decline, or**
This species is not susceptible to diseases that may cause it to decline (DCCEEW, 2014). **The proposed project is considered unlikely to result in the introduction of disease that may cause the species to decline.**
• **interfere with the recovery of the species.**
The proposed project would remove 2.2 ha of potential habitat for this species of which is PCT 76. PCT 76 is characterised by tall grassy woodland on alluvial loam and clay soils (BioNet, 2025). Woodland is preferred habitat for this species; however, the development footprint and surrounds is highly modified from grazing and slashing. There is no adopted or made Recovery Plan for this species (DCCEEW, 2026). Although no Recovery Plan exists for this species, the Saving our Species (SoS) program identifies priority actions for *Austrostipa wakoolica* and three priority management sites, none of which occur within the development footprint or wider subject land (DPE, 2025).Considering these factors and the absence of observations within the development footprint and assessment area (BioNet Atlas, 2025), **the proposed project is highly unlikely to interfere with the recovery of this species due to these factors.** The proposed action is not likely to lead to a long-term decrease in the size of an *A. wakoolica* population, reduce its area of occupancy or fragment an existing population into two or more populations. It is not likely to adversely affect habitat critical to the survival of the species, disrupt the breeding cycle of a population or interfere with the recovery of the species. Due to the degraded condition of the landscape and that multiple key threats already impact the development footprint, the proposed action is not likely to modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline. With standard biosecurity protocols in place, the proposed action is not likely to introduce disease that may cause the species to decline or result in invasive species becoming established in the species' habitat. Recommended mitigation measures include: • Vehicles and machinery to be checked for soil and plant matter and washed down prior to entering the site • Basic weed hygiene measures to align with NSW DPIE Hygiene guidelines - *Protocols to protect priority biodiversity areas in NSW from Phytophthora cinnamomi, myrtle rust, amphibian chytrid fungus and invasive plants* **Due to the assumed presence of the species the potential impact will be offset via the Biodiversity Offset Scheme (BOS) generating 21 species credits.** Considering the above factors, **the proposed action is not likely to have a significant impact on *Austrostipa wakoolica*.**

Pink Cockatoo (*Lophochroa leadbeateri*) – Endangered
An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility that it will: • **lead to a long-term decrease in the size of a population**
The Pink Cockatoo is a species of parrot found across the arid and semi-arid inland, from south-western Queensland to north-west Victoria, through most of South Australia, north into the south-west Northern Territory and across to the west coast between Shark Bay and about Jurien. In NSW it is found regularly as far east as about Bourke and Griffith, and sporadically further east than that. The Subject Land resides within the southern edge of the species known distribution. The Pink Cockatoo was not recorded within the Subject Land and is associated with PCT 76 within the Subject Land. The closest record recorded on BioNet is 25 km east of the Subject Land and was recorded in 1999. The species relies on large and tall trees with large hollow dimensions for nesting. Marginal foraging habitat is present within the Subject Land as the species is known to forage on seeds of native shrubs and trees (absent) but also sometimes roots, bulbs, insect larvae, seeds of crops and weeds (DCCEEW cth, 2023). As no trees are found within the Subject Land, nor was the species recorded, it is **unlikely that the proposed work will lead to a long-term decrease in the size of a population.**
• **reduce the area of occupancy of the species**
The proposed work will disturb or remove 8.30 ha of potential foraging habitat for this species within the Development Footprint. As this potential habitat does not contain any trees or hollows it is unlikely to impact breeding or roosting habitat for the species only marginal foraging habitat will be impacted. No Pink cockatoos were recorded within the Subject Land. **It is unlikely that the proposed work will reduce the area of occupancy for the species** as only marginal foraging habitat is present and no Pink Cockatoos were observed in the Subject Land.
• **fragment an existing population into two or more populations**
No Pink Cockatoos were recorded on the Subject Land. The nearest record on BioNet to the Subject Land was recorded 25 km east in 1999. In 2022 a Pink Cockatoo was recorded approximately 53 km southeast of the Subject Land. As the Assessment Area is predominately non-native with scattered trees only found outside of the Subject Land, it is u**nlikely that the proposed development will fragment an existing population into two or more populations.**
• **adversely affect habitat critical to the survival of a species**
Habitat critical to the survival of the eastern Major Mitchell's cockatoo consist of: • Arid and semi-arid woodlands dominated by mulga (*Acacia aneura*), mallee and box eucalypts, slender cypress pine (*Callitris gracilis*) or belah (*Casuarina cristata*) • Known habitat containing suitable attributes, including potential habitat for the subspecies, especially where there are large mature trees with suitable hollows; and

Pink Cockatoo (*Lophochroa leadbeateri*) – Endangered
• Surrounding matrix of these areas for the role of providing movement corridors for dispersal across the landscape (DCCEEW cth, 2023). No Critical Habitat as defined under section 207A of the EPBC Act has been identified or included in the Register of Critical Habitat. As none of the above habitat is found within the Subject Land it is **unlikely that the proposed work will adversely affect habitat critical to the survival of the species.**
• **disrupt the breeding cycle of a population**
Pink Cockatoos rely on hollows with specific qualities for nesting and breeding. Suitable nesting hollows are found in trees that are large and tall with the following dimensions: • average hollow entrance diameter of 13.3 x 27.7 cm (range 8-30 x 9-80 cm, horizontal x vertical diameter); average hollow depth of 53.9 cm (range 19 – 180 cm) • average nest chamber floor diameter of 18 cm (range 9-34 cm) • average nest tree diameter at breast height of 72.5 cm (range 34-149 cm). (DCCEEW cth, 2023). Additionally, the species prefers to breeding not within close proximity to other Pink Cockatoo breeding pairs. As no trees exist within the Subject land it is **unlikely that the proposed work will disrupt the breeding cycle of a population.**
• **modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline**
The proposed work will result in the clearance of 8.30 ha of PCT 76 within the Development Footprint. PCT 76 vegetation within the Subject land has been identified as being in poor to low condition and lacks wooded areas or scattered trees. Within the Assessment Area 53.23 ha of native vegetation cover of unknown habitat quality exists out of 2143.89 ha (4.28%). While the proposed work will remove 8.30 ha of suitable habitat, the condition is poor and the landscape within the Assessment Area is highly fragmented and lacks large, wooded areas such as forests or woodlands. It is therefore u**nlikely the that proposed work will decrease the availability or quality of habitat to the extent that the species is likely to decline.**
• **result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat**
The proposed action has the potential to contribute to the spread of invasive weed species in the Subject Land through the transfer and introduction of plant material and soil on machinery. Any removal of native plant species also presents opportunities for invasive species to establish where ground cover is exposed. The implementation of a weed management plan will assist to prevent and control these impacts. With the appropriate use of a weed management plan, the proposal is not considered likely to exacerbate this impact to the point that it would constitute a substantial reduction in the quality or integrity of the species habitat within the Subject Land. The proposal is considered unlikely to generate an increase in invasive fauna species harmful to the species, such as feral cats, above what is currently present. The **proposal is not considered likely to**

Pink Cockatoo (*Lophochroa leadbeateri*) – Endangered
exacerbate this impact to the point that it would constitute a substantial reduction in the quality or integrity of the species habitat within the Subject Land.
• **introduce disease that may cause the species to decline, or**
There is a risk that diseases could be introduced to the Subject Land via machinery, vehicles, and materials during construction and operation. With the implementation of the recommended mitigation measures, **the proposal is unlikely to result in the introduction of any disease that may cause the species to decline.**
• **interfere with the recovery of the species.**
There is currently no nationally adopted or Recovery Plan made for this species. A Saving our Species (SoS) strategy exists for the Pink Cockatoo (NSW DPE, 2025) which aims to ensure that the species is secure in the wild in NSW, that its NSW geographic range is extended or maintained, and that its conservation status under the BC Act is maintained. Actions for the species include: • Encourage landholders with suitable breeding habitat to enter into covenants or stewardship agreements that promote the retention of large hollow-bearing trees, including paddock trees. • Undertake revegetation focusing on planting hollow-bearing tree species in areas where particular age/size cohorts are missing from the landscape, to ensure a continual supply of breeding habitat, particularly in areas known to be used by the species. • Raise awareness and encourage relevant landholders and land managers to implement sensitive grazing practices that minimise the removal of seeding grasses and recruiting feed plants (e.g. saltbush, wattles, cypress pine) and nesting (hollow-bearing) trees. • Promote awareness among local communities of the impacts of illegally removing birds or nestlings from the wild as well as the threatened status of the species. Encourage the reporting of suspected nest robbing or trapping to Environment Line (131 555). The **proposed work is unlikely to interfere with the above outlined actions to the degree in which the proposed works will interfere with the recovery of the species.**

Sloane's Froglet (*Crinia sloanei*) – Endangered

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

- **lead to a long-term decrease in the size of a population**

The MNES Significant impact guidelines 1.1 states that an 'population of a species' is defined under the EPBC Act as an occurrence of the species in a particular area. In relation to endangered species, occurrences include but are not limited to:

- a geographically distinct regional population, or collection of local populations, or
- a population, or collection of local populations, that occurs within a particular bioregion.

Crinia sloanei was assumed to be within the Subject Land after the addition of an area which was within 500 m of a waterbody.

The Sloane's Froglet (*Crinia sloanei*) is a species of small ground-dwelling frog endemic to the Murray-Darling Basin and is now restricted to a very small area of NSW near Albury and Corowa and a series disjunct populations at Wangaratta, Chiltern, Little Lake Charm and Moodies Swamp near Cobram (DCCEEW, 2018). It's habitat constraints include semi-permanent/ephemeral wet areas containing relatively shallow sections with submergent and emergent vegetation, or within 500 m of wet areas/swamps or within 500 m of swamps/waterbodies or within 500 m of waterbody.

The Subject Land is adjacent to a permanent freshwater waterbody which has been channelised. This waterbody has been highly modified and contains little to no emergent vegetation on its banks and no adjacent ephemeral shallow overflow present. *Crinia sloanei* prefers waterbodies containing emergent riparian vegetation including a complexity of small-stemmed grasses, reeds, rushes and sedges as it is critical for all life stages of the species (Knight, Sloane's Froglet interim habitat guide and management recommendations, 2014). Females lay eggs which attach to emergent vegetation such as grass or rush stems and sometimes substrate in shallow water. This vegetation also provides critical food resources for both tadpoles and adult froglets (Knight, Sloane's Froglet interim habitat guide and management recommendations, 2014). Additionally, this species is 450 times more likely to occupy waterbodies with adjacent ephemeral shallow overflow present than those without this feature (Knight, Watts, Allen, & McDonald, 2024), this is also lacking in the waterbody present within the Subject Land.

It is important to note that Sloane's froglet needs connections between breeding and refuge sites. The extremely variable climate of inland Australia means that for Sloane's froglet to survive it has to move across the landscape when it is wet. Sloane's froglet uses roadside drains, table drains, irrigation channels and inundated grasslands to move from one area to another (Knight, Sloane's Froglet, Crinia sloanei, Albury Conservation Company, Albury, 2013). As there are no records of *C. sloanei* within the 10 km of the Subject Land it is unlikely that the waterbody would be used to connect breeding and refuge sites for a population.

During aural-visual surveys in a similar channelised stream within the Subject Land, no *Crinia sloanei* were seen nor heard, nor are there any record within the Subject Land or within10km of the Subject Land. Considering the evidence *Crinia sloanei* is highly unlikely that the species would be present.

As there is little to no emergent vegetation or shallow banks/ adjacent ephemeral shallow overflow due to channelisation and the lack of previous records in the area, it is unlikely that the species is present within the Subject Land. Therefore, it is **unlikely that the proposed works will lead to a long-term decrease in the size of a population**.

Sloane's Froglet (*Crinia sloanei*) – Endangered
• **reduce the area of occupancy of the species**
The proposed work will disturb or remove 1.1 ha of grassland within 500m of a heavily modified channelised waterbody within the footprint. As this potential habitat does not contain any ephemeral vegetation or shallow banks, it is unlikely it is suitable habitat for *Crinia sloanei.* No *C. slo*anei were recorded within the Subject Land during surveys of a similar waterbody within the Subject Land. It is **unlikely that the proposed work will reduce the area of occupancy for the species** as the waterbody present is not likely to suitable habitat for the species present and no C. sloanei were observed in an equivalent waterbody within the Subject Land.
• **fragment an existing population into two or more populations**
No *Crinia sloanei* were recorded on the Subject Land in an equivalent waterbody or within the locality (10 km). The nearest record non-historic record appears east of Tocumwal recorded in 2020 approximately 18-20km. **It is unlikely that the proposed development will fragment an existing population into two or more populations as there is no evidence of a population occurring within the Subject Land or locality.**
• **adversely affect habitat critical to the survival of a species**
The MNES Significant Impact Guidelines 1.1 states that habitat critical to the survival of a species or ecological community refers to areas that are necessary: • for activities such as foraging, breeding, roosting, or dispersal • for the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators) • to maintain genetic diversity and long-term evolutionary development, or • for the reintroduction of populations or recovery of the species or ecological community. No habitat critical to the survival of this species is listed on the Register of Critical Habitat (DCCEEW, 2026).The Approved Conservation Advice for *Crinia sloanei* outline key habitat features critical for its survival including: • Temporary and permanent waterbodies (oxbows, farm dams, wetlands, frog ponds, puddles) • It prefers wetlands with riparian and aquatic vegetation (emergent vegetation) • Small-stemmed vegetation including grasses and reeds • Shallow pools up to 20 cm deep with emergent vegetation for breeding • Gilgai and depressions on clay plains • Temporary ponds in river valleys and areas within approximately 8 km of large rivers • Connected wet areas for movement: roadside drains, table drains, irrigation channels, inundated grasslands • Commonly occurs in critically endangered ecological communities including *Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains, the White Box-Yellow Box-Blakely's Red Gum Grassy, Woodland and Derived Native Grassland the Endangered Grey Box (Eucalyptus microcarpa), Grassy Woodlands and the Derived Native Grasslands of South-eastern Australia* ecological communities.

Sloane's Froglet (*Crinia sloanei*) – Endangered
The proposed works is impacting 1.1 ha of Grey Box woodland although it does not meet the criteria of the EPBC listing due its low condition. **The area impact is unlikely to adversely impact habitat critical to the survival of the species** as it is lacking all features other than it being a potential vessel to connecting areas of suitable breeding habitat. As there are no recorded population in the local area it is unlikely this channel will be utilised be the species.
• **disrupt the breeding cycle of a population**
Crinia sloanei rely on waterbodies with emergent vegetation and areas of adjacent ephemeral shallow overflow. They prefer small stem-diameter emergent vegetation and less bare ground as their eggs attach to thin plant material and tadpoles feed on matter. Calling sites being predominantly inundated with area of significantly shallower depths as they call from within the waterbody and rely on substrate or vegetation to perch on as they call. It is important to note that Sloane's froglet needs connections between breeding and refuge sites. The extremely variable climate of inland Australia means that for Sloane's froglet to survive it has to move across the landscape when it is wet. Sloane's froglet uses roadside drains, table drains, irrigation channels and inundated grasslands to move from one area to another (Knight, Sloane's Froglet, Crinia sloanei, Albury Conservation Company, Albury, 2013). As there are no records of *C. sloanei* within the 10 km of the Subject Land it is unlikely that the waterbody would be used to connect breeding and refuge sites for a population. As there is little to no emergent vegetation or shallow banks/ adjacent ephemeral shallow overflow due to channelisation and the lack of previous records in the area, it is unlikely that the species is present within the Subject Land. Therefore, it is **unlikely that the proposed works disrupt the breeding cycle of a population**.
• **modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline**
The proposed work will result in the clearance of 1.1 ha of derived grassland PCT 76 within 500 m of a waterbody. While the proposed work will remove 1.1 ha of grassland adjacent to a waterbody, the waterbody is in poor condition, highly modified and channelised with little to no preferred habitat features including emergent vegetation and adjacent ephemeral shallow overflow. Due to this reason, it is **highly unlikely that Crinia sloanei will be present** and therefore **would not modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.**
• **result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat**
There is no evidence or data with which to assess the threat of invasive species to *Crinia sloanei* **(DCCEEW, 2018)**. General habitat degradation as a result of the spread of invasive aquatic weeds would likely impact suitable habitat of the species and therefore the proposed action has the potential to contribute to the spread of invasive weed species in the Subject Land that may be harmful to *C. sloanei*. There is potential for this to occur through the transfer and introduction of plant material and soil on machinery. The implementation of a

Sloane's Froglet (*Crinia sloanei*) – Endangered
weed management plan will assist to prevent and control these impacts. With the appropriate use of a weed management plan, the proposal is **not considered likely to exacerbate this impact to the point that it would constitute a substantial reduction in the quality or integrity of the species habitat within the Subject Land.**
• **introduce disease that may cause the species to decline, or**
Chytridiomycosis is a lethal disease caused by the amphibian chytrid fungus (*Bactrachochytrium dendrobatidis*) which has caused mass die-offs and some species extinctions. Testings at Thurgoona and Corowa populations found a high rate of infection, although the little is known about the influence of this pathogen with no mortalities as a result of the disease recorded (DCCEEW, 2018). There is a risk that diseases could be introduced to the Subject Land via human contact, machinery, vehicles, and materials during construction and operation. With the implementation of the recommended mitigation measures, the **proposal is unlikely to result in the introduction of any disease that may cause the species to decline.**
• **interfere with the recovery of the species.**
There is currently no nationally adopted or Recovery Plan made for this species. A Saving our Species (SoS) strategy exists for *Crinia sloanei* (NSW DPE, 2008) which aims to secure the species in the long term and that its conservation status under the BC Act is maintained. Objectives for the priority management sites of the species include: • Ensure land management is sympathetic to the long-term requirements of the species • Reduce the impacts of grazing • Improve and maintain connectivity and extent of available habitat • Track species abundance / condition over time. The assumed population of *C. sloanei* is not considered to be part of an important population or priority management as this patch is not a key source for breeding or dispersal and not necessary for maintaining genetic diversity and/or not near the limit of the species' distribution range. It is highly unlikely that this species is present within the Subject Land due to the lack of suitable habitat features. The proposed work is unlikely to interfere with the above outlined objectives to the degree in which the proposed works will interfere with the recovery of the species. Recommended mitigation measures include: • Installation of temporary frog exclusion fencing prior to construction • Vehicles and machinery to be checked for soil and plant matter and washed down prior to entering the site • Basic hygiene measures to align with NSW DPIE Hygiene guidelines - *Protocols to protect priority biodiversity areas in NSW from Phytophthora cinnamomi, myrtle rust, amphibian chytrid fungus and invasive plants* to prevent introduction of Amphibian Chytrid Fungus into the site (NSW DPIE, 2020). Due to the assumed presence of the species the potential impact will be offset via the Biodiversity Offset Scheme (BOS) generating 13 species credits.

Sloane's Froglet (*Crinia sloanei*) – Endangered
Considering the low probability of presence, the planned mitigation measures and the offsetting of potential impacts, the removal of 1.1 ha of derived grassland within 500m of a waterbody, ***is unlikely to have a significant impact on the species.***

C7.2 Vulnerable species

Corben's long-eared Bat (*Nyctophilus corbeni*) – Vulnerable
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will: • **lead to a long-term decrease in the size of an important population of a species**
Corben's Long-eared Bat was determined to be 'potentially present' within the Subject Land during an Anabat Survey. An 'important population' is a population that is necessary for a species' long-term survival and recovery. This may include populations identified as such in recovery plans, and/or that are: • key source populations either for breeding or dispersal • populations that are necessary for maintaining genetic diversity, and/or • populations that are near the limit of the species range. Foraging habitat within the Subject Land associated with Corben's Long-eared Bat present within PCT 76 vegetation and may be associated with up to 53.23 ha of native vegetation cover within the Assessment Area. As a result of the proposed actions, a maximum clearing of approximately 8.30 ha will occur within associated foraging habitat. The Corben's Long-eared Bat is distributed in south-eastern Australia around the Murray-Darling Basin. Important populations are known from the Pillaga scrub (Threatened Species Scientific Committee, 2015), approximately 600 km from the Subject Land. It is possible that the Corben's Long-eared Bat will be using the Subject Land for opportunistic foraging, but it is unlikely that the Subject Land supports an important population of the species as it does not contain its preferred habitat, large intact areas of native woody vegetation or any roosting habitat. In addition, the Subject Land is not a key source population for breeding or dispersal, it is unlikely to be providing populations to maintain genetic diversity and the Subject Land does not occur near the limit of the species' range. It is therefore **unlikely that there will be a long-term decrease in the size of an important population as a result of the proposal.**
• **reduce the area of occupancy of an important population**
This species can be found under bark and dry fissures in branches and utilises tree hollows as maternity sites. Foraging habitat is associated with 11.68 ha of PCT 76 in the Subject Land; however, no trees are found within the Subject Land to provide roosting habitat. Several scattered trees are identified within the Assessment Area**,** but it is unknown if they provide any suitable roosting habitat. It is u**nlikely a maternity site is present or that the area of occupancy for nesting individuals will be reduced or that the proposed actioned will impact the area of occupancy of any important populations.**
• **fragment an existing important population into two or more populations**
Corben's long-eared Bat commonly have a scattered distribution and are highly mobile. There is no known important population present within the Subject Land, and the Subject Land does not support the preferred

Corben's long-eared Bat (*Nyctophilus corbeni*) – Vulnerable
vegetation types of the species. Therefore, **it is unlikely that the proposed actions will fragment an existing important population into two or more populations.**
• **adversely affect habitat critical to the survival of a species**
Habitat critical to the survival of a species or ecological community' refers to areas that are necessary: • for activities such as foraging, breeding, roosting, or dispersal. • for the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators) • to maintain genetic diversity and long-term evolutionary development, or • for the reintroduction of populations or recovery of the species or ecological community. Such habitat may be but is not limited to: habitat identified in a recovery plan for the species or ecological community as habitat critical for that species or ecological community; and/or habitat listed on the Register of Critical Habitat maintained by the minister under the EPBC Act. No habitat critical to the survival of Corben's Long-eared Bat has been declared. The proposal is unlikely to significantly fragment vegetation patches of woody vegetation required by the species as the vegetation is predominately grassland with no trees present. Additionally, the vegetation communities and species found within the Subject Land are not the preferred vegetation, **it is unlikely that the proposed actions will adversely affect habitat critical to the survival of this species.**
• **disrupt the breeding cycle of an important population**
The species is a nomadic species that inhabits a variety of vegetation types, including mallee, buloke (*Allocasuarina leuhmanni*) and box eucalypt dominated communities. It utilises tree-hollows as maternity sites and mating takes place in autumn with one or two young born in late spring to early summer (DPE, 2022). Studies in NSW found maternity roosting sites in ironbarks, Buloke and cypress pines (Threatened Species Scientific Committee, 2015) which are not found within the Assessment Area. It is unlikely that the proposal will disrupt the breeding cycle of an important population particularly as there is no roosting habitat present within the Subject Land. As no roosting habitat or preferred vegetation is present within the Subject Land, **it is unlikely that there will be a disruption to the breeding cycle of an important population of Corben's Long-eared Bat.**
• **modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline**
8.30 ha of PCT 76 identified as foraging habitat was in poor to low condition. As there is no roosting habitat or preferred vegetation within the Subject Land, **it is unlikely that the proposal will modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.**
• **result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat**

Corben's long-eared Bat (*Nyctophilus corbeni*) – Vulnerable
The Corben's Long-eared Bat may be subject to predation by feral species, and competition for hollows by invasive species such as the common starling *Sturnus vulgaris* and the introduced honeybee *Apis mellifera*, although impacts are not well known (Threatened Species Scientific Community, 2015). It is possible that disturbance caused by the proposal will lead to localised increases in invasive fauna species, however, since the vegetation communities preferred by the species or roosting habitat are not present within the Subject Land t**he impact of invasive species on the Corben's Long-eared Bat are likely to be limited.**
• **introduce disease that may cause the species to decline, or**
There is a risk that the proposal may introduce diseases into the Subject Land via machinery, vehicles, and materials during construction and operation. However, with the effective implementation of the mitigation measures detailed in the BDAR, **the risk to Corben's Long-eared Bat habitat as a result of introduced diseases are not considered significant.**
• **interfere substantially with the recovery of the species.**
A recovery plan exists for this species under the Saving Our Species (SoS) program in NSW (NSW DPE, 2022). This SoS strategy aims to manage conservation for this species primarily at the landscape scale and recognises that the occurrence of this species is aligns with the availability of hollow-bearing trees and specific vegetation communities, such as box / ironbark and cypress pine. Actions for the species in the recovery plan include: A Saving our Species (SoS) strategy exists for Corben's Long-eared Bat which aims to ensure that the species is secure in the wild in NSW, that its NSW geographic range is extended or maintained, and that its conservation status under the BC Act is maintained. Actions for the species include: • Encourage land managers to enter into land management agreements that protect and restore key areas. • Raise awareness among landholders about the importance of retaining large live and standing dead hollow-bearing trees in the landscape as habitat for the species. • Raise awareness amongst landholders in close proximity (approximately 15km radius) to maternity or roost sites, of the potential impacts of using harmful pesticides, herbicides, and other chemicals and discourage their use in or adjacent to foraging habitat. • Liaise with relevant authorities or land managers to ensure that the location and sensitivity of roosts/overwintering sites (such as hollow-bearing trees and under bark) and key foraging areas are known prior to any hazard reduction burns. Ensure that areas immediately surrounding maternity and roost sites are identified as an important biodiversity asset in any relevant fire planning and have a 100m buffer zone applied. Planned fires near maternity or roosting sites should not be undertaken during the breeding season, i.e., October to January, or during winter when bats are in residence. Hazard reduction burns in box/ironbark/cypress pine vegetation communities where the bats are known or suspected of using should not occur more than once every 20–50 years. Liaise with the Rural Fire Service, National Parks and Wildlife Service, or relevant land manager, to ensure that prescribed burns that may affect habitat are cool burns and/or do not kill hollow-bearing trees or remove cohorts of smaller hollow-bearing species over large areas. • Liaise with relevant authorities and/or land managers to ensure that the location and sensitivity of

Corben's long-eared Bat (*Nyctophilus corbeni*) – Vulnerable
roosting and key foraging areas are known and encourage that existing lighting and noise impacting on these areas be modified and that any future lighting or noise avoid spilling onto these areas where possible. • Raise public awareness of the damage caused to habitat by thinning, slashing, underscrubbing and inappropriate grazing, and firewood collection. Encourage land managers to retain tree density and a floristically and structurally diverse and spatially variable mid and understorey. As the Subject Land does not contain the vegetation communities preferred by the Corben's Long-eared bat, nor any hollow-bearing trees and it is not a known location for the species (DPE, 2022) it is unlikely that the proposed actions will substantially interfere with the recovery of the species. Noise and light pollution may also be temporary impacts during construction; however, **these are not considered to cause substantial interference due to their limited duration.**

Diamond Firetail (*Stagonopleura guttata*) – Vulnerable
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will: • **lead to a long-term decrease in the size of an important population of a species**
An 'important population' is a population that is necessary for a species' long-term survival and recovery. This may include populations identified as such in recovery plans, and/or that are: • key source populations either for breeding or dispersal • populations that are necessary for maintaining genetic diversity, and/or • populations that are near the limit of the species range. Diamond firetails occur in eucalypt, acacia or casuarina woodlands, open forests and other lightly timbered habitats, including farmland and grassland with scattered trees. They prefer areas with relatively low tree density, few large logs, and little litter cover but high grass cover (Commonwealth of Australia, 2023). The species was not recorded within the Subject Land and the closest record recorded on BioNet is approximately 5 km east of the Subject Land. The species is associated with 11.68 ha of PCT 76: Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions, within the Subject land where grassland foraging habitat is present. No important populations are known to occur within the Assessment Area. It is **therefore unlikely that the proposed work will lead to a long-term decrease in the size of an important population of Diamond Firetails.**
• **reduce the area of occupancy of an important population**
No important population is known to occur within the Subject Land. The clearance of 8.30 ha of PCT 76 will result in a loss of suitable foraging habitat within the Assessment Area however no breeding habitat is currently present within the Subject Land as the species relies on stick-nests built into the base of bird of prey stick-nests or prickly foliage of shrubs such as hakeas, rose bushes, boxthorns or sea urchin hakea which are all absent from the Subject Land. As no important population is known to occur within the Subject Land and only grassland foraging habitat is present, it is **unlikely the proposed works will reduce the area of occupancy of an important population.**
• **fragment an existing important population into two or more populations**
No important population is known to occur within the Subject Land and the native vegetation within the Assessment Area is currently highly fragmented prior to the proposed works. It is **therefore unlikely that any proposed work will fragment an existing important population into two or more populations.**
• **adversely affect habitat critical to the survival of a species**
Habitat critical to the survival of the diamond firetail includes areas of: • Eucalypt, acacia or casuarina woodlands, open forests and other lightly timbered habitats • low tree density, few large logs, and little litter cover but high grass cover for foraging, roosting and breeding

Diamond Firetail (*Stagonopleura guttata*) – Vulnerable
• Drooping she-oak (*Allocasuarina verticillata*) within the Mt Lofty Ranges (Commonwealth of Australia, 2023). None of the above-mentioned habitat are found within the Subject Land and **therefore it is unlikely that the proposed works will adversely affect habitat critical to the survival the species.**
• **disrupt the breeding cycle of an important population**
The Diamond Firetail breeds between August and January in small breeding colonies in bottle-shaped nests built into the base of larger stick-nests of birds of prey or in the prickly foliage of shrubs such as hakeas, rose bushes, boxthorns and sea urchin hakeas. The breeding habitat for the species is absent from the Subject Land, and it is **therefore unlikely that the proposed works will disrupt the breeding cycle of an important population.**
• **modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline**
The proposed work will result in the clearance of 8.30 ha of PCT 76 within the Subject Land. PCT 76 vegetation within the Subject land has been identified as being in poor to low condition and lacks wooded areas or scattered trees. Within the Assessment Area 53.23 ha of native vegetation cover of unknown habitat quality exists out of 2143.89 ha (4.28%). While the proposed work will remove 8.30 ha of suitable habitat, the condition is poor and the landscape within the Assessment Area is also unlikely to already support a large population. It is therefore **unlikely the that proposed work will decrease the availability or quality of habitat to the extent that the species is likely to decline.**
• **result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat**
The proposed action has the potential to contribute to the spread of invasive weed species in the Subject Land through the transfer and introduction of plant material and soil on machinery. Any removal of native plant species also presents opportunities for invasive species to establish where ground cover is exposed. The implementation of a weed management plan will assist to prevent and control these impacts. With the appropriate use of a weed management plan, the proposal is not considered likely to exacerbate this impact to the point that it would constitute a substantial reduction in the quality or integrity of the species habitat within the Subject Land. The proposal is considered unlikely to generate an increase in invasive fauna species harmful to the species, such as feral cats, above what is currently present. The proposal is **not considered likely to exacerbate this impact to the point that it would constitute a substantial reduction in the quality or integrity of the species habitat within the Subject Land.**
• **introduce disease that may cause the species to decline, or**

Diamond Firetail (*Stagonopleura guttata*) – Vulnerable
There is a risk that diseases could be introduced to the Subject Land via machinery, vehicles, and materials during construction and operation. With the implementation of the recommended mitigation measures, **the proposal is unlikely to result in the introduction of any disease that may cause these species to decline.**
• **interfere substantially with the recovery of the species.**
No national recovery plan for this species exists and an NSW Government Saving Our Species conservation project is currently being developed for the species. Current threats listed for the species under its NSW species profile (NSW OEH, 2025) include: • Clearing and fragmentation of woodland, open forest, grassland and mallee habitat for agriculture and residential development, and firewood collection • Poor regeneration of open forest and woodland habitats • Invasion of weeds, resulting in the loss of important food plants • Modification and destruction of ground- and shrub layers within habitat through removal of native plants, litter and fallen timber; introduction of exotic pasture grasses; heavy grazing and compaction by stock; and frequent fire • Predation of eggs and nestlings by increased populations of native predators such as the Pied Currawong (*Strepera graculina*) • Risk of local extinction due to small, isolated populations • Aggressive exclusion from forest and woodland habitat by over abundant Noisy Miners. The proposed works is expected to cause clearing of grasslands; however it is unlikely the impacts will substantially interfere with the recovery of the species due to the species not being recorded within the Subject Land and the lack trees existing currently within the Subject Land to provide roosting or breeding habitat.

Grey Falcon (*Falco hypoleucos*) – Vulnerable
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will: • **lead to a long-term decrease in the size of an important population of a species**
The Grey Falcon is sparsely distributed in NSW, chiefly throughout the Murray-Darling Basin, with the occasional vagrant east of the Great Dividing Range. The closest record recorded on BioNet is ~95km north of the Assessment Area. This species is known to occur in low densities in semi-arid and arid areas of Australia. The breeding range has contracted since the 1950s with most breeding now confined to arid parts of the range. There are possibly less than 5000 individuals left (OEH, 2017). No targeted surveys were undertaken during fieldwork; however, multiple days of fieldwork revealed no sightings of this species. An 'important population' is a population that is necessary for a species' long-term survival and recovery. This may include populations identified as such in recovery plans, and/or that are: • key source populations either for breeding or dispersal • populations that are necessary for maintaining genetic diversity, and/or • populations that are near the limit of the species range. The Subject Land is located towards the southern limit of its known distribution, and although unlikely, if a population was to be present, it is unlikely to be considered an important population necessary for the long-term survival and recovery of this species or impede the ability of other populations to interact for dispersal and genetic viability or diversity. Better quality areas and less disturbed areas of habitat within the Subject Land would remain and any proposed actions, in conjunction with stringent mitigation measures **would unlikely lead to a long-term decrease in the size of any important populations of this species if present.**
• **reduce the area of occupancy of an important population**
It is not considered that an important population, or part thereof, is present within the Subject Land. **Therefore, the action would not decrease the area of occupancy of an important population.**
• **fragment an existing important population into two or more populations**
It is not considered that an important population, or part thereof, is present within the Subject Land. Proposed actions will disturb a portion of potential habitat on one side of the existing rail alignment; however, **the actions would not impede movement of the Grey Falcon, and the proposal would not fragment an important population.**
• **adversely affect habitat critical to the survival of a species**
The is currently no register of critical habitat for the species. The potential habitat within the area of optimal habitat to be disturbed is not unique to this location and **is not considered critical to the survival of this species.**

Grey Falcon (*Falco hypoleucos*) – Vulnerable
• **disrupt the breeding cycle of an important population**
The species was not recorded within the Subject Land. Any population of the species occurring within the Subject Land is not considered to constitute an important population, therefore **the proposal is not considered likely to disrupt the breeding cycle of an important population.**
• **modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline**
The action will disturb the availability of optimal habitat by an extremely small portion. **This degree of habitat modification is not considered likely to occur to the extent that the species is likely to decline.**
• **result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat**
The proposed action has the potential to contribute to the spread of invasive weed species in the Subject Land through the transfer and introduction of plant material and soil on machinery. Any removal of native plant species also presents opportunities for invasive species to establish where ground cover is exposed. The implementation of a weed management plan will assist to prevent and control these impacts. With the appropriate use of a weed management plan, the proposal is not considered likely to exacerbate this impact to the point that it would constitute a substantial reduction in the quality or integrity of the species habitat within the Subject Land. The proposal is considered unlikely to generate an increase in invasive fauna species harmful to the species, such as feral cats, above what is currently present. **The proposal is not considered likely to exacerbate this impact to the point that it would constitute a substantial reduction in the quality or integrity of the species habitat within the Subject Land.**
• **introduce disease that may cause the species to decline, or**
There is a risk that diseases could be introduced to the Subject Land via machinery, vehicles, and materials during construction and operation. With the implementation of the recommended mitigation measures, **the proposal is unlikely to result in the introduction of any disease that may cause these species to decline.**
• **interfere substantially with the recovery of the species.**
No national recovery plan for this species exists, however, a NSW state plan exists under the Saving our Species program. This species has been identified as a data-deficient species with no Priority Management Areas identified yet.

Slender Darling Pea (*Swainsona murrayana*) – Vulnerable
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will: • **lead to a long-term decrease in the size of an important population of a species**
The MNES Significant impact guidelines 1.1 states that an 'important population' is defined under the EPBC Act 1991 as a population that is necessary for a species' long-term survival and recovery. This may include populations identified as such in recovery plans, and/or that are: • key source populations either for breeding or dispersal • populations that are necessary for maintaining genetic diversity, and/or • populations that are near the limit of the species range. *Swainsona murrayana* was assumed to be present within the Subject Land after the inclusion of 1.1 ha of associated PCT 76 derived grassland of *Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions* to the development footprint. There are no known records within the subject land. Targeted surveys have not yet been undertaken. A recovery plan for *Swainsona murrayana* has not been developed with no important populations being identified. *Swainsona murrayana* is an erect perennial forb in the Fabaceae typically growing in grassland, herbland, and open Black-box woodland on heavy clay soils, often with low chenopod shrubs and native grasses, and it may benefit from moderate disturbance such as grazing or occasional cultivation (DCCEEW, 2026; DEWHA, 2008). In NSW it is known to occur across the southern riverine plain, the Hay plain as far north as Willandra National Park, near Broken Hill and in various localities between Dubbo and Moree. It also occurs in the central north and north-west Victoria, west of Broken Hill in South Australia and in the south-central and south-west Queensland. Within the Subject Land, Swainsona murrayana is associated with PCT 76 on clay soils (DCCEEW, 2026; DEWHA, 2008). On grey soils *Swainsona murrayana* commonly grows amongst grass species include Cane Grass (*Eragrostis australasica*), Curly Windmill-grass (*Enteropogon acicularis*), Plains Grass (*Austrostipa aristiglumis*) and Wallaby Grass (*Rytidosperma duttonianum*) as well as forb and herb species Red Darling-pea (*Swainsona plagiotropis*), Broughton Pea (*S. procumbens*), Rough Burr-daisy (*Calotis scabiosifolia*), Murnong (*Microseris lanceolata*), Common Spike-rush (*Eleocharis acuta*), Small White Sunray (*Rhodanthe* corymbiflora), Turnip Copperbur (*Sclerolaena napiformis*), Lobe-seed Daisy *(Brachyscome dentata*), *B. smithwhitei,* Hairy Tails (*Ptilotus semilanatus*), Billy Buttons (*Pycnosorus globosus*) and *P. chrysanthes* (DCCEEW, 2026; DEWHA, 2008). There are no existing populations or records of the species observed within the Subject Land or immediately in the adjacent area. The additional 1.1 ha of associated PCT 76 has been determined to be a low condition derived grassland and was dominated by exotic grasses and forb species as well as a low abundance of native species including *Austrostipa* sp., *Atriplex* sp and *Rytidosperma duttonianum.* Due to these reasons, it is unlikely that a population of *Swainsona murrayana* would be present. Therefore, **it would be unlikely the Proposal would lead to the long-term decrease in size of an important population of *Swainsona murrayana.***
• **reduce the area of occupancy of an important population**

Slender Darling Pea (*Swainsona murrayana*) – Vulnerable

The area of impact for this species is 1.1 ha of PCT 76. This area is low-condition derived grassland PCT 76 on the edge of a main artillery road.

Within the Subject Land, 11.68 ha of derived grassland PCT 76 is present and only 1.1 ha or 9.4% of potential *S. murrayana* habitat is being impacted by the proposed works. Additionally, approximately 1545 ha of available habitat (associated PCTs) occurs within the locality and therefore approximately 0.07% of available habitat within the locality would be impacted as result of the proposed works.

Although this species is associated with PCT 76, due to the degraded condition of vegetation in the development footprint (roadside, cleared and heavily grazed), it is unlikely that suitable habitat would appropriately support the occupancy of this species. This also considers current land use which includes roadside vegetations, pastoral development and livestock, resulting in high nutrient runoff, erosion, grazing pressure and presence of exotic grasses and weeds. No individuals or population of this species have been observed during flora surveys throughout the remaining areas of associated PCT in the Subject Land.

Considering these factors, **the proposed project is unlikely to significantly reduce the area of occupancy of the species.**

- **fragment an existing important population into two or more populations**

There are no existing populations of this species within the Subject Land or locality. Due to the degraded condition of the vegetation along the roadside and current grazing pressure throughout the footprint and surrounding areas, it is unlikely that suitable habitat would appropriately support a population of this species. Therefore, **the project is unlikely to cause further fragmentation into two or more populations of this species.**

- **adversely affect habitat critical to the survival of a species**

The MNES Significant Impact Guidelines 1.1 states 'Habitat critical to the survival of a species or ecological community refers to areas that are necessary:

- for activities such as foraging, breeding, roosting, or dispersal
- for the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators)
- to maintain genetic diversity and long-term evolutionary development, or
- for the reintroduction of populations or recovery of the species or ecological community.

No habitat critical to the survival of this species is listed on the Register of Critical Habitat (DCCEEW, 2026). The Approved Conservation Advice for *Swainsona murrayana* outlines key habitat features critical for its survival including (DEWHA, 2008):

- Grasslands, herblands and Open Black Box woodland
- Heavy grey or brown clays, loam soils, and red cracking clays
- Areas with low chenopod shrubs (*Maireana* spp.), wallaby-grass (*Austrodanthonia* spp.) and spear grass (*Austrostipa* spp.)
- Moderately grazed or occasionally cultivated paddocks (disturbance-tolerant)
- It is known to occur in EPBC-listed ecological communities where it occurs:
    - Great Artesian Basin discharge spring communities

Slender Darling Pea (*Swainsona murrayana*) – Vulnerable
○ Brigalow ecological community ○ White Box–Yellow Box–Blakely's Red Gum Grassy Woodland and Derived Native Grassland ○ Buloke Woodlands of the Riverina and Murray–Darling Depression Bioregions. The proposed works is impacting 1.1 ha of Box-gum woodland derived native grassland, although it does not meet the criteria of the EPBC Act listing due its low condition. The development footprint is not considered critical habitat for this species and **it is unlikely that the proposed actions will adversely affect habitat critical to the survival of this species.**
• **disrupt the breeding cycle of an important population**
Due to the degraded condition of vegetation along the roadside vegetation as a result of erosion, runoff, clearing and disturbance related to vehicles, it is unlikely that suitable habitat would appropriately support a population of this species. **The Proposal is unlikely to disrupt the breeding cycle of a population of *Swainsona murrayana.***
• **modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline**
The 1.1 ha of PCT 76 impacted by the proposed action has been determined to be low condition. As this area is unlikely to be suitable habitat and therefore it is **unlikely that the proposal will modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.**
• **result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat**
The MNES Significant Impact guidelines 1.1 states an 'invasive species' is an introduced species, including an introduced (translocated) native species, which out-competes native species for space and resources or which is a predator of native species. Introducing an invasive species into an area may result in that species becoming established. An invasive species may harm listed threatened species or ecological communities by direct competition, modification of habitat or predation. The Proposal has the potential to contribute to the introduction and spread of invasive species, mainly through the clearing of vegetation, in addition to potential transfer and introduction of both plant material and soil on machinery and vehicles. Mitigation measures have been recommended in the BDAR to minimise the spread of existing weeds throughout the Subject Land and avoid the introduction of new weeds. The proposed action would therefore be **unlikely to result in invasive species that are harmful to this species becoming established in its potential habitat.**
• **introduce disease that may cause the species to decline, or**
This species is not susceptible to any known diseases that may cause it to decline (DCCEEW, 2026). **The Proposal is considered unlikely to result in the introduction of disease that may cause the species to decline.**

Slender Darling Pea (*Swainsona murrayana*) – Vulnerable
• **interfere substantially with the recovery of the species.**

The Proposal would remove 1.1 ha of potential habitat for this species.

There is no recovery or Saving our Species (SoS) program for this species which identifies important populations for *Swainsona murrayana*

The *Swainsona murrayana* SPRAT profile states the following management actions for the threat abatement and recovery of the species (DCCEEW, 2026):

- Maintain grassland vegetation in a relatively open state so that the species is not suppressed by more competitive plants (particularly perennial tussock grasses such as *Rytidosperma* and *Austrostipa* species and annual exotics like *Avena*, *Bromus*, *Vulpia* and *Lolium* species)
- Control rabbits and goats at sites where that are having a deleterious impact
- Ensure that surveys are undertaken during the flowering season
- Where grazing occurs in suitable habitat, ensure that it is light, intermittent grazing occurs rather than heavy grazing
- Research the ecology and impacts of disturbances on the species.

Given that the development footprint is already impacted by multiple known threats including habitat loss, grazing and the presence of weeds, the proposed action is not likely to interfere with the recovery of *S. murrayana*.

The assumed population of *Swainsona murrayana* that is unlikely to be present within the Subject Land is not considered to be an important population as this patch is not a key source for breeding or dispersal and not necessary for maintaining genetic diversity and/or not near the limit of the species' distribution range. It is highly unlikely that this species is present within the Subject Land due to the prolific presence of known threats of the species including clearing of native vegetation, exotic weeds, heavy grazing.

Recommended mitigation measures include:

- Vehicles and machinery to be checked for soil and plant matter and washed down prior to entering the site
- Basic weed hygiene measures to align with NSW DPIE Hygiene guidelines - *Protocols to protect priority biodiversity areas in NSW from Phytophthora cinnamomi, myrtle rust, amphibian chytrid fungus and invasive plants* (NSW DPIE, 2020).

Due to the assumed presence of the species the potential impact will be offset via the Biodiversity Offset Scheme (BOS) generating 9 species credits.

Considering the factors; the population is not an important population, the unlikely probability of its occurrence, the mitigation measures implemented, the offsetting of potential impacts, and the removal of 1.1 ha of potential habitat comprising only 0.07% of available habitat in the locality, **it is unlikely to have a significant impact on the species.**

Superb Parrot (*Polytelis swainsonii*) – Vulnerable
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will: • **lead to a long-term decrease in the size of an important population of a species**
An 'important population' is a population that is necessary for a species' long-term survival and recovery. This may include populations identified as such in recovery plans, and/or that are: • key source populations either for breeding or dispersal • populations that are necessary for maintaining genetic diversity, and/or • populations that are near the limit of the species range. The Superb Parrot is associated with PCT 76 within the Subject land. The closest record recorded on BioNet is 8km south of the Subject Land. The species is known to utilise tree hollows for breeding which were not found within the Subject Land. There is a total area of 11.68 ha (PCTs 76) of potential Superb Parrot (*Polytelis swainsonii*) foraging habitat in the Subject Land and up to 53.23 ha of native vegetation cover within the Assessment Area. The proposed actions will impact 8.30 ha of potential habitat. The core breeding areas in NSW of the Superb Parrot are found in the South-West Slopes and Riverina, and the species utilise the upper Namoi and Gwydir Rivers over winter (DPE, 2022b). The Superb Parrot was not recorded within the Subject land or Assessment Area, and no trees or suitable breeding habitat is present within the Subject Land. While there are scattered trees present within the Assessment Area, they have not been surveyed to determine if suitable breeding habitat is present. It is unlikely an important population is present within the Subject Land. Therefore, it is **unlikely that the proposed works will lead to a long-term decrease in the size of an important population of the species**
• **reduce the area of occupancy of an important population**
One of the key attributes that classifies a population as being important and necessary for a species' long-term survival and recovery include 'key source populations either for breeding or dispersal'. The core breeding area for this species is roughly bounded to the north-east in Cowra, Yass, Grenfell, Cootamundra and Coolac over 200 km from the Subject Land. Birds breeding in this area is typically absent during the winter where they migrate north to the region of the upper Namoi and Gwydir Rivers. Birds may forage up to 10km from nesting sites, primarily in Box-Gum grassy woodland. As the Subject Land is outside of these core breeding areas and over-wintering areas, it is **unlikely that the proposed works will reduce the area of occupancy of an important population.**
• **fragment an existing important population into two or more populations**
The Superb Parrot was not recorded, and no known important populations are known to occur within the Subject Land or Assessment Area. Potential habitat within the Subject Land consists of 11.68 ha of PCT 76 grassland suitable as foraging habitat. The existing vegetation within the Assessment Area is highly fragmented and the native vegetation cover within the Assessment Area only accounts for 53.23 ha out of a total area of 2143.89 ha which equates to 4.28%. It is therefore **unlikely that the proposed work will fragment an existing important population into two or more populations**

Superb Parrot (*Polytelis swainsonii*) – Vulnerable
• **adversely affect habitat critical to the survival of a species**
Critical habitat for the Superb Parrot is divided into breeding and foraging habitat. Breeding habitat consists of Riverine forests in the Riverina and Box-gum woodland**s** in the tablelands and slopes and relies on mature or dead eucalypts, including River Red Gum, Blakely's Red Gum, Grey Box, Red Box and Inland Red Box, with hollows. Foraging habitat critical to the species survival includes Boree *Acacia pendula* woodlands between the Murrumbidgee and Murray Rivers, River Red Gum forest and box-pine woodland in north-central NSW and River Red Gum, box-pine, box, pine and Boree woodland in the Riverina (Baker-Gabb, 2011). No trees and therefore woodlands occur within the Subject Land. Neither breeding habitat or critical foraging habitat is found within the Subject Land and therefore it is **unlikely that the proposed work will adversely affect habitat critical to the survival of a species.**
• **disrupt the breeding cycle of an important population**
The core breeding area for this species occurs over 200km north-east in Coolac, Cootamundra, Cowra, Grenfell and Yass. Birds breeding in this area is typically absent during the winter where they migrate north to the region of the upper Namoi and Gwydir Rivers. Birds may forage up to 10km from nesting sites, primarily in grassy box woodland. The Subject Land is not within the core breeding area of the species and thus the **proposal is unlikely to disrupt the breeding cycle of an important population.**
• **modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline**
11.68 ha of PCT 76 identified as foraging habitat was in poor to low condition. As there are no trees to provide roosting habitat and foraging habitat is limited to grassland food sources and no Superb Parrot were recorded within the Subject Land, it is **unlikely that the proposal will modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.**
• **result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat**
Invasive species that are harmful to the Superb Parrot becoming established in the Superb Parrots habitat include invasive species such as the common starling *Sturnus vulgaris* and the introduced honeybee *Apis mellifera* (Threatened Species Scientific Community, 2015) which compete for hollows as roosting and / or breeding habitat. As no trees are currently present within the Subject Land it is unlikely that the proposed work will cause increased competition for remaining hollows within the Assessment Area. Additionally, the Superb Parrot was not recorded within the Subject Land and therefore it is **unlikely that the proposed work will result in invasive species that are harmful to Superb Parrots becoming established in the Superb Parrot suitable habitat.**

Superb Parrot (*Polytelis swainsonii*) – Vulnerable
• **introduce disease that may cause the species to decline, or**
There is a risk that diseases could be introduced to the Subject Land via machinery, vehicles, and materials during construction and operation. With the implementation of the recommended mitigation measures, **the proposal is unlikely to result in the introduction of any disease that may cause these species to decline.**
• **interfere substantially with the recovery of the species.**
Currently, a NSW Recovery Plan exists for the species (DPE, 2022g). The Commonwealth's National Recovery Plan lapsed in 2021, however the key conservation focus of minimising the probability of extinction of the species in the wild, and to increase the probability of important populations becoming self-sustaining in the long term through conservation of woodland habitats and protection of hollow-bearing trees is still listed in the Commonwealth's Conservation Advice for the Superb Parrot (DoE, 2016a). The conservation actions under the NSW Recovery Plan include: • Retain living and dead paddock trees and plant or direct seed appropriate local eucalypt species, particularly white box, yellow box, Blakely's red gum and river red gum, to replace these trees in the long-term. Ideally, planted paddock trees should be spaced no more than 50m apart to provide connectivity for other fauna species. • Measure abundance and impact of feral European honeybees and common mynas on hollow availability for superb parrots and implement control measures • Report illegal shooting or trapping of superb parrots to Environment Line • Protect living and dead hollow-bearing trees from fire. • Investigate the efficacy of radar and radio/satellite telemetry tracking methods to detect superb parrot local and landscape scale flightpaths and key breeding and foraging sites for targeted on-ground protection and restoration actions. • Supplement the number of natural hollows with artificial hollows. These may be created in living or dead eucalypts without natural hollows using a chainsaw. Alternatively, appropriate nest boxes may also be used, provided that they are monitored for use by superb parrots and not exotic fauna and they are maintained in the long-term. • Raise awareness amongst land managers of the biodiversity and production value of protecting paddock trees and the need to ensure their replacement over the long term through planting and direct seeding • Protect known and potential remnant superb parrot habitat, particularly box-gum, box-ironbark and weeping myall woodland and river red gum riparian gallery forest, with large hollow-bearing trees, native shrubs such as wattles, hop bushes and saltbushes and native grasses and manage to allow ongoing regeneration of local native trees, shrubs and groundcover plants. • Restore superb parrot habitat in strategic locations close to known habitat and movement corridors, including riparian areas, using appropriate local tree, shrub and ground cover species. The planting of wattles, hopbush, saltbush and native grasses will provide important foraging habitat. • Reduce the risk of superb parrots being killed at grain spill sites by re-establishing the superb parrot grain spill prevention campaign which encourages grain truck drivers to cover their loads.

Superb Parrot (*Polytelis swainsonii*) – Vulnerable
• Erect warning signs on roads where superb parrot roadkill events are known to occur. • Revegetation activities to consider the implications of climate change impacts by building resilience in the current known range of the species, but also to look at securing or restoring habitats in areas predicted to be important to the superb parrot in the future under climate change. The proposed works will interfere with many of the actions proposed above, it is **unlikely the impacts will substantially interfere with the recovery of the species due to the species not being recorded within the Subject Land and the lack of hollow-bearing trees existing currently within the Subject Land to provide roosting or breeding habitat.**

White-throated Needletail (*Hirundapus caudacutus*) – Vulnerable

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

- **lead to a long-term decrease in the size of an important population of a species**

An 'important population' is a population that is necessary for a species' long-term survival and recovery. This may include populations identified as such in recovery plans, and/or that are:

- key source populations either for breeding or dispersal
- populations that are necessary for maintaining genetic diversity, and/or
- populations that are near the limit of the species range (DoE, 2013).

Within Australia, the population of White-throated Needletail has not been quantified since meeting the criteria for Vulnerable listing under the EPBC Act <10,000 mature individuals (Threatened Species Scientific Committee, 2019).The species is migratory and is therefore likely to be considered a single population with the Australian distribution estimated to have an area of occupancy of around 126,200km^2 (DCCEEW cth, 2025).Therefore, all occurrences of this species are considered to be part of an important habitat. The closest record recorded on BioNet is 40km southwest of the Subject Land. This species does not breed within Australia (Threatened Species Scientific Committee, 2019).

This species was not detected during surveys; however, some potentially foraging habitat is present. The Approved Conservation Advice, 2019 for this species states '*In Australia, the White-throated Needletail is mostly aerial, from heights of less than 1m up to more than 1,000m above the ground. Although they occur over most types of habitat, they are recorded most often above wooded areas, including open forest and rainforest, and may also fly below the canopy between trees or in clearings. When flying above farmland, they are more often recorded above partly cleared pasture, plantations or remnant vegetation at the edge of paddocks.'*. This species is associated with PCT 76 within the Subject Land. Important habitat for this species is defined as non-breeding habitat only, in wooded areas. The habitat within the Subject Land is not considered important habitat for the species as the potential foraging habitat associated with PCT 76 is highly degraded and identified as having a poor to low condition and lacking wooded areas. There is 11.68 ha of poor to low condition PCT 76 within the Subject land which may be provide marginal foraging habitat for the species as this species has previously been recorded flying above farmland, recorded above partly cleared pasture, plantations or remnant vegetation at the edge of paddocks (Threatened Species Scientific Committee, 2019).

The **proposal is unlikely to impact foraging habitat for an important population of this species resulting in a long-term decrease in the size of an important population of a species.**

- **reduce the area of occupancy of an important population**

As noted above, potential foraging habitat likely to be marginally suitable for this species would be impacted by the proposed works, and any occurrence of this species would form part of an important population within Australia.

The proposal is likely to impact marginal foraging habitat for this species resulting in a long-term decrease in the availability and quality of potential foraging habitat for this species. **This has the potential to reduce the area of occupancy of this species within the site.**

White-throated Needletail (*Hirundapus caudacutus*) – Vulnerable
• **fragment an existing important population into two or more populations**
Within Australia, the population of White-throated Needletail has not been quantified since meeting the criteria for Vulnerable listing under the EPBC Act (<10,000 mature individuals (Threatened Species Scientific Committee, 2019).The species is migratory and is therefore likely to be considered a single population with the Australian distribution estimated to have an area of occupancy of around 126,200km^2 (DCCEEW cth, 2025). The Approved Conservation Advice, 2019 for this species states '*In Australia, the White-throated Needletail is mostly aerial, from heights of less than 1m up to more than 1,000m above the ground.'* *A*lthough marginal foraging habitat for this species is proposed for removal, due to the migratory nature of this species, the **proposal would not result in the fragmentation of any occurrence of this species into two or more populations.**
• **adversely affect habitat critical to the survival of a species**
Critical habitat has not been defined for this species. Therefore, all habitat is considered to be important. The site falls within the southern edge of the non-breeding range mapped for this species, important habitat for this species is associated with "large tracts of native vegetation, particularly forests" (Department of the Environment, 2015) which is lacking in the fragmented landscape of the site. As the native vegetation within the Subject Land lacks trees and wooded areas, this is **not considered important habitat for this species. It is therefore unlikely that the proposed works will adversely affect habitat critical to the survival of the species.**
• **disrupt the breeding cycle of an important population**
This species does not breed within Australia, migrating to and breeding within Asia. **No impact to the breeding cycle would occur.**
• **modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline**
As noted above, potential foraging habitat likely to be marginally suitable for this species would be impacted by the proposed works. The proposal is likely to impact marginal foraging habitat for this species resulting in a long-term decrease in the availability and quality of potential foraging habitat for this species, however, due to the largely aerial nature of this species and the habitat present not being considered important habitat, **it is not expected that the proposal would result in the decline of this species.**
• **result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat**

White-throated Needletail (*Hirundapus caudacutus*) – Vulnerable
As no roosting habitat is present within the Subject Land and therefore will not be lost due to the proposed works, It is unlikely that the proposed work will result in invasive species such as the Common Starling *Sturnus vulgaris* or Noisy Miner *Manorina melanocephala* which compete for roosting habitat, becoming more present and reduce the ability of the White throated needletail to become established within the potential suitable habitat. Likewise, the **proposed work is unlikely to increase the presence of feral cats beyond their current extent within the Subject Land.**
• **introduce disease that may cause the species to decline, or**
There is a risk that diseases could be introduced to the Subject Land via machinery, vehicles, and materials during construction and operation. However, given this species is largely aerial and is only predicted to forage within the Subject Land it is **not expected that the proposal would introduce disease that would result in a decline to this species.**
• **interfere substantially with the recovery of the species.**

No recovery plan has been completed for this species. The Approved Conservation Advice, 2019 states '*A Recovery Plan is not required; an approved Conservation Advice for the species provides sufficient direction to implement priority actions, mitigate against key threats and enable recovery. Management and research activities are being undertaken at international, national, state and local levels.'*
The following conservation actions are provided within the Approved Conservation Advice
Primary conservation actions
Work with governments in East Asia to minimise destruction of key breeding habitats. Important habitats in Australia are identified and protected.
Conservation and Management priorities
• Habitat loss and modifications
  ○ Seek the support of governments in East Asia to protect remaining old growth forests within the breeding range of the species.
  ○ Identify requirements of important habitat in Australia
  ○ Support initiatives to improve habitat management at key sites in Australia.
Stakeholder Engagement
• Through the bilateral migratory bird consultative meetings with the Governments of Japan, China and the Republic of Korea, raise awareness of the conservation of White-throated Needletail.
• Promote the conservation, and raise the profile, of White-throated Needletail through strategic programs and educational products.
• Promote the exchange of information between governments, NGOs and communities through use of networks, publications and websites.
Survey and Monitoring priorities
• Enhance existing White-throated Needletail monitoring programs, such as BirdLife Australia's Swift Monitoring Sites, particularly to improve coverage in under surveyed parts of Australia.
Information and Research priorities

White-throated Needletail (*Hirundapus caudacutus*) – Vulnerable
• Use remote sensing to assess the extent of habitat loss at the breeding grounds. • Undertake work to more precisely assess White-throated Needletail life history, population size, distribution and ecological requirements in Australia. • Improve knowledge about potential threatening processes including the impacts of infrastructure (i.e. wind turbines and overhead wires). • Quantify levels of organochlorines in individuals and prey species. The proposal will result in the reduction of potential foraging habitat for this species, which may incur an interference in the recovery of this species if present within the locality, however, **the proposal will not interfere with the overall recovery objectives for this species outlined within the Approved Conservation Advice.**

C.8 EPBC Act Referral Decision

Australian Government

Department of Climate Change, Energy, the Environment and Water

Notification of referral decision – not controlled action

South Coree BESS, Finley, NSW (EPBC 2025/10152)

This decision is made under section 75 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Proposed Action

person proposing to take the Action	SAMSUNG C&T RENEWABLE ENERGY AUSTRALIA PTY LTD ABN: 74 661 046 331
proposed Action	To construct, operate and decommission a Battery Energy Storage System with a nominal capacity of up to 80 megawatts / 320 megawatt-hours and associated infrastructure in Finley, New South Wales (see EPBC Act referral 2025/10152).

Referral decision: not a controlled action

status of proposed Action	The proposed Action is not a controlled action.

Person authorised to make decision

name and position	Jennifer Pearson Acting Branch Head Environment Assessments NSW and ACT
signature	
date of decision	13 May 2025

Appendix D Survey data

D.1 Vegetation integrity plot data

Table D-1 Vegetation survey data and locations

plot	PCT	area	patchsize	condition class	zone	easting	northing	bearing	compTree	compShrub	compGrass	compForbs	compFerns	compOther	strucTree	strucShrub	strucGrass	strucForbs	strucFerns	strucOther	funLargeTrees	funHollowtrees	funLitterCover	funLenFallenLogs	funTreeStem5to9	funTreeStem10to19	funTreeStem20to29	funTreeStem30to49	funTreeStem50to79	funTreeRegen	funHighThreatExotic	Plot-based vegetation survey?	Vegetation integrity survey?
BP01	76	3.55	40.74	Poor	55	366074	6055217	127°E	0	0	2	8	0	0	0	0	10.1	7.6	0	0	0	0	1.2	0	0	0	0	0	0	0	0.3	☒ Yes ☐ No	☒ Yes ☐ No
BP02	76	0.74	40.74	Road side	55	366170	6055097	81°W	0	1	5	4	0	0	0	0.1	13.2	0.8	0	0	0	0	2.6	0	0	0	0	0	0	0	25.2	☒ Yes ☐ No	☒ Yes ☐ No
BP03	76	2.90	40.74	Low	55	365422	6055095	268°W	0	0	4	5	0	0	0	0	6.3	0.8	0	0	0	0	76	0	0	0	0	0	0	0	0.1	☒ Yes ☐ No	☒ Yes ☐ No
BP04	76	2.90	40.74	Low	55	365349	6055138	268°W	0	3	6	5	0	0	0	0.4	7.1	2.5	0	0	0	0	36	0	0	0	0	0	0	0	0	☒ Yes ☐ No	☒ Yes ☐ No
BP05	0	0.74	40.74	Exotic	55	366153	6055406	144°E	0	1	3	8	0	0	0	0.1	5.4	0.9	0	0	0	0	31.2	0	0	0	0	0	0	0	0.2	☒ Yes ☐ No	☒ Yes ☐ No
BP06	76	3.55	40.74	Poor	55	366145	6055541	127 °W	0	0	3	7	0	0	0	0	22	4	0	0	0	0	15.8	0	0	0	0	0	0	0	0.2	☒ Yes	☒ Yes

plot	PCT	area	patchsize	condition class	zone	easting	northing	bearing	compTree	compShrub	compGrass	compForbs	compFerns	compOther	strucTree	strucShrub	strucGrass	strucForbs	strucFerns	strucOther	funLargeTrees	funHollowtrees	funLitterCover	funLenFallenLogs	funTreeStem5to9	funTreeStem10to19	funTreeStem20to29	funTreeStem30to49	funTreeStem50to79	funTreeRegen	funHighThreatExotic	Plot-based vegetation survey?	Vegetation integrity survey?
																															☐ No	☐ No
BP07	76	1.11	51.20	Road side	55	353728	6031785	259°W	0	1	7	2	0	0	0	0.1	1.5	17	0	0	0	0	6.8	0	0	0	0	0	0	0	30	☒ Yes ☐ No	☒ Yes ☐ No
BP08	76	1.11	51.20	Road side	55	353730	6031735	80°E	0	3	2	3	0	0	0	2.2	4.2	57.5	0	0	0	0	7.8	0	0	0	0	0	0	0		☒ Yes ☐ No	☒ Yes ☐ No

BAM Site Field Survey (All orange cells are for data entry, please do not edit other cells or work sheets as they contain formulas)

Project number:	240316	**Plot Identifier:**	1	**Pic 20x20 Head (ID#)**	1	**Pic 20x50 Tail (ID#)**	1000	
Survey date: (01/01/2021)	6/08/2024					**Compass Orientation (head of 20x20 plot):**	127°E	
Recorders (full name):	Julie Gooding, Evan Creek		**PCT:**	76	**Veg Zone condition (low, mod, high):**		poor	
GPS Easting:	366074.3095	**GPS Northing:**	6055217.121		**Datum (GDA)**	2020	**Zone (54/55/56)**	55
Site location description (eg 2km west of Hay along Mid Western Highway)			Finley NSW					

Landform			**Soils**			**Drainage & Slope**	
Morphology			**Soil Texture**	clay		**Slope**	flat plain
LandF Element			**Soil Colour**	grey		**Aspect**	flat
LandF Pattern			**Soil Depth**			**Drainage**	low
Microrelief			**Geology**			**Watercourses**	irrigation canals surrounding

Plot Disturbance

	Severity	**Age**	**Observational Evidence**
Clearing	3	o	
Cultivation	0		
Soil erosion	0		
Firewood	0		
Grazing	3	R	
Fire Damage	0		Horse poo, sheep poo, old hay. Has been intensively grazed but paddock currently resting
Storm Damage	0		
Weediness	2	R	Bathurst Burr
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), condition of vegetation, hollows

None present

Disturbances (i.e. fire, grazing,ferals, clearing, logging, soil degradation, pollution, weeds, dieback)

Past clearing, grazing block. Used for horses

Significant and threatened species and communities (Note pop. size/area, structure, repro status, habit, habitat, threats, photos)

None present

Dominant Species outside Plot	**Grey Box**

FUNCTION

Function attributes for	1

BAM Attribute (20x20m plot)

	Stratum	Sum
Count of Native Richness	Tree (TG)	0
	Shrub (SG)	0
	Forb (FG)	8
	Grass & grasslike (GG)	2
	Fern (EG)	0
	Other (OG)	0
	TOTAL	10

BAM Attribute (20x20m plot)

	Stratum	Sum
Count of cover abundance (native vascular plants)	Tree (TG)	0
	Shrub (SG)	0
	Forb (FG)	7.6
	Grass & grasslike (GG)	10.1
	Fern (EG)	0
	Other (OG)	0
	TOTAL Native	17.7
	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 %	Photo ID #
Litter Cover	5m	2%	1.2%	
	15m	1%		
	25m	1%		
	35m	1%		
	45m	1%		
Bare ground cover	5m	25%	38.0%	
	15m	25%		
	25m	30%		
	35m	60%		
	45m	50%		
Cryptogam cover	5m	3%	3.4%	
	15m	1%		
	25m	4%		
	35m	5%		
	45m	4%		
Rock Cover	5m	0%	0.0%	
	15m	0%		
	25m	0%		
	35m	0%		
	45m	0%		

Total Cover (>100%)	89%
Native cover	18%
Exotic cover	29%
Other Ground Cover	43%

0.1%	63 x 63cm
0.5%	1.4 x 1.4m
1.0%	2 x 2m
5.0%	4 x 5m
25.0%	10 x 10m

COMPOSITION & STRUCTURE

Species recorded for 1

Genus	Species	Scientific Name	Common Name	Family	% Cover	Abundance	Exotic	Growth Form	High Threat?
			0	0			0		FALSE
Arctotheca	calendula	*Arctotheca calendula*	Capeweed	Asteraceae	5	1000+	*		No
Vittadinia	gracilis	*Vittadinia gracilis*	Woolly New Holland	Asteraceae	6	1000+	0	Forb (FG)	No
Xanthium	spinosum	*Xanthium spinosum*	Bathurst Burr	Asteraceae	0.2	20	*		HTE
Erodium	cicutarium	*Erodium cicutarium*	Common Crowfoot	Geraniaceae	10	1000+	*		No
Lolium	spp.	*Lolium spp.*	A Ryegrass	Poaceae	5	1000+	*		No
Trifolium	spp.	*Trifolium spp.*	A Clover	Fabaceae (Faboideae)	0.5	1000+	*		No
Pseudognaphalium	luteoalbum	*Pseudognaphalium lute*	Jersey Cudweed	Asteraceae	0.5	100	0	Forb (FG)	No
Rytidosperma	setaceum	*Rytidosperma setaceum*	Small-flowered Walla	Poaceae	10	1000+	0	Grass & grasslike	No
Oxalis	perennans	*Oxalis perennans*	0	Oxalidaceae	0.1	10	0	Forb (FG)	No
Echium	plantagineum	*Echium plantagineum*	Patterson's Curse	Boraginaceae	0.1	20	*		No
Hypochaeris	glabra	*Hypochaeris glabra*	Smooth Catsear	Asteraceae	4	1000+	*		No
Crassula	decumbens var. decun	*Crassula decumbens var*	Spreading Stonecrop	Crassulaceae	0.5	1000+	0	Forb (FG)	No
Lepidium	spp.	*Lepidium spp.*	0	0	0.1	20	0	Forb (FG)	No
Cirsium	vulgare	*Cirsium vulgare*	Spear Thistle	Asteraceae	0.1	20	*		No
Centipeda	cunninghamii	*Centipeda cunninghamii*	Common Sneezewee	Asteraceae	0.2	50	0	Forb (FG)	No
Chloris	truncata	*Chloris truncata*	Windmill Grass	Poaceae	0.1	30	0	Grass & grasslike	No
Spergularia	brevifolia	*Spergularia brevifolia*	0	Caryophyllaceae	0.1	8	0	Forb (FG)	No
Cyperus	eragrostis	*Cyperus eragrostis*	Umbrella Sedge	Cyperaceae	0.1	1	*		HTE
Rumex	spp.	*Rumex spp.*	0	Polygonaceae	0.1	1	0	Forb (FG)	No
Romulea	spp.	*Romulea spp.*	0	Iridaceae	4	1000+	*		No

BAM Site Field Survey (All orange cells are for data entry, please do not edit other cells or work sheets as they contain formulas)

Project number:	240316 - South Coree E	**Plot Identifier:**	2	**Pic 20x20 Head (ID#)**	2	**Pic 20x50 Tail (ID#)**	2000	
Survey date: (01/01/2021)	6/08/2024					**Compass Orientation (head of 20x20 plot):**	81°W	
Recorders (full name):	Julie Gooding, Evan Creek		**PCT:**	76	**Veg Zone condition (low, mod, high):**		roadside drain	
GPS Easting:	366170.795	**GPS Northing:**	6055097.663		**Datum (GDA)**	2020	**Zone (54/55/56)**	55
Site location description (eg 2km west of Hay along Mid Western Highway)			Finley NSW					

Landform			**Soils**			**Drainage & Slope**		
Morphology			**Soil Texture**	clay		**Slope**	drain	
LandF Element	Plain		**Soil Colour**	grey		**Aspect**	drain	
LandF Pattern			**Soil Depth**			**Drainage**	drain	
Microrelief			**Geology**			**Watercourses**	roadside drain	

Plot Disturbance

	Severity	**Age**	**Observational Evidence**
Clearing	3	o	
Cultivation	0		
Soil erosion	0		
Firewood	0		
Grazing	0		
Fire Damage	0		
Storm Damage	0		
Weediness	3	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

Table drain - roadside vegetation

Age class of trees (DBH), condition of vegetation, hollows

none present

Disturbances (i.e. fire, grazing,ferals, clearing, logging, soil degradation, pollution, weeds, dieback)

roadside disturbance

Significant and threatened species and communities (Note pop. size/area, structure, repro status, habit, habitat, threats, photos)

none present

Dominant Species outside Plot	**Grey Box**

FUNCTION

Function attributes for	2

BAM Attribute (20x20m plot)

	Stratum	Sum
Count of Native Richness	Tree (TG)	0
	Shrub (SG)	1
	Forb (FG)	4
	Grass & grasslike (GG)	5
	Fern (EG)	0
	Other (OG)	0
	TOTAL	10

BAM Attribute (20x20m plot)

	Stratum	Sum
Count of cover abundance (native vascular plants)	Tree (TG)	0
	Shrub (SG)	0.1
	Forb (FG)	0.8
	Grass & grasslike (GG)	13.2
	Fern (EG)	0
	Other (OG)	0
	TOTAL Native	14.1
	TOTAL 'HTE'	25.2

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 %	Photo ID #
Litter Cover	5m	5%	2.6%	
	15m	3%		
	25m	1%		
	35m	1%		
	45m	3%		
Bare ground cover	5m	1%	1.0%	
	15m	0%		
	25m	1%		
	35m	1%		
	45m	2%		
Cryptogam cover	5m	1%	10.2%	
	15m	0%		
	25m	15%		
	35m	25%		
	45m	10%		
Rock Cover	5m	25%	9.3%	
	15m	0%		
	25m	20%		
	35m	1%		
	45m	1%		

Total Cover (>100%)	104%
Native cover	14%
Exotic cover	67%
Other Ground Cover	23%

0.1%	63 x 63cm
0.5%	1.4 x 1.4m
1.0%	2 x 2m
5.0%	4 x 5m
25.0%	10 x 10m

COMPOSITION & STRUCTURE

Species recorded for 2

Genus	Species	Scientific Name	Common Name	Family	% Cover	Abundance	Exotic	Growth Form	High Threat?
Rumex	crispus	*Rumex crispus*	Curled Dock	Polygonaceae	0.3	100	*		No
Cyperus	eragrostis	*Cyperus eragrostis*	Umbrella Sedge	Cyperaceae	25	1000	*		HTE
Paspalidium	jubiflorum	*Paspalidium jubiflorum*	Warrego Grass	Poaceae	5	200	0	Grass & grasslike	No
Conyza	spp.	*Conyza spp.*	A Fleabane	Asteraceae	3	1000	*		No
Pseudognaphalium	luteoalbum	*Pseudognaphalium lute*	Jersey Cudweed	Asteraceae	0.1	30	0	Forb (FG)	No
Chloris	truncata	*Chloris truncata*	Windmill Grass	Poaceae	4	50	0	Grass & grasslike	No
Malva	parviflora	*Malva parviflora*	Small-flowered Mallo	Malvaceae	0.1	30	*		No
Eragrostis	cilianensis	*Eragrostis cilianensis*	Stinkgrass	Poaceae	0.3	800	*		No
Salsola	australis	*Salsola australis*	0	Chenopodiaceae	0.1	10	0	Shrub (SG)	No
Helminthotheca	echioides	*Helminthotheca echioide*	Ox-tongue	Asteraceae	0.1	200	*		No
Cucumis	myriocarpus subsp. le	*Cucumis myriocarpus su*	Paddy Melon	Cucurbitaceae	0.1	5	*		No
Trifolium	spp.	*Trifolium spp.*	A Clover	Fabaceae (Faboideae)	5	1000	*		No
Sonchus	oleraceus	*Sonchus oleraceus*	Common Sowthistle	Asteraceae	0.2	200	*		No
Brassica	rapa subsp. sylvestris	*Brassica rapa subsp. syl*	Turnip	Brassicaceae	0.5	200	*		No
Panicum	spp.	*Panicum spp.*	Panicum	Poaceae	0.1	30	0	Grass & grasslike	No
Avena	spp.	*Avena spp.*	Oats	Poaceae	5	1000	*		No
Lolium	spp.	*Lolium spp.*	A Ryegrass	Poaceae	25	1000	*		No
Lactuca	serriola	*Lactuca serriola*	Prickly Lettuce	Asteraceae	0.2	1000	*		No
Phalaris	aquatica	*Phalaris aquatica*	Phalaris	Poaceae	0.1	2	*		No
Echium	plantagineum	*Echium plantagineum*	Patterson's Curse	Boraginaceae	0.2	800	*		No
Cynodon	dactylon	*Cynodon dactylon*	Common Couch	Poaceae	4	500	0	Grass & grasslike	No
Polygonum	aviculare	*Polygonum aviculare*	Wireweed	Polygonaceae	1	50	*		No
Vicia	sativa	*Vicia sativa*	Common vetch	Fabaceae (Faboideae)	0.1	30	*		No
Xanthium	spinosum	*Xanthium spinosum*	Bathurst Burr	Asteraceae	0.1	1	*		HTE
Lythrum	hyssopifolia	*Lythrum hyssopifolia*	Hyssop Loosestrife	Lythraceae	0.5	200	0	Forb (FG)	No
Cirsium	vulgare	*Cirsium vulgare*	Spear Thistle	Asteraceae	0.1	10	*		No
Enteropogon	ramosus	*Enteropogon ramosus*	Curly Windmill Grass	Poaceae	0.1	20	0	Grass & grasslike	No
Vittadinia	spp.	*Vittadinia spp.*	Fuzzweed	Asteraceae	0.1	10	0	Forb (FG)	No
Un Id Forb		*#N/A*	#N/A	#N/A	0.1	10	#N/A		FALSE
Alternanthera	pungens	*Alternanthera pungens*	Khaki Weed	Amaranthaceae	0.1	10	*		HTE
Euchiton	involucratus	*Euchiton involucratus*	Star Cudweed	Asteraceae	0.1	1	0	Forb (FG)	No

BAM Site Field Survey (All orange cells are for data entry, please do not edit other cells or work sheets as they contain formulas)

Project number:	240676	**Plot Identifier:**	3	**Pic 20x20 Head (ID#)**	3	**Pic 20x50 Tail (ID#)**	3000	
Survey date:	3/12/2024					**Compass Orientation (head of 20x20 plot):**	268 W	
Recorders (full name):	Julie Gooding, Maddie Robertson		**PCT:**	76	**Veg Zone condition (low, mod, high):**		Poor	
GPS Easting:	365422.5605	**GPS Northing:**	6055095.795		**Datum (GDA)**	2020	**Zone (54/55/56)**	55
Site location description (eg 2km west of Hay along Mid Western Highway)			Finley substation					

Landform			**Soils**			**Drainage & Slope**		
Morphology			**Soil Texture**	clay loam		**Slope**	none	
LandF Element	plain		**Soil Colour**	brown		**Aspect**		
LandF Pattern			**Soil Depth**			**Drainage**	poor	
Microrelief			**Geology**			**Watercourses**	canal directly next to road	

Plot Disturbance

	Severity	**Age**	**Observational Evidence**
Clearing	3	NR	
Cultivation	0		
Soil erosion	2	R	
Firewood	0		
Grazing	2	R	grazed by sheep
Fire Damage	0		
Storm Damage	0		
Weediness	2	R	
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

paddock next to substation

Age class of trees (DBH), condition of vegetation, hollows

Disturbances (i.e. fire, grazing,ferals, clearing, logging, soil degradation, pollution, weeds, dieback)

clearing, weeds, trimming, grazing

Significant and threatened species and communities (Note pop. size/area, structure, repro status, habit, habitat, threats, photos)

Dominant Species outside Plot	**juncus sp**

FUNCTION

Function attributes for	3

BAM Attribute (20x20m plot)

	Stratum	Sum
Count of Native Richness	Tree (TG)	0
	Shrub (SG)	0
	Forb (FG)	5
	Grass & grasslike (GG)	4
	Fern (EG)	0
	Other (OG)	0
	TOTAL	9

BAM Attribute (20x20m plot)

	Stratum	Sum
Count of cover abundance (native vascular plants)	Tree (TG)	0
	Shrub (SG)	0
	Forb (FG)	0.8
	Grass & grasslike (GG)	6.3
	Fern (EG)	0
	Other (OG)	0
	TOTAL Native	7.1
	TOTAL 'HTE'	0.1

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 %	Photo ID #
Litter Cover	5m	70%	76.0%	
	15m	60%		
	25m	85%		
	35m	90%		
	45m	75%		
Bare ground cover	5m	2%	3.0%	
	15m	0%		
	25m	1%		
	35m	2%		
	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%		

Total Cover (>100%)	123%
Native cover	7%
Exotic cover	37%
Other Ground Cover	79%

0.1%	63 x 63cm
0.5%	1.4 x 1.4m
1.0%	2 x 2m
5.0%	4 x 5m
25.0%	10 x 10m

COMPOSITION & STRUCTURE

Species recorded for 3

Genus	Species	Scientific Name	Common Name	Family	% Cover	Abundance	Exotic	Growth Form	High Threat?
Lactuca	serriola	*Lactuca serriola*	Prickly Lettuce	Asteraceae	1	1000	*		No
Lolium	spp.	*Lolium spp.*	A Ryegrass	Poaceae	25	1000	*		No
Conyza	bonariensis	*Conyza bonariensis*	Flaxleaf Fleabane	Asteraceae	0.1	30	*		No
Helminthotheca	echioides	*Helminthotheca echioide*	Ox-tongue	Asteraceae	1	1000	*		No
Hypochaeris	radicata	*Hypochaeris radicata*	Catsear	Asteraceae	0.1	4	*		No
Rumex	crispus	*Rumex crispus*	Curled Dock	Polygonaceae	0.1	5	*		No
Cynodon	dactylon	*Cynodon dactylon*	Common Couch	Poaceae	0.1	5	0	Grass & grasslike	No
Juncus	spp.	*Juncus spp.*	A Rush	Juncaceae	6	800	0	Grass & grasslike	No
Bromus	hordeaceus	*Bromus hordeaceus*	Soft Brome	Poaceae	3	1000+	*		No
Epilobium	billardierianum	*Epilobium billardierianu*	0	Onagraceae	0.1	1	0	Forb (FG)	No
Trifolium	spp.	*Trifolium spp.*	A Clover	Fabaceae (Faboideae)	5	1000+	*		No
Pseudognaphalium	luteoalbum	*Pseudognaphalium lute*	Jersey Cudweed	Asteraceae	0.1	2	0	Forb (FG)	No
Avena	spp.	*Avena spp.*	Oats	Poaceae	0.5	80	*		No
Phalaris	aquatica	*Phalaris aquatica*	Phalaris	Poaceae	1	10	*		No
Hordeum	leporinum	*Hordeum leporinum*	Barley Grass	Poaceae	0.2	500	*		No
Enteropogon	acicularis	*Enteropogon acicularis*	Curly Windmill Grass	Poaceae	0.1	10	0	Grass & grasslike	No
Lythrum	hyssopifolia	*Lythrum hyssopifolia*	Hyssop Loosestrife	Lythraceae	0.4	1000+	0	Forb (FG)	No
Cirsium	vulgare	*Cirsium vulgare*	Spear Thistle	Asteraceae	0.1	5	*		No
Bromus	diandrus	*Bromus diandrus*	Great Brome	Poaceae	0.1	20	*		HTE
Euchiton	involucratus	*Euchiton involucratus*	Star Cudweed	Asteraceae	0.1	1	0	Forb (FG)	No
Carex	spp.	*Carex spp.*	0	Cyperaceae	0.1	10	0	Grass & grasslike	No
Sonchus	oleraceus	*Sonchus oleraceus*	Common Sowthistle	Asteraceae	0.1	20	*		No
Oxalis	perennans	*Oxalis perennans*	0	Oxalidaceae	0.1	1	0	Forb (FG)	No

BAM Site Field Survey (All orange cells are for data entry, please do not edit other cells or work sheets as they contain formulas)

Project number:	240676	**Plot Identifier:**	4	**Pic 20x20 Head (ID#)**	4	**Pic 20x50 Tail (ID#)**	4000	
Survey date:	3/12/2024					**Compass Orientation (head of 20x20 plot):**	268 W	
Recorders (full name):	Julie Gooding, Maddie Robertson		**PCT:**	76	**Veg Zone condition (low, mod, high):**		Low	
GPS Easting:	365349.5022	**GPS Northing:**	6055138.92		**Datum (GDA)**	2020	**Zone (54/55/56)**	55
Site location description (eg 2km west of Hay along Mid Western Highway)			Finley substation					

Landform			**Soils**			**Drainage & Slope**		
Morphology			**Soil Texture**	clay loam		**Slope**	none	
LandF Element	plain		**Soil Colour**	brown		**Aspect**		
LandF Pattern			**Soil Depth**			**Drainage**	poor	
Microrelief			**Geology**			**Watercourses**	Canal directly next to road	

Plot Disturbance

	Severity	**Age**	**Observational Evidence**
Clearing	3	NR	
Cultivation	0		
Soil erosion	1	R	
Firewood	0		
Grazing	2	R	grazed by sheep
Fire Damage	0		
Storm Damage	0		
Weediness	1	R	
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

paddock next to substation

Age class of trees (DBH), condition of vegetation, hollows

Disturbances (i.e. fire, grazing,ferals, clearing, logging, soil degradation, pollution, weeds, dieback)

clearing, weeds, trimming, grazing

Significant and threatened species and communities (Note pop. size/area, structure, repro status, habit, habitat, threats, photos)

Dominant Species outside Plot	**rye grass**

FUNCTION

Function attributes for	4

BAM Attribute (20x20m plot)

	Stratum	Sum
Count of Native Richness	Tree (TG)	0
	Shrub (SG)	3
	Forb (FG)	5
	Grass & grasslike (GG)	6
	Fern (EG)	0
	Other (OG)	0
	TOTAL	14

BAM Attribute (20x20m plot)

	Stratum	Sum
Count of cover abundance (native vascular plants)	Tree (TG)	0
	Shrub (SG)	0.4
	Forb (FG)	2.5
	Grass & grasslike (GG)	7.1
	Fern (EG)	0
	Other (OG)	0
	TOTAL Native	10
	TOTAL 'HTE'	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	

BAM Attributes (1 x 1m Plots)

	Tape length	% cover	Average %	Photo ID #
Litter Cover	5m	45%	36.0%	
	15m	50%		
	25m	45%		
	35m	10%		
	45m	30%		
Bare ground cover	5m	25%	23.2%	
	15m	5%		
	25m	1%		
	35m	60%		
	45m	25%		
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%		

Total Cover (>100%)	77%
Native cover	10%
Exotic cover	8%
Other Ground Cover	59%

0.1%	63 x 63cm
0.5%	1.4 x 1.4m
1.0%	2 x 2m
5.0%	4 x 5m
25.0%	10 x 10m

COMPOSITION & STRUCTURE

Species recorded for 4

Genus	Species	Scientific Name	Common Name	Family	% Cover	Abundance	Exotic	Growth Form	High Threat?
Enteropogon	acicularis	*Enteropogon acicularis*	Curly Windmill Grass	Poaceae	0.3	5	0	Grass & grasslike	No
Oxalis	perennans	*Oxalis perennans*	0	Oxalidaceae	2	4000	0	Forb (FG)	No
Carex	spp.	*Carex spp.*	0	Cyperaceae	1	70	0	Grass & grasslike	No
Lolium	spp.	*Lolium spp.*	A Ryegrass	Poaceae	5	1000	*		No
Atriplex	semibaccata	*Atriplex semibaccata*	Creeping Saltbush	Chenopodiaceae	0.2	2	0	Shrub (SG)	No
Lepidium	spp.	*Lepidium spp.*	0	0	0.2	600	0	Forb (FG)	No
Polygonum	aviculare	*Polygonum aviculare*	Wireweed	Polygonaceae	0.3	400	*		No
Helminthotheca	echioides	*Helminthotheca echioide*	Ox-tongue	Asteraceae	0.2	200	*		No
Rytidosperma	setaceum	*Rytidosperma setaceum*	Small-flowered Walla	Poaceae	2	100	0	Grass & grasslike	No
Cirsium	vulgare	*Cirsium vulgare*	Spear Thistle	Asteraceae	0.1	10	*		No
Sclerolaena	muricata	*Sclerolaena muricata*	Black Rolypoly	Chenopodiaceae	0.1	2	0	Shrub (SG)	No
Sonchus	oleraceus	*Sonchus oleraceus*	Common Sowthistle	Asteraceae	0.1	5	*		No
Echium	plantagineum	*Echium plantagineum*	Patterson's Curse	Boraginaceae	0.1	8	*		No
Hordeum	leporinum	*Hordeum leporinum*	Barley Grass	Poaceae	0.2	100	*		No
Rytidosperma	caespitosum	*Rytidosperma caespitos*	Ringed Wallaby Grass	Poaceae	3	400	0	Grass & grasslike	No
Walwhalleya	proluta	*Walwhalleya proluta*	0	Poaceae	0.5	50	0	Grass & grasslike	No
Brassica	rapa subsp. sylvestris	Brassica	rapa	Brassicaceae	0.1	4	*		No
Phalaris	aquatica	*Phalaris aquatica*	Phalaris	Poaceae	0.2	3	*		No
Bromus	hordeaceus	*Bromus hordeaceus*	Soft Brome	Poaceae	1	2000	*		No
Vittadinia	spp.	*Vittadinia spp.*	Fuzzweed	Asteraceae	0.1	4	0	Forb (FG)	No
Lactuca	serriola	*Lactuca serriola*	Prickly Lettuce	Asteraceae	0.1	20	*		No
Chamaesyce	drummondii	*Euphorbia drummondii*	Caustic Weed	Euphorbiaceae	0.1	10	0	Forb (FG)	No
Zaleya	galericulata	*Zaleya galericulata*	Hogweed	Aizoaceae	0.1	1	0	Forb (FG)	No
Avena	spp.	*Avena spp.*	Oats	Poaceae	0.3	80	*		No
Salsola	australis	*Salsola australis*	0	Chenopodiaceae	0.1	1	0	Shrub (SG)	No
Cynodon	dactylon	*Cynodon dactylon*	Common Couch	Poaceae	0.3	30	0	Grass & grasslike	No

BAM Site Field Survey (All orange cells are for data entry, please do not edit other cells or work sheets as they contain formulas)

Project number:	240316	**Plot Identifier:**	5	**Pic 20x20 Head (ID#)**	5	**Pic 20x50 Tail (ID#)**	5000	
Survey date:	3/12/2024					**Compass Orientation (head of 20x20 plot):**	144°E	
Recorders (full name):	Julie Gooding, Maddie Robertson		**PCT:**	0	**Veg Zone condition (low, mod, high):**			
GPS Easting:	366153.2505	**GPS Northing:**	6055406.681		**Datum (GDA)**	2020	**Zone (54/55/56)**	55
Site location description (eg 2km west of Hay along Mid Western Highway)	3km west of finley							

Landform			**Soils**			**Drainage & Slope**		
Morphology			**Soil Texture**	clay		**Slope**	none	
LandF Element	plain		**Soil Colour**	brown		**Aspect**		
LandF Pattern			**Soil Depth**			**Drainage**	poor	
Microrelief			**Geology**			**Watercourses**	Irrigation canal directly next to roa	

Plot Disturbance

	Severity	**Age**	**Observational Evidence**
Clearing	3	NR	
Cultivation	0		
Soil erosion	3	R	soil erosion from grazing and exposure
Firewood	0		
Grazing	3	R	heavy grazing and a lot of scat
Fire Damage	0		
Storm Damage	0		
Weediness	2	R	weeds and some native vrg
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

paddock

Age class of trees (DBH), condition of vegetation, hollows

Disturbances (i.e. fire, grazing,ferals, clearing, logging, soil degradation, pollution, weeds, dieback)

clearing, weeds, trimming, grazing

Significant and threatened species and communities (Note pop. size/area, structure, repro status, habit, habitat, threats, photos)

Dominant Species outside Plot	**wallaby grass**

FUNCTION

Function attributes for	5

BAM Attribute (20x20m plot)

	Stratum	Sum
Count of Native Richness	Tree (TG)	0
	Shrub (SG)	1
	Forb (FG)	8
	Grass & grasslike (GG)	3
	Fern (EG)	0
	Other (OG)	0
	TOTAL	12

BAM Attribute (20x20m plot)

	Stratum	Sum
Count of cover abundance (native vascular plants)	Tree (TG)	0
	Shrub (SG)	0.1
	Forb (FG)	0.9
	Grass & grasslike (GG)	5.4
	Fern (EG)	0
	Other (OG)	0
	TOTAL Native	6.4
	TOTAL 'HTE'	0.2

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 %	Photo ID #
Litter Cover	5m	1%	31.2%	
	15m	25%		
	25m	50%		
	35m	55%		
	45m	25%		
Bare ground cover	5m	95%	45.0%	
	15m	30%		
	25m	15%		
	35m	35%		
	45m	50%		
Cryptogam cover	5m	3%	7.6%	
	15m	10%		
	25m	5%		
	35m	5%		
	45m	15%		
Rock Cover	5m	0%	0.0%	
	15m	0%		
	25m	0%		
	35m	0%		
	45m	0%		

Total Cover (>100%)	91%
Native cover	6%
Exotic cover	1%
Other Ground Cover	84%

0.1%	63 x 63cm
0.5%	1.4 x 1.4m
1.0%	2 x 2m
5.0%	4 x 5m
25.0%	10 x 10m

COMPOSITION & STRUCTURE

Species recorded for 5

Genus	Species	Scientific Name	Common Name	Family	% Cover	Abundance	Exotic	Growth Form	High Threat?	Comment	BCA Status
Lepidium	spp.	*Lepidium spp.*	0	0	0.1	1	0	Forb (FG)	No		
Zaleya	galericulata	*Zaleya galericulata*	Hogweed	Aizoaceae	0.1	40	0	Forb (FG)	No		
Alternanthera	pungens	*Alternanthera pungens*	Khaki Weed	Amaranthaceae	0.1	200	*		HTE	Seedlings	
Xanthium	spinosum	*Xanthium spinosum*	Bathurst Burr	Asteraceae	0.1	10	*		HTE	Seedlings (Sprayed adults	
Oxalis	perennans	*Oxalis perennans*	0	Oxalidaceae	0.1	20	0	Forb (FG)	No		
Rumex	spp.	*Rumex spp.*	0	Polygonaceae	0.1	2	0	Forb (FG)	No		
Rytidosperma	setaceum	*Rytidosperma setaceum*	Small-flowered Walla	Poaceae	5	1000	0	Grass & grasslike	No		
Chamaesyce	drummondii	*Chamaesyce drummond*	Caustic Weed	Euphorbiaceae	0.1	2	0	Forb (FG)	No		
Vittadinia	spp.	*Vittadinia spp.*	Fuzzweed	Asteraceae	0.1	5	0	Forb (FG)	No		
Chloris	truncata	*Chloris truncata*	Windmill Grass	Poaceae	0.1	10	0	Grass & grasslike	No		
Spergularia	brevifolia	*Spergularia brevifolia*	0	Caryophyllaceae	0.2	80	0	Forb (FG)	No		
Boerhavia	dominii	*Boerhavia dominii*	Tarvine	Nyctaginaceae	0.1	2	0	Forb (FG)	No		
Hordeum	leporinum	*Hordeum leporinum*	Barley Grass	Poaceae	0.2	200	*		No		
Salsola	australis	*Salsola australis*	0	Chenopodiaceae	0.1	20	0	Shrub (SG)	No		
Cynodon	dactylon	*Cynodon dactylon*	Common Couch	Poaceae	0.3	10	0	Grass & grasslike	No		
Trifolium	spp.	*Trifolium spp.*	A Clover	Fabaceae (Faboideae)	0.3	30	*		No		
Tribulus	terrestris	*Tribulus terrestris*	Cat-head	Zygophyllaceae	0.1	2	*		No		

BAM Site Field Survey (All orange cells are for data entry, please do not edit other cells or work sheets as they contain formulas)

Project number:	240316	**Plot Identifier:**	6	**Pic 20x20 Head (ID#)**	6	**Pic 20x50 Tail (ID#)**	6000	
Survey date: (01/01/2021)	9/12/2024		**Compass Orientation (head of 20x20 plot):**				127°W	
Recorders (full name):	Michael Cleland		**PCT:**	76	**Veg Zone condition (low, mod, high):**		Poor	
GPS Easting:	366145.5019	**GPS Northing:**	6055541.629		**Datum (GDA)**	2020	**Zone (54/55/56)**	55
Site location description (eg 2km west of Hay along Mid Western Highway)	Finley							

Landform			**Soils**			**Drainage & Slope**	
Morphology			**Soil Texture**	Clay		**Slope**	None
LandF Element	Plain		**Soil Colour**	Brown		**Aspect**	Flat
LandF Pattern			**Soil Depth**			**Drainage**	Poor
Microrelief			**Geology**			**Watercourses**	Nil

Plot Disturbance

	Severity	**Age**	**Observational Evidence**
Clearing	3	NR	
Cultivation	0		
Soil erosion	2	R	soil erosion from grazing and exposure
Firewood	0		
Grazing	3	R	heavy grazing and some scats
Fire Damage	0		
Storm Damage	0		
Weediness	2	R	mostly weeds and some native grasses
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

Paddock

Age class of trees (DBH), condition of vegetation, hollows

Disturbances (i.e. fire, grazing,ferals, clearing, logging, soil degradation, pollution, weeds, dieback)

clearing, weeds, trimming, grazing

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	6

BAM Attribute (20x20m plot)

	Stratum	Sum
Count of Native Richness	Tree (TG)	0
	Shrub (SG)	0
	Forb (FG)	7
	Grass & grasslike (GG)	3
	Fern (EG)	0
	Other (OG)	0
	TOTAL	10

BAM Attribute (20x20m plot)

	Stratum	Sum
Count of cover abundance (native vascular plants)	Tree (TG)	0
	Shrub (SG)	0
	Forb (FG)	4
	Grass & grasslike (GG)	22
	Fern (EG)	0
	Other (OG)	0
	TOTAL Native	26
	TOTAL 'HTE'	0.2

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 %	Photo ID #
Litter Cover	5m	13%	15.8%	
	15m	18%		
	25m	13%		
	35m	20%		
	45m	15%		
Bare ground cover	5m	80%	73.0%	
	15m	70%		
	25m	80%		
	35m	65%		
	45m	70%		
Cryptogam cover	5m	2%	1.2%	
	15m	1%		
	25m	1%		
	35m	1%		
	45m	1%		
Rock Cover	5m	0%	0.0%	
	15m	0%		
	25m	0%		
	35m	0%		
	45m	0%		

Total Cover (>100%)	116%
Native cover	26%
Exotic cover	0%
Other Ground Cover	90%

0.1%	63 x 63cm
0.5%	1.4 x 1.4m
1.0%	2 x 2m
5.0%	4 x 5m
25.0%	10 x 10m

COMPOSITION & STRUCTURE

Species recorded for 6

Genus	Species	Scientific Name	Common Name	Family	% Cover	Abundance	Exotic	Growth Form	High Threat?
Oxalis	perennans	*Oxalis perennans*	0	Oxalidaceae	0.1	10	0	Forb (FG)	No
Zaleya	galericulata	*Zaleya galericulata*	Hogweed	Aizoaceae	0.1	30	0	Forb (FG)	No
Alternanthera	pungens	*Alternanthera pungens*	Khaki Weed	Amaranthaceae	0.1	35	*		HTE
Xanthium	spinosum	*Xanthium spinosum*	Bathurst Burr	Asteraceae	0.1	5	*		HTE
Rumex	spp.	*Rumex spp.*	0	Polygonaceae	0.1	5	0	Forb (FG)	No
Rytidosperma	setaceum	*Rytidosperma setaceum*	Small-flowered Walla	Poaceae	15	700	0	Grass & grasslike	No
Chamaesyce	drummondii	*Chamaesyce drummond*	Caustic Weed	Euphorbiaceae	0.5	15	0	Forb (FG)	No
Vittadinia	spp.	*Vittadinia spp.*	Fuzzweed	Asteraceae	3	35	0	Forb (FG)	No
Chloris	truncata	*Chloris truncata*	Windmill Grass	Poaceae	2	45	0	Grass & grasslike	No
Spergularia	brevifolia	*Spergularia brevifolia*	0	Caryophyllaceae	0.1	40	0	Forb (FG)	No
Boerhavia	dominii	*Boerhavia dominii*	Tarvine	Nyctaginaceae	0.1	30	0	Forb (FG)	No
Cynodon	dactylon	*Cynodon dactylon*	Common Couch	Poaceae	5	60	0	Grass & grasslike	No
Trifolium	spp.	*Trifolium spp.*	A Clover	Fabaceae (Faboideae	0.1	40	*		No

BAM Site Field Survey (All orange cells are for data entry, please do not edit other cells or work sheets as they contain formulas)

Project number:	240676	**Plot Identifier:**	7	**Pic 20x20 Head (ID#)**	photos on mergin	**Pic 20x50 Tail (ID#)**		
Survey date: (01/01/2021)	6/08/2025		**Compass Orientation (head of 20x20 plot):**				259w	
Recorders (full name):	Michael Cleland, Dominic De Lorenzo		**PCT:**	76	**Veg Zone condition (low, mod, high):**		Derived Grassland	
GPS Easting:	365669	**GPS Northing:**	6056657		**Datum (GDA)**			55
Site location description (eg 2km west of Hay along Mid Western Highway)	Riverina Hwy approx 5 km west of Finley							

Landform			**Soils**			**Drainage & Slope**		
Morphology	plain		**Soil Texture**	clay		**Slope**	none	
LandF Element			**Soil Colour**	red brown		**Aspect**	open	
LandF Pattern	flat		**Soil Depth**			**Drainage**	mod	
Microrelief	none		**Geology**			**Watercourses**		

Plot Disturbance

	Severity	**Age**	**Observational Evidence**
Clearing	1	nr	some Grey box in adjacent areas approx 100m from plot
Cultivation	0		
Soil erosion	1	r	exposed soil
Firewood	0		
Grazing	0		
Fire Damage	0		
Storm Damage	0		
Weediness	2	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

roadside vegetation, powerline easement

Age class of trees (DBH), condition of vegetation, hollows

none

Disturbances (i.e. fire, grazing,ferals, clearing, logging, soil degradation, pollution, weeds, dieback)

slashing, weeds, pollution (rubbish)

Significant and threatened species and communities (Note pop. size/area, structure, repro status, habit, habitat, threats, photos)

none

Dominant Species outside Plot	**Grey Box**

FUNCTION

Function attributes for	7

BAM Attribute (20x20m plot)

	Stratum	Sum
Count of Native Richness	Tree (TG)	0
	Shrub (SG)	1
	Forb (FG)	7
	Grass & grasslike (GG)	2
	Fern (EG)	0
	Other (OG)	0
	TOTAL	10

BAM Attribute (20x20m plot)

	Stratum	Sum
Count of cover abundance (native vascular plants)	Tree (TG)	0
	Shrub (SG)	0.1
	Forb (FG)	1.5
	Grass & grasslike (GG)	17
	Fern (EG)	0
	Other (OG)	0
	TOTAL Native	18.6
	TOTAL 'HTE'	30

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 %	Photo ID #
Litter Cover	5m	5%	6.8%	
	15m	15%		
	25m	4%		
	35m	5%		
	45m	5%		
Bare ground cover	5m	20%	9.2%	
	15m	10%		
	25m	13%		
	35m	1%		
	45m	2%		
Cryptogam cover	5m	0%	10.8%	
	15m	2%		
	25m	7%		
	35m	25%		
	45m	20%		
Rock Cover	5m	0%	0.0%	
	15m	0%		
	25m	0%		
	35m	0%		
	45m	0%		

Total Cover (>100%)	122%
Native cover	19%
Exotic cover	77%
Other Ground Cover	27%

0.1%	63 x 63cm
0.5%	1.4 x 1.4m
1.0%	2 x 2m
5.0%	4 x 5m
25.0%	10 x 10m

COMPOSITION & STRUCTURE

Species recorded for 7

Genus	Species	Scientific Name	Common Name	Family	% Cover	Abundance	Exotic	Growth Form	High Threat
Enchylaena	tomentosa	*Enchylaena tomentosa*	Ruby Saltbush	Chenopodiaceae	0.1	1	0	Shrub (SG)	No
Austrostipa	bigeniculata	*Austrostipa bigeniculata*	Yanganbil	Poaceae	2	22	0	Grass & grasslike	No
Enteropogon	ramosus	*Enteropogon ramosus*	Curly Windmill Grass	Poaceae	15	800	0	Grass & grasslike	No
Chamaesyce	drummondii	*Chamaesyce drummond*	Caustic Weed	Euphorbiaceae	0.1	10	0	Forb (FG)	No
Crassula	decumbens var. decun	*Crassula decumbens var*	Spreading Stonecrop	Crassulaceae	0.5	1000	0	Forb (FG)	No
Einadia	nutans	*Einadia nutans*	Climbing Saltbush	Chenopodiaceae	0.1	2	0	Forb (FG)	No
Erodium	spp.	*Erodium spp.*	0	0	0.1	15	0	Forb (FG)	No
Oxalis	perennans	*Oxalis perennans*	0	Oxalidaceae	0.1	50	0	Forb (FG)	No
Rumex	spp.	*Rumex spp.*	0	Polygonaceae	0.5	40	0	Forb (FG)	No
Sida	corrugata	*Sida corrugata*	Corrugated Sida	Malvaceae	0.1	3	0	Forb (FG)	No
Arctotheca	calendula	*Arctotheca calendula*	Capeweed	Asteraceae	0.1	15	*		No
Brassica	napus	*Brassica napus*	Canola	Brassicaceae	0.1	3	*		No
Cenchrus	clandestinus	*Cenchrus clandestinus*	Kikuyu Grass	Poaceae	3	20	*		HTE
Centaurea	melitensis	*Centaurea melitensis*	Maltese Cockspur	Asteraceae	0.1	20	*		No
Echium	plantagineum	*Echium plantagineum*	Patterson's Curse	Boraginaceae	0.2	20	*		No
Galenia	pubescens	*Galenia pubescens*	Galenia	Aizoaceae	15	600	*		HTE
Hypochaeris	radicata	*Hypochaeris radicata*	Catsear	Asteraceae	0.1	35	*		No
Lepidium	africanum	*Lepidium africanum*	Common Peppercress	Brassicaceae	0.1	5	*		No
Malva	parviflora	*Malva parviflora*	Small-flowered Mallo	Malvaceae	0.2	30	*		No
Paspalum	dilatatum	*Paspalum dilatatum*	Paspalum	Poaceae	5	60	*		HTE
Plantago	lanceolata	*Plantago lanceolata*	Lamb's Tongues	Plantaginaceae	0.2	50	*		No
Polygonum	aviculare	*Polygonum aviculare*	Wireweed	Polygonaceae	0.1	5	*		No
Romulea	rosea var. australis	*Romulea rosea var. aust*	Onion Grass	Iridaceae	7	2000	*		HTE
Lolium	perenne	*rye grass*	Perennial Ryegrass	Poaceae	45	3000	*		No
Sonchus	oleraceus	*Sonchus oleraceus*	Common Sowthistle	Asteraceae	0.1	50	*		No
Trifolium	arvense	*Trifolium arvense*	Haresfoot Clover	Fabaceae (Faboideae)	0.2	500	*		No

BAM Site Field Survey (All orange cells are for data entry, please do not edit other cells or work sheets as they contain formulas)

Project number:	240676	**Plot Identifier:**	8	**Pic 20x20 Head (ID#)**	10 x 40 m plot	**Pic 20x50 Tail (ID#)**	photos on mergin	
Survey date: (01/01/2021)	6/08/2025		**Compass Orientation (head of 20x20 plot):**				80e	
Recorders (full name):	Michael Cleland, Dominic De Lorenzo		**PCT:**	76	**Veg Zone condition (low, mod, high):**		mod	
GPS Easting:	365674	**GPS Northing:**	6056610		**Datum (GDA)**		**Zone (54/55/56)**	55
Site location description (eg 2km west of Hay along Mid Western Highway)	Riverina hwy 5 km west of finley, nsw							

Landform			**Soils**			**Drainage & Slope**		
Morphology	grassland		**Soil Texture**			**Slope**	slight undulation	
LandF Element			**Soil Colour**	red brown		**Aspect**		
LandF Pattern	flat		**Soil Depth**			**Drainage**		
Microrelief			**Geology**			**Watercourses**		

Plot Disturbance

	Severity	**Age**	**Observational Evidence**
Clearing	1	nr	nearby remnant euc trees
Cultivation	0		
Soil erosion	0		
Firewood	0		
Grazing	0		
Fire Damage	0		
Storm Damage	0		
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

roadside reserve

Age class of trees (DBH), condition of vegetation, hollows

none

Disturbances (i.e. fire, grazing,ferals, clearing, logging, soil degradation, pollution, weeds, dieback)

weeds

Significant and threatened species and communities (Note pop. size/area, structure, repro status, habit, habitat, threats, photos)

none

Dominant Species outside Plot	**lolium perene**

FUNCTION

Function attributes for	8

BAM Attribute (20x20m plot)

	Stratum	Sum
Count of Native Richness	Tree (TG)	0
	Shrub (SG)	3
	Forb (FG)	2
	Grass & grasslike (GG)	3
	Fern (EG)	0
	Other (OG)	0
	TOTAL	8

BAM Attribute (20x20m plot)

	Stratum	Sum
Count of cover abundance (native vascular plants)	Tree (TG)	0
	Shrub (SG)	2.2
	Forb (FG)	4.2
	Grass & grasslike (GG)	57.5
	Fern (EG)	0
	Other (OG)	0
	TOTAL Native	63.9
	TOTAL 'HTE'	12.5

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 %	Photo ID #
Litter Cover	5m	4%	7.8%	
	15m	15%		
	25m	7%		
	35m	10%		
	45m	3%		
Bare ground cover	5m	1%	9.8%	
	15m	20%		
	25m	3%		
	35m	20%		
	45m	5%		
Cryptogam cover	5m	0%	0.0%	
	15m	0%		
	25m	0%		
	35m	0%		
	45m	0%		
Rock Cover	5m	0%	1.0%	
	15m	5%		
	25m	0%		
	35m	0%		
	45m	0%		

Total Cover (>100%)	117%
Native cover	64%
Exotic cover	34%
Other Ground Cover	19%

0.1%	63 x 63cm
0.5%	1.4 x 1.4m
1.0%	2 x 2m
5.0%	4 x 5m
25.0%	10 x 10m

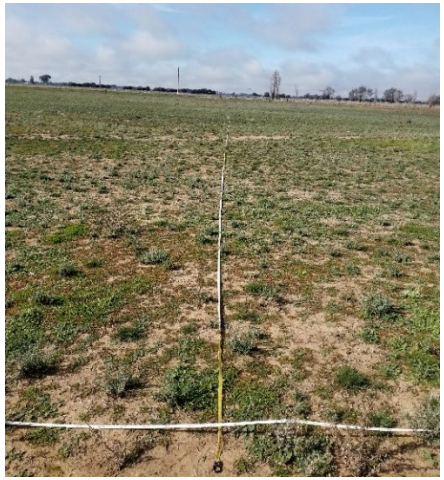
COMPOSITION & STRUCTURE

Species recorded for 8

Genus	Species	Scientific Name	Common Name	Family	% Cover	Abundance	Exotic	Growth Form	High Threat
Enchylaena	tomentosa	*Enchylaena tomentosa*	Ruby Saltbush	Chenopodiaceae	2	400	0	Shrub (SG)	No
Sclerolaena	birchii	*Sclerolaena birchii*	Galvinized Burr	Chenopodiaceae	0.1	1	0	Shrub (SG)	No
Sclerolaena	muricata	*Sclerolaena muricata*	Black Rolypoly	Chenopodiaceae	0.1	5	0	Shrub (SG)	No
Austrostipa	bigeniculata	*Austrostipa bigeniculata*	Yanganbil	Poaceae	55	1500	0	Grass & grasslike	No
Austrostipa	blackii	*Austrostipa blackii*	0	Poaceae	0.5	20	0	Grass & grasslike	No
Enteropogon	ramosus	*Enteropogon ramosus*	Curly Windmill Grass	Poaceae	2	30	0	Grass & grasslike	No
Einadia	nutans	*Einadia nutans*	Climbing Saltbush	Chenopodiaceae	4	60	0	Forb (FG)	No
Rumex	brownii	*Rumex brownii*	Swamp Dock	Polygonaceae	0.2	40	0	Forb (FG)	No
Arctotheca	calendula	*Arctotheca calendula*	Capeweed	Asteraceae	0.1	20	*		No
Cirsium	vulgare	*Cirsium vulgare*	Spear Thistle	Asteraceae	0.5	1	*		No
Galenia	pubescens	*Galenia pubescens*	Galenia	Aizoaceae	12	300	*		HTE
Hypochaeris	radicata	*Hypochaeris radicata*	Catsear	Asteraceae	0.2	30	*		No
Lolium	perenne	*Lolium perenne*	Perennial Ryegrass	Poaceae	20	2000	*		No
Malva	parviflora	*Malva parviflora*	Small-flowered Mallo	Malvaceae	0.1	5	*		No
Romulea	rosea var. australis	*Romulea rosea var. aust*	Onion Grass	Iridaceae	0.5	400	*		HTE
Sonchus	oleraceus	*Sonchus oleraceus*	Common Sowthistle	Asteraceae	0.1	15	*		No
Triticum	aestivum	*Triticum aestivum*	Wheat	Poaceae	0.5	60	*		No

D.2 VI plot photos

Vegetation Integrity plot photos - 240676 South Coree BESS

BP01			
Start 	**End** 	**Quadrat 1** 	**Quadrat 2** 
Quadrat 3 	**Quadrat 4** 	**Quadrat 5** 	

Vegetation Integrity plot photos - 240676 South Coree BESS

BP02			
Start 	**End** 	**Quadrat 1** 	**Quadrat 2** 
Quadrat 3 	**Quadrat 4** 	**Quadrat 5** 	

Vegetation Integrity plot photos - 240676 South Coree BESS

BP03			
Start 	**End** 	**Quadrat 1** 	**Quadrat 2** 
Quadrat 3 	**Quadrat 4** 	**Quadrat 5** 	

Vegetation Integrity plot photos - 240676 South Coree BESS

BP04			
Start 	**End** 	**Quadrat 1** 	**Quadrat 2** 
Quadrat 3 	**Quadrat 4** 	**Quadrat 5** 	

Vegetation Integrity plot photos - 240676 South Coree BESS

BP05			
Start 	**End** 	**Quadrat 1** 	**Quadrat 2** 
Quadrat 3 	**Quadrat 4** 	**Quadrat 5** 	

Vegetation Integrity plot photos - 240676 South Coree BESS

BP06			
Start 	**End** 	**Quadrat 1** 	**Quadrat 2** 
Quadrat 3 	**Quadrat 4** 	**Quadrat 5** 	

Vegetation Integrity plot photos - 240676 South Coree BESS

BP07			
Start 	**End** 	**Quadrat 1** 	**Quadrat 2** 
Quadrat 3 	**Quadrat 4** 	**Quadrat 5** 	

Vegetation Integrity plot photos - 240676 South Coree BESS

BP08			
Start 	**End** 	**Quadrat 1** 	**Quadrat 2** 
Quadrat 3 	**Quadrat 4** 	**Quadrat 5** 	

D.3 Frog Survey results

Survey Date	Target species	Result
04/08/25	*Crinea sloanei*	Not recorded.
05/08/25	*Crinea sloanei*	Not recorded.
06/08/25	*Crinea sloanei*	Not recorded
07/08/25	*Crinea sloanei*	Not recorded

8 August 2025

South Coree BDAR Sloane's Froglet Field Survey Results

Field Staff: Michael Cleland, Dominic De Lorenzo

DAY 1 – Monday 04/08/2025

- Arrived at Site A (dam) at 6:30pm, temperature ~ 9°C with moderate winds and cloud cover. Large permanent, still pond adjacent to the property's access road. Soils were predominantly clay, silty clay with lenses of sand and gravel. Water quality appeared to be in poor condition being notably turbid, potentially due to high nutrient input from farm animals (geese) and rainwater runoff with little riparian or marginal vegetation surrounding the body of water to reduce input. The riparian and marginal vegetation consisted of rushes (*Juncus* sp.) and a large cluster of *Typha* sp. at the southern end of Dam Scotch Thistles (*Onopordum acanthium*) and Cheese Weed (*Malva parviflora*) dominating the banks of the dam. **No Sloane's Froglets (*Crinia sloanei*) were observed either visually or aurally,** although two common species the Eastern sign-bearing froglet (*Crinia parinsignifera*) and the Spotted Marsh Frog (*Limnodynastes tasmanianiensis*) were both observed. Eastern Sign-bearing froglet was heard from a distance. Spotted Marsh Frog (SMF) was seen visually as a few individuals on the banks of the irrigation channels, usually in more open areas. Distant calls also confirmed SMF presence within the channel. The Frog ID app was used on several attempts to analyse call recordings for species confirmation. On each occasion the calls were too faint to be picked up by the app and could not be analysed.
- Eastern Sign-bearing froglet (ESBF) and Sloane's froglet have similar calls. ESBF has a more drawn out and higher-pitched call in comparison to Sloane's froglet. ESBF also has fewer intervals of calls in its call sequence. In comparison Sloane's froglet can have a long call sequence.
- Arrived at Site B (irrigation channel) at ~ 7:30pm, the temperature ~ 8°C with moderate winds and cloud cover. The water body was a still, artificial, irrigation channel consisting of two irrigation channels joint at the intersections of Brookman Rd and Canalla Rd. The soils were predominantly clay, silty clay with lenses of sand and gravel. Water quality appeared to be in poor condition being light brown in colour and notably turbid. The riparian and marginal vegetation consisted of rushes (*Juncus* sp.), Kikuyu Grass (*Cenchrus clandestinus*), Scotch Thistle (*Onopordum acanthium*), Harding Grass (*Phalaris aquatica*) and Common Vetch (*Vicia sativa*). Patches of Plains Grass (*Austrostipa aristiglumis*) were observed along the banks of the channel parallel to Canalla Rd. **No Sloane's Froglets (*Crinia sloanei*) were observed visually or aurally.** Six individual Spotted Marsh Frog (*Limnodynastes tasmanianiensis*) were both observed on the banks of the channel parallel to Broockman Rd, some occupying small holes (~. 1-3cm diameter) in the soil. Eastern Sign-bearing froglet was heard from a distance. Spotted Marsh Frog (SMF) was seen visually as a few individuals on the banks of the irrigation channels, usually in more open areas. Distant calls also confirmed SMF presence within the channel. The Frog ID app was used on several attempts to analyse call recordings for species confirmation. On each occasion the calls were too faint to be picked up by the app and could not be analysed.
-

Wodonga
Unit 2, 83 Hume Street Wodonga VIC 3690
T. (02) 6067 2533 **E**. ngh@nghconsulting.com.au **W**. nghconsulting.com.au **ABN** 31 124 444 622 **ACN** 124 444 622

DAY 2 – Tuesday 05/08/2025

- Arrived at Site A (dam) at ~ 6:20pm, temperature ~ 9°C, clear conditions with little to no wind. Large permanent, still pond adjacent to the property's access road. Soils were predominantly clay, silty clay with lenses of sand and gravel. Water quality appeared to be in poor condition being notably turbid, potentially due to high nutrient input from farm animals (geese) and rainwater runoff with little riparian or marginal vegetation surrounding the body of water to reduce input. The riparian and marginal vegetation consisted of rushes *Juncus* sp*.* and a large cluster of *Typha* sp*.* at the southern end of Dam. Scotch Thistles (*Onopordum acanthium*) and Cheese Weed (*Malva parviflora*) dominating the banks of the dam. **No Sloane's Froglets (*Crinia sloanei*) were observed visually or aurally.** Three individual Eastern sign-bearing froglets (*Crinia parinsignifera*) were observed calling.
- Arrived at Site B (irrigation channel) at ~ 7:30pm, the temperature ~ 8°C with clear conditions, little to no wind. The water body was a still, artificial, irrigation channel consisting of two irrigation channels joint at the intersections of Brookman Rd and Canalla Rd. The soils were predominantly clay, silty clay with lenses of sand and gravel. Water quality appeared to be in poor condition being light brown in colour and notably turbid. The riparian and marginal vegetation consisted of rushes (*Juncus* sp*.*), Kikuyu Grass (*Cenchrus clandestinus*)*,* Scotch Thistles (*Onopordum acanthium*), Harding Grass (*Phalaris* aquatica) and Common Vetch (*Vicia* sativa). Patches of Plains Grass (*Austrostipa aristiglumis*) were observed along the banks of the channel parallel to Canalla Rd. **No Sloane's Froglets (*Crinia sloanei*) were observed visually or aurally.** Three individual Spotted Marsh Frog (*Limnodynastes tasmanianiensis*) were both observed on the banks of the channel parallel to Broockman Rd, all occupying small ground holes (~ 1-3cm diameter).
- Finished at end point of nocturnal frog surveying ~ 9:45pm.

DAY 3 – Wednesday 06/08/2025

- Arrived at Site A (dam) at 6:05pm, the temperature ~ 8°C with clear conditions, little to no wind. Large permanent, still pond adjacent to the property's access road. Soils were predominantly clay, silty clay with lenses of sand and gravel. Water quality appeared to be in poor condition being notably turbid, potentially due to high nutrient input from farm animals (geese) and rainwater runoff with little riparian or marginal vegetation surrounding the body of water. The riparian and marginal vegetation consisted of rushes (*Juncus* sp*.*) and a large cluster of *Typha* sp*.* at the southern end of Dam with Scotch Thistles (*Onopordum acanthium*) and Cheese Weed (*Malva parviflora*) dominating the banks of the dam. **No Sloane's Froglets (*Crinia sloanei*) were observed visually or aurally.** One individual Eastern sign-bearing froglets (*Crinia parinsignifera*) was observed calling and an unidentified microbat observed flying above dam.
- Arrived at Site B (irrigation channel) at ~ 7:00pm, the temperature ~ 8°C with clear conditions, little to no wind. The water body was a still, artificial, irrigation channel consisting of two irrigation channels joint at the intersections of Brookman Rd and Canalla Rd. The soils were predominantly clay, silty clay with lenses of sand and gravel. Water quality appeared to be in poor condition being light brown in colour and notably turbid. The riparian and marginal vegetation consisted of rushes (*Juncus* sp*.*), Kikuyu Grass (*Cenchrus clandestinus*)*,* Scotch Thistles (*Onopordum acanthium*), Harding Grass (*Phalaris* aquatica) and Common Vetch (*Vicia* sativa). Patches of Plains Grass (*Austrostipa aristiglumis*) were observed along the banks of the channel parallel to Canalla Rd. **No Sloane's Froglets (*Crinia sloanei*) were observed visually or aurally.** No other species of frogs observed although an unidentified Owl was observed flying over channel running along Canalla Rd.
- Finished at end point of nocturnal frog surveying ~ 9:10pm.

DAY 4 – Thursday 07/08/2025

- Arrived at Site A (dam) at 2:30pm, the temperature ~ 17°C with clear, sunny conditions, little to no wind. Day time surveys were chosen as no Sloane's Froglets were calling or observed at night, as well as little activity from other frog species. Large permanent, still pond adjacent to the property's access road. Soils were predominantly clay, silty clay with lenses of sand and gravel. Water quality appeared to be in poor condition being notably turbid, potentially due to high nutrient input from farm animals (geese) and rainwater runoff with little riparian or marginal vegetation surrounding the body of water. The riparian and marginal vegetation consisted of rushes (*Juncus* sp.) and a large cluster of *Typha* sp. at the southern end of Dam Scotch Thistles (*Onopordum acanthium*) and Cheese Weed (*Malva parviflora*) dominating the banks of the dam. **No Sloane's Froglets (*Crinia sloanei*) were observed visually or aurally.** No other frog species were observed.
- Arrived at Site B (irrigation channel) at ~ 3:30pm, the temperature ~ 17°C with clear, sunny conditions, little to no wind. The water body was a still, artificial, irrigation channel consisting of two irrigation channels joint at the intersections of Brookman Rd and Canalla Rd. The soils were predominantly clay, silty clay with lenses of sand and gravel. Water quality appeared to be in poor condition being light brown in colour and notably turbid. The riparian and marginal vegetation consisted of rushes (*Juncus* sp.), Kikuyu Grass (*Cenchrus clandestinus*), Scotch Thistles (*Onopordum acanthium*), Harding Grass (*Phalaris* aquatica) and Common Vetch (*Vicia* sativa). Patches of Plains Grass (*Austrostipa aristiglumis*) were observed along the banks of the channel parallel to Canalla Rd. **No Sloane's Froglets (*Crinia sloanei*) were observed visually or aurally.** One individual Spotted Marsh Frog (*Limnodynastes tasmanianiensis*) heard calling at the central area of the channel and one Eastern Sign-bearing Froglet (*Crinia parinsignifera*) was heard calling at the eastern end of the channel.
- Finished at end point of nocturnal frog surveying ~ 5:30pm.

Site A

Site B

Figure 1-1 Photos from Site B. Spotlighting at the edge of irrigation channel with poor structure

Figure 1-2 Photos from Site B. Visual sightings of Spotted Marsh Frog from night 1 of surveys

D.4 Anabat survey results

Microbat Ultrasonic Call Identification Report for the South Coree Battery Energy Storage System - Biodiversity Development Assessment Report

NGH Consulting Pty Ltd

A report prepared for Maddie Roberston and Julia Gooding

Prepared by RA Environmental Consultants

ABN – 63 6685 875 27

Microbat Ultrasonic Call Identification Report for the South Coree Battery Energy Storage System - Biodiversity Development Assessment Report

NGH Consulting Pty Ltd

A report prepared for Maddie Roberston and Julia Gooding

Project aim

The objective of this microbat call identification report was to review the submitted microbat call data to identify the following:

- The microbat species listed as threatened under the New South Wales (NSW) *Biodiversity Conservation Act (2016)* (BC Act) and the *Commonwealth's Environment Protection and Biodiversity Conservation Act (1999)* (EPBC Act) using the proposed South Coree East Battery Energy Storage System (BESS) development site (hereafter known as the subject land).
- The microbat species listed as species-credit species under the Biodiversity Assessment Methodology (BAM) (Department of Planning, Industry and Environment (DPIE) 2020; DPIE 2021) that are present within the subject land.

The results of this assessment will inform a Biodiversity Development Assessment Report (BDAR).

Methods

Survey effort

The subject land is located approximately ~6km west of Finley (NSW). The data received for analysis was collected on two passively deployed Anabat Swift detectors between 3 and 8 December 2024 (Titley Scientific). NGH Consulting staff were responsible for deploying the two Anabat Swift detectors.

Each detector was set to record microbat call data across the entire night (e.g., recording commenced at dusk and concluded at dawn). The submitted data was recorded across seven survey nights (Table 1). An overview of the detectors used to conduct the survey, the nights surveyed, the overall survey effort, and the number of full spectrum files submitted for analysis is provided in Table 1.

Table 1. Survey sites, Anabat Swift detectors used, dates surveyed, survey effort, and the number of full spectrum files submitted for analysis.

Survey site	Detector Type	Detector reference number	Nights surveyed	Survey nights	Files submitted for analysis
Dam 1	Anabat Swift	450034	3 - 8 December 2024	6	14,036
Waterway near substation	Anabat Swift	576053	3 December 2024	1	2,268
Total				7	16,304

Preparation of a candidate species list

The subject land is located within the Riverina bioregion as described by Pennay (*et al.* 2004). Before analysing the submitted microbat call data, a candidate list of microbat species known to or are deemed likely to occur in the region (in this instance, region acquaints to a 20km radius of the subject land, see Appendix 1) was prepared by completing a search and a review of the Australian Bat Society 'Bat Maps' (BatMap - Ausbats), NSW Bionet database search tool, Atlas of Living Australia (Atlas of Living Australia – Open access to Australia's biodiversity data (ala.org.au)), Churchill (2008), Pennay *et al.* (2011) and Van Dyck and Strahan (2008).

This database research and literature review identified 15 microbat species that are known to or are considered likely to occur within a 20 km radius of the subject lands (Appendix 2). To acknowledge that the characteristic frequency (Fc) of the call sequences produced by some

microbat species can differ across biogeographic regions, the regional-specific Fc of each candidate species is shown in Appendix 2 (Penney *et al.* (2004)).

Data analysis

There were 16,304 full-spectrum files submitted for analysis (Table 1). To exclude the non-microbat noise files from the analysis, each file was subject to a generic noise removal filter (Anabat Insight, Version 2.1.2-0-g3566bf9, Titley Scientific). During this process, 11,765 noise files were excluded. The 4,539 files passed by the noise filter were subjected to a Decision Tree (DT) analysis to:

- Separate the microbat call sequences into 5 to 10 kHz average characteristic frequency (Fc) increments.
- Attach a label to each call sequence that best represents a species or a species complex that could be responsible for the call.

Following this process, the sorted and labelled microbat call sequences were manually reviewed in Anabat Insight by Rod Armistead. Species and species complex identifications were confirmed by comparing the Fc, pulse, and call sequence characteristics of the recorded call sequences to the published call parameters presented in:

- The *Region based guide to the echolocation calls of microbats in New South Wales* (Pennay *et al.* 2004) (Bat Calls of New South Wales (PDF - 1.4MB) (nsw.gov.au) and an accompanying reference library of over 200 calls collected from the Sydney Basin bioregion of NSW (Bat calls of New South Wales | Surveys, monitoring and records | Environment and Heritage).
- The *Key to the bat calls of south-east Queensland and north-east New South Wales* (Reinhold *et al.* 2001) (1) (PDF) Key to the bat calls of south-east Queensland and north-east New South Wales (researchgate.net).

While reviewing the recorded microbat call sequences, the following protocols (adapted from Lloyd *et al.* 2006) were applied:

- Recorded call sequences containing less than three pulses were excluded from the analysis as they can often be too short to confidently determine the identity of the species making the call (Law *et al.* 1999). These short call sequences were removed from the data either during the DT analysis or as the data was being manually reviewed.
- For those call sequences that can be used to identify a microbat species (or a species complex), two categories of confidence were used (Mills *et al.* 1996):
    - Present – the Fc, quality and structure of the call sequence (e.g., pulse characteristics) (as per Pennay *et al.* 2004 and Rheinhold *et al.* 2001) are such that the identity of the microbat species making the call can be resolved with a relatively high degree of confidence.
    - Potentially present – the quality and structure of the call sequence are such that there is some uncertainty about the identity of the species that produced the call sequence. Or there is some likelihood of confusion with another species that produces a similar (overlapping) call sequence. Therefore, making it impossible to resolve or attribute that call sequence to a single microbat species.
- Unusual call sequences (e.g. possible social calls, intra and inter-species interaction, forage or feeding buzzes) that cannot be used to identify a microbat species were labeled as being of 'low' quality or dismissed from the analysis.
- Sequences that cannot be attributed to an echolocating microbat (e.g. insect buzzes, wind, train, and vehicle movements), were dismissed from the analysis.

Results and Discussion

Overview

Ten microbat species were identified as being present within the subject land (Table 2 and Table 3). A further five species were determined to be potentially present (Table 2 and Table 3). Examples of the recorded microbat species and species complex call sequences are shown in Figure 1 to Figure 14.

Threatened species information.

Two threatened microbats listed as Vulnerable under the BC Act were determined to be present in the subject land (Table 2 and Table 3). The threatened species deemed to be present comprised of the following:

- *Myotis macropus* (Southern Myotis)
- *Saccolaimus flaviventris* (Yellow-bellied Sheath-tailed Bat)

One microbat species, *Nyctophillus corbeni* (Corben's Long-eared Bat) which is also listed as Vulnerable under the BC Act was determined to be potentially present in the subject land (Table 2 and Table 3).

Corben's Long-eared Bat is also listed as Vulnerable under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Species credit species

Three threatened species were recorded as present or potentially present during the current survey. Following the Biodiversity Assessment Method (Department of Planning, Industry and Environment (DPIE) 2020) and DPIE (2021), two of the three threatened microbats detected during this survey have been allocated to the ecosystem credit species credit class. The two ecosystem credit species consist of the following:

- *Nyctophillus corbeni* (Corben's Long-eared Bat)
- *Saccolaimus flaviventris* (Yellow-bellied Sheath-tailed Bat)

The remaining BC Act-listed microbat species recorded during this survey, the Southern Myotis is allocated to the species credit species credit class (DPIE (2020) and DPIE (2021)).

Table 2. The microbat species that were recorded during this survey.

Species name	Common name	Conservation status		Present / potentially present
		EPBC Act 1999	BC Act 2016	
Austronomus australis	White-striped Free-tailed Bat	-	-	Present
Chalinolobus gouldii	Gould's Wattled Bat	-	-	Present
Chalinolobus morio	Chocolate Wattled Bat	-	-	Present
Myotis macropus	Southern Myotis	-	Vulnerable	Present
Nyctophilus corbeni	Corben's Long-eared Bat	Vulnerable	Vulnerable	Potentially Present
Nyctophilus geoffroyi	Lesser Long-eared Bat	-	-	Potentially Present
Nyctophilus gouldi	Gould's Long-eared Bat	-	-	Potentially Present
Ozimops planiceps	Southern Free-tailed Bat	-	-	Present
Ozimops ridei	Ride's Free-tailed Bat	-	-	Present
Saccolaimus flaviventris	Yellow-bellied Sheath-tailed Bat	-	Vulnerable	Present
Scotorepens balstoni	Inland Broad-nosed Bat	-	-	Present
Scotorepens greyii	Little Broad-nosed Bat	-	-	Potentially Present
Vespadelus darlingtoni	Large Forest Bat	-	-	Present
Vespadelus regulus	Southern Forest Bat	-	-	Potentially Present
Vespadelus vulturnus	Little Forest Bat	-	-	Present

Table 3. The microbat species recorded at each survey site.

Species name	Common name	Present / Potentially present	
		Survey site	
		Dam 1	Waterway near substation
Austronomus australis	White-striped Free-tailed Bat	Present	Present
Chalinolobus gouldii	Gould's Wattled Bat	Present	Present
Chalinolobus morio	Chocolate Wattled Bat	Present	Potentially present
*Myotis macropus**	Southern Myotis	Present	Potentially present
*Nyctophilus corbeni** [and 1]	Corben's Long-eared Bat	Potentially present	Potentially present
Nyctophilus geoffroyi	Lesser Long-eared Bat	Potentially present	Potentially present
Nyctophilus gouldi	Gould's Long-eared Bat	Potentially present	Potentially present
Ozimops planiceps	Southern Free-tailed Bat	Present	Present
Ozimops ridei	Ride's Free-tailed Bat	Present	Present
*Saccolaimus flaviventris**	Yellow-bellied Sheath-tailed Bat	Present	Not detected
Scotorepens balstoni	Inland Broad-nosed Bat	Present	Present
Scotorepens greyii	Little Broad-nosed Bat	Potentially present	Potentially present
Vespadelus darlingtoni	Large Forest Bat	Present	Not detected
Vespadelus regulus	Southern Forest Bat	Potentially present	Potentially present
Vespadelus vulturnus	Little Forest Bat	Present	Present

*Represents those species that are listed as Vulnerable under the BC Act
[1]Represents those species that are listed as Vulnerable under the EPBC Act

Unresolved call sequences and survey limitations

A microbat species was deemed to be present or potentially when the recorded call characteristics matched those described in Pennay *et al.* (2004) and Reinhold *et al.* (2001), and from any other previously recorded and reviewed data collected from this region. In the northeast bioregion of NSW, several species can have overlapping call sequences (Pennay *et al.* 2004). These overlapping call sequences can have a similar Fc range and identical pulse characteristics, thus making it difficult, or at times impossible to attribute (or resolve) a microbat call sequence to a single species. If an overlap has been deemed to occur, that call sequence will be considered 'unresolved' and given a multi-species complex label. Unless specified elsewhere, those species included in an unresolved call sequence will be determined as being 'potentially present' only. The following are examples of those species recorded during this survey that can have overlapping call sequences.

- The higher intensity call sequences of *Austronomus australis* (White-striped Free-tailed Bat) may overlap with the call sequence of the threatened Yellow-bellied Sheath-tailed Bat. See Figure 1 and Figure 9 for examples of the resolved call sequences for these two species.
- The call sequences of the non-threatened *Chalinolobus gouldii* (Gould's Wattled Bat), *Ozimops planiceps* (Southern Free-tailed Bat), and *O. ridei* (Ride's Free-tailed Bat) can overlap. See Figure 2, Figure 7, and Figure 8, for examples of the resolved and unresolved call sequences for these three species.
- The call sequence of the Chocolate Wattled Bat can overlap with the call sequences of the *Vespadelus regulus* (Southern Forest Bat), and *V. vulturnus* (Little Forest Bat). See Figure 3, Figure 13, and Figure 14 for examples of the resolved and unresolved call sequences for these species.

- In this region, the call sequence of the threatened Southern Myotis, the threatened Corben's Long-eared Bat, non-threatened *N. geoffroyi* (Lesser Long-eared Bat), and *N. gouldi* (Gould's Long-eared Bat) can overlap. See Figure 4, Figure 5, and Figure 6 for examples of the resolved and unresolved call sequences for these species.
- The call sequence of the *Vespadelus regulus* (Southern Forest Bat), and *V. vulturnus* (Little Forest Bat) can overlap. See Figure 13 and Figure 14 for examples of the resolved and unresolved call sequences for these species.

To confirm the presence of these species deemed to be potentially present within the subject land, it would be necessary to undertake further surveys. The DPIE (2021) *'Species credit' threatened bats and their habitats* guide suggests that these further surveys could involve:

- The use of mist or harp traps to conduct live capture and release surveys.
- The use of thermal or infrared cameras in conjunction with a hand-held microbat call detector to monitor forage (e.g., flight location and/or patterns, dipping/raking across the surface of a water body by Southern Myotis) and roost emergence activity.
- A search of any potential roost sites (e.g., natural caves, disused mines, bridge structures, stormwater drains or culverts, tree hollows, or under-exfoliating bark) for:
    - The presence of roosting microbats.
    - Indirect evidence of roosting microbats in the form of urine staining, guano, fur, carcasses (dead microbats), and bat fly (e.g., Superfamily: Hippoboscoidea, Family Nycteribiidae and Streblidae) pupae casings.

Reporting and nomenclature

This microbat bat call identification report follows the recommended reporting requirements provided by the Australian Bat Society (Reardon 2003).

Disclaimer

The statements made in this report are made to inform a BDAR that is to be prepared by NGH Consulting Pty Ltd. Rod Armistead Environmental Consultants will not be liable for any loss or damage that might arise from this report being used by a third party.

Rod Armistead Environmental Consultants, if required, reserves the right to re-analysis, review, and/or discuss the labeling and identification of the species identified in this assessment.

Examples of the resolved and unresolved microbat call sequences recorded during this survey. The call sequences are displayed in full spectrum (left-hand side) and zero crossing file (right-hand side) formats. The call sequences are shown with the time compressed (viewed with one millisecond between pulses), time per tick is set at F7 (10 milliseconds), Auto FS is on, and the smoothness is set at either on auto or at 5 (Penney *et al.* 2004; Titley Scientific 2023). The x-axis represents time in milliseconds, and the y-axis represents the characteristic frequency in Kilohertz. The metrics for each call sequence, detector type, detector serial number, GPS location, date, and time of each recording are shown in the two information panels located on the right-hand side of each call sequence.

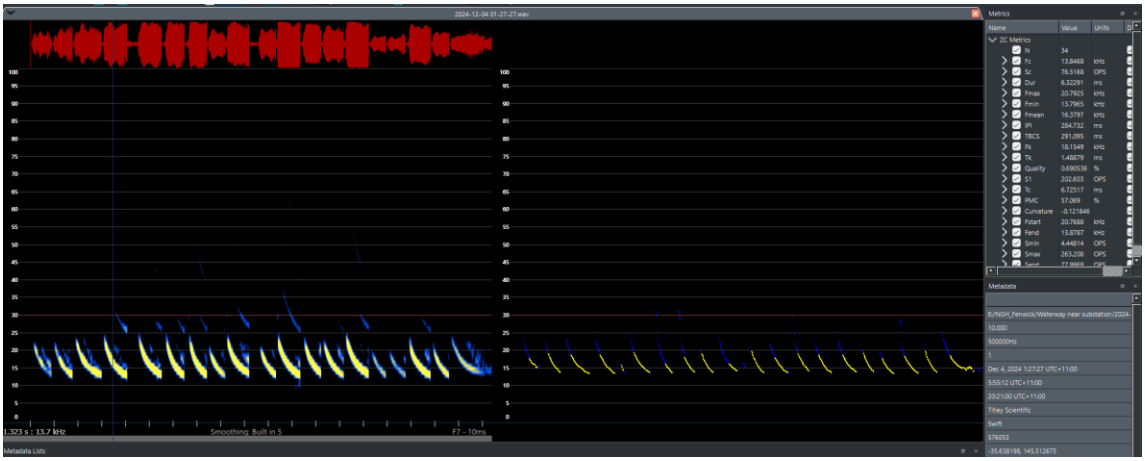


Figure 1. Call sequence for *Austronomus australis* (White-striped Free-tailed Bat).

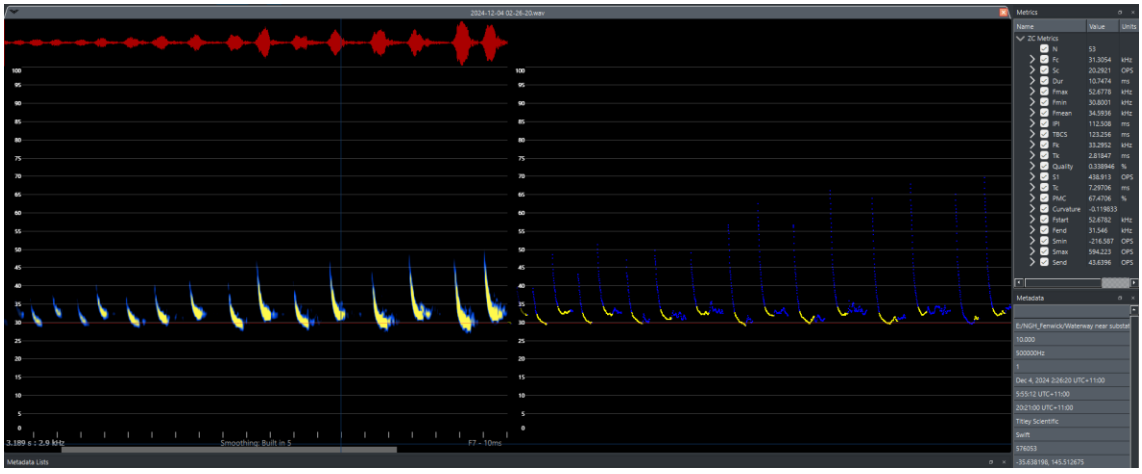


Figure 2. Call sequence for *Chalinolobus gouldii* (Gould's Wattled Bat)

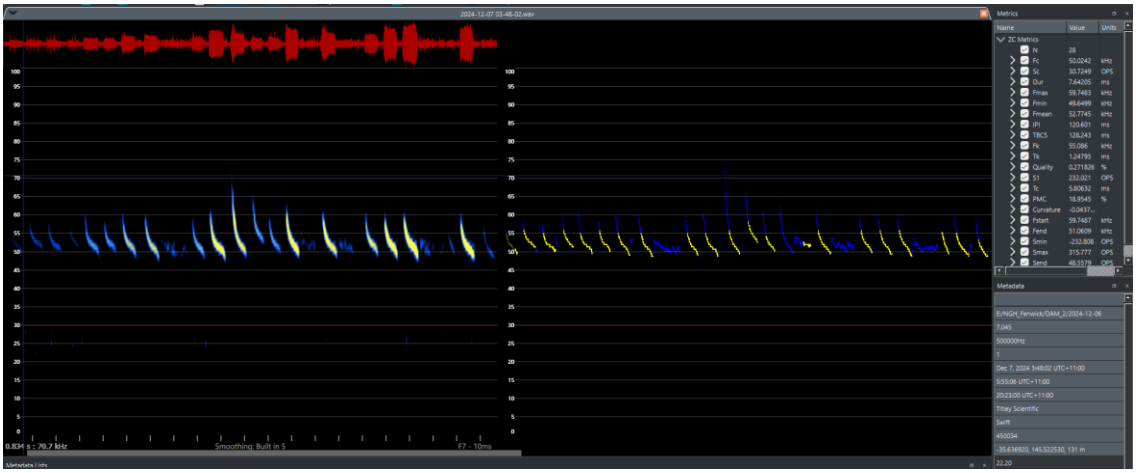


Figure 3. Potential call sequence for *Chalinolobus morio* (Chocolate Wattled Bat) (*Vespadelus regulus* (Southern Forest Bat) was excluded from this call due to alternating undulating consecutive pulses at the beginning of the call sequence).

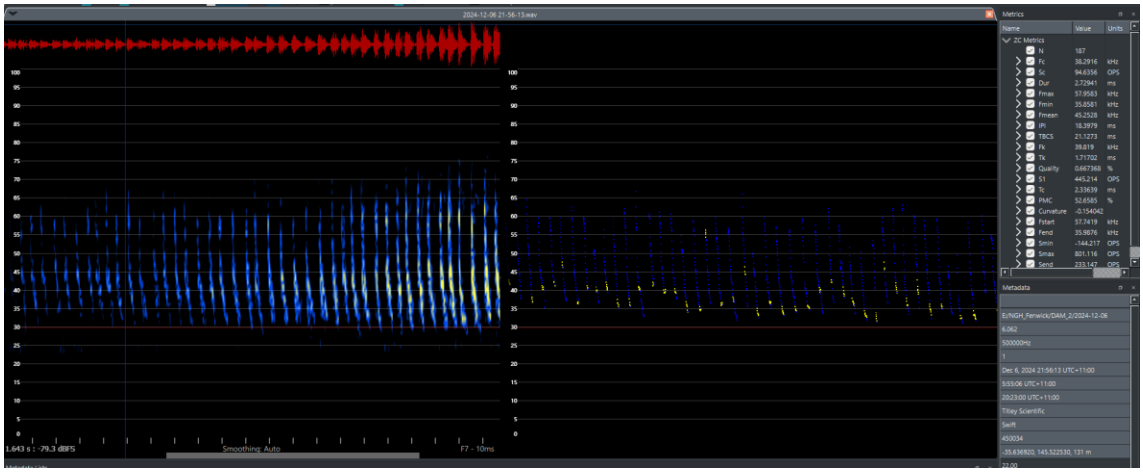


Figure 4. Call sequence for *Myotis macropus* (Southern Myotis). For diagnostic purposes, please note that the average time between calls (TBC) is 21.13 milliseconds, and the initial slope (S1) is 445.21 octaves per second (OPS)) (see ZC metrics in side panels).

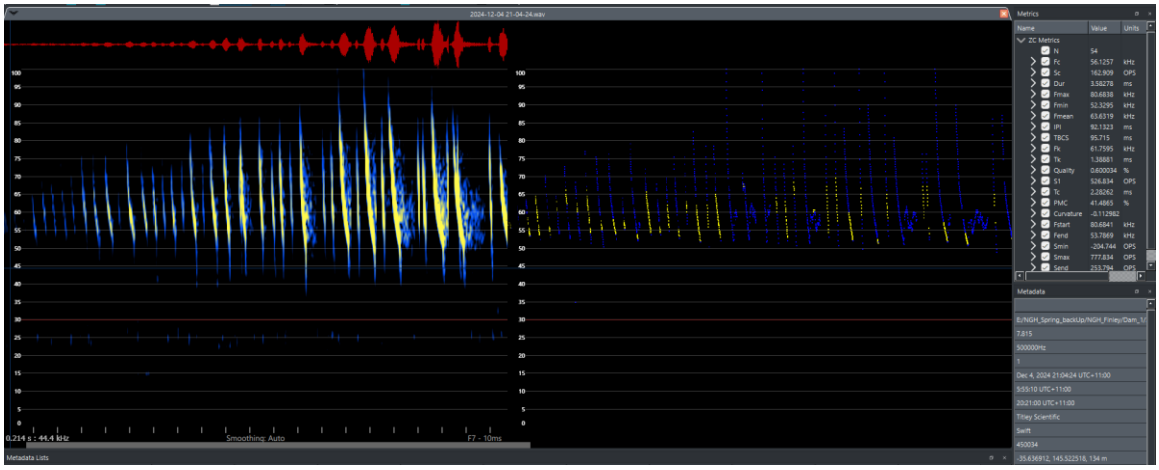


Figure 5. Potential call sequence for *Myotis macropus* (Southern Myotis), *Nyctophilus corbeni* (Corben's Long-eared Bat), *Nyctophilus geoffroyi* (Lesser Long-eared Bat), or *Nyctophilus gouldi* (Gould's Long-eared Bat).

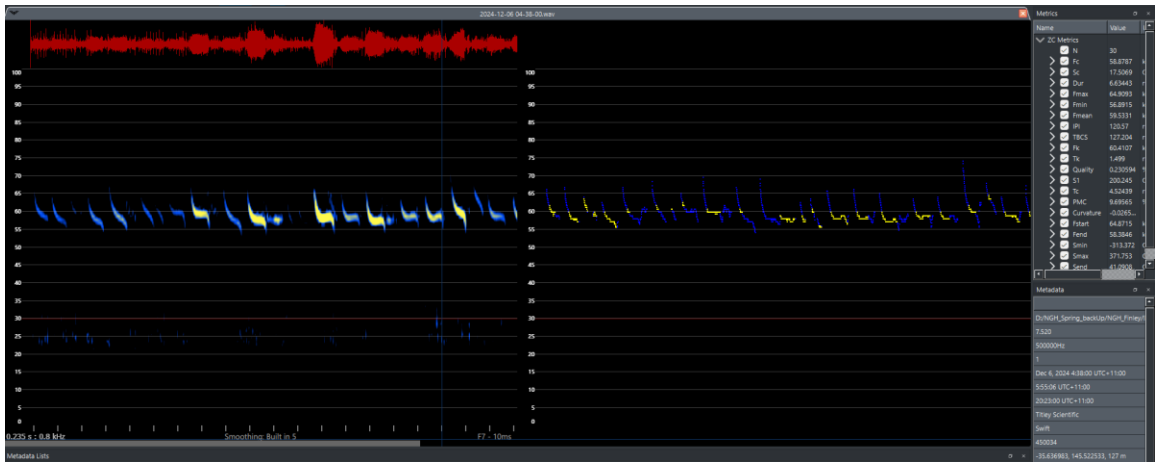


Figure 6. Potential call sequence for *Nyctophilus corbeni* (Corben's Long-eared Bat), *Nyctophilus geoffroyi* (Lesser Long-eared Bat), or *Nyctophilus gouldi* (Gould's Long-eared Bat).

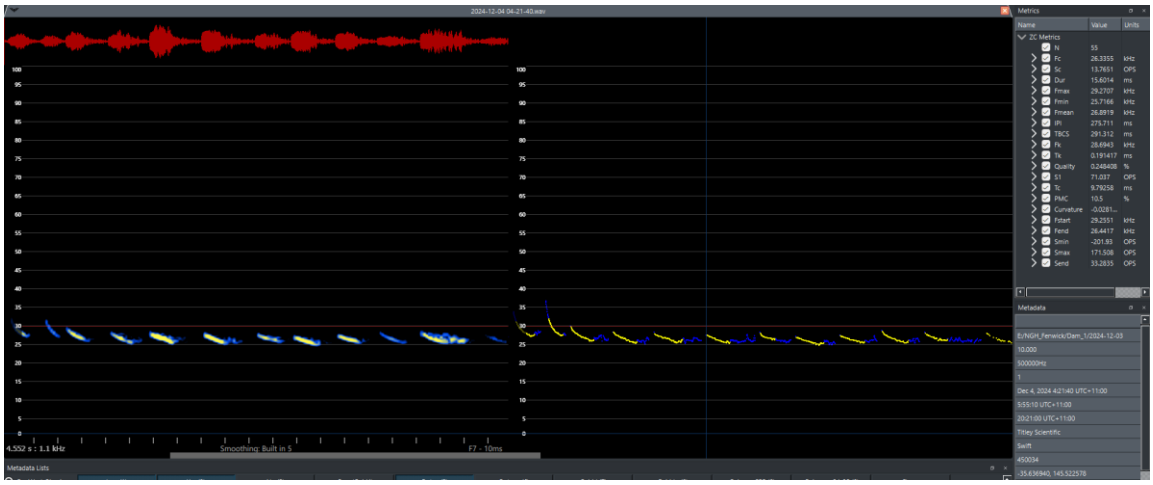


Figure 7. Call sequence for *Ozimops planiceps* (Southern Free-tailed Bat).

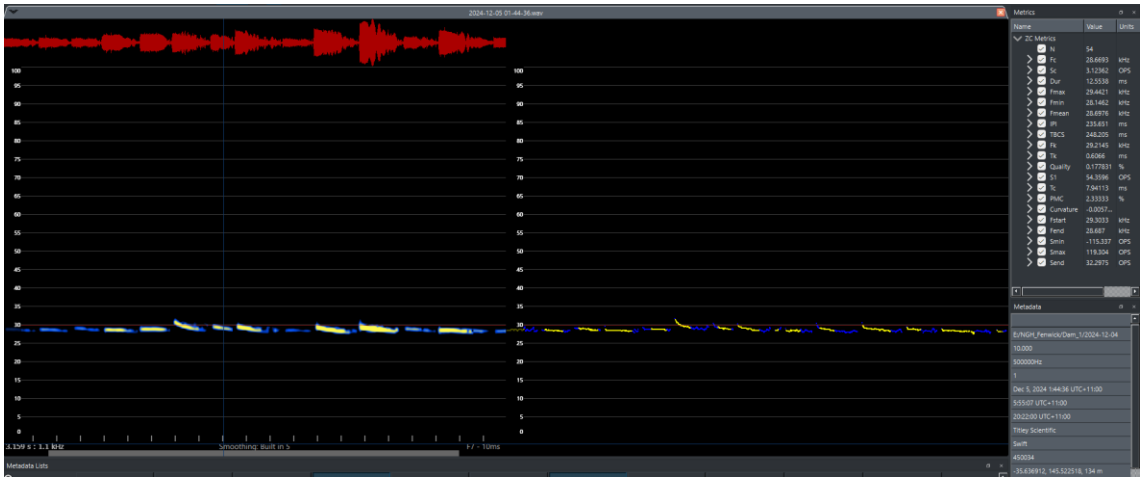


Figure 8. Call sequence for *Ozimops ridei* (Ride's Free-tailed Bat).

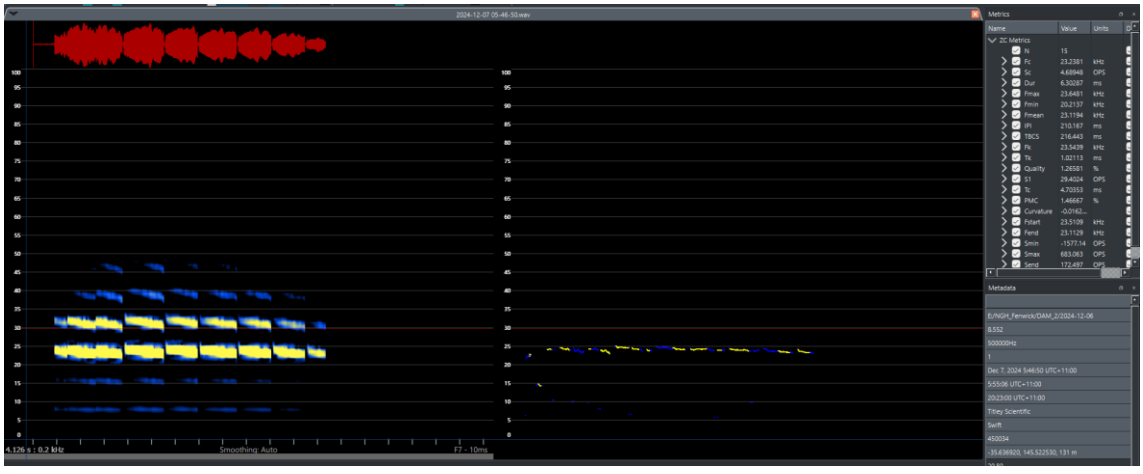


Figure 9. Call sequence for *Saccolaimus flaviventris* (Yellow-bellied Sheath-tailed Bat). For diagnostic purposes, please note the presence of the upper and lower harmonics in the full-spectrum format (left-hand side) (Armstrong *et al.* 2021).

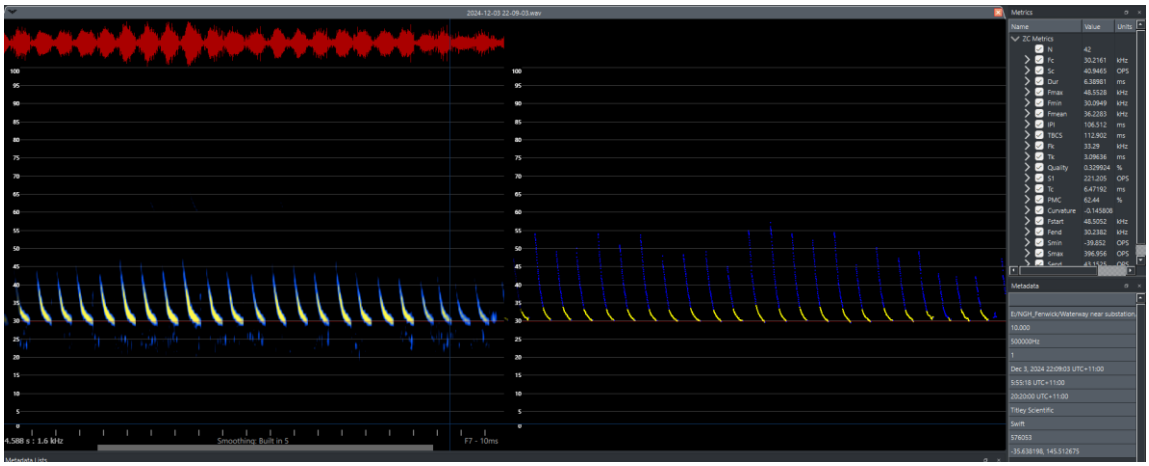


Figure 10. Call sequence for *Scotorepens balstoni* (Inland Broad-nosed Bat).

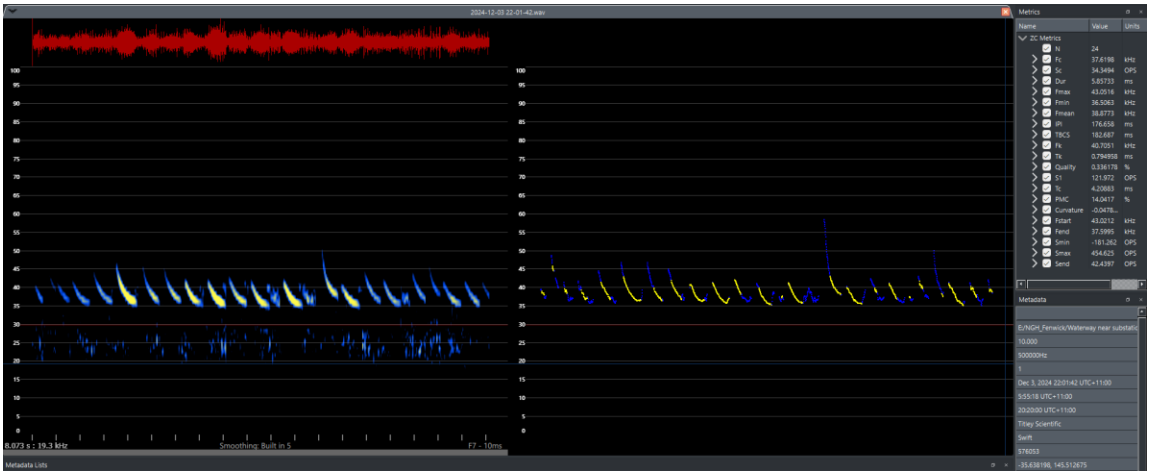


Figure 11. Potential call sequence for *Scotorepens greyii* (Little Broad-nosed Bat).

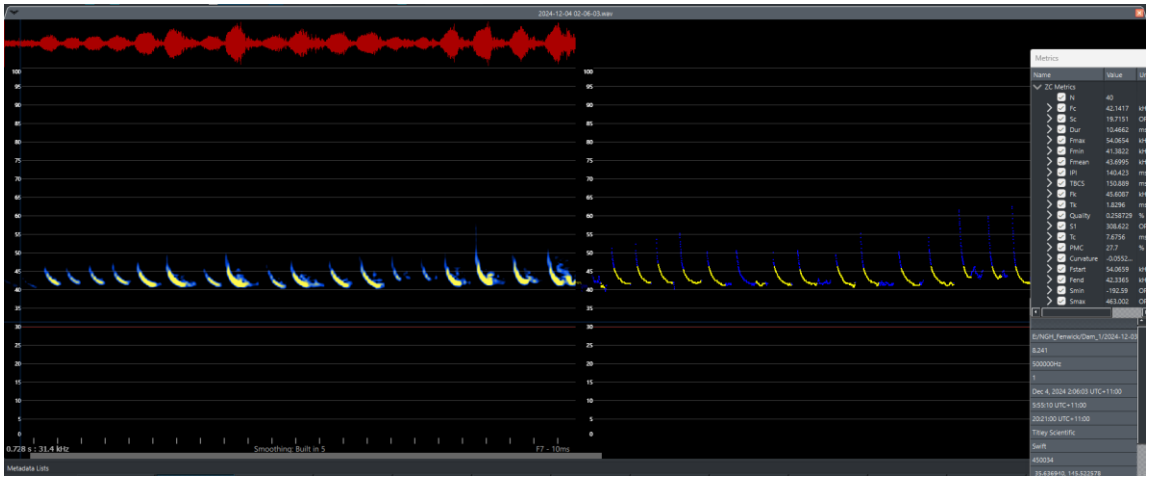


Figure 12. Call sequence for *Vespadelus darlingtoni* (Large Forest Bat).

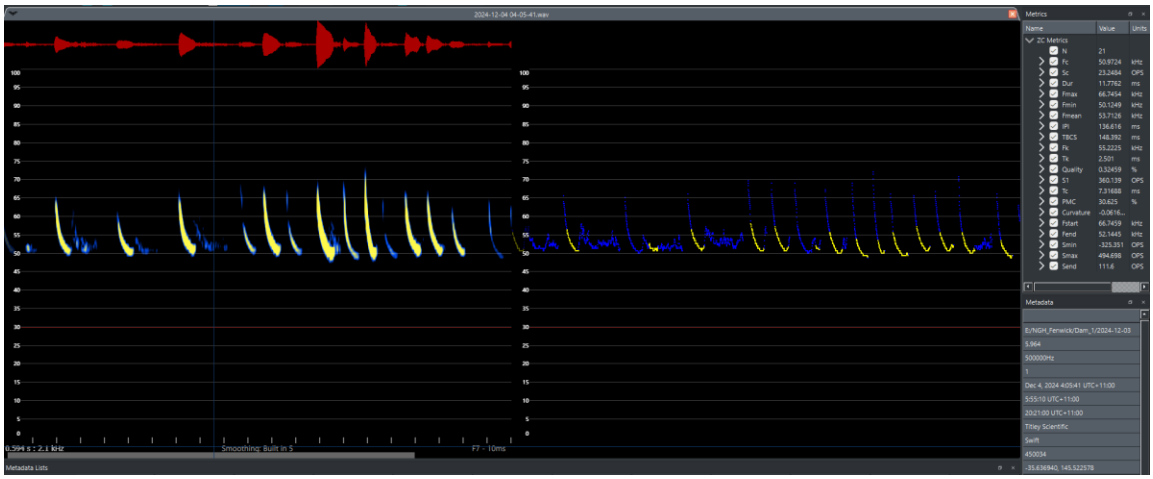


Figure 13. Potential call sequence for *Vespadelus regulus* (Southern Forest Bat) or *Vespadelus vulturnus* (Little Forest Bat).

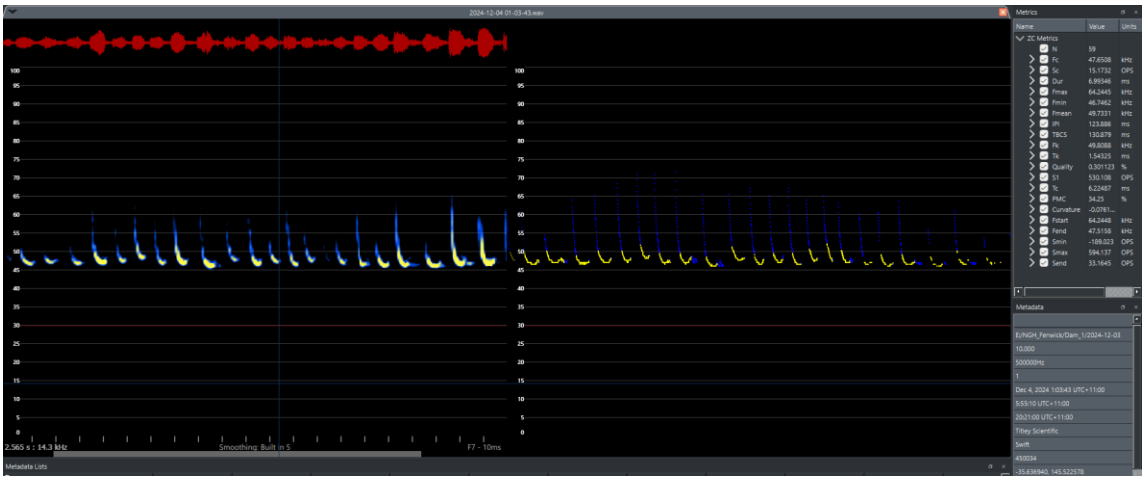


Figure 14. Call sequence for *Vespadelus vulturnus* (Little Forest Bat).

Reference

Armstrong. K. N., Reardon. T.B., and Jackson, S. M. 2020. A current taxonomic list of Australian Chiroptera. Australian Bat Society. Version 2020-06-09

Armstrong. K. N., Broken-Brow. J., Hoye. G., Ford. G., Thomas. M., and Corben. C. (2021) Effective detection and identification of sheath-tailed bats of Australian forests and woodlands. *Australian Journal of Zoology*, 68, Pp. 346-363

Atlas of Living Australia Atlas of Living Australia – Open access to Australia's biodiversity data (ala.org.au) accessed on various dates between 5 December 2024

Australian Bat Society – Aus Maps at BatMap - Ausbats accessed for this project on 5 December 2024

Churchill, S. (2008). *Australian Bats*. Second Edition. Allen and Unwin. New Holland Publishers. Sydney

Department of Planning, Industry, and Environment (DPIE) (2020). Biodiversity Assessment Method

Department of Planning, Industry, and Environment (DPIE) (2021). "Species credit' threatened microbats and their habitats. NSW guide for the biodiversity Assessment Method

NSW Bionet Atlas NSW BioNet | NSW Environment and Heritage accessed for this project on the 5 December 2024

Office of Environment and Heritage. (2019). Large Bent-winged Bat – profile viewed at Large Bent-winged Bat - profile | NSW Environment, Energy and Science

Pennay, M., Law, B., and Reinhold, L. (2004). *Bat calls of New South Wales: Region based guide to echolocation calls of Microchiropteran bats*. NSW Department of Environment and Conservation, Hurstville

Pennay, M., Law. Bradley., Lunney. D. (2011), Review of the distribution and status of the bat fauna of New South Wales and the Australia Capital Territory. In *Biology and Conservation of Australasian Bats*. Edited by Brad Law, Peggy Eby, Daniel Lunney, and Lindy Lumsden. Royal Zoological Society, NSW, Mosman, NSW. Australia

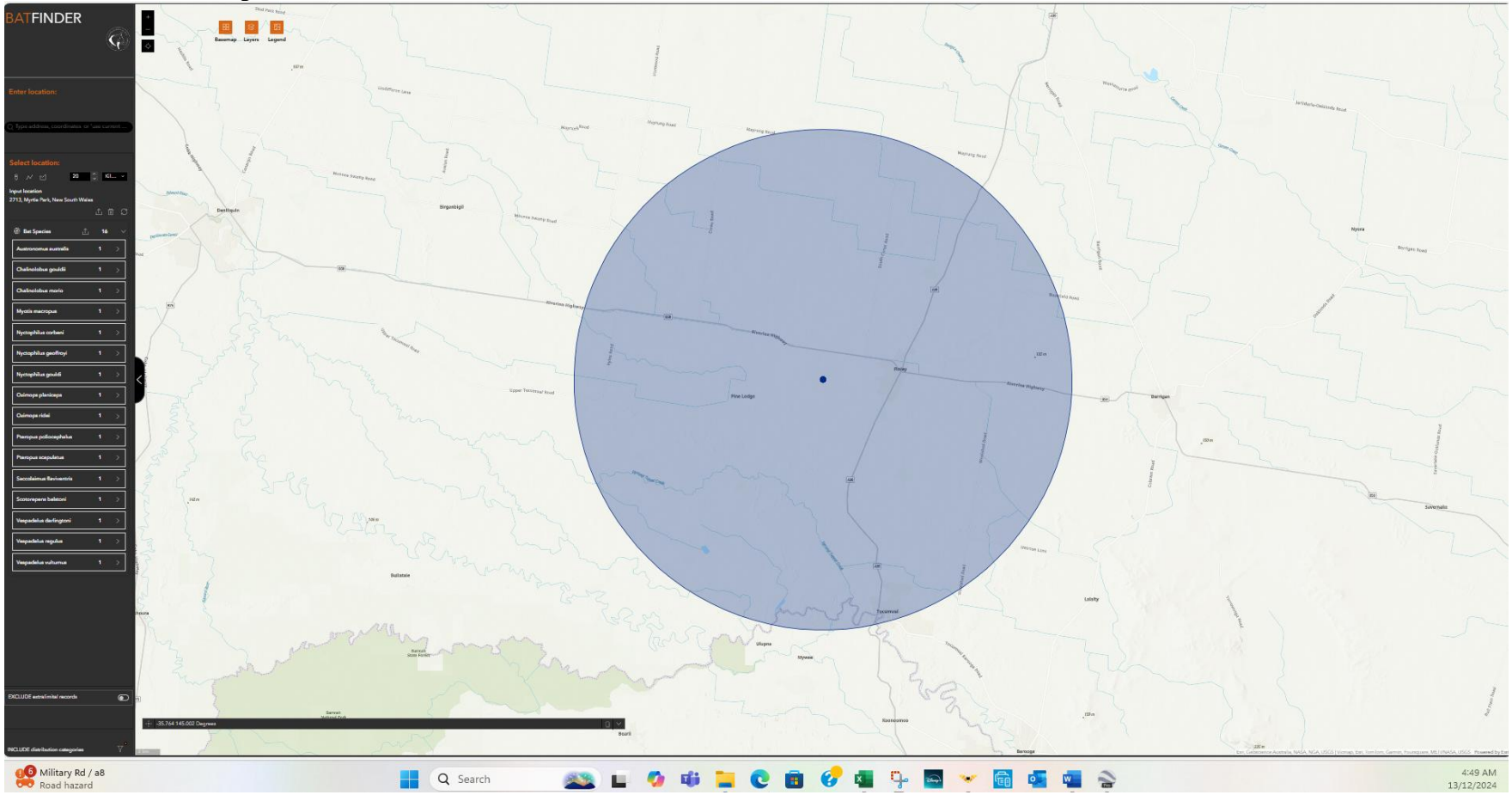
Reardon, T. 2003. Standards in bat detector-based surveys. Australasian Bat Society Newsletter. 20. Pp. 41 – 43

Reinhold, L., Law, B., Ford, G., and Pennay, M. (2001). *Key to the bat calls of south-east Queensland and north-east New South Wales*. 2001. Queensland, DNR.

Van Dyck, S., and Strahan. R. (2008). *Mammals of Australia*. Third Edition. Reed New Holland. Sydney

Van Dyck, S., Gynther. I., and Baker. A. (2013). *Field Companion to the Mammals of Australia*. New Reed New Holland. Sydney

Appendix 1. Microbat species that are predicted to occur or have been previously recorded within a 20 km radius of the subject land (source Australia Bat Society Bat Maps). *Pteropus alecto* (Black Flying-fox), *P. poliocephalus* (Grey-headed Flying-fox) and *P. scapulatus* (Little Red Flying-fox) while included in the side panel below, are non-echolocating megabats and are not considered in this report.



Appendix 2. Candidate species list with species-specific characteristic frequency (Fc) range for the northeast Biogeographic region as described in Penny *et al.* (2004). The candidate species list was developed after a review of the Atlas of Living Australia, BatMaps (Australian Bat Society), Penny *et al.* (2011), NSW threatened species profile webpages, and the NSW Bionet database.

Species name	Common name	Pulse characteristics	Characteristic Frequency range (kilohertz (kHz)
Austronomus australis	White-striped Free-tailed Bat	Flattened, sometimes sloped	10 – 15 kHz
Chalinolobus gouldii	Gould's Wattled Bat	Curved, call sequence contains undulated consecutive pulses	26.5 – 34 kHz
Chalinolobus morio	Chocolate Wattled Bat	Curved, down-sweeping tail	47.5 – 53 kHz
*Myotis macropus**	Southern Myotis	Steep, near-vertical pulses	Variable
*Nyctophilus corbeni** [and 1]	Corben's Long-eared Bat	Steep, near-vertical pulses	Variable
Nyctophilus geoffroyi	Lesser Long-eared Bat	Steep, near-vertical pulses	Variable
Nyctophilus gouldi	Gould's Long-eared Bat	Steep, near-vertical pulses	Variable
Ozimops planiceps	Southern Free-tailed Bat	Flat, or curved	26.5 to 30.5 kHz
Ozimops ridei	Ride's Free-tailed Bat	Flat, or slightly curved	28.5 – 31 kHz
*Saccolaimus flaviventris**	Yellow-bellied Sheath-tailed Bat	Flat, or curved. The presence of upper and/or lower harmonics when viewed in full spectrum formats is an important diagnostic factor.	17.5 – 19.0 kHz
Scotorepens balstoni	Inland Broad-nosed Bat	Curved, hooked pulses, generally with an up-sweeping tail	35 – 40.0 kHz
Scotorepens greyii	Little Broad-nosed Bat	Curved, hooked pulses, generally with an up-sweeping tail	29 – 34 kHz
Vespadelus darlingtoni	Large Forest Bat	Curved, hooked pulses with up-sweeping tail	40.0 – 44.0 kHz
Vespadelus regulus	Southern Forest Bat	Curved, hooked pulses with up-sweeping tail	50.0 – 55.0 kHz

Species name	Common name	Pulse characteristics	Characteristic Frequency range (kilohertz (kHz)
Vespadelus vulturnus	Little Forest Bat	Curved, hooked pulses with up-sweeping tail	44.5 – 51.0 kHz

Source Pennay *et al.* (2004) and Reinhold *et al.* (2001).
*Represents those threatened species listed as Vulnerable under the BC Act.
[1]Represents those threatened species listed as Vulnerable under the EPBC Act.

D.5 Flora survey

Survey datec	Target species	Result
30/09/24	*Swainsona sericea* *Swainsona murrayana*	Not recorded.
19/11/24	*Austrostipa wakoolica*	Not recorded.

Appendix E BAM calculator credit reports

BAM Vegetation Zones Report

Proposal Details

Assessment Id
00050419/BAAS18074/24/00050420

Assessment name
South Coree BESS

BAM data last updated *
05/08/2025

Assessor Name
Julie Gooding

Report Created
31/03/2026

BAM Data version *
Current classification (live - default) (82)

Assessor Number
BAAS18074

Assessment Type
Major Projects

BAM Case Status
Finalised

Assessment Revision
7

BOS entry trigger

Date Finalised
31/03/2026

* 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.

Vegetation Zones

#	Name	PCT	Condition	Area	Minimum number of plots	Management zones
1	76_DG_poor	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	DG_poor	3.55	2	

2	76_DG_roadside	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	DG_roadside	0.74	1	
3	76_DG_Low	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	DG_Low	2.9	2	
4	76_Exotic	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	Exotic	0.69	1	
5	76_Riverina_Highway	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	Riverina_Highway	1.11	1	

BAM Predicted Species Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00050419/BAAS18074/24/00050420	South Coree BESS	05/08/2025
Assessor Name	**Report Created**	**BAM Data version ***
Julie Gooding	31/03/2026	Current classification (live - default) (82)
Assessor Number	**Assessment Type**	**BAM Case Status**
BAAS18074	Major Projects	Finalised
Assessment Revision	**BOS entry trigger**	**Date Finalised**
7		31/03/2026

* 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	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
Brown Treecreeper (eastern subspecies)	Climacteris picumnus victoriae	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
Diamond Firetail	Stagonopleura guttata	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
Dusky Woodswallow	Artamus cyanopterus cyanopterus	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
Flame Robin	Petroica phoenicea	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
Grey Falcon	Falco hypoleucos	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions

Grey-crowned Babbler (eastern subspecies)	Pomatostomus temporalis temporalis	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
Pink Cockatoo	Lophochroa leadbeateri	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
Scarlet Robin	Petroica boodang	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
South-eastern Hooded Robin	Melanodryas cucullata cucullata	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
Speckled Warbler	Chthonicola sagittata	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
Superb Parrot	Polytelis swainsonii	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
Swift Parrot	Lathamus discolor	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
White-bellied Sea-Eagle	Haliaeetus leucogaster	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
White-throated Needletail	Hirundapus caudacutus	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions

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 Candidate Species Report

Proposal Details

Assessment Id 00050419/BAAS18074/24/00050420	Proposal Name South Coree BESS	BAM data last updated * 05/08/2025
Assessor Name Julie Gooding	Report Created 31/03/2026	BAM Data version * Current classification (live - default) (82)
Assessor Number BAAS18074	Assessment Type Major Projects	BAM Case Status Finalised
Assessment Revision 7	BOS entry trigger	Date Finalised 31/03/2026

* 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
Austrostipa wakoolica A spear-grass	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Crinia sloanei Sloane's Froglet	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Myotis macropus Southern Myotis	Yes (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☑ Nov ☐ Dec ☐ Survey month outside the specified months?

Swainsona murrayana Slender Darling Pea	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Swainsona sericea Silky Swainson-pea	Yes (assumed present)	☐ 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
Brush-tailed Phascogale	Phascogale tapoatafa	Habitat degraded
Koala	Phascolarctos cinereus	Habitat constraints
Pink Cockatoo	Lophochroa leadbeateri	Habitat constraints
Squirrel Glider	Petaurus norfolcensis	Habitat degraded
Superb Parrot	Polytelis swainsonii	Habitat constraints
Swift Parrot	Lathamus discolor	Habitat constraints
White-bellied Sea-Eagle	Haliaeetus leucogaster	Habitat constraints

BAM Credit Summary Report

Proposal Details

Assessment Id
00050419/BAAS18074/24/00050420

Proposal Name
South Coree BESS

BAM data last updated *
05/08/2025

Assessor Name
Julie Gooding

Report Created
31/03/2026

BAM Data version *
Current classification (live - default) (82)

Assessor Number
BAAS18074

BAM Case Status
Finalised

Date Finalised
31/03/2026

Assessment Revision
7

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

Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions												
1	76_DG_poor	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	14.6	14.6	3.6	Biodiversity Conservation Act listing status	High Sensitivity to Gain	Endangered Ecological Community	Not Listed	2.00		0
2	76_DG_roadside	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	12.8	12.8	0.74	Biodiversity Conservation Act listing status	High Sensitivity to Gain	Endangered Ecological Community	Not Listed	2.00		0
3	76_DG_Low	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	21.4	21.4	2.9	Biodiversity Conservation Act listing status	High Sensitivity to Gain	Endangered Ecological Community	Not Listed	2.00		31

4	76_Exotic	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	14.4	14.4	0.69	Biodiversity Conservation Act listing status	High Sensitivity to Gain	Endangered Ecological Community	Not Listed	2.00		0
5	76_Riverina_Highway	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	15.3	15.3	1.1	Biodiversity Conservation Act listing status	High Sensitivity to Gain	Endangered Ecological Community	Not Listed	2.00		9
											Subtotal	**40**
											Total	**40**

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

Austrostipa wakoolica / A spear-grass (Flora)									
76_DG_roadside	12.8	12.8	0.07	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	1
76_DG_Low	21.4	21.4	0.98	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	11
76_Riverina_Highway	15.3	15.3	1.1	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	9
								Subtotal	**21**
Crinia sloanei / Sloane's Froglet (Fauna)									
76_Riverina_Highway	15.3	15.3	1.1	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Endangered	Endangered	True	13
								Subtotal	**13**
Myotis macropus / Southern Myotis (Fauna)									
76_DG_roadside	12.8	12.8	0.35	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	2

76_DG_Low	21.4	21.4	2.7	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	29
76_Riverina_Highway	15.3	15.3	1.1	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	9
								Subtotal	**40**
Swainsona murrayana / Slender Darling Pea (Flora)									
76_Riverina_Highway	15.3	15.3	1.1	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	9
								Subtotal	**9**
Swainsona sericea / Silky Swainson-pea (Flora)									
76_Riverina_Highway	15.3	15.3	1.1	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Not Listed	False	9
								Subtotal	**9**

BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment Id
00050419/BAAS18074/24/00050420

Proposal Name
South Coree BESS

BAM data last updated *
05/08/2025

Assessor Name
Julie Gooding

Assessor Number
BAAS18074

BAM Data version *
Current classification (live - default) (82)

Proponent Names

Report Created
31/03/2026

BAM Case Status
Finalised

Assessment Revision
7

BOS entry trigger

Assessment Type
Major Projects

Date Finalised
31/03/2026

* 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.

Potential Serious and Irreversible Impacts

Name of threatened ecological community	Listing status	Name of Plant Community Type/ID
Nil		

Species
Crinia sloanei / Sloane's Froglet

Additional Information for Approval

PCT Outside Ibra Added

None added

PCTs With Customized Benchmarks

PCT
No Changes

Predicted Threatened Species Not On Site

Name
No Changes

Ecosystem Credit Summary (Number and class of biodiversity credits to be retired)

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	HBT Cr	No HBT Cr	Total credits to be retired
76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	9.0	0	40	40

BAM Biodiversity Credit Report (Like for like)

76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions

Like-for-like credit retirement options

Name of offset trading group	Trading group	Zone	HBT	Credits	IBRA region
Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions This includes PCT's: 76, 80, 81, 82, 101, 110, 237, 248, 267, 3405	-	76_DG_poor	No	0	Murray Fans, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions This includes PCT's: 76, 80, 81, 82, 101, 110, 237, 248, 267, 3405	-	76_DG_roadside	No	0	Murray Fans, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions This includes PCT's: 76, 80, 81, 82, 101, 110, 237, 248, 267, 3405	-	76_DG_Low	No	31	Murray Fans, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions This includes PCT's: 76, 80, 81, 82, 101, 110, 237, 248, 267, 3405	-	76_Exotic	No	0	Murray Fans, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions This includes PCT's: 76, 80, 81, 82, 101, 110, 237, 248, 267, 3405	-	76_Riverina_Highway	No	9	Murray Fans, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Species Credit Summary

Species	Vegetation Zone/s	Area / Count	Credits
Austrostipa wakoolica / A spear-grass	**76_DG_roadside, 76_DG_Low, 76_Riverina_Highway**	2.2	21.00
Crinia sloanei / Sloane's Froglet	**76_Riverina_Highway**	1.1	13.00
Myotis macropus / Southern Myotis	**76_DG_roadside, 76_DG_Low, 76_Riverina_Highway**	4.2	40.00
Swainsona murrayana / Slender Darling Pea	**76_Riverina_Highway**	1.1	9.00
Swainsona sericea / Silky Swainson-pea	**76_Riverina_Highway**	1.1	9.00

BAM Biodiversity Credit Report (Like for like)

Credit Retirement Options	Like-for-like credit retirement options	
Austrostipa wakoolica / A spear-grass	Spp	IBRA subregion
	Austrostipa wakoolica / A spear-grass	Any in NSW
Crinia sloanei / Sloane's Froglet	Spp	IBRA subregion
	Crinia sloanei / Sloane's Froglet	Any in NSW
Myotis macropus / Southern Myotis	Spp	IBRA subregion
	Myotis macropus / Southern Myotis	Any in NSW
Swainsona murrayana / Slender Darling Pea	Spp	IBRA subregion
	Swainsona murrayana / Slender Darling Pea	Any in NSW
Swainsona sericea / Silky Swainson-pea	Spp	IBRA subregion
	Swainsona sericea / Silky Swainson-pea	Any in NSW

Appendix F Agency/Consent Authority Consultation

F.1 BOS helpdesk

DCCEEW BOS Help Center / NSW Department of Climate Change, Energy, the Environment and Water Biodiversity Offset Scheme Help Desk / DPE-7346

A240316.00 - South Coree BESS Scoping

Julie Gooding raised this on 15/Apr/25 12:05 PM — Hide details

Description

Hi BOX Help Desk Team,

Is it possible to exclude ecosystem species from the BAM-C if there is no suitable habitat?
For example, if there are no trees present on our site, only derived grassland but we have ecosystem species generated that rely on woodland areas such as brown treecreeper, Swift Parrot, South-eastern Hooded Robin.

There is no habitat constraint box to untick.

Can I exclude these?

Cheers,

Julie Gooding
Technical Lead Ecology

Status
CLOSED

Notifications on

Request type
Email Request

Shared with
Julie Gooding
Creator
Julia Chabros
Share

DCCEEW BOS Help Center / NSW Department of Climate Change, Energy, the Environment and Water Biodiversity Offset Scheme Help Desk / DPE-7346

A240316.00 - South Coree BESS Scoping

Julie Gooding raised this on 15/Apr/25 12:05 PM — Show details

Status
CLOSED

Notifications on

Request type
Email Request

Shared with
Julie Gooding
Creator
Julia Chabros
Share

Activity

Show 5 more

GR **Gabrielle Ryan** 14/May/25 8:11 AM

Hi @Julie Gooding

Thank you for your enquiry and we apologise for the delay in response.

The BOS Subject Matter Officer has provided the following response:

Section 5.2.2(2) of the BAM allows ecosystem species to be removed from further assessment. Although there are no habitat constraints listed in the BAM-C or TBDC for these ecosystem credit species, these may be removed from further assessment if appropriate justification can be provided in the BDAR. Section 5.2.2 (2a and 2b) considers species are unlikely to occur on the subject land if habitat constraints are not present in a vegetation zone, or on the entire subject land. It may be relevant to consider use of trees as an appropriate habitat constraint for some species. Appropriate justification must rely on ecological information for the species that can be found in the TBDC and/or the BioNet threatened species profile. For example, the TBDC identifies Brown Treecreepers as occurring in relictual habitat only if within 100 metres of moderate to good condition vegetation of suitable type. For species that may forage on the ground, exclusion as an ecosystem credit species in this case is unlikely to be appropriate.

F.2 CPHR Consultation Meeting

Conservation Protection Heritage Regulation – Regional Delivery (CPHR-RD)
Consultation Meeting – 240676/South Coree BESS BDAR

1. Meeting details

Date and time:	25/02/2025	**Chair:**	Sarah Hillis	**Minutes:**	45
Invitees:	Andrew Fisher (CPHR-RD Team Leader Planning) Miranda Kerr (CPHR-RD) Giorginna Xu (CPHR-RD) Mel Cotterill (CPHR-RD) Stephan Mitchell (SREA Development Manager), Sarah Hillis (NGH Principal Planner) Julie Gooding (NGH BAM Assessor Ecologist) Maddy Shaw (NGH Project Manager)				
Apologies					

Agenda item	Topic	Discussion	Notes	Actions
1. Site Overview	1a. BAM Plots, habitat and vegetation on site	• Site is a grazed grassland with mostly weeds and exotics. No remnant trees in project area. PCT 76 assigned based on three colonising species, no further features to assist with assigning PCT. • Disturbance footprint in BESS site had vegetation integrity (VI) score of less than 15. Fairly degraded. • VI score in Finley substation low 20s, also degraded.	• BCS queried the vegetation (trees) on landowner property (along the east). Julie confirmed they are outside the Project Area and they had Diameter at Breast Height of 20-30. Juvenile trees.	• Grassland around Finley substation would be a separate zone to the BESS site. BAM plots around Finley substation still to be added into BAM-C
2. Threatened Species	Target Species - Sloanes Froglet (presence yet to be determined)	• Candidate species not yet surveyed. • Now a SAII species	• Noted that habitat more widespread that potentially first thought - in the Albury	• Given it is a SAII species, BCS would like

Agenda item	Topic	Discussion	Notes	Actions
		• No waterbodies impacted within the disturbance footprint. • Potential breeding habitat around farm dam but highly degraded.	region breeding in paddock dams has been recorded; hence they like to see the data. • Noted the habitat guide that states steep slopes is unsuitable habitat (such as the canal running alongside the project area) is more around mitigation and enhancement than identification • Discussed potential survey approach if we don't have access to dam for audio recording; noted that we should reach to Australian museum for frog call recordings	targeted surveys to be done. • BCS confirmed the BDAR should acknowledge this survey will be done (append these minutes as reference). Need to provide detail we are assuming presence in BDAR, including preparing SAII assessment, and acknowledge that we will validate during submission stage via survey.
	Potential presence of Southern Myotis	• Survey conducted in December 2024, and anabat data analysis found potential presence of Southern Myotis. • No suitable breeding but possible foraging • Methodology of applying species polygon	• BCS raised concern about transmission line affecting connectivity. Stephan noted uncertainty about transmission alignment with Transgrid but relatively small footprint and Sarah noted existing overhead lines that are present.	• BCS would expect a species polygon for the southern myotis encompassing a 200m buffer around waterbodies.
3. Timeframe	Expected BDAR submission	• Lodgement of Environmental Impact Statement is expected to occur mid-May.	• BDAR is to be completed by mid-May.	

Appendix G Staff qualifications and experience

Name	Title	Qualifications / experience	Role in BDAR
Julie Gooding	Technical Lead	Accredited Assessor B. Sci (Biology) (BAAS18074)	Supervision, BAM-C, technical review, site assessment, targeted flora surveys, targeted fauna surveys, VI plots surveys
Gillian Young	Senior Ecologist	Senior Ecologist B. Natural Resources (Hons 2)	Threatened flora surveys
Julia Chabros	Ecologist	Ecologist B. EnvMgmt (Ecology), B. Sci (Hons 1)	Report preparation Figure preparation
Justin Solomons	Ecologist	Ecologist B. EnvSc (ConsEcol)	Report preparation
Benjamin Sloggett	Ecologist	Ecologist B. Sci (Zoology), MRes (Animal physiology)	Assessments of Significance
Maddison Robertson	Ecologist	Ecologist BSc (Bio & Con), BEnv	Targeted fauna surveys, VI plots surveys
Michael Cleland	Ecologist	Ecologist BEnvSc and Mgt (Hons)	Targeted flora surveys, Targeted Fauna Surveys (Sloane's Froglet), VI plots surveys
Dominic De Lorenzo	Ecologist	Ecologist B Sc. (Environmental Science)	Targeted Fauna Surveys (Sloane's Froglet)
Evan Creek	Graduate Ecologist	Graduate Ecologist BSc	Site assessment, VI plots surveys

NGH Pty Ltd

NSW • ACT • QLD • VIC

ABN 31 124 444 622 ACN 124 444 622

E: ngh@nghconsulting.com.au

GOLD COAST

2B 34 Tallebudgera Creek Road
Burleigh Heads QLD 4220

T. (07) 3129 7633

SYDNEY REGION

Unit 17, 21 Mary Street
Surry Hills NSW 2010

T. (02) 8202 8333

BEGA

Suite 11, 89-91 Auckland Street
(PO Box 470)
Bega NSW 2550

T. (02) 6492 8333

MELBOURNE

Level 14, 10-16 Queen Street
Melbourne VIC 3000

T: (03) 7031 9123

TOWNSVILLE

Level 4, 67-75 Denham Street
Townsville QLD 4810

T. (07) 4410 9000

BRISBANE

T3, Level 7, 348 Edward Street
Brisbane QLD 4000

T. (07) 3129 7633

NEWCASTLE - HUNTER & NORTH COAST

Level 1, 31-33 Beaumont Street
Hamilton NSW 2303

T. (02) 4929 2301

WAGGA WAGGA - RIVERINA & WESTERN NSW

35 Kincaid Street (PO Box 5464)
Wagga Wagga NSW 2650

T. (02) 6971 9696

CANBERRA

Unit 8, 27 Yallourn Street
(PO Box 62)
Fyshwick ACT 2609

T. (02) 6280 5053

SUNSHINE COAST

Building 1, 30 Chancellor Village Boulevard
Sippy Downs QLD 4556

T: 13 54 93

WODONGA

Unit 2, 83 Hume Street
(PO Box 506)
Wodonga VIC 3690

T. (02) 6067 2533