

# Biodiversity Development Assessment Report, Bluestone Hardrock Quarry, Elderslie NSW

Prepared by David Martin  
BAAS21021



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# Document control

Version	Date	Author	Details
1	06/05/2026	David Martin	Report for Submission

# Executive Summary

This Biodiversity Development Assessment Report (BDAR) has been prepared for Bluestone Hardrock Pty Ltd (the proponent) for the development of a quarry as State Significant Development SSD-76210271. The proposed quarry occurs across four (4) lots, including Lot 65 DP 752473, Lots 903 & 904 DP1061259, and Lot 5 DP1102521, collectively the Subject Land. The proposal is the development of a quarry for the extraction of hard rock and gravel to supply aggregate suitable for roads and concrete batching in the local region. The Project site is within the locality of Elderslie and Glendon Brook, approximately 10 km north of the Branxton in the Hunter Valley, New South Wales.

The Project is proposed across an area of 63.7ha (the Disturbance Footprint) and includes conventional quarry methods to extract and process the resource. This will include drilling and blasting, with excavation by excavator to load trucks for transport for onsite processing and loading of road registered trucks for delivery to the local market. The Project will be completed in the following indicative stages, with Biodiversity Credits retired for each stage:

- Stage 1 – Years 1–4 (development of sediment basins, sealed roads, weighbridge, office, and the processing area. The processing area includes extraction of rock resource to establish a suitable base).
- Stage 2 – Years 4–5 (development of the haul road to the quarry pit and initial development of the main quarrying area).
- Stage 3 – Years 4–5 (clearing of a stockpile and laydown area).
- Stage 4 – Years 5–30 (continued development of the main quarry area, progressively lowering the quarry floor).
- Stage 5 – If required, allows the processing area to be extended.

Under Section 7.14 of the NSW BC Act, major projects are required to enter the Biodiversity Offsets Scheme (BOS). As the proposal is considered an SSD, entry into the BOS and the production of a BDAR is required. This report has been prepared in accordance with the Secretary's Environmental Assessment Requirements (SEARs) and the Biodiversity Assessment Method (BAM) to assess the biodiversity impact and offsetting obligation of the proposal under the Biodiversity Conservation Act 2016 (BC Act).

The native vegetation mapped across the Disturbance Footprint has been assigned to seven distinct Vegetation Zones (VZs) associated with three Plant Community Types (PCTs) as follows:

- 1.65 ha of PCT 3244: Lower North Spotted Gum - Mahogany - Ironbark Sheltered Forest (Forest) VZ1
- 22.43 ha of PCT 3315: Central Hunter ironbark - Spotted Gum Forest (Forest) VZ2
- 10.24 ha of PCT 3315: Central Hunter ironbark - Spotted Gum Forest (Managed) VZ3
- 6.97 ha of PCT 3315: Central Hunter ironbark - Spotted Gum Forest (High Weed) VZ4
- 11.13 ha of PCT 3315: Central Hunter ironbark - Spotted Gum Forest (Derived Native Grassland) VZ5
- 9.19 ha of PCT 3315: Central Hunter ironbark - Spotted Gum Forest (Exotic Pastures) VZ6
- 0.01 ha PCT 4073 Lower North Hinterland River Oak Forest (Forest) VZ7

The proposal will impact vegetation commensurate with one Threatened Ecological Communities (TEC) listed under the NSW Biodiversity Conservation Act 2016 (BC Act), part of

which is listed under the Commonwealth's Environment Protection Biodiversity Conservation Act 1999 (EPBC Act):

- 39.656 ha of PCT 3315: Central Hunter ironbark - Spotted Gum Forest associated with the NSW *Central Hunter Ironbark-Spotted Gum-Grey Box Forest in New South Wales North Coast and Sydney Basin Bioregions* (Equivalent) listed as endangered under the BC Act 2016, this includes:
  - 32.67 ha of PCT 3315: Central Hunter ironbark - Spotted Gum Forest associated with the *Central Hunter Valley Eucalypt Forest and Woodland* (Part) listed as critically endangered under the EPBC Act 1999

Targeted threatened species surveys identified 11 threatened species within the Subject Land. Of these, all are listed under the BC Act and include:

- **Large-eared Pied Bat** (*Chalinolobus dwyeri*) – This species was recorded at four Anabat™ locations (A1, A2, A3, A4), within the Subject Land. The species is a Species Credit Species and there is foraging habitat for the species within 2 km of associated cliffs or escarpments. As such, a species polygon and credit obligation is required.
- **Little Bent-winged Bat** (*Miniopterus australis*) – This species was recorded at two Anabat™ locations within the Subject Land (A1, A2). This species is a dual credit species: an ecosystem credit species for foraging habitat and a Species Credit species for breeding habitat. No breeding habitat is present within the Subject Land, as such there is no species credit obligation.
- **Southern Myotis** (*Myotis macropus*) – This species was recorded at three Anabat™ locations (A1, A2, A3), within the Subject Land. The species is a Species Credit Species and there is foraging habitat for the species within the Residential Area (200 m buffer from waterbodies with >3m of open water). As such, a species polygon and credit obligation is required.
- **Yellow-bellied Sheath-tail-bat** (*Saccolaimus flaviventris*) – An Ecosystem Credit species that was recorded via Anabat™ (A1, A2, A3, A4).
- **Eastern False Pipistrelle** (*Falsistrellus tasmaniensis*) – An Ecosystem Credit species that was recorded via Anabat™ (A2).
- **Greater Broad-nosed Bat** (*Scoteanax rueppellii*) – An Ecosystem Credit species that was recorded via Anabat™ (A1, A4).
- **Large Bent-winged Bat** (*Miniopterus orianae oceanensis*) – This species was recorded at two Anabat™ locations within the Subject Land (A2, A3, A4). This species is a dual credit species: an ecosystem credit species for foraging habitat and a Species Credit species for breeding habitat. No breeding habitat is present within the Subject Land, as such there is no species credit obligation.
- **Brush-tailed Phascogale** (*Phascogale tapoatafa*) – This species was recorded by remote camera within the Subject Land (Cameras 31, 65). The species is a Species Credit Species and the subject land provides suitable habitat. As such, a species polygon and credit obligation is required.
- **Squirrel Glider** (*Petaurus norfolcensis*) – This species was recorded by remote camera within the Subject Land (Cameras 32, 40, 42, 64, 73, 74, 82, 87, 89, 90). The species is a Species Credit Species and the subject land provides suitable habitat. As such, a species polygon and credit obligation is required.
- **Grey-headed Flying Fox** (*Pteropus poliocephalus*) – This species was recorded during spotlighting surveys flying over the Subject Land. No breeding camps were found to occur within the Subject Land so no species polygons were created.
- **Powerful Owl** (*Ninox strenua*) – This species was recorded during call playback surveys within the Subject Land. This species is a dual credit species: an ecosystem credit species for foraging habitat and a Species Credit species for breeding habitat. Potential

breeding habitat is present within the Subject Land, as such there is a species credit obligation.

Of the above listed species, two are also listed under the Commonwealth's EPBC Act; Large-eared Pied Bat and Grey-headed Flying Fox.

Avoidance and impact minimisation measures, include:

- From a nominal resource area of 375 ha in the proponents holdings, the area of higher quality, greatest resource volume relative to the disturbance footprint was selected.
- Within the 200ha Subject Land, 136 ha of vegetation was avoided, including 105 ha of threatened ecological community.
- Minimising impacts to better-quality vegetation.
- Avoidance of constrained quarry pit area adjacent to creek and Nature Reserve.
- Avoidance of Biodiversity Values land.
- Haul roads have been located to utilise existing tracks and fire trails within the property, minimising the level of impact for road construction.
- Avoidance of nine waterbodies (dams and creek lines) that provide suitable foraging habitat for Southern Myotis.
- Avoidance of 20 hollow-bearing trees providing potential habitat for the hollow-dependent threatened species.

One listed Serious and Irreversible Impacts (SAIL) entity was recorded within the Subject Land during targeted surveys, Large-eared Pied Bat. Impacts to breeding habitat could be considered a potential SAIL but potential breeding habitat for this species is situated well outside (>500 m) of the Subject Land. Presence of this species alone does not constitute a potential SAIL. As such, there is no potential for an SAIL on these species and further assessment of SAIL provision is not required.

Offset are required as a result of residual impacts to vegetation and threatened species habitat, as detailed in **Table E1** (as per BAM Subsection 9.2.2(2.)).

**Table E1 Impacts that require an offset – ecosystem credits**

VZ no.	VZ Code	PCT name	TEC	Number of ecosystem credits required	HBT credits?
1	3244_Forest	3244 Lower North Spotted Gum - Mahogany - Ironbark Sheltered Forest	No	30	No
2	3315_Forest	3315 Central Hunter Ironbark - Spotted Gum Forest	Yes BC EPBC	666	Yes
3	3315_Managed	3315 Central Hunter Ironbark - Spotted Gum Forest	Yes BC EPBC	139	Yes
4	3315_High_Weed	3315 Central Hunter Ironbark - Spotted Gum Forest	Yes BC	169	Yes
5	3315_DNG	3315 Central Hunter Ironbark - Spotted Gum Forest	No	173	No

VZ no.	VZ Code	PCT name	TEC	Number of ecosystem credits required	HBT credits?
7	4073_Forest	4073 Lower North Hinterland River Oak Forest	No	1	No

**Table E2** identifies impacts that require an offset (as per BAM Subsection 9.2.2(2)).

**Table E2 Impacts that require an offset – species credits**

Common name	Scientific name	Loss of habitat (ha) or individuals	Number of species credits required
Large-eared Pied Bat	<i>Chalinolobus dwyeri</i>	41.31	1521
Southern Myotis	<i>Myotis macropus</i>	24.62	594
Powerful Owl	<i>Ninox strenua</i>	6.97	169
Squirrel Glider	<i>Petaurus norfolcensis</i>	41.31	1014
Brush-tailed Phascogale	<i>Phascogale tapoatafa</i>	41.31	1014

As the Project will be staged, the proportionate credit obligation has been calculated for each stage according to the relative area of impact on each VZ and species polygon. **Table E3** provides the credit requirements associated with the impacts of each Project stage.

Credits must be retired prior to the disturbance of each stage.

**Table E3 Staged offset requirements**

Credit	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Total
PCT 3244 Lower North Spotted Gum - Mahogany - Ironbark Sheltered Forest	0	30	0	0	0	30
PCT 3315 Central Hunter Ironbark - Spotted Gum Forest (TEC)	180	421	107	196	70	974
PCT 3315 Central Hunter Ironbark - Spotted Gum Forest (non-TEC)	143	13	7	0	10	173
PCT 4073 Lower North Hinterland River Oak Forest	1	0	0	0	0	1
<i>Chalinolobus dwyeri</i> / Large-eared Pied Bat	224	759	133	319	86	1521
<i>Myotis macropus</i> / Southern Myotis	57	281	43	194	19	594
<i>Ninox strenua</i> / Powerful Owl	0	51	0	118	0	169
<i>Petaurus norfolcensis</i> / Squirrel Glider	150	506	89	213	56	1014
<i>Phascogale tapoatafa</i> / Brush-tailed Phascogale	150	506	89	213	56	1014

The proposed development was determined to be a “controlled action under section 75 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The controlling provision for the proposed action is “*listed threatened species and communities (sections 18 and*

18A). The proposed action will be assessed in accordance with the bilateral assessment agreement. Impacts to the following key Matters of National Environmental Significance (MNES) were considered in this assessment in accordance with Attachment A of the Supplementary SEARs:

- a) Central Hunter Valley eucalypt forest and woodland threatened ecological community (CHV TEC) – critically endangered ecological community
- b) Large-eared Pied Bat (*Chalinolobus dwyeri*) – Endangered
- c) Grey-headed Flying-fox (*Pteropus poliocephalus*) – Vulnerable
- d) Koala (*Phascolarctos cinereus*) (combined populations of Qld, NSW and the ACT) – Endangered
- e) Regent Honeyeater (*Anthochaera phrygia*) – Critically endangered
- f) Swift Parrot (*Lathamus discolor*) – Critically endangered
- g) Brown Treecreeper (south-eastern) (*Climacteris picumnus victoriae*) – Vulnerable; and
- h) Spotted-tailed Quoll (*Dasyurus maculatus*) – Endangered

The results of these assessment is detailed further in **Appendix C**.

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## Shortened forms

APZ	asset protection zone
BAM	Biodiversity Assessment Method
BAM-C	Biodiversity Assessment Method Calculator
BC Act	Biodiversity Conservation Act 2016 (NSW)
BC Regulation	Biodiversity Conservation Regulation 2017 (NSW)
BDAR	Biodiversity Development Assessment Report
BOAMS	Biodiversity Offsets and Agreement Management System
BOS	Biodiversity Offsets Scheme
CEEC	critically endangered ecological community
DBH	diameter at breast height over bark
EC	ecological community listed under the EPBC Act
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Cwlth)
EP&A Act	Environmental Planning and Assessment Act 1979 (NSW)
EEC	endangered ecological community
HTW	high threat weed
IBRA	Interim Biogeographic Regionalisation for Australia
LLS Act	Local Land Services Act 2013 (NSW)
MNES	matters of national environmental significance
NPW Act	National Parks and Wildlife Act 1974 (NSW)
NSW	New South Wales
PCT	plant community type
SAII	serious and irreversible impact
SEARs	Secretary's Environmental Assessment Requirements
TBDC	Threatened Biodiversity Data Collection
TEC	threatened ecological community
tpa	tonnes per annum
VZ	Vegetation Zone

# Declarations

## i. Certification under clause 6.15 *Biodiversity Conservation Act 2016*

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



Signature: \_\_\_\_\_

Date: 06/05/2026

BAM Assessor Accreditation no: 21021

This BDAR has been prepared to meet the requirements of the Biodiversity Assessment Method (BAM) 2020. Appendix A provides an assessment of compliance with the minimum information requirements outlined in BAM Appendix K.

## ii. Details and experience of author/s and contributors

Details of the person/s responsible for preparing this BDAR including surveys and investigations on which this BDAR relies (excluding approved biodiversity experts) are detailed within the 'Authors and Contributors' section following.

### Authors and contributors

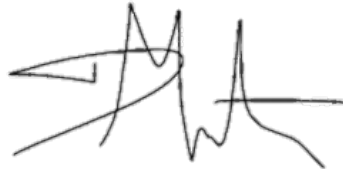
Name	BAM Assessor Accreditation no.	Position/role	Tasks performed	Relevant qualifications
Dr George Plunkett	BAAS19010	Senior Botanist BAM Accredited Assessor	BAM case setup, habitat assessment, vegetation mapping, threatened flora surveys, vegetation integrity plots, report writing	BSc (Hons), PhD
David Martin	BAAS21021	Senior Botanist BAM Accredited Assessor	Internal report review BAM case owner,	BEnvSc & Mgmt, MSc
Mark Dean	BAAS23008	Senior Ecologist (fauna) BAM Accredited Assessor	Fauna survey design, remote camera photograph identification	BEnvSc & Mgmt
Olivia Szekelyhidly	-	Ecologist	Threatened fauna surveys, acoustic bat detector installation and call identification	BZool
Stephanie Gilmore	-	Ecologist	Habitat assessment, Koala Spot Assessment Technique (SAT), acoustic bat detector installation and retrieval, threatened flora surveys, threatened fauna surveys, remote camera installation and rebait	BZool
Katrina Hailstone	-	Ecologist	Threatened flora surveys, threatened fauna surveys, acoustic bat detector installation and retrieval, remote camera installation and rebait	Cert I & II Conservation and land Mgmt
Theo Tasoulis	-	Ecologist	Habitat assessment, Koala Spot Assessment Technique (SAT), acoustic bat detector retrieval	BSc (Hons), PhD
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Name	BAM Assessor Accreditation no.	Position/role	Tasks performed	Relevant qualifications
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Debbie Plunkett	-	Ecologist	Threatened flora surveys, vegetation integrity plots, data management, report writing	BNatRes (Hons), Plant identification (UNSW, Tocal)
Rachel Neal	-	Ecologist	Threatened flora surveys, vegetation integrity plots, data	BBSc (Hons), Plant identification (UNSW, Tocal)
Sarah Cochrane	-	Ecologist	Threatened flora surveys	BSc
Dr. Keryn Dowling	-	GIS Analyst	GIS/figure preparation	BEnvSc (Hons), PhD
Kane Blundell	-	GIS Analyst	GIS/figure preparation	Dip Spatial Sc
Ashley Blundell	BAAS21020	Senior Ecologist	Threatened flora surveys	DipSc, BSc (Ecology)
Samara Schulz	BAAS17039	Principal Ecologist	Threatened flora surveys	BEnvSc & Mgmt (Hons)
Christina Swinsburg	-	Ecologist	Threatened flora surveys	BEnvSc & Mgmt
Jonathan Berry		Principal Advisor	Threatened flora surveys, EPBC Referral and Summary Report compilation BDAR Review	B.AppSc (Hons)

### iii. Conflict of interest

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

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



Signature: \_\_\_\_\_

Date: 06/05/2026

BAM Assessor Accreditation no: BAAS21021

# Stage 1: Biodiversity assessment

## 1. Introduction

### 1.1 Proposed development

#### 1.1.1 Development overview

The proposed development is a hard rock and aggregate quarry, located at 253 Stanhope Road, Elderslie and Blind Creek Road, Glendon Brook (Lot 65 DP 752473, Lots 903 & 904 DP1061259, and Lot 5 DP1102521) (hereafter referred to as the “Project Site”) (**Figure 1** and **Figure 2**). The proposed quarry is expected to extract up to 30 million tonnes (Mt) over the duration of the project, therefore constituting a State Significant Development (SSD) (SSD-76210271), pursuant to Schedule 1, Clause 7 of the *State Environmental Planning Policy (Planning Systems) 2021*.

This assessment has been undertaken in accordance with the NSW Biodiversity Assessment Method 2020 (BAM) (Department of Planning, Infrastructure and Environment [DPIE] 2020a, now NSW Department of Climate Change, Energy, Environment, and Water [DCCEEW]) under the *Biodiversity Conservation Act 2016* (NSW) (BC Act) and the *Biodiversity Conservation Regulation 2017* (BC Regulation) to support the State Significant Development Application (SSDA).

The proposed development has been designed to facilitate the efficient and economically viable extraction of the identified hard rock resource, while ensuring that potential environmental and community impacts are avoided or minimised wherever practicable. In addition, the proposed development is expected to generate a range of socio-economic benefits that will support regional development.

#### 1.1.2 Terminology

The following terms are used throughout this report to describe geographical areas (**Figure 3**):

- **Subject Land** – the full extent of the property at 253 Stanhope Road, Elderslie and Blind Creek Road, Glendon Brook including the Subject Lots, Lot 65 DP 752473, Lots 903 & 904 DP1061259, and Lot 5 DP1102521 (186 ha). Also referred to as Project Area per EPBC guidance.
- **Disturbance Footprint**, is land to which the BAM is applied to assess the biodiversity values. In this case it refers to the area subject to direct impacts from the proposed SSD (63.7 ha). This term is generally synonymous with Impact Area, Development Footprint and Development Site.
- **Study Area** – Area subject to biodiversity surveys as part the proposal. The study area extends as far as is necessary to assess all important biodiversity values known and likely to be impacted and extends beyond the Development Footprint as far as is necessary. The Study Area changed during the Project, the area shown is the full extent of surveys.
- **Assessment Area** – Land within 1500m of the Disturbance Footprint.
- **Locality** – Land within a 5-kilometre (km) radius of the Development Footprint.

### 1.1.3 Proposed development and the Subject Land

#### Development Overview

A general description of the proposed development and associated infrastructure works are outlined following:

**Table 1 Proposed Development Summary**

Project Element	Summary of the Project
Proposed Development	Hard Rock Quarry
Legal Property Description – Subject Land	Lot 65 DP 752473, Blind Creek Road, Glendon Brook. Lot 904 DP 1061259, Blind Creek Road, Elderslie. Lot 903 DP 1061259, Blind Creek Road, Elderslie. Lot 5 DP 1102521, 253 Springvale Road, Elderslie.
Resource Extraction Method	Traditional drilling and blasting
Resource	Quarry extraction of high-quality Tuff and Agglomerate from a reduced level (RL) of 215 m AHD down to RL 110 m AHD.
Project Site Area	200.40ha.
Disturbance Areas	Total Disturbance Area – 63.7 ha, broken down as per below. 37.9 ha - Pit Area. 4.1 ha – Stockpile and Laydown Area 16.6 ha - Processing Area. 0.6 ha - Weighbridge and Office Area 1.3 ha – Haul Road 1 2.9 ha – Haul Road 2
Annual Production	Up to 1,000,000 tonnes.
Quarry Life	Up to 30 years (under this application).
Potential Resource Life	Up to 50 years.
Hours of Operation	<u>Extraction and processing operations</u> Monday to Friday: 7:00am to 5:00pm. Saturday: 8:00am to 1:00pm. <u>Internal product transfers to stockpiles</u> Monday to Friday: 7:00am to 5:00pm. Saturday: 8:00am to 1:00pm. <u>Haulage from the quarry site</u> 6:30am to 4:00pm Monday to Friday. No haulage on Saturday, Sunday or a Public Holiday. <u>Drilling and Blasting activities</u> Blasting between 9:00am to 5:00pm Monday to Friday only. On average one (1) blast per week, carried out by an external contractor. <u>Maintenance activities</u> 6:00am to 6:00pm (Monday to Saturday). No work on Sundays and Public Holidays.

Project Element	Summary of the Project
	<p><u>Construction hours</u>            7:00am to 5:00pm (Monday to Saturday).            8:00am to 3:00pm (Saturday).            No work on Sundays and Public Holidays.</p>
Operational Workforce	At full operation, up to 15 full-time staff, with further support from the local and regional construction industry and associated haulage contractors.
Product Transport	<p>Road haulage of product via semi-trailer / truck and dog trailer.</p> <p>On average 110 laden trucks per day in order to meet peak production.</p> <p>Maximum of 30 laden trucks per hour at peak rates.</p> <p>Maximum daily extraction rate of 7,000 tonnes per day.</p>
Transport Route	<p>The road transport route from the site extends over approximately 13km from the site entrance to the Hunter Expressway interchange at Branxton. The road transport route incorporates Springvale Road, Stanhope Road, Elderslie Road and the New England Highway. Elderslie Road was previously used by the Great Greta Coal Mine to haul coal.</p> <p>The road transport route includes use of the Elderslie Bridge which crosses the Hunter River. The bridge is located 600m south of the intersection of Elderslie Road and Stanhope Road and has a mass restriction of 50 tonnes.</p>
Water Management	Erosion and sediment control devices such as catch drains, road drainage, dirty water dams and clean water dams.
Utilities	<p>Power supply from existing electricity network and diesel generators.</p> <p>Water supply sourced from onsite dams, surface water runoff, and rainwater tanks. Potable water imported as needed</p>
Operational Activities and Areas	<p>Site office and employee facilities.</p> <p>Car parking.</p> <p>Existing site access from Springvale Road via Haul Road 1 (sealed) to Weighbridge and Office Area.</p> <p>Use of Haul Road 1 and Haul Road 2.</p> <p>Workshop and fuel storage – to be initially located at the Weighbridge and Office Area.</p> <p>Fuel and supply deliveries.</p> <p>Equipment storage.</p> <p>Waste management.</p> <p>Equipment parking areas.</p> <p>Processing Area including crusher and screening plant.</p> <p>Raw material stockpiles.</p> <p>Product stockpiles and truck loading areas.</p> <p>Truck parking.</p> <p>Weighbridge.</p> <p>Environmental management measures including road watering, site rehabilitation, etc.</p> <p>Use of ancillary plant and equipment.</p>
Rehabilitation	<p>Rehabilitation will initially be limited to areas of immediate disturbance such as road batters, access road construction and sediment dams.</p> <p>Progressive rehabilitation of the quarry benches will occur as they</p>

**Project Element****Summary of the Project**

become available, with the majority of the rehabilitation taking place at the completion of resource extraction when the quarry floor, stockpile areas, and portions of the infrastructure areas will be rehabilitated.

The proposed development includes the following activities:

- Vegetation clearing, earthworks and installation of surface water management controls to facilitate construction of the first section of Haul Road 1 which will be a sealed road approximately 600 m in length from the northern end of Springvale Road to the western end of the proposed Weighbridge and Office Area. Construction of Haul Road 1 along this section will include a minor culvert crossing of a third order un-named drainage line.
- Vegetation clearing, earthworks and installation of surface water management controls for the construction of the Weighbridge and Office Area. Construction works will include erection of temporary buildings and facilities, installation of a weighbridge, installation of necessary infrastructure and other supporting services to facilitate operations at the site.
- Vegetation clearing, earthworks and installation of surface water management controls to facilitate construction of the second section of Haul Road 1 which will be unsealed and will extend approximately 150m from the Weighbridge and Office Area to the Processing Area. Construction of Haul Road 1 along this section will include minor culvert crossings of two un-named drainage lines, one being a first order and the second being a third order drainage line.
- Clearing of vegetation, installation of surface water management controls and overburden removal for the creation of the Processing Area. Establishment of the Processing Area may require extraction of hard rock from to achieve finished design levels. Extraction in these parts will be undertaken through a combination of drilling and blasting with the resultant material, once processed, suitable for commercial sale.
- A mobile crusher and screening plant will be located in the Processing Area to process extracted material from within the Processing Area and ultimately the resource material from within the Pit Area. Once operations within the Pit Area are fully established the mobile crusher and screening plant will become fixed plant.
- Vegetation clearing, earthworks and installation of surface water management controls to facilitate construction of Haul Road 2, approximately 1,620 m in length, from the Processing Area to a point approximately 750 m within the Pit Area.
- Vegetation clearing, earthworks and installation of surface water management controls to facilitate construction of the Stockpile and Laydown Area immediately southwest of the Pit Area.
- Progressive vegetation clearing and extraction of the Pit Area with the high-quality resource being drilled, blasted and extracted, prior to transporting to the Processing Area.
- Installation of surface water management controls to manage runoff within the Pit Area and the Processing Area.
- Stripping and stockpiling of topsoil for future rehabilitation will be carried out during all stages of construction and operation. Topsoil will be stockpiled in the Stockpile Area immediately southwest of the Pit Area.

- Extraction and processing of up to 1 million tonnes of resource per annum, for 30 years.
- Transport of processed material along Springvale Road, Stanhope Road, Elderslie Road to the New England Highway, Wine Country Drive, the Hunter Expressway and the local region.
- Existing fencing around the site will be modified as necessary to exclude stock and unauthorised personnel from operational areas. For the majority of areas this will be a typical rural fence, unless dictated by any other safety requirements.
- Progressive rehabilitation works within the Pit Area.

### **Indicative Development Staging**

The Project will be completed in the following indicative stages (**Figure 3**):

#### **Stage 1 – Years 1–4**

Construction of Haul Road 1 from Springvale Road to the Processing Area including the sealing of the haul road to the Weighbridge and Office Area and construction of creek crossings, sediment basins and water storage dams. This stage will also include construction of the weighbridge, office, amenities and workshop and installation of weighbridge equipment.

The construction of the Processing Area will involve drilling and blasting to achieve finished design levels for this area. The materials created from this area will be suitable for construction of roads and infrastructure for the Project and any surplus materials will be stockpiled and sold.

#### **Stage 2 – Years 4–5**

Construction of Haul Road 2 from the Processing Area to the Pit Area, passing the proposed Stockpile and Laydown Area. This will involve the use of materials created from the construction of the Processing Area. Haul Road 2 will extend approximately 750m into the Pit Area to create access to the northern end of the pit to allow extraction in that area of the pit.

Extraction of materials from the Stage 2 Pit Area using drilling and blasting and then loading and haulage of materials to the Processing Area where materials will be sold and transported via registered haulage trucks to their end use market

#### **Stage 3 – Years 4–5**

Clearing and establishment of Stockpiling and Laydown Area.

#### **Stage 4 – Years 5–30**

Extraction of materials from the Stage 4 Pit Area using drilling and blasting and then loading and haulage of materials to the Processing Area where materials will be sold and transported via registered haulage trucks to their end use market.

#### **Stage 5 – Dependent on needs**

Extraction of materials from the Stage 5 Area dependent on needs.

Pit closure and rehabilitation

### **Biodiversity Credits**

Biodiversity credit obligations calculated as part of this BDAR will be staged accordingly. The proportionate credit requirements for ecosystem and species credits have been calculated and are detailed in Section 11.3.

#### **1.1.4 Other documentation**

The key documentation relevant to the proposed development is the Environmental Impact Statement - Bluestone Hard Rock Quarry (BARR Planning 2026).

Biodiversity impact assessment requirements provided in the NSW Secretary's Environmental Assessment Requirements (SEARs) for SSD-76210271 are detailed below.

### Secretary's Environmental Assessment Requirements (SEARs)

As the proposed development requires consent under Part 4 of the EP&A Act, this Biodiversity Development Assessment Report (BDAR) has been completed in accordance with all of the relevant biodiversity impact assessment requirements of the SEARs summarised below in Table 2.

**Table 2 Biodiversity impact requirements provided in the SEARs for SSD-76210271**

Issues and Assessment Requirements	Response
<p>Prepare a <b>Biodiversity Development Assessment Report (BDAR)</b> that assesses biodiversity impacts in accordance with the <i>Biodiversity Conservation Act 2016</i> and the Biodiversity Assessment Method 2020.</p> <p>The BDAR must use the template available at:  <a href="https://www.environment.nsw.gov.au/research-and-publications/publications">https://www.environment.nsw.gov.au/research-and-publications/publications</a></p>	<p>This BDAR has been prepared to assess and document biodiversity impacts in accordance with the <i>Biodiversity Conservation Act 2016</i> and the Biodiversity Assessment Method 2020, using the appropriate template.</p>
<p>Biodiversity impacts related to the proposed development (SSD-76210271) are to be assessed in accordance with the Biodiversity Assessment Method 2020 and documented in a Biodiversity Development Assessment Report (BDAR). The BDAR must include information in the form detailed in the <i>Biodiversity Conservation Act 2016</i> (s6.12), <i>Biodiversity Conservation Regulation 2017</i> (s6.8) and Biodiversity Assessment Method 2020.</p>	<p>This BDAR includes information in the form detailed in the <i>Biodiversity Conservation Act 2016</i> (s6.12), <i>Biodiversity Conservation Regulation 2017</i> (s6.8) and Biodiversity Assessment Method 2020.</p>
<p>The BDAR must document the application of the avoid, minimise and offset framework including assessing all direct, indirect and prescribed impacts in accordance with the Biodiversity Assessment Method 2020.</p>	<p><b>Section 7</b> of this BDAR documents the application of the avoid, minimise and offset framework in accordance with the BAM.</p>
<p>The BDAR must include details of the measures proposed to address the offset obligation as follows;</p> <ul style="list-style-type: none"> <li>• The total number and classes of biodiversity credits required to be retired for the development/project;</li> <li>• The number and classes of like-for-like biodiversity credits proposed to be retired;</li> <li>• The number and classes of biodiversity credits proposed to be retired in accordance with the variation rules;</li> <li>• Any proposal to fund a biodiversity conservation action;</li> <li>• Any proposal to conduct ecological rehabilitation (if a mining project);</li> <li>• Any proposal to make a payment to the Biodiversity Conservation Fund.</li> </ul>	<p>Details regarding the measures to meet the offset obligations of the proposal are provided in <b>Section 11</b> of this BDAR.</p> <p>Details of proposed ecological rehabilitation are provided in <b>Section 8.4</b> of this BDAR.</p>
<p>If seeking approval to use the variation rules, the BDAR must contain details of the reasonable steps that have been taken to obtain requisite like-for-like biodiversity credits.</p>	<p>No variation rules are sort by the proponent.</p>
<p>The BDAR must be prepared by a person accredited in accordance with the Accreditation Scheme for the Application of the Biodiversity Assessment Method 2017 under s6.10 of the Biodiversity Conservation Act 2016.</p>	<p>This BDAR has been prepared and certified by an accredited person as certified within this BDAR</p>

## 1.2 Biodiversity Offsets Scheme entry

The NSW Biodiversity Offsets Scheme (BOS) is the framework for assessing and offsetting unavoidable impacts on biodiversity from development. Under the BC Act there are several triggers for entry into the BOS, these are outlined in Table along with an assessment of the proposed Development against these thresholds. Under the BC Act, where the BOS is triggered, a Biodiversity Development Assessment Report (BDAR) is required.

Criteria to which the BOS applies includes the following:

- Local Development (assessed under Part 4 of the Environmental Planning and Assessment Act 1979) that is likely to significantly affect threatened species. Local development is likely to significantly affect threatened species and require a biodiversity development assessment report (section 7.7 of the Biodiversity Conservation Act 2016) if impacts either:
  - exceed the Biodiversity Offsets Scheme threshold (BC Act, section 7.4); the threshold includes clearing on land within the Biodiversity Values Map or clearing of an area that exceeds the threshold.
  - are carried out on an Area of Outstanding Biodiversity Value (AOBV)
  - are likely to significantly affect threatened species, ecological communities, and their habitats according to the test in section 7.3 of the BC Act
- State Significant Development (SSD) and State Significant Infrastructure (SSI) projects, unless “the Secretary of the Department of Planning and Environment and the environment agency head determine that the project is not likely to have a significant impact”.
- Biodiversity certification proposals.
- Clearing of native vegetation in urban areas and areas zoned for environmental conservation that exceeds the BOS threshold and does not require development consent.
- Clearing of native vegetation that requires approval by the Native Vegetation Panel under the LLS Act.
- Activities assessed and determined under Part 5 of the EP&A Act (generally, proposals by government entities) if proponents choose to ‘opt in’ to the Scheme.

Under Section 7.14 of the BC Act, major projects are required to enter the Biodiversity Offsets Scheme (BOS). As the proposal is considered an SSD, entry into the BOS and the production of a BDAR is required (Table 3). This is also specified in the SEARs.

**Table 3 Biodiversity Offset Scheme Triggers**

BOS Threshold	Proposed Development
State Significant Development / State Significant Infrastructure trigger (BC Act Section 7.14)	<b>BOS Triggered:</b> As the proposal is considered an SSD, entry into the BOS and the production of a BDAR is required.
Clearing of native vegetation, or other activity, on land included on the Biodiversity Values Map	<b>N/A – BOS Triggered by SSD:</b> The Subject Land is not mapped on the Biodiversity Values Map and avoids impact to BV lands (Figure 6).
Clearing of native vegetation that exceeds the clearing thresholds	<b>N/A – BOS Triggered by SSD:</b> Clearing thresholds are based on the smallest minimum lot size of all included lots, which is 40 ha under the Singleton LEP. As this minimum lot size is less than 1,000 ha

BOS Threshold	Proposed Development
	<p>but not less than 40 ha, the clearing threshold for the BOS is 1 ha.</p> <p>The proposal will impact 61.63 ha of native vegetation. As such the proposed development exceeds this threshold, but entry into the BOS is already required for SSDs.</p>
Undertaking an activity that is likely to significantly affect threatened species or communities	<b>N/A – BOS Triggered by SSD, not assessed.</b>

### 1.3 Excluded impacts

Clause 6.8(3) of the BC Act specifies that the BAM is to exclude the assessment of the impacts of any clearing of native vegetation and loss of habitat on category 1-exempt land (as defined in Part 5A of the LLS Act), other than prescribed impacts (as defined in clause 6.1 of the Biodiversity Conservation Regulation 2017 (BC Regulation)). Prescribed impacts must therefore be assessed for category 1-exempt land.

Existing mapping of Category 1-exempt land is mapped in the northern and central portions of the site on the Native Vegetation Regulatory Map (**Figure 7**). As these mapped areas did not readily align with observed lands likely to constitute category 1-exempt land (e.g. land cleared prior to 1990 and low conservation grasslands), impacts relating to the clearing of vegetation within those areas were conservatively included for assessment under the BAM. Further detail is provided in Appendix B: Determination of excluded impacts.

### 1.4 Matters of national environmental significance

The *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities, heritage places and water resources which are defined as Matters of National Environmental Significance (MNES) under the EPBC Act. These are:

- World heritage properties.
- Places listed on the National Heritage Register.
- Ramsar wetlands of international significance.
- Threatened flora and fauna species and ecological communities.
- Migratory species.
- Commonwealth marine areas.
- The Great Barrier Reef Marine Park.
- Nuclear actions (including uranium mining).
- Water resources, in relation to coal seam gas or large coal mining development.

The EPBC Act requires that developments or undertakings that are likely to have a significant impact on MNES be referred for a determination as to whether they are a controlled action that requires approval under the EPBC Act (Section 1.5.1). Of the nine (9) MNES listed under the Act, one (1) MNES considered relevant to the proposed development was potential impacts on listed threatened species or communities.

A total of three (3) threatened species listed under the EPBC Act were recorded within the Disturbance Footprint, including:

- *Central Hunter Valley Eucalypt Forest and Woodland* - listed as Critically Endangered Ecological Community (CEEC)
- Large-eared Pied Bat (*Chalinolobus dwyeri*) – species recorded by Anabat and foraging habitat present within the Disturbance Footprint.

- Grey-headed Flying Fox (*Pteropus poliocephalus*) – species recorded flying overhead and foraging habitat present within the Disturbance Footprint.

These recorded entities are assessed further in **Appendix C: Matters of national environmental significance**. Impact to the *Central Hunter Valley Eucalypt Forest and Woodland* are likely to constitute a controlled action. Referral under the EPBC act is recommended.

No other threatened species listed under the EPBC Act were recorded during surveys undertaken. However, the native vegetation to be removed as part of the proposed development would represent potential foraging habitat for some EPBC Act fauna species that were not required to be specifically surveyed as part of this BDAR. Examples include Regent Honeyeater, Brown Treecreeper, Spotted-tailed Quoll and Swift Parrot. However, existing survey efforts provide a high likelihood of detection for species. As these species are also listed as threatened in NSW under the BC Act, impacts on these species, namely removal of potential foraging habitat for mobile threatened fauna, have been addressed through application of the BAM Credit Calculator and calculation of ecosystem credit offset requirement, which is detailed in Sections 5.1.1 and 11.1.

Assessment of MNES in accordance with the requirements of the Supplementary SEARs is provided in **Appendix C**.

## 1.5 Information sources

Existing information on the flora and fauna of the Subject Land and the locality, including relevant threatened biota, was obtained from the following resources:

- The *NSW BioNet* (<http://www.bionet.nsw.gov.au/>) and *Protected Matters Search Tool* (<https://www.environment.gov.au/epbc/protected-matters-search-tool>) for previous records of threatened species, populations and ecological communities within a 10 km radius centred on the centre of the Subject Land (12/11/2025).
- The *NSW BioNet* 'Threatened Biodiversity Data Collection' (TBDC) (DPE 2023), *Final Determinations* (NSW Scientific Committee) and *Species Profile and Threats Database* (DCCEE 2023) for information on threatened species, populations and ecological communities.
- BioNet Vegetation Classification (NSW DCCEE)
- Commonwealth Department of Climate Change, Energy, the Environment and Water (Commonwealth DCCEE) Species Profile and Threats Database (SPRAT) (<https://environment.gov.au/cgi-bin/sprat/public/sprat.pl>)
- The NSW Department of Climate Change, Energy, Environment and Water (NSW DCCEE) Threatened Species Profiles (<https://threatenedspecies.bionet.nsw.gov.au/>)
- Mitchell Landscapes Version V3.1 (OEH 2017).

Base map data was obtained from NSW Department of Finance, Services and Innovation (DFS) databases, with cadastral data obtained from DFS digital cadastral database. Mapping for stream orders was obtained from NSW Department of Primary Industry (DPI).

The following spatial datasets were utilised during the development of this report:

- Interim Biogeographic Regionalisation of Australia (IBRA) Version 7 (DoEE 2018).
- Mitchell Landscapes Version V3.1 (OEH 2017).
- Directory of important wetlands in Australia (DAWE 2021a).
- Australian Ramsar Wetlands (DAWE 2021b).
- Fauna Corridors for North East NSW (OEH 2018).
- SEED Portal (Acid Sulfate Soil Risk) (NSW Government 2018).
- NSW Hydrography (Department of Finance, Services and Innovation 2018).
- NVR Map (State Government of NSW 2022)

Mapping undertaken during the assessment was conducted using a hand-held GPS unit, mobile tablet computers running Terraflex for Trimble™ and aerial photo interpretation. Accuracy is subject to accuracy of GPS devices, generally  $\pm 5$  m. Mapping has been produced using a Geographic Information System (GIS; QGIS).

A full list of resources is provided in References (Section 12).

## 2. Methods

### 2.1 Site context methods

#### 2.1.1 Landscape features

The identification of landscape features within the subject area was undertaken in accordance with Section 3 of the BAM (DPIE 2020a) are described in **Table 4** and shown on **Figure 1** and **Figure 2**.

**Table 4** Landscape Features

Landscape Features	Subject Area
Interim Biogeographic Regionalisation for Australia (IBRA) bioregion & Subregion	NSW North Coast IBRA Bioregion Upper Hunter IBRA Sub-region
LGA	Singleton Council
NSW (Mitchell) Landscapes	Central Hunter Foothills
Rivers, streams and estuaries	A total of one (1) third order, one (1) second order, four (4) first order water courses occur within the Project Site, all unnamed. Two (2) dams are located in the central Project Site. No estuaries occur within the Project Site.
Habitat connectivity	The vegetation within the Project Site is part of a larger patch of vegetation in the locality, directly connected to extensive areas of forested habitat within the Tangory Nature Reserve (NR) and adjacent areas around Glendon Brook, Mitchells Flat and Stanhope.
Wetlands	There are no local or important wetlands within or adjoining to the site. However, the Hunter River and adjoining riparian corridor is within 3 km south of the Project Site.
Geological features of significance	There are no karst, caves, cliffs, rocks or other geological features of significance within the Project Site.
Areas of outstanding biodiversity value	There are no areas of outstanding biodiversity value mapped within the Project Site or nearby.

#### 2.1.2 Native vegetation cover

Native vegetation cover was assessed as per Section 3.2 of the BAM (DPIE 2020a). Whereby, the native vegetation cover is assessed within the Disturbance Footprint and within a 1,500 m buffer area surrounding the outside edge of the boundary of the Disturbance Footprint. This 1,500 m site buffer has an area of 1,833 ha and there is native vegetation cover of 1,516 ha or 99% (>70%) (Section 3.3).

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

### 2.2.1 Existing information

The following data sources and studies were reviewed prior to conducting the vegetation assessment within the study area. These were used to assist with the stratification of the site into vegetation zones, selection of plot/transect locations and determination of plant community types (PCTs), these included:

- State Vegetation Type Mapping C2.0
- BioNet Vegetation Classification (NSW DCCEEW)
- Aerial imagery from multiple sources including recently commissioned by the landholder (July 2025).
- Vegetation of the Tangory Nature Reserve – preliminary map (Stephen Bell 2017)
- Preliminary vegetation mapping for Pittman Land Holdings (Wedgetail Project Consulting 2023)

### 2.2.2 Vegetation mapping surveys

#### Field Surveys

The boundaries of the identified vegetation communities within the Project Site were mapped using a combination of rapid data points (RDPs) and walking transects. RDPs involved collecting waypoints over the Project Site using a handheld GPS unit and recording dominant species, structure and condition. Walking transects involved verifying polygons were homogenous in floristic composition and condition, as well as walking vegetation ecotones and using the recorded tracks to define vegetation community boundaries.

#### Linework and Attribution

The RDPs and survey tracks were overlaid on aerial photograph and used to delineate and/or clarify vegetation boundaries using RDP data including dominant species, structure and condition. RDPs and vegetation community polygons within the Project Site were assigned to best-fit PCTs as described below.

#### Plant Community Type and TEC Determination

The identification of vegetation communities was based on dominant species present in the overstorey, mid-storey, shrub and ground layers as recorded in RDPs and floristic plots. The best-fit PCT for vegetation within the Project Site was determined through the comparison of collected data with available PCT descriptions with emphasis on: floristic composition, community structure, location (IBRA region/subregions), landscape position, geology, soils, and other diagnostic features.

Vegetation within the Project Site were also assessed against descriptions of relevant listed Threatened Ecological Communities (TECs) listed under the NSW Biodiversity Conservation Act 2016 (BC Act) and the Commonwealth Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act).

#### Vegetation Zones

Vegetation zones were identified and delineated within the Project Site in accordance with Section 4.3 of the BAM (DPIE 2020a). A vegetation zone is defined in the BAM (DPIE 2020a) as a relatively homogenous area that is the same vegetation type and broad condition.

### 2.2.3 Vegetation integrity survey

Following stratification of the proposed study area into vegetation zones, plots/transects were undertaken to collect site condition data for the composition, structure and function attributes listed in Table 5 in accordance with Section 4.3 of the BAM (DPIE 2020a). The

location of the plots/transects were selected through stratified random sampling to provide a representative sample of the variation in vegetation composition and condition within each vegetation zone.

**Table 5 Composition, structure and function components of vegetation integrity**

Growth form groups used to assess composition (species richness) and structure (percent foliage cover)	Function attributes
<ul style="list-style-type: none"> <li>• Tree (TG)</li> <li>• Shrub (SG)</li> <li>• Grass and grass-like (GG)</li> <li>• Forb (FG)</li> <li>• Fern (EG)</li> <li>• Other (OG)</li> </ul>	<ul style="list-style-type: none"> <li>• Number of large trees</li> <li>• Tree regeneration (presence/absence)</li> <li>• Tree stem size class (presence/absence)</li> <li>• Total length of fallen logs</li> <li>• Litter cover</li> <li>• High threat exotic vegetation cover (HTE)</li> <li>• Hollow-bearing trees (HBT)</li> </ul>

## 2.3 Threatened flora survey methods

### 2.3.1 Review of existing information

A desktop assessment was undertaken to identify habitat suitability for threatened species and populations within the Project Site, this assessment included a review of the NSW DPE BioNet Atlas, the Commonwealth's Protected Matters Search Tool (PMST), the Biodiversity Assessment Method Calculator (BAM-C), and the BioNet Atlas Threatened Biodiversity Database Collection (TBDC). The information collected from these online resources was used to identify habitat constraints and potential microhabitats for each species likely to occur within the Project Site.

### 2.3.2 Habitat constraints assessment

A habitat constraint assessment for threatened flora was completed during vegetation and habitat assessments within the Study Area. Specific constraints assessed include:

- Floodplains of watercourses, including rivers, creeks, intermittent streams or billabongs (habitat constraint for *Eucalyptus camaldulensis* population in the Hunter catchment)
- Epiphytic in a range of eucalypts, Acacia and Angophora (habitat constraint for *Cymbidium canaliculatum* population in the Hunter catchment)
- Fallen/standing dead timber including logs; Cut stumps or logs on ground (habitat constraint for *Cymbidium canaliculatum* population in the Hunter catchment)

Results of the habitat constraint assessment is provided in **Section 5.1**.

### 2.3.3 Field surveys

Surveys for candidate threatened flora were completed in accordance with *Surveying threatened plants and their habitats: NSW survey guide for the Biodiversity Assessment Method* (DPIE 2020b). Parallel field traverses were completed for all candidate threatened flora species, with transect width spaced at an appropriate distance relative to the growth form of the candidate species. Survey timing was based on recommended survey periods and survey requirements detailed in the TBDC (**Table 6, Figure 9, Figure 10, Figure 11**). **Section 5.3** provides more specific detail on survey method, timing and results for each candidate species.

With regard to the threatened flora surveys, the following is noted:

- Survey for *Pterostylis chaetophora* was undertaken to align with peak flowering of known reference populations at Columbey National Park and North Rothbury

- Threatened flora surveys were completed in groups of up to five (5) species, with the exception being survey group 3 where the six (6) listed species were targeted within associated PCTs only (i.e. the number of species surveyed within each vegetation zone was always five [5] species or less):
  - *Eucalyptus camaldulensis* associated with VZ1 4073\_Forest only
  - *Eucalyptus glaucina* and *Eucalyptus largeana* not associated with VZ2 4073\_Forest
- No threatened flora species were recorded during targeted surveys

**Table 6 Targeted threatened flora surveys**

Survey group	Target species	Method	Dates
Group 1: ground layer	<i>Pterostylis chaetophora</i> , <i>Tetraloche juncea</i> , <i>Cymbidium canaliculatum</i> and <i>Rutidosia heterogama</i>	Parallel field traverses spaced at 5–10 m (in dense or sparse vegetation respectively)	9, 10, 11, 13, 16, 19 October 2023 9, 10, 13 & 14 October 2025
Group 2: shrubs & climbers	<i>Callistemon linearifolius</i> , <i>Cynanchum elegans</i> , <i>Grevillea parviflora</i> subsp. <i>parviflora</i> , <i>Rhodamnia rubescens</i> and <i>Rhodomyrtus psidioides</i>	Parallel field traverses spaced at 10–20 m (in dense or sparse vegetation respectively)	30 September 2025 1 & 2 October 2025
Group 3: trees, epiphytes and climbers	<i>Acacia pendula</i> , <i>Cymbidium canaliculatum</i> , <i>Cynanchum elegans</i> , <i>Eucalyptus camaldulensis</i> , <i>Eucalyptus glaucina</i> and <i>Eucalyptus largeana</i>	Parallel field traverses spaced at 20–40 m (in dense or sparse vegetation respectively)	19, 21, 24, 26 & 27 March 2025 7 & 15 April 2025

## 2.4 Threatened fauna survey methods

### 2.4.1 Review of existing information

A desktop assessment was undertaken to identify habitat suitability for threatened species and populations within the Project Site, this assessment included a review of the NSW DPE BioNet Atlas, the Commonwealth's Protected Matters Search Tool (PMST), the Biodiversity Assessment Method Calculator (BAM-C), species-specific survey guidelines, and the BioNet Atlas Threatened Biodiversity Database Collection (TBDC). The information collected from these online resources was used to identify habitat constraints and potential microhabitats for each species likely to occur within the Project Site.

### 2.4.2 Habitat constraints assessment

Habitat constraints assessments were completed throughout 2025 to identify the following key habitat constraints:

- Location and mapping of hollow-bearing trees and assessment according to habitat constraints for threatened owls and cockatoos.
- Presence of Grey-headed Flying Fox camps
- Presence of large Eucalypts suitable for raptor nests, and suitable raptor nests
- Assessment of waterbodies, watercourses and drainage lines for suitability as frog habitat within 200 m of the Subject Land
- Surveys of the Subject Land for the following habitat features: site condition, vegetation structure, cliffs or caves.

- Opportunistic and incidental observations of fauna species during field surveys, including opportunistic observation of fauna activity such as scats, tracks, burrows, or other traces.
- Opportunistic searching for signs of foraging e.g. chewed cones beneath *Allocasuarina* and *Casuarina* tree species.

### Habitat Tree survey

A hollow-bearing tree survey was completed within the Project Site on 18/03/2025 to locate hollow-bearing trees, and dead standing stags. The number and diameter of all hollows was recorded, and the height and orientation of the hollow was assessed. These attributes informed hollow suitability for threatened species such as threatened forest owls, cockatoos and arboreal mammals. The location of Habitat Trees and the type of feature it contained was recorded using a handheld GPS (**Figure 13**).

A total of 53 hollow-bearing trees and dead stags containing large hollows were identified during surveys, 33 of which occur within the Disturbance Footprint (**Figure 13**), including:

- Three (3) trees with large hollows (>20 cm) potentially suitable for threatened owls
- Nine (9) trees with medium hollows (8-20 cm) – seven (7) potentially suitable for Glossy Black Cockatoo, and two (2) potentially suitable for Gang-gang Cockatoo
- 21 trees with small to medium hollows (5-20 cm) suitable for threatened and non-threatened fauna, but not suitable for threatened owls or cockatoos

### 2.4.3 Field surveys

Threatened fauna surveys were undertaken with reference to the survey notes within the TBDC, as well as the following BAM survey guidelines:

- NSW Survey Guide for Threatened Frogs (DPIE 2020b).
- Koala (*Phascolarctos cinereus*): Biodiversity Assessment Method Survey Guide (DPE 2022b).
- 'Species credit' threatened bats and their habitats NSW survey guide for the Biodiversity Assessment Method (OEH 2018).

Survey methods, timing and results are listed below in Table 23 for all candidate fauna species requiring survey. Section 5.3 provides more specific detail on survey method, timing and results for each candidate species. Survey locations are shown on **Figure** and **Figure 14**.

In summary, field surveys undertaken to target threatened species of fauna included:

- Spotlighting to target Squirrel Glider, Brush-tailed Phascogale, Southern Greater Glider and Koala
- Call playback to target Masked Owl, Barking Owl, Powerful Owl, Sooty Owl and Koala
- Searches for breeding presence of Gang-gang Cockatoo and Glossy Black Cockatoo
- Searches for stick nest suitable for Little Eagle and Square-tailed Kite
- Searches for Red Goshawk
- Passive surveillance using remote motion-sensor cameras to target Squirrel Glider, Brush-tailed Phascogale, Southern Greater Glider and Eastern Pygmy Possum.
- Koala SAT searches targeting Koala
- Deployment of ultrasonic bat detectors (Anabats) targeting threatened microbats
- Aural-visual searches for threatened frogs around dams and creeks targeting Green and Golden Bell Frog
- Harp trapping to target Eastern Cave Bat

## Arboreal Mammals

A total of 44 Boly Guard remote motion-sensor cameras (hereafter “remote cameras”) were installed at heights of approximately 3 m, targeting arboreal fauna species (**Figure 14**). A further eight (8) remote cameras were installed at approximately 1.5 m, targeting the Eastern Pygmy Possum. Cameras were baited with an oats, peanut butter, treacle, vanilla essence and truffle oil mixture in a mesh canister, and the surrounding area (including the tree trunk) was sprayed with honey water and/or fish sauce depending on the target species. Cameras were installed for at least four (4) weeks between 12 March and 15 April 2025 and were re-baited once during the survey period (24-25/03/2025) (**Table 33**). Additionally, batteries were changed within the cameras where they were getting low during the re-baiting effort. Images were analysed to identify species captured on camera by an experienced ecologist.

Spotlighting surveys were conducted on the 13 March 2025, and 14, 15, 16, 23 and 24 April 2025 using high-powered headtorches to search for all types of nocturnal fauna (**Figure 14**). Spotlighting was undertaken via random meanders for 1 hr on each night by two fauna ecologists.

A total of 24 Spot Assessment Technique (SAT) surveys (Phillips and Callaghan, 2011) were undertaken across the Disturbance Footprint on the 18, 19 and 21 March 2025 (**Figure 14**). This technique involves the selection of a centre tree (survey point) which is selected according to the following criteria:

- A tree of any species beneath which one or more Koala faecal pellets have been observed; and/or
- A tree in which a Koala is observed; and/or
- Any other tree known or considered to be potentially important for Koalas, or for other assessment purposes.

A minimum of 30 trees (including the centre tree) with a DBH of 100 mm or greater are then surveyed. Surveys involve the inspection of the ground surface within 100 cm from the base of the tree. The base of each tree was inspected for 2 person minutes.

## Terrestrial Mammals

A total of nine (9) remote cameras were installed at approximately 0.5 m targeting terrestrial fauna for a total of 32 nights between 12 March and 15 April 2025 (**Figure 14**). Cameras were baited with an oats, peanut butter, treacle, vanilla essence and truffle oil mixture in a mesh canister, and the surrounding area (tree trunk) was sprayed with honey water. Images from the cameras were analysed by an experienced ecologist to identify species captured on camera.

## Microbats

Anabat™ bat-call detectors were used passively to record the calls of passing microbats. A total of four (4) Anabats™ were set up within suitable microchiropteran bat habitat and along potential flyways and left to record between 12–13/03/2025 and 21/04/2025 (**Figure 13**) in accordance with the requirements of the *‘Species credit’ threatened bats and their habitats – NSW survey guide for the Biodiversity Assessment Method* (OEH 2018). Bat calls were analysed by senior fauna ecologist Mark Dean using ANABAT info software.

## Diurnal Birds

Habitat assessments (raptor nests searches) were completed across the Project Site on 31 October 2025 and 3 November 2025 (**Figure 13**).

Targeted visual and auditory bird surveys were conducted at dusk on 11 and 12 June 2025, 31 October 2025 and dawn on 3, 4, and 5 November 2025. Surveys were a combination of 20 minute bird surveys and general meander through the Subject Land. Species were identified visually with the aid of binoculars or aurally from call identification (**Figure 13**).

## Nocturnal Birds

Call playback for Powerful Owl, Barking Owl, Sooty Owl and Marked Owl was conducted in accordance with the TBDC survey comments. Pre-recorded calls were broadcast at two locations (**Figure 13**) within the Subject Land after dusk over four (4) separate nights: 13 March, 16 April, and 11-12 June 2025.

## Frogs

Aural visual surveys were conducted in areas of suitable habitat over four nights on the 12, 24, 26 and 27 March 2025, in accordance with the *NSW Survey Guide for Threatened Frogs* (DPIE 2020b). Targeted frog surveys involved the completion of nocturnal aural-visual surveys along a transect through available breeding habitat. Surveys involved active searches inspecting of emergent vegetation with a spotlight or head torch, with listening points positioned within suitable habitat, along the transect at approximately 50 m intervals. Adult frogs encountered were identified by visual confirmation or by their distinct advertisement Search transects are shown on **Figure 14**.

## Reptiles

Surveys for *Delma vescolineata* have included:

- Installation of ten (10) artificial cover (roof tile arrays) in the grassland habitats in October 2025 one month prior to the first survey. These arrays were positioned across suitable habitat, targeting variation and areas where grass sward height >10 cm, ideally on a northerly aspect.
- Each array to consisted of 50 roof tiles, pale coloured or installed pale side up, spaced 5 m apart in a 10 x 5 grid.
- Tiles were inspected once per week over 5 weeks during late October / November and during March/ April 2026 when ambient temperature was 15–25°C.
- Where a positive detection occurs, surveys may cease within the vegetation zone where the detection was recorded. Surveys in all other vegetation zones should continue for 10 weeks or until the species is detected.

No individuals were recorded during these surveys.

## 2.5 Weather conditions

Temperature and rainfall data for the survey period is summarised per month in **Table 7** below. Temperature rainfall data is from the Maitland NSW AWS {station 061428}.

**Table 7** Weather conditions during threatened species surveys

Survey undertaken (Method / targeted species)	Date	Temperature (°C)		Max Wind gusts (Direction km/h)	Rainfall (mm) to 9am	Other conditions relevant to the species
		Min	Max			
Targeted Flora Surveys – ground layer	9/10/2023	17.0	30.2	No data	0	
	10/10/2023	17.6	29.0	No data	0	
	11/10/2023	19.5	27.6	No data	0	
	12/10/2023	17.1	29.4	No data	0	
	13/10/2023	20.0	31.1	No data	0	
	14/10/2023	18.9	28.6	No data	0	
	04/03/2025	19.6	26.9	50 SSE	2.2	

Survey undertaken (Method / targeted species)	Date	Temperature (°C)		Max Wind gusts (Direction km/h)	Rainfall (mm) to 9am	Other conditions relevant to the species
		Min	Max			
Vegetation Mapping and Habitat Assessment (Nest and Hollows)	05/03/2025	19.6	27.3	39 ESE	3.6	
	06/03/2025	19.3	23.9	46 SE	4	
Remote Camera Installation	12/03/2025	18.3	27.1	26 SSE	1.2	
Spotlighting, Remote Camera and Anabat Installation.	13/03/2025	17.7	29.6	20 N	0	
	14/05/2025	16.7	33.6	20 WNW	0.2	
Habitat Assessment (Nest and Hollows), and Targeted Flora Surveys – Trees, climbers & epiphytes	18/03/2025	12	26	33 ESE	0	
Vegetation Mapping, Targeted Flora Surveys – Trees, climbers & epiphytes, and Koala Spot Assessment Technique (SAT)	19/03/2025	15.5	30	30 NE	0	0mm rain prior to koala SAT surveys
-	20/03/2025	15.6	32.1	28 ENE	0	0mm rain prior to koala SAT surveys
Anabat Collection, Flora Surveys – Trees, climbers & epiphytes, and Koala Spot Assessment Technique (SAT)	21/03/2025	15.4	26.1	26 W	0	0mm rain prior to koala SAT surveys
Spotlighting	22/03/2025	17.5	28.3	30 SSE	9.8	
Spotlighting	23/03/2025	19.9	24.3	39 SE	2.2	
Vegetation Mapping, Targeted Flora Surveys – Trees, climbers & epiphytes, and Remote Camera Rebait	24/03/2025	20.4	26.1	30 E	4.2	
Remote Camera Rebait	25/03/2025	18.5	27	39 NNE	19.6	
Flora Surveys – Trees, climbers & epiphytes, and Frog Surveys	26/03/2025	17.9	26.6	28 SE	5.6	
	27/03/2025	17.4	26.8	31 ESE	0.2	
Targeted Flora Surveys – Trees, climbers & epiphytes	07/04/2025	13.7	27.6	30 WNW	0	
Remote Camera Collection, and Spotlighting	14/04/2025	12.2	27.6	28 SSE	0	

Survey undertaken (Method / targeted species)	Date	Temperature (°C)		Max Wind gusts (Direction km/h)	Rainfall (mm) to 9am	Other conditions relevant to the species
		Min	Max			
Remote Camera Collection, Spotlighting, Targeted Flora Surveys – Trees, climbers & epiphytes, and BAM Plots	15/04/2025	16.7	23.9	44 S	5.2	
	16/04/2025	14.3	22.1	No data available	1.8	
BAM Plots	17/04/2025	15.5	24.6	No data available	0	
Call Playback	13/03/2025	14.3	24.9	46 E	0	
	14/03/2025	13.3	25.1	44 E	0.2	
	23/04/2025	14.3	24.9	46 E	0	
	24/04/2025	13.3	25.1	44 E	0.6	
	11/06/2025	8.6	17.6	41 WNW	0	
	12/06/2025	5.4	16.8	33 WNW	0	
Targeted Flora Surveys – shrubs and climbers	30/09/2025	11.3	30.0	17 NW	0	
	1/10/2025	11.4	28.2	48 WNW	0	
	2/10/2025	7.1	26.3	63 WNW	0	
Stick nest searches	31/10/2025	12.6	26.7	35 E	0.2	
Harp Trap install; Stick nest searches	3/11/2025	19.0	33.5	50NW	0.4	
Harp Trap check; Stick nest searches; dawn bird surveys	4/11/2025	15.2	25.1	56 WNW	1.8	
Harp Trap check; Stick nest searches; dawn bird surveys	5/11/2025	10	27.3	52 WNW	0	
Harp Trap check	6/11/2025	9.5	26.5	37 ESE	0	
Harp Trap check and collect	7/11/2025	14.1	31.7	No data	0	
Targeted Flora Surveys – ground layer	9/11/2025	16.1	26.2	43 ESE	0	
	10/11/2025	11.2	25.3	35 SE	0	
	11/11/2025	10.4	29.8	50 WNW	0	
	13/11/2025	7	30.6	44 NW	0	
	16/11/2025	18.7	33.3	56 WNW	1.0	
	19/11/2025	11	33.4	41 NE	0	

## 2.6 Limitations

Wedgetail employees involved in the current study are licensed or approved under the *Biodiversity Conservation Act 2016* (License Number: SL102506, Expiry: 31 May 2026) and the *Animal Research Act 1985* to harm/trap/release protected native fauna, to pick native flora for identification purposes, and to undertake fauna surveys.

Soft copies of all field data sheets are stored at the Wedgetail office in Bennetts Green.

As detailed in **Table 6** targeted flora surveys were conducted simultaneously for up to five species within each search group. This is not considered a limitation and is in accordance with *Surveying threatened plants and their habitats: NSW survey guide for the Biodiversity Assessment Method* (DPIE 2020b).

During survey for threatened ground flora in October 2025, a technical error occurred in recording GPS tracks for one surveyor. This resulted in some gaps in the recorded transects for that surveyor, but the effort was still completed in those locations. Missing transects have been manually added to the appropriate map (**Figure 10**).

Some areas of the site are heavily infested with dense *Lantana camara* (Lantana) or *Olea europaea* (African Olive). Best efforts were made during threatened flora surveys to access all suitable habitat within the Disturbance Footprint, however these areas of dense weed cover were considered both impenetrable during surveys, and unsuitable habitat for most threatened flora species.

## 3. Site context

### 3.1 Assessment area

The assessment area consists of the Disturbance Footprint and a 1,500 m buffer surrounding the outside edge of the boundary of the proposed development (Refer to Location Map provided in **Figure 2**).

### 3.2 Landscape features

Landscape features identified within the Disturbance Footprint and assessment area are shown on **Figure 1** and **Figure 2**, respectively. A discussion of relevant landscape features is provided below.

#### 3.2.1 IBRA bioregions and IBRA subregions

The Disturbance Footprint occurs within the NSW North Coast Interim Biogeographic Regionalisation for Australia (IBRA) bioregion and Upper Hunter IBRA subregion.

#### 3.2.2 Rivers, streams, estuaries and wetlands

The Disturbance Footprint intercepts the following unnamed water features:

- One (1) third order water course, that flows under the access road, this is a tributary of Stanhope Creek. This stream is ephemeral in nature with limited semi-permanent pools.
- Three (3) first order water courses including one in the processing area, one by the quarry access road and one by the quarry pit (the latter two are not defined and are affected for less than 30m of the upper head water).
- One (1) artificial dam occurs in the central part of the quarry pit.

More broadly within the Subject Land there is additional farm dams, a third order water course called Blind Creek and its associated first and second order tributaries, a first order headwater of Stewarts Creek, and other first and second order tributaries in the Stanhope Creek catchment.

No estuaries occur within the Subject Land.

#### 3.2.3 Habitat connectivity

The vegetation within the Project Site is part of a larger patch of vegetation within the locality directly connected to extensive areas of forested habitat within the Tangory Nature Reserve (NR) and adjacent areas around Glendon Brook, Mitchells Flat and Stanhope (**Figure 2**).

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

No karst, caves, crevices, cliffs, rocks or other geological features of significance were identified within the Subject Land. The nearest feature of this nature is the cliff lines within the Tangory Nature Reserve over 500m to the north east.

#### 3.2.5 Areas of outstanding biodiversity value

There are no areas of outstanding biodiversity value mapped within the Disturbance Footprint or broader Subject Land.

#### 3.2.6 NSW (Mitchell) landscape

The Central Hunter Foothills NSW (Mitchell) landscape was mapped across the Subject Land. This is described as undulating lowlands, rounded to steep hills with rock outcrop on ridges on Permian lithic sandstone, conglomerate, shale and coal, general elevation 40 to

300m with a few higher peaks, local relief 30 to 120m. Red-brown to yellow brown harsh texture-contrast soils on slopes, dark coloured clays in valleys and limited accumulations of sand and gravel in streams. Woodlands to open forest of spotted gum (*Corymbia maculata*), forest red gum (*Eucalyptus tereticornis*), narrow-leaved ironbark (*Eucalyptus crebra*), red ironbark (*Eucalyptus sideroxylon*), white box (*Eucalyptus albens*), slaty gum (*Eucalyptus dawsonii*), rough-barked apple (*Angophora floribunda*) with kangaroo grass (*Themeda triandra*) and wallaby grass (*Austrodanthonia* sp.) (Mitchell 2002).

For clarity, geologically it should be noted that the site is located north of the Hunter Thrust where the NSW Seamless Geological Mapping shows the Disturbance Footprint is within the older Carboniferous aged rock units including the Martins Creek Ignimbrites (Blue-grey, red-mottled welded andesitic ignimbrite with minor interbeds of beige to grey dacitic ignimbrite) and the Breckin Ignimbrites (Grey andesitic and red rhyodacitic ignimbrite). This underlying geology is a marked difference from the Mitchell Landscapes (i.e. (Permian sediments vs Carboniferous volcanics).

### 3.2.7 Additional landscape features identified in SEARs

No additional landscape features were identified in the SEARs (see **Table 2**).

### 3.2.8 Soil hazard features

No soil hazards occur within the Subject Land.

Deposits of Acid Sulphate Soils (ASS) are commonly found less than five meters above sea level, particularly in low-lying coastal areas. As the subject is not coastal and is situated at elevations greater than 150 m above sea level, it is unlikely that ASS is located within or adjoining the property. There was no evidence of ASS during the site inspection and a review of the Singleton Local Environmental Plan 2013 and the NSW Government ePlanning Portal has determined that the site is not mapped with lands for potential occurrence of acid sulphate soils (ASS).

## 3.3 Native vegetation cover

**Table 8** summarises the extent of native vegetation cover within the assessment area. **Figure 2** shows native vegetation cover within the assessment area.

Native vegetation cover was assessed as per Section 3.2 of the BAM (DPIE 2020a). Whereby, the native vegetation cover is assessed within the Disturbance Footprint and within a 1,500 m buffer area surrounding the outside edge of the boundary of the Disturbance Footprint. This 1,500 m site buffer has an area of 1,833 ha and there is native vegetation cover of 1,516 ha or 99% (>70%). **Table 8** summarises the extent of native vegetation cover within the assessment area. **Figure 2** shows native vegetation cover within the assessment area.

**Table 8** Native vegetation cover in the assessment area

Assessment area (ha)	1,833 ha
Total area of native vegetation cover (ha)	1,516 ha
Percentage of native vegetation cover (%)	99 %
Class (0–10, >10–30, >30–70 or >70%)	>70 %

## 4. Native vegetation, threatened ecological communities and vegetation integrity

### 4.1 Native vegetation extent

A total of 52.44 ha of native vegetation was mapped as occurring within the Development Footprint

#### 4.1.1 Changes to the mapped native vegetation extent

The extent of native vegetation differs in some areas from the aerial image as there has been significant regrowth (both native and exotic) since the most recently available aerial image was taken (Six Maps). Other areas have been recently cleared of weeds, particularly *Olea europaea* and *Lantana camara*, and are now more open. Vegetation mapping provided in this report is based on the completion of a site vegetation assessment and is an accurate representation of the current vegetation extent and condition within the Disturbance Footprint.

#### 4.1.2 Areas that are not native vegetation

All vegetation within the Disturbance Footprint has been assigned to a PCT (**Figure 17**), noting the 9.19 ha of PCT 3315 is largely exotic pastures though includes some native groundcover species.

## 4.2 Plant community types

### 4.2.1 Overview

A total of five (5) PCTs were recorded within the Subject Land, of these three (3) occur within the Disturbance Footprint, including:

- *PCT 3244: Lower North Spotted Gum - Mahogany - Ironbark Sheltered Forest*
- *PCT 3315: Central Hunter Ironbark - Spotted Gum Forest*
- *PCT 4073: Lower North Hinterland River Oak Forest*

The extent of each of these PCTs are summarised in **Table 9** and illustrated in **Figure 15**.

**Table 9** PCTs identified within the Disturbance Footprint

PCT ID	PCT name	Disturbance Footprint area total (ha)	Within Subject Land (ha)
PCT 3110	Greater Sydney Enriched Grey Myrtle Dry Rainforest	0	1.55
PCT 3244	Lower North Spotted Gum - Mahogany - Ironbark Sheltered Forest	1.65	8.82
PCT 3315	Central Hunter Ironbark - Spotted Gum Forest	59.96 (includes 9.19ha of exotic pastures)	183.88 (includes 10.06 ha of exotic pastures)
PCT 3444	Lower Hunter Spotted Gum - Ironbark Forest	0	0.51
PCT 4073	Lower North Hinterland River Oak Forest	0.01	2.12

PCT ID	PCT name	Disturbance Footprint area total (ha)	Within Subject Land (ha)
Total area		61.63	200.40

#### 4.2.2 PCT 3244 Lower North Spotted Gum - Mahogany - Ironbark Sheltered Forest



Photo 1 PCT 3244 Lower North Spotted Gum - Mahogany - Ironbark Sheltered Forest (Forest)

##### 4.2.2.1 PCT overview

Table 10 PCT 3244 Lower North Spotted Gum - Mahogany - Ironbark Sheltered Forest

PCT ID	PCT 3244
PCT name	Lower North Spotted Gum - Mahogany - Ironbark Sheltered Forest
Vegetation formation	Wet Sclerophyll Forests (Grassy sub-formation)
Vegetation class	Northern Hinterland Wet Sclerophyll Forests
Percent cleared value (%)	39.18
Extent within Subject Land (ha)	8.82 ha
Extent within Development Footprint (ha)	1.65 ha or 19% of that within Subject Land

A tall sclerophyll open forest with a mid-stratum of dry and soft-leaved shrubs or small trees and a ground cover of grasses and graminoids on lower slopes in the escarpment foothills of the lower north coast. Within the Subject Land, this PCT occurs in small patches on sheltered slopes with the following species:

Canopy: *Eucalyptus acmenoides*, *Eucalyptus canaliculata* and *Eucalyptus moluccana*.

Mid-stratum: A layered diversity of small trees and shrubs, including *Notelaea longifolia*, *Alphitonia excelsa*, *Acacia longissima*, *Breynia oblongifolia*, *Denhamia silvestris*, *Hibbertia diffusa*, *Leucopogon juniperinus*, *Myrsine variabilis*, *Persoonia linearis*, *Pittosporum revolutum*, *Pittosporum undulatum*, *Solanum stelligerum*, *Synoum glandulosum* subsp. *glandulosum*, *Trema tomentosa* var. *aspera*. Vines are also common and include *Jasminum volubile*, *Pandorea pandorana* subsp. *pandorana*, *Passiflora herbertiana* and *Clematis glycinoides*.

Ground layer: Typically dominated by grasses and graminoids such as *Oplismenus aemulus*, *Microlaena stipoides*, *Gahnia aspera*, *Imperata cylindrica*, *Lepidosperma laterale*, *Lomandra filiformis* and *Lomandra longifolia*. An abundance of other species also occurs, including *Brunoniella australis*, *Centella asiatica*, *Cheilanthes sieberi*, *Dianella caerulea* var. *producta*, *Dichondra repens*, *Galium gaudichaudii*, *Lagenophora stipitata*, *Lobelia purpurascens*, *Maekawaea rhytidophylla*, *Paspalidium distans*, *Plantago debilis*, *Plectranthus parviflorus*, *Pseuderanthemum variabile*, *Scaevola aemula*, *Sigesbeckia orientalis* and *Veronica plebeia*.

#### 4.2.2.2 Condition states

One condition state present: "Forest", as illustrated in **Photo 1** above.

**Table 11** Condition states of PCT 3244 Lower North Spotted Gum - Mahogany - Ironbark Sheltered Forest

Vegetation Zone no.	Condition state	Description
1	Forest	Intact forest on sheltered slopes with all vegetation strata present and relatively low weed presence. Trees are generally mature.

#### 4.2.2.3 Justification of PCT selection

This vegetation within the Subject Land is characterised as a wet sclerophyll forest with a grassy understory and occasional shrubs, consistent with a Wet Sclerophyll Forests formation and Northern Hinterland Wet Sclerophyll Forests vegetation class.

A search of the BioNet Vegetation Classification for Wet Sclerophyll Forests formation within the Upper Hunter IBRA sub-region, with trees including *Eucalyptus canaliculata*, *Eucalyptus acmenoides*, *Eucalyptus crebra*, *Corymbia maculata* and *Eucalyptus moluccana*, shrubs including *Leucopogon juniperinus*, *Denhamia sylvestris*, *Synoum glandulosum*, *Pittosporum* spp., and grasses including *Oplismenus aemulus* and *Microlaena stipoides* produced a shortlist of three (3) suitable PCTs:

- PCT 3241 Lower North White Mahogany-Spotted Gum Moist Forest
- PCT 3242 Lower North Ranges Turpentine Moist Forest
- PCT 3244 Lower North Spotted Gum-Mahogany-Ironbark Sheltered Forest

PCT 3242 was excluded from the shortlist based on the lack of *Syncarpia glomulifera* within the Subject Land, a species which is described as occurring within PCT 3242.

Both PCT 3241 and 3244 are floristically a close match with the vegetation community within the Subject Land. Both PCTs contain a range of Eucalypt species observed within the Subject Land, occur within the locality, and are structurally consistent with the vegetation within the Subject Land (grassy ground layer and sparse mid-stratum).

PCT 3244 is known to occur on volcanic geology and is the only shortlisted PCT with a Carboniferous geology of mostly volcanic substrate (tuff is the dominant rock type within the Subject Land). Therefore, PCT 3244 was considered the best fit PCT for the vegetation within the Subject Land.

#### *4.2.2.4 Alignment with BC Act listed TECs*

This PCT is not commensurate with any TEC listed under the NSW BC Act.

#### *4.2.2.5 Alignment with EPBC Act listed TECs*

This PCT is not commensurate with any TEC listed under the Commonwealth's EPBC Act.

### 4.2.3 PCT 3315 Central Hunter Ironbark - Spotted Gum Forest



Photo 2 PCT 3315 Central Hunter ironbark - Spotted Gum Forest (Forest)

#### 4.2.3.1 PCT overview

Table 12 PCT 3315 Central Hunter ironbark - Spotted Gum Forest

<b>PCT ID</b>	PCT 3315
<b>PCT name</b>	Central Hunter ironbark - Spotted Gum Forest
<b>Vegetation formation</b>	Grassy Woodlands
<b>Vegetation class</b>	Coastal Valley Grassy Woodlands
<b>Percent cleared value (%)</b>	77.70
<b>Extent within Subject Land</b>	183.88 ha
<b>Extent within Disturbance Footprint (ha)</b>	59.96 ha (9.19 ha of exotic pastures) or 33% of that within Subject Land

This PCT is described as a tall sclerophyll open forest with dry shrubs and a ground cover of grasses and graminoids occurring on moderately fertile soils on lower slopes of hills in the central Hunter valley to the west of Newcastle from North Rothbury to Lake Liddell.

In its most intact form within the Subject Land, the PCT is characterised by the following floristics:

Canopy: *Corymbia maculata*, *Eucalyptus crebra* and *Eucalyptus moluccana*.

**Mid-stratum:** Small trees and shrubs provide scattered cover and include *Acacia longissima*, *Acacia implexa*, *Breynia oblongifolia*, *Denhamia silvestris*, *Hibbertia diffusa*, *Jacksonia scoparia*, *Leucopogon juniperinus*, *Lissanthe strigosa*, *Myrsine variabilis*, *Notelaea longifolia*, *Persoonia linearis*, *Pittosporum revolutum*, *Pittosporum undulatum*, *Solanum stelligerum*, *Synoum glandulosum* subsp. *glandulosum* and *Trema tomentosa* var. *aspera*. Vines are also common and include *Billardiera scandens*, *Glycine clandestina*, *Eustrephus latifolius*, *Geitonoplesium cymosum*, *Hardenbergia violacea* and *Pandorea pandorana* subsp. *pandorana*.

**Ground layer:** Typically dominated by grasses and graminoids such as *Aristida vagans*, *Cymbopogon refractus*, *Entolasia stricta*, *Eragrostis leptostachya*, *Gahnia aspera*, *Microlaena stipoides* and *Panicum effusum*. There is also a diverse suite of forbs with low cover including *Alternanthera denticulata*, *Arthropodium milleflorum*, *Cheilanthes sieberi*, *Commelina cyanea*, *Cyanthillium cinereum*, *Euchiton sphaericus*, *Goodenia hederacea*, *Lagenophora stipitata*, *Lobelia purpurascens*, *Phyllanthus virgatus*, *Pomax umbellata*, *Poranthera microphylla*, *Sigesbeckia orientalis* subsp. *orientalis* and *Wahlenbergia gracilis*.

#### 4.2.3.2 Condition states

Condition states of PCT 3315 Central Hunter ironbark - Spotted Gum Forest are described in **Table**

**Table 13 Condition states of PCT 3315 Central Hunter ironbark - Spotted Gum Forest**

Vegetation Zone no.	Condition state	Description
2	Forest	Intact woodland with all vegetation strata present and relatively low weed presence. Trees are generally mature. Occurs in the north-east and central portions of the Subject Land. Weed presence is relatively low.  This also includes young, regrowing trees and shrubs, with a predominantly native ground layer. These areas generated the same VI score and where therefore included within the one VZ.
3	Managed	Woodland vegetation with an understory that has been cleared and managed for grazing. Trees are generally mature, shrubs absent to very sparse, and exotic pasture grasses are present at high cover.
4	High Weed	Woodland vegetation with high cover of <i>Lantana camara</i> and <i>Olea europaea</i> . Native shrubs and ground covers are present but in reduced density compared to intact vegetation. Native species richness is also reduced. Occurs primarily in the northern parts of the Disturbance Footprint, with a small patch in the south.
5	Derived Native Grassland (DNG)	Grassland vegetation with few scattered trees and shrubs, dominated by native grass species and minimal exotic species.
6	Exotic Pasture	Grassland vegetation dominated by exotic species with few native groundcovers. Presence of some natives means this must be treated as a VZ and assigned to a PCT.



**Photo 3 PCT 3315 Central Hunter ironbark - Spotted Gum Forest (Managed)**



**Photo 4 PCT 3315 Central Hunter ironbark - Spotted Gum Forest (High Weed)**



**Photo 5 PCT 3315 Central Hunter ironbark - Spotted Gum Forest (DNG)**



**Photo 6 PCT 3315 Central Hunter ironbark - Spotted Gum Forest (Exotic Pasture)**

#### 4.2.3.3 Justification of PCT selection

This vegetation community within the Subject Land is characterised as a grassy woodland to open dry sclerophyll forest with a grassy understory and occasional shrubs, consistent with a Grassy Woodland or Dry Sclerophyll Forests formation.

A search of the BioNet Vegetation Classification for Grassy Woodland or Dry Sclerophyll Forests formation within the Upper Hunter IBRA sub-region, with the following key tree species *Corymbia maculata*, *Eucalyptus crebra* and *Eucalyptus moluccana*, shrubs *Acacia falcata*, *Acacia implexa*, *Hibbertia diffusa* and *Persoonia linearis*, and ground cover *Microlaena stipoides*, *Poa labillardierei* var. *labillardierei*, *Themeda triandra* and *Oplismenus aemulus* produced a shortlist of four (4) PCTs:

- PCT 3315 Central Hunter Ironbark-Spotted Gum Forest
- PCT 3431 Central Hunter Ironbark Grassy Woodland
- PCT 3433 Hunter Coast Foothills Spotted Gum-Ironbark Grassy Forest
- PCT 3446 Lower North Foothills Ironbark-Box-Gum Grassy Forest

All four (4) PCTs are floristically close to the vegetation within this vegetation community, except for PCT 3431 which usually contains *Allocasuarina luehmannii* but is absent from the community. From a geological perspective, PCTs 3315 and 3446 are the closest matches as they do occur on volcanic substrates (in addition to sedimentary), whereas PCTs 3431 and 3433 typically only occur on sediments and are a poor match. PCT 3446 occurs within the lower north coast and lower Hunter valley and thus a poor fit for location. Therefore, PCT 3315 is the best fit PCT for the community based on floristics, geology, landscape position and location (Table 14).

**Table 14 PCT justification PCT 3315 Central Hunter Ironbark-Spotted Gum Forest**

Shortlisted PCT	Floristic composition	Soils / geology	Landscape position and location	Conclusion
3315	Close match	Sediments and volcanic substrates – match.	Lower slopes of hills Central Hunter North Rothbury to Lake Liddell – close match; site is within the stated area	Best fit PCT
3431	Moderate match. <i>Allocasuarina luehmannii</i> is common in PCT 3431 but absent from the community.	Permian and Carboniferous sediments – poor match.	Undulating floor of the central Hunter valley – poor match; site is not on the valley floor	Poor match
3433	Close match	Permian sediments and Narrabeen claystone – poor match.	Undulating foothills of the Hunter coast hinterland from Tuggerah to Stratford, and the lower Hunter valley around Cessnock – location is poor match; site is not within these areas	Poor match
3446	Close match	Sedimentary and volcanic substrates – match.	Foothills of lower north coast and lower Hunter valley – location is poor match; site is not within these areas	Low match



#### 4.2.3.4 Alignment with NSW (BC Act) listed TECs

PCT 3315: Central Hunter ironbark - Spotted Gum Forest is associated with the Central Hunter Ironbark-Spotted Gum-Grey Box Forest in New South Wales North Coast and Sydney Basin Bioregions, listed as endangered under the BC Act. Assessment of the vegetation within the Disturbance Footprint against criteria detailed within the Central Hunter Ironbark-Spotted Gum-Grey Box Forest in the NSW North Coast and Sydney Basin Bioregions EEC NSW Scientific Committee's Final Determination (2010) is provided below (Table 15).

**Table 15 Criteria detailed in Central Hunter Ironbark-Spotted Gum-Grey Box Forest in the NSW North Coast and Sydney Basin Bioregions EEC Final Determination (NSW Scientific Committee 2010)**

Determination Criteria	Meets Criteria	Justification
<p>Paragraph 1: Central Hunter Ironbark - Spotted Gum - Grey Box Forest in the NSW North Coast and Sydney Basin Bioregions is the name given to the ecological community that generally occurs on Permian sediments in the Hunter Valley and is characterised by the assemblage of species in paragraph 2. The community typically forms an open forest to woodland.</p>	Partially	<p>All Vegetation Zones</p> <p>The vegetation within the Disturbance Footprint does not occur on Permian sediments. However, the determination is not exclusive of other geologies, using the term “generally occurs”, which suggests the TEC can and does occur on geologies other than Permian sediments.</p> <p>The vegetation within the Disturbance Footprint is open forest to woodland with tree covers ranging from 5% to 44 % (typically between mid-20% and 40%).</p>
<p>Paragraph 2: Central Hunter Ironbark-Spotted Gum-Grey Box Forest is characterised by the following assemblage of species: <i>Acacia falcata</i>, <i>Acacia parvippinula</i>, <i>Allocasuarina luehmanii</i>, <i>Brachyscome multifida</i>, <i>Breyenia oblongifolia</i>, <i>Brunoniella australis</i>, <i>Bursaria spinosa subsp. spinosa</i>, <i>Calotis cuneifolia</i>, <i>Cheilanthes sieberi subsp. sieberi</i>, <i>Chrysocephalum apiculatum</i>, <i>Corymbia maculata</i>, <i>Cymbopogon refractus</i>, <i>Daviesia ulicifolia subsp. ulicifolia</i>, <i>Desmodium varians</i>, <i>Dianella revoluta var. revoluta</i>, <i>Dichondra repens</i>, <i>Echinopogon caespitosus var. caespitosus</i>, <i>Entolasia stricta</i>, <i>Eremophila debilis</i>, <i>Eucalyptus crebra</i>, <i>Eucalyptus fibrosa</i>, <i>Eucalyptus glaucina</i>, <i>Eucalyptus moluccana</i>, <i>Eucalyptus tereticornis</i>, <i>Glycine clandestina</i>, <i>Glycine tabacina</i>, <i>Hakea sericea</i>, <i>Hypericum gramineum</i>, <i>Laxmannia gracilis</i>, <i>Lissanthe strigosa</i>, <i>Lomandra multiflora subsp. multiflora</i>, <i>Melichrus urceolatus</i>, <i>Microlaena stipoides var. stipoides</i>, <i>Opercularia diphylla</i>, <i>Paspalidium distans</i>, <i>Pomax</i></p>	Yes	<p>Vegetation Zones 2, 3, and 4</p> <p>The vegetation within the Disturbance Footprint is dominated by <i>Corymbia maculata</i> and <i>Eucalyptus crebra</i> with <i>Eucalyptus moluccana</i> and <i>Eucalyptus tereticornis</i> occurring in lower abundance.</p> <p>A number of listed characteristic species listed under Paragraph 2 of the Final Determination do occur within the vegetation within the Disturbance Footprint. This includes; <i>Bursaria spinosa</i>, <i>Breyenia oblongifolia</i>, <i>Cymbopogon refractus</i>, <i>Daviesia ulicifolia</i>, <i>Entolasia stricta</i>, <i>Glycine clandestina</i>, <i>Lissanthe strigosa</i>, <i>Microlaena stipoides</i>, <i>Pomax umbellata</i>, <i>Solanum prinophyllum</i> and <i>Wahlenbergia gracilis</i>.</p> <p>Vegetation Zones 5 and 6</p> <p>The vegetation within these two vegetation zones are derived communities with no canopy and don't have the composition or structure to meet the TEC.</p>

Determination Criteria	Meets Criteria	Justification
<p><i>umbellata</i>, <i>Pratia purpurascens</i>, <i>Pultenaea spinosa</i>, <i>Solanum prinophyllum</i>, <i>Stackhousia viminea</i>, <i>Themeda australis</i>, <i>Vernonia cinerea</i> var. <i>cinerea</i>, <i>Wahlenbergia communis</i>, <i>Wahlenbergia gracilis</i></p>		
<p>Paragraph 4:            Central Hunter Ironbark - Spotted Gum - Grey Box Forest typically forms an open forest to woodland dominated by <i>Eucalyptus crebra</i> (Narrow-leaved Ironbark), <i>Corymbia maculata</i> (Spotted Gum) and <i>Eucalyptus moluccana</i> (Grey Box). Other tree species may be present and occasionally dominate or co-dominate, and include <i>Eucalyptus fibrosa</i> (Broad-leaved Ironbark) and <i>Eucalyptus tereticornis</i> (Forest Red Gum). A sparse layer of small trees may be present in some areas, typically including <i>Allocasuarina luehmannii</i> (Bulloak) or <i>Acacia parvipinnula</i> (Silver Streamed Wattle). The shrub layer is typically sparse or absent in some cases, through to moderately dense. Common shrub species include <i>Daviesia ulicifolia</i> subsp. <i>ulicifolia</i> (Gorse Bitter Pea), <i>Pultenaea spinosa</i> (Grey Bush Pea), <i>Breynia oblongifolia</i> (Coffee Bush), <i>Hakea sericea</i> (Bushy Needlebush), and <i>Bursaria spinosa</i> subsp. <i>spinosa</i> (Native Blackthorn) (Peake 2006). Ground cover can be sparse to moderately dense, and consists of numerous forbs, a few grass species, and a limited number of ferns, sedges or other herbs. Common species include <i>Cheilanthes sieberi</i> subsp. <i>sieberi</i> (Poison Rock Fern), <i>Cymbopogon refractus</i> (Barbed Wire Grass), <i>Pratia purpurascens</i> (Whiteroot), <i>Lomandra multiflora</i> subsp. <i>multiflora</i> (Many-flowered Mat-rush), <i>Pomax umbellata</i> (Pomax), <i>Glycine tabacina</i> (Variable Glycine), <i>Dianella revoluta</i> (Blue Flax Lily), <i>Laxmannia gracilis</i> (Slender Wire Lily), <i>Microlaena stipoides</i> var. <i>stipoides</i> (Weeping Rice Grass), <i>Vernonia cinerea</i> var. <i>cinerea</i>, <i>Lissanthe strigosa</i> (Peach Heath), <i>Brunoniella australis</i> (Blue Trumpet), <i>Desmodium varians</i> (Variable Tick-trefoil), <i>Dichondra repens</i> (Kidney Weed), <i>Eremophila debilis</i> (Winter Apple),</p>	<p>Yes</p>	<p>Vegetation Zones 2, 3, and 4</p> <p>The vegetation within the Disturbance Footprint is dominated by <i>Corymbia maculata</i> and <i>Eucalyptus crebra</i> with <i>Eucalyptus moluccana</i> and <i>Eucalyptus tereticornis</i> occurring in lower abundance. The vegetation within the Disturbance Footprint does contain <i>Daviesia ulicifolia</i>, <i>Bursaria spinosa</i>, and <i>Breynia oblongifolia</i>, but lacks <i>Acacia parvipinnula</i>, <i>Allocasuarina luehmannii</i>, <i>Pultenaea spinosa</i> and <i>Hakea sericea</i>.</p> <p>The Disturbance Footprint contains several ground layer species aligned to the TEC, including <i>Cheilanthes sieberi</i> subsp. <i>sieberi</i> (Poison Rock Fern), <i>Cymbopogon refractus</i> (Barbed Wire Grass), <i>Pratia purpurascens</i> (Whiteroot), <i>Lomandra multiflora</i> subsp. <i>multiflora</i> (Many-flowered Mat-rush), <i>Pomax umbellata</i> (Pomax), <i>Glycine tabacina</i> (Variable Glycine), <i>Microlaena stipoides</i> var. <i>stipoides</i> (Weeping Rice Grass), <i>Lissanthe strigosa</i> (Peach Heath), <i>Brunoniella australis</i> (Blue Trumpet), <i>Grona varians</i> syn. <i>Desmodium varians</i> (Variable Tick-trefoil), <i>Dichondra repens</i> (Kidney Weed), <i>Hypericum gramineum</i> (Small St. John's Wort), <i>Paspalidium distans</i> (Tufted Hedgehog Grass) and <i>Themeda triandra</i> syn. <i>T. australis</i> (Kangaroo Grass).</p> <p>Vegetation Zones 5 and 6</p> <p>The vegetation within these two vegetation zones are derived communities with no canopy and don't have the composition or structure to meet the TEC.</p>

Determination Criteria	Meets Criteria	Justification
<p><i>Calotis cuneifolia</i> (Purple burr-daisy), <i>Hypericum gramineum</i> (Small St. John's Wort), <i>Chrysocephalum apiculatum</i> (Common Everlasting), <i>Opercularia diphylla</i> (Stinkweed), <i>Paspalidium distans</i> (Tufted Hedgehog Grass) <i>Themeda australis</i> (Kangaroo Grass), <i>Stackhousia viminea</i> (Slender Stackhousia) and <i>Wahlenbergia communis</i> (Tufted Bluebell) (Peake 2006).</p>		
<p>Paragraph 5: Central Hunter Ironbark - Spotted Gum - Grey Box Forest has been described by Peake (2006) as Central Hunter Ironbark - Spotted Gum - Grey Box Forest (Map Unit 27) and as Map Unit 18 (NSW NPWS 2000; DECC 2008). It includes a part of a unit described by Thomas (1998) as <i>Eucalyptus crebra</i> – <i>Eucalyptus moluccana</i> – <i>Eucalyptus glaucina/tereticornis</i> woodland. It shares some characteristics with, but is not part of a community described by Bell (2005) as Narrabeen Residual Spotted Gum Forest from a small area near Bulga. It shares some characteristics with, but is not part of a community described by Peake (2006) as Central Hunter Grey Box – Ironbark Woodland, and also shares some characteristics with but is not part of the Endangered Ecological Community 'Central Hunter Grey Box – Ironbark Woodland in the NSW North Coast and Sydney Basin Bioregions (Scientific Committee 2010).</p>	Partially	<p>There are two map units; MU25 and MU27 within the area consideration of the applicability of these is detailed below.</p> <p>The vegetation within the Disturbance Footprint was considered generally consistent with <i>Central Hunter Ironbark - Spotted Gum - Grey Box Forest</i> as described by Peake (2006) (MU 27) because of the following:</p> <p>MU 27 is described as occurring "Occurs throughout the central and eastern part of the study area, largely north of the New England Highway but south of the Hunter Thrust, and mostly west to the Antiene-Grasstree Ridge area". While the majority of the mapped occurrence of the community occurs north of the New England Highway but south of the Thrust, it does occur north of the Thrust on Peake's mapping. The majority of the Disturbance Footprint is <u>outside</u> Peake's Study Area (refer Plate 1). Therefore, although the Disturbance Footprint is located north of the Hunter Thrust, this criterion cannot exclude it from being part of MU 27.</p>

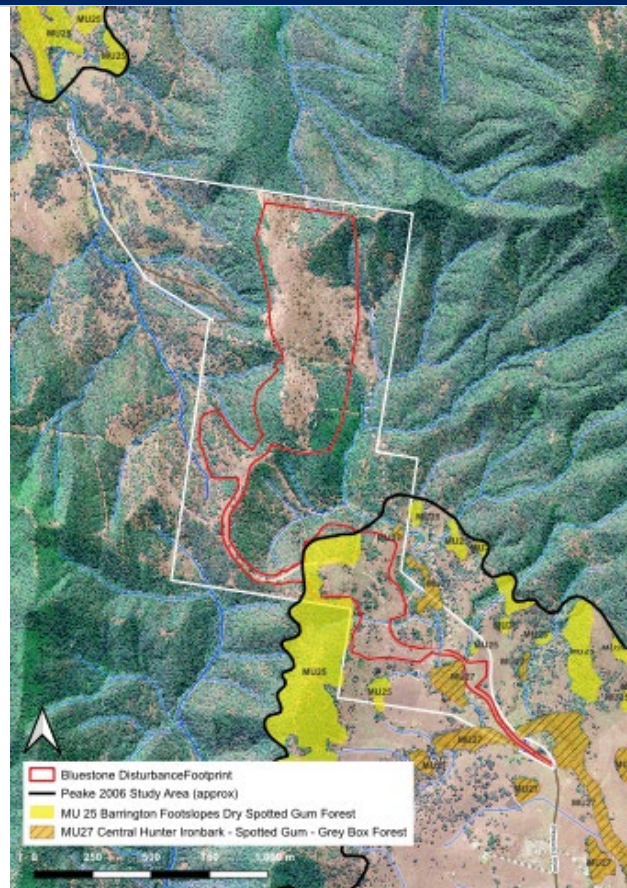
**Determination Criteria****Meets  
Criteria****Justification**

Plate 1: Peake 2006 mapping and site context

The portions of site within the Disturbance Footprint are predominantly MU25 with a small area of MU27 near the creek line. The dominant pattern of Peake's mapping with respect to MU27 is its presence on the lower undulating valley floor and MU25 on the hills above the valley floor as the geology changes from a dominant Permian sedimentary origin to an older Carboniferous volcanic and sedimentary origin.

The Disturbance Footprint is located north of the Hunter Thrust and is predominantly outside Peake's Study Area, this criterion is not definitive. Though it suggests the site is likely outside the intended definition for the CEEC community that was aimed at the more over cleared valley floor communities rather than the fringing more vegetated hills.

MU 27 "mostly occurs on clayey soils found on Permian sediments". The Disturbance Footprint occurs on Carboniferous geology. However, the description by Peake (2006) is not exclusive of other geologies, using the term "mostly occurs", which suggests the TEC can and does occur on geologies other than Permian sediments. The Disturbance Footprint contains clayey soils.

Determination Criteria	Meets Criteria	Justification
		<p>MU 27 is dominated by include “<i>Corymbia maculata</i>, <i>Eucalyptus crebra</i> and <i>Eucalyptus moluccana</i>”. The vegetation within the Disturbance Footprint is dominated by the <i>Corymbia maculata</i> and <i>Eucalyptus crebra</i>. <i>Eucalyptus moluccana</i> is also abundant in areas.</p> <p>A sparse mid-understorey may be present in MU 27 <i>Allocasuarina luehmannii</i> (Bulloak) and <i>Acacia parvipinnula</i> (Silver-stemmed Wattle). These two species are absent from the vegetation within the Disturbance Footprint, but these species are not always present within the TEC.</p> <p>MU 27 is characterised as having a shrub layer including; <i>Daviesia ulicifolia</i> (Gorse Bitter Pea), <i>Pultenaea spinosa</i> (Grey Bush Pea), <i>Breynia oblongifolia</i> (Coffee Bush), <i>Hakea sericea</i> (Bushy Needlebush), <i>Bursaria spinosa</i>, and <i>Acacia falcata</i>. The vegetation within the Disturbance Footprint contains four out of these six species: <i>Daviesia ulicifolia</i>, <i>Breynia oblongifolia</i>, <i>Bursaria spinosa</i>, and <i>Acacia falcata</i>, indicating a close alignment to the TEC.</p> <p>MU 27 ground layer consists of numerous forbs, grasses and herbs, most of which are present within the Disturbance Footprint.</p> <p>The vegetation within the Disturbance Footprint also has similarities with Barrington Footslopes Dry Spotted Gum Forest (MU 25), based on the following:</p> <p>MU 25 is described as occurring “along the undulating and sometimes rugged Hunter Thrust, typically on slopes and ridges, but also in some lower lying areas”. The Disturbance Footprint is located north of the Hunter Thrust on slopes and ridges.</p> <p>MU 25 is described as occurring “in the north-eastern margin of the study area, extending north-west from Lambs Valley to Greenland (north of Singleton), with an outlier north of Antiene”. The Disturbance Footprint is west of Lambs Valley and south-east of Greenland.</p> <p>MU 25 is described as having example locations including; “most slopes and rides south of Glendonbrook”. The Disturbance Footprint is located on slopes and ridges south of Glendonbrook.</p> <p>MU 25 is characterised as having “the underlying rock is most often Carboniferous sandstones and conglomerates”. The Disturbance Footprint occurs on Carboniferous geology but is of volcanic origin rather than sedimentary sandstone or conglomerate.</p> <p>MU 25 is characterised as having a canopy “dominated by spotted gum (<i>Corymbia maculata</i>)</p>

Determination Criteria	Meets Criteria	Justification
		<p>with a number of other eucalypt species being locally abundant, including narrow-leaved ironbark (<i>Eucalyptus crebra</i>) and white mahogany (<i>Eucalyptus acmenoides</i>), while Kurrajong (<i>Brachychiton populneus</i>) is also relatively frequent. Rough-barked apple (<i>Angophora floribunda</i>), grey gum (<i>Eucalyptus punctata</i>), forest red gum (<i>Eucalyptus tereticornis</i>), grey ironbark (<i>Eucalyptus siderophloia</i>), grey box (<i>Eucalyptus moluccana</i>), thin-leaved stringybark (<i>Eucalyptus eugeniooides</i>) and large-fruited grey gum (<i>Eucalyptus canaliculata</i>) can also be locally abundant. The vegetation within the Disturbance Footprint is dominated by <i>Corymbia maculata</i> and <i>Eucalyptus crebra</i>, and also contains <i>Eucalyptus moluccana</i>, <i>Brachychiton populneus</i> and <i>Eucalyptus tereticornis</i>. <i>Eucalyptus acmenoides</i> is very occasionally present, and is mostly associated with PCT 3244 within the Disturbance Footprint rather than PCT 3315.</p> <p>MU 25 is characterised as having a mid-storey containing “<i>Allocasuarina torulosa</i>, <i>Jacksonia scoparia</i>, <i>Acacia implexa</i>, or [<i>Myrsine variabilis</i>]”. The Disturbance Footprint contains the above species.</p> <p>MU 25 is characterised as having a “sparse to mid-dense understorey” “dominated by coffee bush (<i>Breynia oblongifolia</i>), large mock olive (<i>Notelaea longifolia</i>), narrow-leaved geebung (<i>Persoonia linearis</i>), narrow-leaved Orangebark (<i>Denhamia silvestris</i>) and hairy (<i>Clerodendrum tomentosum</i>). The vegetation within the Disturbance Footprint contains all the species above except <i>Clerodendrum tomentosum</i>.</p> <p>MU 25 contains a number of other ground cover species, most of which occur within the vegetation within the Disturbance Footprint to a similar extent as MU 27.</p> <p>Peake (2008) identifies that MU 27 and MU 25 are known to integrate and as these communities “are similar in nature and share many similar species, establishing a boundary between each of them can be reasonable arbitrary, inevitably leading to errors”. Considering this, and on the balance of the identifying features above, the vegetation within the Disturbance Footprint was determined to be on the intergrade between MU 25 and MU 27.</p> <p>Applying the precautionary principle, MU 27 is the most appropriate Peake MU, especially in light of the alignment with other components of the TEC.</p>
<p>Paragraph 6: Central Hunter Ironbark - Spotted Gum - Grey Box Forest has been recorded from the local government areas of</p>	<p>Yes</p>	<p>All Vegetation Zones The Disturbance Footprint occurs within the Singleton LGA</p>

Determination Criteria	Meets Criteria	Justification
Cessnock, Singleton and Muswellbrook but may occur elsewhere within the NSW North Coast and Sydney Basin Bioregions (sensu Thackway and Creswell 1995).		
Conclusion		<p>The vegetation within the Disturbance Footprint (PCT 3315) is <u>conservatively commensurate</u> with Central Hunter Ironbark-Spotted Gum-Grey Box Forest in New South Wales North Coast and Sydney Basin Bioregions EEC as listed under the NSW BC Act.</p> <p>However, it is also of note that the community is located outside Peake's 2006 Study Area and is therefore perhaps an extension of the previously envisioned and calculated extent.</p>

#### 4.2.3.5 Alignment with Commonwealth (EPBC Act) listed TECs

PCT 3315 Central Hunter ironbark - Spotted Gum Forest is associated with the Central Hunter Valley Eucalypt Forest and Woodland Critically Endangered Ecological Community (CEEC) listed under the Commonwealth's EPBC Act 1999.

In order to be protected as a matter of national environmental significance areas of the ecological community must meet both:

- 1) the key diagnostic characteristics AND
- 2) at least the minimum condition thresholds for Moderate quality (i.e. for class C or D)

**Table 16 Key Diagnostic Features of Central Hunter Valley eucalypt forest and woodland ecological community CEEC from Approved Conservation Advice (2015)**

Determination Criteria	Meets Criteria	Justification
It occurs in the Hunter River catchment (typically called the Hunter Valley region),	Yes	The Subject Land is located within the Hunter River catchment
AND		
It typically occurs on lower hillslopes and low ridges, or valley floors in undulating country; on soils derived from Permian <sup>8</sup> sedimentary rocks;	Partially	<p>The Subject Land occurs on the Central Hunter Foothills Mitchell landscape (Mitchell, 2002), which are described as undulating lowlands with steep hills and rock outcrops.</p> <p>The geology of the site is Carboniferous volcanic, with tuff the dominant rock type. This rock weathers to soil with a high clay content and higher fertility than sedimentary soils.</p> <p>The absence or occurrence of the TEC on Carboniferous volcanics is not explicitly stated, only that it "typically" occurs on soils derived from sedimentary rock, conservatively it has not been used to exclude the TEC within the Disturbance Footprint.</p>
AND		

Determination Criteria	Meets Criteria	Justification
<p>It does not occur on alluvial flats, river terraces, aeolian sands<sup>9</sup>, Triassic sediments, or escarpments<sup>10</sup>;</p> <p>AND</p>	Yes	<p>The vegetation within the Disturbance Footprint does not occur on alluvial flats, river terraces, aeolian sands, Triassic sediments, or escarpments.</p> <p>It is of note that the site does effectively occur between two landforms similar to escarpments associated with the folding of the Carboniferous geology on the edge of the Hunter basin. The Disturbance Footprint has escarpment to the south west, and also to the north east. Portions of the Disturbance Footprint have very shallow soils overlying bedrock.</p>
<p>It is woodland or forest, with a projected canopy cover<sup>11</sup> of trees of 10% or more; or with a native tree density of at least 10 native tree stems per 0.5 ha (at least 20 native tree stems/ha) that are at least one metre in height<sup>12</sup>;</p> <p>AND</p>	Yes	<p>The vegetation within the Disturbance Footprint is a woodland/open forest with a projected canopy cover &gt;10%.</p>
<p>The canopy of the ecological community is dominated<sup>13</sup> by one or more of the following four eucalypt species: <i>Eucalyptus crebra</i> (narrow-leaved ironbark), <i>Corymbia maculata</i> (syn. <i>E. maculata</i>) (spotted gum), <i>E. dawsonii</i> (slaty gum) and <i>E. moluccana</i> (grey box);</p> <p>OR</p> <p>a fifth species, <i>Allocasuarina luehmannii</i> (bulloak, buloke) dominates in combination with one or more of the above four eucalypt species, in sites previously dominated by one or more of the above four eucalypt species<sup>14</sup>;</p> <p>AND</p>	Yes	<p>The community is characterised by an open canopy dominated by <i>Corymbia maculata</i> and <i>Eucalyptus crebra</i> throughout most of its extent. Other overstorey species varying in local dominance include <i>Eucalyptus tereticornis</i> which is locally dominant in a few small patches.</p>
<p><i>Allocasuarina torulosa</i> (forest oak/ she-oak, rose she-oak/oak), <i>Eucalyptus acmenoides</i> (white mahogany) and <i>E. fibrosa</i> (red/broad-leaved ironbark) are largely absent<sup>15</sup> from the canopy of a patch<sup>16</sup>;</p> <p>AND</p>	Yes	<p>While <i>Allocasuarina torulosa</i> and <i>Eucalyptus acmenoides</i> occur within PCT 3315, they are in very low abundance and can be considered largely absent.</p>
<p>A ground layer is present (although it may vary in development and composition), as a sparse to thick layer of</p>	Yes	<p>Shrubs including <i>Acacia</i> spp., <i>Breynia oblongifolia</i>, <i>Bursaria spinosa</i> subsp. <i>spinosa</i>, <i>Jacksonia scoparia</i>, <i>Leucopogon juniperinus</i>,</p>

Determination Criteria	Meets Criteria	Justification
native grasses and other native herbs and/or native shrubs.		and <i>Pittosporum undulatum</i> occur within this vegetation, typically at <5% cover. Groundcover is present and varies in composition and density.
Other diagnostic considerations (Section 1.5.2)		
A number of other tree species may be sub-dominant <sup>17</sup> (or locally dominant within a patch). These include <i>Angophora floribunda</i> (rough barked apple), <i>Eucalyptus blakelyi</i> (Blakely's red gum), <i>E. glaucina</i> (slaty red gum) and <i>E. tereticornis</i> (forest red gum);	Yes	The community is characterised by an open canopy dominated by <i>Corymbia maculata</i> and <i>Eucalyptus crebra</i> throughout most of its extent. Other overstorey species varying in local dominance include <i>Eucalyptus tereticornis</i> which is locally dominant in a few small patches.
Patches that are dominated solely by <i>Allocasuarina luehmannii</i> (bulloak, buloke) are excluded (i.e. patches in which all four of the typically dominant eucalypt species are entirely or mostly absent);	N/A	The vegetation mapped as PCT 3315 within the Disturbance Footprint does not include patches dominated by <i>Allocasuarina luehmannii</i> (Bulloak).
Hybrids of eucalypt species may be present <sup>18</sup> and where possible relevant hybrids should be included when assessing dominance of key diagnostic canopy tree species (e.g. <i>Eucalyptus moluccana</i> x <i>E. albens</i> counts towards <i>E. moluccana</i> dominance) - Areas with hybrid eucalypt species are included in the ecological community (i.e. areas should not be excluded on the basis of hybridisation);	N/A	Hybrids including <i>Eucalyptus moluccana</i> x <i>E. albens</i> do not occur within the Disturbance Footprint.
The ecological community may contain fauna species listed in Appendix B, Table B2;	N/A	Not Applicable
Derived native grasslands and shrublands are not included in this nationally protected ecological community. The exceptions are where there is a gap, in or at the edge of a patch; or connecting two patches across a short distance (i.e. 30 m) <sup>19</sup> ;	Yes	Derived forms of PCT 3315 are not commensurate with the TEC.
The Hunter River catchment includes the catchment of the Goulburn River.	N/A	The Subject Land does not occur within the Goulburn River Catchment
The ecological community predominantly occurs in the Sydney Basin (SYB) and the NSW North Coast (NNC) IBRA (Version 7) bioregions in New South Wales <sup>20</sup> ;	Yes	The Subject Land is located within the NSW North Coast IBRA Region
It also occurs in IBRA subregions that are adjacent to the Hunter Valley IBRA subregion - for example in the Hunter (Mooki) Thrust Fault Zone in the Upper Hunter IBRA subregion (NNC16); and in	Yes	The Subject Land occurs north of the Hunter (Mooki) Thrust Fault within the Upper Hunter IBRA Subregion.

Determination Criteria	Meets Criteria	Justification
<p>the Goulburn Valley in the Kerrabee subregion (SYB01).</p> <p>The ecological community typically occurs on supporting soils with a high clay content (argillaceous), mid nutrient level soils that are not highly dispersible<sup>21</sup> and that have formed in erosional or colluvial<sup>22</sup> environments. These typically occur on Permian-aged strata. These Permian sediments are much older than nearby Triassic<sup>23</sup> sediments; and are finer grained, typically producing soils with a higher clay content, as opposed to the sandy soils associated with Triassic sediments.</p>	<p>Partially</p>	<p>The Disturbance Footprint is located on colluvial and insitu weathered soils derived from Carboniferous geology, (ie. older than Permian), that where present are clayey in nature with a moderately higher fertility than typical sedimentary soils. The Disturbance Footprint does not contain sandy soils associated with Triassic sediments.</p> <p>The absence of significant erosion onsite suggests the soils are not aggressively dispersive in nature.</p> <p>The geology of the site is primarily Carboniferous, characterised as part of the Breckin Ignimbrite Member (Cgimb) and Lambs Valley Ignimbrite Member (Cgiml), and Martins Creek Ignimbrite Member (Curim) stratigraphic units. The Disturbance Footprint primarily occurs on the Stanhope soil landscape, with a small area in the SW occupying the Lochinvar soil landscape. These soil landscapes are characterized by low to moderate soil fertility with moderate to high clay content. Observed soils within the Disturbance Footprint are generally high in clay content.</p>
<p>Determination</p>		<p>The vegetation within the Disturbance Footprint conservatively <u>does meet the diagnostic characteristics</u> for the Critically Endangered Ecological Community <i>Central Hunter Valley eucalypt forest and woodland ecological community</i> as listed under the Commonwealth's EPBC Act 1999.</p>
<p>8 - See the next section (1.5.2) and Appendix D for more information on soil types.</p> <p>9 - Aeolian sands: Sediment, which has been carried or weathered by the wind.</p> <p>10 - Escarpment: A steep slope or long cliff that separates two relatively level areas of differing elevations.</p> <p>11 - Projected cover of canopy trees is calculated by assuming a solid canopy.</p> <p>12 - This figure is to allow for woodland or forest with a sparse canopy and regenerating areas.</p> <p>13 - Dominant means that one, or more, of the four Eucalypt species, account(s) for more than 50% of the projected canopy cover. Projected canopy cover of trees is calculated by assuming a solid canopy. Projected canopy cover is the preferred benchmark for dominance; except in regenerating areas with few mature canopy trees. Where this is the case, tree basal area is the next best surrogate.</p> <p>14 - See footnote above (i.e. Allocasuarina luehmannii plus one or more of the four Eucalypt species above, should together account for more than 50% of the projected canopy cover). Evidence that in the past at least one of the four diagnostic Eucalypt species was amongst the most common canopy species could include aerial photography, past surveys, or historical journal entries / documents. Patches that are dominated solely by Allocasuarina luehmannii (bulloak, buloke) are excluded.</p> <p>15 - Largely absent: Meaning no more than two trees per hectare on average across a patch (of each of the three species) e.g. if there are three or more Allocasuarina torulosa trees per hectare on average across a patch it is not the ecological community. 'Confounding' hybrids (such as Eucalyptus fibrosa x E. moluccana) should be ignored when deciding whether to exclude areas because of contra-indicative species.</p>		

Determination Criteria	Meets Criteria	Justification
16 - These exclusions (along with soil type) help to differentiate between the ecological community and other woodland types, such as 'Lower Hunter Spotted Gum-Ironbark Forest', with which it integrates (see also Section 1.6.1 Relationship to state-listed ecological communities).		
17 - Sub-dominant: Whilst a tree species may be locally dominant in a limited area, the species would still need to be <30% of overall projected canopy cover, within the patch, to be considered a sub-dominant.		
18 - Examples of possible hybrids in this ecological community include <i>Eucalyptus moluccana</i> x <i>E. albens</i> (grey box x white box), <i>E. tereticornis</i> x <i>blakelyi</i> (forest red gum x Blakely's red gum) and <i>E. tereticornis</i> x <i>E. glaucina</i> (forest red gum x slaty red gum).		
19 - Where native grassland/shrubland (whether derived from the ecological community or not) connects discrete patches of the ecological community in close proximity (up to 30 m apart) then it should be treated as part of a single patch. Also native grassland/shrubland within a gap in, or at the edge of a patch, (up to 30 m from the edge of the tree canopy/saplings) is part of the patch. See also sections 1.5.4.1 (Defining a patch) and 1.3.4 (Derived native grassland/shrubland). "Native" here means vegetation 'dominated by native species'; i.e. that 50% or more of the perennial vegetation cover is native.		
20 - There may be outliers just over the border, in the extreme south east of the Brigalow Belt South Bioregion.		
21 - A dispersible soil: A soil that is structurally unstable in water, breaking down into its constituent particles (sand, silt and clay) and allowing the dispersive clay fraction to disperse and cloud the water.		
22 - Colluvial material / Colluvium: A loose deposit of sharp edged rock debris and/or sediment that has moved downhill to the bottom of the slope (or cliff) without the help of running water in streams.		
23 - Triassic: A geologic period (201 – 251 Ma).		

### Condition Thresholds

For the ecological community, classes C and D (Table 17) are considered Moderate quality condition and the minimum thresholds for a patch of the ecological community to be subject to the referral, assessment and compliance provisions of the EPBC Act. Classes A and B are considered the minimum thresholds for a patch of the ecological community to be regarded as an example of High quality condition.

**Table 17 Condition Thresholds for EPBC Act Central Hunter Valley eucalypt forest and woodland ecological community CEEC**

Category and rationale	Threshold	Justification
Class A. High Quality Condition  E.g. A larger patch with good quality native understorey	Patch size is $\geq 5$ ha; AND	Yes – the patch size is $>5$ ha
	$\geq 50\%$ of perennial understorey vegetative cover is native; AND	Vegetation Zone 2 and 3 Yes – Vegetation Zone 2 and 3 are characterised by $>50\%$ perennial native understorey consisting of grass, shrubs, fern and forb species.
		Vegetation Zone 4 <u>No</u> – Vegetation Zone 4 has a very high cover of perennial exotic shrubs in the form of <i>Olea europaea</i> and <i>Lantana camara</i> , which exceed 50% cover
	The patch contains at least 12 native understorey species	Vegetation Zones 2, 3, 4

Category and rationale	Threshold	Justification
		Yes - All vegetation integrity plots completed within Vegetation Zone 2, 3, and 4 recorded at least 12 native understorey species.
Class A Conclusion	Vegetation Zone 2 and 3 meet the minimum condition thresholds for Class A Vegetation Zone 4 does not meet the minimum condition thresholds for Class A	
Class B. High Quality Condition  E.g. A patch with high quality native understorey	Patch size is $\geq 0.5$ ha; AND $\geq 70\%$ of perennial vegetative cover in each layer present is native; AND The patch contains at least 12 native understorey species	Vegetation Zone 2 and 3 Not applicable – vegetation zones meet the condition thresholds for Class A.  Vegetation Zone 4 <u>No</u> - $<70\%$ of the perennial understorey vegetative cover is native.
Class C. Moderate Quality Condition E.g. A patch with good quality native understorey	Patch size is $\geq 0.5$ ha; AND $\geq 50\%$ of perennial understorey vegetative cover is native; AND The patch contains at least 12 native understorey species	Vegetation Zone 2 and 3 Not applicable – vegetation zones meet the condition thresholds for Class A.  Vegetation Zone 4 <u>No</u> - $<50\%$ of the perennial understorey vegetative cover is native.
Class D. Moderate Quality Condition E.g. A moderate to large sized patch with: connectivity to a native vegetation area; or a mature tree; or a tree with hollows.	Patch size is $\geq 2$ ha; AND $\geq 50\%$ of perennial understorey vegetative cover is native; AND The patch is contiguous with another patch of native woody vegetation <sup>25</sup> $\geq 1$ ha in area	Vegetation Zone 2 and 3 Not applicable – vegetation zones meet the condition thresholds for Class A.  Vegetation Zone 4 <u>No</u> - $<50\%$ of the perennial vegetative cover for the understorey is native.
	The patch has at least one large locally indigenous tree ( $\geq 60$ cm dbh <sup>26</sup> ), or at least one tree with hollows	Not applicable
	OR	
Determination	Vegetation Zones 2 and 3 These two vegetation zones <u>meet the minimum condition thresholds</u> (Condition Class A) for the Critically Endangered Ecological Community Central Hunter Valley eucalypt forest and woodland ecological community as listed under the Commonwealth's EPBC Act 1999. Vegetation Zone 4 The vegetation within this vegetation zone does not meet the diagnostic characteristics or minimum condition thresholds for the <i>Central Hunter Valley eucalypt forest and woodland ecological community</i> CEEC.	

Category and rationale	Threshold	Justification
	Vegetation Zones 5 and 6	These vegetation zones do not meet the diagnostic characteristics for the TEC
<p>Perennial understorey vegetation cover (i.e. below the tree canopy) includes vascular plant species, of both the ground layer and the mid/shrub layer (where present), with a life-cycle of more than two growing seasons. The ground layer includes herbs (i.e. grasses and forbs) and some low shrubs (woody plants <math>\leq 0.5</math> m high). Measurement of perennial understorey vegetation cover excludes annuals, cryptogams, leaf litter or exposed soil.</p> <p>In addition, please see the footnotes below and Section 1.5.4 of the Conservation Advice for further information to assist in determining the presence of the ecological community and significant impacts (including on the timing of surveys and sampling protocols).</p> <p>24 – Each layer present includes the canopy layer, as well as the ground layer and mid/shrub layer</p> <p>25 – Contiguous with another patch of native woody vegetation means continuous with, or near (within 100 m of), another area of native woody vegetation. Native vegetation is 'dominated by native species'; meaning that 50% or more of the perennial vegetation cover is native (See also the 'Notes to the above', in Table 1). This condition is also met if the patch of the ecological community is <math>\geq 3</math> ha in size.</p> <p>26 – dbh is diameter at breast height.</p>		

#### 4.2.4 PCT 4073 Lower North Hinterland River Oak Forest



Photo 7 PCT 4073 Lower North Hinterland River Oak Forest

##### 4.2.4.1 PCT overview

Table 18 PCT 4073 Lower North Hinterland River Oak Forest

PCT ID	PCT 4073
PCT name	Lower North Hinterland River Oak Forest
Vegetation formation	Forested Wetlands
Vegetation class	Eastern Riverine Forests
Percent cleared value (%)	80.40
Extent within Disturbance Footprint (ha)	0.01 ha
Extent within Subject Land (ha)	2.12 ha

This PCT is described as a tall to extremely tall riverine open forest occurring on alluvium along rivers and creeks in the Gloucester and Hunter valleys to the north and west of Newcastle. Within the Disturbance Footprint, PCT 4703 occurs in the far southeast as riparian vegetation associated with the unnamed stream in that location, and contains the following species:

Canopy: *Casuarina glauca* and *Angophora floribunda*.

Mid-stratum: Dominated by exotic *Lantana camara*. Native species are sparse and include *Alchornea ilicifolia*, *Breynia oblongifolia*, *Hibiscus heterophyllus* subsp. *heterophyllus*, *Jasminum volubile*, *Maclura cochinchinensis*, *Melicope micrococca* and *Trema tomentosa* var. *aspera*.

Ground layer: Sparse with low abundance, including *Oplismenus aemulus*, *Oplismenus imbecillis*, *Microlaena stipoides*, *Gahnia aspera*, *Carex longibrachiata*, *Commelina cyanea*, *Dichondra repens* and *Solanum prinophyllum*.

#### 4.2.4.2 Condition states

One (1) condition state was identified as present in *PCT 4073: Lower North Hinterland River Oak Forest* (**Photo 7**).

**Table 19** Condition states of *PCT 4073 Lower North Hinterland River Oak Forest*

Vegetation Zone no.	Condition state	Description
7	Forest	Intact forest with all vegetation strata present and relatively low weed presence.

#### 4.2.4.3 Justification of PCT selection

The vegetation is consistent with the Forested Wetlands vegetation formation.

A search of the BioNet Vegetation Classification Forested Wetlands formation within the Upper Hunter IBRA sub-region, with key canopy species *Casuarina glauca*, *Casuarina cunninghamiana* and *Angophora floribunda*, produced a shortlist of one (1) suitable PCT:

- *PCT 4073 Lower North Hinterland River Oak Forest*

To search for any other suitable PCTs, the IBRA sub-region filter was removed. This produced an additional three PCTs:

- *PCT 4023 Coastal Valleys Riparian Forest*
- *PCT 4025 Cumberland Red Gum Riverflat Forest*
- *PCT 4058 Sydney Hinterland Red Gum Riverflat Forest*

PCTs 4025 and PCT 4058 can be excluded as they are Eucalypt-dominated communities restricted to the Sydney and Central Coast hinterlands and do not occur in the Hunter Valley.

PCT 4023 and PCT 4073 are appropriate candidates for the vegetation within the Disturbance Footprint based on location and landscape position with PCT 4023 while being largely restricted to the Cumberland Plain, is also known to extend into the Hunter Valley north of Rothbury, which is c. 12 km south of the Disturbance Footprint. PCT 4073 is known to occur within the Upper Hunter IBRA Subregion and is described as occurring on “*alluvium along rivers and creeks in the Gloucester and Hunter valleys*”.

Both PCT 4023 and PCT 4073 are good floristic matches to the vegetation within the Subject Land. However, PCT 4073 is considered a slightly better match as *Glochidion ferdinandi*, *Hibiscus heterophyllus*, *Alchornea ilicifolia*, *Jasminum volubile* and *Maclura cochinchinensis*, present within the vegetation within the Disturbance Footprint are only listed for PCT 4073. Also, while PCT 4023 is dominated by *Casuarina glauca* with a grassy understory, characteristic eucalypt species *Eucalyptus moluccana* and *Eucalyptus tereticornis* do not occur within this vegetation community.

Considering the distribution, landscape position, and floristic composition, PCT 4073 was determined to be the best-fit PCT for this vegetation community.

**Table 20 PCT justification for Zone 8**

Shortlisted PCT	Floristic composition	Soils / geology	Landscape position and location	Conclusion
4023	Close match – <i>Casuarina glauca</i> dominant	Not specified for this PCT, presumably alluvium.	Adjacent to streams or on river flats on Cumberland Plain and Hunter Valley north of Rothbury; site is 12 km north of this distribution.	Close match
4025	Poor match - Eucalypt-dominated.	Alluvium.	Alluvial flats alongside streams of the Cumberland Plain or more rarely the broad alluvial flats of the Hawkesbury and Nepean valleys; site is not within these areas. Between 50 and 150 m asl.	Poor match
4058	Poor match - Eucalypt-dominated.	Not specified for this PCT, presumably alluvium.	Undulating foothills of the Hunter coast hinterland from Tuggerah to Stratford, and the lower Hunter valley around Cessnock – location is poor match; site is not within these areas	Poor match
4073	Close match – <i>Casuarina</i> dominated. Presence of <i>Glochidion ferdinandi</i> , <i>Hibiscus heterophyllus</i> , <i>Alchornea ilicifolia</i> , <i>Jasminum volubile</i> and <i>Maclura cochinchinensis</i> gives the slight edge over 4023.	Alluvium	Alluvium along rivers and creeks in the Gloucester and Hunter valleys to the north and west of Newcastle.	Close match – slightly better fit than 4023

#### 4.2.4.4 Alignment with BC Act listed TECs

This PCT is not associated with any TEC listed under the NSW BC Act. Low-lying forests dominated by *Casuarina glauca* may be aligned to the *Swamp oak floodplain forest of the NSW North Coast, Sydney Basin and South East Corner bioregions* TEC. However, this TEC occurs below 20 m where the groundwater is saline or sub-saline (NSW Scientific Committee 2011). As the vegetation within the Disturbance Footprint is above 60 m ASL and lacks saline influence, it is not commensurate with this TEC.

#### 4.2.4.5 Alignment with EPBC Act listed TECs

This PCT is not associated with any TEC listed under the EPBC Act

## 4.2.5 PCT 3110 Greater Sydney Enriched Grey Myrtle Dry Rainforest



Photo 8 PCT 3110 Greater Sydney Enriched Grey Myrtle Dry Rainforest outside the Subject Land

### 4.2.5.1 PCT overview

Table 21 PCT 3110 Greater Sydney Enriched Grey Myrtle Dry Rainforest

<b>PCT ID</b>	PCT 3110
<b>PCT name</b>	Greater Sydney Enriched Grey Myrtle Dry Rainforest
<b>Vegetation formation</b>	Rainforests
<b>Vegetation class</b>	Dry Rainforests
<b>Percent cleared value (%)</b>	7.65
<b>Extent within Subject Land (ha)</b>	Not within Subject Land

A low to tall dry rainforest with a mid-stratum of mesic shrubs or small trees, a ferny ground cover and occasional emergent Eucalypts and *Ficus rubiginosa*. This PCT occurs in a small patch associated with a small creek line to the east of the Subject Land and is characterised by the following species:

Canopy: emergent Eucalyptus acmenoides, Eucalyptus canaliculata and Ficus rubiginosa

Mid-stratum: A dense mid-stratum of small trees and shrubs dominated by *Backhousia myrtifolia*, and including *Alphitonia excelsa*, *Brachychiton populneus*, *Capparis arborea*, *Croton insularis*, *Drypetes deplanchei*, *Hibiscus heterophyllus*, *Notelaea longifolia*, *Pittosporum*

*undulatum* and *Streblus brunonianus*. Vines are abundant and diverse, including species such as *Cayratia clematidea*, *Cissus antarctica*, *Cissus hypoglauca*, *Clematis glycinoides*, *Dioscorea transversa*, *Eustrephus latifolius*, *Geitonoplesium cymosum*, *Gynochthodes jasminoides* and *Pandorea pandorana*.

Ground layer: Dominated by the ferns *Adiantum aethiopicum* and *Pellaea paradoxa*. Other species include *Adiantum hispidulum*, *Aneilema acuminatum* and *Oplismenus aemulus*.

#### 4.2.5.2 Condition states

One condition state present: “High weed”.

**Table 22 Condition states of PCT 3110 Greater Sydney Enriched Grey Myrtle Dry Rainforest**

Vegetation Zone no.	Condition state	Description
N/A	High Weed	Intact forest with all vegetation strata present and high weed cover.

#### 4.2.5.3 Justification of PCT selection

The vegetation within the Project Site is consistent with a the Rainforest formation, and Dry Rainforest class. A search of the BioNet Vegetation Classification for Rainforest formation within the Upper Hunter IBRA sub-region, with canopy species including *Drypetes deplanchei* and *Brachychiton populneus*, key shrub species *Backhousia myrtifolia*, *Pittosporum multiflorum* and *Myrsine variabilis*, and ferns including *Pellaea paradoxa* and *Adiantum aethiopicum* produced a shortlist of four PCTs:

- *PCT 3076: Hunter Valley Whalebone Dry Rainforest*
- *PCT 3100: Northern Hinterland Baloghia-Dendrocnide Subtropical Rainforest*
- *PCT 3101: Northern Hinterland Shatterwood Dry Rainforest*
- *PCT 3110: Greater Sydney Enriched Grey Myrtle Dry Rainforest*

PCT 3076 has high floristic overlap with the observed community, and appropriate landscape position and geology (can occur on tuff / ignimbrite). But this PCT typically contains *Mallotus philippinensis* and *Streblus brunonianus* in high abundance – neither of these species occur in high abundance. Additionally, PCT 3076 does not usually contain *Backhousia myrtifolia* in the high abundance observed.

PCT 3100 is not a good fit as it typically includes high cover of *Dendrocnide excelsa* and *Baloghia inophylla* – both species are not abundant within the community, with *Dendrocnide excelsa* only observed very occasionally, while *Baloghia inophylla* was not observed.

PCT 3101 can be excluded as it almost always includes a high cover of *Backhousia sciadophora*, a species absent from the observed community.

PCT 3110 is the best-fit for the observed community, being the only shortlisted PCT dominated by *Backhousia myrtifolia*. The landscape position (along creeks, in gullies or on steep rocky slopes) and geology (can occur on tuff / ignimbrite) are also a close fit for this PCT.

#### 4.2.5.4 Alignment with TECs

PCT 3110 is associated with two TECs listed under the BC Act:

- *Western Sydney Dry Rainforest in the Sydney Basin Bioregion EEC*
- *Lowland Rainforest in the NSW North Coast and Sydney Basin Bioregions EEC*

## Western Sydney Dry Rainforest in the Sydney Basin Bioregion EEC

Western Sydney Dry Rainforest in the Sydney Basin Bioregion is restricted to the Sydney Basin Bioregion on clay soils derived from Wianamatta shale and can therefore be excluded from the Disturbance Footprint which is in the North Coast Bioregion and situated on Carboniferous geology.

## Lowland Rainforest in the NSW North Coast and Sydney Basin Bioregions

Lowland Rainforest belongs to the Subtropical Rainforests class of Keith (2004), although some stands may be interpreted as structurally complex assemblages within the Dry Rainforests class. This TEC encompasses stands which fall principally within the following alliances and suballiances of Floyd (1990b).

PCT 3110 is consistent with the Dry Rainforest vegetation class and not the Subtropical Rainforest class, and the vegetation within the Project Site is inconsistent with the listed alliances and suballiances described by Floyd (1990b). As such, the vegetation within the Project Site is not commensurate with Lowland Rainforest in the NSW North Coast and Sydney Basin Bioregions as listed under the BC Act.

### 4.2.5.5 Alignment with EPBC Act listed TECs

PCT 3110 is associated with one (1) TEC listed under the EPBC Act, *Western Sydney Dry Rainforest and Moist Woodland on Shale* CEEC.

## Western Sydney Dry Rainforest and Moist Woodland on Shale CEEC

This TEC is restricted to the Sydney Basin Bioregion on clay soils derived from Wianamatta shale. As the vegetation within the Project Site occurs within the North Coast Bioregion and on Carboniferous geology, the vegetation within the Project Site is considered to not be commensurate with Western Sydney Dry Rainforest and Moist Woodland on Shale CEEC.

## 4.3 Threatened ecological communities

TECs and where relevant, ECs identified within the Disturbance Footprint are listed in **Table 27** and their extent is shown on **Figure 11**.

Assessment against the requirements for each TEC is provided in the preceding Section 4.2 for each PCT and VZ.

**Table 23** TECs within the Disturbance Footprint

TEC name	Profile ID (from TBDC)	BC Act status	EPBC Act status	Associated vegetation zones within the Disturbance Footprint	Area within Disturbance Footprint (ha)
Central Hunter Ironbark-Spotted Gum-Grey Box Forest in New South Wales North Coast and Sydney Basin Bioregions	20127	E	-	VZ2 3315 Forest VZ3 3315 Managed VZ4 3315 High Weed	39.65
Central Hunter Valley Eucalypt	20381	-	CE	VZ2 3315 Forest VZ3 3315 Managed	32.67

TEC name	Profile ID (from TBDC)	BC Act status	EPBC Act status	Associated vegetation zones within the Disturbance Footprint	Area within Disturbance Footprint (ha)
Forest and Woodland					

## 4.4 Vegetation zones

Vegetation zones were delineated based on PCT and condition in accordance with Section 4.3.1 of BAM 2020, which requires mapping of vegetation condition under “broad condition states”, and suggests the following approach: “Disturbance to growth form groups for tree, shrub and ground cover or extent of exotics (or combinations of these) can be used to identify areas of similar condition”. The condition state of PCTs 3244 and 4073 were considered broadly uniform and only assigned to one condition state. PCT 3315 on the other hand was highly variable across the site and was assigned to either of five condition states / VZs based on:

- Presence / absence of canopy species
- Presence / absence of shrub layer
- Prevalence of exotic shrubs
- Dominance of native or exotic groundcovers
- Approximate time since clearing or other disturbance

The vegetation zones mapped within the Disturbance Footprint are mapped on **Figure 17** and details for each zone, including VI plots completed, are listed below in **Table 24**. The Vegetation Zones are aligned with the condition states identified with each PCT as described in **Section 4.2**. A total of seven (7) Vegetation Zones have been identified, which align to the three (3) PCTs mapped within the Disturbance Footprint.

**Table 24**      **Vegetation zones and patch sizes in the Disturbance Footprint**

Vegetation zone ID	PCT ID number and name	Condition	Area (ha)	Patch size class (select multiple if areas of native vegetation are discontinuous)	No. vegetation integrity plots required	No. vegetation integrity plots completed	No. vegetation integrity plots used in assessment	Plot IDs of vegetation integrity plots used in assessment
1	3244 Lower North Spotted Gum - Mahogany - Ironbark Sheltered Forest	Forest	1.65	>100 ha	1	1	1	Q03
2	3315 Central Hunter Ironbark - Spotted Gum Forest	Forest	22.43	>100 ha	4	6	6	Q02, Q07, Q08, Q09, Q11, Q12
3	3315 Central Hunter Ironbark - Spotted Gum Forest	Managed	10.24	>100 ha	3	5	5	Q18, Q19, Q20 Q21, Q22
4	3315 Central Hunter Ironbark - Spotted Gum Forest	High Weed	6.97	>100 ha	3	5	5	Q04, Q05, Q06, Q14, Q27
5	3315 Central Hunter Ironbark - Spotted Gum Forest	Derived Native Grassland	11.13	>100 ha	3	5	5	Q01, Q10, Q13, Q15, Q16
6	3315 Central Hunter Ironbark - Spotted Gum Forest	Exotic Pastures	9.19	>100 ha	3	3	3	Q23, Q24, Q25
7	4073 Lower North Hinterland River Oak Forest	Forest	0.01	>100 ha	1	1	1	Q26
N/A: outside Subject Land	3110 Greater Sydney Enriched Grey Myrtle Dry Rainforest	High Weed	0	-	0	1	0	Q17

## 4.5 Vegetation integrity (vegetation condition)

### 4.5.1 Vegetation integrity survey plots

For all vegetation zones the minimum number of plots has been met or exceeded (**Table 24**). Additional plots were sampled for zones 2–5 to account for variation within these zones. The remaining zones 1, 6 and 7 were relatively small and uniform and did not require any additional plots to capture micro-variations in condition.

Plot Q17 was conducted within PCT 3110 which had potential to be impacted in one development scenario but is now outside Disturbance Footprint. This plot was therefore not used in the BAM-C.

Due to the small area of PCT 4073 within the Disturbance Footprint, Q26 was required to be located outside the Disturbance Footprint to fit the full BAM plot and allow for a representative sample of the vegetation. Similarly, Q14 was located outside the Disturbance Footprint in order to capture a representative sample of a small patch of Vegetation Zone 4 PCT 3315 (High Weed) in the south of the site.

### 4.5.2 Scores

The Vegetation Integrity Scores (VIS) for each vegetation zone are presented in **Table 25**.

**Table 25** Vegetation integrity scores

Vegetation Zone number	Vegetation zone ID	Composition condition score	Structure condition score	Function condition score (where relevant)	Vegetation integrity score	Hollow bearing trees present ?
1	3244_Forest	87.8	29.3	42.3	47.8	No
2	3315_Forest	92.6	39.2	57.8	59.4	Yes
3	3315_Managed	82.6	7.4	32.9	27.2	Yes
4	3315_High_Weed	80.3	23.1	61.7	48.5	Yes
5	3315_DNG	52.5	45.5	12.5	31	No
6	3315_Exotic_Pasture	52.8	2.1	1.4	5.4	No
7	4073_Forest	60.5	42.6	79	58.8	No

### 4.5.3 Use of benchmark data

Benchmarks were not amended and were adopted as per the BAM Calculator at the time of the assessment, which used benchmark Version 65 (14/03/2024).

## 5. Habitat suitability for threatened species

### 5.1 Identification of threatened species for assessment

To inform the assessment of suitable habitat for, and likelihood of, threatened species and populations within the Disturbance Footprint, a database search of the NSW DCCEEW BioNet Atlas (DCCEEW 2024a) and the Commonwealth DCCEEW Protected Matters Search Tool (PMST) (DCCEEW 2024b) were conducted to a distance of 10 km. This, in combination with the BAM-C, were used to create a list of threatened species for consideration as target threatened species. The TBDC was used to identify habitat constraints and potential microhabitats (see Section 5.1) for each species likely to occur within the PCTs mapped on the Disturbance Footprint.

#### 5.1.1 Ecosystem credit species

**Table 26** lists ecosystem credit species likely to occur on or use the Disturbance Footprint, identified via the BAM-C and in accordance with BAM Subsections 5.2.1 and 5.2.2.

Consideration of included the NSW DCCEEW BioNet Atlas and the Commonwealth DCCEEW Protected Matters Search Tool (PMST) was undertaken to determine any additional candidate species to be included for further assessment. No additional species were manually added following this assessment.

Some Predicted Species have been excluded from the assessment, with justification provided in **Table 26**.

**Table 26 Predicted ecosystem credit species**

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	Sensitivity to gain class
		BC Act	EPBC Act						
Regent Honeyeater (Foraging)	<i>Anthochaera phrygia</i>	Critically Endangered	Critically Endangered	Yes	<input checked="" type="checkbox"/> BAM-C PMST	Yes	Not Applicable	All Zones	High
Dusky Woodswallow	<i>Artamus cyanopterus cyanopterus</i>	Vulnerable	Not Listed	No	<input checked="" type="checkbox"/> BAM-C	Yes	Not Applicable	All Zones	Moderate
Australasian Bittern	<i>Botaurus poiciloptilus</i>	Endangered	Endangered	No	<input checked="" type="checkbox"/> BAM-C PMST	Yes	Not Applicable	4073_Forest	Moderate
Gang-gang Cockatoo (Foraging)	<i>Callocephalon fimbriatum</i>	Endangered	Endangered	Yes	<input checked="" type="checkbox"/> BAM-C PMST	Yes	Not Applicable	All Zones	Moderate
South-eastern Glossy Black-Cockatoo (Foraging)	<i>Calyptorhynchus lathami lathami</i>	Vulnerable	Vulnerable	Yes	<input checked="" type="checkbox"/> BAM-C PMST	Partial (when a species is retained within one vegetation zone but not another)	VZ4 3315_Managed, VZ5 3315_DNG, VZ6 3315_Exotic Pasture lack any <i>Allocasuarina</i> or <i>Casuarina</i> species providing	VZ1 3244_Forest VZ2 3315_Forest VZ4 3315_High Weed 4073_Forest	High

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	Sensitivity to gain class
		BC Act	EPBC Act						
Speckled Warbler	<i>Chthonicola sagittata</i>	Vulnerable	Not Listed	No	<input checked="" type="checkbox"/> BAM-C BioNet PMST	Yes	foraging resources Not Applicable	All Zones	High
Spotted Harrier	<i>Circus assimilis</i>	Vulnerable	Not Listed	No	<input checked="" type="checkbox"/> BAM-C	Yes	Not Applicable	VZ2 3315_Forest VZ3 3315_Managed VZ4 3315_High Weed VZ5 3315_DNG VZ6 3315_Exotic Pasture VZ7 4073_Forest	Moderate
Brown Treecreeper (eastern subspecies)	<i>Climacteris picumnus victoriae</i>	Vulnerable	Vulnerable	No	<input checked="" type="checkbox"/> BAM-C PMST	Yes	Not Applicable	All Zones	High
Varied Sittella	<i>Daphoenositta chrysoptera</i>	Vulnerable	Not Listed	No	<input checked="" type="checkbox"/> BAM-C	Yes	Not Applicable	All Zones	Moderate
Spotted-tailed Quoll	<i>Dasyurus maculatus</i>	Vulnerable	Endangered	No	<input checked="" type="checkbox"/> BAM-C BioNet PMST	Yes	Not Applicable	All Zones	High

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	Sensitivity to gain class
		BC Act	EPBC Act						
Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>	Endangered	Not Listed	No	<input checked="" type="checkbox"/> BAM-C	No	Habitat constraints absent: no swamps, wetlands, lakes or estuaries present.	No Zones	Moderate
Eastern False Pipistrelle	<i>Falsistrellus tasmaniensis</i>	Vulnerable	Not Listed	No	<input checked="" type="checkbox"/> BAM-C	Yes	Not Applicable	VZ1 3244_Forest	High
Little Lorikeet	<i>Glossopsitta pusilla</i>	Vulnerable	Not Listed	No	<input checked="" type="checkbox"/> BAM-C	Yes	Not Applicable	All Zones	High
White-bellied Sea-Eagle (Foraging)	<i>Haliaeetus leucogaster</i>	Vulnerable	Not Listed	Yes	<input checked="" type="checkbox"/> BAM-C	No	Habitat constraints absent: Subject Land is more than 1 km from any rivers, lakes, large dams or creeks, wetlands and coastlines. Creeks and dams on site are too small to provide habitat	No Zones	High

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	Sensitivity to gain class
		BC Act	EPBC Act						
Little Eagle (Foraging)	<i>Hieraetus morphnoides</i>	Vulnerable	Not Listed	Yes	<input checked="" type="checkbox"/> BAM-C	Yes	Not Applicable	All Zones	Moderate
White-throated Needletail	<i>Hirundapus caudacutus</i>	Vulnerable	Vulnerable	No	<input checked="" type="checkbox"/> BAM-C PMST	Yes	Not Applicable	All Zones	High
Black Bittern	<i>Ixobrychus flavicollis</i>	Vulnerable	Not Listed	No	<input checked="" type="checkbox"/> BAM-C PMST	No	Habitat Constrains absent: Associated PCT 3244 is not within 40 m of freshwater and estuarine wetlands, in areas of permanent water and dense vegetation. Other PCTs are not associated with this species.	No Zones	Moderate
Swift Parrot (Foraging)	<i>Lathamus discolor</i>	Endangered	Critically Endangered	Yes	<input checked="" type="checkbox"/> BAM-C PMST	Yes	Not Applicable	All Zones	Moderate

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	Sensitivity to gain class
		BC Act	EPBC Act						
Square-tailed Kite (Foraging)	<i>Lophoictinia isura</i>	Vulnerable	Not Listed	Yes	<input checked="" type="checkbox"/> BAM-C	Yes	Not Applicable	All Zones	Moderate
South-eastern Hooded Robin	<i>Melanodryas cucullata cucullata</i>	Endangered	Endangered	No	<input checked="" type="checkbox"/> BAM-C PMST	Yes	Not Applicable	VZ1 3244_Forest	Moderate
Black-chinned Honeyeater (eastern subspecies)	<i>Melithreptus gularis gularis</i>	Endangered	Endangered	No	<input checked="" type="checkbox"/> BAM-C	Yes	Not Applicable	All Zones	Moderate
Eastern Coastal Free-tailed Bat	<i>Micronomus norfolkensis</i>	Vulnerable	Not Listed	No	<input checked="" type="checkbox"/> BAM-C BioNet	Yes	Not Applicable	All Zones	High
Little Bent-winged Bat (Foraging)	<i>Miniopterus australis</i>	Vulnerable	Not Listed	Yes	<input checked="" type="checkbox"/> BAM-C	Yes	Not Applicable	VZ1 3244_Forest VZ2 3315_Forest VZ3 3315_Managed VZ4 3315_High Weed VZ5 3315_DNG VZ6 3315_Exotic Pasture	High
Large Bent-winged Bat (Foraging)	<i>Miniopterus orianae oceanensis</i>	Vulnerable	Not Listed	Yes	<input checked="" type="checkbox"/> BAM-C BioNet	Yes	Not Applicable	VZ1 3244_Forest VZ2 3315_Forest VZ3 3315_Managed	High

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	Sensitivity to gain class
		BC Act	EPBC Act						
								VZ4 3315_High Weed VZ5 3315_DNG VZ6 3315_Exotic Pasture	
Olive Whistler	<i>Pachycephala olivacea</i>	Vulnerable	Not Listed	No	<input checked="" type="checkbox"/> BAM-C	Yes	Not Applicable	VZ1 3244_Forest	Moderate
Yellow-bellied Glider	<i>Petaurus australis</i>	Vulnerable	Vulnerable	No	<input checked="" type="checkbox"/> BAM-C PMST	Yes	Not Applicable	VZ1 3244_Forest	High
Scarlet Robin	<i>Petroica boodang</i>	Vulnerable	Not Listed	No	<input checked="" type="checkbox"/> BAM-C	Yes	Not Applicable	All Zones	Moderate
Flame Robin	<i>Petroica phoenicea</i>	Vulnerable	Not Listed	No	<input checked="" type="checkbox"/> BAM-C	Yes	Not Applicable	VZ1 3244_Forest VZ7 4073_Forest	Moderate
Golden-tipped Bat	<i>Phoniscus papuensis</i>	Vulnerable	Not Listed	No	<input checked="" type="checkbox"/> BAM-C	Yes	Not Applicable	All Zones	High
Grey-crowned Babbler	<i>Pomatostomus temporalis</i>	Vulnerable	Not Listed	No	<input checked="" type="checkbox"/> BAM-C BioNet	Yes	Not Applicable	All Zones	Moderate

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	Sensitivity to gain class
		BC Act	EPBC Act						
(eastern subspecies)									
Eastern Chestnut Mouse	<i>Pseudomys gracilicaudatus</i>	Vulnerable	Not Listed	No	<input checked="" type="checkbox"/> BAM-C	Yes	Not Applicable	VZ2 3315_Forest VZ3 3315_Managed VZ4 3315_High Weed VZ5 3315_DNG VZ6 3315_Exotic Pasture VZ7 4073_Forest	High
New Holland Mouse	<i>Pseudomys novaehollandiae</i>	Vulnerable	Vulnerable	No	<input checked="" type="checkbox"/> BAM-C PMST	Yes	Not Applicable	VZ1 3244_Forest VZ2 3315_Forest VZ3 3315_Managed VZ4 3315_High Weed VZ5 3315_DNG VZ6 3315_Exotic Pasture	High
Grey-headed Flying-fox (Foraging)	<i>Pteropus poliocephalus</i>	Vulnerable	Vulnerable	Yes	<input checked="" type="checkbox"/> BAM-C BioNet PMST	Yes	Not Applicable	All Zones	High
Wompoo Fruit-Dove	<i>Ptilinopus magnificus</i>	Vulnerable	Not Listed	No	<input checked="" type="checkbox"/> BAM-C	Yes	Not Applicable	VZ1 3244_Forest	Moderate

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	Sensitivity to gain class
		BC Act	EPBC Act						
Yellow-bellied Sheath-tail-bat	<i>Saccolaimus flaviventris</i>	Vulnerable	Not Listed	No	<input checked="" type="checkbox"/> BAM-C	Yes	Not Applicable	VZ1 3244_Forest VZ2 3315_Forest VZ3 3315_Managed VZ4 3315_High Weed VZ5 3315_DNG VZ6 3315_Exotic Pasture	High
Greater Broad-nosed Bat	<i>Scoteanax rueppellii</i>	Vulnerable	Not Listed	No	<input checked="" type="checkbox"/> BAM-C	Yes	Not Applicable	VZ1 3244_Forest VZ2 3315_Forest VZ3 3315_Managed VZ4 3315_High Weed VZ5 3315_DNG VZ6 3315_Exotic Pasture	High
Diamond Firetail	<i>Stagonopleura guttata</i>	Vulnerable	Vulnerable	No	<input checked="" type="checkbox"/> BAM-C PMST	Yes	Not Applicable	All Zones	Moderate

### 5.1.2 Species credit species

Candidate species auto populated from the BAM-C are provided in **Table 27** (flora) and **Table 28** (fauna).

One (1) fauna species, Eastern Cave Bat (*Vespadelus troughtoni*), was manually added as a *Vespadelus* species was detected by call during site surveys but not populated by the BAM-C. As calls from the species are unable to be differentiated from the common Little Forest Bat (*Vespadelus vulturnus*), additional harp trap surveys were completed for the species. Harp traps identified Little Forest Bat (*Vespadelus vulturnus*) thus the Eastern Cave Bat (*Vespadelus troughtoni*) presence within the Disturbance Footprint has been ruled out (**Table 31**; **Table 33**).

Desktop assessments including a review of the NSW DCCEEW BioNet Atlas and the Commonwealth DCCEEW Protected Matters Search Tool (PMST) was undertaken to determine any additional candidate species to be included for further assessment. No additional species were manually added following this assessment.

**Table 27 Predicted flora species credit species**

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				
-	<i>Acacia pendula</i>	Endangered Population	Not Listed	<input checked="" type="checkbox"/> BAM-C	Yes	Retained for further assessment	All Zones
Charmhaven Apple	<i>Angophora inopina</i>	Vulnerable	Vulnerable	<input checked="" type="checkbox"/> BAM-C BioNet PMST	No	Geographic limitations: Subject Land is not within 10 km of Wallaroo National Park	N/A
Netted Bottle Brush	<i>Callistemon linearifolius</i>	Vulnerable	Not Listed	<input checked="" type="checkbox"/> BAM-C	Yes	Retained for further assessment	All Zones
Red Helmet Orchid	<i>Corybas dowlingii</i>	Endangered	Not Listed	<input checked="" type="checkbox"/> BAM-C	No	Geographic limitations: Subject Land is not within Columbey National Park nor east of the Park	N/A
<i>Cymbidium canaliculatum</i> population in the Hunter Catchment	<i>Cymbidium canaliculatum</i> endangered population	Endangered Population	Not Listed	<input checked="" type="checkbox"/> BAM-C	Yes	Retained for further assessment	All Zones

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				
White-flowered Wax Plant	<i>Cynanchum elegans</i>	Endangered	Endangered	<input checked="" type="checkbox"/> BAM-C	Yes	Retained for further assessment	All zones
<i>Eucalyptus camaldulensis</i> population in the Hunter catchment	<i>Eucalyptus camaldulensis</i>	Endangered Population	Not Listed	<input checked="" type="checkbox"/> BAM-C	Yes	Retained for further assessment	VZ7 4073_Forest
<i>Slaty Red Gum</i>	<i>Eucalyptus glaucina</i>	Vulnerable	Vulnerable	<input checked="" type="checkbox"/> BAM-C	Yes	Retained for further assessment	VZ1 3244_Forest VZ2 3315_Forest VZ3 3315_Managed VZ4 3315_High Weed VZ5 3315_DNG VZ6 3315_Exotic Pasture
Craven Grey Box	<i>Eucalyptus largeana</i>	Endangered	Endangered	<input checked="" type="checkbox"/> BAM-C	Yes	Retained for further assessment	VZ1 3244_Forest

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				
Small-flower Grevillea	<i>Grevillea parviflora</i> subsp. <i>parviflora</i>	Vulnerable	Vulnerable	<input checked="" type="checkbox"/> BAM-C	Yes	Retained for further assessment	VZ1 3244_Forest
-	<i>Pterostylis chaetophora</i>	Vulnerable	Not Listed	<input checked="" type="checkbox"/> BAM-C	Yes	Retained for further assessment	VZ1 3244_Forest VZ2 3315_Forest VZ3 3315_Managed VZ4 3315_High Weed VZ5 3315_DNG VZ6 3315_Exotic Pasture
Scrub Turpentine	<i>Rhodamnia rubescens</i>	Critically Endangered	Critically Endangered	<input checked="" type="checkbox"/> BAM-C BioNet	Yes	Retained for further assessment	VZ1 3244_Forest VZ7 4073_Forest
Native Guava	<i>Rhodomyrtus psidioides</i>	Critically Endangered	Critically Endangered	<input checked="" type="checkbox"/> BAM-C	Yes	Retained for further assessment	VZ7 4073_Forest

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				
Heath Wrinklewort	<i>Rutidosia heterogama</i>	Vulnerable	Vulnerable	<input checked="" type="checkbox"/> BAM-C PMST	Yes	Retained for further assessment	VZ1 3244_Forest VZ2 3315_Forest VZ3 3315_Managed VZ4 3315_High Weed VZ5 3315_DNG VZ6 3315_Exotic Pasture
Black-eyed Susan	<i>Tetradthea juncea</i>	Vulnerable	Vulnerable	<input checked="" type="checkbox"/> BAM-C	Yes	Retained for further assessment	VZ1 3244_Forest

**Table 28 Predicted fauna species credit species**

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					
Regent Honeyeater (Breeding)	<i>Anthochaera phrygia</i>	Critically Endangered	Critically Endangered	Yes	<input checked="" type="checkbox"/> BAM-C PMST	No	Habitat constraints absent: Disturbance Footprint is not included in Important Habitat Map	N/A

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					
Gang-gang Cockatoo (Breeding)	<i>Callocephalon fimbriatum</i>	Endangered	Endangered	Yes	<input checked="" type="checkbox"/> BAM-C PMST	Yes	Retained for further assessment	VZ1 3244_Forest VZ2 3315_Forest VZ3 3315_Managed VZ4 3315_High Weed
South-eastern Glossy Black-Cockatoo (Breeding)	<i>Calyptorhynchus lathami lathami</i>	Vulnerable	Vulnerable	Yes	<input checked="" type="checkbox"/> BAM-C PMST	Yes	Retained for further assessment	VZ2 3315_Forest VZ3 3315_Managed
Eastern Pygmy-possum	<i>Cercartetus nanus</i>	Vulnerable	Not Listed	No	<input checked="" type="checkbox"/> BAM-C	Partial (when a species is retained within one vegetation zone but not another)	Unsuitable microhabitat: This species occurs in a broad range of habitats from rainforest through sclerophyll (including Box-Ironbark) forest and woodland to heath (TBDC) and requires nectar and pollen resources from banksias, eucalypts and bottlebrushes to feed. As VZs 3315_DNG and 3315_Exotic Pasture are derived grassland, not forest, woodland or heath, and lack suitable feeding resources in the form of flowering banksias, eucalypts and bottlebrushes,	VZ1 3244_Forest VZ2 3315_Forest VZ3 3315_Managed VZ4 3315_High Weed

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					
							they do not provide suitable habitat for this species.	
Large-eared Pied Bat	<i>Chalinolobus dwyeri</i>	Endangered	Endangered	No	<input checked="" type="checkbox"/> BAM-C PMST	Yes	Retained for further assessment	All Zones
Hunter Valley Delma	<i>Delma vescolineata</i>	Endangered	Endangered	No	<input checked="" type="checkbox"/> BAM-C PMST	Yes	Retained for further assessment This species has had five (5) weeks of tile array survey in Spring 2025 and during March/April 2026, with no individuals found in this period. In addition, there is no expectation of the species due to Species vagrancy and the absence of microhabitats within the Disturbance Footprint. Further details are provided below.	VZ5 and VZ6
Red Goshawk	<i>Erythroriorchis radiatus</i>	Endangered	Endangered	No	<input checked="" type="checkbox"/> BAM-C PMST	Yes	Retained for further assessment	All Zones
White-bellied Sea-Eagle (Breeding)	<i>Haliaeetus leucogaster</i>	Vulnerable	Not Listed	Yes	<input checked="" type="checkbox"/> BAM-C	Yes	Habitat constraint absent: Disturbance Footprint is not within 1 km of rivers, lakes,	N/A

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					
							large dams or creeks, wetlands and coastlines.	
Little Eagle (Breeding)	<i>Hieraaetus morphnoides</i>	Vulnerable	Not Listed	Yes	<input checked="" type="checkbox"/> BAM-C	Yes	Unsuitable microhabitat: 3315_DNG and 3315_Exotic Pasture do not provide suitable breeding habitat in the form of large trees suitable for nesting.	VZ1 3244_Forest VZ2 3315_Forest VZ3 3315_Managed VZ4 3315_High-Weed VZ7 4073_Forest
Swift Parrot (Breeding)	<i>Lathamus discolor</i>	Endangered	Critically Endangered	Yes	<input checked="" type="checkbox"/> BAM-C PMST	No	Habitat constraints absent: Subject Land is not included in Important Habitat Map	N/A
Green and Golden Bell Frog	<i>Litoria aurea</i>	Endangered	Vulnerable	No	<input checked="" type="checkbox"/> BAM-C PMST	Yes	Retained for further assessment	All Zones
Square-tailed Kite (Breeding)	<i>Lophoictinia isura</i>	Endangered	Vulnerable	Yes	<input checked="" type="checkbox"/> BAM-C	Yes	Unsuitable microhabitat: 3315_DNG and 3315_Exotic Pasture do not provide suitable breeding habitat in the form of large trees suitable for nesting.	VZ1 3244_Forest VZ2 3315_Forest VZ3 3315_Managed

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					
								VZ4 3315_High-Weed VZ7 4073_Forest
Little Bent-winged Bat (Breeding)	<i>Miniopterus australis</i>	Vulnerable	Not Listed	Yes	<input checked="" type="checkbox"/> BAM-C	No	Habitat constraints absent: No 'caves, tunnels, mines, culverts or other structures' present within the Subject Land or within the relevant buffer distances from the Subject Land for these species (100 m)	N/A
Large Bent-winged Bat (Breeding)	<i>Miniopterus orianae oceanensis</i>	Vulnerable	Not Listed	Yes	<input checked="" type="checkbox"/> BAM-C BioNet	No	Habitat constraints absent: No 'caves, tunnels, mines, culverts or other structures' present within the Subject Land or within the relevant buffer distances from the Subject Land for these species (100 m)	N/A
Southern Myotis	<i>Myotis macropus</i>	Vulnerable	Not Listed	No	<input checked="" type="checkbox"/> BAM-C	Yes	Retained for further assessment	All Zones
Barking Owl	<i>Ninox connivens</i>	Vulnerable	Not Listed	No	<input checked="" type="checkbox"/> BAM-C	Partial (when a species is retained within one vegetation zone but not another)	Suitable breeding habitat only occurs in Vegetation Zones containing suitable hollows as defined in the TBDC: <i>Hollow bearing trees; a living or dead tree with a hollow &gt;20 cm</i>	VZ4 3315_High Weed

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					
							<i>diameter that occurs &gt;4 metres above the ground.</i> Suitable hollows only occur within VZ 3 -PCT 3315 High Weed (HBTs 11, 18 & 23).	
Powerful Owl	<i>Ninox strenua</i>	Vulnerable	Not Listed	No	<input checked="" type="checkbox"/> BAM-C	Partial (when a species is retained within one vegetation zone but not another)	Suitable breeding habitat only occurs in Vegetation Zones containing suitable hollows as defined in the TBDC: <i>Hollow bearing trees; a living or dead tree with a hollow &gt;20 cm diameter that occurs &gt;4 metres above the ground</i> Suitable hollows only occur within VZ 3 -PCT 3315 High Weed (HBTs 11, 18 & 23).	VZ4 3315_High Weed
Parma Wallaby	<i>Notamacropus parma</i>	Vulnerable	Vulnerable	No	<input checked="" type="checkbox"/> BAM-C PMST	Yes	Retained for further assessment	VZ1 3244_Forest
Southern Greater Glider	<i>Petauroides volans</i>	Endangered	Endangered	No	<input checked="" type="checkbox"/> BAM-C PMST	Partial (when a species is retained within one vegetation zone but not another)	Retained for further assessment Unsuitable microhabitat: This species is arboreal and dependant on large tree within eucalypt forest and woodland (TBDC). 3315_DNG and 3315_Exotic Pasture do not provide suitable habitat in the form of large trees able to be used by gliders.	VZ1 3244_Forest VZ2 3315_Forest VZ3 3315_Managed VZ4 3315_High-Weed

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					
								VZ7 4073_Forest
Squirrel Glider	<i>Petaurus norfolcensis</i>	Vulnerable	Not Listed	No	<input checked="" type="checkbox"/> BAM-C	Partial (when a species is retained within one vegetation zone but not another)	Unsuitable microhabitat: The TBDC states that Squirrel Gliders rely on large old trees with hollows for breeding and nesting. These trees are also critical for movement and typically need to be closely-connected (i.e. no more than 50 m apart). 3315_DNG and 3315_Exotic Pasture lack tree connectivity and therefore do not provide suitable habitat.	VZ1 3244_Forest VZ2 3315_Forest VZ3 3315_Managed VZ4 3315_High-Weed VZ7 4073_Forest
Brush-tailed Phascogale	<i>Phascogale tapoatafa</i>	Vulnerable	Not Listed	No	<input checked="" type="checkbox"/> BAM-C PMST	Partial (when a species is retained within one vegetation zone but not another)	Unsuitable microhabitat: The TBDC states this species prefers dry sclerophyll open forest, heath, swamps, rainforest and wet sclerophyll forest. It does not occupy derived or exotic grassland except as a temporary refuge moving between areas of habitat. As such, 3315_DNG and 3315_Exotic Pasture do not provide suitable habitat.	VZ1 3244_Forest VZ2 3315_Forest VZ3 3315_Managed VZ4 3315_High-Weed VZ7 4073_Forest

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					
Koala	<i>Phascolarctos cinereus</i>	Endangered	Endangered	No	<input checked="" type="checkbox"/> BAM-C PMST	Partial (when a species is retained within one vegetation zone but not another)	Retained for further assessment Unsuitable microhabitat: 3315_DNG and 3315_Exotic Pasture do not provide suitable habitat in the form of large trees able to be used by koalas for feeding.	VZ1 3244_Forest VZ2 3315_Forest VZ3 3315_Managed VZ4 3315_High-Weed VZ7 4073_Forest
Grey-headed Flying-fox (Breeding)	<i>Pteropus poliocephalus</i>	Vulnerable	Vulnerable	No	<input checked="" type="checkbox"/> BAM-C BioNet PMST	No	Habitat constraints absent: no breeding camps within Disturbance Footprint.	N/A
Masked Owl	<i>Tyto novaehollandiae</i>	Vulnerable	Not Listed	No	<input checked="" type="checkbox"/> BAM-C	Partial (when a species is retained within one vegetation zone but not another)	Suitable breeding habitat only occurs in Vegetation Zones containing suitable hollows as defined in the TBDC: <i>Hollow bearing trees; a living or dead tree with a hollow &gt;20 cm diameter that occurs &gt;4 metres above the ground</i> Suitable hollows only occur within VZ 3 -PCT 3315 High Weed (HBTs 11, 18 & 23).	VZ4 3315_High Weed
Sooty Owl	<i>Tyto tenebricosa</i>	Vulnerable	Not Listed	No	<input checked="" type="checkbox"/> BAM-C	Partial (when a species is retained within one vegetation	Suitable breeding habitat only occurs in Vegetation Zones containing suitable hollows or	VZ4 3315_High Weed

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					
						zone but not another)	caves, clifflines and edges as defined in the TBDC: Caves Cliffs;including clifflines/ledges Escarpments;including clifflines/ledges Hollow bearing trees; a living or dead tree with a hollow >20 cm diameter that occurs >4 metres above the ground Suitable hollows only occur within VZ 3 -PCT 3315 High Weed (HBTs 11, 18 & 23). No cliffs or caves are present within the Subject Land.	
Eastern Cave Bat	<i>Vespadelus troughtoni</i>	Vulnerable	Not Listed	No	Added to BAM-C following detection of <i>Vespadelus</i> sp.	Yes	Retained for further assessment	All Zones

### 5.1.2.1 *Delma vescolineata* – justification for exclusion from further assessment

Following an update to the BAM-C (Biodiversity Offset Scheme [BOS] update [No. 40]) on 30 July 2025, the Hunter Valley Delma (*Delma vescolineata*) was automatically added as an additional Candidate Species to the BAM-C case requiring assessment for the proposed development. However, for the purpose of this proposal the Hunter Valley Delma was removed as a Candidate Species for further assessment within the Disturbance Footprint based on the following:

- Species is not distributed within the “*IBRA subregion within which the Subject Land is mostly located*”, therefore does not meet key habitat criteria listed within Chapter 5.2.1 part 2 (a) of the BAM 2020
- Species vagrancy within the Upper Hunter IBRA Subregion in accordance with Chapter 5.2.2 of the BAM 2020
- Absence of microhabitats within the Disturbance Footprint in accordance with Chapter 5.2.3 of the BAM

Justification for the removal of this Candidate Species for survey assessment is outlined below.

#### **Species not distributed within the Upper Hunter IBRA Subregion**

In accordance with Chapter 5.2.1 (part 2) of the BAM 2020 “*the assessor must use the following criteria to identify those threatened species that have or may have, suitable habitat on the Subject Land*”, with Part 2a listed as “*the distribution of the species includes the IBRA subregion within which the Subject Land is mostly located*”. As there are no records of any species of *Delma* (including *D. vescolineata*) occurring within the Upper Hunter IBRA Subregion the distribution of *D. vescolineata* does not include the IBRA Subregion within which the Subject Land is mostly located. As the assessor is required to use this criteria to identify threatened species that have or may have suitable habitat on the Subject Land, not being able to meet this criteria requires the assessor to determine that the species does not have suitable habitat within the Subject Land. This is described in Chapter 5.2.1 (part 5) of BAM 2020; “*If any one of the criteria (2.a-2.f relevant to the threatened species is not met, the Subject Land should be considered as unsuitable habitat for that species. No further assessment is required for that species*”. As such, in accordance with Chapter 5.2.1 the species can be excluded as a Candidate Species for further assessment.

#### **Species Vagrancy**

In accordance with Chapter 5.2.2 (part 2c) of the BAM 2020 “*the assessor may consider that a threatened species is unlikely to occur on the Subject Land or in a vegetation zone if: the species is a vagrant in the IBRA subregion. No further assessment is required. The assessor must record their reasoning for this determination in the BAR*”.

“*Vagrant species*” is defined in the BAM as “*refers to occasional records of species in NSW that are outside their **normal distribution** or habitat, including escaped animals and planted specimens*”.

As there are no records of any species within the *Delma* genus occurring within the Upper Hunter IBRA Subregion the species can be excluded on the basis of Chapter 5.2.1 (part 2a), however, if any new records of *D. vescolineata* were to occur prior to submission of the BDAR the species would be considered “vagrant” in accordance with the BAM and can be excluded as a Candidate Species for further assessment.

## Absence of microhabitats

In accordance with Chapter 5.2.3 of the BAM 2020 “a candidate species credit species is considered unlikely to occur on the Subject Land (or specific vegetation zone) if one of the following applies:

- a. After carrying out a field assessment:
  - i. The assessor determines that microhabitats required by a species are absent from the Subject Land (or specific vegetation zone). The assessor must include a description of the microhabitats assessed as being required by the species in the BAR. This must be based on evidence such as published literature, or
  - ii. The assessor determines that the habitat constraints or microhabitats are degraded to the point that the species is unlikely to use the Subject Land (or specific vegetation zones)”

Habitat for *D. vescolineata* is characterized by the Department’s Threatened biodiversity profile search webpage as the following:

- *D. vescolineata* is known almost entirely from a 25 km wide corridor in the Hunter Valley, between Maitland and Muswellbrook, New South Wales (Mahony et al. 2022). A further specimen has been identified from just north of Parraweena on the Liverpool Plains, approximately 80 km north-west of Muswellbrook (Comm. DCCEEW 2024).
- Secondary native grassland remaining after the removal or dieback of previous woody canopy vegetation in association with sparse box-gum or ironbark woodland (Comm. DCCEEW 2024).
- Primary canopy species consists of *Eucalyptus melliodora* (yellow-box gum) and *E. crebra* (narrow-leaved ironbark), with a diverse ground cover layer containing multiple grasses including *Austrostipa* spp. (Speargrass), *Bothriochloa* spp. (Beardgrass), and *Chloris* spp. (finger grass) (Comm. DCCEEW 2024).
- It has been found sheltering under rocks and discarded rubbish, including building rubble, metal and organic waste (Comm. DCCEEW 2024).
- The species has been detected under dried cow pats in agricultural land that is heavily disturbed by livestock and contain no natural surface refugia (Comm. DCCEEW 2024)

Vegetation within the Subject Land is mapped as three (3) PCTs, being:

- PCT 3244: Lower North Spotted Gum - Mahogany - Ironbark Sheltered Forest
- PCT 3315: Central Hunter ironbark - Spotted Gum Forest
- PCT 4023: Coastal Valleys Swamp Oak Riparian Forest

Defined further below:

**Table 29: Summary of vegetation within the Disturbance Footprint**

PCT ID	PCT Name	Vegetation Formation	Vegetation Class	Dominant Canopy (average cover % across plots)
3244	Lower North Spotted Gum - Mahogany - Ironbark Sheltered Forest	Wet Sclerophyll Forests (Grassy sub-formation)	Northern Hinterland Wet Sclerophyll Forests	<i>Eucalyptus canaliculata</i> (20%), <i>Eucalyptus acmenoides</i> (3%), <i>Eucalyptus moluccana</i> (2%)
3315	Central Hunter ironbark - Spotted Gum Forest	Grassy Woodlands	Coastal Valley Grassy Woodlands	<i>Corymbia maculata</i> (24%), <i>Eucalyptus moluccana</i> (12.5%), <i>Eucalyptus crebra</i> (4%)
4073	Lower North Hinterland River Oak Forest	Forested Wetlands	Eastern Riverine Forests	<i>Casuarina glauca</i> (30%), <i>Angophora floribunda</i> (10%)

A review of the location of records also indicates within the Hunter Valley most records of species within the *Delma* genus occur on Permian geology, with less records to the south and west on Triassic stratigraphic units. There are no records of species within the *Delma* genus occurring on Carboniferous geological units as found within the Subject Land.

Based on the above, the vegetation within the Disturbance Footprint is not considered representative of known microhabitats for the species, noting that the Disturbance Footprint:

- Occurs on carboniferous geology,
- Occurs outside of a 25km wide corridor between Muswellbrook and Maitland,
- Does not contain “sparse box-gum or ironbark woodland” or grasslands derived from such communities, and
- Does not contain vegetation dominated by key canopy species *E. melliodora* and *E. crebra*,

#### Surveys were completed in accordance with guidelines at the time of the assessment

In accordance with Section 4.4.4 of the *Biodiversity Assessment Method Operation Manual – Stage 1* (DPE 2022) “If the department publishes new or revised survey guides, assessors are expected to apply them to all assessments for which the survey component is yet to be completed, and to all new assessments that commence on or after the publication date. This is to ensure that BARs meet the requirements of BAM Section 5.3(2.b.). Where survey has been completed prior to the publication of a new or revised survey guide, the department expects the assessor (or surveyor) to have applied current best-practice in searching for the target species (in accordance with BAM Section 5.3(2.c.)”.

Biodiversity Offsets Scheme Updates No. 40 was published on 30 July 2025. This document detailed the adding of *Delma vescolineata* as a Candidate Species and reduction of IBRA subregions for *Delma impar* (striped legless lizard). The document detailed that data including PCT and IBRA subregion associations would be published online in the TBDC and Bionet on 31 July 2025 and on the BAM-C on the week of the 4 August 2025.

Prior to the BOS update *Delma impar* was not associated with the PCTs within the Subject Land or IBRA Subregion in which the Subject Land is located. As such, no surveys were proposed for the species.

Once *Delma vescolineata* was added to the BAM-C during the week of 4 August 2025. As the proposal was due for submission by the end of 2025, surveys for the species would need to be completed in Spring 2025. Updates to the BAM-C did not allow enough time to complete surveys in accordance with the published guidelines within the proposal timeframe. As such, the species was removed as a Candidate Species for further assessment on the

basis that no surveys were required prior to the publication of a new survey guide. Therefore, “surveys” were completed in compliance with guidelines at the time. Wedgetail Project Consulting requested further advice on the inclusion of the species as a Candidate Species. A response was provided on 29 October 2025.

Notwithstanding the above change in methodology, a five week survey in Spring 2025 and Autumn 2026 across 10 tile arrays was conducted. During this period, no *Delma vescolineata* or any legless lizard species were recorded during this time, further justifying the assessment that the site does not contain suitable habitat.

### **Conclusion**

Considering the justification above, *Delma vescolineata* is feasible to be excluded as a Candidate Species for further assessment, however, conservatively survey has been completed.

## 5.2 Presence of candidate species credit species

This section of the BDAR summarises the determination of whether or not candidate threatened species are present on the Subject Land (or a specific vegetation zone). In accordance with BAM subsection 5.2.4, candidate species are determined to be present within the Subject Land based on:

- ‘Assumed presence’.
- Important habitat map (for dual credit species).
- Targeted threatened species surveys.
- An expert report.

In the case of the Project, there are no species with habitat mapped on the Important Areas Map (which applies to Regent Honeyeater and Swift Parot) and no expert reports have been used in the preparation of this BDAR. No species have been assumed present. Therefore, presence of candidate species on the Subject Land is determined by survey results.

**Table 30 Determining the presence of candidate flora species credit species on the Subject Land**

Common name	Scientific name	Listing status		Method used to determine presence	Present?	Further assessment required? (BAM Subsections 5.2.5 and 5.2.6)
		BC Act	EPBC Act			
<i>Acacia pendula</i> population in the Hunter catchment	<i>Acacia pendula</i> endangered population	Endangered Population	Not Listed	Targeted threatened species survey	No	No
Charmhaven Apple	<i>Angophora inopina</i>	Vulnerable	Vulnerable	Targeted threatened species survey	No	No
Netted Bottle Brush	<i>Callistemon linearifolius</i>	Vulnerable	Not Listed	Targeted threatened species survey	No	No
<i>Cymbidium canaliculatum</i> population in the Hunter Catchment	<i>Cymbidium canaliculatum</i> endangered population	Endangered Population	Not Listed	Targeted threatened species survey	No	No

Common name	Scientific name	Listing status		Method used to determine presence	Present?	Further assessment required? (BAM Subsections 5.2.5 and 5.2.6)
		BC Act	EPBC Act			
White-flowered Wax Plant	<i>Cynanchum elegans</i>	Endangered	Endangered	Targeted threatened species survey	No	No
<i>Eucalyptus camaldulensis</i> population in the Hunter catchment	<i>Eucalyptus camaldulensis</i> endangered population	Endangered Population	Not Listed	Targeted threatened species survey	No	No
Slaty Red Gum	<i>Eucalyptus glaucina</i>	Vulnerable	Vulnerable	Targeted threatened species survey	No	No
Craven Grey Box	<i>Eucalyptus largeana</i>	Endangered	Endangered	Targeted threatened species survey	No	No
Small-flower Grevillea	<i>Grevillea parviflora</i> subsp. <i>parviflora</i>	Vulnerable	Vulnerable	Targeted threatened species survey	No	No
(an orchid)	<i>Pterostylis chaetophora</i>	Vulnerable	Not Listed	Targeted threatened species survey	No	No
Scrub Turpentine	<i>Rhodamnia rubescens</i>	Critically Endangered	Critically Endangered	Targeted threatened species survey	No	No
Native Guava	<i>Rhodomyrtus psidioides</i>	Vulnerable	Vulnerable	Targeted threatened species survey	No	No
Heath Wrinklewort	<i>Rutidosis heterogama</i>	Vulnerable	Vulnerable	Targeted threatened species survey	No	No
Black-eyed Susan	<i>Tetradlea juncea</i>	Vulnerable	Vulnerable	Targeted threatened species survey	No	No

**Table 31 Determining the presence of candidate fauna species credit species on the Subject Land**

Common name	Scientific name	Listing status		Method used to determine presence	Present?	Further assessment required? (BAM Subsections 5.2.5 and 5.2.6)
		BC Act	EPBC Act			
Gang-gang Cockatoo (Breeding)	<i>Callocephalon fimbriatum</i>	Endangered	Endangered	Targeted threatened species survey	No	No
South-eastern Glossy Black-Cockatoo (Breeding)	<i>Calyptorhynchus lathami lathami</i>	Vulnerable	Vulnerable	Targeted threatened species survey	No	No
Eastern Pygmy-possum	<i>Cercartetus nanus</i>	Vulnerable	Not Listed	Targeted threatened species survey	No	No
Large-eared Pied Bat	<i>Chalinolobus dwyeri</i>	Endangered	Endangered	Targeted threatened species survey	<b>Yes</b>	<b>Yes</b>
Red Goshawk	<i>Erythroriorchis radiatus</i>	Endangered	Endangered	Targeted threatened species survey	No	No
White-bellied Sea-Eagle (Breeding)	<i>Haliaeetus leucogaster</i>	Vulnerable	Not Listed	Targeted threatened species survey	No	No
Little Eagle (Breeding)	<i>Hieraetus morphnoides</i>	Vulnerable	Not Listed	Targeted threatened species survey	No	No
Green and Golden Bell Frog	<i>Litoria aurea</i>	Endangered	Vulnerable	Targeted threatened species survey	No	No
Square-tailed Kite (Breeding)	<i>Lophoictinia isura</i>	Endangered	Vulnerable	Targeted threatened species survey	No	No
Southern Myotis	<i>Myotis macropus</i>	Vulnerable	Not Listed	Targeted threatened species survey	<b>Yes</b>	<b>Yes</b>
Barking Owl	<i>Ninox connivens</i>	Vulnerable	Not Listed	Targeted threatened species survey	No	No

Common name	Scientific name	Listing status		Method used to determine presence	Present?	Further assessment required? (BAM Subsections 5.2.5 and 5.2.6)
		BC Act	EPBC Act			
Powerful Owl	<i>Ninox strenua</i>	Vulnerable	Not Listed	Targeted threatened species survey	Yes	Yes
Parma Wallaby	<i>Notamacropus parma</i>	Vulnerable	Vulnerable	Targeted threatened species survey	No	No
Southern Greater Glider	<i>Petauroides volans</i>	Endangered	Endangered	Targeted threatened species survey	No	No
Squirrel Glider	<i>Petaurus norfolcensis</i>	Vulnerable	Not Listed	Targeted threatened species survey	Yes	Yes
Brush-tailed Phascogale	<i>Phascogale tapoatafa</i>	Vulnerable	Not Listed	Targeted threatened species survey	Yes	Yes
Koala	<i>Phascolarctos cinereus</i>	Endangered	Endangered	Targeted threatened species survey	No	No
Masked Owl	<i>Tyto novaehollandiae</i>	Vulnerable	Not Listed	Targeted threatened species survey	No	No
Sooty Owl	<i>Tyto tenebricosa</i>	Vulnerable	Not Listed	Targeted threatened species survey	No	No
Eastern Cave Bat	<i>Vespadelus troughtoni</i>	Vulnerable	Not Listed	Targeted threatened species survey	No	No

## 5.3 Threatened species surveys

**Table 32** (flora) and **Table 33** (fauna) detail survey method, timing and effort where targeted threatened species surveys were used to determine presence of threatened species.

**Table 32** 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 (transects or grids)	Timing of survey – within recommended period? (BAM-C/TBDC)	Effort (hours & no. people)			
<i>Acacia pendula</i> population in the Hunter catchment	<i>Acacia pendula</i> endangered population	20-40m transects (in dense or sparse vegetation respectively)	<input checked="" type="checkbox"/> Yes (All year) 19, 21, 24, 26 & 27 March 2025 7 & 15 April 2025	<input type="checkbox"/> No <Dates & times>	7 days, 8 people	No	No
Charmhaven Apple	<i>Angophora inopina</i>	20-40m transects (in dense or sparse vegetation respectively)	<input checked="" type="checkbox"/> Yes (All year) 19, 21, 24, 26 & 27 March 2025 7 & 15 April 2025	<input type="checkbox"/> No <Dates & times>	7 days, 8 people	No	No
Netted Bottle Brush	<i>Callistemon linearifolius</i>	10-20m transects (in dense or sparse vegetation respectively)	<input checked="" type="checkbox"/> Yes (Jan, Oct-Dec) 30 September 2025 1 & 2 October 2025	<input type="checkbox"/> No <Dates & times>	3 days, 11 people	No	No

Common name	Scientific name	Threatened flora species surveys			Present	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)	
		Survey method (transects or grids)	Timing of survey – within recommended period? (BAM-C/TBDC)	Effort (hours & no. people)			
<i>Cymbidium canaliculatum</i> population in the Hunter Catchment	<i>Cymbidium canaliculatum</i> endangered population	Surveys repeated twice: 5m transects during ground surveys and 20-40m transects (in dense or sparse vegetation respectively) during tree surveys	<input checked="" type="checkbox"/> Yes (All year) 9, 10, 11, 13, 16, 19 October 2023 19, 21, 24, 26 & 27 March 2025 7 & 15 April 2025 9, 10, 13 & 14 October 2025	<input type="checkbox"/> No <Dates & times>	17 days, 12 people	No	No
White-flowered Wax Plant	<i>Cynanchum elegans</i>	Transects repeat twice: 10-20m transects (in dense or sparse vegetation respectively) during shrub surveys and 20-40m transects (in dense or sparse vegetation respectively) during tree surveys	<input checked="" type="checkbox"/> Yes (All year) 19, 21, 24, 26 & 27 March 2025 7 & 15 April 2025 30 September 2025 1 & 2 October 2025	<input type="checkbox"/> No	10 days, 15 people	No	No

Common name	Scientific name	Threatened flora species surveys			Present	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)	
		Survey method (transects or grids)	Timing of survey – within recommended period? (BAM-C/TBDC)	Effort (hours & no. people)			
<i>Eucalyptus camaldulensis</i> population in the Hunter catchment	<i>Eucalyptus camaldulensis</i> endangered population	20-40m transects (in dense or sparse vegetation respectively)	<input checked="" type="checkbox"/> Yes (All year) 19, 21, 24, 26 & 27 March 2025 7 & 15 April 2025	<input type="checkbox"/> No <Dates & times>	7 days, 8 people	No	No
Slaty Red Gum	<i>Eucalyptus glaucina</i>	20-40m transects (in dense or sparse vegetation respectively)	<input checked="" type="checkbox"/> Yes (All year) 19, 21, 24, 26 & 27 March 2025 7 & 15 April 2025	<input type="checkbox"/> No <Dates & times>	7 days, 8 people	No	No
Craven Grey Box	<i>Eucalyptus largeana</i>	20-40m transects (in dense or sparse vegetation respectively)	<input checked="" type="checkbox"/> Yes (All year) 19, 21, 24, 26 & 27 March 2025 7 & 15 April 2025	<input type="checkbox"/> No <Dates & times>	7 days, 8 people	No	No
Small-flower Grevillea	<i>Grevillea parviflora</i> subsp. <i>parviflora</i>	10-20m transects (in dense or sparse vegetation respectively)	<input checked="" type="checkbox"/> Yes (Aug-Nov) 30 September 2025 1 & 2 October 2025	<input type="checkbox"/> No <Dates & times>	3 days, 11 people	No	No
(an orchid)	<i>Pterostylis chaetophora</i>	5m transects	<input checked="" type="checkbox"/> Yes (Sept-Nov) 9, 10, 11, 13, 16, 19 October 2023 9, 10, 13 & 14 October 2025	<input type="checkbox"/> No <Dates & times>	10 days, 12 people	No	No
Scrub Turpentine	<i>Rhodamnia rubescens</i>	10-20m transects (in dense or sparse vegetation respectively)	<input checked="" type="checkbox"/> Yes (All year) 30 September 2025 1 & 2 October 2025	<input type="checkbox"/> No <Dates & times>	3 days, 11 people	No	No

Common name	Scientific name	Threatened flora species surveys			Present	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)
		Survey method (transects or grids)	Timing of survey – within recommended period? (BAM-C/TBDC)	Effort (hours & no. people)		
Native Guava	<i>Rhodomyrtus psidioides</i>	10-20m transects (in dense or sparse vegetation respectively)	<input checked="" type="checkbox"/> Yes (All year) 30 September 2025 1 & 2 October 2025	<input type="checkbox"/> No <Dates & times>	3 days, 11 people	No
Heath Wrinklewort	<i>Rutidosia heterogama</i>	5m transects	<input checked="" type="checkbox"/> Yes (All year) 9, 10, 11, 13, 16, 19 October 2023 9, 10, 13 & 14 October 2025	<input type="checkbox"/> No <Dates & times>	10 days, 12 people	No
Black-eyed Susan	<i>Tetradlea juncea</i>	5m transects	<input checked="" type="checkbox"/> Yes (Sept-Oct) 9, 10, 11, 13, 16, 19 October 2023 9, 10, 13 & 14 October 2025	<input type="checkbox"/> No <Dates & times>	10 days, 12 people	No

**Table 33 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 (e.g. harp trap, Elliott trap, bioacoustics, etc.)	Timing of survey – within recommended period? (BAM-C/TBDC)	Effort (hours & no. people)		
Gang-gang Cockatoo (Breeding)	<i>Callocephalon fimbriatum</i>	Dawn bird survey	<input checked="" type="checkbox"/> Yes (Oct-Jan)	<input type="checkbox"/> No <Dates & times>	2 days, 3 people	No

Common name	Scientific name	Threatened fauna species surveys			Present	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)	
		Survey method (e.g. harp trap, Elliott trap, bioacoustics, etc.)	Timing of survey – within recommended period? (BAM-C/TBDC)	Effort (hours & no. people)			
			4 & 5 November 2025				
South-eastern Glossy Black-Cockatoo (Breeding)	<i>Calyptorhynchus lathami lathami</i>	Dusk bird survey	<input checked="" type="checkbox"/> Yes (Apr-Aug) 11 & 12 June 2025	<input type="checkbox"/> No <Dates & times>	2 days, 2 people	No	No
Eastern Pygmy-possum	<i>Cercartetus nanus</i>	Remote camera (All cameras were installed for a minimum of 4 weeks).	<input checked="" type="checkbox"/> Yes (Jan-Mar, Oct-Dec) 12, 13, 14 (install), 24 and 25 (re bait) March 2025 15 April 2025 (collect)	<input type="checkbox"/> No <Dates & times>	4 weeks, 2 people	No	No
Large-eared Pied Bat	<i>Chalinolobus dwyeri</i>	Anabat bioacoustic recorder (installed for 2 weeks) and harp traps	<input checked="" type="checkbox"/> Yes (Nov-Jan) Anabat 13 March–27 April 2025  Harp trap 3–7 November 2025	<input type="checkbox"/> No <Dates & times>	4 nights, 4 people	<b>Yes</b>	<b>Yes</b>
Red Goshawk	<i>Erythrotriorchis radiatus</i>	Dawn and dusk bird survey	<input checked="" type="checkbox"/> Yes (All year) 4 & 5 November 2025	<input type="checkbox"/> No <Dates & times>	4 days, 4 people	No	No

Common name	Scientific name	Threatened fauna species surveys			Present	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)
		Survey method (e.g. harp trap, Elliott trap, bioacoustics, etc.)	Timing of survey – within recommended period? (BAM-C/TBDC)	Effort (hours & no. people)		
			11 & 12 June 2025			
Little Eagle (Breeding)	<i>Hieraaetus morphnoides</i>	Stick nest search and dawn bird survey	<input checked="" type="checkbox"/> Yes (Aug-Oct) 31 October 2025 3, 4 & 5 November 2025	<input type="checkbox"/> No <Dates & times>	4 days, 4 people	No
Green and Golden Bell Frog	<i>Litoria aurea</i>	Nocturnal search	<input checked="" type="checkbox"/> Yes (Jan-Mar, Nov-Dec) 12, 24, 26 and 27 March 2025	<input type="checkbox"/> No <Dates & times>	4 nights, 3 people	No
Square-tailed Kite (Breeding)	<i>Lophoictinia isura</i>	Stick nest search and dawn bird survey	<input checked="" type="checkbox"/> Yes (Sep-Jan) 3, 4 & 5 November 2025 31 October 2025 3 November 2025	<input type="checkbox"/> No <Dates & times>	4 days, 4 people	No
Southern Myotis	<i>Myotis macropus</i>	Anabat and harp traps	<input checked="" type="checkbox"/> Yes (Jan-Mar, Oct-Dec) 13 March 2025 3–7 November 2025	<input type="checkbox"/> No <Dates & times>	5 days, 4 people	<b>Yes</b>
Barking Owl	<i>Ninox connivens</i>	Call playback	<input checked="" type="checkbox"/> Yes (All year) 13 March 2025 14 April 2025	<input type="checkbox"/> No <Dates & times>	4 days, 4 people	No

Common name	Scientific name	Threatened fauna species surveys			Present	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)
		Survey method (e.g. harp trap, Elliott trap, bioacoustics, etc.)	Timing of survey – within recommended period? (BAM-C/TBDC)	Effort (hours & no. people)		
			16 April 2025 24 April 2025 11 & 12 June 2025			
Powerful Owl	<i>Ninox strenua</i>	Call playback	<input checked="" type="checkbox"/> Yes (All year) 13 March 2025 14 April 2025 16 April 2025 24 April 2025 11 & 12 June 2025	<input type="checkbox"/> No <Dates & times>	4 nights, 4 people	Yes
Parma Wallaby	<i>Notamacropus parma</i>	Spotlighting and remote cameras (All cameras were installed for a minimum of 4 weeks).	<input checked="" type="checkbox"/> Yes (All year) Spotlighting 13 March 2025 14, 15, 16, 23 and 24 April 2025  Remote cameras 12, 13, 14 (install), 24 and 25 (re bait) March 2025 15 April 2025 (collect)	<input type="checkbox"/> No <Dates & times>	Spotlighting 5 days, 5 people  Remote cameras 4 weeks, 2 people	No

Common name	Scientific name	Threatened fauna species surveys			Effort (hours & no. people)	Present	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)
		Survey method (e.g. harp trap, Elliott trap, bioacoustics, etc.)	Timing of survey – within recommended period? (BAM-C/TBDC)				
Southern Greater Glider	<i>Petauroides volans</i>	Spotlighting and remote cameras (All cameras were installed for a minimum of 4 weeks).	<input checked="" type="checkbox"/> Yes (All year) Spotlighting 13 March 2025 14, 15, 16, 23 and 24 April 2025  Remote cameras 12, 13, 14 (install), 24 and 25 (re bait) March 2025 15 April 2025 (collect)	<input type="checkbox"/> No <Dates & times>	Spotlighting 5 days, 5 people  Remote cameras 4 weeks, 2 people	No	No
Squirrel Glider	<i>Petaurus norfolcensis</i>	Spotlighting and remote cameras (All cameras were installed for a minimum of 4 weeks).	<input checked="" type="checkbox"/> Yes (All year) Spotlighting 13 March 2025 14, 15, 16, 23 and 24 April 2025  Remote cameras 12, 13, 14 (install), 24 and 25 (re bait) March 2025	<input type="checkbox"/> No <Dates & times>	Spotlighting 5 days, 5 people  Remote cameras 4 weeks, 2 people	<b>Yes</b>	<b>Yes</b>

Common name	Scientific name	Threatened fauna species surveys			Present	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)	
		Survey method (e.g. harp trap, Elliott trap, bioacoustics, etc.)	Timing of survey – within recommended period? (BAM-C/TBDC)	Effort (hours & no. people)			
			15 April 2025 (collect)				
Brush-tailed Phascogale	<i>Phascogale tapoatafa</i>	Spotlighting and remote cameras (All cameras were installed for a minimum of 4 weeks).	<input checked="" type="checkbox"/> Yes (Dec-Jun) Spotlighting 13 March 2025 14, 15, 16, 23 and 24 April 2025  Remote cameras 12, 13, 14 (install), 24 and 25 (re bait) March 2025 15 April 2025 (collect)	<input type="checkbox"/> No <Dates & times>	Spotlighting 5 days, 5 people  Remote cameras 4 weeks, 2 people	<b>Yes</b>	<b>Yes</b>
Koala	<i>Phascolarctos cinereus</i>	Spotlighting, call playback and Koala Spot Assessment Technique (SAT)	<input checked="" type="checkbox"/> Yes (All year) Spotlighting 13 March 2025 14, 15, 16, 23 and 24 April 2025  Call playback 13 March 2025	<input type="checkbox"/> No <Dates & times>	Spotlighting 5 days, 5 people  Call Playback 4 days, 4 people  SAT 3 days, 3 people	No	No

Common name	Scientific name	Threatened fauna species surveys			Present	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)	
		Survey method (e.g. harp trap, Elliott trap, bioacoustics, etc.)	Timing of survey – within recommended period? (BAM-C/TBDC)	Effort (hours & no. people)			
			14 April 2025 16 April 2025 24 April 2025 11 & 12 June 2025  SAT 18, 19 and 21 March 2025				
Masked Owl	<i>Tyto novaehollandiae</i>	Call playback	<input checked="" type="checkbox"/> Yes (All year)	<input type="checkbox"/> No <Dates & times>	4 days, 4 people	No	No
			13 March 2025 14 April 2025 16 April 2025 24 April 2025 11 & 12 June 2025				
Sooty Owl	<i>Tyto tenebricosa</i>	Call playback	<input checked="" type="checkbox"/> Yes (All year)	<input type="checkbox"/> No <Dates & times>	4 days, 4 people	No	No
			13 March 2025 14 April 2025 16 April 2025 24 April 2025 11 & 12 June 2025				

Common name	Scientific name	Threatened fauna species surveys			Effort (hours & no. people)	Present	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)
		Survey method (e.g. harp trap, Elliott trap, bioacoustics, etc.)	Timing of survey – within recommended period? (BAM-C/TBDC)				
Eastern Cave Bat	<i>Vespadelus troughtoni</i>	Anabat bioacoustic recorder (installed for 2 weeks) and harp traps (see Note 1)	<input checked="" type="checkbox"/> Yes (Nov-Jan) Anabat 13 March – 27 April 2025  Harp trap 3–7 November 2025	<input type="checkbox"/> No <Dates & times>	5 days, 4 people	No	No
Hunter Valley Delma	<i>Delma vescolineata</i>	Tile arrays, with weekly checks for 10 weeks following tile placement 4 weeks before commencement	<input checked="" type="checkbox"/> Yes (Spring / Autumn)	<input type="checkbox"/> No <Dates & times>	10 weeks, weekly checks	No	No

Note 1:

Potential Eastern Cave Bat calls were detected via Anabat surveys within the Study Area. However, calls from the species were unable to be differentiated from the common Little Forest Bat (*Vespadelus vulturnus*). Additional surveys were completed for the species, including the use of four harp traps for a period of four nights within the Subject Land. Little Forest Bat was trapped during this survey but no Eastern Cave Bats were trapped. This indicates the call detected via Anabat were Little Forest Bat rather than Eastern Cave Bat. As such, Eastern Cave Bat could not be confirmed present within the Study Area, and as the species is not associated with any of the PCTs mapped within the Study Area, no species polygon or credit obligation will be created for the species.

## 5.4 Expert reports

No expert reports were sought as part of this BDAR.

## 5.5 More appropriate local data (where relevant)

Local data were not used for this BDAR.

## 5.6 Area or count, and location of suitable habitat for a species credit species (a species polygon)

The assessment of survey results and presence on site for relevant candidate species is summarised above in **Table 32** and **Table 33**. The removal of native vegetation as part of the construction of the project will generate a requirement for offsetting impacts on threatened species habitat. The following candidate species have been recorded within the Disturbance Footprint and require credit offsets:

- Brush-tailed Phascogale
- Squirrel Glider
- Powerful Owl
- Southern Myotis
- Large-eared Pied Bat

A species polygon was generated for all species credits within the Disturbance Footprint, as detailed below in **Table 34** with details on habitat constraints, mapped area of suitable habitat (i.e. area of species polygon) and requirements for species polygons (from the TBDC). Species polygons mapped on **Figure 18–Figure 22**.

**Table 34** Calculation of species polygons

Common name	Scientific name	Method for generating species polygon	Polygon area (ha) / count
Large-eared Pied Bat	<i>Chalinolobus dwyeri</i>	The species polygon aligns with intact VZs (i.e. excluding derived and exotic grasslands) containing associated intact PCTs that are within 2 km of caves, scarps, cliffs, rock overhangs and disused mines.  The entire Disturbance Footprint is within 2 km of cliffs and caves to the northeast. As such all VZs with the exception of VZ5 and VZ6 form part of the species polygon. These include: VZ1 3244_Forest VZ2 3315_Forest VZ3 3315_Managed VZ4 3315_High Weed VZ7 4073_Forest	41.31
Southern Myotis	<i>Myotis macropus</i>	The species polygon aligns with intact VZs (i.e. excluding derived and exotic grasslands) containing associated intact PCTs that are within 200m of suitable waterbodies (3 m or wider).  These include: VZ1 3244_Forest VZ2 3315_Forest VZ3 3315_Managed VZ4 3315_High Weed VZ7 4073_Forest	24.62

Common name	Scientific name	Method for generating species polygon	Polygon area (ha) / count
Powerful Owl	<i>Ninox strenua</i>	Species polygon includes vegetation zones containing associated PCTs; 1. within 800 m from the location of a detected owl, and 2. containing a living or dead tree with a hollow >20cm diameter that occurs >4m above the ground. Only VZ4 PCT 3315 High Weed contained suitable hollows, and is within 800 m of the recorded owl, thus the polygon equates to all of PCT 3315 High Weed.	6.97
Squirrel Glider	<i>Petaurus norfolcensis</i>	All VZs containing associated PCTs and canopy connectivity. These include: VZ1 3244_Forest VZ2 3315_Forest VZ3 3315_Managed VZ4 3315_High Weed VZ7 4073_Forest	41.31
Brush-tailed Phascogale	<i>Phascogale tapoatafa</i>	All VZs containing associated PCTs and canopy connectivity. These include: VZ1 3244_Forest VZ2 3315_Forest VZ3 3315_Managed VZ4 3315_High Weed VZ7 4073_Forest	41.31

**Table 35 Results for present species (recorded within the Subject Land)**

Common name	Scientific name	Biodiversity risk weighting	SAIL entity	Habitat constraints/ microhabitats present on the Subject Land/ vegetation zone	Extent (ha) of suitable habitat present on site	TBDC species specific recommendations e.g. buffers, general comments
Large-eared Pied Bat	<i>Chalinolobus dwyeri</i>	Very High (3)	Yes	Within 2 km of rocky areas containing caves, overhangs, escarpments, outcrops, or crevices, or within 2 km of old mines or tunnels	41.31	<p>All associated PCTs within 2 km of suitable breeding habitat (i.e. all intact VZs).</p> <p>Guidelines note degraded PCTs may generate credits in a Stewardship Site where restoration is planned. VZ5 and VZ6 do not include a canopy or shrub layer, are not planned for restoration and are therefore unlikely to be suitable habitat.</p> <p>Williams &amp; Bruce 2018 identified the sharp grassland forest borders at mid to upper canopy height and creeks or moist gully areas with wet vegetation types as preferred habitat. The open grassland of VZ5 and VZ6 are therefore unlikely to be suitable.</p>
Southern Myotis	<i>Myotis macropus</i>	High (2)	No	Waterbodies with permanent pools/stretchers 3 m (dams and creeks)	24.62	<p>All associated PCTs within 200 m of suitable waterbodies.</p> <p>Roosting in trees, crevices and caves and foraging over streams and pools, grassland habitats are unlikely to constitute suitable habitat.</p> <p>Guidelines note degraded PCTs may generate credits in a Stewardship Site where restoration is planned. VZ5 and VZ6 do not include a canopy or shrub layer, are not planned for restoration and unlikely to be suitable habitat.</p>
Powerful Owl	<i>Ninox strenua</i>	High (2)	No	Tree hollows >20 cm diameter >4 m above ground	6.97	<p>All vegetation zones (i) within 800m of detected owl, and (ii) containing living or dead tree with hollow &gt;20cm diameter &gt;4m above ground</p>

Common name	Scientific name	Biodiversity risk weighting	SAIL entity	Habitat constraints/ microhabitats present on the Subject Land/ vegetation zone	Extent (ha) of suitable habitat present on site	TBDC species specific recommendations e.g. buffers, general comments
Squirrel Glider	<i>Petaurus norfolcensis</i>	High (2)	No	VZ5 3315_DNG and VZ6 3315_Exotic Pasture do not provide suitable habitat due to absence of microhabitats	41.31	n/a (All PCTs associated with species)
Brush-tailed Phascogale	<i>Phascogale tapoatafa</i>	High (2)	No	3315_DNG and 3315_Exotic Pasture do not provide suitable habitat due to absence of microhabitats	41.31	n/a (All PCTs associated with species)

**Table 36 Results for EPBC Act listed species present (recorded within the Subject Land)**

<b>Common name</b>	<b>Scientific name</b>	<b>Extent (ha) of suitable habitat present on site</b>
Large-eared Pied Bat	<i>Chalinolobus dwyeri</i>	41.31
Grey-headed Flying Fox (non-breeding)	<i>Pteropus poliocephalus</i>	41.31

## 6. Identifying prescribed impacts

Prescribed additional biodiversity impacts (prescribed impacts) are defined under clause 6.1 of the BC Regulation. Such prescribed impacts (including direct and indirect impacts) are impacts:

- On the habitat of threatened entities including:
  - Karst, caves, crevices, cliffs, rocks and other geological features of significance.
  - Human-made structures.
  - Non-native vegetation.
- On areas connecting threatened species habitat, such as movement corridors.
- That affect water quality, water bodies and hydrological processes that sustain threatened entities (including from subsidence or upsidence from underground mining).
- On threatened and protected animals from turbine strikes from a wind farm.
- On threatened species of fauna, or fauna that are part of a TEC, from vehicle strikes.

Prescribed impact features that are identified in BAM 2020 are listed below in **Table 37** with respect to the Disturbance Footprint.

**Table 37 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. Where relevant, threatened species or fauna that are part of a TEC or EC, that are at risk of vehicle strike
Karst, caves, crevices, cliffs, rocks or other geological features of significance	<input type="checkbox"/> Yes / <input checked="" type="checkbox"/> No	Not present within the Disturbance Footprint or nearby.  Cliff lines are located outside the Project Site, the nearest section of quarry pit is located approximately 500m south west of the cliff lines. No vibration impacts on these features predicted.	n/a
Human-made structures	<input type="checkbox"/> Yes / <input checked="" type="checkbox"/> No	No human-made structures are present within the Disturbance Footprint.	n/a
Non-native vegetation	<input type="checkbox"/> Yes / <input checked="" type="checkbox"/> No	Exotic-dominated pasture contains some native species and therefore has been assessed as a VZ assigned to 3315 Exotic Pasture. No assessment for prescribed impacts is required.	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. Where relevant, threatened species or fauna that are part of a TEC or EC, that are at risk of vehicle strike
Habitat connectivity	<input checked="" type="checkbox"/> Yes / <input type="checkbox"/> No	The proposal is unlikely to lead to any major separation or disconnection between areas of vegetation within corridors. Cross-site connectivity will be reduced at a local scale.	Threatened mammal species. Threatened bird species with limited dispersal ability. Common fauna species that are part of the Central Hunter Ironbark-Spotted Gum-Grey Box Forest TEC.
Waterbodies, water quality and hydrological processes	<input checked="" type="checkbox"/> Yes / <input type="checkbox"/> No	1 <sup>st</sup> -3 <sup>rd</sup> order streams. The proposal will directly impact a dam providing habitat for recorded Southern Myotis.	Southern Myotis.
Vehicle strikes	<input checked="" type="checkbox"/> Yes / <input type="checkbox"/> No	Development and use of haul roads within site plus increased traffic on public roads used to access site (average increase of 110 laden trucks per day). Increased risk of vehicle strike impacts on native fauna.	Threatened terrestrial mammal and low-flying bird species. Common fauna terrestrial mammal and low-flying bird species that occur within the locality.

The list of threatened entities was generated based on site survey, habitat assessment and consideration of the habitats described for each species in the TBDC.

Potential impacts associated with prescribed impact features are discussed in Section 8.3.

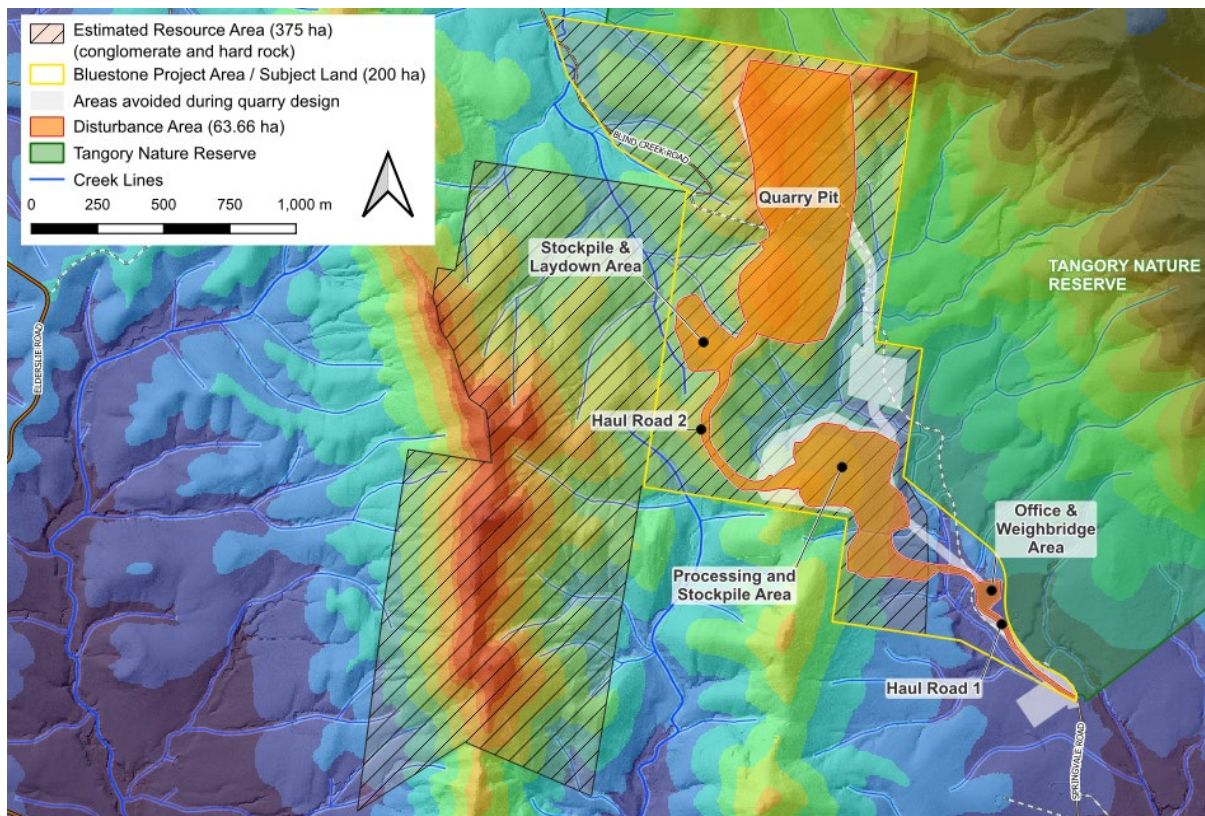
## 7. Avoid and minimise impacts

The current proposed layout of the quarry and associated infrastructure has undergone an iterative design process, taking into consideration engineering, surface water, traffic and transport and biodiversity values. Avoidance of impacts on native vegetation, fauna habitats watercourses and other biodiversity values have been taken into consideration in the design.

The Bluestone Hardrock Quarry design and avoidance process is summarised below:

1. Investigated land holdings for hard rock and conglomerate resources, identifying a nominal potential resource area of 375 ha (refer **Plate 2**).
2. Undertook further resource assessment of areas that appeared to show better potential (e.g. greater presence of surface bedrock), within the adopted 200ha Subject Land for the Development Application.
3. Adopted the current resource and disturbance boundary considering a complex mix of factors including:
  - a. Ability to transport material from the site, considering four potential site haulage options including:
    - i. To Springvale Road along the valley floor using several different routes, adopted the most practical route considering grades and crossing locations of the creeklines.
    - ii. To Blind Creek Road, discounted due to additional road works needed and additional distance.
    - iii. Via a more elevated route to the south avoiding Springvale Road, avoided due to greater potential noise and additional intersection limitations on Stanhope Road.
    - iv. Alternative quarry access road following the creek line closer to Tangory Nature Reserve, discounted due to the additional creek crossings and required grades to reach top of resource area.
  - b. Removed a smaller quarry to the north of processing area due to location adjacent to creeks and proximity to Nature Reserve.
  - c. Location of surrounding private land holdings and receptors to limit noise and dust impacts.
  - d. Positioned the processing area away from receptors and adopted a design that would maximise the use of natural topography and cuttings to screen work areas.
  - e. Likely extent of overburden, adopted areas where overburden was shallowest, this is most evident on the northern portion of the quarry pit.
  - f. Ability to have more than one material for extraction (ie conglomerate gravels in the south and hard rock reserves in the north)
  - g. Avoidance of the Tangory Nature Reserve:
    - i. 50m buffer for resource extraction area, This buffer aligns with the aims of the *Developments adjacent to NPWS lands: Guidelines for consent and planning authorities* (DPIE 2022).
    - ii. 30m buffer for the resource processing area, noting the reserve in this area was substantially cleared for agriculture.
    - iii. 18m buffer for the office and weighbridge area, noting the reserve in this area is open grasslands cleared for agriculture.

- h. Avoidance of mapped drainage lines in the resource area and limiting the extent of crossings by haulage roads
- i. Maximising resource within the smallest footprint, whilst avoiding the creating a void on completion. The proposed development has been positioned on more elevated landforms with suitable geology to maximise the resource availability within the applications spatial extent. This reduces the long term footprint of the quarry whilst enabling a free draining final landform at the conclusion of resource extraction. The application is for 30 years of quarrying from an estimated resource extent of at least 50 years.
- j. The resource area is effectively screened to the north east and south west by higher ridgelines limiting the extent of visibility in these directions.
- k. Engineering feasibility to create haulage roads and processing areas with suitable grades for access.
- l. The extent of previously cleared lands within the disturbance area, aiming to utilise areas that had been more cleared in the past, and which also had higher spread of weeds.
- m. Considering the extent of higher quality vegetation, including the Commonwealth protected CEEC, the current Disturbance Footprint targets areas of lower quality vegetation.



**Plate 2: Quarry design and avoidance considerations**

## 7.1 Avoid and minimise direct and indirect impacts

Direct and indirect impacts have been avoided and minimised through locating and designing the proposal in the following ways:

- The full extent of the lots owned by the proponent within the Project Site have large potential for hardrock quarrying beyond the Subject Land. The proposed

development has been located within the Project Site to avoid impacts on the majority of the vegetation within the property (**Figure 5**), including the following:

- 1.55 ha of PCT 3110 Greater Sydney Enriched Grey Myrtle Dry Rainforest
  - 7.17 ha of PCT 3244 Lower North Spotted Gum - Mahogany - Ironbark Sheltered Forest
  - 105.49 ha of PCT 3315 Central Hunter Ironbark - Spotted Gum Forest equivalent to the TEC *Central Hunter ironbark - Spotted Gum Forest is associated with the Central Hunter Ironbark-Spotted Gum-Grey Box Forest in New South Wales North Coast and Sydney Basin Bioregions*
  - 17.56 ha of derived native grassland assigned to PCT 3315 Central Hunter Ironbark - Spotted Gum Forest (non-TEC)
  - 0.51 ha of PCT 3444 Lower Hunter Spotted Gum - Ironbark Forest associated with the TEC *Lower Hunter Spotted Gum - Ironbark Forest in the Sydney Basin Bioregion*
  - 2.10 ha of PCT 4073 Lower North Hinterland River Oak Forest
- The proposed development has been located to minimise impacts to higher condition vegetation zones (VZ 1, VZ 2 and VZ 7), prioritising impacts to lower condition vegetation zones (VZ 3, VZ 4, VZ 5 and VZ 6) and Category 1-exempt land mapped by the NVR map. Substantial areas of the site where remnant vegetation existed in 1961 (Figure 4, Figure 5) have been avoided, retaining these more mature areas.
  - The location of the stockpile and laydown area has been located to avoid Biodiversity Values Land associated with the upper reaches of Blind Creek (Figure 5).
  - Haul roads have been located to utilise existing tracks and fire trails within the property, minimising the level of impact for road construction. Access to the Disturbance Footprint will be achieved by upgrade of the existing property access track (as an alternative to construction along a new track alignment, which would involve substantial vegetation clearing) so that minimal clearing of native vegetation is required.
  - Alternative design with eastern haul road would impact PCT 3110 rainforest vegetation and second-order stream (**Figure 5**). The current haul road location avoids these impacts.
  - Dust suppression using water carts will minimise indirect impacts caused by excessive dust.
  - The proposal avoids impacts to 20 hollow-bearing trees providing potential habitat for the hollow-dependent threatened species including recorded Powerful Owl, Squirrel Glider and Brush-tailed Phascogale.

## 7.2 Avoid and minimise prescribed impacts

Prescribed impacts have been avoided and minimised through locating and designing the proposal in the following ways:

- The proposal avoids impacts to nine waterbodies (dams and creek lines) that provide suitable foraging habitat for Southern Myotis
- Design of the watercourse / drainage line crossings will be consistent with the NSW Department of Planning Environment Fact Sheet, *Controlled activities – Guidelines for watercourse crossings on waterfront land*, to minimise changes to hydrology and maintain natural functioning of the watercourses
- The proposed pit has been located to avoid significant adverse impacts on water quality, bed and bank stability, aquatic and riparian habitats, and ecological processes (Martens 2025b)

- Sediment and erosion control measures consistent with *Managing Urban Stormwater: Soils and Construction* (the Blue Book) will be adopted to minimise erosion, sedimentation and nutrient loads in runoff
- 30 kmh speed limit imposed throughout the project site will minimise vehicle strike on threatened and common species

### 7.3 Other measures considered

Other measures were not considered.

### 7.4 Summary of measures to avoid and minimise impacts

A summary of avoidance and minimisation actions is provided in **Table 38**.

**Table 38** Avoidance and minimisation measures for direct, indirect and prescribed impacts

Action	Outcome (Describe the outcome of implementing the measure, with reference to specific entities identified in Sections 4 (Native vegetation, threatened ecological communities and vegetation integrity) and 5 (Habitat suitability for threatened species))	Timing	Responsibility
Location of pit, processing and weighbridge/office	The proposed development has been located to minimise impacts to higher condition vegetation zones (VZ 1, VZ 2 and VZ 7), prioritising impacts to lower condition vegetation zones (VZ 3, VZ 4, VZ 5 and VZ 6) and Category 1-exempt land mapped by the NVR map.	Vegetation clearing prior to construction at all stages	Proponent
Location of quarry pit	The proposed development has been positioned on more elevated landforms with suitable geology to maximise the resource availability within the applications spatial extent. This reduces the long term footprint of the quarry whilst enabling a free draining final landform at the conclusion of resource extraction. The application is for 30 years of quarrying from an estimated resource extent of at least 50 years.	Stage 2, 4	Proponent
Location of stockpile area	Avoids impacts to mapped Biodiversity Values associated with Blind Creek	Stage 3 vegetation clearing and construction	Proponent
Haul roads utilise existing tracks and site access	Minimise vegetation clearing for haul roads	Stage 1 and 2 clearing and construction	Proponent
Alternative option chosen over eastern option	Avoid impacts to PCT 3110 rainforest and 2 <sup>nd</sup> order stream	Stage 1 and 2 clearing and construction	Proponent
Dust suppression water trucks	Minimise indirect impacts caused by dust	Operation of all stages	Site manager, Plant operators

<b>Action</b>	<b>Outcome</b> (Describe the outcome of implementing the measure, with reference to specific entities identified in Sections 4 (Native vegetation, threatened ecological communities and vegetation integrity) and 5 (Habitat suitability for threatened species))	<b>Timing</b>	<b>Responsibility</b>
Quarry location	Avoids impacts to nine waterbodies (dams and creeklines) that provide suitable foraging habitat for Southern Myotis	All stages	Proponent
Watercourse crossing design	Minimise changes to hydrology and maintain natural functioning of the watercourses	Construction of haul road Stage 1	Proponent, engineers, construction team
Sediment and erosion control	Minimise sediment and pollution impacts to watercourses	All stages	Proponent, engineers, construction team
Quarry speed limit	Minimise vehicle strike on threatened and common species	Operation from Stage 1 onward	Site manager, truck operators

## 8. Impact assessment

### 8.1 Direct impacts

#### 8.1.1 Residual direct impacts

The Proposal will require the removal of 59.30 ha of native vegetation and associated fauna habitat, including 11 hollow-bearing trees. Direct residual impacts on native vegetation (by PCT) within the Subject Land as a result of the Proposal, after steps are taken to avoid and minimise impacts, are provided below in **Table 39**. Note that these areas exclude areas of land mapped at Category 1 land on the Native Vegetation Regulatory Map which have been excluded from impact assessment (Section 1.3). A breakdown of impacts for each development stage are also provided.

The biodiversity offsets required (under the BAM) to compensate for the loss of the above vegetation are detailed in Sections 10.1 and 11 below.

**Table 39** Summary of residual direct impacts

Direct impact	BC Act status	EPBC Act status	SAll entity	Project Stage (ha/count)					Total Extent (ha/count)
				1	2	3	4	5	
<b>Ecosystem Impacts</b>									
VZ1 3244_Forest-3244 Lower North Spotted Gum - Mahogany - Ironbark Sheltered Forest	-	-	No	0.00	1.63	0.00	0.03	0.00	1.65
VZ2 3315_Forest-3315 Central Hunter Ironbark - Spotted Gum Forest	EEC	CEEC	No	6.07	8.76	3.61	1.66	2.33	22.43
VZ3 3315_Managed-3315 Central Hunter Ironbark - Spotted Gum Forest	EEC	CEEC	No	0.00	8.13	0.00	2.10	0.00	10.24
VZ4 3315_High_Weed-3315 Central Hunter Ironbark - Spotted Gum Forest	EEC	-	No	0.02	2.08	0.00	4.87	0.00	6.97
VZ5 3315_DNG-3315 Central Hunter Ironbark - Spotted Gum Forest	-	-	No	9.17	0.86	0.44	0.00	0.66	11.13

Direct impact	BC Act status	EPBC Act status	SAIL entity	Project Stage (ha/count)					Total Extent (ha/count)
				1	2	3	4	5	
VZ6 3315_ Exotic Pasture	-	-	No	0.00	8.74	0.00	0.45	0.00	9.19
VZ7 4073_ Forest-4073 Lower North Hinterland River Oak Forest	-	-	No	0.01	0.00	0.00	0.00	0.00	0.01
<b>Threatened Species</b>									
Chalinolobus dwyeri / Large-eared Pied Bat	Endangered	Endangered	No	6.10	20.61	3.61	8.66	2.33	41.31
Myotis macropus / Southern Myotis	Vulnerable	-	No	2.36	11.64	1.79	8.03	0.79	24.62
Ninox strenua / Powerful Owl	Vulnerable	-	No	0.02	2.08	0	4.87	0	6.97
Petaurus norfolcensis / Squirrel Glider	Vulnerable	-	No	6.10	20.61	3.61	8.66	2.33	41.31
Phascogale tapoatafa / Brush-tailed Phascogale	Vulnerable	-	No	6.10	20.61	3.61	8.66	2.33	41.31
<b>Prescribed Impacts</b>									
Removal of one dam providing foraging habitat for Southern Myotis	Vulnerable	-	No	-	-	-	1 dam	-	1 dam
Removal of three hollow-bearing trees providing assumed breeding hollows for Powerful Owl	Vulnerable	-	No	-	-	-	3	-	3 HBTs
Removal of 30 additional hollow-bearing trees providing potential roosting and breeding hollows for threatened and non-threatened fauna	Various	Various	No	3	16	2	9	0	30 HBTs

### 8.1.2 Change in vegetation integrity score

**Table 40** documents the change in vegetation integrity for residual direct impacts on native vegetation, TECs, threatened species and their habitat that were identified on the Subject Land. As all vegetation within the Subject Land will be removed, the VI score after development will be zero.

**Table 40**      **Impacts to vegetation integrity**

Vegetation zone	Area (ha)	Before development				After development				Change	
		Composition	Structure	Function	VI score	Composition	Structure	Function	VI score	Change in VI score	
VZ1 3244_Forest	1.65	87.8	29.3	42.3	47.8	0	0	0	0	-47.8	
VZ2 3315_Forest	22.43	92.6	39.2	57.8	59.4	0	0	0	0	-59.4	
VZ3 3315_Managed	10.24	82.6	7.4	32.9	27.2	0	0	0	0	-27.2	
VZ4 3315_High_Weed	6.97	80.3	23.1	61.7	48.5	0	0	0	0	-48.5	
VZ5 3315_DNG	11.13	52.5	45.5	12.5	31	0	0	0	0	-31	
VZ6 3315_Exotic_Pasture	9.19	52.8	2.1	1.4	5.4	0	0	0	0	-5.4	
VZ7 4073_Forest	0.01	60.5	42.6	79	58.8	0	0	0	0	-58.8	

## 8.2 Indirect impacts

Potential indirect impacts on native vegetation and habitat could occur during the construction and operational phases of the Proposal and are detailed in **Table 41**. Indirect impacts can affect retained vegetation and habitats during and following development. Measures are proposed to mitigate indirect impacts and are discussed in Section 8.4.

**Table 41 Summary of residual indirect impacts**

Indirect impact (Describe impact, e.g. transport of weeds and pathogens from the site to adjacent vegetation)	Impacted entities (PCT/threatened entity and their habitats and where relevant, EPBC Act listing)	Extent (ha or zone reference)	Frequency	Duration (long-term/ short-term/ medium-term)	Project phase/ timing of impact (e.g. construction, operation, rehabilitation)	Likelihood and consequences
Accidental clearing outside of Disturbance Footprint, inadvertent impacting adjacent habitat or vegetation	Native vegetation and associated general fauna habitats	5–10 m from disturbance edge	Unlikely during construction or operation. Greater potential for accidental incursions during construction.	Long-term	Construction and operation	<u>Likelihood</u> : Low provided exclusion fencing and other mitigation measures in place. <u>Consequence</u> : Disturbance and damage to adjacent vegetation and disturbance to resident fauna; reduction in quality of adjacent vegetation and habitats
General edge effects (clearing, light, noise, weeds)	Native vegetation and associated general fauna habitats	5–10 m from disturbance edge	Daily for the duration of construction and operation, reducing in intensity and location as the quarry project becomes established.	Long-term	Construction and operation	<u>Likelihood</u> : High <u>Consequence</u> : could impact condition of retained vegetation and habitats
Noise, dust or light spill	Native vegetation and associated	5–10 m from disturbance edge	Daily for the duration of construction and operation.	Long-term	Construction and operation	<u>Likelihood</u> : high. <u>Consequence</u> : could reduce quality of habitats for foraging and breeding

Indirect impact (Describe impact, e.g. transport of weeds and pathogens from the site to adjacent vegetation)	Impacted entities (PCT/threatened entity and their habitats and where relevant, EPBC Act listing)	Extent (ha or zone reference)	Frequency	Duration (long-term/ short-term/ medium-term)	Project phase/ timing of impact (e.g. construction, operation, rehabilitation)	Likelihood and consequences
	general fauna habitats					<p>activities of local or resident fauna. Powerful Owl may be disturbed by construction and operational noise but large area of surrounding habitat will allow for dispersal.</p> <p>Note: no night works are proposed, so light spill is not a relevant impact on adjacent habitats within the quarry.</p>
Movement of weeds and pathogens from the site to adjacent vegetation	Native vegetation and associated general fauna habitats	Vegetation adjoining haul roads and operation areas	Daily for the duration of construction and operation.	Long-term	Construction and operation	<p><u>Likelihood</u>: moderate</p> <p><u>Consequence</u>: potential reduction in native flora diversity and increase in cover and diversity of weeds (including high threat weeds, HTWs), and function of the retained vegetation. High prevalence of <i>Olea europaea</i> (African Oliva) and <i>Lantana camara</i> (Lantana) within the Subject Land and surrounding property provides a large seed bank for further dispersal outside of the site. These weeds, however, are ubiquitous within the region and any movement outside the Disturbance Footprint is likely to be negligible.</p>

Indirect impact (Describe impact, e.g. transport of weeds and pathogens from the site to adjacent vegetation)	Impacted entities (PCT/threatened entity and their habitats and where relevant, EPBC Act listing)	Extent (ha or zone reference)	Frequency	Duration (long-term/ short-term/ medium-term)	Project phase/ timing of impact (e.g. construction, operation, rehabilitation)	Likelihood and consequences
						Controls include management of residual avoided lands to minimise weeds.

## 8.3 Prescribed impacts

### 8.3.1 Karst, caves, crevices, cliffs, rocks or other geological features of significance

None present in Project Site. Nearest cliff lines approximately 500m east of quarry pit. Blast and Vibration assessment determined predicted blast vibration will not affect the integrity of these cliff lines.

### 8.3.2 Human-made structures

None present.

### 8.3.3 Non-native vegetation

None present.

### 8.3.4 Habitat connectivity

At a local scale, the proposed quarry lies within a large patch of vegetation (approx. 3,500 ha) that includes Tangory Nature Reserve to the north east and private forested land to the north, south and west. Connectivity continues to even more vegetation further east (Figure 2). More open farmland extends to the south east.

As there is connective habitat to the west, north and east of the Disturbance Footprint the proposal unlikely to lead to any major separation or disconnection between areas of vegetation and connectivity will be maintained within the larger patch. At a site-specific level, the removal of vegetation within the quarry will not increase separation between vegetation patches in the area. Connectivity will be maintained via vegetation to the north of the quarry pit and south of the quarry pit, noting the haul road between the processing area and quarry pit has some, though limited impacts on connectivity. As such, impacts to these areas of vegetation is unlikely to impact on the movement of fauna in the local area. Cross-site movement of less mobile species, such as small terrestrial mammals and forest birds, may be reduced but this is unlikely to affect the persistence or viability of any local populations.

### 8.3.5 Waterbodies, water quality and hydrological processes

The mapped streams within the Subject Land are poorly defined, with minimal riparian vegetation or banks, lack of flow or ability to hold water. Impacts to these drainage lines is unlikely to impact threatened species or ecological communities.

Impacts to waterbodies and hydrology have been assessed by Martens in The Hydrogeological Impact Assessment (Martens 2025a) and the Water Resource Assessment (Martens 2025b). These assessments made the following conclusions relevant to this prescribed impact:

- No significant detrimental hydrogeological impacts would result from the proposal, and that surface water systems are unlikely to be impacted given that there is minimal interaction between surface water and groundwater, and discharge to nearby surface water bodies is unlikely (Martens 2025a).
- Except where the internal access road requires the watercourse to be crossed, the development footprint will not interfere with natural watercourses (Martens 2025b)
- Watercourse crossings will be restricted to those existing under the present farm access track within the site, but will be upgraded to ensure trafficability in the 1 %AEP local catchment overland flow. All crossing designs will be in accordance with relevant guidelines and will ensure that adequate permanent erosion control measures are incorporated into the design to mitigate against any risks to bed or bank stability (Martens 2025b)

- Water quality modelling demonstrated that pollutant reduction targets for total suspended solids (TSS), total phosphorus (TP), total nitrogen (TN) and gross pollutants would be achieved for the duration of quarry operations, and potentially for a further 20 years if operations were ultimately extended from 30 to 50 years

Surface Water Management will mitigate impacts to the first and second order streams outside the Disturbance Footprint, thus minimising or avoiding any indirect impact on habitats which have the potential to support threatened species.

The removal of one artificial dam will directly impact on foraging habitat for Southern Myotis which was detected within the Disturbance Footprint. Species credits are required for impacts to the vegetation for the species within 200 m of this dam, and other waterbodies not directly impacted. As Southern Myotis is a highly mobile species able to utilise multiple foraging habitats easily, the removal of one small dam is unlikely to reduce the persistence or viability of the local population of this species.

### 8.3.6 Vehicle strikes

**Table 42 Residual prescribed impacts – vehicle strikes**

Threatened fauna or protected fauna that are part of a TEC that are at risk of vehicle strike (identified in Section 6)	SAIL entity	Likelihood	Estimated vehicle strike rates	Consequences
Threatened mammal and low-flying bird species including recorded Brush-tailed Phascogale, Squirrel Glider and Powerful Owl. Common mammal and low-flying bird species that are part of the <i>Central Hunter Ironbark-Spotted Gum-Grey Box Forest</i> TEC.	No	Within Disturbance Footprint: low On public roads: low	Low	Likelihood of vehicle strikes within the operating quarry is low due to the low speed limits to be imposed. Increased strikes on public roads due to traffic increase is expected, but impacted species are likely to be common species. Vegetation surrounding these public roads is managed farmland without TECs, therefore any common species impacted are unlikely to be part of any TEC.

## 8.4 Assessing and mitigating residual impacts on biodiversity values

The Proposal will directly remove native vegetation and associated fauna habitats. There is also potential to impact on habitats within and adjoining the Subject Land indirectly through sedimentation, dust, pollution, noise and light during construction. The following mitigation measures are recommended to minimise direct, indirect and prescribed impacts on biodiversity values.

**Table 43 Proposed mitigation and management measures for residual impacts (direct, indirect and prescribed)**

Mitigation measure	Method/technique	Timing	Frequency	Responsibility	Likely efficacy (including risk of failure)
Direct & prescribed impacts					

Mitigation measure	Method/technique	Timing	Frequency	Responsibility	Likely efficacy (including risk of failure)
On site measures to mitigate clearing of native vegetation	<p>Clearly delineate the boundaries of the Disturbance Footprint to ensure no accidental incursions within retained vegetation.</p> <p>Ensure vehicle and equipment parking areas and stockpile areas are identified and sited to avoid areas containing ecological value wherever practicable.</p> <p>Appropriate signage such as 'No Go Zone' or 'Environmental Protection Area' is to be installed.</p> <p>Identify and communicate the location of any 'No Go Zones' in site inductions.</p>	During any vegetation clearance for construction and operation	One off during any site clearing activities	Construction team, project ecologist	Effective (low risk of failure)
Measures to mitigate fauna injury and mortality during removal of vegetation and hollow-bearing trees	<p>Undertake ecological pre-clearance surveys of native vegetation areas</p> <p>If any fauna species, a nest or roost is located during development works, then works should cease until safe relocation can be advised by a contact fauna ecologist.</p> <p>All habitat trees should be soft-felled to reduce potential impacts on inhabiting fauna.</p> <p>A suitably qualified and trained fauna handler is to be present during hollow-bearing tree clearing to rescue and relocate displaced fauna.</p> <p>If a threatened species is found to be occupying the hollow at the time of removal then this hollow section is to be reattached to a recipient tree within the nearby retained vegetation as selected and directed by the fauna ecologist. The welfare and temporary holding of the residing animal(s) is at the discretion of the fauna ecologist</p>	During any vegetation clearance for construction and operation	One off during any site clearing activities	Site manager, construction team, project ecologist	Effective (low risk of failure)

Mitigation measure	Method/technique	Timing	Frequency	Responsibility	Likely efficacy (including risk of failure)
Relocation and replacement of impacted tree hollows	<p>Felled tree hollows of retention value are to be relocated to nearby areas within the Subject Land outside the Disturbance Footprint. All hollow sections considered suitable for recorded hollow-dependent threatened species (Squirrel Glider, Brush-tail Phascogale and Powerful Owl) should where possible be recovered and prepared for placement into an appropriate retained tree.</p> <p>All hollows that are not salvaged are to be replaced with constructed nest boxes suitable for use by recorded hollow-dependent threatened species. Boxes should be constructed all of weatherproof timber (marine ply), fasteners and external paint and appropriately affixed to a recipient tree under the guidance of a fauna ecologist.</p>	Prior to any vegetation clearance for construction and operation	One off prior to site clearing activities	Site manager, construction team, project ecologist	Moderately effective (moderate risk of failure)
Dam dewatering protocol	Dam dewatering is to be undertaken in accordance with appropriate protocols to ensure consideration is given to all potentially impacted aquatic fauna within the dam (e.g. eels / turtles) and breeding water birds as well as species potentially indirectly impacted elsewhere. Protocols are to include frog hygiene, relocating aquatic fauna to recipient sites and appropriate euthanasia of any <i>Gambusia</i> (Mosquito Fish).	Prior to dam removal	Once off	Site manager, construction team, project ecologist	Moderately effective (moderate risk of failure)
Surface water management controls to mitigate sediment run-off and/or contaminant runoff impacting surface	Watercourse crossings will be restricted to those existing under the present farm access track within the site, but will be upgraded to ensure trafficability in the 1 %AEP local catchment overland flow. All crossing designs will be in accordance with relevant guidelines and will ensure that adequate	Construction and operation	Once off	Site manager, construction team	Effective (low risk of failure)

Mitigation measure	Method/technique	Timing	Frequency	Responsibility	Likely efficacy (including risk of failure)
water quality and quantity	<p>permanent erosion control measures are incorporated into the design to mitigate against any risks to bed or bank stability</p> <p>'Clean' water runoff from undisturbed areas of the site will be diverted via channels / bunding to areas downstream of disturbed areas so as to reduce water flows within the development footprint and ensure flow continuity to downstream environments</p> <p>'Dirty' water runoff from all disturbed areas of the site will be directed via channels and drains to a series of sediment detention basins designed and managed in accordance with Volumes 1 and 2 of Landcom's Blue Book (<i>Managing Urban Stormwater: Soils and Construction</i>)</p> <p>Diversion drains and earth bunds shall be constructed to ensure that runoff from disturbed catchments is directed to the site's sediment dams.</p> <p>Erosion and sediment controls are to be employed during construction activities.</p> <p>Site-based vehicles will carry spill kits.</p>				
Progressive rehabilitation works within the Pit Area	<p>Initially be limited to areas of immediate disturbance such as road batters, access road construction and sediment dams.</p> <p>Progressive rehabilitation of the quarry benches will occur as they become available, with the majority of the rehabilitation taking place at the completion of resource extraction when the quarry floor, stockpile areas, and portions of the infrastructure areas will be rehabilitated.</p>	<p>Immediately following road and sediment dam construction.</p> <p>Progressively as quarry benches are available.</p>	Once following each construction or extraction stage	Site manager, contractors	Effective (low-moderate risk of failure)

Mitigation measure	Method/technique	Timing	Frequency	Responsibility	Likely efficacy (including risk of failure)
	Revegetated areas are to use native species commensurate with the TEC <i>Central Hunter Ironbark-Spotted Gum-Grey Box Forest in New South Wales North Coast and Sydney Basin Bioregions</i>	At completion of resource extraction			
Indirect impacts					
Transfer of weeds and pathogens	<p>Fungal pathogens, including <i>Phytophthora cinnamomi</i> and Myrtle Rust (<i>Puccinia psidii</i>), can impact on native plant communities and inhabiting fauna if not managed. Vehicles and equipment will be washed down prior to arrival on-site.</p> <p>During pre-clearing surveys, areas of major weed infestation will be delineated with flagging tape to allow for separate stockpiling of this soil and vegetative material. This will reduce the spread and weed establishment of weed infestations in rehabilitated areas post construction.</p> <p>Ensure soil and seed material is not transferred on machinery through appropriate wash down procedures.</p>	During vegetation clearance for construction and operation	Ongoing	Site manager, construction team, operations team	Effective (low risk of failure)
Noise, vibration, waste and air pollution impacts to adjacent sensitive habitat areas	<p>Fence sensitive areas to delineate 'no go' zones. Impacts of noise and light will be limited as night works are not proposed</p> <p>Dust control measures will include: setting maximum speed limits, covering loads where required; amending operations under excessive wind conditions including ceasing operations if required; use of water as required to control dust.</p>	During construction and operation	Ongoing	Site manager, construction team, operations team	Moderate (moderate risk of failure)

**Table 44 Implementation and Monitoring of Mitigation Actions**

<b>Measure/action</b>	<b>Monitoring and evaluation strategy</b> (data, frequency, timing and reporting)	<b>Performance criteria</b> (linked to monitoring and evaluation strategy)	<b>Adaptive management threshold</b> (trigger for adaptive management plan/actions)	<b>Adaptive management response</b> (when triggered)
On site measures to mitigate clearing of native vegetation	Survey of protective measures undertaken preconstruction commencement. Protective measures to be photographed and documented in pre-construction report.	No accidental clearing of areas of native vegetation that have been identified for retention	Accidental clearing outside (development footprint) occurs	Rehabilitate area with native vegetation as soon as practicable after disturbance
Undertake ecological pre-clearance surveys	Survey once prior to construction commencement. Details and outcomes reported in pre-clearance report.	No fauna deaths recorded during clearing activities	Pre-clearance surveys detect evidence of breeding (nest)	Where evidence of nest or roost detected, postpone clearing and instigate fauna rescue and relocation plan
Supervision of tree felling – project ecologist or licensed wildlife handler is on-site during all clearance of trees >100 mm DBH. Undertake appropriate hollow-felling protocol	Daily during clearance of trees >100 mm DBH. Details and outcomes reported in post-clearance report.	No fauna deaths recorded during clearing activities	Wildlife injured during site clearing	Displaced animals to be captured and relocated to nearby bushland (subject to landowner approval); Trees containing wildlife shall be sectioned and dismantled before relocating the animals. Injured animals to be captured and rehabilitated before being returned to nearby bushland.
Relocation and replacement of impacted tree hollows	Once during site clearing or as needed. Relocated habitat features to be mapped and documented in post-clearance report.	Suitable habitat features re-located under supervision of project ecologist	Hollows not suitable for salvage.	Replacement nest boxes installed according to specifications.

Measure/action	Monitoring and evaluation strategy (data, frequency, timing and reporting)	Performance criteria (linked to monitoring and evaluation strategy)	Adaptive management threshold (trigger for adaptive management plan/actions)	Adaptive management response (when triggered)
Relocated hollow and nest box monitoring	Annual inspection of nest boxes (installed within trees within the property); record photos and notes on (i) condition of box (ii) evidence of habitation (iii) resident fauna	Box in working order and attachment to host tree secure	Box damaged and/or attachment failing; Box detached from host tree Box occupied by pest species	Replace lost or damaged boxes
Dam dewatering	Once during dam dewatering.	No native fauna deaths recorded during dewatering. <i>Gambusia</i> (Mosquito Fish) euthanized ethically.	Native fauna injured during dewatering	Injured animals to be captured and rehabilitated before being returned to nearby creek or dam
Surface water management controls in place to control water quality released into streams	Annual monitoring and reporting in accordance with the Operations Monitoring Plan (OMP)	Controls functioning; acceptable sediment and nutrient loads in streams.	Controls failing. Water quality reduced.	Repair / replace
Rehabilitation works	Annual monitoring of rehabilitation success by qualified botanist.	>60% establishment rate of planted plants after first year. Increasing cover of plants each year.	<60% establishment. Decreasing cover.	Evaluate causes and reinstall replacement plants where warranted.
Vehicles and equipment will be washed down prior to arrival on-site to reduce weed and pathogen transfer.	Enforced by Site Manager	All vehicles and equipment washed down.	Vehicle / equipment enters site without wash-down.	Vehicle / equipment to be immediately washed down.
Separate and stockpile top soil from high-weed areas	Enforced by Site Manager	All high-weed topsoil kept separate from low-weed topsoil	Accidental mixing or incorrect handling of high-weed topsoil.	Adjust flagging tape /identifier to indicate mixed soil is not contaminated.
Implement dust suppression controls	Inspect retained vegetation for evidence of dust and	No obvious dust accumulations on retained vegetation	Dust accumulation detected on adjoining vegetation,	Construction team to adjust dust management measures, continue to

<b>Measure/action</b>	<b>Monitoring and evaluation strategy</b> (data, frequency, timing and reporting)	<b>Performance criteria</b> (linked to monitoring and evaluation strategy)	<b>Adaptive management threshold</b> (trigger for adaptive management plan/actions)	<b>Adaptive management response</b> (when triggered)
	document outcome in post-construction report		continue to monitor until reduction evident	monitor until reduction evident

## 8.5 Adaptive management strategy for uncertain impacts

Adaptive management plan can help address impacts that are infrequent or difficult to measure. These include indirect or prescribed impacts, or other remaining biodiversity impacts. The proponent must develop an adaptive management plan to address any remaining impacts where mitigation measures have not been proposed. In the case of the Proposal, the indirect and prescribed impacts on adjacent vegetation and fauna that will require adaptive management measures are:

- Changes to hydrological regime of streams within and adjacent to the Disturbance Footprint.
- Vehicle strikes on mobile threatened fauna (prescribed impact, see Section 8.3.6).

To minimise the risk of ongoing or long-term adverse effects on these two threatened entities, a 'Trigger-Action-Response-Plan' (TARP) is to be developed. The TARP will be based on monitoring results and data collected as part of monitoring conducted prior to and during the construction and operation phases of the quarry. The TARP will set out performance criteria, which will be related to the water quality and flow of streams, and the number of animal sightings and collisions (if any) along the haul roads, and associated actions and responses when criteria meet certain thresholds. The TARP will be updated as necessary over the implementation period.

Other indirect impacts are likely to be minor in nature and limited in extent and/or will be sufficiently mitigated and managed by implementing measures outlined in this BDAR. Additionally, no other prescribed impacts or other residual impacts are predicted to occur.

## 9. Serious and irreversible impacts

### 9.1 Assessment for serious and irreversible impacts on biodiversity values

The BDAR must contain details of the assessment of SALLs, in accordance with the criteria set out in Subsection 9.1 of the BAM. All criteria must be addressed for each TEC or threatened species at risk of an SALL and likely to be impacted by the Project.

No TECs recorded on site are listed as SALL entities.

One threatened species detected within the Disturbance Footprint is listed as an SALL entities, Large-eared Pied Bat (Figure 21). Impacts to breeding habitat could be considered a potential SALL. Presence of this species alone, with the absence of breeding habitat, does not constitute a potential SALL. As stated in the TBDC:

#### Large-eared Pied Bat

*The species is a full species credit because it cannot be reliably predicted to occur on a site based on vegetation and other landscape features (either foraging or breeding). Any impacts on breeding habitat used by this species could be considered potentially serious and irreversible. Potential breeding habitat is PCTs associated with the species within 100m of rocky areas containing caves, or overhangs or crevices, cliffs or escarpments, or old mines, tunnels, culverts, derelict concrete buildings.*

Potential breeding habitat for this species is situated well outside (>500 m) of the Disturbance Footprint to the north east, within the adjacent Tangory Nature Reserve (see Figure 21). No other suitable breeding habitat is present within the Subject Land or within 100 m. As such, there is no potential for an SALL on these species and further assessment of SALL provision is not required.

# 10. Impact summary

## 10.1 Determine an offset requirement for impacts

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

**Table 45** identifies impacts on native vegetation and TECs or ECs that do not require an offset (as per BAM Subsection 9.2.1(3.)). **Table 46** identifies impacts that require an offset. As per BAM Subsection 9.2.1(1.), VZ 6 3315\_Exotic\_Pasture does not require an offset for ecosystem credits as the VI score is less than 17, which is the threshold for a PCT associated with threatened species habitat but not commensurate with an EEC or CEEC.

A breakdown of credit requirements for each stage of the proposal is provided in Section 11.

**Table 45** Impacts that do not require offset – ecosystem credits

VZ no.	VZ code	PCT name	TEC	Area (ha)	TEC association	Entity at risk of an SAI?	Current VI score
6	3315_Exotic_Pasture	3315 Central Hunter Ironbark-Spotted Gum Forest	No	9.19	No	No	5.4

**Table 46** Impacts that require an offset – ecosystem credits

VZ no.	VZ Code	PCT name	TEC	Area (ha)	Current VI score	Future VI score	Change in VI score	Biodiversity risk weighting	Number of ecosystem credits required	HBT credits?
1	3244_Forest	3244 Lower North Spotted Gum - Mahogany - Ironbark Sheltered Forest	No	1.65	47.8	0	-47.8	1.5	30	No
2	3315_Forest	3315 Central Hunter Ironbark - Spotted Gum Forest	Yes BC EPBC	22.43	59.4	0	-59.4	2	666	Yes

VZ no.	VZ Code	PCT name	TEC	Area (ha)	Current VI score	Future VI score	Change in VI score	Biodiversity risk weighting	Number of ecosystem credits required	HBT credits?
3	3315_Managed	3315 Central Hunter Ironbark - Spotted Gum Forest	Yes BC EPBC	10.24	27.2	0	-27.2	2	139	Yes
4	3315_High_Weed	3315 Central Hunter Ironbark - Spotted Gum Forest	Yes BC	6.97	48.5	0	-48.5	2	169	Yes
5	3315_DNG	3315 Central Hunter Ironbark - Spotted Gum Forest	No	11.13	31	0	-31	2	173	No
7	4073_Forest	4073 Lower North Hinterland River Oak Forest	No	0.01	58.8	0	-58.8	2	1	No
									<b>Total credits 1178</b>	

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

**Table 47** identifies impacts on threatened species (species credits) that require an offset (as per BAM Subsection 9.2.2(2.)).

**Table 47** Impacts that require an offset – species credits

Common name	Scientific name	BC Act status	EPBC Act status	Loss of habitat (ha) or individuals	Biodiversity risk weighting	Number of species credits required
Large-eared Pied Bat	<i>Chalinolobus dwyeri</i>	Endangered	Endangered	41.31	Very High (3)	1521
Southern Myotis	<i>Myotis macropus</i>	Vulnerable	Not Listed	24.62	High (2)	594
Powerful Owl	<i>Ninox strenua</i>	Vulnerable	Not Listed	6.97	High (2)	169
Squirrel Glider	<i>Petaurus norfolcensis</i>	Vulnerable	Not Listed	41.31	High (2)	1014
Brush-tailed Phascogale	<i>Phascogale tapoatafa</i>	Vulnerable	Not Listed	41.31	High (2)	1014
<b>Total credits</b>						<b>4312</b>

### 10.1.3 Indirect and prescribed impacts

Indirect and prescribed impacts will be mitigated as detailed in Section 8.4. No offsets are required for residual indirect and prescribed impacts.

## 10.2 Impacts that do not need further assessment

**Table 48** identifies impacts that do not need further assessment for ecosystem credits (as per BAM Section 9.3(1–2.)).

**Table 48** Impacts that do not need further assessment for ecosystem credits

Impact	Location within Subject Land	Justification why no further assessment is required
Impacts to existing internal roads and tracks	Throughout Disturbance Footprint.	Existing farm tracks are already cleared for agricultural use and have been excised from VZs.
Open water of existing farm dam	Central portion of Disturbance Footprint.	Areas of open water do not contain vegetation so cannot be mapped as part of a VZ.

# 11. Biodiversity credit report

The BAM-C credit report below identifies the numbers and classes of biodiversity credits required to be retired in accordance with the like-for-like requirements of the offset rules and those that could be retired in accordance with the variation rules. Credit reports output by the BAM calculator are provided in **Appendix F: Credit reports**.

## 11.1 Ecosystem credits

**Table 49 Ecosystem credit class and matching credit profile**

Ecosystem credits	Attributes shared with matching credits						
	PCT name	PCT vegetation class	PCT vegetation formation	Associated TEC or EC	Offset trading group	Hollow bearing trees present?	IBRA subregion
30	3244-Lower North Spotted Gum-Mahogany-Ironbark Sheltered Forest	Northern Hinterland Wet Sclerophyll Forests	Wet Sclerophyll Forests (Grassy sub-formation)	Not a TEC	Northern Hinterland Wet Sclerophyll Forests - < 50% cleared group	No	Upper Hunter , Ellerston, Hunter, Karuah Manning, Mummel Escarpment and Tomalla. or Any IBRA subregion that is within 100 kilometres of the outer edge of the impacted site.
974	3315-Central Hunter Ironbark-Spotted Gum Forest	Coastal Valley Grassy Woodlands	Grassy Woodlands	Central Hunter Ironbark-Spotted Gum-Grey Box Forest in the New South Wales North Coast and Sydney Basin Bioregions	Central Hunter Ironbark-Spotted Gum-Grey Box Forest in the New South Wales North Coast and Sydney Basin Bioregions	Yes	
173	3315-Central Hunter Ironbark-Spotted Gum Forest	Coastal Valley Grassy Woodlands	Grassy Woodlands	Not a TEC	Coastal Valley Grassy Woodlands - ≥ 70% - <90% cleared group	No	

Ecosystem credits	Attributes shared with matching credits						
	PCT name	PCT vegetation class	PCT vegetation formation	Associated TEC or EC	Offset trading group	Hollow bearing trees present?	IBRA subregion
1	4073 - Lower North Hinterland River Oak Forest	Eastern Riverine Forests	Forested Wetland	Not a TEC	Eastern Riverine Forests - ≥ 70% - <90% cleared group	No	

## 11.2 Species credits

**Table 50** Species credit class and matching credit profile

Species credit	Attributes shared with matching credits				
	Name of threatened species	Kingdom	BC Act status	EPBC Act status	IBRA region
1521	<i>Chalinolobus dwyeri</i> / Large-eared Pied Bat	Animalia	Endangered	Endangered	Any in NSW
594	<i>Myotis macropus</i> / Southern Myotis	Animalia	Vulnerable	Not Listed	Any in NSW
169	<i>Ninox strenua</i> / Powerful Owl	Animalia	Vulnerable	Not Listed	Any in NSW
1014	<i>Petaurus norfolcensis</i> / Squirrel Glider	Animalia	Vulnerable	Not Listed	Any in NSW
1014	<i>Phascogale tapoatafa</i> / Brush-tailed Phascogale	Animalia	Vulnerable	Not Listed	Any in NSW

## 11.3 Staged Credit requirements

The proposed quarry will be developed over 35 years across four stages, as detailed in Section 1.1.1. Proportionate credit requirements have been calculated based on relative impacts for each ecosystem and species credits within each development stage and are shown in Table 51. Due to rounding some adjustment was needed to balance the total credit requirements for PCT 3315 non-TEC and Southern Myotis.

**Table 51 Credit Staging**

Credit	Stage 1		Stage 2		Stage 3		Stage 4		Stage 5		Total	
	area (ha)	credit	area (ha)	credit	area (ha)	credit	area (ha)	credit	area (ha)	credit	Total Extent	Total credits
PCT 3244 Lower North Spotted Gum - Mahogany - Ironbark Sheltered Forest	0.00	0	1.63	30	0.00	0	0.03	0	0.00	0	1.65	30
PCT 3315 Central Hunter Ironbark - Spotted Gum Forest (TEC)	6.08	180	18.98	421	3.61	107	8.64	196	2.33	70	39.65	974
PCT 3315 Central Hunter Ironbark - Spotted Gum Forest (non-TEC)	9.17	143	9.60	13	0.44	7	0.45	0	0.66	10	20.32	173
PCT 4073 Lower North Hinterland River Oak Forest	0.01	1	0.00	0	0.00	0	0.00	0	0.00	0	0.01	1
<i>Chalinolobus dwyeri</i> / Large-eared Pied Bat	6.10	224	20.61	759	3.61	133	8.66	319	2.33	86	41.31	1521
<i>Myotis macropus</i> / Southern Myotis	2.36	57	11.64	281	1.79	43	8.03	194	0.79	19	24.62	594
<i>Ninox strenua</i> / Powerful Owl	0.02	0	2.08	51	0	0	4.87	118	0	0	6.97	169
<i>Petaurus norfolcensis</i> / Squirrel Glider	6.10	150	20.61	506	3.61	89	8.66	213	2.33	56	41.31	1014
<i>Phascogale tapoatafa</i> / Brush-tailed Phascogale	6.10	150	20.61	506	3.61	89	8.66	213	2.33	56	41.31	1014

## 12. References

Department of Planning, Industry and Environment (DPIE) (2020a). *Biodiversity Assessment Method*. Environment, Energy and Science, Parramatta.

Department of the Environment (2015). Approved Conservation Advice (including listing advice) for the Central Hunter Valley eucalypt forest and woodland ecological community. Canberra: Department of the Environment.

<http://www.environment.gov.au/biodiversity/threatened/communities/pubs/130-conservation-advice.pdf>.

DPIE (2020b) Surveying threatened plants and their habitats: NSW survey guide for the Biodiversity Assessment Method. Environment, Energy and Science, Parramatta.

DPIE (2020c) NSW Survey Guide for Threatened Frogs. Environment, Energy and Science, Parramatta.

DPIE (2022) Biodiversity Assessment Method Operation Manual – Stage 1. Department of Planning and Environment, Parramatta.

Floyd A (1990a) Australian rainforests in New South Wales. Volume 1. (Surrey Beatty and Sons: Sydney.)

Floyd A (1990b) Australian rainforests in New South Wales. Volume 2. (Surrey Beatty and Sons: Sydney.)

IUCN. (2012). IUCN Red List Categories and Criteria: Version 3.1. Second edition. Gland, Switzerland and Cambridge, UK: IUCN.

Keith, DA (2004), Ocean shores to desert dunes : the native vegetation of New South Wales and the ACT. Dept. of Environment and Conservation (NSW) Hurstville, N.S.W.

Martens (2018) Preliminary Resource Feasibility Assessment: Lots 903 and 904 in DP 1061259, Lot 5 in DP 1102521 and Lot 65 in DP 752473, Elderslie, NSW. Report prepared for Pittman Building Pty Ltd.

Martens (2025a) Hydrogeological Impact Assessment (DRAFT) - Proposed Bluestone Hardrock Quarry, Springvale Road, Elderslie, NSW & Blind Creek Road, Glendon Brook, NSW. P2410628JR06V02. Prepared December 2025 for Pittman Building Pty Ltd.

Martens (2025b) Water Resources Assessment (DRAFT) - Proposed Bluestone Hardrock Quarry, Springvale Road, Elderslie, NSW & Blind Creek Road, Glendon Brook, NSW. P2410628JR04V02. Prepared December 2025 for Pittman Building Pty Ltd.

NSW Scientific Committee (2010) Central Hunter Ironbark-Spotted Gum-Grey Box Forest in the NSW North Coast and Sydney Basin Bioregions - endangered ecological community listing. 12 February 2010

NSW Scientific Committee (2011). *Swamp Oak Floodplain Forest of the NSW North Coast, Sydney Basin and South East Corner bioregions - Determination to make a minor amendment to Part 3 of Schedule 1 of the Threatened Species Conservation Act*.

<https://www.environment.nsw.gov.au/topics/animals-and-plants/threatened-species/nsw-threatened-species-scientific-committee/determinations/final-determinations/2011-2012/swamp-oak-floodplain-forest-of-the-nsw-north-coast-minor-amendment-determination>

New South Wales National Parks and Wildlife Service (2000) Vegetation Survey, Classification and Mapping: Lower Hunter and Central Coast Region. Version 1.2. New South Wales National Parks and Wildlife Service, Hurstville.

Office of Environment and Heritage (OEH)(2018) Species credit' threatened bats and their habitats – NSW survey guide for the Biodiversity Assessment Method.

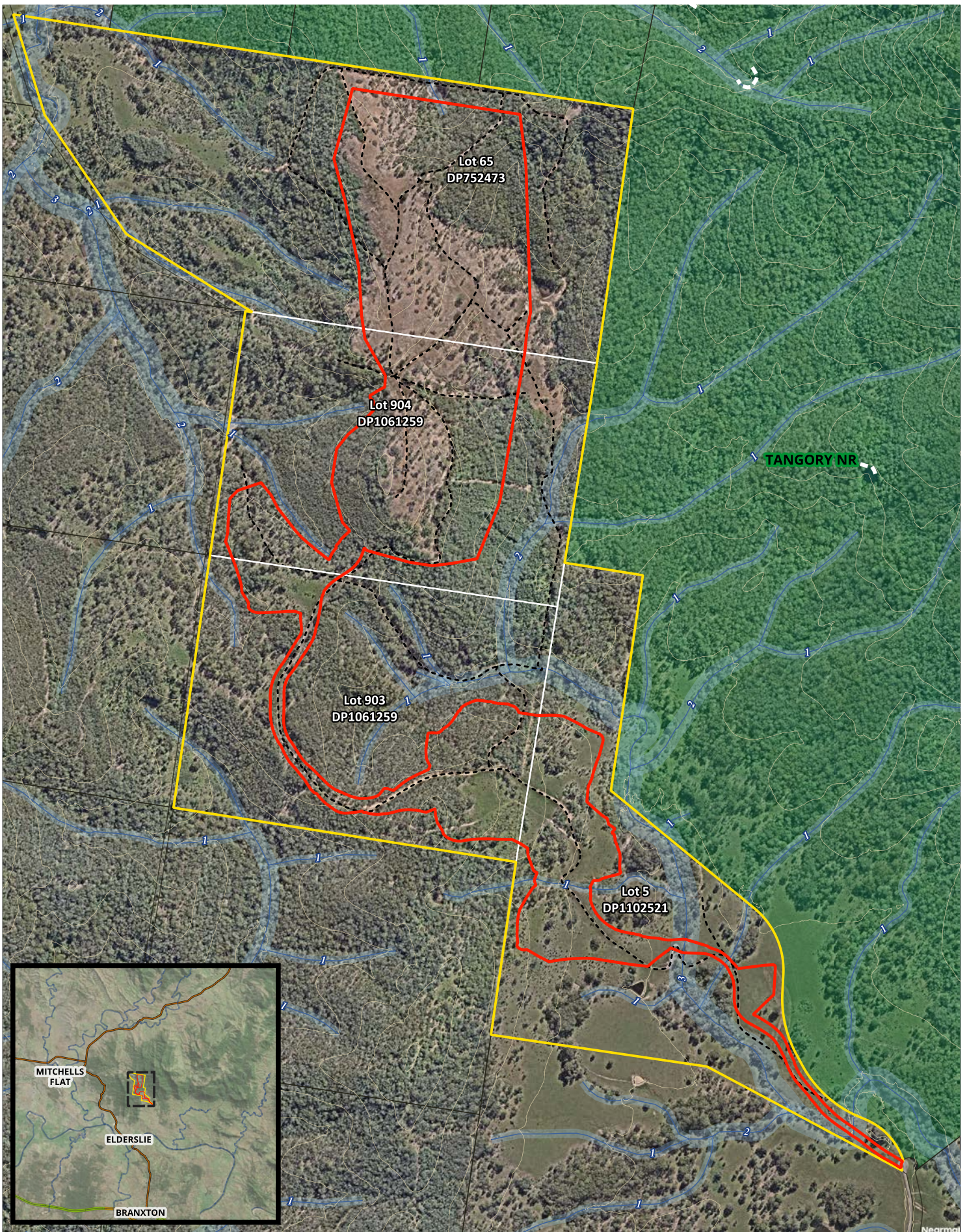
Peake TC (2006) The Vegetation of the Central Hunter Valley, New South Wales. A report on the findings of the Hunter Remnant Vegetation Project. Hunter- Central Rivers Catchment Authority, Paterson.

Phillips, S and Callaghan, J. 2011. *The Spot assessment technique*: a tool for determining localised levels of habitat use by koalas *Phascolarctos cinereus*. Australian Zoologist, 35 (3) pp774-780.

Rasmus P.L., Rose D.M. and Rose G., 1969, Singleton 1:250 000 Geological Sheet SI/56-01, 1st edition, Geological Survey of New South Wales, Sydney

Williams, Elizabeth R. and Thomson, Bruce (2018). Aspects of the foraging and roosting ecology of the large-eared pied bat (*Chalinolobus dwyeri*) in the western Blue Mountains, with implications for conservation. Australian Mammalogy 41 (2) 212-219.  
<https://doi.org/10.1071/AM17064>

## 13. Figures

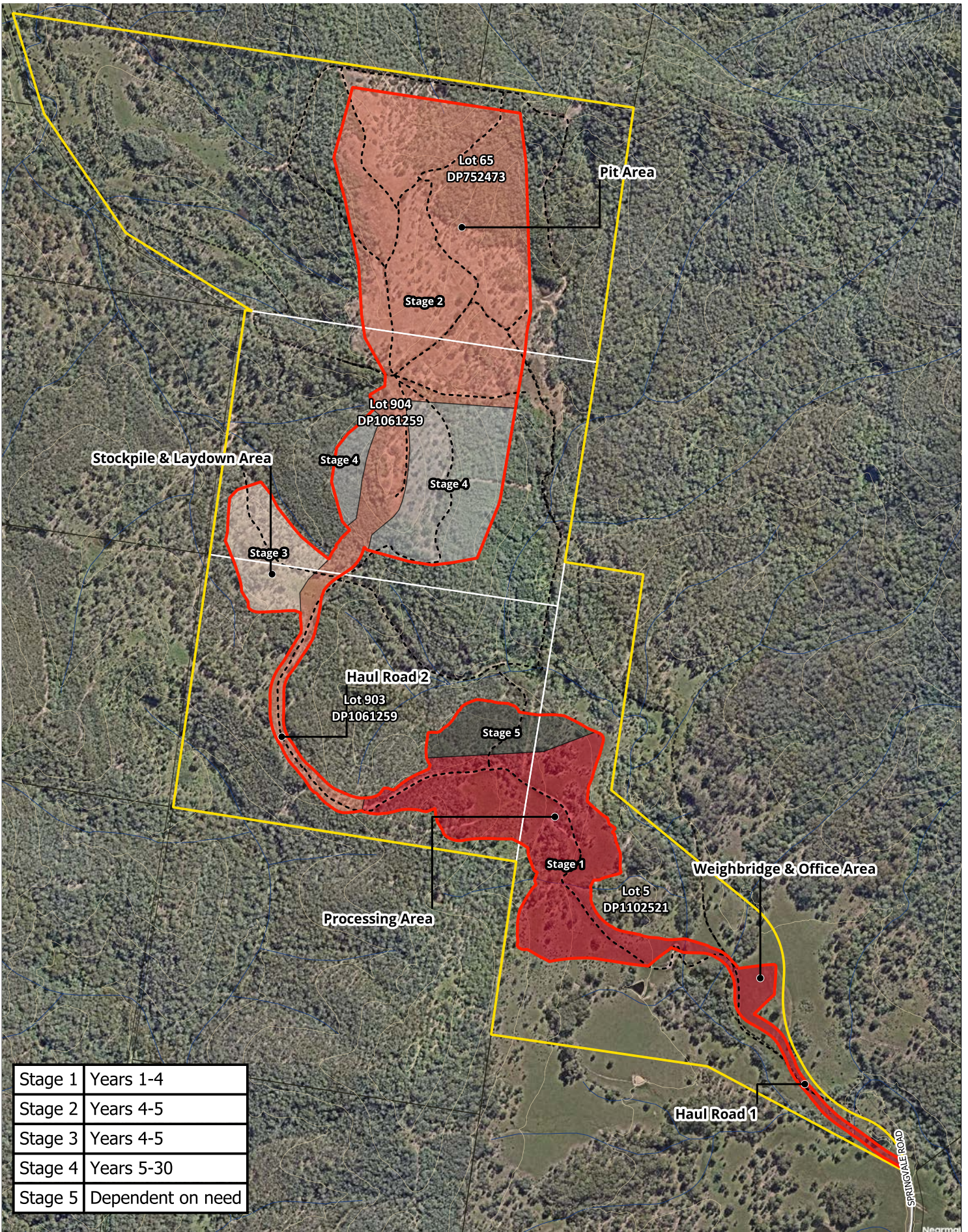


- |                       |                      |               |             |
|-----------------------|----------------------|---------------|-------------|
| Development footprint | Subject lot          | Escarpment    | 20m Contour |
| Subject land          | Cadastre             | Watercourse   |             |
| Track                 | National park (NPWS) | Riparian zone |             |

Figure 1. Site Map



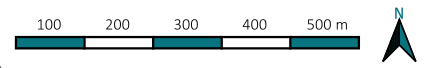




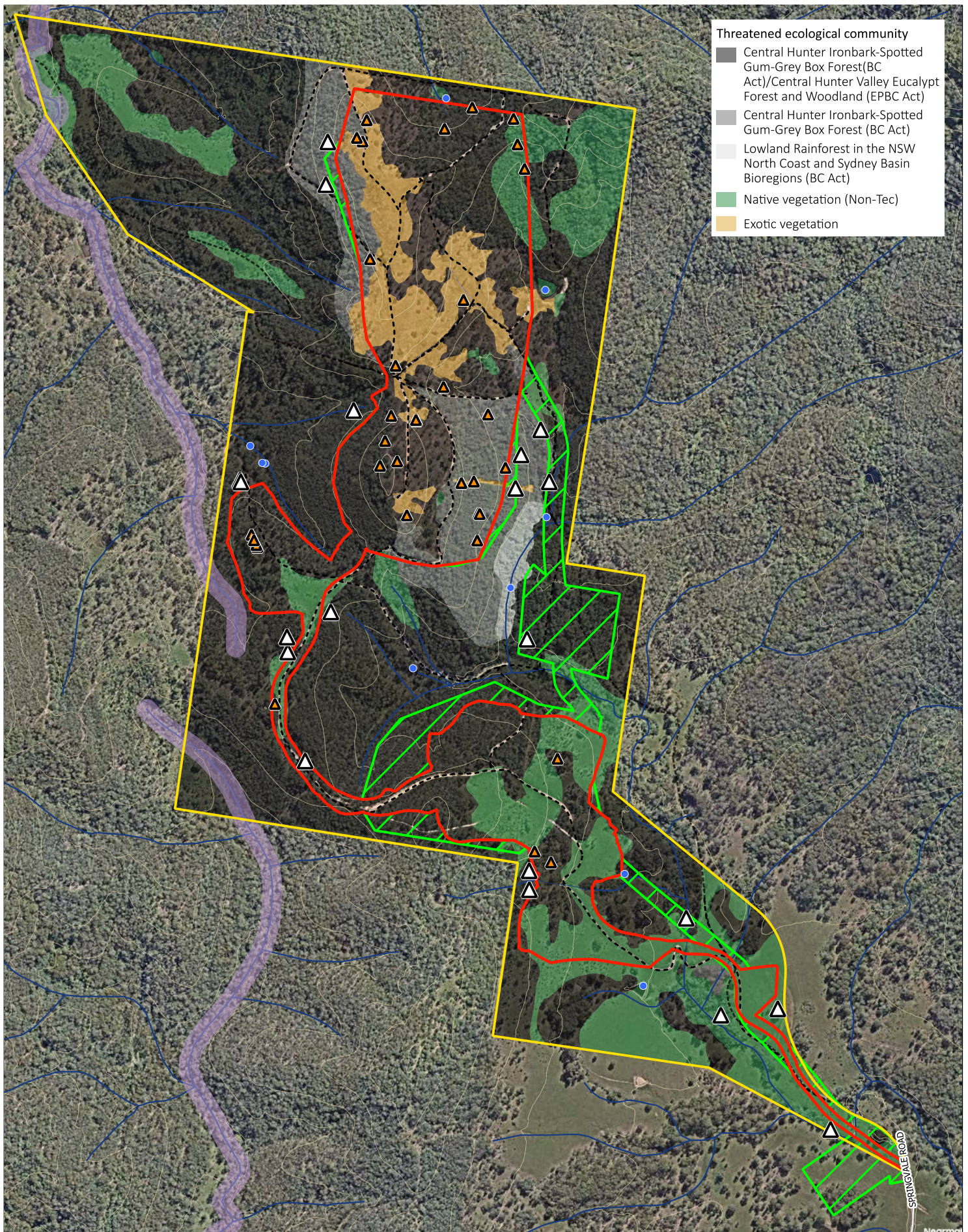
Stage 1	Years 1-4
Stage 2	Years 4-5
Stage 3	Years 4-5
Stage 4	Years 5-30
Stage 5	Dependent on need

- Development footprint
- Track
- Subject lot
- Cadastre
- Stage 1 ( Access and Processing)
- Stage 2 ( Quarry Pit S2)
- Stage 3 ( Stockpile Area)
- Stage 4 ( Quarry Pit South)
- Stage 5 ( Processing North Extension)
- 20m Contour
- Local Road
- Track-Vehicular
- Watercourse

Figure 3. Development Layout



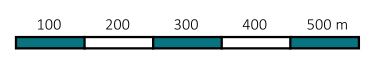


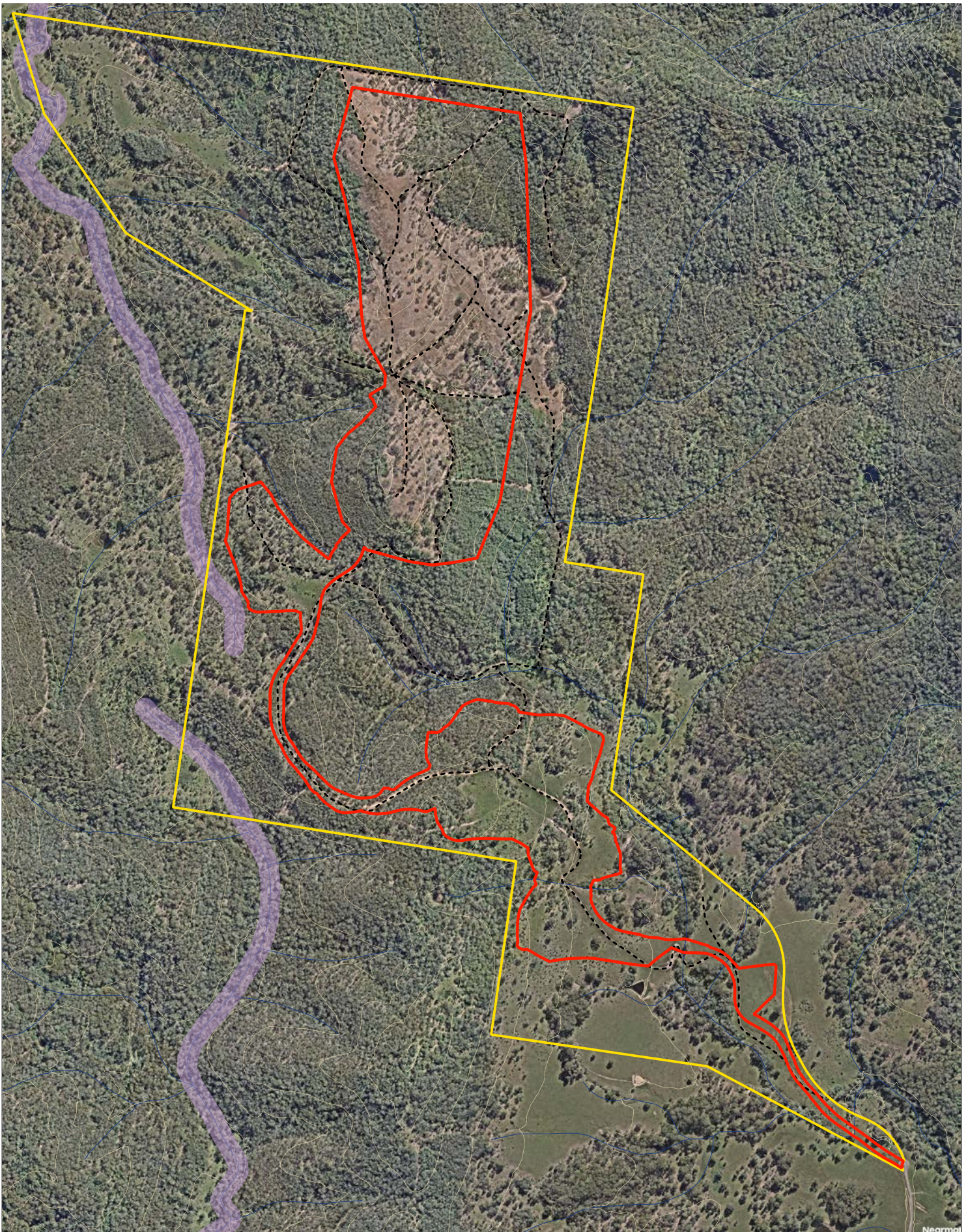


- Threatened ecological community**
- Central Hunter Ironbark-Spotted Gum-Grey Box Forest (BC Act)/Central Hunter Valley Eucalypt Forest and Woodland (EPBC Act)
  - Central Hunter Ironbark-Spotted Gum-Grey Box Forest (BC Act)
  - Lowland Rainforest in the NSW North Coast and Sydney Basin Bioregions (BC Act)
  - Native vegetation (Non-Tec)
  - Exotic vegetation

- Development footprint
- Avoidance area from adjusted development footprint
- Subject land
- Biodiversity values
- Track
- Hollow-bearing tree
- ▲ Impacted
- ▲ Avoided
- Water body (>3m)
- Watercourse
- 20m Contour
- Local Road
- Track-Vehicular

Figure 5. Avoid and Minimise





- Development footprint
- Track
- Watercourse
- Subject land
- Biodiversity values
- 20m Contour

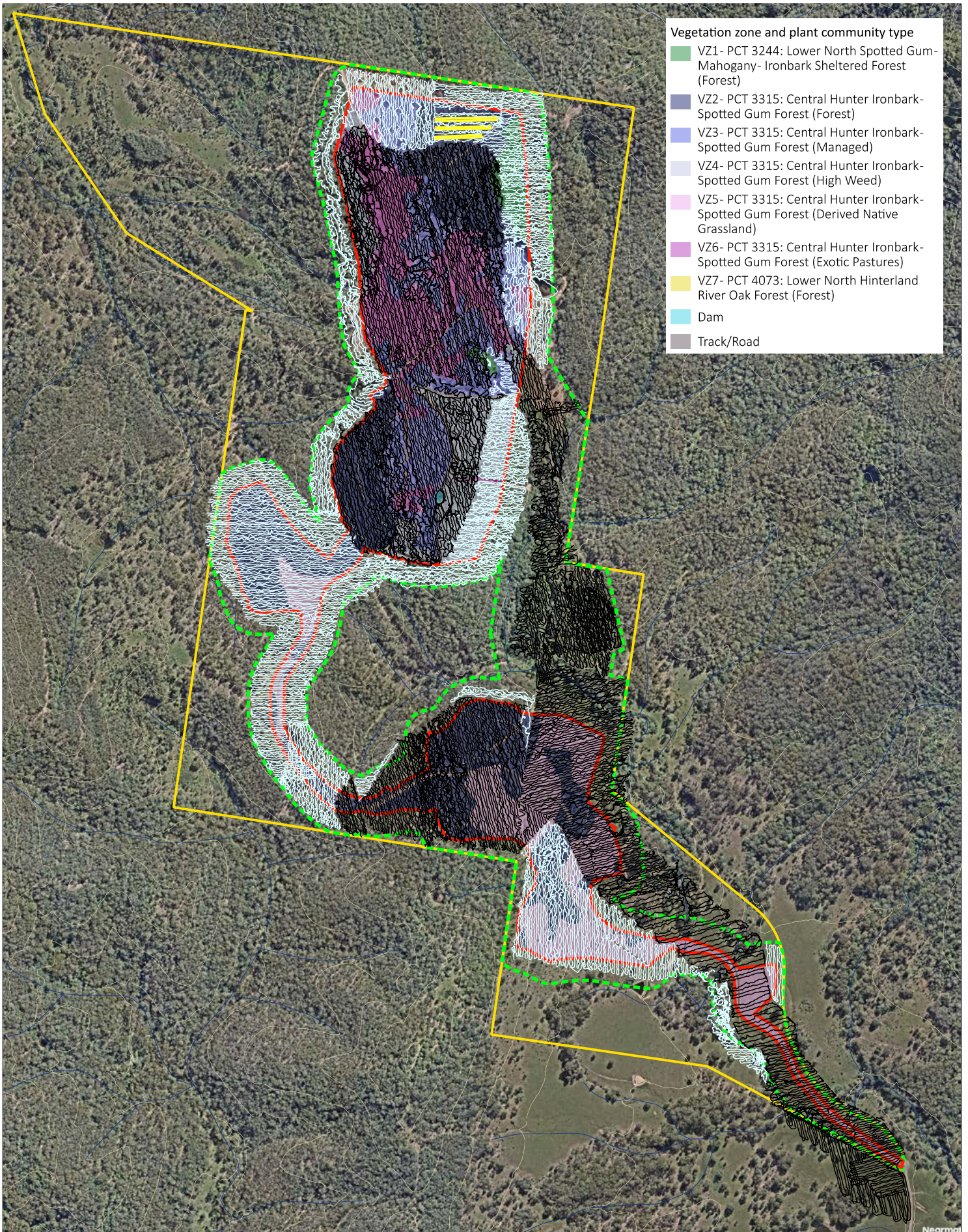
Figure 6. Biodiversity Values



Date: 30/04/2026  
 By: Keryn Dowling  
 GDA94 / MGA zone 56  
 Source: © Near Maps







- Vegetation zone and plant community type**
- VZ1- PCT 3244: Lower North Spotted Gum- Mahogany- Ironbark Sheltered Forest (Forest)
  - VZ2- PCT 3315: Central Hunter Ironbark- Spotted Gum Forest (Forest)
  - VZ3- PCT 3315: Central Hunter Ironbark- Spotted Gum Forest (Managed)
  - VZ4- PCT 3315: Central Hunter Ironbark- Spotted Gum Forest (High Weed)
  - VZ5- PCT 3315: Central Hunter Ironbark- Spotted Gum Forest (Derived Native Grassland)
  - VZ6- PCT 3315: Central Hunter Ironbark- Spotted Gum Forest (Exotic Pastures)
  - VZ7- PCT 4073: Lower North Hinterland River Oak Forest (Forest)
  - Dam
  - Track/Road

- Development footprint
- Subject land
- Study area

- Threatened Flora Transect**
- Ground species- October 2023
  - Ground species- October 2025
  - Ground species- October 2025 (Manually Added)

- Watercourse
- 20m Contour

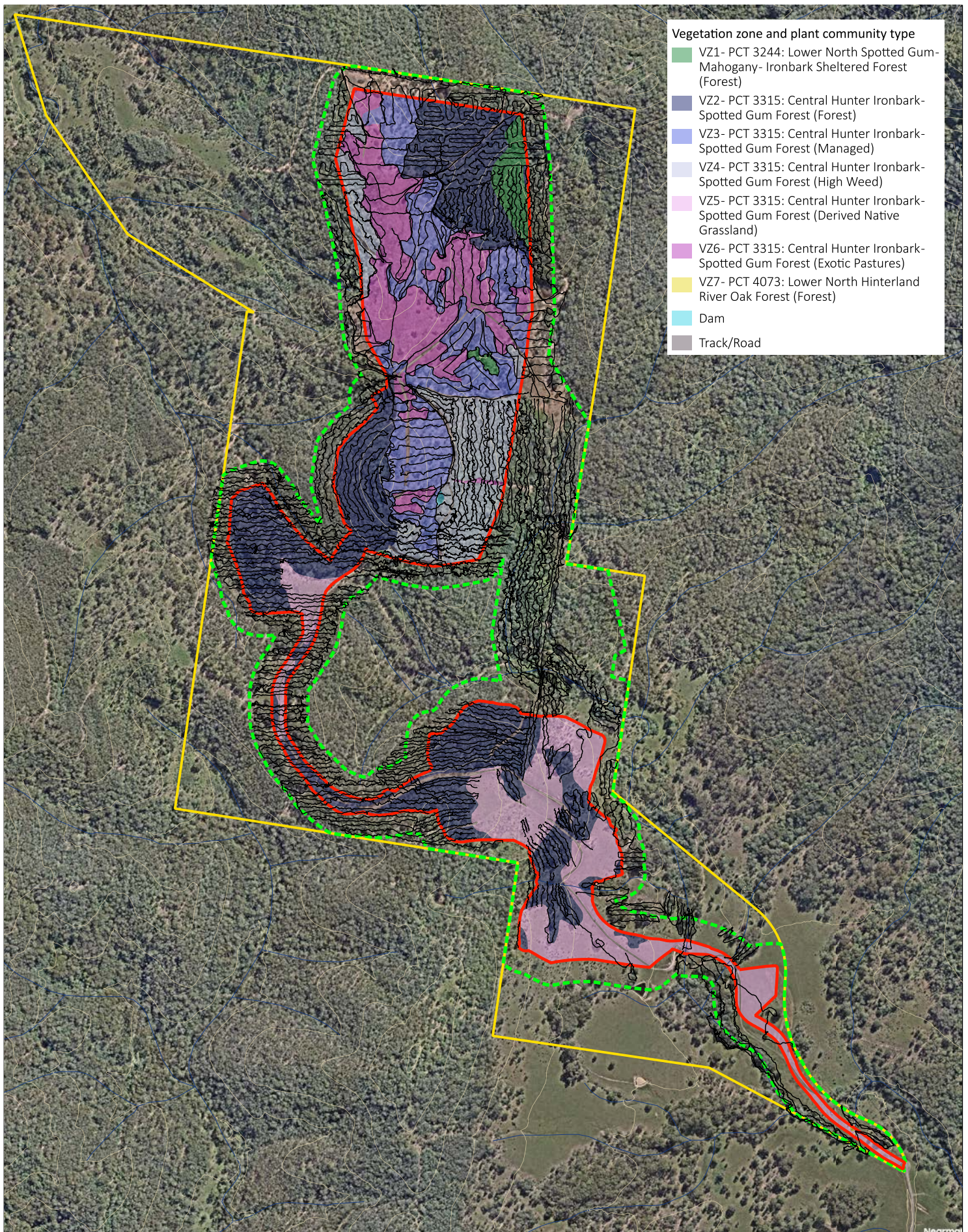
**Target species**  
 Pterostylis chaetophora, Tetratheca juncea, Cymbidium canaliculatum, and Rutidosis heterogama

Figure 9. Threatened Flora Searches: Ground Layer



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 GDA94 / MGA zone 56  
 Source: © Near Maps



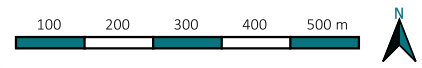


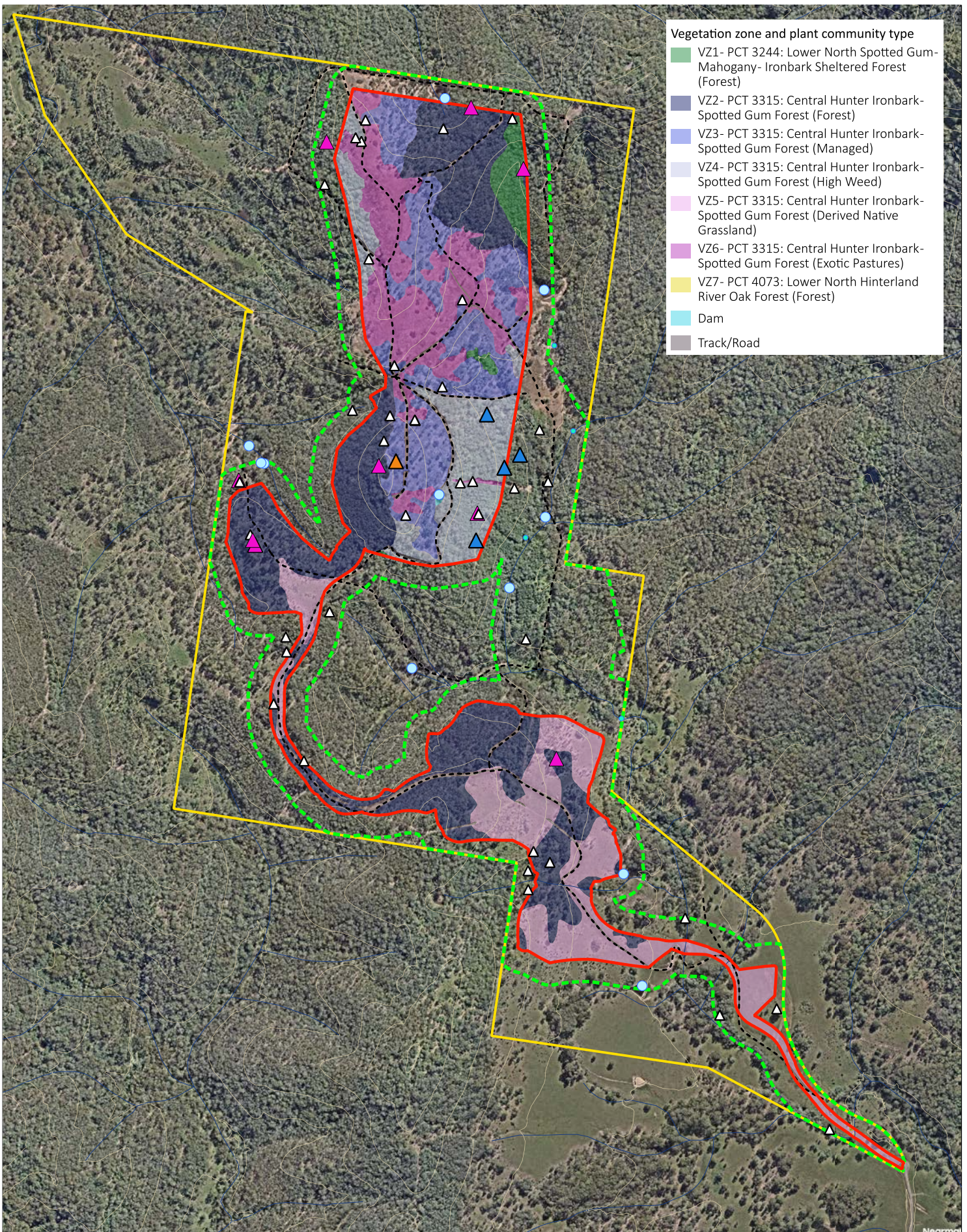
- Vegetation zone and plant community type**
- VZ1- PCT 3244: Lower North Spotted Gum-Mahogany- Ironbark Sheltered Forest (Forest)
  - VZ2- PCT 3315: Central Hunter Ironbark-Spotted Gum Forest (Forest)
  - VZ3- PCT 3315: Central Hunter Ironbark-Spotted Gum Forest (Managed)
  - VZ4- PCT 3315: Central Hunter Ironbark-Spotted Gum Forest (High Weed)
  - VZ5- PCT 3315: Central Hunter Ironbark-Spotted Gum Forest (Derived Native Grassland)
  - VZ6- PCT 3315: Central Hunter Ironbark-Spotted Gum Forest (Exotic Pastures)
  - VZ7- PCT 4073: Lower North Hinterland River Oak Forest (Forest)
  - Dam
  - Track/Road

- Development footprint
- Subject land
- Study area
- Threatened Flora Transect
- Tree, epiphytes and climbers- April/March 2025
- Watercourse
- 20m Contour

**Target species**  
*Acacia pendula*, *Cymbidium canaliculatum*, *Cynanchum elegans*, *Eucalyptus camaldulensis*, *Eucalyptus glaucina* and *Eucalyptus largeana*

**Figure 11. Threatened Flora Searches: Trees, Epiphytes & Climbers**

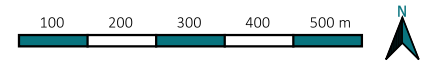




- Vegetation zone and plant community type**
- VZ1- PCT 3244: Lower North Spotted Gum-Mahogany- Ironbark Sheltered Forest (Forest)
  - VZ2- PCT 3315: Central Hunter Ironbark-Spotted Gum Forest (Forest)
  - VZ3- PCT 3315: Central Hunter Ironbark-Spotted Gum Forest (Managed)
  - VZ4- PCT 3315: Central Hunter Ironbark-Spotted Gum Forest (High Weed)
  - VZ5- PCT 3315: Central Hunter Ironbark-Spotted Gum Forest (Derived Native Grassland)
  - VZ6- PCT 3315: Central Hunter Ironbark-Spotted Gum Forest (Exotic Pastures)
  - VZ7- PCT 4073: Lower North Hinterland River Oak Forest (Forest)
  - Dam
  - Track/Road

- Development footprint
- Subject land
- Study area
- Track
- Hollow-bearing tree
  - Glossy-black cockatoo suitable hollow
  - Owl suitable hollow
  - Gang-gang suitable hollow
- Other
  - Open water patches >3 m wide (potential Southern Myotis foraging)
  - Open water patches
- Watercourse
- 20m Contour

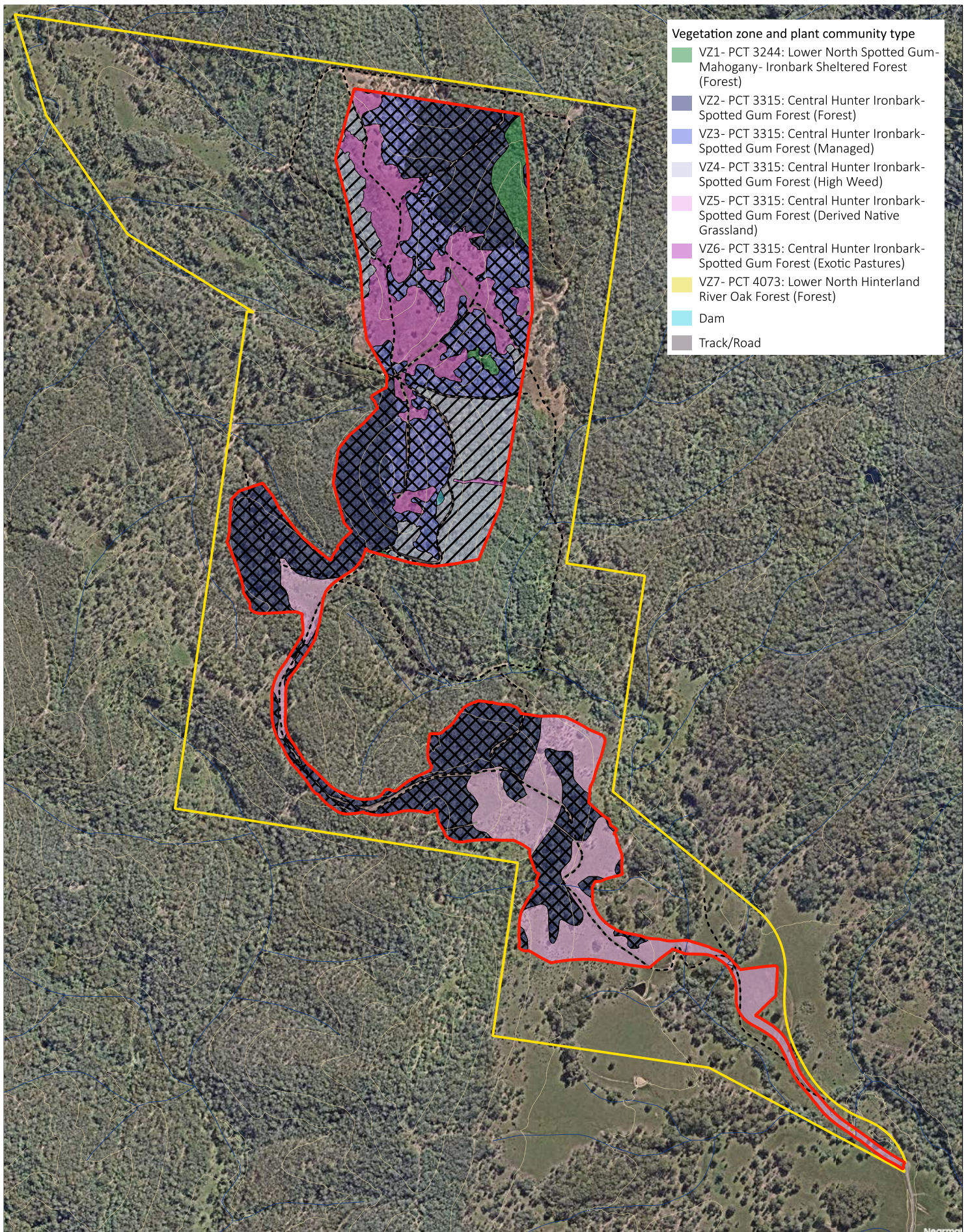
Figure 12. Fauna Habitat Features







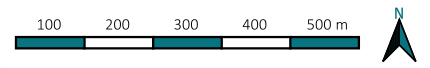




- Vegetation zone and plant community type**
- VZ1- PCT 3244: Lower North Spotted Gum-Mahogany- Ironbark Sheltered Forest (Forest)
  - VZ2- PCT 3315: Central Hunter Ironbark-Spotted Gum Forest (Forest)
  - VZ3- PCT 3315: Central Hunter Ironbark-Spotted Gum Forest (Managed)
  - VZ4- PCT 3315: Central Hunter Ironbark-Spotted Gum Forest (High Weed)
  - VZ5- PCT 3315: Central Hunter Ironbark-Spotted Gum Forest (Derived Native Grassland)
  - VZ6- PCT 3315: Central Hunter Ironbark-Spotted Gum Forest (Exotic Pastures)
  - VZ7- PCT 4073: Lower North Hinterland River Oak Forest (Forest)
  - Dam
  - Track/Road

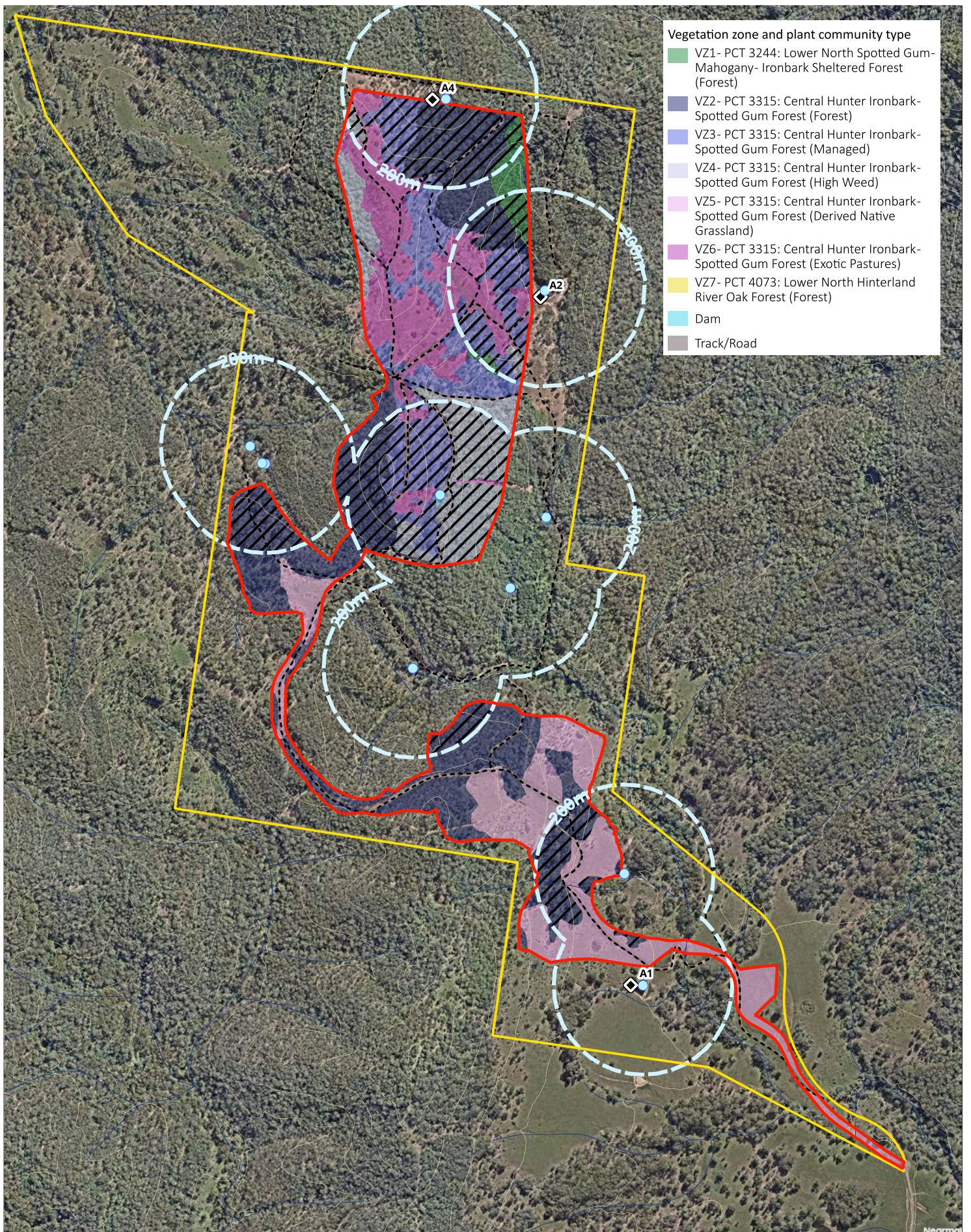
- Development footprint
- Track
- Subject land
- TEC
- Central Hunter Ironbark-Spotted Gum-Grey Box Forest in New South Wales North Coast and Sydney Basin Bioregions (BC Act)
- Central Hunter Valley Eucalypt Forest and Woodland (EPBC Act)
- Watercourse
- 20m Contour

Figure 16. Threatened Ecological Communities



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 GDA94 / MGA zone 56  
 Source: © Near Maps

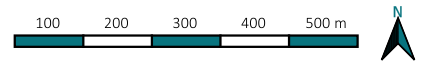


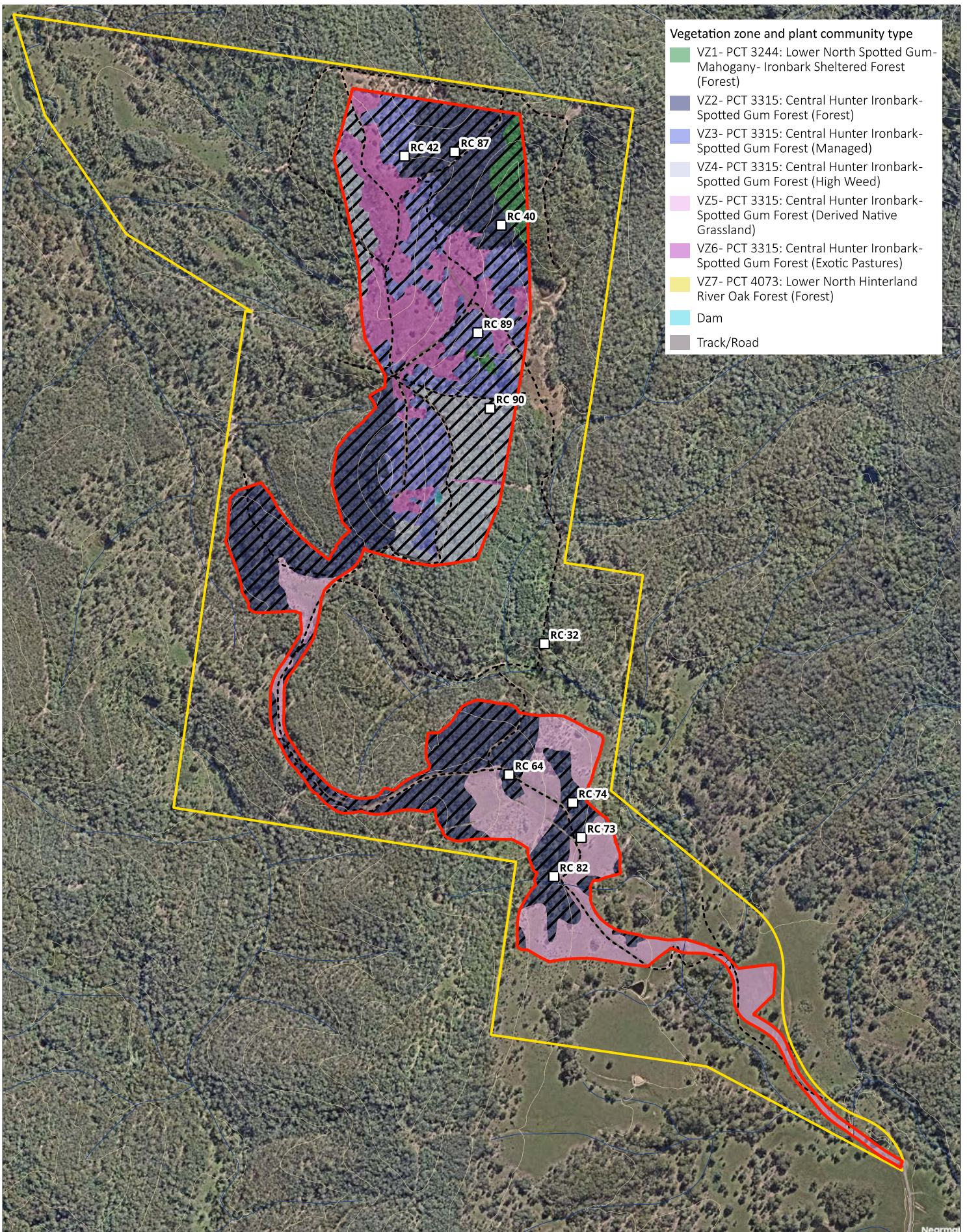


- Vegetation zone and plant community type**
- VZ1- PCT 3244: Lower North Spotted Gum-Mahogany- Ironbark Sheltered Forest (Forest)
  - VZ2- PCT 3315: Central Hunter Ironbark-Spotted Gum Forest (Forest)
  - VZ3- PCT 3315: Central Hunter Ironbark-Spotted Gum Forest (Managed)
  - VZ4- PCT 3315: Central Hunter Ironbark-Spotted Gum Forest (High Weed)
  - VZ5- PCT 3315: Central Hunter Ironbark-Spotted Gum Forest (Derived Native Grassland)
  - VZ6- PCT 3315: Central Hunter Ironbark-Spotted Gum Forest (Exotic Pastures)
  - VZ7- PCT 4073: Lower North Hinterland River Oak Forest (Forest)
  - Dam
  - Track/Road

- Development footprint
- Subject land
- Track
- Southern Myotis detected
- Southern Myotis Species Polygon
- 200m buffer (Waterbodies >3m)
- Water body (>3m)
- Watercourse
- 20m Contour

**Figure 18. Southern Myotis Records & Species Polygon**

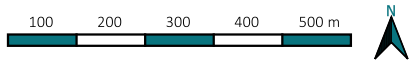


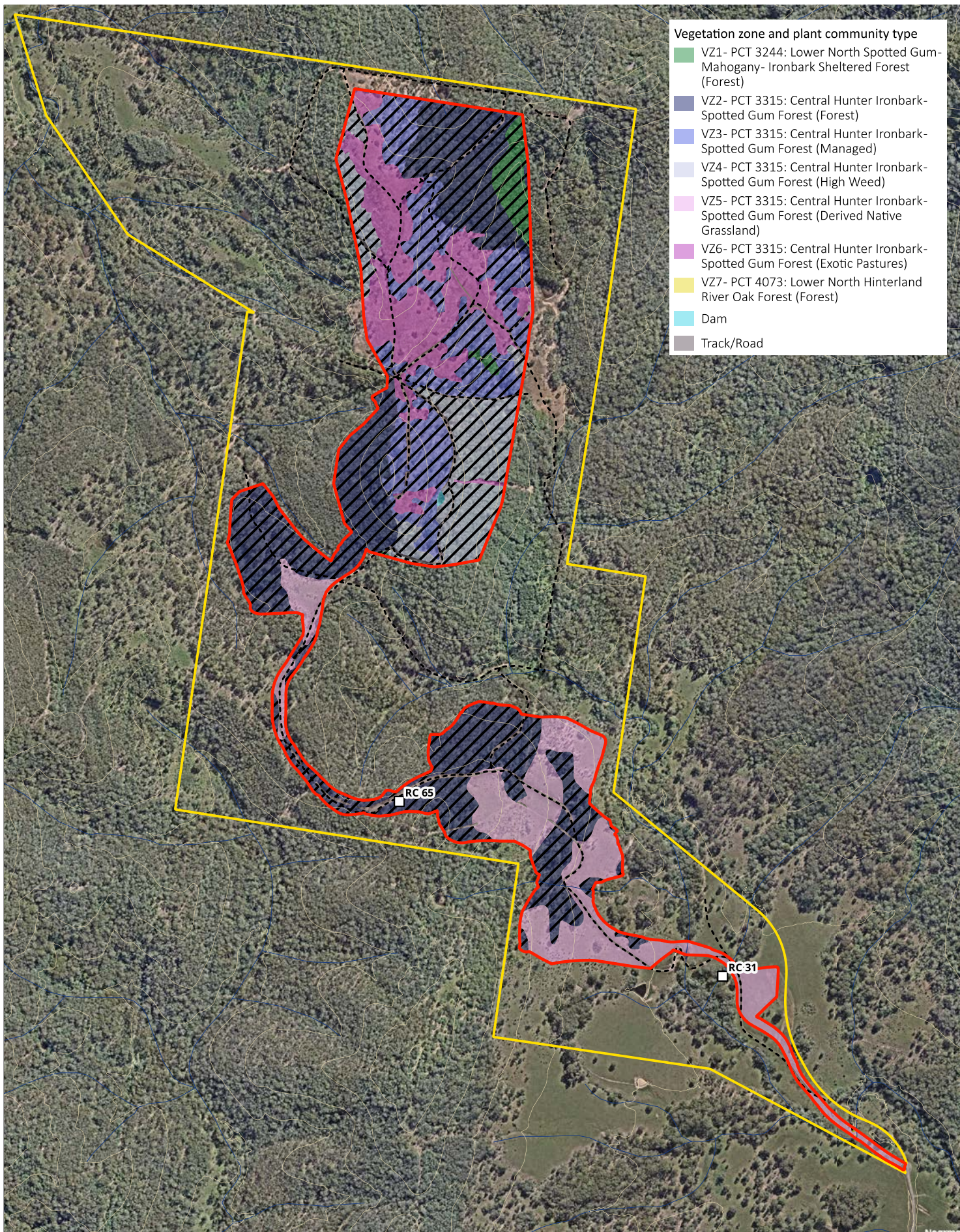


- Vegetation zone and plant community type**
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  - VZ2- PCT 3315: Central Hunter Ironbark- Spotted Gum Forest (Forest)
  - VZ3- PCT 3315: Central Hunter Ironbark- Spotted Gum Forest (Managed)
  - VZ4- PCT 3315: Central Hunter Ironbark- Spotted Gum Forest (High Weed)
  - VZ5- PCT 3315: Central Hunter Ironbark- Spotted Gum Forest (Derived Native Grassland)
  - VZ6- PCT 3315: Central Hunter Ironbark- Spotted Gum Forest (Exotic Pastures)
  - VZ7- PCT 4073: Lower North Hinterland River Oak Forest (Forest)
  - Dam
  - Track/Road

- Development footprint
- Subject land
- Track
- Squirrel Glider detection
- Squirrel Glider Species Polygon
- Watercourse
- 20m Contour

Figure 19. Squirrel Glider Records & Species Polygon

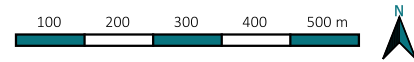




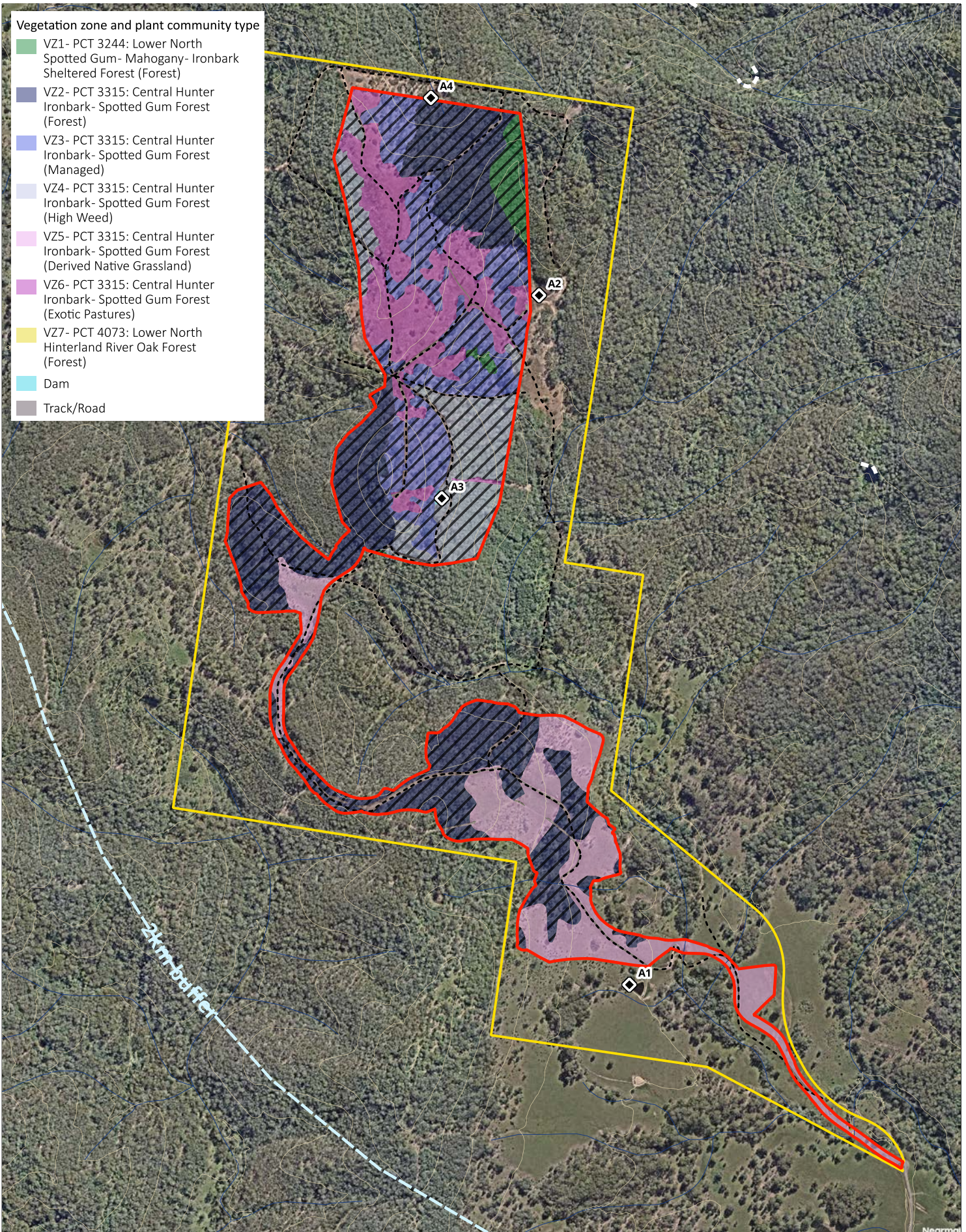
- Vegetation zone and plant community type**
- VZ1- PCT 3244: Lower North Spotted Gum-Mahogany- Ironbark Sheltered Forest (Forest)
  - VZ2- PCT 3315: Central Hunter Ironbark-Spotted Gum Forest (Forest)
  - VZ3- PCT 3315: Central Hunter Ironbark-Spotted Gum Forest (Managed)
  - VZ4- PCT 3315: Central Hunter Ironbark-Spotted Gum Forest (High Weed)
  - VZ5- PCT 3315: Central Hunter Ironbark-Spotted Gum Forest (Derived Native Grassland)
  - VZ6- PCT 3315: Central Hunter Ironbark-Spotted Gum Forest (Exotic Pastures)
  - VZ7- PCT 4073: Lower North Hinterland River Oak Forest (Forest)
  - Dam
  - Track/Road

- Development footprint
- Subjet land
- Track
- Brush-tailed Phascogale detection
- Brush-tail Phascogale Species Polygon
- Watercourse
- 20m Contour

**Figure 20. Brush-tail Phascogale Records & Species Polygon**

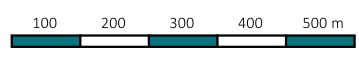


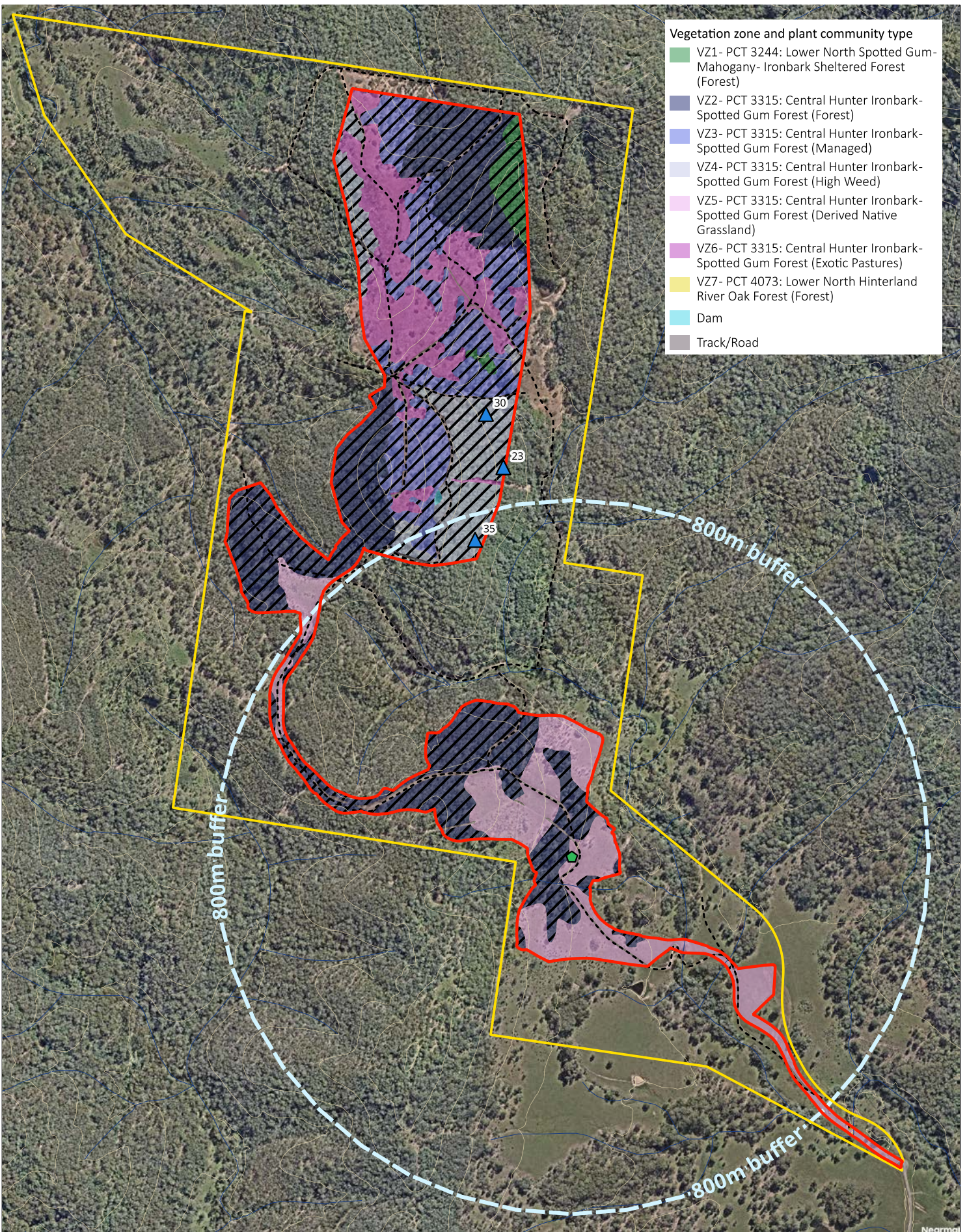
- Vegetation zone and plant community type**
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  - VZ2- PCT 3315: Central Hunter Ironbark- Spotted Gum Forest (Forest)
  - VZ3- PCT 3315: Central Hunter Ironbark- Spotted Gum Forest (Managed)
  - VZ4- PCT 3315: Central Hunter Ironbark- Spotted Gum Forest (High Weed)
  - VZ5- PCT 3315: Central Hunter Ironbark- Spotted Gum Forest (Derived Native Grassland)
  - VZ6- PCT 3315: Central Hunter Ironbark- Spotted Gum Forest (Exotic Pastures)
  - VZ7- PCT 4073: Lower North Hinterland River Oak Forest (Forest)
  - Dam
  - Track/Road



- Development footprint
- Escarpment
- 2km buffer (Escarpment)
- Subject land
- Large-eared Pied Bat detection
- Watercourse
- Track
- Large-eared Pied Bat Species Polygon
- 20m Contour

**Figure 21. Large Eared Pied Bat Records & Species Polygon**

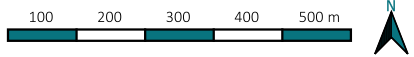




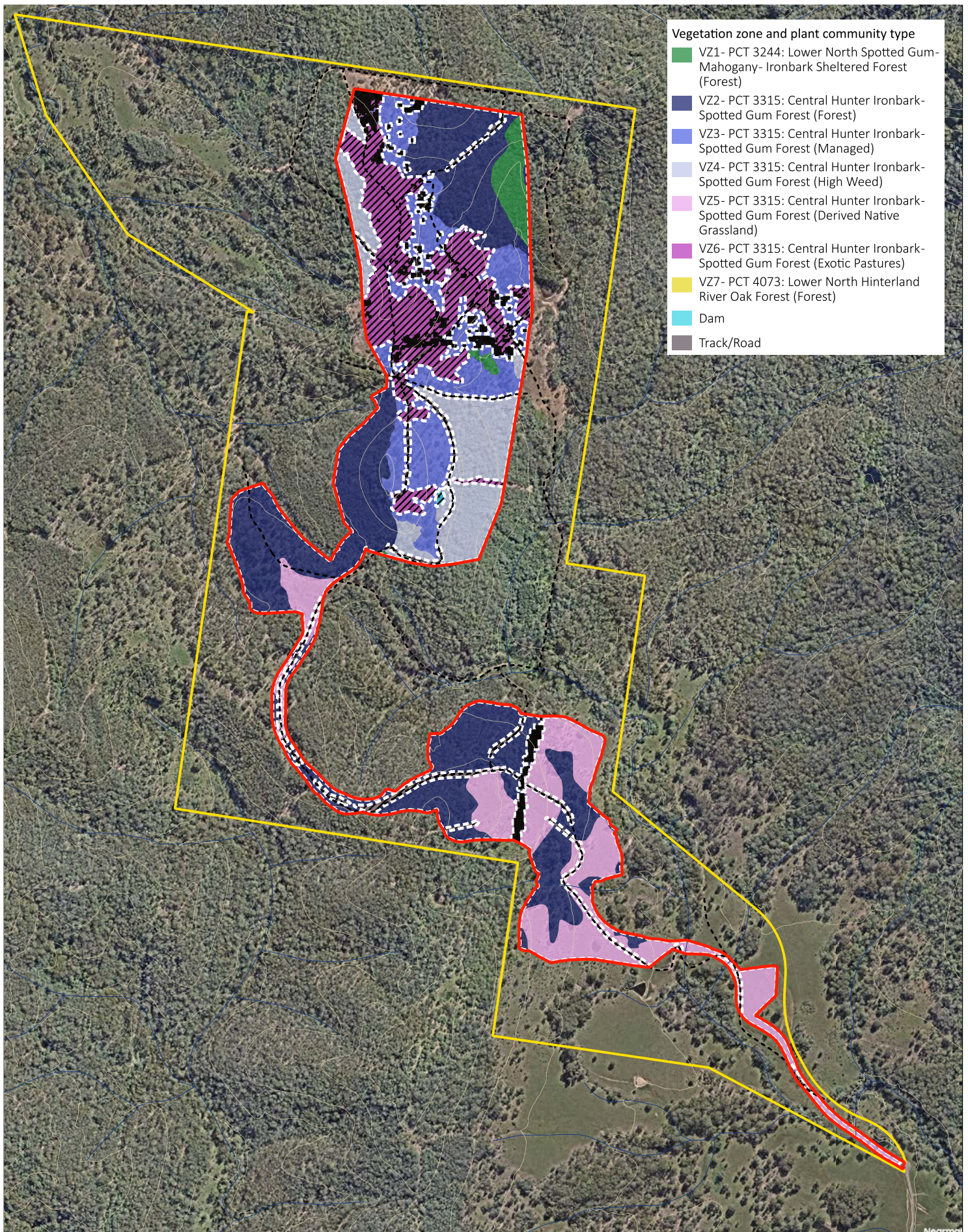
- Vegetation zone and plant community type**
- VZ1- PCT 3244: Lower North Spotted Gum-Mahogany- Ironbark Sheltered Forest (Forest)
  - VZ2- PCT 3315: Central Hunter Ironbark-Spotted Gum Forest (Forest)
  - VZ3- PCT 3315: Central Hunter Ironbark-Spotted Gum Forest (Managed)
  - VZ4- PCT 3315: Central Hunter Ironbark-Spotted Gum Forest (High Weed)
  - VZ5- PCT 3315: Central Hunter Ironbark-Spotted Gum Forest (Derived Native Grassland)
  - VZ6- PCT 3315: Central Hunter Ironbark-Spotted Gum Forest (Exotic Pastures)
  - VZ7- PCT 4073: Lower North Hinterland River Oak Forest (Forest)
  - Dam
  - Track/Road

- Development footprint
- Subject land
- Track
- Powerful Owl detection
- Hollow-bearing tree
- Owl suitable hollow
- Powerful Owl Species Polygon
- 800m buffer (Powerful Owl detection)
- Watercourse
- 20m Contour

Figure 22. Powerful Owl Records & Species Polygon







- Development footprint
- Subjet land
- Track
- Areas requiring an offset
- Areas not requiring an offset
- Areas not requiring further assessment (Cat 1 Land)
- Watercourse
- 20m Contour

Figure 24. Thresholds For Assessing & Offsetting Impacts



## Appendix A: BDAR requirements compliance

The operational manuals (Stage 1 and Stage 2) provide further operational guidance for the preparation of a BDAR and are companion documents to the BAM. In preparing BDARs, assessors should read the operational manuals in conjunction with the BAM. Some best practice items outlined in the operational manuals that are not reflected in BAM Appendix K have been added in red within **Table 52**.

**Table 52 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	<b>Information</b>	
		Introduction to the biodiversity assessment including:	–
		<input checked="" type="checkbox"/> brief description of the proposal	<1.1.1>
		<input checked="" type="checkbox"/> identification of Subject Land boundary, including:	<1.1.3>
		<input checked="" type="checkbox"/> operational footprint	
		<input checked="" type="checkbox"/> construction footprint indicating clearing associated with temporary/ancillary construction facilities and infrastructure	
		<input checked="" type="checkbox"/> general description of the Subject Land	1.1.3
		<input checked="" type="checkbox"/> sources of information used in the assessment, including reports and spatial data	<1.5>
		<input checked="" type="checkbox"/> identification and justification for entering the BOS	<1.2>
		<b>Maps and tables</b>	
		<input checked="" type="checkbox"/> Map of the Subject Land boundary	<Figure 1>
Landscape	Sections 3.1 and 3.2, Appendix E	<b>Information</b>	
		Identification of site context components and landscape features, including:	–

BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		<input checked="" type="checkbox"/> general description of Subject Land topographic and hydrological setting, geology and soils	<3.2>
		<input checked="" type="checkbox"/> percent native vegetation cover in the assessment area (as described in BAM Section 3.2)	
		<input checked="" type="checkbox"/> IBRA bioregions and subregions (as described in BAM Subsection 3.1.3(2.))	<3.2.1>
		<input checked="" type="checkbox"/> rivers and streams classified according to stream order (as described in BAM Subsection 3.1.3(3.) and Appendix E)	<3.2.2>
		<input checked="" type="checkbox"/> wetlands within, adjacent to and downstream of the site (as described in BAM Subsection 3.1.3(3.))	<3.2.2>
		<input checked="" type="checkbox"/> connectivity of different areas of habitat (as described in BAM Subsection 3.1.3(5–6.))	<3.2.3>
		<input checked="" type="checkbox"/> 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>
		<input checked="" type="checkbox"/> 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>
		<input checked="" type="checkbox"/> any additional landscape features identified in any SEARs for the proposal	<3.2.7>
		<input checked="" type="checkbox"/> NSW (Mitchell) landscape on which the Subject Land occurs	<3.2.6>
		<input checked="" type="checkbox"/> 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>
		<b>Maps and tables</b>	
		<input checked="" type="checkbox"/> Site Map	<Figure 1>
		<input checked="" type="checkbox"/> Property boundary	
		<input checked="" type="checkbox"/> Boundary of Subject Land	
		<input checked="" type="checkbox"/> Cadastre of Subject Land (including labelling of Lot and DP or section plan if relevant)	
		<input checked="" type="checkbox"/> Landscape features identified in BAM Subsection 3.1.3	

BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		<input checked="" type="checkbox"/> Location Map <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Digital aerial photography at 1:1,000 scale or finer</li> <li><input checked="" type="checkbox"/> Boundary of Subject Land</li> <li><input checked="" type="checkbox"/> Assessment area (i.e. the Subject Land and either 1500 m buffer area or 500 m buffer for linear development)</li> <li><input checked="" type="checkbox"/> Landscape features identified in BAM Subsection 3.1.3</li> <li><input checked="" type="checkbox"/> Additional detail (e.g. local government area boundaries) relevant at this scale</li> </ul>	<Figure 2>
		Landscape features identified in BAM Subsection 3.1.3 and to be shown on the Site Map and/or Location Map include:	–
		<input checked="" type="checkbox"/> IBRA bioregions and subregions <input checked="" type="checkbox"/> rivers, streams and estuaries <input checked="" type="checkbox"/> wetlands and important wetlands <input checked="" type="checkbox"/> connectivity of different areas of habitat <input checked="" type="checkbox"/> karst, caves, crevices, cliffs, rocks and other geological features of significance and if required, soil hazard features <input checked="" type="checkbox"/> areas of outstanding biodiversity value occurring on the Subject Land and assessment area <input checked="" type="checkbox"/> any additional landscape features identified in any SEARs for the proposal <input checked="" type="checkbox"/> NSW (Mitchell) landscape on which the Subject Land occurs	<Figure 1 & Figure 2> Section 2.1.1
		<b>Data</b>	
		<input checked="" type="checkbox"/> All report maps as separate jpeg files	–
		Individual digital shape files of:	–
		<input checked="" type="checkbox"/> Subject Land boundary	–
		<input checked="" type="checkbox"/> assessment area (i.e. Subject Land and 1500 m buffer area) boundary	–
		<input checked="" type="checkbox"/> cadastral boundary of Subject Land	–
		<input checked="" type="checkbox"/> areas of native vegetation cover	–

BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		<input checked="" type="checkbox"/> landscape features	–
Native vegetation	Chapter 4, Appendix A and Appendix H	<b>Information</b>	
		<input checked="" type="checkbox"/> 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 15 Figure 17>
		<input checked="" type="checkbox"/> 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>
		<input checked="" type="checkbox"/> 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)	<2.3.1>
		<input checked="" type="checkbox"/> Describe the systematic field-based floristic vegetation survey undertaken in accordance with BAM Section 4.2	<2.2>
		<input checked="" type="checkbox"/> 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:	–
		<input checked="" type="checkbox"/> PCT name and ID	<4.1, Figure 14 Figure 16>
		<input checked="" type="checkbox"/> vegetation class	<4.1.2>
		<input checked="" type="checkbox"/> extent (ha) within Subject Land	<4.2>
		<input checked="" type="checkbox"/> evidence used to identify a PCT including any analyses undertaken, references/sources, existing vegetation maps (BAM Section 4.2(1–3.))	<4.2.2.3, 4.2.3.3, 4.2.4.3, 4.2.5.3>

BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		<input checked="" type="checkbox"/> plant species relied upon for identification of the PCT and relative abundance of each species	<4.2.2.3, 4.2.3.3, 4.2.4.3, 4.2.5.3>
		<input checked="" type="checkbox"/> if relevant, TEC status including evidence used to determine vegetation is the TEC (BAM Subsection 4.2.2(1–2.))	<4.2.2.4, 4.2.2.5, 0, 4.2.3.5, 4.2.4.4, 4.2.4.5, 4.2.5.4, 4.2.5.5, 4.3>
		<input checked="" type="checkbox"/> estimate of percent cleared value of PCT (BAM Subsection 4.2.1(5.))	<4.2.2.1, 4.2.3.1, 4.2.4.1, 4.2.5.1>
		Describe the vegetation integrity assessment of the Subject Land, including:	–
		<input checked="" type="checkbox"/> identification and mapping of vegetation zones (as described in BAM Subsection 4.3.1)	<4.4 & Figure 16>
		<input checked="" type="checkbox"/> description of vegetation zones within the Subject Land (as described in Operational Manual Stage 1 Table 2 and Subsection 3.3.2)	<4.4 & Figure 16>
		<input checked="" type="checkbox"/> area (ha) of each vegetation zone	<4.4, Table 24>
		<input checked="" type="checkbox"/> assessment of patch size (as described in BAM Subsection 4.3.2)	<4.4>
		<input checked="" type="checkbox"/> survey effort (i.e. number of vegetation integrity survey plots) as described in BAM Subsection 4.3.4(1–2.)	<4.5.1>
		<input checked="" type="checkbox"/> use of relevant benchmark data from BioNet Vegetation Classification (as described in BAM Subsection 4.3.3(5.))	<4.5.3>
		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):	n/a
		<input type="checkbox"/> identify the PCT or vegetation class for which local benchmark data will be applied	<n/a>
		<input type="checkbox"/> identify published sources of local benchmark data (if benchmarks obtained from published sources)	
		<input type="checkbox"/> describe methods of local benchmark data collection (if reference plots used to determine local benchmark data)	
		<input type="checkbox"/> provide justification for use of local data rather than BioNet Vegetation Classification benchmark values	<n/a>

BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		<input type="checkbox"/> provide written confirmation from the decision-maker that they support the use of local benchmark data	<n/a>
<b>Maps and tables</b>			
		<input checked="" type="checkbox"/> 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 2, Figure 15, Figure 16 >
		<input checked="" type="checkbox"/> Map of PCTs within the Subject Land (as described in BAM Section 4.2(1.))	<Figure 10>
		<input checked="" type="checkbox"/> Map of vegetation zones within the Subject Land (as described in BAM Subsection 4.3.1)	<Figure 14>
		<input checked="" type="checkbox"/> Map the location of floristic vegetation survey plots and vegetation integrity survey plots relative to PCT boundaries	<Figure 8 >
		<input checked="" type="checkbox"/> Map of TEC distribution on the Subject Land and table of TEC listing, status and area (ha)	<Figure 16 & Table 23>
		<input checked="" type="checkbox"/> 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 2 & Table 24>
		Table of current vegetation integrity scores for each vegetation zone within the site and including:	–
		<input checked="" type="checkbox"/> composition condition score	<Table 25>
		<input checked="" type="checkbox"/> structure condition score	
		<input checked="" type="checkbox"/> function condition score	
		<input checked="" type="checkbox"/> presence of hollow bearing trees	
<b>Data</b>			
		<input checked="" type="checkbox"/> All report maps as separate jpeg files	–
		<input checked="" type="checkbox"/> Plot field data (MS Excel format)	Supporting documentation

BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		<input checked="" type="checkbox"/> Plot field datasheets	<Appendix E: Vegetation survey data>
		Digital shape files of:	–
		<input checked="" type="checkbox"/> PCT boundaries within Subject Land	–
		<input checked="" type="checkbox"/> TEC boundaries within Subject Land	–
		<input checked="" type="checkbox"/> vegetation zone boundaries within Subject Land	–
		<input checked="" type="checkbox"/> floristic vegetation survey and vegetation integrity plot locations	–
Threatened species	Chapter 5	<b>Information</b>	
		Identify ecosystem credit species likely to occur on the Subject Land, including:	–
		<input checked="" type="checkbox"/> list of ecosystem credit species derived from the BAM-C (as described in BAM Subsection 5.1.1 and Section 5.2(1.))	<Table 26>
		<input checked="" type="checkbox"/> 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>
		<input type="checkbox"/> justification for addition of any ecosystem credit species to the list	<n/a>
		Identify species credit species likely to occur on the Subject Land, including:	–
		<input checked="" type="checkbox"/> list of species credit species derived from the BAM-C (as described in BAM Subsection 5.1.1)	<Table 27 & Table 28>
		<input checked="" type="checkbox"/> 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>
		<input checked="" type="checkbox"/> 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>
		<input checked="" type="checkbox"/> justification for addition of any species credit species to the list	<5.1.2>

BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		From the list of candidate species credit species, identify:	–
		<input checked="" type="checkbox"/> species assumed present within the Subject Land (if relevant) (as described in BAM Subsection 5.2.4(2.a.))	<Table 30 & Table 31>
		<input checked="" type="checkbox"/> 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.))	
		<input checked="" type="checkbox"/> species for which targeted surveys are to be completed to determine species presence (BAM Subsection 5.2.4(2.b.))	
		<input checked="" type="checkbox"/> species for which an expert report is to be used to determine species presence (BAM Subsection 5.2.4(2.c.))	
		Present the outcomes of species credit species assessments from:	–
		<input checked="" type="checkbox"/> threatened species survey (as described in BAM Section 5.2.4)	<Table 32 & Table 33>
		<input type="checkbox"/> 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:	–
		<input checked="" type="checkbox"/> survey method and effort (as described in BAM Section 5.3)	<Table 32 & Table 33>
		<input checked="" type="checkbox"/> 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>
		<input checked="" type="checkbox"/> 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	<Table 32 & Table 33 & 5.3>
		<input checked="" type="checkbox"/> survey personnel and relevant experience	<Declarations ii>
		<input checked="" type="checkbox"/> 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:	–

BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		<input type="checkbox"/> justification of the use of an expert report	N/A
		<input type="checkbox"/> identify the expert, provide evidence of their expert credentials and departmental approval of expert status	
		<input type="checkbox"/> all requirements of Box 3 have been addressed in the expert report	
		Where use of local data is proposed (BAM Subsection 1.4.2):	–
		<input type="checkbox"/> identify relevant species	N/A
		<input type="checkbox"/> identify data to be amended	
		<input type="checkbox"/> identify source of information for local data, e.g. published literature, additional survey data, etc.	
		<input type="checkbox"/> justify use of local data in preference to VIS Classification or TBDC data	
		<input type="checkbox"/> provide written confirmation from the decision-maker that they support the use of local data	N/A
		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:	–
		<input checked="" type="checkbox"/> the unit of measure for each species is documented	<Table 35 & Table 36>
		for species assessed by area:	–
		<input checked="" type="checkbox"/> 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 14>
		<input checked="" type="checkbox"/> 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	<5.6>
		for species assessed by counts of individuals:	–
		<input checked="" type="checkbox"/> the number of individual plants present on the Subject Land (as described in BAM Subsection 5.2.5(3.))	<5.6>
		<input checked="" type="checkbox"/> the method used to derive this number (i.e. threatened species survey or expert report) and evidence-based justification for the approach taken	<5.6>

BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		<input checked="" type="checkbox"/> 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 14>
		<input checked="" type="checkbox"/> 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 35 & Table 36>
		<b>Maps and tables</b>	
		<input checked="" type="checkbox"/> Table showing ecosystem credit species in accordance with BAM Subsection 5.1.1, and identifying:	
		<input checked="" type="checkbox"/> the ecosystem credit species removed from the list	<Table 26>
		<input checked="" type="checkbox"/> the sensitivity to gain class of each species	<Table 26>
		<input checked="" type="checkbox"/> Table detailing species credit species in accordance with BAM Section 5.2 and identifying:	<Table 27 & Table 28>
		<input checked="" type="checkbox"/> 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 27 & Table 28>
		<input checked="" type="checkbox"/> the candidate species credit species not recorded on the Subject Land as determined by targeted survey, expert report or important habitat map	<Table 30 & Table 31>
		<input checked="" type="checkbox"/> 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)	<5.6 & Table 35 & Table 36>
		<input checked="" type="checkbox"/> 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 14>
		<b>Data</b>	
		<input type="checkbox"/> Digital shape files of suitable habitat identified for survey for each candidate species credit species	–
		<input type="checkbox"/> Survey locations including GPS coordinates of any plots, transects, grids	
		<input type="checkbox"/> Digital shape files of each species polygon including GPS coordinates of located individuals	–
		<input type="checkbox"/> Species polygon map in jpeg format	–

BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		<input type="checkbox"/> Expert reports and any supporting data used to support conclusions of the expert report	
		<input type="checkbox"/> Field datasheets detailing survey information including prevailing conditions, date, time, equipment used, etc.	
Prescribed impacts	Chapter 6	<b>Information</b>	
		Identify potential prescribed biodiversity impacts on threatened entities, including:	–
		<input checked="" type="checkbox"/> karst, caves, crevices, cliffs, rocks and other geological features of significance (as described in BAM Subsection 6.1.1)	<Table 37>
		<input checked="" type="checkbox"/> occurrences of human-made structures and non-native vegetation (as described in BAM Subsection 6.1.2)	
		<input checked="" type="checkbox"/> corridors or other areas of connectivity linking habitat for threatened entities (as described in BAM Subsection 6.1.3)	
		<input checked="" type="checkbox"/> waterbodies or any hydrological processes that sustain threatened entities (as described in BAM Subsection 6.1.4)	
		<input checked="" type="checkbox"/> 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>
		<input checked="" type="checkbox"/> 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 37>
		<input checked="" type="checkbox"/> Identify a list of threatened entities that may be dependent upon or may use habitat features associated with any of the prescribed impacts	<8.3>
		<input checked="" type="checkbox"/> 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)	<6>
		Where the proposed development is for a wind farm:	–
		<input type="checkbox"/> 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>

BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		<input type="checkbox"/> 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 >
		<input type="checkbox"/> 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:	–
		<input checked="" type="checkbox"/> 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 38>
<b>Maps and tables</b>			
		<input checked="" type="checkbox"/> Map showing location of any prescribed impact features (i.e. karst, caves, crevices, cliffs, rocks, human-made structures, etc.)	<Figure 1 & Figure 2>
		<input checked="" type="checkbox"/> Map showing location of potential vehicle strike locations	<Figure 1>
		<input checked="" type="checkbox"/> 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)	<Figure 1 & Figure 2>
<b>Data</b>			
		<input type="checkbox"/> Digital shape files of prescribed impact feature locations	–
		<input type="checkbox"/> Prescribed impact features map in jpeg format	–
Avoid and minimise impacts	Chapter 7	<b>Information</b>	
		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:	–
		<input checked="" type="checkbox"/> modes or technologies that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed mode or technology	<7.1>

BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		<input checked="" type="checkbox"/> routes that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed route	<7.1>
		<input checked="" type="checkbox"/> alternative locations that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed location	<7.1>
		<input checked="" type="checkbox"/> 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>
		<input checked="" type="checkbox"/> 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; 7.4>
		<input checked="" type="checkbox"/> 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>
		<input type="checkbox"/> Detail measures or options considered but not implemented because they are not feasible and/or practical (e.g. due to site constraints)	<n/a>
<b>Maps and tables</b>			
		<input checked="" type="checkbox"/> Table of measures to be implemented to avoid and minimise the impacts of the proposal, including action, outcome, timing and responsibility	<Table 38>
		<input checked="" type="checkbox"/> Map of alternative footprints considered to avoid or minimise impacts on biodiversity values; and of the final proposal footprint, including construction and operation	<Figure 5>
		<input type="checkbox"/> Maps demonstrating indirect impact zones where applicable	<n/a>
<b>Data</b>			
		Digital shape files of:	–
		<input type="checkbox"/> alternative and final proposal footprint	–
		<input type="checkbox"/> direct and indirect impact zones	–
		<input type="checkbox"/> Maps in jpeg format	–

BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
Assessment of impacts	Chapter 8, Sections 8.1 and 8.2	<b>Information</b>	
		☒ 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 39>
		Assessment of indirect impacts on vegetation and threatened species and their habitat including (as described in BAM Section 8.2):	–
		☒ description of the nature, extent, frequency, duration and timing of indirect impacts of the proposal	<Table 41>
		☒ 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	<Table 41>
		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	<8.3.1>
		☒ human-made structures	<8.3.2>
		☒ non-native vegetation	<8.3.3>
		☒ connectivity of different areas of habitat of threatened species that facilitates the movement of those species across their range	<8.3.4>
		☒ movement of threatened species that maintains their life cycle	<8.3.4>
		☒ water quality, waterbodies and hydrological processes that sustain threatened species and threatened ecological communities	<8.3.5>

BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		<input checked="" type="checkbox"/> assessment of the impacts of vehicle strikes on threatened species of animals or on animals that are part of a TEC	<8.3.6>
		<input checked="" type="checkbox"/> evaluate the consequences of prescribed impacts	<8.3>
		<input checked="" type="checkbox"/> describe impacts that are uncertain	<8.2 & 8.3>
		<input checked="" type="checkbox"/> document limitations to data, assumptions and predictions	<8.2 & 8.3>
		<b>Maps and tables</b>	
		<input checked="" type="checkbox"/> Table showing change in vegetation integrity score for each vegetation zone as a result of identified impacts	<Table 40>
		<b>Data</b>	
		N/A	–
Mitigation and management of impacts	Chapter 8, Sections 8.4 and 8.5	<b>Information</b>	
		Identification of measures to mitigate or manage impacts in accordance with the recommendations in BAM Sections 8.4 and 8.5 including:	–
		<input checked="" type="checkbox"/> techniques, timing, frequency and responsibility	<Table 43>
		<input checked="" type="checkbox"/> identify measures for which there is risk of failure	
		<input checked="" type="checkbox"/> evaluate the risk and consequence of any residual impacts	
		<input checked="" type="checkbox"/> document any adaptive management strategy proposed	<8.5>
		Identification of measures for mitigating impacts related to:	–
		<input checked="" type="checkbox"/> displacement of resident fauna (as described in BAM Subsection 8.4.1(2.))	<8.4>
		<input checked="" type="checkbox"/> indirect impacts on native vegetation and habitat (as described in BAM Subsection 8.4.1(3.))	
		<input checked="" type="checkbox"/> mitigating prescribed biodiversity impacts (as described in BAM Subsection 8.4.2)	

BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		<input checked="" type="checkbox"/> Details of the adaptive management strategy proposed to monitor and respond to impacts on biodiversity values that are uncertain (BAM Section 8.5)	<8.5>
		<b>Maps and tables</b>	
		<input checked="" type="checkbox"/> 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 43>
		<b>Data</b>	
		N/A	–
Impact summary	Chapter 9	<b>Information</b>	
		Identification and assessment of impacts on TECs and threatened species that are at risk of a serious and irreversible impacts (SAIL, in accordance with BAM Section 9.1) including:	<9.1>
		<input type="checkbox"/> addressing all criteria in Subsection 9.1.1 for each TEC listed as at risk of an SAIL present on the Subject Land	<n/a>
		<input type="checkbox"/> for each TEC, report the extent of the TEC in NSW	<n/a >
		<input type="checkbox"/> addressing all criteria in Subsection 9.1.2 for each threatened species at risk of an SAIL present on the Subject Land	<n/a >
		<input type="checkbox"/> for each threatened species, report the population size in NSW	< n/a >
		<input type="checkbox"/> documenting assumptions made and/or limitations to information	< n/a >
		<input type="checkbox"/> documenting all sources of data, information, references used or consulted	
		<input type="checkbox"/> clearly justifying why any criteria could not be addressed	
		<input checked="" type="checkbox"/> Identification of impacts requiring offset in accordance with BAM Section 9.2	<Table 46 & Table 47>
		<input checked="" type="checkbox"/> Identification of impacts not requiring offset in accordance with BAM Subsection 9.2.1(3.)	<Table 45>
		<input checked="" type="checkbox"/> Identification of areas not requiring assessment in accordance with BAM Section 9.3	<Table 48>

BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		<b>Maps and tables</b>	
		<input type="checkbox"/> Map showing the extent of TECs at risk of an SAIL within the Subject Land	<n/a>
		<input checked="" type="checkbox"/> Map showing location of threatened species at risk of an SAIL within the Subject Land	<Figure 22>
		Map showing location of:	–
		<input checked="" type="checkbox"/> impacts requiring offset	<Figure 24>
		<input checked="" type="checkbox"/> impacts not requiring offset	<Figure 24>
		<input checked="" type="checkbox"/> areas not requiring assessment	<Figure 24>
		<b>Data</b>	
		Digital shape files of:	–
		<input type="checkbox"/> extent of TECs at risk of an SAIL within the Subject Land	–
		<input type="checkbox"/> location of threatened species at risk of an SAIL within the Subject Land	–
		<input type="checkbox"/> boundary of impacts requiring offset	–
		<input type="checkbox"/> boundary of impacts not requiring offset	–
		<input type="checkbox"/> boundary of areas not requiring assessment	–
		<input type="checkbox"/> Maps in jpeg format	–
Impact summary	Chapter 10	<b>Information</b>	
		Ecosystem credits and species credits that measure the impact of the development on biodiversity values, including:	–
		<input checked="" type="checkbox"/> future vegetation integrity score for each vegetation zone within the Subject Land (Equation 25 and Equation 26 in BAM Appendix H)	<Table 46>
		<input checked="" type="checkbox"/> change in vegetation integrity score (BAM Subsection 8.1.1)	

BDAR section	BAM ref.	BAM requirement	Section reference(s) in the BDAR
		<input checked="" type="checkbox"/> 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)	
		<input checked="" type="checkbox"/> biodiversity risk weighting for each	<Table 46 & Table 47>
		<input checked="" type="checkbox"/> number of required species credits for each candidate threatened species that is directly impacted on by the proposal (BAM Subsection 10.1.3)	<Table 47>
		<b>Maps and tables</b>	
		<input checked="" type="checkbox"/> Table of PCTs requiring offset and the number of ecosystem credits required	<Table 46>
		<input checked="" type="checkbox"/> Table of threatened species requiring offset and the number of species credits required	<Table 47>
		<b>Data</b>	
		<input type="checkbox"/> Submitted proposal in the BAM Calculator	–
Biodiversity credit report	Chapter 10	<b>Information</b>	
		<input checked="" type="checkbox"/> 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 49 & Table 50>
		<input checked="" type="checkbox"/> BAM credit report in pdf format	<Appendix F: Credit reports>
		<b>Maps and tables</b>	
		<input checked="" type="checkbox"/> Table of credit class and matching credit profile	<Table 50>
		<b>Data</b>	
		<input checked="" type="checkbox"/> BAM credit report in pdf format	<Appendix F: Credit reports>

# Appendix B: Determination of excluded impacts

## Consideration of Native Vegetation Regulatory (NVR) map land categorisation – Category 1-exempt land

Parts of the subject land are mapped as Category 1-exempt land on the Native Vegetation Regulatory Map (**Figure 7**). The presence of category 1-exempt land affects whether the BOS applies to a clearing or development proposal and the assessment requirements for the BDAR. Clause 6.8(3) of the BC Act specifies that the BAM is to exclude the assessment of the impacts of any clearing of native vegetation and loss of habitat on category 1-exempt land (as defined in Part 5A of the LLS Act), other than prescribed impacts (as defined in clause 6.1 of the Biodiversity Conservation Regulation 2017 (BC Regulation)). Prescribed impacts must therefore be assessed for category 1-exempt land. Specific requirements for State Significant Development (SSD) are detailed in

**Table 53 Application of the BOS on category 1-exempt land**

Clearing or development proposal type	Assessment considerations on category 1-exempt land	Compliance of this BDAR
State significant development (SSD) and state significant infrastructure (SSI) projects	<p><b>Biodiversity Development Assessment Report (BDAR) waiver (if applicable)</b></p> <p>Information demonstrating how land meets the criteria of category 1-exempt land must be provided in a BDAR waiver request (see Biodiversity Development Assessment Report waiver, Appendix E).</p>	N/A – no BDAR waiver is sought
	<p><b>BAM</b></p> <p>Where the Scheme applies, an assessment of prescribed impacts is required on category 1-exempt land. Clearing of native vegetation on category 1-exempt land does not require BAM assessment (Section 3.2)</p>	Prescribed impacts are assessed to include areas mapped as Category 1-exempt land in Sections 6 and 8.3 of this BDAR.

As the determination of category 1-exempt land on the Subject Land has been determined from the Native Vegetation Regulatory Map, justification of how category 1-exempt land was determined is not required.

# Appendix C: Matters of national environmental significance assessment

# Appendix D: Vegetation survey data

**Table 54** 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
Q01	3315	11.13	101	DNG	56	345741	6395099	346	0	1	13	10	2	0	0	0.5	51.1	1.4	1.4	0	0	0	2.6	1	1	0	0	0	0	1	2.4
Q02	3315	22.43	101	Forest	56	345454	6396365	119	5	7	13	11	1	8	28.7	1.3	28.7	2.3	2.3	1.2	0	0	59	27	1	1	1	1	0	1	30.2
Q03	3244	1.65	101	Forest	56	345556	6396386	170	5	12	8	15	1	9	25.3	3.3	24.9	2.3	2.3	2.1	0	0	69	12	0	1	1	1	0	1	40.2
Q04	3315	6.97	101	High_Weed	56	345224	6396280	320	4	10	10	10	1	5	12.7	1.5	43.3	1	1	0.5	1	0	61	50	1	1	1	1	0	1	75.2
Q05	3315	6.97	101	High_Weed	56	345482	6395757	333	1	6	4	7	1	4	5	13.2	15.1	0.7	0.7	0.4	0	0	56	43	1	1	1	0	0	1	65.2
Q06	3315	6.97	101	High_Weed	56	345455	6395597	202	4	7	3	7	1	10	10.8	1	0.8	0.9	0.9	1.9	0	0	60	15	1	1	1	1	0	1	60.3
Q07	3315	22.43	101	Forest	56	345229	6395773	172	4	14	12	12	1	3	22.3	4.2	43.1	2.9	2.9	0.4	0	0	70	32	1	1	1	0	0	1	30.1
Q08	3315	22.43	101	Forest	56	345248	6395606	325	2	6	7	10	0	6	40.2	0.8	19.2	1.2	1.2	0.6	0	0	82	16	1	1	1	0	0	1	15.1
Q09	3315	22.43	101	Forest	56	344988	6395571	291	4	4	17	20	0	5	44.1	4.1	41.3	14	14	0.5	1	2	80	19	1	0	1	1	1	1	1.2
Q10	3315	11.13	101	DNG	56	345096	6395471	150	0	2	10	14	1	2	0	1.1	65.8	3.4	3.4	0.3	0	0	9	0	1	0	0	0	0	1	30.2
Q11	3315	22.43	101	Forest	56	345431	6395134	45	4	10	15	10	1	2	27.2	3.7	4.6	2	2	0.2	0	0	92.6	17	1	1	1	1	0	1	1.2
Q12	3315	22.43	101	Forest	56	345725	6394942	338	2	7	17	12	1	2	10.2	1.6	57.7	8.6	8.6	0.3	0	0	32	17	1	1	1	1	0	1	3.3
Q13	3315	11.13	101	DNG	56	345772	6394904	168	1	3	9	10	1	0	0.1	1.3	90.1	1.2	1.2	0	0	0	7	0	1	0	0	0	0	1	3.1
Q14	3315	6.97	101	High_Weed	56	346029	6394608	258	3	0	7	11	1	1	28	0	57.4	2.1	2.1	0.1	1	0	45	13.5	0	0	1	1	1	0	54.1
Q15	3315	11.13	101	DNG	56	346104	6394595	120	0	0	6	7	0	0	0	0	72.3	0.7	0.7	0	0	0	9.6	0	0	0	0	0	0	0	7.2
Q16	3315	11.13	101	DNG	56	346212	6394327	307	1	0	5	7	0	1	0.1	0	41.2	0.7	0.7	0.1	0	0	5.2	0	0	0	0	0	0	0	1.2
Q17	3110	1.25	101	High_Weed	56	345573.88	6395502.06	7	7	8	1	2	4	10	29.8	38.4	0.2	2.3	2.3	3.6	1	0	57	15	1	1	1	1	1	1	0.6
Q18	3315	10.07	101	Managed	56	345300	6396506	130	2	3	9	11	1	1	9	0.7	4.7	1.1	1.1	0.1	0	0	4.6	5	1	1	1	1	0	1	4.2
Q19	3315	10.07	101	Managed	56	345364	6396268	179	2	4	6	12	1	0	5.1	0.6	0.6	1.7	1.7	0	0	0	2.2	25	0	0	1	1	0	1	5.6
Q20	3315	10.07	101	Managed	56	345544	6396160	339	4	4	10	15	1	3	25.2	0.4	9.6	1.5	1.5	0.3	0	0	13.6	3	1	1	1	1	0	1	8.2
Q21	3315	10.07	101	Managed	56	345472	6395958	130	3	7	13	17	1	4	7.4	2.6	70.4	2.6	2.6	0.5	0	0	7	0	0	1	1	1	0	1	8.1
Q22	3315	10.07	101	Managed	56	345311	6395797	170	3	7	5	13	0	5	12.1	1.1	0.5	1.3	1.3	0.5	1	1	9	20	0	0	1	1	1	1	2.3
Q23	3315	9.36	101	Exotic_Pasture	56	345270	6396319	158	0	1	2	12	1	0	0	0.1	6	2.3	2.3	0	0	0	4.4	0	0	0	0	0	0	0	5.3
Q24	3315	9.36	101	Exotic_Pasture	56	345449	6396234	136	1	4	7	15	1	1	2.5	0.5	15.2	1.9	1.9	0.1	0	0	18.2	0	0	0	1	0	0	0	0.7
Q25	3315	9.36	101	Exotic_Pasture	56	345356	6396080	206	1	5	7	11	0	1	0.1	2.5	10.2	1.2	1.2	0.1	0	0	7	3	0	0	0	0	0	0	2
Q26	4073	0.04	101	Forest	56	346040	6394488	350	3	5	5	3	0	3	40.1	1.8	6.3	0.3	0.3	7.1	2	0	75	58	1	1	1	1	2	1	41
Q27	3315	6.97	101	High_Weed	56	345507	6395816	191	4	8	9	12	1	3	20.3	3.9	42.5	1.3	1.3	0.3	0	1	83	14	1	1	0	1	0	1	55.4



Site	Plot	Quarry	Plot ID	Date	Recorders				
GF	Cover %	Abund	N	E	HW	Top 3 natives in each GF: Full species name mandatory. All others where practicable			voucher
	0.5	10	✓			1	<i>Acacia implexa</i>		
	0.5	20	✓			2	<i>Sigesbeckia orientalis</i>		
	5.0	5000	✓			3	<i>Digitaria didactyla</i>		
	0.1	10		✓		4	<i>Digitaria tall.</i> <i>Axonopus fissifolius</i> ✓		
	0.1	5		✓		5	<i>Setaria pumila</i>		
	0.1	5	✓			6	<i>Juncus uritatus</i>		
	0.1	5	✓			7	<i>Eragrostis brownii</i>		
	0.1	10	✓			8	<i>Cenchrus ciliaris</i>		
	0.1	10			✓	9	<i>Echinochloa polystachya</i>		
	0.1	10			✓	10	<i>Bidens pilosa</i>		
	1	100	✓			11	<i>Plantago lanceolata</i>		
	0.1	10	✓			12	<i>Lymnathus arvensis</i>		
	0.1	5		✓		13	<i>Paspalum dilatatum</i>		
	0.1	10			✓	14	<i>Hypochaeris rad.</i>		
	0.1	5	✓			15	<i>Verbena hispida rigida</i>	✓	
	0.1	20	✓			16	<i>Verbena bonariensis</i> × <i>braziliensis</i>	✓	
	0.1	10			✓	17	<i>Conyza bonariensis</i>		
	0.1	10	✓			18	<i>Eleusine indica</i> <i>Eleusine indica</i>		
	2	200	✓			19	<i>Jenynsia madagascariensis</i>		
	0.1	5	✓			20	<i>Cheilanthes litcheri</i>		
	0.1	5	✓			21	<i>Lobelia purpurascens</i>		
	0.1	3	✓			22	<i>Hydrocotyle litoralis</i>		
	0.1	10	✓			23	<i>Waltheria gracilis</i>		
	0.1	5	✓			24	<i>Rumex crispus</i>		
	0.1	5				25	<i>Oxalis psoralea</i>		
	0.1	5				26	<i>Phyllanthus virgatus</i>		
	0.1	5	✓			27	<i>Sporobolus africanus</i>		
	0.1	10	✓			28	<i>Dichelachne micrantha</i>		
	0.1	3	✓			29	<i>Desmodium brachy.</i> <i>Oxytes brachypoda</i>		
	0.1	1	✓			30	<i>Sida rhombifolia</i>		
	0.1	10	✓			31	<i>Eragrostis leptostachya</i>		
	0.1	3				32	<del>Bothriochloa</del> <i>Bothriochloa ? blanda</i> <i>Capillipedium spicigerum</i> ✓		
	40	2000	✓			33	<i>Cynodon dactylon</i>		
	0.1	5	✓			34	<i>Microstachya stipoides</i>		
	0.1	10	✓			35	<i>Bothriochloa mara</i>		
	0.1	1	✓			36	<i>Olea europaea</i>		
	0.1	5	✓			37	<i>Solanum nigrum</i>		
	0.1	20	✓			38	<i>Cheilanthes distans</i> (hairy)		
	0.1	10				39	<i>Aristida ramosa</i>		
	0.1	3				40	Yellow		
	0.1	5				41	<i>Melinis repens</i>		
	0.1	5				42	<i>Panicum simile</i>	✓	
	0.1	10				43	<i>Aristida virginica</i>		
	0.1	5				44	<i>Tritolium repens</i>		
	0.1	10	✓			45	<i>Sporobolus ciber</i>		
	0.1	1				46	<i>Amaranthus viridis</i>		
						47			
						48			
						49			
						50			

# 1,000 m<sup>2</sup> PLOT

Quadrat Number: 201 Date: 15/4/25 Recorder: RN+DP+GP

Property Name or Project Name: Pittman Quarry

Tree Stem Size Class*		Trees <sup>^</sup>
<b>Count</b> of Large Trees Record DBH of each tree at 1.3 m from ground.	80+ cm	/
	50+ cm	
All other Trees: Only record <b>presence</b> or <b>absence</b> of trees in these stem size classes. Record DBH of each tree at 1.3 m from ground.	30-49 cm	
	20-29 cm	
	10-19 cm	
	5-9 cm	✓
<b>Presence or absence of Regeneration<sup>#</sup></b> Maximum stem diameter of <5 cm regardless of height.	<5 cm	✓

Count of HBTs <sup>†</sup>	Hollows >20cm? <sup>∞</sup>	Hollows >4m high? <sup>∞</sup>
/		

\*Living trees only; for **multi-stemmed trees**, only largest stem is counted or recorded as present;  
<sup>#</sup>Record presence of regeneration for any tree with a maximum stem diameter of <5 cm, regardless of height (i.e., record presence of regeneration if sapling or seedlings that are <1.3 m high and have DBH <5 cm).  
<sup>^</sup>Includes species classified as Trees under the BAM Growth Form Table.

<sup>†</sup>Count of **hollow-bearing trees** and **shrubs**; includes living and dead; record by stem size class.  
<sup>∞</sup>If present, collect GPS location and HBT details

Length of logs (m)	Tally	TOTAL LENGTH (m)
Fallen logs = >10 cm diameter, that is dead and entirely or partly on the ground within the 1,000 m <sup>2</sup> plot. Only the length of log within the plot is recorded.		

## 1 m<sup>2</sup> sub PLOT

Litter cover (%)				
Subplot	1	5	2	2
Average				

**Litter** includes leaves, seeds, twigs, branchlets and branches **less than 10 cm diameter**. Include all plant material that is detached from a plant and forms part of the litter layer on the ground surface. Litter cover is the two-dimensional litter layer in contact with the ground surface, including litter under the canopies of erect plants. Plant material that is not detached should be assessed as foliage cover, regardless of whether it appears alive or dead.

- Both Start and End points collected on GPS
- Start and End locations are approximately 50 m apart on GPS

400 m <sup>2</sup> floristics plot:	Survey name	Plot identifier	Recorders
Date 16/04/25	Pitman BDAR	Q02	J.M, R.N

GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	<sup>2</sup> Foliage cover	Abundance	Voucher
1	African Olive <i>Olea europaea</i>		30 <del>75</del>	<del>30</del> 35	
2	<i>Dichondra repens</i>		0.1	100	
3	<i>Eustrephus latifolius</i>		0.1	100	
4	<i>Labellia purpascens</i>		0.1	100	
5	<i>Cymbopogon refractus</i>		1	100	
6	<i>Eragrostis leptostachya</i>		5	500	
7	<i>Arona varians</i>		0.5	100	
8	<i>Eucalyptus crebra</i>		3	2	
9	<i>Bidens pilosa</i>		0.1	10	
10	<i>Allocasuarina torulosa</i>		0.5	10	
11	<i>Oxalis perranalis</i>		0.1	100	
12	<i>Hibbertia diffusa</i>		6.2	100	
13	<i>Corymbia maculata</i>		10	5	
14	<i>Microlaena stipoides</i>		2	200	
15	<i>Oplismenus aemulus</i>		0.5	50	
16	<i>Lantana camara</i>		0.1	10	
17	<i>Persoonia linearis</i>		0.5	10	
18	<i>Breynia oblongifolia</i>		6.1	10	
19	<i>Cyanthillium cinerum</i>		0.1	10	
20	<i>Glycine clandestina</i>		0.1	10	
21	<i>Lomandra filiformis</i>		0.2	10	
22	<i>Glycine tabacina</i>		0.1	100	
23	<i>Anthropodium milleflorum</i>		0.1	20	
24	<i>Dianella caerulea</i>		0.5	50	
25	<i>Eucalyptus moluccana</i>		15	6	
26	<i>Gahnia sieberiana</i>		0.2	10	
27	<i>Poa sieberiana</i>		15	200	
28	<i>Pandorea pandorana</i>		0.1	10	
29	<i>Paspalidium distans</i>		0.1	20	
30	<i>Lepidosperma laterale</i>		0.5	10	
31	<i>Acacia longissima</i>		0.1	10	
32	<i>Geitoplesium cymosum</i>		0.1	100	
33	<i>Themeda triandra</i>		0.2	250	
34	<i>Aristida vagans</i>		<del>0.2</del> 2	<del>30</del> 100	
35	<i>Echinopogon caespitosus</i>		1	<del>50</del> 100	

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

**GF Code:** see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed. **Voucher:** specimens collected for identification by a herbarium.

<sup>2</sup> **Foliage cover:** 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m. Note the top 3 dominant native species within each GF group.

**Abundance:** Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1,000, 2,000, 3,000 ... (as integer values).

400 m <sup>2</sup> floristics plot:	Survey name	Plot identifier	Recorders
Date	16/09/25	Pittman BDAR	GO2 Continued J.M, R.N

GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	<sup>2</sup> Foliage cover	Abundance	Voucher
1	<i>Pittosporum undulatum</i>		0.2	5	
2	<i>Cenyzia panariensis</i>		0.1	10	
3	<i>Oxytes brachypoda</i>		0.5	100	
4	<i>Commelina cyanea</i>		0.1	5	
5	<i>Exocarpos</i> spp.		0.1	10	
6	<i>Cleinthantes sieberi</i>		0.1	100	
7	<i>Vittadenia cuneata</i>		0.1	10	
8	<i>Notelea longifolia</i>		0.2	5	
9	<i>Jacksonia scoparia</i>		0.1	5	
10	<i>Entolasia stricta</i>		1	100	
11	<i>Hardenbergia violacea</i>		0.1	10	
12	<i>Desmodium rhytidophyllum</i> <small>Maekawaea rhytidophylla</small>		0.5	100	
13	<i>Macrozamia communis</i>		0.1	1	
14	<i>Galium claudigaudi</i>		0.1	100	
15	<i>Galium aparine</i>		0.1	100	
16					
17					
18					
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25					
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29					
30					
31					
32					
33					
34					
35					

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

**GF Code:** see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed. **Voucher:** specimens collected for identification by a herbarium.

**<sup>2</sup> Foliage cover:** 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m. Note the top 3 dominant native species within each GF group.

**Abundance:** Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1,000, 2,000, 3,000 ... (as integer values).

# 1,000 m<sup>2</sup> PLOT

Quadrat Number: 202

Date: 16/4/25

Recorder: RU + JM

Property Name or Project Name: Pitman BOAR

Tree Stem Size Class*		Trees <sup>^</sup>
<b>Count</b> of Large Trees Record DBH of each tree at 1.3 m from ground.	80+ cm	—
	50+ cm	—
All other Trees: Only record <b>presence or absence</b> of trees in these stem size classes. Record DBH of each tree at 1.3 m from ground.	30-49 cm	/
	20-29 cm	/
	10-19 cm	/
	5-9 cm	/
<b>Presence or absence of Regeneration<sup>#</sup></b> Maximum stem diameter of <5 cm regardless of height.	<5 cm	/

Count of HBTs <sup>†</sup>	Hollows >20cm? <sup>∞</sup>	Hollows >4m high? <sup>∞</sup>

\*Living trees only; for **multi-stemmed trees**, only largest stem is counted or recorded as present;

<sup>#</sup>Record presence of regeneration for any tree with a maximum stem diameter of <5 cm, regardless of height (i.e., record presence of regeneration if sapling or seedlings that are <1.3 m high and have DBH <5 cm).

<sup>^</sup>Includes species classified as Trees under the BAM Growth Form Table.

<sup>†</sup>Count of **hollow-bearing trees** and **shrubs**; includes living and dead; record by stem size class.

<sup>∞</sup>If present, collect GPS location and HBT details

Length of logs (m)	Tally	TOTAL LENGTH (m)
Fallen logs = >10 cm diameter, that is dead and entirely or partly on the ground within the 1,000 m <sup>2</sup> plot. Only the length of log within the plot is recorded.	<u>3 + 4 + 5 + 4 + 6 + 3 + 2</u>	<u>27m</u>

## 1 m<sup>2</sup> sub PLOT

	Litter cover (%)				
Subplot	<u>50</u>	<u>45</u>	<u>70</u>	<u>30</u>	<u>90</u>
Average					

**Litter** includes leaves, seeds, twigs, branchlets and branches **less than 10 cm diameter**. Include all plant material that is detached from a plant and forms part of the litter layer on the ground surface. Litter cover is the two-dimensional litter layer in contact with the ground surface, including litter under the canopies of erect plants. Plant material that is not detached should be assessed as foliage cover, regardless of whether it appears alive or dead.

- Both Start and End points collected on GPS
- Start and End locations are approximately 50 m apart on GPS

TOTAL SPECIES = 55 ✓

Data entered 28/4/25, DP.

400m <sup>2</sup> plot: Sheet of		Survey Name	Plot Identifier		Recorders					
Date	16/4/2025	PITTMAN BDAR	Q03		DP + AP					
GF	Top 3 natives in each GF: Full species name mandatory. All others where practicable				N	E	HTE	Cover %	Abund	voucher
	1	<i>E. coriaticulata</i>						20	10	
	2	<i>E. acuminoides</i>						3	1	
	3	<i>E. moluccana</i>						2	1	
	4	<i>Breynia oblongifolia</i>						0.5	10	
	5	<i>Olea europaea</i>						40	200	
	6	<i>Panicum linearis</i>						0.1	2	
	7	<i>Pitosporum revolutum</i>						0.2	3	
	8	<i>Lantana camara</i>						0.1	3	
	9	<i>Pitosporum undulatum</i>						1	10	
	10	<i>Plectranthus parviflorus</i>						0.2	50	
	11	<i>Opismenus acuminatus</i>						10	250	
	12	<i>Microleona stipoides</i>						10	500	
	13	<i>Sida acuta</i>						0.1	1	
	14	<i>Maekawaea rhytidophylla</i>						0.1	10	
	15	<i>Imperata cylindrica</i>						3	25	
	16	<i>Lomandra longifolia</i>						0.2	5	
	17	<i>Dinnella caerulea</i> var. <i>producta</i>						0.2	10	
	18	<i>Eustrephus latifolius</i>						0.2	25	
	19	<i>Lubelia purpurascens</i>						0.2	20	
	20	<i>Lepidosperma laterale</i>						0.1	3	
	21	<i>Pandorea pandorana</i>						0.2	20	
	22	<i>Passiflora herbertiana</i>						0.1	1	
	23	<i>Dichondra repens</i>						0.2	50	
	24	<i>Aronia varians</i>						1	250	
	25	<i>Glycine microphylla</i>						0.1	20	
	26	<i>Tournefortia tomentosa</i>						0.2	1	
	27	<i>Nyctoloba longifolia</i>						0.2	1	
	28	<i>Veronica pleibea</i>						0.1	5	
	29	<i>Burmannia australis</i>						0.2	50	
	30	<i>Pseuderanthemum variabile</i>						0.2	50	
	31	<i>Oxalis corniculata</i>						0.1	10	✓
	32	<i>Crotalaria aspera</i>						1	10	✓
	33	<i>Lomandra filiformis</i>						0.1	5	
	34	<i>Dorhamia silvestris</i>						0.5	1	
*	35	<i>Syracium glandulosum</i>						0.2	3	✓
*	36	<i>Jasminum volubile</i>						0.2	3	✓
	37	<i>Clematis glycinoides</i>						0.1	5	
	38	<i>Lagenophora stipitata</i>						0.2	25	
*	39	<i>Hibbertia diffusa</i> (confirmed)						0.1	5	✓
	40	<i>Galium gaudichaudii</i>						0.1	1	
	41	<i>Peperidium distans</i>						0.5	50	
	42	<i>Centella asiatica</i>						0.1	10	
	43	<i>Acacia longissima</i>						0.1	3	
	44	<i>Aytonia cymosum</i>						0.1	5	
	45	<i>Glycine clandestina</i>						0.1	5	
	46	<i>Bidens pilosa</i>						0.1	1	
	47	<i>Leucopogon juniperinus</i>						0.2	5	

GF Code: see growth form definitions in Appendix 1 N: native, E: exotic, HTE: high threat exotic GF - circle code of 'top 3'  
 Cover: 0.1, 0.2, 0.3..... 1, 2, 3..... 10, 15, 20, 25..... 100% (foliage cover): Note: 0.1% cover = 63 x 63 cm or a circle 71 cm across,  
 0.5% cover = 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10m. Abundance: 1, 2, 3...10, 20, 30...100, 200...1000...

# 1,000 m<sup>2</sup> PLOT

Quadrat Number: Q03

Date: 16-4-2024

Recorder: GP DP

Property Name or Project Name: Pittman Quarry BOMR

Tree Stem Size Class*		Trees <sup>^</sup>
<b>Count</b> of Large Trees Record DBH of each tree at 1.3 m from ground.	80+ cm	
	50+ cm	
All other Trees: Only record <b>presence</b> or <b>absence</b> of trees in these stem size classes. Record DBH of each tree at 1.3 m from ground.	30-49 cm	✓
	20-29 cm	✓
	10-19 cm	✓
	5-9 cm	
<b>Presence or absence of Regeneration<sup>#</sup></b> Maximum stem diameter of <5 cm regardless of height.	<5 cm	✓

Count of HBTs <sup>†</sup>	Hollows >20cm? <sup>∞</sup>	Hollows >4m high? <sup>∞</sup>

\*Living trees only; for **multi-stemmed trees**, only largest stem is counted or recorded as present;

<sup>#</sup>Record presence of regeneration for any tree with a maximum stem diameter of <5 cm, regardless of height (i.e., record presence of regeneration if sapling or seedlings that are <1.3 m high and have DBH <5 cm).

<sup>^</sup>Includes species classified as Trees under the BAM Growth Form Table.

<sup>†</sup>Count of **hollow-bearing trees** and **shrubs**; includes living and dead; record by stem size class.

<sup>∞</sup>If present, collect GPS location and HBT details

Length of logs (m)	Tally	TOTAL LENGTH (m)
Fallen logs = >10 cm diameter, that is dead and entirely or partly on the ground within the 1,000 m <sup>2</sup> plot. Only the length of log within the plot is recorded.	12	12

## 1 m<sup>2</sup> sub PLOT

Litter cover (%)					
Subplot	85	90	60	50	60
Average					

**Litter** includes leaves, seeds, twigs, branchlets and branches **less than 10 cm diameter**. Include all plant material that is detached from a plant and forms part of the litter layer on the ground surface. Litter cover is the two-dimensional litter layer in contact with the ground surface, including litter under the canopies of erect plants. Plant material that is not detached should be assessed as foliage cover, regardless of whether it appears alive or dead.



Both Start and End points collected on GPS



Start and End locations are approximately 50 m apart on GPS

TOTAL COUNT = 45 ✓

Date entered 28/4/25, DP.

Site	Plot ID	Date	Recorders							
GF	Q4	24/7/24	SR RN	N	E	HW	Cover %	Abund	voucher	
51	Top 3 natives in each GF: Full species name mandatory. All others where practicable									
52	<i>African olive. Olea europaea</i>							75	100.	
53	<i>Acacia longissima</i>							0.1	3.	
54	<del><i>Acacia longissima</i></del>									
55	<i>Pittosporum undulatum</i>							0.1	5.	
56	<i>Myrsine variab.</i>							0.1	2	
57	<i>Breyeria oblonga</i>							0.1	5	
58	<i>Ficus rubiginosa</i>							10	1	
59	<i>Euc. acuminoides</i>							2.5	2.	
60	<i>Pittosporum multiflorum</i>							0.1	1	
61	<i>Pandorea pand.</i>							0.1	5.	
62	<i>Billardiera scum.</i>							0.1	25	
63	<i>Desmodium varians</i> <i>Arina varians</i>							0.1	25	
64	<i>Dichondra repens</i>							0.1	50	
65	<i>Chilanthum sibericum</i>							0.1	50	
66	<i>Leucopogon juniper.</i>							0.5	10.	
67	<i>Tachyura scop.</i>							0.1	2.	
68	<i>Acacia <del>sp</del> inornata</i>							0.2	5	✓
69	<i>Senecio madag.</i>							0.1	3.	
70	<i>Hibbertia diffusa</i>							0.1	5	
71	<i>Ahania <del>aspera</del> <del>staph.</del> aspera</i>							25	100	
72	<i>Lepidosperma laterale</i>							0.1	20.	
73	<i>Lobelia purp.</i>							0.1	25.	
74	<i>Personia inermis</i>							0.1	1	
75	<i>Stellaria media</i>							0.1	10	
76	<i>Alternanthera denticulata</i>							0.1	5	?
77	<i>Goodenia hederacea</i>							0.1	20	
78	<i>Desmodium <del>sp</del> Rhynchospora Brachy</i>							0.1	15.	
79	<i>Alphitonia exaltata</i>							0.1	2	
80	<del><i>Styphelia sp. or <del>sp</del> <del>sp</del></i></del>									
81	<i>Oplismenus <del>sp</del> aculeatus</i>							10	1000	
82	<i>Entolasia stricta</i>							5	500	
83	<i>Dianella caerulea</i>							0.1	10.	
84	<i><del>sp</del> cynensis sp?</i>							0.1	5.	✓
85	<i>Eragrostis brownii</i>							0.1	25.	
86	<i>Glycine tuberculata</i>							0.1	10	
87	<i>Polygonum microphyllum</i>							0.1	5	
88	<i>Cymbopogon refractus</i>							0.1	10	
89	<i>Aristida vayan</i>							0.2	50.	
90	<i>Microlaena stip.</i>							0.2	50	
91	<i>Lantana camara</i>							0.1	3.	
92	<i>Oxalis perrenis</i>							0.1	10	
93	<i>Eragrostis leptostachya</i>							2.5	250.	
94	<i>Dalman</i>							0.1	5.	
95	<i>Sydesbechia orient.</i>							0.1	3.	
96	<i>Clochidium Ferdinandii</i>							0.1	3.	
97	<i>Jasminoides (sweet morinda)</i>							0.1	1	
98	<i>Chloris virg.</i>							0.1	5	
99	(45)									
100										

Data entered 28/4/25,  
DP.

# 1,000 m<sup>2</sup> PLOT

Quadrat Number: Q04 Date: 24.4.25 Recorder: RU + SR

Property Name or Project Name: Pittman BDAR

Tree Stem Size Class*		Trees <sup>^</sup>
<b>Count</b> of Large Trees Record DBH of each tree at 1.3 m from ground.	80+ cm	1
	50+ cm	
All other Trees: Only record <b>presence or absence</b> of trees in these stem size classes. Record DBH of each tree at 1.3 m from ground.	30-49 cm	✓
	20-29 cm	✓
	10-19 cm	✓
	5-9 cm	✓
<b>Presence or absence of Regeneration<sup>#</sup></b> Maximum stem diameter of <5 cm regardless of height.	<5 cm	✓

Count of HBTs <sup>†</sup>	Hollows >20cm? <sup>∞</sup>	Hollows >4m high? <sup>∞</sup>
/		

\*Living trees only; for **multi-stemmed trees**, only largest stem is counted or recorded as present;

<sup>#</sup>Record presence of regeneration for any tree with a maximum stem diameter of <5 cm, regardless of height (i.e., record presence of regeneration if sapling or seedlings that are <1.3 m high and have DBH <5 cm).

<sup>^</sup>Includes species classified as Trees under the BAM Growth Form Table.

<sup>†</sup>Count of **hollow-bearing trees** and **shrubs**; includes living and dead; record by stem size class.

<sup>∞</sup>If present, collect GPS location and HBT details

Length of logs (m)	Tally	TOTAL LENGTH (m)
Fallen logs = >10 cm diameter, that is dead and entirely or partly on the ground within the 1,000 m <sup>2</sup> plot. Only the length of log within the plot is recorded.	12 + 3 + 2 + 4 + 2 + 3 + 2 + 6 + 3 + 6 + 5 + 2	50m

## 1 m<sup>2</sup> sub PLOT

	Litter cover (%)				
Subplot	90	45	60	35	75
Average					

**Litter** includes leaves, seeds, twigs, branchlets and branches **less than 10 cm diameter**. Include all plant material that is detached from a plant and forms part of the litter layer on the ground surface. Litter cover is the two-dimensional litter layer in contact with the ground surface, including litter under the canopies of erect plants. Plant material that is not detached should be assessed as foliage cover, regardless of whether it appears alive or dead.

- Both Start and End points collected on GPS
- Start and End locations are approximately 50 m apart on GPS

TOTAL SPECIES = 31 ✓

Data entered 28/4/25,  
DP.

400 m <sup>2</sup> floristics plot:	Survey name	Plot identifier	Recorders
Date 17/04/25	Pittman BDAR QOS		J.M

GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	<sup>2</sup> Foliage cover	Abundance	Voucher
1	Lantana camara		50	100	
2	Gahnia clarkei		10	100	
3	Trema tomentosum		10	20	
4	Lobelia purpurascens		0.1	100	
5	Dichondra repens		0.1	100	
6	Veronica plebeia		0.1	10	
7	Eucalyptus crebra		5	5	
8	Chalanthus sieberi		0.1	50	
9	Brazynia oblongifolia		0.1	10	
10	Scotch thistle <i>Cirsium vulgare</i>		0.1	5	
11	Acacia falcata		1	10	
12	Poa labillardieri		3	20	
13	Cymbopogon refractus		2	100	
14	Oxalis oxilis		0.1	10	
15	Native grape - vine <i>Cayratia clematidea</i>		0.1	10	
16	Hypochaeris radicata		0.1	20	
17	Verbena rigida		0.1	50	
18	Acacia implexa		1	5	
19	Conyza bonariensis		0.1	10	
20	African olive		15	20	
21	Glycine clandestina		0.1	100	
22	Bidens pilosa		0.1	10	
23	Cyanthillium cinerum		0.1	10	
24	Lissanthe strigosa		0.1	5	
25	Senecio madagascariensis		0.1	5	
26	Panicum similis		0.1	10	
27	Solanum prinosphyllum		0.1	10	
28	Centella asiatica		0.1	100	
29	Sustrephus latifolius		0.1	10	
30	Geitoplesium gymosum		0.1	10	
31	Acacia inroata		0.1	2	
32					
33					
34					
35					

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

**GF Code:** see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed. **Voucher:** specimens collected for identification by a herbarium.

<sup>2</sup>**Foliage cover:** 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m. Note the top 3 dominant native species within each GF group.

**Abundance:** Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1,000, 2,000, 3,000 ... (as integer values).

# 1,000 m<sup>2</sup> PLOT

Quadrat Number: Q05

Date: 17/04/25

Recorder: J.M

Property Name or Project Name: Pittman BAR

Tree Stem Size Class*		Trees <sup>^</sup>
<b>Count</b> of Large Trees Record DBH of each tree at 1.3 m from ground.	80+ cm	—
	50+ cm	—
All other Trees: Only record <b>presence</b> or <b>absence</b> of trees in these stem size classes. Record DBH of each tree at 1.3 m from ground.	30-49 cm	<del>—</del>
	20-29 cm	✓
	10-19 cm	✓
	5-9 cm	✓
<b>Presence or absence of Regeneration<sup>#</sup></b> Maximum stem diameter of <5 cm regardless of height.	<5 cm	✓

Count of HBTs <sup>†</sup>	Hollows >20cm? <sup>∞</sup>	Hollows >4m high? <sup>∞</sup>
	—	—

\*Living trees only; for **multi-stemmed trees**, only largest stem is counted or recorded as present;

<sup>#</sup>Record presence of regeneration for any tree with a maximum stem diameter of <5 cm, regardless of height (i.e., record presence of regeneration if sapling or seedlings that are <1.3 m high and have DBH <5 cm).

<sup>^</sup>Includes species classified as Trees under the BAM Growth Form Table.

<sup>†</sup>Count of **hollow-bearing trees** and **shrubs**; includes living and dead; record by stem size class.

<sup>∞</sup>If present, collect GPS location and HBT details

Length of logs (m)	Tally	TOTAL LENGTH (m)
Fallen logs = >10 cm diameter, that is dead entirely or partly on the ground within the 1,000 m <sup>2</sup> plot. Only the length of log within the plot is recorded.	2, 1, 2, 7, 2, 2, 1, 8, 5, 2, 5, 2 1, 2	43m approx

## 1 m<sup>2</sup> sub PLOT

	Litter cover (%)				
Subplot	50	30	70	70	60
Average	56%				

**Litter** includes leaves, seeds, twigs, branchlets and branches **less than 10 cm diameter**. Include all plant material that is detached from a plant and forms part of the litter layer on the ground surface. Litter cover is the two-dimensional litter layer in contact with the ground surface, including litter under the canopies of erect plants. Plant material that is not detached should be assessed as foliage cover, regardless of whether it appears alive or dead.

- Both Start and End points collected on GPS
- Start and End locations are approximately 50 m apart on GPS

400m <sup>2</sup> plot: Sheet of		Survey Name	Plot Identifier	Recorders			
Date	17/4/25	Pittman BDAR	806	RV + DP			
GF	Top 3 natives in each GF: Full species name mandatory. All others where practicable	N	E	HTE	Cover %	Abund	voucher
1	African olive				60	50	
2	E. crebra				10	10	
3	epilimnion aemulus				0.2	20	
4	desmodium varians Arona varians				0.2	30	
5	sigisbeckia orientalis				0.1	2	
6	gahnia strobilifera aspera				0.5	20	
7	notela longifolia				0.5	10	
8	dichandra repens				0.2	150	
9	lantana camara				0.1	10	
10	galium gaudichaudii				0.1	2	
11	pardrea pandorana				0.2	50	
12	eustrephus latifolius				0.2	50	
13	phyllanthus gummii				0.3	10	
14	glacium fernandii				0.1	2	
15	pallaea paradoxa				0.1	2	
16	<del>maida</del> jasminoides cynochthodes				0.5	30	
17	brenionella australis				0.2	30	
18	solanum pinnatifidum				0.1	3	
19	parsonsia straminea				0.1	10	
20	myrsine variable				0.1	2	
21	sacopotalum <del>harriganum</del> harveyanum				0.1	1	
22	dianella caerulea				0.1	2	
23	gietaraplesium cynosom				0.2	50	
24	leucopogon juniperinus				0.1	3	
25	billerdtara scandens				0.1	10	
26	aphelandra excelsa				0.2	10	
27	diospyros australis				0.1	1	
28	dematis glycinoides				0.1	2	
29	glycine tabacina				0.2	50	
30	peltospermum undulatum				0.2	10	
31	bidenis pilosa				0.2	10	
32	lagerphora stipata				0.1	10	
33	acacia longissima (collis)				0.1	10	
34	denhamia silvestris				0.1	1	
35	microleana stipoides				0.1	2	
36							
37							
38							
39							
40							
41							
42							
43							
44							
45							
46							
47							

GF Code: see growth form definitions in Appendix 1 N: native, E: exotic, HTE: high threat exotic GF - circle code of 'top 3'  
 Cover: 0.1, 0.2, 0.3..... 1, 2, 3 ..... 10, 15, 20, 25 ..... 100% (foliage cover): Note: 0.1% cover = 63 x 63 cm or a circle 71 cm across,  
 0.5% cover = 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10m. Abundance: 1, 2, 3...10, 20, 30...100, 200... 1000...

# 1,000 m<sup>2</sup> PLOT

Quadrat Number: Q06 Date: 17/4/2025 Recorder: DP + RN  
 Property Name or Project Name: PITMAN BDAR

Tree Stem Size Class*		Trees <sup>^</sup>
<b>Count</b> of Large Trees Record DBH of each tree at 1.3 m from ground.	80+ cm	0
	50+ cm	0
All other Trees: Only record <b>presence</b> or <b>absence</b> of trees in these stem size classes. Record DBH of each tree at 1.3 m from ground.	30-49 cm	✓
	20-29 cm	✓
	10-19 cm	✓
	5-9 cm	✓
<b>Presence or absence of Regeneration</b> <sup>#</sup> Maximum stem diameter of <5 cm regardless of height.	<5 cm	✓

Count of HBTs <sup>†</sup>	Hollows >20cm? <sup>∞</sup>	Hollows >4m high? <sup>∞</sup>
0	n/a	
0	n/a	

\*Living trees only; for **multi-stemmed trees**, only largest stem is counted or recorded as present;  
<sup>#</sup>Record presence of regeneration for any tree with a maximum stem diameter of <5 cm, regardless of height (i.e., record presence of regeneration if sapling or seedlings that are <1.3 m high and have DBH <5 cm).  
<sup>^</sup>Includes species classified as Trees under the BAM Growth Form Table.

<sup>†</sup>Count of **hollow-bearing trees** and **shrubs**; includes living and dead; record by stem size class.  
<sup>∞</sup>If present, collect GPS location and HBT details

Length of logs (m)	Tally	TOTAL LENGTH (m)
Fallen logs = >10 cm diameter, that is dead and entirely or partly on the ground within the 1,000 m <sup>2</sup> plot. Only the length of log within the plot is recorded.		15m

## 1 m<sup>2</sup> sub PLOT

Litter cover (%)					
Subplot	60	65	50	75	50
Average					

**Litter** includes leaves, seeds, twigs, branchlets and branches **less than 10 cm diameter**. Include all plant material that is detached from a plant and forms part of the litter layer on the ground surface. Litter cover is the two-dimensional litter layer in contact with the ground surface, including litter under the canopies of erect plants. Plant material that is not detached should be assessed as foliage cover, regardless of whether it appears alive or dead.

- Both Start and End points collected on GPS
- Start and End locations are approximately 50 m apart on GPS

Site	PITTMAN BOAR					Plot ID	Q07	Date	Recorders	DP + RN	
GF	Cover %	Abund	N	E	HW	Top 3 natives in each GF: Full species name mandatory. All others where practicable					voucher
	15	20				1	<i>Corymbia maculata</i>				
	7	10				2	<i>Eucalyptus crebra</i>				
	0.1	2				3	<i>Acacia longissima</i>				
	30	50				4	<i>Olea europaea</i>				
	0.1	3				5	<i>Lantana camara</i>				
	0.2	5				6	<i>Cakile aspera</i>				
	0.2	20				7	<i>Aronia varians</i>				
	0.2	25				8	<i>Mackenzia rhytidophylla</i>				
	10	250				9	<i>Cymbopogon refractus</i>				
	0.2	50				10	<i>Panicum umbellata</i>				
	2	200				11	<i>Microlaena stipoides</i>				
	0.5	20				12	<i>Ubbertia diffusa</i>				✓
	0.5	50				13	<i>Paspalidium distans</i>				
	1	200				14	<i>Goodenia hederacea</i> ✓				✓
	1	5				15	<i>Parsoonia linearis</i>				
	0.1	1				16	<i>Bregnia obtusifolia</i>				
	0.1	5				17	<i>Allyce tinctoria</i>				
	0.1	2				18	<i>Brunoniella australis</i>				
	0.1	3				19	<i>Glycine microphylla</i>				
	0.2	25				20	<i>Eragrostis brownii</i>				
	0.2	5				21	<i>Pitohypnum revolutum</i>				
	0.1	10				22	<i>Commelina cyanea</i>				
	0.5	25				23	<i>Dianella caerulea</i> var. <i>producta</i>				
	0.1	3				24	<i>Lomandra filiformis</i>				
	3	50				25	<i>Themeda triandra</i>				
	0.2	50				26	<i>Cheilanthes distans</i>				
	5	250				27	<i>Aristida vagans</i>				
	0.2	5				28	<i>Daviesia ulicifolia</i>				
	0.5	3				29	<i>Jacksonia scoparia</i>				
	0.1	50				30	<i>Panicum effusum</i> ✓ <i>mile?</i>				✓
	0.2	3				31	<i>Dianella longifolia</i>				
	20	150				32	<i>Poa labillardiere</i>				✓
	0.1	1				33	<i>Phyllanthus virgatus</i>				
	0.2	1				34	<i>Leucopogon juniperinus</i>				
	0.2	2				35	<i>Acacia decora</i> ✓				✓
	0.2	3				36	<i>Acacia longifolia</i>				
	0.1	5				37	<i>Lobelia purpureo-scens</i>				
	0.2	50				38	<i>Cynathillium cinerium</i>				
	0.1	5				39	<i>Bursaria spinosa</i>				
	0.5	5				40	<i>Acacia falcata</i>				
	0.1	1				41	<i>Lomandra longifolia</i>				
	0.1	20				42	<i>Lance-leaf-forb - Alternanthera dentata</i> ✓				✓
	0.2	1				43	<i>Notelaea longifolia</i>				
	0.2	5				44	<i>Melicthus unicoloratus</i> - <i>Urn heath</i> ✓				✓
	0.2	5				45	<i>Epacris - Lissanthe strigosa</i> ✓				✓
	0.1	1				46	<i>Allorhiza teretifolia</i> ✓				✓
	1	50				47	<i>Aristida ramosa</i>				
	0.1	1				48	<i>Opercularia varia</i>				
						49					
						50					

# 1,000 m<sup>2</sup> PLOT

Quadrat Number: Q07

Date: 17/4/25

Recorder: RN + DP

Property Name or Project Name: Pittman BDAR

Tree Stem Size Class*		Trees <sup>^</sup>
<b>Count</b> of Large Trees Record DBH of each tree at 1.3 m from ground.	80+ cm	
	50+ cm	
All other Trees: Only record <b>presence</b> or <b>absence</b> of trees in these stem size classes. Record DBH of each tree at 1.3 m from ground.	30-49 cm	
	20-29 cm	✓
	10-19 cm	✓
	5-9 cm	✓
<b>Presence or absence of Regeneration<sup>#</sup></b> Maximum stem diameter of <5 cm regardless of height.	<5 cm	✓

Count of HBTs <sup>†</sup>	Hollows >20cm? <sup>∞</sup>	Hollows >4m high? <sup>∞</sup>

\*Living trees only; for **multi-stemmed trees**, only largest stem is counted or recorded as present;

<sup>#</sup>Record presence of regeneration for any tree with a maximum stem diameter of <5 cm, regardless of height (i.e., record presence of regeneration if sapling or seedlings that are <1.3 m high and have DBH <5 cm).

<sup>^</sup>Includes species classified as Trees under the BAM Growth Form Table.

<sup>†</sup>Count of **hollow-bearing trees** and **shrubs**; includes living and dead; record by stem size class.

<sup>∞</sup>If present, collect GPS location and HBT details

<b>Length of logs (m)</b> Fallen logs = >10 cm diameter, that is dead and entirely or partly on the ground within the 1,000 m <sup>2</sup> plot. Only the length of log within the plot is recorded.	<u>3+6+6+17+</u>	<b>Tally</b>	<b>TOTAL LENGTH (m)</b> <u>32m</u>
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## 1 m<sup>2</sup> sub PLOT

	Litter cover (%)				
Subplot	<u>90</u>	<u>85</u>	<u>35</u>	<u>50</u>	<u>90</u>
Average					

**Litter** includes leaves, seeds, twigs, branchlets and branches **less than 10 cm diameter**. Include all plant material that is detached from a plant and forms part of the litter layer on the ground surface. Litter cover is the two-dimensional litter layer in contact with the ground surface, including litter under the canopies of erect plants. Plant material that is not detached should be assessed as foliage cover, regardless of whether it appears alive or dead.

Both Start and End points collected on GPS

Start and End locations are approximately 50 m apart on GPS

400 m <sup>2</sup> floristics plot:	Survey name	Plot identifier	Recorders
Date 11/04/25	Pittman BDAR	Q08	J.M, R.N

GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	<sup>2</sup> Foliage cover	Abundance	Voucher
1	<i>C. Maculata</i>		40	50	
2	<i>Hibbertia diffusa</i>		0.2	20	
3	<i>Pittosporum undulatum</i>		0.2	5	
4	<i>Cymbopogon refractus</i>		3	100	
5	<i>Lepidosperma laterale</i>		3	50	
6	<i>Labelia purpurascens</i>		0.1	100	
7	African olive 'olea europaea		15	15	
8	<i>Poa labillarderi</i>		5	1500	
9	<i>Pandorea pandorana</i>		0.1	50	
10	<i>Dianella caerulea</i>		0.2	20	
11	<i>Galium glandicaudi</i>		0.1	10	
12	<i>Veronica plebia</i>		0.1	50	
13	<i>Acacia longissima</i>		0.1	5	
14	<i>Dichondra repens</i>		0.1	100	
15	<i>Eustrephus latifolius</i>		0.1	50	
16	<i>Eragrostis leptostachya</i>		2	200	
17	<i>Aetoplesium cymosum</i>		0.1	50	
18	<i>Hypochaeris radicata</i>		0.1	100	
19	<i>Cyanthillium cinerum</i>		0.1	10	
20	<i>Notelea longifolia</i>		0.2	20	
21	<i>Crona varians</i>		0.1	20	
22	<i>Persoonia linearis</i>		0.1	10	
23	<i>Breynia oblongifolia</i>		0.1	10	
24	<i>Glycine clandestina</i>		0.1	50	
25	<i>Glycine tabacina</i>		0.1	50	
26	<i>Lantana camara</i>		0.1	5	
27	<i>Oplismenus aemulus</i>		1	100	
28	<i>Oxytes brachypoda</i>		0.2	30	
29	<i>Microkana stipoides</i>		5	300	
30	<i>Lissanthe strigosa</i>		0.1	20	
31	<i>Commelina cyprip</i>		0.1	10	
32	<i>Aphnica etakeri aspera</i>		0.2	10	
33	<i>Vittadenia cuneata</i>		0.1	10	
34	<i>Oxalis oxitis perennans</i>		0.1	100	
35	80-90% Cover, patches of litter and bare ground				

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

**GF Code:** see growth form definitions in BAM 2020 Appendix F.

**N:** native, **HTW:** high threat weed. **Voucher:** specimens collected for identification by a herbarium.

**<sup>2</sup> Foliage cover:** 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m. Note the top 3 dominant native species within each GF group.

**Abundance:** Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1,000, 2,000, 3,000 ... (as integer values).

# 1,000 m<sup>2</sup> PLOT

Quadrat Number: Q08

Date: 17/04

Recorder: J, M

Property Name or Project Name: Dittman BDAR

Tree Stem Size Class*		Trees <sup>^</sup>
<b>Count</b> of Large Trees Record DBH of each tree at 1.3 m from ground.	80+ cm	—
	50+ cm	—
All other Trees: Only record <b>presence</b> or <b>absence</b> of trees in these stem size classes. Record DBH of each tree at 1.3 m from ground.	30-49 cm	—
	20-29 cm	✓
	10-19 cm	✓
	5-9 cm	✓
<b>Presence or absence of Regeneration<sup>#</sup></b> Maximum stem diameter of <5 cm regardless of height.	<5 cm	✓

Count of HBTs <sup>†</sup>	Hollows >20cm? <sup>∞</sup>	Hollows >4m high? <sup>∞</sup>
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

\*Living trees only; for **multi-stemmed trees**, only largest stem is counted or recorded as present;

<sup>#</sup>Record presence of regeneration for any tree with a maximum stem diameter of <5 cm, regardless of height (i.e., record presence of regeneration if sapling or seedlings that are <1.3 m high and have DBH <5 cm).

<sup>^</sup>Includes species classified as Trees under the BAM Growth Form Table.

<sup>†</sup>Count of **hollow-bearing trees** and **shrubs**; includes living and dead; record by stem size class.

<sup>∞</sup>If present, collect GPS location and HBT details

Length of logs (m)	Tally	TOTAL LENGTH (m)
Fallen logs = >10 cm diameter, that is dead and entirely or partly on the ground within the 1,000 m <sup>2</sup> plot. Only the length of log within the plot is recorded.	1, 1, 2, 2, 6, 4	16m

## 1 m<sup>2</sup> sub PLOT

Litter cover (%)			
Subplot	80	70	80
Average	82%		

**Litter** includes leaves, seeds, twigs, branchlets and branches **less than 10 cm diameter**. Include all plant material that is detached from a plant and forms part of the litter layer on the ground surface. Litter cover is the two-dimensional litter layer in contact with the ground surface, including litter under the canopies of erect plants. Plant material that is not detached should be assessed as foliage cover, regardless of whether it appears alive or dead.

- Both Start and End points collected on GPS
- Start and End locations are approximately 50 m apart on GPS

Site	Cover %	Abund	N	E	HW	Plot ID	Date	Recorders	voucher
T	30	14	✓			1			
T	10	4	✓			2			
T	4	3	✓			3			
S	2	6	✓			4			
F	2	40	✓			5			
-	1	20		✓		6			
G	4	30	✓			7			
	10	400	✓			8			
	5	100	✓			9			
	0.1	10	✓			10		Oxytes brachypoda	
	2	300	✓			11			
	0.1	10	✓			12			
	0.1	3	✓			13			
	1	50		✓		14			
✓	0.1	25	✓			15			✓
	0.1	20	✓			16		Arona varians	
	0.1	30	✓			17			
	0.1	20	✓			18			✓
	0.5	100	✓			19			
	3	500	✓			20			
✓	0.1	3	✓			21			
G	15	400	✓			22			✓
G	0.1	10				23			
✓	0.1	5	✓			24			
S	0.1	10	✓			25			
G	0.1	5	✓			26			#
✓	0.1	10	✓			27			
G	0.1	20	✓			28			✓
G	0.1	10	✓			29			
G	0.1	5	✓			30			
G	0.1	10	✓			31			
G	5	100	✓			32			
G	0.1	10	✓			33			
G	0.1	10	✓			34			
G	0.1	10	✓			35			
G	0.1	10	✓			36			
-	0.1	5		✓		37			
G	0.1	5	✓			38			
	0.1	10				39			✓
	0.1	5	✓			40			
	1	50	✓			41			✓
	0.1	3		✓		42			
	0.1	10	✓			43			
	0.1	5	✓			44			
	0.1	25	✓			45			
	0.5	20	✓			46			
	0.1	3	✓			47			
	0.1	10	✓			48			
	3	100	✓			49			
	0.1	1		✓		50			

# 1,000 m<sup>2</sup> PLOT

Quadrat Number: 009

Date: 16/4/2025

Recorder: DP + GP

Property Name or Project Name: PITMAN BEAR

Tree Stem Size Class*		Trees <sup>^</sup>
<b>Count</b> of Large Trees Record DBH of each tree at 1.3 m from ground.	80+ cm	0
	50+ cm	1
All other Trees: Only record <b>presence</b> or <b>absence</b> of trees in these stem size classes. Record DBH of each tree at 1.3 m from ground.	30-49 cm	✓
	20-29 cm	✓
	10-19 cm	0
	5-9 cm	✓
<b>Presence or absence of Regeneration<sup>#</sup></b> Maximum stem diameter of <5 cm regardless of height.	<5 cm	✓

Count of HBTs <sup>†</sup>	Hollows >20cm? <sup>∞</sup>	Hollows >4m high? <sup>∞</sup>
0	n/a	
0	n/a	

\*Living trees only; for **multi-stemmed trees**, only largest stem is counted or recorded as present;

<sup>#</sup>Record presence of regeneration for any tree with a maximum stem diameter of <5 cm, regardless of height (i.e., record presence of regeneration if sapling or seedlings that are <1.3 m high and have DBH <5 cm).

<sup>^</sup>Includes species classified as Trees under the BAM Growth Form Table.

<sup>†</sup>Count of **hollow-bearing trees** and **shrubs**; includes living and dead; record by stem size class.

<sup>∞</sup>If present, collect GPS location and HBT details

Length of logs (m)	Tally	TOTAL LENGTH (m)
Fallen logs = >10 cm diameter, that is dead and entirely or partly on the ground within the 1,000 m <sup>2</sup> plot. Only the length of log within the plot is recorded.		19m

## 1 m<sup>2</sup> sub PLOT

Litter cover (%)					
Subplot	75	70	85	75	95
Average					

**Litter** includes leaves, seeds, twigs, branchlets and branches **less than 10 cm diameter**. Include all plant material that is detached from a plant and forms part of the litter layer on the ground surface. Litter cover is the two-dimensional litter layer in contact with the ground surface, including litter under the canopies of erect plants. Plant material that is not detached should be assessed as foliage cover, regardless of whether it appears alive or dead.

Both Start and End points collected on GPS

Start and End locations are approximately 50 m apart on GPS

Site	Pittman Quarry					Plot ID	Q10	Date	16/4/25	Recorders	RN + JM	
GF	Cover %	Abund	N	E	HFW	Top 3 natives in each GF: Full species name mandatory. All others where practicable						voucher
	30	500				1	<i>Senecio Madagascariensis</i>					
	1	10				2	<i>Gomphocarpus fruticosus</i>					
	1	50				3	<i>Sigesbeckia orientalis</i>					
	0.5	30				4	<i>Sida rhombifolia</i>					
	0.1	20				5	<i>Coryza bonariensis</i>					
	0.1	10				6	<i>Verbena bonariensis</i>					
	0.1	5				7	<i>Verbena rigida</i>					
	0.2	10				8	<i>Eleusine indica?</i> Confirmed.					X
	0.5	30				9	<i>Cynarchia aurens</i>					
	5	50				10	<i>Nucleolaria stipoides</i>					
	0.5	30				11	<del>La</del> <i>Plantago lanceolata</i>					
	0.2	50				12	<i>Geranium homeanum</i>					
	0.2	50				13	<i>Centella asiatica</i>					
	0.2	50				14	<i>Trifolium repens</i> (clover)					X
	0.2	50				15	<i>Oxalis perennans</i>					
	0.2	50				16	<i>Labellia purpurescens</i>					
	30	1000				17	<i>Cynodon dactylon</i>					
	30	1000				18	blue couch ( <i>Digitaria</i> ) <i>Digitaria didactyla</i>					
	0.1	2				19	<i>Phyllanthus virgatus</i>					
	0.2	50				20	<i>Walthergia gracilis</i>					
	0.1	10				21	<i>Dichelachne micrantha</i>					
	0.1	10				22	<i>Eragrostis leptostachya</i>					
	0.1	10				23	<i>Setaria parviflora</i>					X
	1	15				24	<i>Acacia falcata</i>					
	0.1	1				25	<i>Acacia imbricata</i>					
	0.1	10				26	<i>Bidens pilosa</i>					
	0.1	10				27	<i>Panicum simile</i>					
	0.1	10				28	<i>Paspalum dilatatum</i>					
	0.2	50				29	<i>Dichondra repens</i>					
	0.1	30				30	<i>Euchiton sphaericus</i>					
	0.2	10				31	hairy veronica ( <i>Stachys aurens</i> )					X
	0.5	50				32	<i>Mentha saturoides</i>					
	0.1	5				33	<i>Rumex brownii</i>					
	0.1	20				34	<i>Hydrocyle laxiflora</i>					
	0.1	20				35	<i>Gnena vireans</i>					
	0.1	5				36	<i>Juncus acitatus</i>					
	0.2	20				37	<i>Glycine tabacina</i>					
	0.2	10				38	<i>Spinebolus creber</i>					
	0.2	20				39	<i>Cymbonatus lawsonias</i>					
	0.1	2				40	stachon dude ( <i>haloragis heterophylla</i> )					X
	0.1	5				41	<i>Bothriocloa macra</i>					
	0.1	5				42	<i>Cheilanthes seibori</i>					
	0.1	5				43	<i>Crostida ramosa</i>					
	0.1	2				44	<i>Fagetes minuta</i>					
						45						
						46						
						47						
						48						
						49						
						50						

# 1,000 m<sup>2</sup> PLOT

Quadrat Number: Q10

Date: 16/04/25

Recorder: J.M., R.N

Property Name or Project Name: Pittman BDAR

Tree Stem Size Class*		Trees <sup>^</sup>
<b>Count</b> of Large Trees Record DBH of each tree at 1.3 m from ground.	80+ cm	—
	50+ cm	—
All other Trees: Only record <b>presence or absence</b> of trees in these stem size classes. Record DBH of each tree at 1.3 m from ground.	30-49 cm	✓
	20-29 cm	✓
	10-19 cm	✓
	5-9 cm	✓
<b>Presence or absence of Regeneration<sup>#</sup></b> Maximum stem diameter of <5 cm regardless of height.	<5 cm	✓

Count of HBTs <sup>†</sup>	Hollows >20cm? <sup>∞</sup>	Hollows >4m high? <sup>∞</sup>
—	—	—
—	—	—
—	—	—
—	—	—
—	—	—
—	—	—
—	—	—

\*Living trees only; for **multi-stemmed trees**, only largest stem is counted or recorded as present;

<sup>#</sup>Record presence of regeneration for any tree with a maximum stem diameter of <5 cm, regardless of height (i.e., record presence of regeneration if sapling or seedlings that are <1.3 m high and have DBH <5 cm).

<sup>^</sup>Includes species classified as Trees under the BAM Growth Form Table.

<sup>†</sup>Count of **hollow-bearing trees** and **shrubs**; includes living and dead; record by stem size class.

<sup>∞</sup>If present, collect GPS location and HBT details

Length of logs (m)	Tally	TOTAL LENGTH (m)
Fallen logs = >10 cm diameter, that is dead and entirely or partly on the ground within the 1,000 m <sup>2</sup> plot. Only the length of log within the plot is recorded.	—	0m

## 1 m<sup>2</sup> sub PLOT

Litter cover (%)				
Subplot	5	5	10	15
Average	9%			

**Litter** includes leaves, seeds, twigs, branchlets and branches **less than 10 cm diameter**. Include all plant material that is detached from a plant and forms part of the litter layer on the ground surface. Litter cover is the two-dimensional litter layer in contact with the ground surface, including litter under the canopies of erect plants. Plant material that is not detached should be assessed as foliage cover, regardless of whether it appears alive or dead.

Both Start and End points collected on GPS

Start and End locations are approximately 50 m apart on GPS

SPECIES COUNT = 46 ✓

Date entered 29/4/25,  
DP.

400m <sup>2</sup> plot: Sheet of		Survey Name	Plot Identifier		Recorders			
Date	24.4.25	Pittman RRAR	Q11		RW + SJ			
GF	Top 3 natives in each GF: Full species name mandatory. All others where practicable		N	E	HTE	Cover %	Abund	voucher
1	Cimaculata					25	30	
2	E. crebra					2	4	
3	Alea europea (African olive)					1	5	
4	Personia linearis					0.5	3	
5	acacia falcata					1	15	
6	jacksonia scoparia					0.2	1	
7	breytia oblongifolia					0.2	10	
8	cassinia uncata					0.1	10	
9	hibbertia diffusa					1	30	
10	panax umbellata					0.3	150	
11	eragrostis brownii					0.2	20	
12	eragrostis leptostachys					0.2	30	
13	lobelia perpersensis					0.5	100	
14	comandra filiformis					0.5	30	
15	comandra multiflorum					0.5	50	
16	panicum simile					0.2	20	
17	leucopogon juniperinus					0.1	10	
18	ussanthe strigosa sub subulata					0.3	30	
19	anthoscahne scabra					0.5	50	
20	entolasia stricta					0.5	50	
21	crestida vagans					0.3	40	
22	chedanthes sieberi					0.3	100	
23	galinia <del>datuif</del> aspera					0.2	5	
24	acacia longissima					0.2	5	
25	phyllanthus virgatus					0.2	10	
26	gardenia hederacea					0.3	100	
27	lantana camara					0.2	5	
28	cyanthillium cerearea					0.1	20	
29	ozothamnus diosmifolius					0.1	3	
30	Alphitonia excelsior					0.1	1	
31	hypochaeris radicata					0.1	3	
32	miralena stipoides					0.5	100	
33	glycine clandestine					0.1	5	
34	cymbopogon refractus					0.5	50	
35	lagensia stipata					0.2	5	
36	comandra longifolia					0.1	1	
37	lysmachia anensis					0.1	10	
38	glochidion forandii					0.1	1	
39	bothriocloa macra					0.1	5	
40	billardiera scandens					0.1	10	
41	euchiton spicatus					0.1	5	
42	impeata cylindrica					0.1	10	
43	poranthera microphylla					0.1	20	
44	alteranthera denticulata					0.1	15	
45	panicum effusum					0.2	20	
46	salanum priiophyllum					0.1	1	
47								

GF Code: see growth form definitions in Appendix 1 N: native, E: exotic, HTE: high threat exotic GF - circle code of 'top 3'  
 Cover: 0.1, 0.2, 0.3..... 1, 2, 3 ..... 10, 15, 20, 25 ..... 100% (foliage cover): Note: 0.1% cover = 63 x 63 cm or a circle 71 cm across,  
 0.5% cover = 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10m. Abundance: 1, 2, 3...10, 20, 30...100, 200...1000...

### 1,000 m<sup>2</sup> PLOT

Tree Stem Size Class*		Trees <sup>^</sup>
<b>Count of Large Trees</b> Record DBH of each tree at 1.3 m from ground.	80+ cm	X
	50+ cm	X
All other Trees: Only record <b>presence or absence</b> of trees in these stem size classes. Record DBH of each tree at 1.3 m from ground.	30-49 cm	✓
	20-29 cm	✓
	10-19 cm	✓
	5-9 cm	✓
<b>Presence or absence of Regeneration<sup>#</sup></b> Maximum stem diameter of <5 cm regardless of height.	<5 cm	✓

Count of HBTs <sup>†</sup>

\*Living trees only; for **multi-stemmed trees**, only largest stem is counted or recorded as present;

<sup>#</sup>Record presence of regeneration for any tree with a maximum stem diameter of <5 cm, regardless of height (i.e., record presence of regeneration if sapling or seedlings that are <1.3 m high and have DBH <5 cm).

<sup>^</sup>Includes species classified as Trees under the BAM Growth Form Table.

<sup>†</sup>Count of **hollow-bearing trees** and **shrubs**; includes living and dead; record by stem size class.

Length of logs (m)	Tally	TOTAL LENGTH (m)
Fallen logs = >10 cm diameter, that is dead and entirely or partly on the ground within the 1,000 m <sup>2</sup> plot. Only the length of log within the plot is recorded.		17m

### 1 m<sup>2</sup> sub PLOT

Litter cover (%)				
Subplot	95	95	95	98
Average	90			

**Litter** includes leaves, seeds, twigs, branchlets and branches **less than 10 cm diameter**. Include all plant material that is detached from a plant and forms part of the litter layer on the ground surface. Litter cover is the two-dimensional litter layer in contact with the ground surface, including litter under the canopies of erect plants. Plant material that is not detached should be assessed as foliage cover, regardless of whether it appears alive or dead.

Quadrat Number: Q11. Date: 24/4/25. Recorder: SBFEN.  
 Property Name or Project Name: Pitman

- Both Start and End points collected on GPS
- Start and End locations are approximately 50 m apart on GPS

400m <sup>2</sup> plot: Sheet of		Survey Name Pottman BDAR	Plot Identifier Q12	Recorders RN + DP			
Date	17/4/25						
GF	Top 3 natives in each GF: Full species name mandatory. All others where practicable	N	E	HTE	Cover %	Abund	voucher
1	<i>E. cakra</i>				10	30	
2	<i>Acacia longissima</i>				0.5	10	
3	<i>Acacia falcata</i>				0.5	10	
4	<i>Leucopogon juniperinus</i>				0.2	5	
5	<i>Cymbopogon refractus</i>				2	100	
6	<i>Calvaia alata aspera</i>				0.5	10	
7	<i>Bidens pilosa</i>				1	20	
8	<i>Lantana camara</i>				0.2	20	
9	<i>Sporobolus creber</i>				3	100	
10	<i>Chelidonium purpureoescens</i>				1	100	
11	<i>Desmodium venosum Cronium venosum</i>				0.2	50	
12	<i>Murdannia stricta</i>				3	100	
13	<i>Dichelachne micrantha</i>				5	500	
14	<i>Dichandra repens</i>				0.2	50	
15	<i>Centella asiatica</i>				0.2	50	
16	<i>Plantago lanceolata</i>				0.2	30	
17	<i>Bothriochloa macra</i>				1	100	
18	<i>Agerophora stipitata</i>				1	100	
19	<i>Richardia stellaris</i>				0.2	50	
20	<i>Olea europaea (Olea europaea)</i>				1	10	
21	<i>Juncus usitatus</i>				0.2	50	
22	<i>Cristida vagans</i>				3	500	
23	<i>Eragrostis leptostachys</i>				3	500	
24	<i>Fimbristylis dichroma</i>				3	500	
25	<i>Euchiton sphaericus</i>				5	500	
26	<i>Oxalis perennans</i>				0.2	50	
27	<i>Glochidion torrandii</i>				0.2	2	
28	<i>Phyllanthus gunii</i>				0.1	1	
29	<i>Hibbertia diffusa</i>				0.1	2	
30	<i>Glycine tabacina</i>				0.1	5	
31	<i>Veronica plebia</i>				0.1	3	
32	<i>Vittadenia cuneata</i>				0.2	20	
33	<i>Digitalis didactyla</i>				15	1000	
34	<i>Panicum effusum</i>				1	100	
35	<i>Cyperus cyrtoides dactylon</i>				15	1000	
36	<i>Albanthera dentata</i>				0.2	20	
37	<i>Davosia ulicifolia</i>				0.1	3	
38	<i>Chelanthus seiberi</i>				0.5	100	
39	<i>Senecio madagascariensis</i>				0.5	100	
40	<i>Taraxacum officinale</i>				0.3	50	
41	<i>Dianella caerulea</i>				0.1	2	
42	<i>Bothriochloa capillipedium spicigerum</i>				0.3	10	
43	<i>Verbena rigida</i>				0.2	10	
44	<i>Cyperus oragrostis</i>				0.2	20	
45	<i>Whalenbergia gracilis</i>				0.2	50	
46	<i>Conyza bonariensis</i>				0.5	50	
47	<i>Panicum semile</i>				2	100	

GF Code: see growth form definitions in Appendix 1 N: native, E: exotic, HTE: high threat exotic GF - circle code of 'top 3'  
 Cover: 0.1, 0.2, 0.3..... 1, 2, 3 ..... 10, 15, 20, 25 ..... 100% (foliage cover): Note: 0.1% cover = 63 x 63 cm or a circle 71 cm across,  
 0.5% cover = 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10m. Abundance: 1, 2, 3...10, 20, 30...100, 200...1000...

400m <sup>2</sup> plot: Sheet of		Survey Name	Plot Identifier	Recorders			
Date	17/4/25	Pittman BINAN	Q12	KV + DP			
GF	Top 3 natives in each GF: Full species name mandatory. All others where practicable		continued				
GF	Top 3 natives in each GF: Full species name mandatory. All others where practicable	N	E	HTE	Cover %	Abund	voucher
1	<i>Cyperus brevifolius</i>				0.2	10	
2	<i>Lomandra multiflora</i>				0.2	10	
3	<i>Setaria parviflora</i>				0.5	50	
4	<i>Paspalum dilatatum</i>				0.2	20	
5	<i>Eragrostis brownii</i>				0.5	50	
6	<i>Mediola caroliniana</i>				0.2	2	
7	<i>Hydrocotyle laxiflora</i>				0.2	10	
8	<i>Verberna bonerensis</i>				0.2	10	
9	<i>Axonopus fissifolius</i>				0.2	10	
10	<i>Lissanthe stigosa</i> / <del><i>Leptocarpus</i></del>				0.1	1	
11							
12							
13							
14							
15							
16							
17							
18							
19							
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44							
45							
46							
47							

GF Code: see growth form definitions in Appendix 1 N: native, E: exotic, HTE: high threat exotic GF - circle code of 'top 3'  
 Cover: 0.1, 0.2, 0.3..... 1, 2, 3 ..... 10, 15, 20, 25 ..... 100% (foliage cover): Note: 0.1% cover = 63 x 63 cm or a circle 71 cm across,  
 0.5% cover = 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10m. Abundance: 1, 2, 3... 10, 20, 30... 100, 200... 1000...

# 1,000 m<sup>2</sup> PLOT

Quadrat Number: Q12 Date: 17/4/2025 Recorder: DP + RN

Property Name or Project Name: PITTMAN BDAR

Tree Stem Size Class*		Trees <sup>^</sup>
<b>Count</b> of Large Trees Record DBH of each tree at 1.3 m from ground.	80+ cm	0
	50+ cm	0
All other Trees: Only record <b>presence</b> or <b>absence</b> of trees in these stem size classes. Record DBH of each tree at 1.3 m from ground.	30-49 cm	✓
	20-29 cm	✓
	10-19 cm	✓
	5-9 cm	✓
<b>Presence or absence of Regeneration<sup>#</sup></b> Maximum stem diameter of <5 cm regardless of height.	<5 cm	✓

Count of HBTs <sup>†</sup>	Hollows >20cm? <sup>∞</sup>	Hollows >4m high? <sup>∞</sup>
0	n/a	
0	n/a	

\*Living trees only; for **multi-stemmed trees**, only largest stem is counted or recorded as present;

<sup>#</sup>Record presence of regeneration for any tree with a maximum stem diameter of <5 cm, regardless of height (i.e., record presence of regeneration if sapling or seedlings that are <1.3 m high and have DBH <5 cm).

<sup>^</sup>Includes species classified as Trees under the BAM Growth Form Table.

<sup>†</sup>Count of **hollow-bearing trees** and **shrubs**; includes living and dead; record by stem size class.

<sup>∞</sup>If present, collect GPS location and HBT details

Length of logs (m)	Tally	TOTAL LENGTH (m)
Fallen logs = >10 cm diameter, that is dead and entirely or partly on the ground within the 1,000 m <sup>2</sup> plot. Only the length of log within the plot is recorded.		17m

## 1 m<sup>2</sup> sub PLOT

Litter cover (%)					
Subplot	40	15	5	75	25
Average					

**Litter** includes leaves, seeds, twigs, branchlets and branches **less than 10 cm diameter**. Include all plant material that is detached from a plant and forms part of the litter layer on the ground surface. Litter cover is the two-dimensional litter layer in contact with the ground surface, including litter under the canopies of erect plants. Plant material that is not detached should be assessed as foliage cover, regardless of whether it appears alive or dead.

- Both Start and End points collected on GPS
- Start and End locations are approximately 50 m apart on GPS

400 m <sup>2</sup> floristics plot:	Survey name	Plot identifier	Recorders
Date 17/04/25	Pittman BPAR	Q13	J.M

GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	<sup>2</sup> Foliage cover	Abundance	Voucher
1	<i>Cynodon Dactylon</i>	50	<del>40</del> <del>100</del> <del>700</del> <del>1000</del>		500
2	<i>Paspalum dilatatum</i>		2	2050	
3	<i>Eragrostis leptostachya</i>		3	100	
4	<i>Senecio madagascariensis</i>		0.5	100	
5	<i>Bothriocloa macra</i>		2	200	
6	<i>Verbena bonariensis</i>		0.1	5	
7	<i>Hypochaeris radicata</i>		0.1	100	
8	<i>Cheilanthes sieberi</i>		0.1	100	
9	<i>Setaria parviflora</i>		0.5	20	
10	<i>Centella asiatica</i>		0.1	100	
11	<i>Verbena rigida</i>		0.1	20	
12	<i>Sigesbeckia orientalis</i>		0.2	20	
13	<i>Conyza bonariensis</i>		0.1	20	
14	<i>Digitalis dactylon</i>		30	300	
15	<i>Eleusine indica</i>		0.5	20	
16	<i>Dichondra repens</i>		0.1	200	100
17	<i>Labellia purpurens</i>		0.1	100	
18	<i>Plantago debilis</i>		0.1	10	
19	<i>Eragrostis brownii</i>		2	100	
20	<i>Juncus usitatus</i>		0.1	5	
21	<i>Axonopus fissifolius</i>		0.5	50	
22	<i>Wahlenbergia gracilis</i>		0.1	50	
23	<i>Lysmachia arvensis</i>		0.1	10	
24	<i>Galium gaudichaudii</i>		0.1	10	
25	<i>Euchiton sphaericus</i>		0.2	<del>20</del> 50	
26	<i>Oxalis pernanans</i>		0.1	100	
27	<i>Daucus carota</i>		0.1	100	
28	<i>Trifolium repens</i>		0.1	100	
29	<i>Alochidion fernandii</i>		0.1	2	
30	<i>Sporobolus creber</i>		1	150	
31	Wild Aster <i>Aster subulatus</i>		0.1	10	
32	<i>Capillipedium spicigerum</i>		1	100	
33	<i>Alternantra pungens</i>		0.1	10	
34	<i>Aristida ramosa</i>		1	100	
35	<i>Bursaria spinosa</i>		1	20	

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

**GF Code:** see growth form definitions in BAM 2020 Appendix F.

**N:** native, **HTW:** high threat weed. **Voucher:** specimens collected for identification by a herbarium.

<sup>2</sup> **Foliage cover:** 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ... 100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m. Note the top 3 dominant native species within each GF group.

**Abundance:** Count 1, 2, 3 ..., when ≤ 10, estimate when > 10, 20, 30 ... 100, 200, 300 ..., 1,000, 2,000, 3,000 ... (as integer values).

36. *Cyanthillium cinerum* 0.1 10

37. *Acacia implexa* 0.2 2

(38) *Breynia oblongifolia* 0.1 1

# 1,000 m<sup>2</sup> PLOT

Quadrat Number: Q13

Date: 17/04/25

Recorder: J.M

Property Name or Project Name: Pittman BDAR

Tree Stem Size Class*		Trees <sup>^</sup>
<b>Count</b> of Large Trees Record DBH of each tree at 1.3 m from ground.	80+ cm	—
	50+ cm	—
All other Trees: Only record <b>presence</b> or <b>absence</b> of trees in these stem size classes. Record DBH of each tree at 1.3 m from ground.	30-49 cm	—
	20-29 cm	—
	10-19 cm	—
	5-9 cm	— ✓
<b>Presence or absence of Regeneration<sup>#</sup></b> Maximum stem diameter of <5 cm regardless of height.	<5 cm	✓

Count of HBTs <sup>†</sup>	Hollows >20cm? <sup>∞</sup>	Hollows >4m high? <sup>∞</sup>
—	—	—
—	—	—
—	—	—
—	—	—
—	—	—
—	—	—
—	—	—

\*Living trees only; for **multi-stemmed trees**, only largest stem is counted or recorded as present;

<sup>#</sup>Record presence of regeneration for any tree with a maximum stem diameter of <5 cm, regardless of height (i.e., record presence of regeneration if sapling or seedlings that are <1.3 m high and have DBH <5 cm).

<sup>^</sup>Includes species classified as Trees under the BAM Growth Form Table.

<sup>†</sup>Count of **hollow-bearing trees** and **shrubs**; includes living and dead; record by stem size class.

<sup>∞</sup>If present, collect GPS location and HBT details

Length of logs (m)	Tally	TOTAL LENGTH (m)
Fallen logs = >10 cm diameter, that is dead and entirely or partly on the ground within the 1,000 m <sup>2</sup> plot. Only the length of log within the plot is recorded.	—	0m

## 1 m<sup>2</sup> sub PLOT

Litter cover (%)					
Subplot	10	5	10	5	5
Average	7%				

**Litter** includes leaves, seeds, twigs, branchlets and branches **less than 10 cm diameter**. Include all plant material that is detached from a plant and forms part of the litter layer on the ground surface. Litter cover is the two-dimensional litter layer in contact with the ground surface, including litter under the canopies of erect plants. Plant material that is not detached should be assessed as foliage cover, regardless of whether it appears alive or dead.



Both Start and End points collected on GPS



Start and End locations are approximately 50 m apart on GPS

Site	PITMAN BDAR					Plot ID	Q14	Date	16/4/25	Recorders	DP + RN	
GF	Cover %	Abund	N	E	HW	Top 3 natives in each GF: Full species name mandatory. All others where practicable						voucher
	20	20				1	<i>E. crebra</i>					
	5	0				2	<i>Ficus rubiginosa</i> ✓					✓
	3	1				3	<i>E. canaliculata</i> ✓					✓
	1	20				4	<i>Setaria parviflora</i> ✓					✓
	1	25				5	<i>Paspalum dilatatum</i>					
	50	750				6	<i>Lantana camara</i>					
	1	10				7	<i>Olea europaea</i>					
	0.1	1				8	<i>Eragrostis leptostachya</i>					
	3	25				9	<i>Austrorhynchos verticillata</i> ✓ Conf.					ref. Q9
	0.2	20				10	<i>Lobelia purpurescens</i>					
	50	2500				11	<i>Microlaena stipoides</i>					
	0.1	20				12	<i>Rumex brownii</i>					
	0.5	100				13	<i>Sidaesbeekia orientalis</i>					
	0.1	25				14	<i>Plantago lanceolata</i>					
	5	250				15	<i>Sida rhombi-foia</i>					
	1	50				16	<i>Bidens sp. subalternans</i> ✓					✓
	0.5	50				17	<i>Commelina cyanea</i>					
	1	100				18	<i>Senecio madagascariensis</i>					
	0.1	10				19	<i>Alysicarpus debacina</i>					
	0.1	5				20	<i>Congea bonariensis</i>					
	0.1	20				21	<i>Oxalis perennans</i> ✓					✓
	0.1	10				22	<i>Stellaria media</i>					
	0.1	10				23	<i>Cyperus gracilis</i>					
	0.2	20				24	<i>Syntherisma nutans</i>					
	2	250				25	<i>Digitaria didactyla</i>					
	2	500				26	<i>Oplismenus aemulus</i>					
	1	50				27	<i>Adiantum aethiopicum</i>					
	0.2	2				28	<i>Antennaria aspera</i>					
	0.1	1				29	<i>Plectranthus parvifolia</i>					
	0.2	25				30	<i>Modiola caroliniana</i>					
	0.1	10				31	<del>Stenochoa longistylis lancea</del> <i>Aster subulatus</i>					✓
	0.1	5				32	<i>Bidens pilosa</i>					
	0.1	2				33	<i>Solanum prino-phyllum</i>					
	0.1	3				34	<i>Soliva sessilis</i>					
	0.1	3				35	<i>Diosphoria pumillo</i>					
	0.1	25				36	<i>Dichomandra repens</i>					
	0.1	5				37	<i>Eleusine indica</i>					
	0.1	20				38	<i>Sporobolus africanus</i>					
	0.1	1				39	<i>Alternanthera denticulata</i>					
	0.1	10				40	<i>Cyperus brevifolius</i>					
						41						
						42						
						43						
						44						
						45						
						46						
						47						
						48						
						49						
						50						

# 1,000 m<sup>2</sup> PLOT

Quadrat Number: Q14

Date: 16/4/25

Recorder: RU + DP

Property Name or Project Name:

Tree Stem Size Class*		Trees <sup>^</sup>
<b>Count</b> of Large Trees Record DBH of each tree at 1.3 m from ground.	80+ cm	—
	50+ cm	1
All other Trees: Only record <b>presence</b> or <b>absence</b> of trees in these stem size classes. Record DBH of each tree at 1.3 m from ground.	30-49 cm	✓
	20-29 cm	✓
	10-19 cm	—
	5-9 cm	—
<b>Presence or absence of Regeneration<sup>#</sup></b> Maximum stem diameter of <5 cm regardless of height.	<5 cm	

Count of HBTs <sup>†</sup>	Hollows >20cm? <sup>∞</sup>	Hollows >4m high? <sup>∞</sup>
<del> </del>		

\*Living trees only; for **multi-stemmed trees**, only largest stem is counted or recorded as present;

<sup>#</sup>Record presence of regeneration for any tree with a maximum stem diameter of <5 cm, regardless of height (i.e., record presence of regeneration if sapling or seedlings that are <1.3 m high and have DBH <5 cm).

<sup>^</sup>Includes species classified as Trees under the BAM Growth Form Table.

<sup>†</sup>Count of **hollow-bearing trees** and **shrubs**; includes living and dead; record by stem size class.

<sup>∞</sup>If present, collect GPS location and HBT details

<b>Length of logs (m)</b> Fallen logs = >10 cm diameter, that is dead and entirely or partly on the ground within the 1,000 m <sup>2</sup> plot. Only the length of log within the plot is recorded.	1.5 + 6 + 6 +	Tally	<b>TOTAL LENGTH (m)</b>  13.5
---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------	-------	-------------------------------------

## 1 m<sup>2</sup> sub PLOT

Subplot	Litter cover (%)				
	10	10	40	80	85
Average					

**Litter** includes leaves, seeds, twigs, branchlets and branches **less than 10 cm diameter**. Include all plant material that is detached from a plant and forms part of the litter layer on the ground surface. Litter cover is the two-dimensional litter layer in contact with the ground surface, including litter under the canopies of erect plants. Plant material that is not detached should be assessed as foliage cover, regardless of whether it appears alive or dead.

Both Start and End points collected on GPS

Start and End locations are approximately 50 m apart on GPS

Site	Pithman Grass BDAL					Plot ID	Date	Recorders		
GF	Cover %	Abund	N	E	HW	Top 3 natives in each GF: Full species name mandatory. All others where practicable				voucher
	50	4000	✓			1	<i>Digitaria lindleyana</i>			
	20	2000				2	<i>Cynodon dactylon</i>			
	0.1	10			✓	3	<i>Paspalum dilatatum</i>			
	1	100				4	<i>Eleusine indica</i>			
	3	500		✓		5	<i>Plantago lanceolata</i>			
	3	200			✓	6	<i>Senecio madagascariensis</i>			
	3	100			✓	7	<i>Cenchrus clandestinus</i>			
	<del>0.1</del>	<del>20</del>				8	<del><i>Digitaria - tall</i></del> <i>Axonopus fissifolius</i>			✓
	2	100	✓			9	<i>Eragrostis bournii</i>			
	1	20		✓		10	<i>Verbena bonariensis</i> x <i>brasilensis</i>			✓
	4	100		✓		11	<i>Sporobolus africanus</i>			
	1	50		✓		12	<i>Setaria pumila</i>			
	0.1	40				13	<i>Echinochloa polystachya</i>			
	0.1	10		✓		14	<i>Cenchrus bonariensis</i>			
	<del>0.1</del>	<del>10</del>				15	<del>Flat spikelet grass = <i>Eleusine indica</i></del>			✓
	0.1	10		✓		16	<i>Cyperus rotundus</i> <i>brasilensis</i>			✓
	0.1	20				17	<i>Clatis peruviana</i>			✓
	0.1	10		✓		18	<i>Tribolium repens</i>			
	1	2040			✓	19	<i>Axonopus fissifolius</i>			
	0.1	10	✓			20	<i>Juncus tenuis</i> <i>subsecundus</i>			✓
	0.1	20		✓		21	<i>Sida rhomb.</i>			
	0.1	10	✓			22	<i>Sigesbeckia orientalis</i>			
	0.1	10.5	✓			23	<i>Centella asiatica</i>			
	0.1	20	✓			24	<i>Labellia purpurascens</i>			
	0.1	10		✓		25	<i>Verbena rigida</i>			
	0.1	15		✓		26	<i>Hyarbaeis indicata</i>			
	0.1	5	✓			27	<i>Dichelanthe micrantha</i>			
	0.1	40				28	distical Forb = <i>Haloragis heterophylla</i>			✓
	0.1	20	✓			29	<i>Agericum gramineum</i>			
	<del>0.1</del>	<del>5</del>	✓			30	<del><i>Centella asiatica</i></del>			✓
	0.1	3			✓	31	<i>Bidens pilosa</i>			
	0.1	1		✓		32	<i>Bothriochloa maura</i>			
						33				
						34	(29)			
						35				
						36				
						37				
						38				
						39				
						40				
						41				
						42				
						43				
						44				
						45				
						46				
						47				
						48				
						49				
						50				

# 1,000 m<sup>2</sup> PLOT

Quadrat Number: 015 Date: 16-4-2025 Recorder: AP  
 Property Name or Project Name: Pittman Quarry BOM

Tree Stem Size Class*		Trees <sup>^</sup>
<b>Count of Large Trees</b> Record DBH of each tree at 1.3 m from ground.	80+ cm	/
	50+ cm	
All other Trees: Only record <b>presence or absence</b> of trees in these stem size classes. Record DBH of each tree at 1.3 m from ground.	30-49 cm	
	20-29 cm	
	10-19 cm	
Presence or absence of <b>Regeneration</b> <sup>#</sup> Maximum stem diameter of <5 cm regardless of height.	5-9 cm	
	<5 cm	

Count of HBTs <sup>†</sup>	Hollows >20cm? <sup>∞</sup>	Hollows >4m high? <sup>∞</sup>
/		

\*Living trees only; for **multi-stemmed trees**, only largest stem is counted or recorded as present;

#Record presence of regeneration for any tree with a maximum stem diameter of <5 cm, regardless of height (i.e., record presence of regeneration if sapling or seedlings that are <1.3 m high and have DBH <5 cm).

<sup>^</sup>Includes species classified as Trees under the BAM Growth Form Table.

<sup>†</sup>Count of **hollow-bearing trees** and **shrubs**; includes living and dead; record by stem size class.

<sup>∞</sup>If present, collect GPS location and HBT details

Length of logs (m)	Tally	TOTAL LENGTH (m)
Fallen logs = >10 cm diameter, that is dead and entirely or partly on the ground within the 1,000 m <sup>2</sup> plot. Only the length of log within the plot is recorded.	○	○

## 1 m<sup>2</sup> sub PLOT

Litter cover (%)					
Subplot	10	10	5	8	15
Average					

Litter includes leaves, seeds, twigs, branchlets and branches **less than 10 cm diameter**. Include all plant material that is detached from a plant and forms part of the litter layer on the ground surface. Litter cover is the two-dimensional litter layer in contact with the ground surface, including litter under the canopies of erect plants. Plant material that is not detached should be assessed as foliage cover, regardless of whether it appears alive or dead.

- Both Start and End points collected on GPS
- Start and End locations are approximately 50 m apart on GPS

SPECIES COUNT = 37. ✓

Date entered 29/4/25, DP.

400m <sup>2</sup> plot: Sheet of		Survey Name	Plot Identifier	Recorders				
Date	24/4/25	Pitman	Q16	SB + RN				
GF	Top 3 natives in each GF: Full species name mandatory. All others where practicable		N	E	HTE	Cover %	Abund	voucher
1	---							
2	---							
3	---							
4	sida <del>coron</del> rhombica					10	150	
5	verbena bon.					0.1	20	
6	<del>Conyza bon.</del>							
7	Erigeron flombrundus					0.5	55	
8	plantago lance.					0.1	25	
9	Senecio madag.					0.1	25	
10	chlores <del>sp</del> virgatum					5 <del>ms</del>	850	
11	sporobolus					5 <del>ms</del>	250	
12	Setaria <del>sp</del> penniflora					10	500	
13	Paspalum dilatatum					1 <del>ms</del>	200	
14	lobelia purp.					0.1	10	
15	Cirsium vulg.					0.1	2	
16	oxalis perenne					0.1	50	
17	Comphocarpus fruticosus					0.1	5	
18	Anodon dactyl.					20	1000	
19	Digitaria dactyl. D. didactyla					20	1000	
20	(Mallow) - modelida caroliniana					0.1	50	
21	Aster ferax? photos					0.1	10	
22	Rumex brunellii					0.1	5	
23	Euphorbia prostrata					0.1	10	
24	Eleusine indica					0.1	50	
25	Trifolium repens					0.1	50	
26	Desmodium varians - Corona varians					0.1	10	
27	<del>Erugrostis?</del> danicum effusum					0.1	20	
28	Hairy trifolium Gomphrena selosoides					0.1	5	
29	Euc crebra seedling					0.1	2	
30	Aristida vagen					1 <del>ms</del>	100	
31	Solanum pruni					0.1	2	
32	Taraxicum off.					0.1	20	
33	Richardia stellaris					0.1	5	
34	Sydesbeckia orientalis					0.1	10	
35	Echiton sch.					0.1	10	
36	Xanthium strumarium					0.1	2	
37	Hydrocotyle laxiflora					0.1	50	
38	Lepidium africanum					0.1	5	
39	- Echinochloa colona					0.1	50	
40	Schkubria pinnate? (sample)					0.1	20	
41	medicago sativa					0.1	20	
42								
43								
44								
45								
46								
47								

37

GF Code: see growth form definitions in Appendix 1 N: native, E: exotic, HTE: high threat exotic GF - circle code of 'top 3'  
 Cover: 0.1, 0.2, 0.3..... 1, 2, 3 ..... 10, 15, 20, 25 ..... 100% (foliage cover): Note: 0.1% cover = 63 x 63 cm or a circle 71 cm across,  
 0.5% cover = 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10m! Abundance: 1, 2, 3...10, 20, 30...100, 200...1000...

# 1,000 m<sup>2</sup> PLOT

Quadrat Number: Q16

Date: 24.4.25

Recorder: RN + JB

Property Name or Project Name: Pittman BDAR

Tree Stem Size Class*		Trees <sup>^</sup>
<b>Count</b> of Large Trees Record DBH of each tree at 1.3 m from ground.	80+ cm	
	50+ cm	
All other Trees: Only record <b>presence</b> or <b>absence</b> of trees in these stem size classes. Record DBH of each tree at 1.3 m from ground.	30-49 cm	
	20-29 cm	
	10-19 cm	
	5-9 cm	
<b>Presence or absence of Regeneration<sup>#</sup></b> Maximum stem diameter of <5 cm regardless of height.	<5 cm	

Count of HBTs <sup>†</sup>	Hollows >20cm? <sup>∞</sup>	Hollows >4m high? <sup>∞</sup>


\*Living trees only; for **multi-stemmed trees**, only largest stem is counted or recorded as present;

<sup>#</sup>Record presence of regeneration for any tree with a maximum stem diameter of <5 cm, regardless of height (i.e., record presence of regeneration if sapling or seedlings that are <1.3 m high and have DBH <5 cm).

<sup>^</sup>Includes species classified as Trees under the BAM Growth Form Table.

<sup>†</sup>Count of **hollow-bearing trees** and **shrubs**; includes living and dead; record by stem size class.

<sup>∞</sup>If present, collect GPS location and HBT details

Length of logs (m) Fallen logs = >10 cm diameter, that is dead and entirely or partly on the ground within the 1,000 m <sup>2</sup> plot. Only the length of log within the plot is recorded.	Tally	TOTAL LENGTH (m)
		

## 1 m<sup>2</sup> sub PLOT

	Litter cover (%)				
Subplot	<u>2</u>	<u>2</u>	<u>10</u>	<u>10</u>	<u>2</u>
Average					

**Litter** includes leaves, seeds, twigs, branchlets and branches **less than 10 cm diameter**. Include all plant material that is detached from a plant and forms part of the litter layer on the ground surface. Litter cover is the two-dimensional litter layer in contact with the ground surface, including litter under the canopies of erect plants. Plant material that is not detached should be assessed as foliage cover, regardless of whether it appears alive or dead.

Both Start and End points collected on GPS

Start and End locations are approximately 50 m apart on GPS

TOTAL SPECIES = 34 ✓

Data entered 25/4/25, DP.

400m <sup>2</sup> plot: Sheet of		Survey Name	Plot Identifier		Recorders					
Date	24.4.25	Pittman BOAR	Q17		RN + SB					
GF	Top 3 natives in each GF: Full species name mandatory. All others where practicable				N	E	HTE	Cover %	Abund	voucher
*	1	<i>Pilea paradisa</i>						30	1000	
	2	<i>Cayratia</i> (native grape) - <i>Causonis clematidea</i>						0.3	20	
	3	<i>Jacscora transvosa</i>						0.5	50	
	4	<i>clematis glycinoides</i>						0.5	30	
	5	<i>adiantum aethiopicum</i>						30	500	
	6	<i>opilismenus demulius</i>						0.2	50	
	7	<del>atchonrea</del> (holly) - <i>Alchornea ilicifolia</i>						.5	30	
	8	<i>gictonomoxium cyrosium</i>						0.5	100	
Peperomia	9	<i>Blanda</i> var. <i>floribunda</i> (Hauy) ( <i>Cephaelis</i> )						.2	100	
	10	<i>myrsine variabilis</i>						5	50	
	11	<i>cissus hypoglauca</i> (rubbery palmate one)						0.3	10	
	12	<i>eustrephus latifolius</i>						0.3	30	
	13	<i>pittosporum undulatum</i>						0.2	5	
	14	<del>Antire hibiscus</del> <i>hibiscus heterophylla</i>						2	40	
	15	<i>backhousia myrifolia</i>						10	20	
	16	<i>Alphitonia excelsior</i>						0.5	10	
Gynerium	17	<i>ides. marchida jasminoides</i>						0.2	30	
	18	<i>fius rubiginosa</i>						5	50	
	19	<i>pittosporum multiflorum</i>						15	100	
	20	<i>olea europea</i>						0.5	10	
	21	<i>brachychiton populaneus</i>						10	5	
	22	<i>lantana camara</i>						0.1	2	
*	23	<i>capparis aborea</i> stabby						15	30	
*	24	<i>Streblus brunonianus</i> (white bore tree)						2	2	
*	25	foxtail fern - <i>Pyrrosia Pyrrhosia confluens</i>						0.2	5	
	26	<i>pandorea pandorana</i>						0.3	50	
	27	<i>hetelea longifolia</i>						0.3	10	
	28	<i>drypetes diplache</i>						10	5	
*	29	<i>croton insularis</i>						.2	2	
	30	<del>logania albiflora</del>						<del>0.5</del>	+	
	31	<i>tetrasigma nitans</i>						0.5	20	
	32	<i>cissus antia</i> <del>antia</del> <i>antatia</i>						0.2	10	
	33	<i>adiantum hispidula</i>						0.5	40	
	34	<i>ancilema decuminatum</i>						0.3	20	
	35	<del>phyllanthus grand</del> <i>Breynia oblongifolia</i>						0.2	2	
	36									
	37									
	38									
	39									
	40									
	41									
	42									
	43									
	44									
	45									
	46									
	47									

34

GF Code: see growth form definitions in Appendix 1 N: native, E: exotic, HTE: high threat exotic GF - circle code of 'top 3'  
 Cover: 0.1, 0.2, 0.3..... 1, 2, 3 ..... 10, 15, 20, 25 ..... 100% (foliage cover): Note: 0.1% cover = 63 x 63 cm or a circle 71 cm across, 0.5% cover = 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10m. Abundance: 1, 2, 3... 10, 20, 30... 100, 200... 1000...

Data entered 29/4/25, DP

### 1,000 m<sup>2</sup> PLOT

Tree Stem Size Class*		Trees <sup>^</sup>
<b>Count of Large Trees</b> Record DBH of each tree at 1.3 m from ground.	80+ cm	—
	50+ cm	1
All other Trees: Only record <b>presence or absence</b> of trees in these stem size classes. Record DBH of each tree at 1.3 m from ground.	30-49 cm	✓
	20-29 cm	✓
	10-19 cm	✓
	5-9 cm	✓
<b>Presence or absence of Regeneration<sup>#</sup></b> Maximum stem diameter of <5 cm regardless of height.	<5 cm	✓

Count of HBTs <sup>†</sup>

\*Living trees only; for **multi-stemmed trees**, only largest stem is counted or recorded as present;

<sup>#</sup>Record presence of regeneration for any tree with a maximum stem diameter of <5 cm, regardless of height (i.e., record presence of regeneration if sapling or seedlings that are <1.3 m high and have DBH <5 cm).

<sup>^</sup>Includes species classified as Trees under the BAM Growth Form Table.

<sup>†</sup>Count of **hollow-bearing trees** and **shrubs**; includes living and dead; record by stem size class.

Length of logs (m)	Tally	TOTAL LENGTH (m)
Fallen logs = >10 cm diameter, that is dead and entirely or partly on the ground within the 1,000 m <sup>2</sup> plot. Only the length of log within the plot is recorded.		15

### 1 m<sup>2</sup> sub PLOT

	Litter cover (%)
Subplot	<del>50 50 60 40 45</del>
Average	55 65 60 50 55

*litter high due to storm*

**Litter** includes leaves, seeds, twigs, branchlets and branches **less than 10 cm diameter**. Include all plant material that is detached from a plant and forms part of the litter layer on the ground surface. Litter cover is the two-dimensional litter layer in contact with the ground surface, including litter under the canopies of erect plants. Plant material that is not detached should be assessed as foliage cover, regardless of whether it appears alive or dead.

Quadrat Number: Q17. Date: 24/4/25 Recorder: SBTRN  
 Property Name or Project Name: Pitman

- Both Start and End points collected on GPS
- Start and End locations are approximately 50 m apart on GPS

100000 plot (1000000)

Site	Plot ID	Date	Recorders	GF	DF				
GF	Top 3 natives in each GF: Full species name mandatory. All others where practicable			N	E	HW	Cover %	Abund	voucher
1							4	3	
2							5	1	
3							2	5	
4							0.1	20	
5							1	40	
6							0.1	20	
7							1	50	
8							0.1	5	
9							3	500	/
10							5	400	/
11							0.1	20	
12							0.1	50	
13							0.1	20	
14							2	500	
15							0.1	20	
16							0.1	10	
17							0.1	10	
18							0.1	3	
19							0.1	5	
20							0.1	3	
21							3	500	
22							0.1	3	
23							0.1	1	
24							0.1	3	
25							2	100	
26							0.1	3	
27							0.1	10	
28							0.1	3	
29							0.5	3	
30							0.1	3	
31							0.1	3	
32							0.1	3	
33							0.1	10	
34							0.1	3	
35							0.1	10	
36							0.1	3	
37							0.1	20	
38							0.1	3	
39							0.1	10	
40							0.1	3	
41							0.1	5	
42							0.1	5	
43							0.1	5	
44							0.1	3	
45							0.1	3	
46							0.1	10	
47							0.1	3	
48							0.1	10	✓
49							0.1	5	
50							0.1	3	

### 1,000 m<sup>2</sup> PLOT

Tree Stem Size Class*	Trees <sup>^</sup>	
<b>Count</b> of Large Trees Record DBH of each tree at 1.3 m from ground.	80+ cm	0
	50+ cm	0
All other Trees: Only record <b>presence or absence</b> of trees in these stem size classes. Record DBH of each tree at 1.3 m from ground.	30-49 cm	✓
	20-29 cm	✓
	10-19 cm	✓
	5-9 cm	✓
<b>Presence or absence of Regeneration<sup>#</sup></b> Maximum stem diameter of <5 cm regardless of height.	<5 cm	✓

Count of HBTs <sup>†</sup>
0

\*Living trees only; for **multi-stemmed trees**, only largest stem is counted or recorded as present;

<sup>#</sup>Record presence of regeneration for any tree with a maximum stem diameter of <5 cm, regardless of height (i.e., record presence of regeneration if sapling or seedlings that are <1.3 m high and have DBH <5 cm).

<sup>^</sup>Includes species classified as Trees under the BAM Growth Form Table.

<sup>†</sup>Count of **hollow-bearing trees** and **shrubs**; includes living and dead; record by stem size class.

Length of logs (m)	Tally	TOTAL LENGTH (m)
Fallen logs = >10 cm diameter, that is dead and entirely or partly on the ground within the 1,000 m <sup>2</sup> plot. Only the length of log within the plot is recorded.	4HT	5m

### 1 m<sup>2</sup> sub PLOT

Litter cover (%)					
Subplot	1	5	10	2	5
Average					

**Litter** includes leaves, seeds, twigs, branchlets and branches **less than 10 cm diameter**. Include all plant material that is detached from a plant and forms part of the litter layer on the ground surface. Litter cover is the two-dimensional litter layer in contact with the ground surface, including litter under the canopies of erect plants. Plant material that is not detached should be assessed as foliage cover, regardless of whether it appears alive or dead.

Quadrat Number: Q18

Date: 10/07/2025

Recorder: DP + GP

Property Name or Project Name: Pitman Quarry BQAR

Both Start and End points collected on GPS

Start and End locations are approximately 50 m apart on GPS

Site	Pitman Quarry BDAR	Plot ID	Q19	Date	14/3/25	Recorders	D. Plunkett			
GF	Top 3 natives in each GF: Full species name mandatory. All others where practicable				N	E	HTW	Cover %	Abund	voucher
1	<i>Eucalyptus crebra</i>			- conf.				5	3	✓
2	<i>Lotium perenne</i>							25	5000	
3	<i>Secale cereale</i>							15	2500	
4	<i>Cirsium vulgare</i>							0.5	50	
5	<i>Senecio madagascariensis</i>							3	500	
6	<i>Lysimachia arvensis</i>							1	200	
7	<i>Trifolium subterraneum</i>							5	1000	
8	<i>Conyza bonariensis</i>							0.2	50	
9	<i>Solanum nigrum</i>							0.1	10	
10	<i>Waltherbergia gracilis</i>							0.2	50	
11	<i>Cichorium intybus</i>							10	1500	
12	<i>Cimochacta calviceps</i>							0.1	5	
13	<i>Tagetes minuta</i>							0.1	5	
14	<i>Gomphocarpus fruticosus</i>							0.1	3	
15	<i>Soliva sessilis</i>			- conf.				0.2	100	✓
16	<i>Lobelia purpurea</i>							0.5	200	
17	<i>Facelis retusa</i>							0.2	50	
18	<i>Verbena rigida</i>							0.1	3	
19	<i>Poranthera microphylla</i>			- conf.				0.1	20	✓
20	<i>Richardia stellaris</i>							0.1	1	
21	<i>Euchiton sphaericus</i>							0.1	10	
22	<i>Sisyrinchium iridifolium</i>							0.1	15	
23	<i>Bidens pilosa</i>							0.2	50	
24	<i>Dichondra repens</i>							0.1	20	
25	<i>Solanum prinophyllum</i>							0.1	1	
26	<i>Trifolium repens</i>							0.5	100	
27	<i>Cheilanthes sieberi</i>							0.2	50	
28	<i>Romulea rosea</i>							0.2	100	
29	<i>Sidgesbeckia orientalis</i>							0.1	10	
30	<i>Aristida vagans</i>							0.1	5	
31	<i>Lomandra longifolia</i>							0.1	5	
32	<i>Galnia aspera</i>							0.1	10	
33	<i>Sonchus asper</i>							0.1	5	
34	<i>Oxalis perennans</i>							0.1	3	
35	<i>Lomandra multiflora</i>							0.1	5	
36	<i>Cyperus gracilis</i>							0.1	10	
37	<i>Hypochaeris radicata</i>							0.1	25	
38	<i>Pseuderanthemum variabile</i>			- conf.				0.1	10	✓
39	<i>Eucalyptus tereticornis</i>			- conf.				0.1	1	✓
40	<i>Lantana camara</i>							2	25	
41	<i>Sonchus oleraceus</i>							0.2	25	
42	<i>Aerarium Solanderi</i>			- conf.				0.1	1	
43	<i>Plantago lanceolata</i>							0.1	1	
44	<i>Hackelia suaveolens</i>							0.1	2	
45	<i>Centella asiatica</i>							0.1	5	
46	<i>Acacia impleva</i>			- conf.				0.2	3	✓
47	<i>Olea europaea</i>							0.2	5	
48	<i>Bregnia oblongifolia</i>							0.1	5	
49	<i>Leucopogon juniperinus</i>							0.2	1	
50	<i>Taraxicum officinale</i>							0.1	5	

### 1,000 m<sup>2</sup> PLOT

Tree Stem Size Class*	Trees <sup>^</sup>	
<b>Count</b> of Large Trees Record DBH of each tree at 1.3 m from ground.	80+ cm	0
	50+ cm	0
All other Trees: Only record <b>presence or absence</b> of trees in these stem size classes. Record DBH of each tree at 1.3 m from ground.	30-49 cm	✓
	20-29 cm	✓
	10-19 cm	0
	5-9 cm	0
<b>Presence or absence of Regeneration<sup>#</sup></b> Maximum stem diameter of <5 cm regardless of height.	<5 cm	✓

Count of HBTs <sup>†</sup>
n/a
n/a

\*Living trees only; for **multi-stemmed trees**, only largest stem is counted or recorded as present;

<sup>#</sup>Record presence of regeneration for any tree with a maximum stem diameter of <5 cm, regardless of height (i.e., record presence of regeneration if sapling or seedlings that are <1.3 m high and have DBH <5 cm).

<sup>^</sup>Includes species classified as Trees under the BAM Growth Form Table.

<sup>†</sup>Count of **hollow-bearing trees** and **shrubs**; includes living and dead; record by stem size class.

Length of logs (m)	Tally	TOTAL LENGTH (m)
Fallen logs = >10 cm diameter, that is dead and entirely or partly on the ground within the 1,000 m <sup>2</sup> plot. Only the length of log within the plot is recorded.		25 m

### 1 m<sup>2</sup> sub PLOT

Litter cover (%)					
Subplot	3	3	1	1	3
Average					

**Litter** includes leaves, seeds, twigs, branchlets and branches **less than 10 cm diameter**. Include all plant material that is detached from a plant and forms part of the litter layer on the ground surface. Litter cover is the two-dimensional litter layer in contact with the ground surface, including litter under the canopies of erect plants. Plant material that is not detached should be assessed as foliage cover, regardless of whether it appears alive or dead.

Quadrat Number: 019      Date: 14/07/25      Recorder: D. Plunkett  
 Property Name or Project Name: Pittman Quarry BAR

- Both Start and End points collected on GPS
- Start and End locations are approximately 50 m apart on GPS

Site	Plot ID	Date	Recorders	GF	N	E	HTW	Cover %	Abund	voucher
1	Q1.0	14-7-25	GP	Top 3 natives in each GF: Full species name mandatory. All others where practicable				10	3	
2				<i>Eucalyptus crebra</i>	/			15	8	
3				<i>Eucalyptus tereticornis</i>	/			5	2000	
4				<i>Cyperus gracilis</i>	✓			5	100	
5				<i>Olea europaea</i>			/	2	5	
6				<i>Lantana camara</i>			/	1	200	
7				<i>Microstalea stipoides</i>	/			0.1	200	
8				<i>Seneio mad.</i>	/		/	0.1	5	
9				<i>Dichondra repens</i>	/			0.1	40	
10				<i>Bulbinella pilosa</i>	/		/	0.1	20	
11				<i>Sigesbeckia orientalis</i>	/			0.1	50	
12				<i>Cenchrus asiaticus</i>	/			1	100	
13				<i>Chicory = Cichorium intybus</i>	✓	✓		0.1	20	
14				<i>Facelia tetuoa</i>				0.1	20	
15				<i>Trifolium subterraneum subterraneum</i>			/	0.1	20	
16				<i>Lycopodium arvensis</i>	/			4	800	
17				<i>Lolium perenne</i>	/		/	0.1	10	
18				<i>Glycine clandestina</i>	/			0.1	3	
19				<i>Pachyrhizum terrore</i>	/			0.1	10	
20				<i>Euclyptus sparsus</i>	/			0.1	3	ph
21				<i>Orossera (tall) deltata</i>				0.1	5	✓
22				<i>Paranthera microphylla</i>	/			0.1	1	✓
23				<i>Juncus sp. usitatus</i>	/			0.1	10	
24				<i>Conyza bonariensis</i>	/		/	0.1	5	
25				<i>Sonchus asper</i>	✓			0.1	10	
26				<i>Hypochaeris radicata</i>	/		/	1	100	
27	Maekawaea			<i>Alge corn = Secale cereale</i>	/			0.1	5	
28				<i>Maek — r. fibulophyllum</i>	/			0.1	3	
29				<i>Hypericum gramineum</i>	/			0.1	5	
30				<i>Chenanthus sieberi</i>	/			0.1	400	
31				<i>orig. weeds = Ranunculus rosca</i>	/		/	0.1	20	
32				<i>Wahlebergia gracilis</i>	/			0.1	20	
33				<i>Galmia aspera</i>	/			0.1	5	
34				<i>Lobelia purpurascens</i>	/			0.1	10	
35				<i>Complexa sp. fruticosus</i>	/		/	0.1	5	
36				<i>Bregmia oblongifolia</i>	/			0.1	3	
37				<i>Citium ulgare</i>	/		/	0.1	5	
38				<i>Commelina cyanea</i>	/			0.1	20	
39				<i>Tagetes minima</i>	/		/	0.1	5	
40				<i>Notelaea longifolia</i>	/			0.1	3	
41				<i>Cycloperium leptophyllum</i>	/			0.1	5	
42				<i>Solanum nigrum</i>	/		/	0.1	5	
43				<i>Acerium molle</i>	/			0.1	10	✓
44				<i>Plantago debilis var.</i>	/			0.1	20	
45				<i>Lomandra multiflora</i>	/			2	30	
46				<i>Bothriochloa aurea</i>	/			0.1	3	
47				<i>Acacia implexa</i>	/			0.1	10	
48				<i>Hydrocotyle tripartita</i>	/			0.1	1	
49				<i>Leucopogon juniperinus</i>	/			1	50	
50				<i>Imperata cylindrica</i>	/		/	0.1	3	

# 1,000 m<sup>2</sup> PLOT

Tree Stem Size Class*		Trees <sup>^</sup>
<b>Count of Large Trees</b> Record DBH of each tree at 1.3 m from ground.	80+ cm	/
	50+ cm	/
All other Trees: Only record <b>presence or absence</b> of trees in these stem size classes. Record DBH of each tree at 1.3 m from ground.	30-49 cm	✓
	20-29 cm	✓
	10-19 cm	✓
	5-9 cm	✓
<b>Presence or absence of Regeneration<sup>#</sup></b> Maximum stem diameter of <5 cm regardless of height.	<5 cm	✓

Count of HBTs <sup>†</sup>

\*Living trees only; for **multi-stemmed trees**, only largest stem is counted or recorded as present;

<sup>#</sup>Record presence of regeneration for any tree with a maximum stem diameter of <5 cm, regardless of height (i.e., record presence of regeneration if sapling or seedlings that are <1.3 m high and have DBH <5 cm).

<sup>^</sup>Includes species classified as Trees under the BAM Growth Form Table.

<sup>†</sup>Count of **hollow-bearing trees** and **shrubs**; includes living and dead; record by stem size class.

Length of logs (m)	Tally	TOTAL LENGTH (m)
Fallen logs = >10 cm diameter, that is dead and entirely or partly on the ground within the 1,000 m <sup>2</sup> plot. Only the length of log within the plot is recorded.		3

## 1 m<sup>2</sup> sub PLOT

Litter cover (%)					
Subplot	5	10	8	30	15
Average					

**Litter** includes leaves, seeds, twigs, branchlets and branches **less than 10 cm diameter**. Include all plant material that is detached from a plant and forms part of the litter layer on the ground surface. Litter cover is the two-dimensional litter layer in contact with the ground surface, including litter under the canopies of erect plants. Plant material that is not detached should be assessed as foliage cover, regardless of whether it appears alive or dead.

Quadrat Number: Q20

Date: 14-7-25

Recorder: CP

Property Name or Project Name: Pittman Quarry

- Both Start and End points collected on GPS
- Start and End locations are approximately 50 m apart on GPS

Site	Pittman Quarry BOAR	Plot ID	Q2	Date	4/7/25	Recorders	D. P. Lunnhoff
GF	Top 3 natives in each GF: Full species name mandatory. All others where practicable	N	E	HTW	Cover %	Abund	voucher
1	<i>Eucalyptus crebra</i>				7	10	
2	<i>Olea europaea</i>				0.1	2	
3	<i>Lantana camara</i>				1	15	
4	<i>Imperata cylindrica</i>				30	2000	
5	<i>Senecio madagascariensis</i>				3	200	
6	<i>Breynia oblongifolia</i>				0.5	10	
7	<i>Clomphocarpus fruticosus</i>				0.1	5	
8	<i>Sida acuta</i>				0.5	50	
9	<i>Ahnia aspera</i>				1	25	
10	<i>Commelina cyanea</i>				0.1	10	
11	<i>Conyza bonariensis</i>				0.2	25	
12	<i>Hydrocotyle sibthorpioides</i>	- conf.			0.2	200	✓
13	<i>Dichondra repens</i>				0.1	50	
14	<i>Bidens pilosa</i>				1	50	
15	<i>Cyperus gracilis</i>				0.5	250	
16	<i>Facelis retusa</i>				0.2	100	
17	<i>Hypochaeris radicata</i>				0.2	50	
18	<i>Modiola caroliniana</i>				0.1	1	
19	<i>Linum trigynum</i> (Forb 2)	- conf.			0.1	5	✓
20	<i>Eragrostis</i> sp.				5	50	
21	<i>Lomandra multiflora</i>				0.2	5	
22	<i>Dichelachne micrantha</i>	- conf.			0.5	50	✓
23	<i>Acacia implexa</i>				1	5	
24	<i>Cirsium vulgare</i>				0.1	3	
25	<i>Trifolium repens</i>				0.2	50	
26	<i>Trema tomentosum</i>	- conf.			0.5	5	✓
27	<i>Chloris gayana</i>	- conf.			3	100	✓
28	<i>Tagetes minor</i>				0.2	50	
29	<i>Sonchum oleraceum</i>				0.1	3	
30	<i>Oxalis perennans</i>				0.1	1	
31	<i>Juncus subsecundus</i>				0.1	10	✓
32	<i>Lobelia purpurea</i>				0.5	100	
33	<i>Daucus glochidiatus</i>	- conf.			0.1	10	✓
34	<i>Trifolium subterraneum</i>				0.2	100	
35	<i>Geranium solanderi</i>	- conf.			0.1	10	✓
36	<i>Echiton sphaericus</i>				0.1	1	
37	<i>Wahlenbergia gracilis</i>				0.1	5	
38	<i>Pseudanthemum variable</i>	- conf.			0.1	1	✓
39	<i>Cichorium intybus</i>				1	500	
40	<i>Solanum nigrum</i>				0.1	5	
41	<i>Solanum prinophyllum</i>				0.1	1	
42	<i>Cheilanthes sieberi</i>				0.2	50	
43	<i>Microlaena stipoides</i>				25	500	
44	<i>Centella asiatica</i>				0.1	10	
45	<i>Hypericum gramineum</i>				0.1	1	
46	<i>Drosera peltata</i>	- conf.			0.1	10	ph
47	<i>Aristida vagans</i>				5	100	
48	<i>Secale cereale</i>				0.5	25	
49	<i>Poranthus microphylla</i>				0.1	10	
50	<i>Lolium perenne</i>				5	100	

### 1,000 m<sup>2</sup> PLOT

Tree Stem Size Class*		Trees <sup>^</sup>
<b>Count</b> of Large Trees Record DBH of each tree at 1.3 m from ground.	80+ cm	0
	50+ cm	0
All other Trees: Only record <b>presence or absence</b> of trees in these stem size classes. Record DBH of each tree at 1.3 m from ground.	30-49 cm	✓
	20-29 cm	✓
	10-19 cm	✓
	5-9 cm	0
<b>Presence or absence of Regeneration<sup>#</sup></b> Maximum stem diameter of <5 cm regardless of height.	<5 cm	✓

Count of HBTs <sup>†</sup>
0
0

\*Living trees only; for **multi-stemmed trees**, only largest stem is counted or recorded as present;

<sup>#</sup>Record presence of regeneration for any tree with a maximum stem diameter of <5 cm, regardless of height (i.e., record presence of regeneration if sapling or seedlings that are <1.3 m high and have DBH <5 cm).

<sup>^</sup>Includes species classified as Trees under the BAM Growth Form Table.

<sup>†</sup>Count of **hollow-bearing trees** and **shrubs**; includes living and dead; record by stem size class.

Length of logs (m)	Tally	TOTAL LENGTH (m)
Fallen logs = >10 cm diameter, that is dead and entirely or partly on the ground within the 1,000 m <sup>2</sup> plot. Only the length of log within the plot is recorded.	0	0m

### 1 m<sup>2</sup> sub PLOT

Litter cover (%)					
Subplot	10	10	3	7	5
Average					

**Litter** includes leaves, seeds, twigs, branchlets and branches **less than 10 cm diameter**. Include all plant material that is detached from a plant and forms part of the litter layer on the ground surface. Litter cover is the two-dimensional litter layer in contact with the ground surface, including litter under the canopies of erect plants. Plant material that is not detached should be assessed as foliage cover, regardless of whether it appears alive or dead.

Quadrat Number: Q21      Date: 14/07/25      Recorder: O. Plunkett

Property Name or Project Name: Pitman Quarry BDR

- Both Start and End points collected on GPS
- Start and End locations are approximately 50 m apart on GPS

TOTAL SPECIES = 50

Date entered 16/7/25, DP

400 m plot (10x10m)

checked correct.

Site	Plot ID	Date	Recorders	GF					
GF	Top 3 natives in each GF: Full species name mandatory. All others where practicable			N	E	W	Cover %	Abund	voucher
1				✓			8	4	
2				✓			4	10	
3					✓		4	2000	
4						✓	2	3	
5					✓		2	500	
6				✓			0.1	3	
7				✓			0.1	3	
8					✓		2	1000	
9					✓		2	500	
10						✓	0.1	5	
11				✓			0.1	3	
12					✓		1	200	
13				✓			0.1	10	
14					✓		0.1	10	
15						✓	0.1	3	
16				✓			0.1	5	
17				✓			0.5	10	
18				✓			0.1	3	
19							0.1	3	
20				✓			0.1	5	
21				✓			0.1	3	
22				✓			0.1	5	✓
23							0.1	10	
24				✓			0.1	1	
25				✓			0.1	3	
26					✓		0.1	5	
27					✓		0.1	10	
28				✓			0.1	10	
29					✓		0.1	3	
30				✓			0.1	5	
31				✓			0.1	1	ph
32				✓			0.1	10	
33					✓		0.1	5	
34				✓			0.1	5	ph
35				✓			0.1	3	
36					✓		0.1	5	
37				✓			0.1	5	
38				✓			0.1	3	
39				✓			0.1	3	
40				✓			0.1	5	
41				✓			0.1	1	✓
42				✓			0.1	3	
43				✓			0.1	3	
44				✓			0.1	3	ph
45				✓			0.1	3	
46				✓			0.1	3	
47				✓			0.1	5	
48				✓			0.1	3	
49				✓			0.1	3	
50				✓			0.1	3	

### 1,000 m<sup>2</sup> PLOT

Tree Stem Size Class*		Trees <sup>^</sup>
<b>Count</b> of Large Trees Record DBH of each tree at 1.3 m from ground.	80+ cm	
	50+ cm	1
All other Trees: Only record <b>presence or absence</b> of trees in these stem size classes. Record DBH of each tree at 1.3 m from ground.	30-49 cm	✓
	20-29 cm	✓
	10-19 cm	
	5-9 cm	
<b>Presence or absence of Regeneration<sup>#</sup></b> Maximum stem diameter of <5 cm regardless of height.	<5 cm	✓

Count of HBTs <sup>†</sup>
0
1 (sapling)

\*Living trees only; for **multi-stemmed trees**, only largest stem is counted or recorded as present;  
<sup>#</sup>Record presence of regeneration for any tree with a maximum stem diameter of <5 cm, regardless of height (i.e., record presence of regeneration if sapling or seedlings that are <1.3 m high and have DBH <5 cm).  
<sup>^</sup>Includes species classified as Trees under the BAM Growth Form Table.

<sup>†</sup>Count of **hollow-bearing trees** and **shrubs**; includes living and dead; record by stem size class.

Length of logs (m) Fallen logs = >10 cm diameter, that is dead and entirely or partly on the ground within the 1,000 m <sup>2</sup> plot. Only the length of log within the plot is recorded.	Tally	TOTAL LENGTH (m)
	20 (pile)	20

### 1 m<sup>2</sup> sub PLOT

	Litter cover (%)				
Subplot	5	20	5	10	5
Average					

**Litter** includes leaves, seeds, twigs, branchlets and branches **less than 10 cm diameter**. Include all plant material that is detached from a plant and forms part of the litter layer on the ground surface. Litter cover is the two-dimensional litter layer in contact with the ground surface, including litter under the canopies of erect plants. Plant material that is not detached should be assessed as foliage cover, regardless of whether it appears alive or dead.

Quadrat Number: Q22      Date: 14-7-25      Recorder: GP  
 Property Name or Project Name: Pittman Quarry

- Both Start and End points collected on GPS
- Start and End locations are approximately 50 m apart on GPS

Cotula 46 species ✓  
 SB entered 11/7/25

400m <sup>2</sup> plot: Sheet of		Survey Name	Plot Identifier	Recorders			
Date	10/7/25	Pittman	Q23	S-BT RN			
GF	Top 3 natives in each GF: Full species name mandatory. All others where practicable	N	E	HTE	Cover %	Abund	voucher
1	<i>Lysimachia cunn.</i>				50	2000	✓
2	<i>Senecio madag.</i>				5	300	✓
3	<i>fuclis retusa</i>				0.1	25	✓
4	<i>Lantana cam.</i>				0.1	5	✓
5	<i>Tagetes minuta</i>				0.1	50	✓
6	<i>Solanum nigrum</i>				0.5	25	✓
7	<i>Evchiton sph.</i>				0.1	10	✓
8	<i>whalenbergia striata gracillis</i>				0.5	150	✓
9	<i>Trifolium repens</i>				1	250	✓
10	<i>Gnomochaeta coarctata</i>				0.5	60	✓
11	rye grass ?? (Ryecom): <i>Secale cereale</i>				10	1000	✓
12	<i>Microlaena stip.</i>				5	500	✓
13	<i>Geranium holbo.</i>				0.4	100	✓
14	<i>Hypochaeris glabra radocubra</i>				0.2	50	✓
15	<i>Conyza bon</i>				0.2	25	✓
16	<i>Silybum</i>				0.1	15	✓
17	<i>Solanum prinni</i>				0.1	10	✓
18	<i>modolia carolina</i>				0.5	150	✓
19	<i>Cerastium glomeratum</i>				0.2	50	✓
20	<i>Sonchus aspera</i>				0.1	20	✓
21	<i>Cyperus gracillis</i> sp. (gracillis)				1	500	✓
22	<i>Rumex blonnii</i>				0.1	5	✓
23	<i>Verbena rigid.</i>				0.1	2	✓
24	<i>Gnomo carpus fruticosa</i>				0.1	5	✓
25	<i>Bidens pilosa</i>				0.1	15	✓
26	<i>Richardra repens</i>				0.1	25	✓
27	<i>stellaria media</i>				0.1	10	✓
28	<del><i>Hypochaeris radi</i></del>				<del>0.1</del>	<del>5</del>	<del>✓</del>
29	<i>Cirsium vulgare</i>				0.1	5	✓
30	<i>lobelia purp.</i>				0.1	10	✓
31	<i>oxalis perneu</i>				0.1	10	✓
32	<i>Biza minor</i>				1	100	✓
33	<i>Centella asiatica</i>				0.1	25	✓
34	<del><i>Centella</i></del> Forb #1. ( <i>stellaria</i> sp?)				0.1	25	✓
35	<i>Centaurium erythraea</i>				0.1	25	✓
36	<i>Plantago lance.</i>				0.1	25	✓
37	<i>Olea europ.</i>				0.1	1	✓
38	<i>chilanties sib.</i>				0.1	25	✓
39	<i>sidesbechia orient.</i>				0.5	50	✓
40	<del><i>suavelona</i> (leaves to ring)</del>				<del>0.1</del>	<del>5</del>	<del>✓</del>
41	<i>plantago debilis</i>				0.1	10	✓
42	<i>Acacia longyfolia</i>				0.1	1	✓
43	<i>Laduca semicola</i>				0.5	100	✓
44	lobium - shiny grass (perene)				20	1000	✓
45	<i>lepidium didymum</i>				0.1	10	✓
46	<del>Forb #1. fine grass - for sp</del>				<del>0.1</del>	<del>5</del>	<del>✓</del>
47	<i>Soliva sessilis</i>				0.2	50	✓

GF Code: see growth form definitions in Appendix 1 N: native, E: exotic, HTE: high threat exotic GF - circle code of 'top 3'  
 Cover: 0.1, 0.2, 0.3..... 1, 2, 3 ..... 10, 15, 20, 25 ..... 100% (foliage cover): Note: 0.1% cover = 63 x 63 cm or a circle 71 cm across,  
 0.5% cover = 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10m. Abundance: 1, 2, 3...10, 20, 30...100, 200...1000...

Verbena bon. 0.1 5  
 Cotula aust. 0.1 25

# 1,000 m<sup>2</sup> PLOT

Quadrat Number: CR23

Date: 10/7/25

Recorder: RN + SB

Property Name or Project Name: Pittman Quarry BDR

Tree Stem Size Class*		Trees <sup>^</sup>
<b>Count of Large Trees</b> Record DBH of each tree at 1.3 m from ground.	80+ cm	
	50+ cm	
<b>All other Trees:</b> Only record <b>presence or absence</b> of trees in these stem size classes. Record DBH of each tree at 1.3 m from ground.	30-49 cm	
	20-29 cm	
	10-19 cm	
	5-9 cm	
<b>Presence or absence of Regeneration<sup>#</sup></b> Maximum stem diameter of <5 cm regardless of height.	<5 cm	

Count of HBTs <sup>†</sup>	Hollows >20cm? <sup>∞</sup>	Hollows >4m high? <sup>∞</sup>

\*Living trees only; for **multi-stemmed trees**, only largest stem is counted or recorded as present;

<sup>#</sup>Record presence of regeneration for any tree with a maximum stem diameter of <5 cm, regardless of height (i.e., record presence of regeneration if sapling or seedlings that are <1.3 m high and have DBH <5 cm).

<sup>^</sup>Includes species classified as Trees under the BAM Growth Form Table.

<sup>†</sup>Count of **hollow-bearing trees** and **shrubs**; includes living and dead; record by stem size class.

<sup>∞</sup>If present, collect GPS location and HBT details

Length of logs (m)	Tally	TOTAL LENGTH (m)
Fallen logs = >10 cm diameter, that is dead and entirely or partly on the ground within the 1,000 m <sup>2</sup> plot. Only the length of log within the plot is recorded.		

## 1 m<sup>2</sup> sub PLOT

	Litter cover (%)				
Subplot	2	1	4	10	5
Average					

**Litter** includes leaves, seeds, twigs, branchlets and branches **less than 10 cm diameter**. Include all plant material that is detached from a plant and forms part of the litter layer on the ground surface. Litter cover is the two-dimensional litter layer in contact with the ground surface, including litter under the canopies of erect plants. Plant material that is not detached should be assessed as foliage cover, regardless of whether it appears alive or dead.

Both Start and End points collected on GPS

Start and End locations are approximately 50 m apart on GPS

cont. 55 species. 11/7/25 ~~Ab.~~ S.B. entered.

400 III Plot (11/11/25)

Site	Pitman.	Plot ID	Q24.	Date	10/7/25	Recorders	S.B. + R.N.				
GF	Top 3 natives in each GF: Full species name mandatory. All others where practicable					N	E	HTW	Cover %	Abund	voucher
1	Ghania aspera								2.5	50	✓
2	Gomphocarpus <del>physocarpus</del> fruticosa								0.1	10	✓
3	Senecio madag.								0.2	50	✓
4	Lantana can.								0.2	5	✓
5	Conyza bon.								0.5	150	✓
6	Trifolium repens								0.5	150	✓
7	Verbena rigidol.								0.2	55	✓
8	Imperata cyl.								10	1000	✓
9	Cyperus gracillius sp.								<del>100</del> 1	500	✓
10	Lysmachia avensis								1	100	✓
11	Sidaesbechia orient.								0.1	25	✓
12	Cirsium vulgare								0.1	10	✓
13	Lobelia purp.								0.2	50	✓
14	Linum frig.								0.1	10	✓
15	Sonchus asper/asper								0.2	25	✓
16	Drosera auriculata								0.1	25	✓
17	Centella asiatica								0.2	<del>100</del> 50	✓
18	Chilantles sib.								0.2	50	✓
19	Facelis retusa								0.2	50	✓
20	Lomandra multiflora								0.5	20	✓
21	Whalenbergia stricta gracillius								0.2	25	✓
22	Haloragis heterophylla								<del>0.2</del> 0.1	5	✓
23	Bidens pillosa								0.2	50	✓
24	Breyeria oblong. (seedlings)								0.1	15	✓
25	Cytosperma leptophylla								0.2	100	✓
26	Dichondra repens								0.1	25	✓
27	Oplismenus aem.								0.1	10	✓
28	Dianella long.								0.1	3	✓
29	Lactuca serriola								0.5	100	✓
30	Carex appressa								0.1	2	✓
31	Euc. Crebra								2.5	1	✓
32	Plantago lance.								0.1	<del>2</del> 25	✓
33	Leucopogon juniper.								0.1	2	✓
34	Acacia longifolia								0.1	3	✓
35	Olea europ.								0.1	1	✓
36	Stachys viridica								0.1	10	✓
37	Bernardia dominii								0.1	10	✓
38	Pittosporum undulatum multiflorum								0.2	1	✓
39	Microlaena stip.								<del>1</del> 1	200	✓
40	Modiola carolina								0.2	100	✓
41	Sonchus olear.								0.1	50	✓
42	<del>Hypochaeris glabra</del> Hypo radicata								0.5	100	✓
43	Richardia hum.								0.1	10	✓
44	Geranium honoi								0.2	100	✓
45	Plantago debilis								0.1	10	✓
46	Euchiton sph.								0.1	20	✓
47	Solanum pruni								0.1	10	✓
48	Solanum nigrum								0.1	5	✓
49	Oxalis penen.								0.1	15	✓
50	Grey hairy forb ?? Lamodactylus-coarctata								0.1	25	✓

Site	Plot ID	Date	Recorders			Abund	voucher			
GF	Top 3 natives in each GF: Full species name mandatory. All others where practicable				N	E	HTW	Cover %	Abund	voucher
51	shiny green grass - <i>Lolium perenne</i>							15	1500	✓
52	<del>Prunus</del> <del>type</del> grass? <i>Secale cereale</i>							0.2	25	✓
53	<i>Lolium perenne</i>							0.1	5	✓
54										
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100										

# 1,000 m<sup>2</sup> PLOT

Quadrat Number: 024      Date: 10/7/25      Recorder: RV+SR  
 Property Name or Project Name: Pittman Quarry BDAR

Tree Stem Size Class*		Trees <sup>^</sup>
<b>Count</b> of Large Trees Record DBH of each tree at 1.3 m from ground.	80+ cm	—
	50+ cm	—
All other Trees: Only record <b>presence or absence</b> of trees in these stem size classes. Record DBH of each tree at 1.3 m from ground.	30-49 cm	—
	20-29 cm	✓
	10-19 cm	—
	5-9 cm	—
<b>Presence or absence of Regeneration<sup>#</sup></b> Maximum stem diameter of <5 cm regardless of height.	<5 cm	—

Count of HBTs <sup>†</sup>	Hollows >20cm? <sup>∞</sup>	Hollows >4m high? <sup>∞</sup>
/		

\*Living trees only; for **multi-stemmed trees**, only largest stem is counted or recorded as present;

<sup>#</sup>Record presence of regeneration for any tree with a maximum stem diameter of <5 cm, regardless of height (i.e., record presence of regeneration if sapling or seedlings that are <1.3 m high and have DBH <5 cm).

<sup>^</sup>Includes species classified as Trees under the BAM Growth Form Table.

<sup>†</sup>Count of **hollow-bearing trees** and **shrubs**; includes living and dead; record by stem size class.

<sup>∞</sup>If present, collect GPS location and HBT details

Length of logs (m) Fallen logs = >10 cm diameter, that is dead and entirely or partly on the ground within the 1,000 m <sup>2</sup> plot. Only the length of log within the plot is recorded.	Tally	TOTAL LENGTH (m)
	/	

## 1 m<sup>2</sup> sub PLOT

Litter cover (%)				
Subplot	5	1	5	20
Average				

**Litter** includes leaves, seeds, twigs, branchlets and branches **less than 10 cm diameter**. Include all plant material that is detached from a plant and forms part of the litter layer on the ground surface. Litter cover is the two-dimensional litter layer in contact with the ground surface, including litter under the canopies of erect plants. Plant material that is not detached should be assessed as foliage cover, regardless of whether it appears alive or dead.

- Both Start and End points collected on GPS
- Start and End locations are approximately 50 m apart on GPS

Site	Pittman Quarry BDAR	Plot ID	Q25	Date	10/9/25	Recorders	DP + GP				
GF	Top 3 natives in each GF. Full species name mandatory. All others where practicable					N	E	HTW	Cover %	Abund	voucher
1	<i>Senecio madagascariensis</i>								1	200	
2	<i>Lolium perenne</i>				- conf.				30	2000	
3	<i>Secale cereale</i>				- conf.				25	1500	
4	<i>Cyperus gracilis</i>								5	2000	
5	<i>Briza minor</i>				- conf.				2	500	✓
6	<i>Lysimachia arvensis</i>								2	500	
7	<i>Gomphocarpus fruticosus</i>								0.5	50	
8	<i>Acacia implexa</i>				- conf.				2	50	✓
9	<i>Cerastium glomeratum</i>								0.2	50	✓
10	<i>Cichorium intybus</i>				- conf.				1	250	
11	<i>Gahnia aspera</i>				- conf.				0.5	10	✓
12	<i>Congza bonariensis</i>								0.1	10	
13	<i>Plantago lanceolata</i>								0.2	50	
14	<i>Tagetes minuta</i>								0.1	10	
15	<i>Gnaphalium calvicaeps</i>								0.2	20	✓
16	<i>Facalis retusa</i>				- conf.				0.1	10	✓
17	<i>Persoonia linearis</i> (seedling)				- conf.				0.1	2	✓
18	<i>Panicum effusum</i>								0.5	20	
19	<i>Suchiton sphaericus</i>				- conf.				0.1	3	✓
20	<i>Cirsium vulgare</i> (seedling)								0.1	50	
21	<i>Trifolium repens</i>								0.5	100	
22	Forb 1. Succulent forb								0.1	50	✓+ph
23	<i>Oxalis perigrans</i>								0.1	10	
24	<i>Wahlenbergia gracilis</i>				- conf.				0.2	20	✓
25	<i>Trifolium subterraneum</i>								0.1	15	
26	<i>Cotula australis</i>				- conf.				0.1	10	✓
27	<i>Lantana camara</i>								0.2	5	
28	<i>Hackelia suaveolens</i>				- conf.				0.1	5	✓
29	<i>Solanum cinereum</i>								0.1	2	ph
30	<i>Glochidion ferdinandi</i>								0.2	1	
31	<i>Veronica plebeia</i>				- conf.				0.1	1	✓
32	<i>Breytia oblongifolia</i>								0.1	1	
33	<i>Dichondra repens</i>								0.1	2	
34	<i>Commelina cyanea</i>								0.1	5	
35	<i>Rubus parvifolius</i>				- conf.				0.2	10	✓
36	<i>Verbena rigida</i>								0.1	10	
37	<i>Solanum nigrum</i>								0.1	1	
38	<i>Eustrophys latifolius</i>								0.1	3	
39	Forb 2 (Pimelea-like forb)								0.1	10	✓
40	<i>Richardia stellaris</i>								0.1	1	
41	<i>Hypericum graniticum</i>								0.1	5	
42	<i>Sanctus ateraceus</i>								0.1	5	
43	<i>Lemnandra longifolia</i>								0.1	2	
44	<i>Romulea rosea</i>				- conf.				0.5	200	✓
45	<i>Lobelia purpurea</i>								0.1	10	
46	<i>Digitaria didactyla</i>								3	50	
47	<i>Axonopus fissifolius</i>								0.2	20	
48	<i>Sanctus asper</i>								0.1	1	ph
49	<i>Maekwaena chytidophyllum</i>								0.1	2	
50	<i>Bidens pilosa</i>								0.1	1	

## 1,000 m<sup>2</sup> PLOT

Tree Stem Size Class*		Trees <sup>^</sup>
<b>Count</b> of Large Trees Record DBH of each tree at 1.3 m from ground.	80+ cm	/
	50+ cm	
All other Trees: Only record <b>presence or absence</b> of trees in these stem size classes. Record DBH of each tree at 1.3 m from ground.	30-49 cm	
	20-29 cm	
	10-19 cm	
	5-9 cm	
<b>Presence or absence of Regeneration</b> <sup>#</sup> Maximum stem diameter of <5 cm regardless of height.	<5 cm	

Count of HBTs <sup>†</sup>
/

\*Living trees only; for **multi-stemmed trees**, only largest stem is counted or recorded as present;

<sup>#</sup>Record presence of regeneration for any tree with a maximum stem diameter of <5 cm, regardless of height (i.e., record presence of regeneration if sapling or seedlings that are <1.3 m high and have DBH <5 cm).

<sup>^</sup>Includes species classified as Trees under the BAM Growth Form Table.

<sup>†</sup>Count of **hollow-bearing trees** and **shrubs**; includes living and dead; record by stem size class.

Length of logs (m) Fallen logs = >10 cm diameter, that is dead and entirely or partly on the ground within the 1,000 m <sup>2</sup> plot. Only the length of log within the plot is recorded.	Tally	TOTAL LENGTH (m)
	///	3

## 1 m<sup>2</sup> sub PLOT

Litter cover (%)					
Subplot	5	8	5	2	15
Average					

**Litter** includes leaves, seeds, twigs, branchlets and branches **less than 10 cm diameter**. Include all plant material that is detached from a plant and forms part of the litter layer on the ground surface. Litter cover is the two-dimensional litter layer in contact with the ground surface, including litter under the canopies of erect plants. Plant material that is not detached should be assessed as foliage cover, regardless of whether it appears alive or dead.

Quadrat Number: 25

Date: 10/7/25

Recorder: GP DP

Property Name or Project Name: \_\_\_\_\_

- Both Start and End points collected on GPS
- Start and End locations are approximately 50 m apart on GPS

### 1,000 m<sup>2</sup> PLOT

Tree Stem Size Class*		Trees <sup>^</sup>
<b>Count</b> of Large Trees Record DBH of each tree at 1.3 m from ground.	80+ cm	0
	50+ cm	2
All other Trees: Only record <b>presence or absence</b> of trees in these stem size classes. Record DBH of each tree at 1.3 m from ground.	30-49 cm	✓
	20-29 cm	✓
	10-19 cm	✓
	5-9 cm	✓
<b>Presence or absence of Regeneration<sup>#</sup></b> Maximum stem diameter of <5 cm regardless of height.	<5 cm	✓

Count of HBTs <sup>†</sup>
0
0

\*Living trees only; for **multi-stemmed trees**, only largest stem is counted or recorded as present;

<sup>#</sup>Record presence of regeneration for any tree with a maximum stem diameter of <5 cm, regardless of height (i.e., record presence of regeneration if sapling or seedlings that are <1.3 m high and have DBH <5 cm).

<sup>^</sup>Includes species classified as Trees under the BAM Growth Form Table.

<sup>†</sup>Count of **hollow-bearing trees** and **shrubs**; includes living and dead; record by stem size class.

Length of logs (m)	Tally	TOTAL LENGTH (m)
Fallen logs = >10 cm diameter, that is dead and entirely or partly on the ground within the 1,000 m <sup>2</sup> plot. Only the length of log within the plot is recorded.	IIII IIII IIII IIII IIII IIII IIII IIII IIII IIII IIII IIII	58 m

### 1 m<sup>2</sup> sub PLOT

Litter cover (%)					
Subplot	90	70	50	70	95
Average					

**Litter** includes leaves, seeds, twigs, branchlets and branches **less than 10 cm diameter**. Include all plant material that is detached from a plant and forms part of the litter layer on the ground surface. Litter cover is the two-dimensional litter layer in contact with the ground surface, including litter under the canopies of erect plants. Plant material that is not detached should be assessed as foliage cover, regardless of whether it appears alive or dead.

Quadrat Number: Q26

Date: 14/07/25

Recorder: DP + GP

Property Name or Project Name: Pitman Quarry BDAR.

Both Start and End points collected on GPS

Start and End locations are approximately 50 m apart on GPS

Site	Plot ID	Date	Recorders	GF	DP				
GF	Top 3 natives in each GF: Full species name mandatory. All others where practicable			N	E	HTW	Cover %	Abund	voucher
1	Casuarina glauca	✓		30	8				
2	Angophora floribunda <del>striatata</del>	✓		10	2				
3	Native Holly = Akhornea ilicifolia	✓		1	5				
4	Hibiscus heterophyllus	✓		0.5	5				
5	Jasminum volubile	✓		4	10	✓			
6	Lantana camara		✓	40	100				
7	Breynia oblongifolia	✓		0.1	3				
8	Canthelina cyanea	✓		0.1	10				
9	Oplismenus aeneolus	✓		1	20				
10	Gahnia aspera	✓		0.1	3				
11	Microlaena stipoides	✓		0.1	20				
12	Carex longibractiata	✓		0.1	10				
13	Oxalis corniculata		✓	0.1	5	✓			
14	Caryocolla dematidea	✓		0.1	3				
15	Trema tomentosa	✓		0.1	3				
16	Abdrichion ferridandi	✓		0.1	3				
17	Olea europaea		✓	1	3				
18	Solanum praioophyllum?			0.1	3	✓			
19	Oplismenus <del>canadensis</del> imbecilis	✓		5	100				
20	Machua cochinchinensis	✓		3	1				
21	Modiola caroliniana <del>Barracoutus</del> <del>Polygonum</del> <del>indorum</del>	✓	✓	0.1	3	✓			
22	Dichondra repens	✓		0.1	20				
23	Melicope microlola	✓		0.1	3				
24									
25									
26									
27									
28	TOTAL = 23								
29	SPECIES								
30	Checked - correct ✓								
31									
32									
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49									
50									

400m <sup>2</sup> plot: Sheet of		Survey Name	Plot Identifier	Recorders				
Date	5/11/25	P. Linnam	Q27	SB + S.L.				
GF	Top 3 natives in each GF: Full species name mandatory. All others where practicable		N	E	HTE	Cover %	Abund	voucher
1	E. crebra					15	20	●
2								
3	Leuco. juniper					0.5	20	●
4	Breynea oblong	HT 11				0.2	20	●
5	African olive					40	50	●
6	Acacia <del>isortia</del> <del>impati</del> <del>HT</del> <del>HT</del>					20	15	●
7	Aphotina. exalta	HT 11				5	7	●
8	Piptosporum undulatum	11				0.5	3	●
9	Nyctelia variable	1				0.2	1	●
10	Denhamia s. west	11				0.1	2	●
11	Allochlidium fernai					0.2	1	●
12	Ficus. rubiginosa	1				0.1	1	●
13	Piospiras <del>portuguesa</del> <del>Aust.</del>					0.2	1	●
14	Daucus gloch					0.1	5	●
15	Bragrostis sp. ? (gamboge)					0.1	15	●
16	Oxalis pemonan					0.1	3	●
17	Plantago debilis					0.1	15	●
18	Eriogeron sumatrensis					0.1	10	●
19	Lobelia purp					0.1	25	●
20	Chilanthus sili					0.2	55	●
21	Whalanbergia grac.					0.1	5	●
22	<del>Roseodonta obtusa</del> Opercularia <del>depile.</del>					0.1	10	●
23	Euchiton ophaericus					0.1	10	●
24	Hypochaeris radicata					0.1	5	●
25	Brunomall					0.1	20	●
26	<del>Desmodium varians</del> Leptella asi.					0.1	20	●
27	Conoclinium tenuiflorum					0.1	10	●
28	Dasium s. sinuatifolium					0.1	2	●
29	Aestropterium cyan					0.1	5	●
30	<del>Palmaria gnari</del> Corona venius.					0.1	20	●
31	Chascolytrum subaristatum					0.1	20	●
32	Dichondra repens					0.1	50	●
33	Lysmachia arvensis					0.1	20	●
34	Lomandra myrtilloides					0.1	5	●
35	Theselia tridentata					5	200	●
36	Ghania appressa					15	50	●
37	Sorghum sp					15	1000	●
38	Dicheladene micrantha					15	1000	●
39	Microlaena stilo					2	100	●
40	Sanjuncus sp.					0.2	5	●
41	Dianella caerulea					0.1	10	●
42	Opilismenus aem.					5	500	●
43	Senecio naldy.					0.1	25	●
44	Sydesbeckia orient.					0.2	45	●
45	Lantana cam					15	45	●
46	Bidens pilosa					0.2	45	●
47	Cirsium vulgare					0.1	2	●

GF Code: see growth form definitions in Appendix 1 N: native, E: exotic, HTE: high threat exotic GF - circle code of 'top 3'  
 Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ..., 100% (foliage cover) Note: 0.1% cover = 63 x 63 cm or a circle 71 cm across,  
 0.5% cover = 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10m. Abundance: 1, 2, 3, ..., 10, 20, 30, ..., 100, 200, ..., 1000...

Verbena rigida 0.1 20  
 Gamochaeta pens ?? 0.1 25  
 Fae lid retusa 0.1 20



2 of 2

400 m<sup>2</sup> floristics Plot: Survey name Plot identifier Recorders  
 Date 5/11/25 Pittman 027 S.B + S.G.

GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	<sup>2</sup> Foliage cover	Abundance	Voucher
1	Blown grass <i>Lochnagrostis filiformis</i>		0.1	20	
2	<i>Thysanotus tuberosus</i>		0.1	5	
3	<i>Aristida vagans</i>		0.1	20	
4	<i>Trema toment.</i>		0.3	12	
5	Poa lab.		0.5	20	
6					
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Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.  
**GF Code:** see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed. **Voucher:** specimens collected for identification by a herbarium.  
<sup>2</sup> **Foliage cover:** 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m. Note the top 3 dominant native species within each GF group.  
**Abundance:** Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1,000, 2,000, 3,000 ... (as integer values).

# 1,000 m<sup>2</sup> PLOT

Tree Stem Size Class*		Trees <sup>^</sup>
<b>Count</b> of Large Trees Record DBH of each tree at 1.3 m from ground.	80+ cm	—
	50+ cm	—
All other Trees: Only record <b>presence or absence</b> of trees in these stem size classes. Record DBH of each tree at 1.3 m from ground.	30-49 cm	✓
	20-29 cm	✓
	10-19 cm	✓
	5-9 cm	✓
<b>Presence or absence of Regeneration<sup>#</sup></b> Maximum stem diameter of <5 cm regardless of height.	<5 cm	✓

Count of HBTs <sup>†</sup>
1 ((stag) > 3 hollows))

\*Living trees only; for **multi-stemmed trees**, only largest stem is counted or recorded as present;

<sup>#</sup>Record presence of regeneration for any tree with a maximum stem diameter of <5 cm, regardless of height (i.e., record presence of regeneration if sapling or seedlings that are <1.3 m high and have DBH <5 cm).

<sup>^</sup>Includes species classified as Trees under the BAM Growth Form Table.

<sup>†</sup>Count of **hollow-bearing trees** and **shrubs**; includes living and dead; record by stem size class.

Length of logs (m)	Tally	TOTAL LENGTH (m)
Fallen logs = >10 cm diameter, that is dead and entirely or partly on the ground within the 1,000 m <sup>2</sup> plot. Only the length of log within the plot is recorded.		14

# 1 m<sup>2</sup> sub PLOT

Subplot	Litter cover (%)				
	5	15	25	35	45
Average	95	95	60	75	90

**Litter** includes leaves, seeds, twigs, branchlets and branches **less than 10 cm diameter**. Include all plant material that is detached from a plant and forms part of the litter layer on the ground surface. Litter cover is the two-dimensional litter layer in contact with the ground surface, including litter under the canopies of erect plants. Plant material that is not detached should be assessed as foliage cover, regardless of whether it appears alive or dead.

Quadrat Number: 27      Date: 5-11-25      Recorder: SG+SB  
 Property Name or Project Name: Elderslie / pitman Quarry.

- Both Start and End points collected on GPS
- Start and End locations are approximately 50 m apart on GPS

# Appendix E: Credit reports

## Proposal Details

Assessment Id 00057135/BAAS19010/25/00057136	Proposal Name Pittman Quarry - final	BAM data last updated * 09/04/2026
Assessor Name David Martin	Report Created 06/05/2026	BAM Data version * Current classification (live - default) (94)
Assessor Number BAAS21021	Assessment Type Major Projects	BAM Case Status Finalised
Assessment Revision 13	BOS entry trigger	Date Finalised 06/05/2026

\* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

**Threatened species reliably predicted to utilise the site. No surveys are required for these species. Ecosystem credits apply to these species.**

Common Name	Scientific Name	Vegetation Types(s)
Australasian Bittern	<i>Botaurus poiciloptilus</i>	4073-Lower North Hinterland River Oak Forest
Black Bittern	<i>Ixobrychus flavicollis</i>	3244-Lower North Spotted Gum-Mahogany-Ironbark Sheltered Forest
Black-chinned Honeyeater (eastern subspecies)	<i>Melithreptus gularis gularis</i>	3244-Lower North Spotted Gum-Mahogany-Ironbark Sheltered Forest
		3315-Central Hunter Ironbark-Spotted Gum Forest
		4073-Lower North Hinterland River Oak Forest
Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>	3244-Lower North Spotted Gum-Mahogany-Ironbark Sheltered Forest
		3315-Central Hunter Ironbark-Spotted Gum Forest
		4073-Lower North Hinterland River Oak Forest
Brown Treecreeper (eastern subspecies)	<i>Climacteris picumnus victoriae</i>	3244-Lower North Spotted Gum-Mahogany-Ironbark Sheltered Forest
		3315-Central Hunter Ironbark-Spotted Gum Forest
		4073-Lower North Hinterland River Oak Forest
Diamond Firetail	<i>Stagonopleura guttata</i>	3244-Lower North Spotted Gum-Mahogany-Ironbark Sheltered Forest

## BAM Predicted Species Report

Diamond Firetail	Stagonopleura guttata	3315-Central Hunter Ironbark-Spotted Gum Forest
		4073-Lower North Hinterland River Oak Forest
Dusky Woodswallow	Artamus cyanopterus cyanopterus	3244-Lower North Spotted Gum-Mahogany-Ironbark Sheltered Forest
		3315-Central Hunter Ironbark-Spotted Gum Forest
		4073-Lower North Hinterland River Oak Forest
Eastern Chestnut Mouse	Pseudomys gracilicaudatus	3315-Central Hunter Ironbark-Spotted Gum Forest
		4073-Lower North Hinterland River Oak Forest
Eastern Coastal Free-tailed Bat	Micronomus norfolkensis	3244-Lower North Spotted Gum-Mahogany-Ironbark Sheltered Forest
		3315-Central Hunter Ironbark-Spotted Gum Forest
		4073-Lower North Hinterland River Oak Forest
Eastern False Pipistrelle	Falsistrellus tasmaniensis	3244-Lower North Spotted Gum-Mahogany-Ironbark Sheltered Forest
Flame Robin	Petroica phoenicea	3244-Lower North Spotted Gum-Mahogany-Ironbark Sheltered Forest
		4073-Lower North Hinterland River Oak Forest
Gang-gang Cockatoo	Callocephalon fimbriatum	3244-Lower North Spotted Gum-Mahogany-Ironbark Sheltered Forest
		3315-Central Hunter Ironbark-Spotted Gum Forest
		4073-Lower North Hinterland River Oak Forest
Golden-tipped Bat	Phoniscus papuensis	3244-Lower North Spotted Gum-Mahogany-Ironbark Sheltered Forest
		3315-Central Hunter Ironbark-Spotted Gum Forest
		4073-Lower North Hinterland River Oak Forest
Greater Broad-nosed Bat	Scoteanax rueppellii	3244-Lower North Spotted Gum-Mahogany-Ironbark Sheltered Forest
		3315-Central Hunter Ironbark-Spotted Gum Forest
Grey-crowned Babbler (eastern subspecies)	Pomatostomus temporalis temporalis	3244-Lower North Spotted Gum-Mahogany-Ironbark Sheltered Forest
		3315-Central Hunter Ironbark-Spotted Gum Forest
		4073-Lower North Hinterland River Oak Forest
Grey-headed Flying-fox	Pteropus poliocephalus	3244-Lower North Spotted Gum-Mahogany-Ironbark Sheltered Forest
		3315-Central Hunter Ironbark-Spotted Gum Forest
		4073-Lower North Hinterland River Oak Forest

## BAM Predicted Species Report

Large Bent-winged Bat	<i>Miniopterus orianae oceanensis</i>	3244-Lower North Spotted Gum-Mahogany-Ironbark Sheltered Forest
		3315-Central Hunter Ironbark-Spotted Gum Forest
Latham's Snipe	<i>Gallinago hardwickii</i>	3244-Lower North Spotted Gum-Mahogany-Ironbark Sheltered Forest
		3315-Central Hunter Ironbark-Spotted Gum Forest
		4073-Lower North Hinterland River Oak Forest
Little Bent-winged Bat	<i>Miniopterus australis</i>	3244-Lower North Spotted Gum-Mahogany-Ironbark Sheltered Forest
		3315-Central Hunter Ironbark-Spotted Gum Forest
Little Eagle	<i>Hieraaetus morphnoides</i>	3244-Lower North Spotted Gum-Mahogany-Ironbark Sheltered Forest
		3315-Central Hunter Ironbark-Spotted Gum Forest
		4073-Lower North Hinterland River Oak Forest
Little Lorikeet	<i>Parvipsitta pusilla</i>	3244-Lower North Spotted Gum-Mahogany-Ironbark Sheltered Forest
		3315-Central Hunter Ironbark-Spotted Gum Forest
		4073-Lower North Hinterland River Oak Forest
New Holland Mouse	<i>Pseudomys novaehollandiae</i>	3244-Lower North Spotted Gum-Mahogany-Ironbark Sheltered Forest
		3315-Central Hunter Ironbark-Spotted Gum Forest
Olive Whistler	<i>Pachycephala olivacea</i>	3244-Lower North Spotted Gum-Mahogany-Ironbark Sheltered Forest
Regent Honeyeater	<i>Anthochaera phrygia</i>	3244-Lower North Spotted Gum-Mahogany-Ironbark Sheltered Forest
		3315-Central Hunter Ironbark-Spotted Gum Forest
		4073-Lower North Hinterland River Oak Forest
Scarlet Robin	<i>Petroica boodang</i>	3244-Lower North Spotted Gum-Mahogany-Ironbark Sheltered Forest
		3315-Central Hunter Ironbark-Spotted Gum Forest
		4073-Lower North Hinterland River Oak Forest
South-eastern Glossy Black-Cockatoo	<i>Calyptorhynchus lathami lathami</i>	3244-Lower North Spotted Gum-Mahogany-Ironbark Sheltered Forest
		3315-Central Hunter Ironbark-Spotted Gum Forest
		4073-Lower North Hinterland River Oak Forest
South-eastern Hooded Robin	<i>Melanodryas cucullata cucullata</i>	3244-Lower North Spotted Gum-Mahogany-Ironbark Sheltered Forest

## BAM Predicted Species Report

Speckled Warbler	Pyrrholaemus sagittatus	3244-Lower North Spotted Gum-Mahogany-Ironbark Sheltered Forest
		3315-Central Hunter Ironbark-Spotted Gum Forest
		4073-Lower North Hinterland River Oak Forest
Spotted Harrier	Circus assimilis	3315-Central Hunter Ironbark-Spotted Gum Forest
		4073-Lower North Hinterland River Oak Forest
Spotted-tailed Quoll	Dasyurus maculatus	3244-Lower North Spotted Gum-Mahogany-Ironbark Sheltered Forest
		3315-Central Hunter Ironbark-Spotted Gum Forest
		4073-Lower North Hinterland River Oak Forest
Square-tailed Kite	Lophoictinia isura	3244-Lower North Spotted Gum-Mahogany-Ironbark Sheltered Forest
		3315-Central Hunter Ironbark-Spotted Gum Forest
		4073-Lower North Hinterland River Oak Forest
Swift Parrot	Lathamus discolor	3244-Lower North Spotted Gum-Mahogany-Ironbark Sheltered Forest
		3315-Central Hunter Ironbark-Spotted Gum Forest
		4073-Lower North Hinterland River Oak Forest
Varied Sittella	Daphoenositta chrysoptera	3244-Lower North Spotted Gum-Mahogany-Ironbark Sheltered Forest
		3315-Central Hunter Ironbark-Spotted Gum Forest
		4073-Lower North Hinterland River Oak Forest
White-bellied Sea-Eagle	Haliaeetus leucogaster	3244-Lower North Spotted Gum-Mahogany-Ironbark Sheltered Forest
		3315-Central Hunter Ironbark-Spotted Gum Forest
		4073-Lower North Hinterland River Oak Forest
White-throated Needletail	Hirundapus caudacutus	3244-Lower North Spotted Gum-Mahogany-Ironbark Sheltered Forest
		3315-Central Hunter Ironbark-Spotted Gum Forest
		4073-Lower North Hinterland River Oak Forest
Wompoo Fruit-Dove	Ptilinopus magnificus	3244-Lower North Spotted Gum-Mahogany-Ironbark Sheltered Forest
Yellow-bellied Glider	Petaurus australis	3244-Lower North Spotted Gum-Mahogany-Ironbark Sheltered Forest
Yellow-bellied Sheath-tail-bat	Saccolaimus flaviventris	3244-Lower North Spotted Gum-Mahogany-Ironbark Sheltered Forest
		3315-Central Hunter Ironbark-Spotted Gum Forest



# BAM Predicted Species Report

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## 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
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## Proposal Details

Assessment Id 00057135/BAAS19010/25/00057136	Proposal Name Pittman Quarry - final	BAM data last updated * 09/04/2026
Assessor Name David Martin	Report Created 06/05/2026	BAM Data version * Current classification (live - default) (94)
Assessor Number BAAS21021	Assessment Type Major Projects	BAM Case Status Finalised
Assessment Revision 13	BOS entry trigger	Date Finalised 06/05/2026

\* 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
<p><b><i>Acacia pendula - endangered population</i></b> Acacia pendula population in the Hunter catchment</p>	No (surveyed)	<input type="checkbox"/> Jan <input type="checkbox"/> Feb <input checked="" type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Sep <input type="checkbox"/> Oct <input type="checkbox"/> Nov <input type="checkbox"/> Dec <input type="checkbox"/> Survey month outside the specified months?
<p><b><i>Callistemon linearifolius</i></b> Netted Bottle Brush</p>	No (surveyed) *Survey months are outside of the months specified in Bionet.	<input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input checked="" type="checkbox"/> Sep <input checked="" type="checkbox"/> Oct <input type="checkbox"/> Nov <input type="checkbox"/> Dec <input checked="" type="checkbox"/> Survey month outside the specified months?
<p><b><i>Callocephalon fimbriatum</i></b> Gang-gang Cockatoo</p>	No (surveyed)	<input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Sep <input type="checkbox"/> Oct <input checked="" type="checkbox"/> Nov <input type="checkbox"/> Dec <input type="checkbox"/> Survey month outside the specified months?

## BAM Candidate Species Report

<p><b><i>Calyptorhynchus lathami lathami</i></b> South-eastern Glossy Black-Cockatoo</p>	<p>No (surveyed)</p>	<p> <input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr  <input type="checkbox"/> May <input checked="" type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug  <input type="checkbox"/> Sep <input type="checkbox"/> Oct <input type="checkbox"/> Nov <input type="checkbox"/> Dec         </p> <p><input type="checkbox"/> Survey month outside the specified months?</p>
<p><b><i>Cercartetus nanus</i></b> Eastern Pygmy-possum</p>	<p>No (surveyed)</p>	<p> <input type="checkbox"/> Jan <input type="checkbox"/> Feb <input checked="" type="checkbox"/> Mar <input type="checkbox"/> Apr  <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug  <input type="checkbox"/> Sep <input type="checkbox"/> Oct <input type="checkbox"/> Nov <input type="checkbox"/> Dec         </p> <p><input type="checkbox"/> Survey month outside the specified months?</p>
<p><b><i>Chalinolobus dwyeri</i></b> Large-eared Pied Bat</p>	<p>Yes (surveyed) *Survey months are outside of the months specified in Bionet.</p>	<p> <input type="checkbox"/> Jan <input type="checkbox"/> Feb <input checked="" type="checkbox"/> Mar <input type="checkbox"/> Apr  <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug  <input type="checkbox"/> Sep <input type="checkbox"/> Oct <input type="checkbox"/> Nov <input type="checkbox"/> Dec         </p> <p><input checked="" type="checkbox"/> Survey month outside the specified months?</p>
<p><b><i>Cymbidium canaliculatum - endangered population</i></b> Cymbidium canaliculatum population in the Hunter Catchment</p>	<p>No (surveyed)</p>	<p> <input type="checkbox"/> Jan <input type="checkbox"/> Feb <input checked="" type="checkbox"/> Mar <input type="checkbox"/> Apr  <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug  <input type="checkbox"/> Sep <input checked="" type="checkbox"/> Oct <input type="checkbox"/> Nov <input type="checkbox"/> Dec         </p> <p><input type="checkbox"/> Survey month outside the specified months?</p>
<p><b><i>Cynanchum elegans</i></b> White-flowered Wax Plant</p>	<p>No (surveyed)</p>	<p> <input type="checkbox"/> Jan <input type="checkbox"/> Feb <input checked="" type="checkbox"/> Mar <input type="checkbox"/> Apr  <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug  <input type="checkbox"/> Sep <input checked="" type="checkbox"/> Oct <input type="checkbox"/> Nov <input type="checkbox"/> Dec         </p> <p><input type="checkbox"/> Survey month outside the specified months?</p>
<p><b><i>Erythrorchis radiatus</i></b> Red Goshawk</p>	<p>No (surveyed)</p>	<p> <input type="checkbox"/> Jan <input type="checkbox"/> Feb <input checked="" type="checkbox"/> Mar <input type="checkbox"/> Apr  <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug  <input type="checkbox"/> Sep <input checked="" type="checkbox"/> Oct <input checked="" type="checkbox"/> Nov <input type="checkbox"/> Dec         </p> <p><input type="checkbox"/> Survey month outside the specified months?</p>

# BAM Candidate Species Report

<p><b><i>Eucalyptus camaldulensis</i> - endangered population</b> Eucalyptus camaldulensis population in the Hunter catchment</p>	No (surveyed)	<input type="checkbox"/> Jan <input type="checkbox"/> Feb <input checked="" type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Sep <input type="checkbox"/> Oct <input type="checkbox"/> Nov <input type="checkbox"/> Dec <input type="checkbox"/> Survey month outside the specified months?
<p><b><i>Eucalyptus glaucina</i></b> Slaty Red Gum</p>	No (surveyed)	<input type="checkbox"/> Jan <input type="checkbox"/> Feb <input checked="" type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Sep <input type="checkbox"/> Oct <input type="checkbox"/> Nov <input type="checkbox"/> Dec <input type="checkbox"/> Survey month outside the specified months?
<p><b><i>Eucalyptus largeana</i></b> Craven Grey Box</p>	No (surveyed)	<input type="checkbox"/> Jan <input type="checkbox"/> Feb <input checked="" type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Sep <input type="checkbox"/> Oct <input type="checkbox"/> Nov <input type="checkbox"/> Dec <input type="checkbox"/> Survey month outside the specified months?
<p><b><i>Grevillea parviflora subsp. parviflora</i></b> Small-flower Grevillea</p>	No (surveyed)	<input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Sep <input checked="" type="checkbox"/> Oct <input type="checkbox"/> Nov <input type="checkbox"/> Dec <input type="checkbox"/> Survey month outside the specified months?
<p><b><i>Hieraetetus morphnoides</i></b> Little Eagle</p>	No (surveyed) *Survey months are outside of the months specified in Bionet.	<input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Sep <input checked="" type="checkbox"/> Oct <input checked="" type="checkbox"/> Nov <input type="checkbox"/> Dec <input checked="" type="checkbox"/> Survey month outside the specified months?
<p><b><i>Litoria aurea</i></b> Green and Golden Bell Frog</p>	No (surveyed)	<input type="checkbox"/> Jan <input type="checkbox"/> Feb <input checked="" type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Sep <input type="checkbox"/> Oct <input type="checkbox"/> Nov <input type="checkbox"/> Dec <input type="checkbox"/> Survey month outside the specified months?

## BAM Candidate Species Report

<p><b><i>Lophoictinia isura</i></b> Square-tailed Kite</p>	<p>No (surveyed)</p>	<table border="1"> <tr> <td><input type="checkbox"/> Jan</td> <td><input type="checkbox"/> Feb</td> <td><input type="checkbox"/> Mar</td> <td><input type="checkbox"/> Apr</td> </tr> <tr> <td><input type="checkbox"/> May</td> <td><input type="checkbox"/> Jun</td> <td><input type="checkbox"/> Jul</td> <td><input type="checkbox"/> Aug</td> </tr> <tr> <td><input type="checkbox"/> Sep</td> <td><input checked="" type="checkbox"/> Oct</td> <td><input checked="" type="checkbox"/> Nov</td> <td><input type="checkbox"/> Dec</td> </tr> </table> <p><input type="checkbox"/> Survey month outside the specified months?</p>	<input type="checkbox"/> Jan	<input type="checkbox"/> Feb	<input type="checkbox"/> Mar	<input type="checkbox"/> Apr	<input type="checkbox"/> May	<input type="checkbox"/> Jun	<input type="checkbox"/> Jul	<input type="checkbox"/> Aug	<input type="checkbox"/> Sep	<input checked="" type="checkbox"/> Oct	<input checked="" type="checkbox"/> Nov	<input type="checkbox"/> Dec
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<p><b><i>Myotis macropus</i></b> Southern Myotis</p>	<p>Yes (surveyed)</p>	<table border="1"> <tr> <td><input type="checkbox"/> Jan</td> <td><input type="checkbox"/> Feb</td> <td><input checked="" type="checkbox"/> Mar</td> <td><input type="checkbox"/> Apr</td> </tr> <tr> <td><input type="checkbox"/> May</td> <td><input type="checkbox"/> Jun</td> <td><input type="checkbox"/> Jul</td> <td><input type="checkbox"/> Aug</td> </tr> <tr> <td><input type="checkbox"/> Sep</td> <td><input type="checkbox"/> Oct</td> <td><input type="checkbox"/> Nov</td> <td><input type="checkbox"/> Dec</td> </tr> </table> <p><input type="checkbox"/> Survey month outside the specified months?</p>	<input type="checkbox"/> Jan	<input type="checkbox"/> Feb	<input checked="" type="checkbox"/> Mar	<input type="checkbox"/> Apr	<input type="checkbox"/> May	<input type="checkbox"/> Jun	<input type="checkbox"/> Jul	<input type="checkbox"/> Aug	<input type="checkbox"/> Sep	<input type="checkbox"/> Oct	<input type="checkbox"/> Nov	<input type="checkbox"/> Dec
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<p><b><i>Ninox connivens</i></b> Barking Owl</p>	<p>No (surveyed)</p>	<table border="1"> <tr> <td><input type="checkbox"/> Jan</td> <td><input type="checkbox"/> Feb</td> <td><input type="checkbox"/> Mar</td> <td><input checked="" type="checkbox"/> Apr</td> </tr> <tr> <td><input checked="" type="checkbox"/> May</td> <td><input type="checkbox"/> Jun</td> <td><input type="checkbox"/> Jul</td> <td><input type="checkbox"/> Aug</td> </tr> <tr> <td><input type="checkbox"/> Sep</td> <td><input type="checkbox"/> Oct</td> <td><input type="checkbox"/> Nov</td> <td><input type="checkbox"/> Dec</td> </tr> </table> <p><input type="checkbox"/> Survey month outside the specified months?</p>	<input type="checkbox"/> Jan	<input type="checkbox"/> Feb	<input type="checkbox"/> Mar	<input checked="" type="checkbox"/> Apr	<input checked="" type="checkbox"/> May	<input type="checkbox"/> Jun	<input type="checkbox"/> Jul	<input type="checkbox"/> Aug	<input type="checkbox"/> Sep	<input type="checkbox"/> Oct	<input type="checkbox"/> Nov	<input type="checkbox"/> Dec
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<p><b><i>Ninox strenua</i></b> Powerful Owl</p>	<p>Yes (surveyed)</p>	<table border="1"> <tr> <td><input type="checkbox"/> Jan</td> <td><input type="checkbox"/> Feb</td> <td><input type="checkbox"/> Mar</td> <td><input checked="" type="checkbox"/> Apr</td> </tr> <tr> <td><input checked="" type="checkbox"/> May</td> <td><input type="checkbox"/> Jun</td> <td><input type="checkbox"/> Jul</td> <td><input type="checkbox"/> Aug</td> </tr> <tr> <td><input type="checkbox"/> Sep</td> <td><input type="checkbox"/> Oct</td> <td><input type="checkbox"/> Nov</td> <td><input type="checkbox"/> Dec</td> </tr> </table> <p><input type="checkbox"/> Survey month outside the specified months?</p>	<input type="checkbox"/> Jan	<input type="checkbox"/> Feb	<input type="checkbox"/> Mar	<input checked="" type="checkbox"/> Apr	<input checked="" type="checkbox"/> May	<input type="checkbox"/> Jun	<input type="checkbox"/> Jul	<input type="checkbox"/> Aug	<input type="checkbox"/> Sep	<input type="checkbox"/> Oct	<input type="checkbox"/> Nov	<input type="checkbox"/> Dec
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<p><b><i>Notamacropus parma</i></b> Parma Wallaby</p>	<p>No (surveyed)</p>	<table border="1"> <tr> <td><input type="checkbox"/> Jan</td> <td><input type="checkbox"/> Feb</td> <td><input checked="" type="checkbox"/> Mar</td> <td><input checked="" type="checkbox"/> Apr</td> </tr> <tr> <td><input checked="" type="checkbox"/> May</td> <td><input type="checkbox"/> Jun</td> <td><input type="checkbox"/> Jul</td> <td><input type="checkbox"/> Aug</td> </tr> <tr> <td><input type="checkbox"/> Sep</td> <td><input type="checkbox"/> Oct</td> <td><input type="checkbox"/> Nov</td> <td><input type="checkbox"/> Dec</td> </tr> </table> <p><input type="checkbox"/> Survey month outside the specified months?</p>	<input type="checkbox"/> Jan	<input type="checkbox"/> Feb	<input checked="" type="checkbox"/> Mar	<input checked="" type="checkbox"/> Apr	<input checked="" type="checkbox"/> May	<input type="checkbox"/> Jun	<input type="checkbox"/> Jul	<input type="checkbox"/> Aug	<input type="checkbox"/> Sep	<input type="checkbox"/> Oct	<input type="checkbox"/> Nov	<input type="checkbox"/> Dec
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<p><b><i>Petauroides volans</i></b> Southern Greater Glider</p>	<p>No (surveyed)</p>	<table border="1"> <tr> <td><input type="checkbox"/> Jan</td> <td><input type="checkbox"/> Feb</td> <td><input checked="" type="checkbox"/> Mar</td> <td><input checked="" type="checkbox"/> Apr</td> </tr> <tr> <td><input checked="" type="checkbox"/> May</td> <td><input type="checkbox"/> Jun</td> <td><input type="checkbox"/> Jul</td> <td><input type="checkbox"/> Aug</td> </tr> <tr> <td><input type="checkbox"/> Sep</td> <td><input type="checkbox"/> Oct</td> <td><input type="checkbox"/> Nov</td> <td><input type="checkbox"/> Dec</td> </tr> </table> <p><input type="checkbox"/> Survey month outside the specified months?</p>	<input type="checkbox"/> Jan	<input type="checkbox"/> Feb	<input checked="" type="checkbox"/> Mar	<input checked="" type="checkbox"/> Apr	<input checked="" type="checkbox"/> May	<input type="checkbox"/> Jun	<input type="checkbox"/> Jul	<input type="checkbox"/> Aug	<input type="checkbox"/> Sep	<input type="checkbox"/> Oct	<input type="checkbox"/> Nov	<input type="checkbox"/> Dec
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## BAM Candidate Species Report

<p><b><i>Petaurus norfolcensis</i></b> Squirrel Glider</p>	<p>Yes (surveyed)</p>	<table border="1"> <tr> <td><input type="checkbox"/> Jan</td> <td><input type="checkbox"/> Feb</td> <td><input type="checkbox"/> Mar</td> <td><input checked="" type="checkbox"/> Apr</td> </tr> <tr> <td><input type="checkbox"/> May</td> <td><input type="checkbox"/> Jun</td> <td><input type="checkbox"/> Jul</td> <td><input type="checkbox"/> Aug</td> </tr> <tr> <td><input type="checkbox"/> Sep</td> <td><input type="checkbox"/> Oct</td> <td><input type="checkbox"/> Nov</td> <td><input type="checkbox"/> Dec</td> </tr> </table> <p><input type="checkbox"/> Survey month outside the specified months?</p>	<input type="checkbox"/> Jan	<input type="checkbox"/> Feb	<input type="checkbox"/> Mar	<input checked="" type="checkbox"/> Apr	<input type="checkbox"/> May	<input type="checkbox"/> Jun	<input type="checkbox"/> Jul	<input type="checkbox"/> Aug	<input type="checkbox"/> Sep	<input type="checkbox"/> Oct	<input type="checkbox"/> Nov	<input type="checkbox"/> Dec
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<p><b><i>Phascogale tapoatafa</i></b> Brush-tailed Phascogale</p>	<p>Yes (surveyed)</p>	<table border="1"> <tr> <td><input type="checkbox"/> Jan</td> <td><input type="checkbox"/> Feb</td> <td><input type="checkbox"/> Mar</td> <td><input checked="" type="checkbox"/> Apr</td> </tr> <tr> <td><input type="checkbox"/> May</td> <td><input type="checkbox"/> Jun</td> <td><input type="checkbox"/> Jul</td> <td><input type="checkbox"/> Aug</td> </tr> <tr> <td><input type="checkbox"/> Sep</td> <td><input type="checkbox"/> Oct</td> <td><input type="checkbox"/> Nov</td> <td><input type="checkbox"/> Dec</td> </tr> </table> <p><input type="checkbox"/> Survey month outside the specified months?</p>	<input type="checkbox"/> Jan	<input type="checkbox"/> Feb	<input type="checkbox"/> Mar	<input checked="" type="checkbox"/> Apr	<input type="checkbox"/> May	<input type="checkbox"/> Jun	<input type="checkbox"/> Jul	<input type="checkbox"/> Aug	<input type="checkbox"/> Sep	<input type="checkbox"/> Oct	<input type="checkbox"/> Nov	<input type="checkbox"/> Dec
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<p><b><i>Phascolarctos cinereus</i></b> Koala</p>	<p>No (surveyed)</p>	<table border="1"> <tr> <td><input type="checkbox"/> Jan</td> <td><input type="checkbox"/> Feb</td> <td><input checked="" type="checkbox"/> Mar</td> <td><input checked="" type="checkbox"/> Apr</td> </tr> <tr> <td><input type="checkbox"/> May</td> <td><input type="checkbox"/> Jun</td> <td><input type="checkbox"/> Jul</td> <td><input type="checkbox"/> Aug</td> </tr> <tr> <td><input type="checkbox"/> Sep</td> <td><input type="checkbox"/> Oct</td> <td><input type="checkbox"/> Nov</td> <td><input type="checkbox"/> Dec</td> </tr> </table> <p><input type="checkbox"/> Survey month outside the specified months?</p>	<input type="checkbox"/> Jan	<input type="checkbox"/> Feb	<input checked="" type="checkbox"/> Mar	<input checked="" type="checkbox"/> Apr	<input type="checkbox"/> May	<input type="checkbox"/> Jun	<input type="checkbox"/> Jul	<input type="checkbox"/> Aug	<input type="checkbox"/> Sep	<input type="checkbox"/> Oct	<input type="checkbox"/> Nov	<input type="checkbox"/> Dec
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<p><b><i>Pterostylis chaetophora</i></b> Pterostylis chaetophora</p>	<p>No (surveyed)</p>	<table border="1"> <tr> <td><input type="checkbox"/> Jan</td> <td><input type="checkbox"/> Feb</td> <td><input type="checkbox"/> Mar</td> <td><input type="checkbox"/> Apr</td> </tr> <tr> <td><input type="checkbox"/> May</td> <td><input type="checkbox"/> Jun</td> <td><input type="checkbox"/> Jul</td> <td><input type="checkbox"/> Aug</td> </tr> <tr> <td><input type="checkbox"/> Sep</td> <td><input checked="" type="checkbox"/> Oct</td> <td><input type="checkbox"/> Nov</td> <td><input type="checkbox"/> Dec</td> </tr> </table> <p><input type="checkbox"/> Survey month outside the specified months?</p>	<input type="checkbox"/> Jan	<input type="checkbox"/> Feb	<input type="checkbox"/> Mar	<input type="checkbox"/> Apr	<input type="checkbox"/> May	<input type="checkbox"/> Jun	<input type="checkbox"/> Jul	<input type="checkbox"/> Aug	<input type="checkbox"/> Sep	<input checked="" type="checkbox"/> Oct	<input type="checkbox"/> Nov	<input type="checkbox"/> Dec
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<p><b><i>Rhodamnia rubescens</i></b> Scrub Turpentine</p>	<p>No (surveyed)</p>	<table border="1"> <tr> <td><input type="checkbox"/> Jan</td> <td><input type="checkbox"/> Feb</td> <td><input type="checkbox"/> Mar</td> <td><input type="checkbox"/> Apr</td> </tr> <tr> <td><input type="checkbox"/> May</td> <td><input type="checkbox"/> Jun</td> <td><input type="checkbox"/> Jul</td> <td><input type="checkbox"/> Aug</td> </tr> <tr> <td><input type="checkbox"/> Sep</td> <td><input checked="" type="checkbox"/> Oct</td> <td><input type="checkbox"/> Nov</td> <td><input type="checkbox"/> Dec</td> </tr> </table> <p><input type="checkbox"/> Survey month outside the specified months?</p>	<input type="checkbox"/> Jan	<input type="checkbox"/> Feb	<input type="checkbox"/> Mar	<input type="checkbox"/> Apr	<input type="checkbox"/> May	<input type="checkbox"/> Jun	<input type="checkbox"/> Jul	<input type="checkbox"/> Aug	<input type="checkbox"/> Sep	<input checked="" type="checkbox"/> Oct	<input type="checkbox"/> Nov	<input type="checkbox"/> Dec
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<p><b><i>Rhodomyrtus psidioides</i></b> Native Guava</p>	<p>No (surveyed)</p>	<table border="1"> <tr> <td><input type="checkbox"/> Jan</td> <td><input type="checkbox"/> Feb</td> <td><input type="checkbox"/> Mar</td> <td><input type="checkbox"/> Apr</td> </tr> <tr> <td><input type="checkbox"/> May</td> <td><input type="checkbox"/> Jun</td> <td><input type="checkbox"/> Jul</td> <td><input type="checkbox"/> Aug</td> </tr> <tr> <td><input type="checkbox"/> Sep</td> <td><input checked="" type="checkbox"/> Oct</td> <td><input type="checkbox"/> Nov</td> <td><input type="checkbox"/> Dec</td> </tr> </table> <p><input type="checkbox"/> Survey month outside the specified months?</p>	<input type="checkbox"/> Jan	<input type="checkbox"/> Feb	<input type="checkbox"/> Mar	<input type="checkbox"/> Apr	<input type="checkbox"/> May	<input type="checkbox"/> Jun	<input type="checkbox"/> Jul	<input type="checkbox"/> Aug	<input type="checkbox"/> Sep	<input checked="" type="checkbox"/> Oct	<input type="checkbox"/> Nov	<input type="checkbox"/> Dec
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## BAM Candidate Species Report

<p><b><i>Rutidosis heterogama</i></b> Heath Wrinklewort</p>	<p>No (surveyed)</p>	<table border="1"> <tr> <td><input type="checkbox"/> Jan</td> <td><input type="checkbox"/> Feb</td> <td><input type="checkbox"/> Mar</td> <td><input type="checkbox"/> Apr</td> </tr> <tr> <td><input type="checkbox"/> May</td> <td><input type="checkbox"/> Jun</td> <td><input type="checkbox"/> Jul</td> <td><input type="checkbox"/> Aug</td> </tr> <tr> <td><input type="checkbox"/> Sep</td> <td><input checked="" type="checkbox"/> Oct</td> <td><input type="checkbox"/> Nov</td> <td><input type="checkbox"/> Dec</td> </tr> </table> <p><input type="checkbox"/> Survey month outside the specified months?</p>	<input type="checkbox"/> Jan	<input type="checkbox"/> Feb	<input type="checkbox"/> Mar	<input type="checkbox"/> Apr	<input type="checkbox"/> May	<input type="checkbox"/> Jun	<input type="checkbox"/> Jul	<input type="checkbox"/> Aug	<input type="checkbox"/> Sep	<input checked="" type="checkbox"/> Oct	<input type="checkbox"/> Nov	<input type="checkbox"/> Dec
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<p><b><i>Tetradlea juncea</i></b> Black-eyed Susan</p>	<p>No (surveyed)</p>	<table border="1"> <tr> <td><input type="checkbox"/> Jan</td> <td><input type="checkbox"/> Feb</td> <td><input type="checkbox"/> Mar</td> <td><input type="checkbox"/> Apr</td> </tr> <tr> <td><input type="checkbox"/> May</td> <td><input type="checkbox"/> Jun</td> <td><input type="checkbox"/> Jul</td> <td><input type="checkbox"/> Aug</td> </tr> <tr> <td><input type="checkbox"/> Sep</td> <td><input checked="" type="checkbox"/> Oct</td> <td><input type="checkbox"/> Nov</td> <td><input type="checkbox"/> Dec</td> </tr> </table> <p><input type="checkbox"/> Survey month outside the specified months?</p>	<input type="checkbox"/> Jan	<input type="checkbox"/> Feb	<input type="checkbox"/> Mar	<input type="checkbox"/> Apr	<input type="checkbox"/> May	<input type="checkbox"/> Jun	<input type="checkbox"/> Jul	<input type="checkbox"/> Aug	<input type="checkbox"/> Sep	<input checked="" type="checkbox"/> Oct	<input type="checkbox"/> Nov	<input type="checkbox"/> Dec
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<p><b><i>Tyto novaehollandiae</i></b> Masked Owl</p>	<p>No (surveyed)</p>	<table border="1"> <tr> <td><input type="checkbox"/> Jan</td> <td><input type="checkbox"/> Feb</td> <td><input type="checkbox"/> Mar</td> <td><input checked="" type="checkbox"/> Apr</td> </tr> <tr> <td><input checked="" type="checkbox"/> May</td> <td><input type="checkbox"/> Jun</td> <td><input type="checkbox"/> Jul</td> <td><input type="checkbox"/> Aug</td> </tr> <tr> <td><input type="checkbox"/> Sep</td> <td><input type="checkbox"/> Oct</td> <td><input type="checkbox"/> Nov</td> <td><input type="checkbox"/> Dec</td> </tr> </table> <p><input type="checkbox"/> Survey month outside the specified months?</p>	<input type="checkbox"/> Jan	<input type="checkbox"/> Feb	<input type="checkbox"/> Mar	<input checked="" type="checkbox"/> Apr	<input checked="" type="checkbox"/> May	<input type="checkbox"/> Jun	<input type="checkbox"/> Jul	<input type="checkbox"/> Aug	<input type="checkbox"/> Sep	<input type="checkbox"/> Oct	<input type="checkbox"/> Nov	<input type="checkbox"/> Dec
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<p><b><i>Tyto tenebricosa</i></b> Sooty Owl</p>	<p>No (surveyed)</p>	<table border="1"> <tr> <td><input type="checkbox"/> Jan</td> <td><input type="checkbox"/> Feb</td> <td><input type="checkbox"/> Mar</td> <td><input checked="" type="checkbox"/> Apr</td> </tr> <tr> <td><input checked="" type="checkbox"/> May</td> <td><input type="checkbox"/> Jun</td> <td><input type="checkbox"/> Jul</td> <td><input type="checkbox"/> Aug</td> </tr> <tr> <td><input type="checkbox"/> Sep</td> <td><input type="checkbox"/> Oct</td> <td><input type="checkbox"/> Nov</td> <td><input type="checkbox"/> Dec</td> </tr> </table> <p><input type="checkbox"/> Survey month outside the specified months?</p>	<input type="checkbox"/> Jan	<input type="checkbox"/> Feb	<input type="checkbox"/> Mar	<input checked="" type="checkbox"/> Apr	<input checked="" type="checkbox"/> May	<input type="checkbox"/> Jun	<input type="checkbox"/> Jul	<input type="checkbox"/> Aug	<input type="checkbox"/> Sep	<input type="checkbox"/> Oct	<input type="checkbox"/> Nov	<input type="checkbox"/> Dec
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<p><b><i>Vespadelus troughtoni</i></b> Eastern Cave Bat</p>	<p>No (surveyed)</p>	<table border="1"> <tr> <td><input type="checkbox"/> Jan</td> <td><input type="checkbox"/> Feb</td> <td><input type="checkbox"/> Mar</td> <td><input type="checkbox"/> Apr</td> </tr> <tr> <td><input type="checkbox"/> May</td> <td><input type="checkbox"/> Jun</td> <td><input type="checkbox"/> Jul</td> <td><input type="checkbox"/> Aug</td> </tr> <tr> <td><input type="checkbox"/> Sep</td> <td><input type="checkbox"/> Oct</td> <td><input checked="" type="checkbox"/> Nov</td> <td><input type="checkbox"/> Dec</td> </tr> </table> <p><input type="checkbox"/> Survey month outside the specified months?</p>	<input type="checkbox"/> Jan	<input type="checkbox"/> Feb	<input type="checkbox"/> Mar	<input type="checkbox"/> Apr	<input type="checkbox"/> May	<input type="checkbox"/> Jun	<input type="checkbox"/> Jul	<input type="checkbox"/> Aug	<input type="checkbox"/> Sep	<input type="checkbox"/> Oct	<input checked="" type="checkbox"/> Nov	<input type="checkbox"/> Dec
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### Threatened species Manually Added

Common Name	Scientific Name
Eastern Cave Bat	<i>Vespadelus troughtoni</i>

### Threatened species assessed as not on site

Refer to BAR for detailed justification

## BAM Candidate Species Report

Common name	Scientific name	Justification in the BAM-C
Charmhaven Apple	<i>Angophora inopina</i>	Refer to BAR
Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	Habitat constraints
Hunter Valley Delma	<i>Delma vescolineata</i>	Habitat degraded Species is vagrant Geographic limitations
Large Bent-winged Bat	<i>Miniopterus orianae oceanensis</i>	Habitat constraints
Little Bent-winged Bat	<i>Miniopterus australis</i>	Habitat constraints
Red Helmet Orchid	<i>Corybas dowlingii</i>	Refer to BAR
Regent Honeyeater	<i>Anthochaera phrygia</i>	Habitat constraints
Swift Parrot	<i>Lathamus discolor</i>	Habitat constraints
White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>	Habitat constraints



# BAM Biodiversity Credit Report (Like for like)

## Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00057135/BAAS19010/25/00057136	Pittman Quarry - final	09/04/2026
Assessor Name	Assessor Number	BAM Data version *
David Martin	BAAS21021	Current classification (live - default) (94)
Proponent Names	Report Created	BAM Case Status
	06/05/2026	Finalised
Assessment Revision	BOS entry trigger	Assessment Type
13		Major Projects
Date Finalised		
06/05/2026		

\* 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
<b>Nil</b>		
Species		
<b>Chalinolobus dwyeri</b> / Large-eared Pied Bat		

## Additional Information for Approval

Assessment Id	Proposal Name
00057135/BAAS19010/25/00057136	Pittman Quarry - final

## BAM Biodiversity Credit Report (Like for like)

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
3244-Lower North Spotted Gum-Mahogany-Ironbark Sheltered Forest	Not a TEC	1.7	0	30	30
3315-Central Hunter Ironbark-Spotted Gum Forest	Central Hunter Ironbark-Spotted Gum-Grey Box Forest in the New South Wales North Coast and Sydney Basin Bioregions	39.6	974	0	974
3315-Central Hunter Ironbark-Spotted Gum Forest	Not a TEC	20.3	0	173	173
4073-Lower North Hinterland River Oak Forest	Not a TEC	0.0	0	1	1



## BAM Biodiversity Credit Report (Like for like)

<b>3244-Lower North Spotted Gum-Mahogany-Ironbark Sheltered Forest</b>	<b>Like-for-like credit retirement options</b>					
	Class	Trading group	Zone	HBT	Credits	IBRA region
	Northern Hinterland Wet Sclerophyll Forests This includes PCT's: 3063, 3069, 3094, 3115, 3144, 3152, 3155, 3167, 3170, 3179, 3230, 3231, 3232, 3233, 3234, 3235, 3236, 3237, 3238, 3239, 3240, 3241, 3242, 3243, 3244, 3245, 3246, 3247, 3248, 3249, 3250, 3251, 3252, 3253, 3254, 3255, 3256, 3257, 3258, 3259, 3260, 3261, 3262, 3263, 3264, 3285, 4109	Northern Hinterland Wet Sclerophyll Forests <50%	3244_VZ1_Forest	No	30	Upper Hunter, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
<b>3315-Central Hunter Ironbark-Spotted Gum Forest</b>	<b>Like-for-like credit retirement options</b>					
	Name of offset trading group	Trading group	Zone	HBT	Credits	IBRA region

## BAM Biodiversity Credit Report (Like for like)

	<p>Central Hunter Ironbark-Spotted Gum-Grey Box Forest in the New South Wales North Coast and Sydney Basin Bioregions This includes PCT's: 1604, 3315</p>	-	3315_VZ2_Forest	Yes	666	<p>Upper Hunter, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.</p>
	<p>Central Hunter Ironbark-Spotted Gum-Grey Box Forest in the New South Wales North Coast and Sydney Basin Bioregions This includes PCT's: 1604, 3315</p>	-	3315_VZ3_Managed	Yes	139	<p>Upper Hunter, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.</p>
	<p>Central Hunter Ironbark-Spotted Gum-Grey Box Forest in the New South Wales North Coast and Sydney Basin Bioregions This includes PCT's: 1604, 3315</p>	-	3315_VZ4_High Weed	Yes	169	<p>Upper Hunter, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.</p>



## BAM Biodiversity Credit Report (Like for like)

<b>3315-Central Hunter Ironbark-Spotted Gum Forest</b>	<b>Like-for-like credit retirement options</b>					
	Class	Trading group	Zone	HBT	Credits	IBRA region
	Coastal Valley Grassy Woodlands This includes PCT's: 618, 1603, 1604, 1691, 3312, 3314, 3315, 3318, 3319, 3320, 3323, 3325, 3327, 3328, 3329, 3330, 3332, 4052	Coastal Valley Grassy Woodlands >=70% and <90%	3315_VZ5_DN G	No	173	Upper Hunter, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
Coastal Valley Grassy Woodlands This includes PCT's: 618, 1603, 1604, 1691, 3312, 3314, 3315, 3318, 3319, 3320, 3323, 3325, 3327, 3328, 3329, 3330, 3332, 4052	Coastal Valley Grassy Woodlands >=70% and <90%	3315_VZ6_Exot icPasture	No	0	Upper Hunter, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.	
<b>4073-Lower North Hinterland River Oak Forest</b>	<b>Like-for-like credit retirement options</b>					
	Class	Trading group	Zone	HBT	Credits	IBRA region

## BAM Biodiversity Credit Report (Like for like)

	Eastern Riverine Forests This includes PCT's: 42, 85, 4070, 4073, 4075, 4077, 4081	Eastern Riverine Forests >=70% and <90%	4073_VZ7_Fore st	No	1 Upper Hunter, 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
<b>Chalinolobus dwyeri</b> / Large-eared Pied Bat	<b>3244_VZ1_Forest, 3315_VZ2_Forest, 3315_VZ3_Managed, 3315_VZ4_HighWeed</b>	41.3	1521.00
<b>Myotis macropus</b> / Southern Myotis	<b>3244_VZ1_Forest, 3315_VZ2_Forest, 3315_VZ3_Managed, 3315_VZ4_HighWeed</b>	24.6	594.00
<b>Ninox strenua</b> / Powerful Owl	<b>3315_VZ4_HighWeed</b>	7.0	169.00

## BAM Biodiversity Credit Report (Like for like)

<b>Petaurus norfolcensis</b> / Squirrel Glider	<b>3244_VZ1_Forest, 3315_VZ2_Forest, 3315_VZ3_Managed, 3315_VZ4_HighWeed, 4073_VZ7_Forest</b>	41.3	1014.00
<b>Phascogale tapoatafa</b> / Brush-tailed Phascogale	<b>3244_VZ1_Forest, 3315_VZ2_Forest, 3315_VZ3_Managed, 3315_VZ4_HighWeed, 4073_VZ7_Forest</b>	41.3	1014.00

### Credit Retirement Options

Like-for-like credit retirement options

<b>Chalinolobus dwyeri</b> / Large-eared Pied Bat	Spp	IBRA subregion
	<b>Chalinolobus dwyeri</b> / Large-eared Pied Bat	Any in NSW
<b>Myotis macropus</b> / Southern Myotis	Spp	IBRA subregion
	<b>Myotis macropus</b> / Southern Myotis	Any in NSW
<b>Ninox strenua</b> / Powerful Owl	Spp	IBRA subregion
	<b>Ninox strenua</b> / Powerful Owl	Any in NSW

## BAM Biodiversity Credit Report (Like for like)

<b>Petaurus norfolcensis</b> / Squirrel Glider	Spp	IBRA subregion
	<b>Petaurus norfolcensis</b> / Squirrel Glider	Any in NSW
<b>Phascogale tapoatafa</b> / Brush-tailed Phascogale	Spp	IBRA subregion
	<b>Phascogale tapoatafa</b> / Brush-tailed Phascogale	Any in NSW