Department of Planning and Environment

Preliminary Biodiversity Development Assessment Report

Planning proposal to rezone for residential development, Lot 2 DP 569505, 44 Middle Arm Road, Middle Arm

Prepared by Ms Rebecca Hogan, BAAS17090

Preliminary Report v1.2 – September 2024

Hayes Environmental reference: 22017

Document control

Version	Date	Author	Details
1	31/05/2023	R. Hogan	Final preliminary report for Planning Proposal.
1.2	05/09/2024	R. Hogan	Final preliminary report for Planning Proposal, with amendment to include additional field data in Appendix C. No changes made to the body of the report. BAM-C calculations not updated.

Summary

The subject property is identified as Lot 2 DP 569505, 44 Middle Arm Road, Middle Arm, NSW 2580. The subject land for this assessment is the entirety of the subject property. The subject land is 11.5 hectares.

The purpose of the planning proposal is to rezone the subject property for residential use. A proposed subdivision has been prepared to complement this proposal, which would create a potential 93 new residential lots varying in size from 709m^2 to 1,195m^2.

The land has historically been cleared for agriculture and is currently used for cattle grazing. Existing infrastructure includes a dwelling located on higher land in the east, with various sheds, tracks, fences, water tanks and irrigation lines. A shared private access from Middle Arm Road runs along the southern boundary of the land.

Small groups of remnant native trees occur in paddock areas in the eastern half of the property. A row of native trees has been planted along the existing access road. Grassland areas are almost entirely exotic

No part of the subject land is included on the Biodiversity Values Map. The BOS area of clearing threshold for the land is 0.5ha. The extent of impact on native vegetation would be 0.84 hectares. The project would exceed the area threshold.

Impacts of the project have been assessed using two of the streamlined assessment modules of the BAM:

* Remnant native trees - the project would remove 0.66ha of remnant native trees. The streamlined assessment module (small area) threshold for this site is 2.0ha. Impacts on remnant native trees have been assessed in accordance with Appendix C of the BAM.
* Planted native trees - it appears additional trees were planted for reason 5 of the decision-making key – aesthetic roadside planting. The impact on planted native trees has been assessed in accordance with D.2 of Appendix D of the BAM.

The property is subject to a variety of planning constraints. Biodiversity values are limited to the remnant and planted native trees scattered across the subject land. The distribution of trees and lack of supporting understorey does not practicably enable, nor warrant, retention of trees within a dedicated conservation reserve. The proposal, therefore, would set aside land for biodiversity conservation in areas which can more practicably be used for this purpose, given other site constraints and feasibility considerations.

A series of subdivision layouts have been prepared and considered during the planning and design phase of the project.

The final design offers the following to avoid and minimise impacts on biodiversity:

* Retention of native trees along the western part of the southern boundary (including retention of seven individuals of *Eucalyptus macarthurii*).

* Retention of native trees in private lots along the eastern boundary. Encumbered lots would have a restriction placed on title pertaining to the retention of specified trees.
* Retention of the group of native trees within a road reserve in the southeastern corner, with a private access formed through the trees. The access would be designed in consultation with an Arborist to minimise and mitigate impacts.
* Retention of native trees, where practicable, on boundaries within private lots. Encumbered lots would have a restriction placed on title pertaining to the retention of specified trees.
* Designation of revegetation zones for compensatory replanting (with a combined area of approximately 0.89ha).

Remnant native vegetation within the subject land has been assessed as aligning with the BioNet Vegetation Classification PCT 3376 *Southern Tableland Grassy Box Woodland*.

This community is part of the BC Act listed CEEC *White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions*. Remnant native vegetation within the subject land is considered to be part of this TEC. This TEC is listed to be at risk of Serious And Irreversible Impact (SAII).

PCT 3376 is also associated with the EPBC Act listed CEEC *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland.* However, vegetation within the subject land does not meet the specified condition criteria to be included within this listing.

Seventeen threatened 'ecosystem credit' fauna species are predicted to use the subject land.

No threatened 'species credit' species are known or assumed to use the subject land.

Paddy's River Box *Eucalyptus macarthurii* is a species credit species. However, it has been planted on the subject land for aesthetic reasons. It Is not part of the local PCT. Impacts upon planted vegetation on the subject land have been assessed in accordance with BAM Appendix D.2.

The development would directly impact upon 0.84 hectares of native vegetation, comprised of 0.66ha hectares of PCT 3376 remnant trees and 0.18 hectares of planted non-local native trees.

Proposed mitigation measures include:

* Implementation of a tree removal protocol to avoid injury to individual animals at the time of clearing.
* Revegetation of reserves within the subject land to include box-gum woodland species appropriate to the conditions and compatible with other uses of the reserves.
* Collection of propagules from planted individuals of Paddy's River Box *Eucalyptus macarthurii* within the subject land, for propagation and replanting within the subdivision, or in other conservation projects.

No additional offsets for indirect or prescribed impacts are proposed or warranted.

Table E1 Impacts that require an offset – ecosystem credits

Vegetation zone	PCT	TEC/EC	Impact area (ha)	Number of ecosystem credits required
PCT 3376 (remnant trees)	*Southern Tableland Grassy Box Woodland*	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions.	0.66 ha	10

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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
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
NSW	New South Wales
PCT	plant community type
SAII	serious and irreversible impact
TBDC	Threatened Biodiversity Data Collection
TEC	threatened ecological community

Terms used in this BDAR

Assessment Area	941 ha	The subject land and land within a 1500m buffer measured from the outside edge of the subject land.
Subject Property	11.8 ha	Lot 2 DP 569505, 44 Middle Arm Road, Middle Arm NSW 2580
Subject Land	11.8 ha	Land that would be affected directly or indirectly by the proposed masterplan, considered to be the entirety of the subject property for this assessment.

Declarations

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

This BDAR is a preliminary document prepared for the purpose of a Planning Proposal. The credit assessment has not been finalised or submitted within BOAMS.

I certify that this report has otherwise 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:

Rebecca Hogan

Date: 31st May 2023

BAM Assessor Accreditation no: BAAS17090

This BDAR has been prepared to meet the requirements of BAM 2020 streamlined assessment module (small area). 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

Authors and contributors

Name	BAM Assessor Accreditation no. (if relevant)	Position/Role	Tasks performed	Relevant qualifications & experience
Ms Rebecca Hogan	BAAS17090	Accredited Assessor Lead Ecologist Principal, Hayes Environmental	Project management; BDAR preparation & certification; BAM-C assessment; GIS work & figure preparation; BAM plot surveys (function attributes); Identification of Plant Community Type/s; Fauna habitat evaluation: Threatened bird surveys.	BSc (environmental biology), UTS Sydney, 1996 MEngMngt, UTS Sydney, 2000 Executive member of the Ecological Consultants Association of NSW. 26 years of ecological consulting experience in the Sydney and greater Sydney region.
Mr Daniel Clark	n/a	Project Botanist	BAM plot surveys (composition & structure attributes); Review and assistance with identification of plant community type/s; Targeted threatened plant surveys.	BSc (Hons) (Botany), University of Sydney, 2010 Cert. IV in General Horticulture, 2005 Cert. II in Bushland Regeneration, 2000 Cert. IV in Workplace Training and Assessment, 2011 Grad. Plant Science Internship, National Herbarium of NSW, Royal Botanic Gardens, 2009 Practicing member of the Ecological Consultants Association of NSW. 22 years of field botanist experience in the Sydney and greater Sydney region.

Name	BAM Assessor Accreditation no. (if relevant)	Position/Role	Tasks performed	Relevant qualifications & experience
Mr Deryk Engel	n/a	Project Fauna Surveyor Principal, Lesryk Environmental	Targeted surveys for threatened fauna	BEnvSc (Hons), University of Wollongong, 1990. Practicing member of the Ecological Consultants Association of NSW. Over 30 years of fauna field survey experience across a wide variety of landscapes throughout NSW.
Harry Engel	n/a	Fauna surveyor	Targeted surveys for threatened fauna	BMarSc 8 years of experience carrying out fauna field surveys and biodiversity project management, based in Sydney

iii. Conflict of interest

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

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

Signature:

Rebecca Hogan

Date: 31st May 2023

BAM Assessor Accreditation no: BAAS17090

Stage 1: Biodiversity assessment

1. Introduction

1.1 Proposed development

1.1.1 Development overview

The purpose of the planning proposal is to rezone the subject property for residential use. A proposed subdivision has been prepared to complement this proposal, which would create a potential 93 new residential lots varying in size from 709m^2 to 1,195m^2

The project would be a development that requires consent under Part 4 of the EP&A Act.

1.1.2 Location

The subject property is identified as Lot 2 DP 569505, 44 Middle Arm Road, Middle Arm, NSW 2580. It is located on the northern outskirts of Goulburn approximately 4.5km from the town centre, within the Goulburn Mulwaree Local Government Area.

The subject land for this assessment (being land that would be affected either directly or indirectly by the development) is the entire subject property.

Refer to Figure 1 (Site map) and Figure 2 (Location map).

1.1.3 Proposed development and the subject land

The subject land is 11.8 hectares in size and is zoned RU6 Transition under Goulburn Mulwaree LEP 2009, with a minimum lot size of 20 hectares.

The land is fairly level and sits within a broad plain drained by ephemeral tributaries to Kenmore Creek. The land contains two moderate-sized farm dams.

The land has historically been cleared for agriculture and is currently used for cattle grazing. Existing infrastructure includes a dwelling located on higher land in the east, with various sheds, tracks, fences, water tanks and irrigation lines. A shared private access from Middle Arm Road runs along the southern boundary of the land.

Small groups of remnant native trees occur in paddock areas in the eastern half of the property. A row of native trees has been planted along the existing access road. Grassland areas are almost entirely exotic.

A conceptual lot layout has been prepared that reflects the site's opportunities and constraints in the areas of biodiversity, bushfire management, traffic planning, Aboriginal heritage, biophysical strategic agricultural lands, and stormwater and wastewater management.

Open space areas would be created for the purpose of compensatory planting for biodiversity, for the existing high pressure gas line easement, and for stormwater management.

Refer to Figure 3 (Native vegetation and habitats) and Figure 4 (Subdivision layout).

1.1.4 Other documentation

Documents referred to and relied upon in this assessment include:

* *Proposed subdivision layout & road design detail (Ref 0050722-03A)*, prepared by SOWDES, 26 April 2023.
* *Stormwater drainage & water management site plan (Ref 0050722-04A)*, prepared by SOWDES, 26 April 2023;
* *Sewer drainage & reticulated water supply site plan (Ref 0050722-05A*, prepared by SOWDES, 26 April 2023;
* *Strategic bush fire study - hazard assessment site plan*, prepared by SOWDES, April 2023;

1.2 Biodiversity Offsets Scheme entry

No part of the subject land is included on the Biodiversity Values Map. The project would not exceed the map threshold.

The minimum lot size of the subject land is 20 hectares. The area of clearing threshold for this land is 0.5ha. The extent of impact on native vegetation would be 0.89 hectares. The project would exceed the area threshold.

The Biodiversity Offset Scheme (BOS), therefore, applies to the project. The project must be assessed using the Biodiversity Assessment Method 2020 (BAM).

Impacts of the project have been assessed using two of the streamlined assessment modules of the BAM:

* Remnant native trees - the project would remove 0.66ha of remnant native trees. The streamlined assessment module (small area) threshold for this site is 2.0ha. Impacts on remnant native trees have been assessed in accordance with Appendix C of the BAM.
* Planted native trees – the project would remove a row of native trees planted along the existing private access road. The trees are not locally indigenous species and are not planted amongst remnant native vegetation. There is no evidence to suggest the trees were planted as part of an environmental rehabilitation program, either obligated or voluntary. It appears the trees were planted for reason 5 of the decision-making key – aesthetic roadside planting. The impact on planted native trees has been assessed in accordance with D.2 of Appendix D of the BAM.

1.3 Excluded impacts

There are no biodiversity values not assessed under BAM 2020 (listed in s1.5 of BAM 2020) of relevance to the subject land. No areas of LLS Act Category 1 – exempt land have been identified within the subject land.

1.4 Matters of national environmental significance

Remnant native vegetation within the subject land is a plant community type associated with the critically endangered *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland* listed under the EPBC Act. However, none of the vegetation zones within the subject land meet the minimum condition criteria to be included within the EPBC Act listing.

One of the planted tree species on the subject land, Paddys River Box *Eucalyptus macarthurii*, is listed as endangered under the EPBC Act. The project would result in removal of up to thirty-four individuals of this species.

Six of the threatened fauna species predicted (ecosystem credit species) to occur are listed as threatened under the Commonwealth EPBC Act. These six species are mobile and wide-ranging and do not reside or breed within the subject land.

Impacts of the project on matters of national environmental significance (MNES) have been considered and assessed in accordance with the BAM.

Refer to Appendix B (Matters of national environmental significance - MNES) for a summary of details provided throughout the BDAR.

1.5 Information sources

Relevant legislation and policies for this report include:

* Commonwealth Environment Protection & Biodiversity Conservation Act 1999 (EPBC Act);
* Amending Agreement No. 1 – Amending the Original Agreement relating to environmental assessment. Commonwealth of Australia and the State of New South Wales. 2020;
* NSW Biodiversity Conservation Act 2016 (BC Act);
* NSW Biodiversity Conservation Regulation 2017 (BC Reg);
* NSW Biodiversity Assessment Method Order 2020 (BAM);
* Goulburn Mulwaree Local Environmental Plan 2009 (GMLEP).

Relevant guidelines for this report include:

* *Biodiversity Assessment Method Operational Manual – Stage 1*. State of NSW and Department of Planning, Industry & Environment (2020).

- *Biodiversity Assessment Method Operational Manual – Stage 2*. State of NSW and Department of Planning, Industry & Environment (2019).
- *Biodiversity Assessment Method operation manual – Streamlined assessment module*, *planted native vegetation.* Department of Planning and Environment (2022).
- *NSW Survey Guide for Threatened Frogs.* Department of Planning, Industry & Environment (2020).
- *Biodiversity Assessment Method Survey Guide – Koala (Phascolarctos cinereus).* NSW Department of Planning and Environment (2022).
- *Threatened reptiles, Biodiversity Assessment Method survey guide*. Department of Planning and Environment (2022).
- *NSW survey guide – 'Species credit' threatened bats and their habitats* (2018).
- *Surveying threatened plants and their habitats*. NSW survey guide for the Biodiversity Assessment Method (2020). Department of Planning, Industry & Environment (2020).
- *Flora species with specific survey requirements*. NSW Office of Environment & Heritage.
- *Guide for mapping threatened species for inclusion in the NSW regulatory framework*. Department of Planning, Industry & Environment (2020).
- *Threatened biodiversity survey and assessment: Guidelines for developments and activities*. NSW Department of Environment and Conservation (2004, in draft).

Data sources researched include:

- NSW Bionet (www.bionet.nsw.gov.au): Vegetation Classification tool, Threatened Biodiversity Data Collection (TBDC), and Atlas records.
- Threatened biodiversity profiles. NSW Office of Environment & Heritage.
- *A Directory of Important Wetlands in Australia*, Third Edition, Environment Australia (2001). http://www.environment.gov.au/water/wetlands/publications/directory-important-wetlands-australia-third-edition.
- SEED | Sharing and Enabling Environmental Data (www.seed.nsw.gov.au): NSW Interim Biogeographic Regions of Australia (IBRA) regions and subregions, NSW Mitchell Landscapes (version 3.1), State Vegetation Type Map – SVTM_NSW_Extant_PCT, State Vegetation Type Map – SVTM_NSW_1750_PCT.
- Aerial photography of the site: Department of Lands SIX Viewer, Google Maps ©2023 and Nearmap (various dates up to 28th January 2023).

2. Methods

2.1 Site context methods

2.1.1 Landscape features

A general inspection of the subject property and surrounding lands was undertaken by Ms Rebecca Hogan on the 15th November 2022. Site features were compared in the field to high resolution aerial images of the land (Nearmap, various dates up to 28/01/2023).

2.1.2 Native vegetation cover

The northern two-thirds of the assessment area (1500m buffer around the subject land) is characterised by predominantly cleared agricultural land. The southern third is predominantly residential. Calculation of native woodland and forest cover in the assessment area was obtained through interpretation of aerial images (Nearmap, various dates up to 28/01/2023) and Ms Rebecca Hogan's knowledge of the local area.

For grassland areas, it is not possible to determine the percent cover of native plants without intensive field survey beyond the feasible scope of this assessment. Grassland in the local area typically occupies land that was once woodland or forest but has historically been cleared and managed for grazing. Different land management practices have resulted in some properties containing paddocks with a high proportion (15-70%) of native grasses, and other properties containing paddocks that are almost entirely (0-15%) composed of exotic grasses.

The Plant Community Types (PCTs) relevant to the subject land are all of a woodland or forest formation. Predicted pre-European PCT mapping (SEED – SVTM_NSW_1750_PCT) indicates the whole of the subject land would once have supported woodland or forest. There are no natural grassland PCTs that would be impacted by the project and as such, require an estimate of native grassland cover to apply threatened species filters.

2.2 Native vegetation, threatened ecological communities and vegetation integrity methods

2.2.1 Existing information

2.2.1.1 Existing regional vegetation maps

Remnant trees within the subject land are shown on the most recent regional vegetation map as PCT 3376 *Southern Tableland Grassy Box Woodland* (SEED: SVTM_NSW_Extant_PCT). Planted trees along the access road are not included in the mapping.

Vegetation across the subject land prior to European settlement (SEED: SVTM_NSW_1750_PCT) is predicted to have been PCT 3376 across the southern and central areas, with areas of PCT 3373 *Goulburn Tableland Box-Gum Grassy Forest* in the northwest.

Earlier mapping of the region (SEED: SouthCoast_SCIVI_V14_E_2230) shows an area of *Tableland Grassy Box-Gum Woodland* (p24) on the eastern fringe of the subject land. This community was the profile source for PCT 1330 *Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion*, which in turn is a parent PCT for both PCTs 3373 and 3376.

A review was undertaken of the scientific descriptions for these communities within the BioNet Vegetation Classification database.

2.2.1.2 Threatened Ecological Communities potentially relevant to the subject land

PCTs 3373 and 3376 are both associated with:

* *White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions* listed as 'critically endangered' under the BC Act; and
* *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland* listed as 'critically endangered' under the EPBC Act.

2.2.2 Mapping native vegetation extent

Mapping of native vegetation extent and of vegetation zones within the subject land was based on:

* site inspections by Ms Rebecca Hogan on the 15th November 2022, and by Mr Daniel Clarke on the 18th October 2022;
* consideration of high resolution Nearmap aerial images spanning several years and seasons (in regard to extent of the woodland formations);
* consideration of historical aerial images from 1987 and 1997 to provide background context to the current pattern of trees on the land;
* random meanders and twenty-six botanical spot surveys conducted by Mr Daniel Clark on the 18th October 2022 (including calculation of the percent cover of native plants in the groundlayer and consideration of the reliability of the calculation based on species present and the season); and
* verification of percent cover of native plants by Mr Daniel Clarke during and following the BAM-VIS plot survey on the 29th March 2023.
* Inspection and identification of each individual tree planted along the private access road by Mr Daniel Clarke on the 29th March 2023.

Refer to Appendix C (Vegetation survey data) and Figure 5 (Field survey locations).

2.2.3 Plot-based vegetation survey

One BAM-VIS plot survey was undertaken within the subject property by Ms Rebecca Hogan and Mr Daniel Clark on the 29th March 2023.

The number of plots surveyed was in accordance with requirements set out in Table 3 of BAM 2020 Ch4.3.4. The plot location was selected using a random point generator within the remnant native vegetation polygons, which was then adjusted due to site and zone constraints, and the direction selected to ensure the plot remained within the zone and was representative of the zone.

A walked inspection was conducted of each of the other stands of remnant native vegetation present within the subject land immediately following the plot survey, to visually assess the attributes of the stands and confirm that the single plot was sufficient to capture representative data for the zone.

The method uses a 20m x 20m plot to assess composition and structure, within a 20m x 50m plot to assess function attributes, with five $1m^2$ sub-plots to assess litter cover, as set out in BAM 2020. Plot data was collected in accordance with BAM 2020 and is provided in Appendix C (Vegetation survey data).

Refer to Figure 5 (Field survey locations).

2.2.4 Vegetation integrity survey

Vegetation integrity scores were calculated using data obtained from the plot-based survey described in Ch 2.2.3 above and formulae embedded in the BAM-Calculator. The calculation used standard condition benchmarks within the BAM-Calculator (as at 31st May 2023).

2.3 Threatened flora survey methods

2.3.1 Review of existing information

The BAM-Calculator (Part 4 Developments – Small Area) was used to generate a list of relevant threatened species on the basis of IBRA subregion (Monaro SEH16), native vegetation cover class in the assessment area (0-10%), patch size class (25-100ha) and PCTs present.

A review was undertaken of habitat and constraints information held in the TBDC in relation to the list of relevant species, and geographic and habitat constraints set out in the BAM-Calculator.

A search was also undertaken within the BioNet Atlas (sightings) database for records of all threatened species on and in the vicinity of the subject land.

2.3.2 Habitat constraints assessment

Site inspections were conducted on foot by Ms Rebecca Hogan on the 15th November 2022, and by Mr Daniel Clarke on the 18th October 2022.

On all occasions, a primary purpose of the inspection was to identify habitat constraints and microhabitats of potential value for relevant threatened species.

2.3.3 Field surveys

No targeted surveys for candidate threatened plant species are required for this assessment.

2.4 Threatened fauna survey methods

2.4.1 Review of existing information

The BAM-Calculator (Part 4 Developments – Small Area) was used to generate a list of relevant threatened species on the basis of IBRA subregion (Monaro SEH16), native vegetation cover class in the assessment area (0-10%), patch size class (25-100ha) and PCTs present.

A review was undertaken of habitat and constraints information held in the TBDC in relation to the list of relevant species, and geographic and habitat constraints set out in the BAM-Calculator.

A search was also undertaken within the BioNet Atlas (sightings) database for records of all threatened species on and in the vicinity of the subject land (with a final check on the 31st May 2023).

2.4.2 Habitat constraints assessment

Site inspections were conducted on foot by Ms Rebecca Hogan on the 15th November 2022, and by Mr Deryk Engel on the 17th August 2022.

On all occasions, a primary purpose of the inspection was to identify habitat constraints and microhabitats of potential value for relevant threatened species.

The habitat assessment included consideration of vegetation structure and diversity, identification of hollow-bearing trees (noting presence of medium and large hollows), and identification of other specific elements such as caves and rock habitat, watercourses and dams, presence of *Allocasuarina* species, mistletoes, termite mounds, quantity and size of fallen timber and logs, burrows etc.

2.4.3 Field surveys

No targeted surveys for candidate threatened fauna species are required for this assessment.

However, due to uncertainty during the course of project planning, some targeted fauna surveys were conducted, as set out in Table 1.

Opportunistic records of fauna were collected during all site activities, including records of indirect evidence found, such as tracks, scats, scratchings and diggings.

Refer to Figure 5 (Field survey locations). Refer to Appendix D (Fauna survey data) for a list of species recorded.

Table 1 Summary of dedicated threatened fauna survey methods and effort

Survey Method	Cumulative survey effort
Dedicated bird surveys – winter breeding raptors and parrots (17 August 2022): Point count method (DEC 2004). Two 20-minute surveys conducted in areas of suitable habitat, such as near hollow-bearing trees and previous records of stick nests.	40 person-minutes
Dedicated bird surveys – spring (15 November 2022): Area search method (DEC 2004). Focussed on the treed areas within the subject land (0.91ha), including at least 10 minutes spent in each stand of trees with hollows, noting any fresh signs of use, and inspecting surrounding vegetation (where present) for roosting or guarding birds.	60 person-minutes
Echolocation detection targeting insectivorous bats (Anabat): Three Anabat ExpressTM echolocation detectors were set to nocturnal record on the 21st March 2023 and collected on the 30th March 2023. The units were noted to still be operating upon collection. The detectors were placed at approximately 3-6m above ground in hollow-bearing trees within a maximum distance of 300m from a farm dam. Calls from one of the detectors were analysed by Lesryk Environmental Pty Ltd using Anabat 6.3 software. Due to data corruption, files from the other two detectors could not be opened by the software and need manual analysis exceeding the project budget. However, as the project is being assessed using the small area streamlined module, there are no bat species that require targeted survey, so this data has not been analysed, but has been filed for future use, if needed.	24 recording-nights (3 units set for 8 nights).

2.5 Weather conditions

Table 2 Environmental conditions during threatened species surveys

Survey undertaken (e.g. method / targeted species)	**Date**	**Time**	**Temperature** (min. & max.)	**Wind** (light, mod…)	**Rainfall** (mm)	**Other conditions relevant to the species**
Bird surveys (diurnal)	17/08/2022	1200-1315	13°C	mild	0	cloud 30%
	15/11/2022	0800-0930	12°C	moderate	0	cloud 5/8
Anabat recording (microchiropteran bats)	21-30/03/2023	nocturnal	min 10°C max (daytime) 22°C	not recorded	~100mm over six nights during the period.	-
Random meander and spot surveys (flora)	18/10/2022	morning	12°C	light	1.6m over the 24hr period	-
BAM-VIS plot surveys	29/03/2023	0830-1030	15°C	light	8mm	cloud 2/8

* some weather data was recorded on site at the time of surveys and some data was later obtained from BOM records – Taralga Post Office AWS.

2.6 Limitations

2.6.1 Flora

Botanical surveys were conducted over a limited number of days – 18th October 2022 and 29th March 2023. Whilst the surveys were thorough, it is noted some species are seasonal in appearance and may not have been visible at the time of the surveys, or able to be identified at the time of the surveys.

In relation to estimating the percent cover of native species (for the purpose of mapping extent of native vegetation), the surveys were conducted during periods of good rainfall and milder conditions in which grass and herbaceous species generally exhibited good growth. Consideration was given in the field to the potential for seasonal variability, and this was tested with verification checks across two years. The survey dates are believed appropriate to enable detection of the majority of native species present and an acceptable accuracy for estimation of percent cover of native species.

No candidate threatened plant species require targeted survey.

There is a high level of confidence in the accuracy and completeness of flora data used for the assessment.

Surveyor Licences:

Mr Daniel Clark

Scientific Licence, s132c of the NP&W Act 1974 (SL101495)

2.6.2 Fauna

No candidate threatened fauna species require targeted survey.

Nevertheless, a range of fauna surveys were conducted within the subject land to target species most likely to use the resources present (raptors, parrots, microchiropteran bats).

There are inherent limitations to fauna surveying due to the mobility of species and natural population fluctuations and movements. To address these limitations, fauna surveys included searches for indirect evidence of fauna (such as nests, feathers, scats etc), which can persist on a site for some time, and fauna data is augmented by historical local records within the Bionet (sightings) database.

There is a high level of confidence in the accuracy and completeness of fauna data used for the assessment.

Surveyor Licences:

Ms Rebecca Hogan

Scientific Licence, s132c of the NP&W Act 1974 (SL100778)

DPI Animal Care & Ethics Committee Approval (exp. September 2023)

Mr Deryk Engel

Scientific Licence, s132c of the NP&W Act 1974 (SL100484)

DPI Animal Care & Ethics Committee Approval

Mr Harry Engel

Scientific Licence, s132c of the NP&W Act 1974

DPI Animal Care & Ethics Committee Approval

3. Site context

3.1 Assessment area

The assessment area is the subject land and land within a 1500m buffer measured from the outer boundary of the subject land. Refer to Figure 2 (Location map).

3.2 Landscape features

Landscape features identified within the subject land and assessment area are shown on Figure 1 (Site map) and Figure 2 (Location map), respectively.

3.2.1 IBRA bioregions and IBRA subregions

Subject Land:

* IBRA bioregion: South East Highlands (SEH)
  - IBRA subregion: Monaro (SEH16)

Assessment Area:

* IBRA bioregion: South East Highlands (SEH)
  - IBRA subregion: Monaro (SEH16)

3.2.2 Rivers, streams, estuaries and wetlands

The assessment area contains undulating land in the catchment of the Wollondilly River. Most of the assessment area drains eastwards to Kenmore Creek.

Streams are generally present as ephemeral grassy swales with regular in-line farm dams. A relatively large dam has been constructed at the junction of two second order streams (Strahler classification), approximately 1km north of the subject land.

There are no significant wetlands of habitat value within the assessment area. No important wetlands (DIWA) are present within the assessment area.

3.2.3 Habitat connectivity

The subject land contains small groups of remnant and planted native trees which are loosely connected to the east towards a moderate-sized patch of what appears to be moderate condition woodland on reserved land associated with the Cookbundoon Sports Fields.

Habitats within the subject land represent the outer fringe of the patch and would not be part of a wildlife corridor. The remnant trees would provide some general landscape connectivity for highly mobile birds and bats, but are not likely to be of particular importance for connectivity through the landscape.

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

No karst, caves, crevices, cliffs, or other such geological features occur within the subject land or assessment area.

Minor areas of exposed rock and potentially some low escarpments are associated with the Cookbundoon Range, approximately 5km to the east of the subject land.

The nearest karst habitat and areas of geological significance appear to be those associated with the Bungonia complex more than 20km to the east of the subject land.

3.2.5 Areas of outstanding biodiversity value

Not applicable.

3.2.6 NSW (Mitchell) landscape

Subject Land:

- *Rockley Plains* (Rop): Landscape 62% cleared

Assessment Area:

- *Rockley Plains* (Rop): Landscape 62% cleared
- *Breadalbane Swamps and Lagoons* (Brl): Landscape 91% cleared

3.2.7 Additional landscape features identified in SEARs

Not applicable.

3.2.8 Soil hazard features

Not applicable.

3.3 Native vegetation cover

Approximately 56 hectares of native woodland and forest in variable condition occurs within the assessment area (based on woody vegetation cover evident on aerial images – Google Satellite 2023 and Nearmap, various dates).

Table 3 summarises the extent of native vegetation cover within the assessment area. Figure 2 (Location map) shows native vegetation cover within the assessment area.

Table 3 Native vegetation cover in the assessment area

Assessment area (ha)	941 ha
Total area of native vegetation cover (ha)	56 ha
Percentage of native vegetation cover (%)	6 %
Class (0-10, >10-30, >30-70 or >70%)	0-10%

4. Native vegetation, threatened ecological communities and vegetation integrity

4.1 Native vegetation extent

The subject land contains 0.89 ha of native vegetation, of which 0.05ha would be retained. The vegetation is comprised of groups of remnant native trees and a roadway planting of native (non-indigenous) trees. The groundlayer is an exotic pasture that does not meet minimum criteria to be classed as native vegetation.

Due to the lack of native groundlayer or midlayer, native vegetation extent has been mapped and calculated on the basis of native tree canopy cover alone, using a high resolution Nearmap aerial image dated 28th January 2023.

Refer to Figure 3 (Native vegetation and habitats).

4.1.1 Changes to the mapped native vegetation extent

Site inspection and field surveys during 2022 and 2023 found that aerial images current at the time of the surveys accurately represented the extent of native woodland across the subject land.

4.1.2 Areas that are not native vegetation

Cleared grassland areas across the subject land contain less than 5% cover of native plants and are not classed as native vegetation.

Existing built areas and associated exotic ornamental gardens planted around existing structures are not classed as native vegetation.

Open water dams are not classed as native vegetation. These features are addressed as prescribed impacts in Chapter 6. Fringing vegetation is comprised primarily of exotic grasses, with minor occurrence of Common Bog Rush *Juncus usitatus* at less than 15% cover.

Refer to Figure 3 (Native vegetation and habitats).

4.2 Plant community types

4.2.1 Overview

Groups of remnant native trees within the subject land have been assessed as aligning with the BioNet Vegetation Classification PCT 3376 *Southern Tableland Grassy Box Woodland*. A detailed description of the PCT is provided in the following subsection.

Planted native trees are not locally indigenous species and are not planted in areas with remnant native vegetation. These have not been assigned to a PCT and are instead assessed only for threatened species habitat using D.2 of BAM Appendix D.

Table 4 PCTs identified within the subject land

PCT ID	PCT name	Subject land area (ha)
3376	Southern Tableland Grassy Box Woodland – to be removed	0.66 ha
3376	Southern Tableland Grassy Box Woodland – to be retained	0.05 ha
n/a	planted native trees	0.18 ha
	Total area	0.89 ha

4.2.2 PCT 3376: Southern Tableland Grassy Box Woodland

4.2.2.1 PCT overview

Table 5 PCT 3376

PCT ID	3376
PCT name	Southern Tableland Grassy Box Woodland
Vegetation formation	Grassy Woodlands
Vegetation class	Southern Tableland Grassy Woodlands
Per cent cleared value (%)	92.96 %
Extent within subject land (ha)	0.71 ha

Remnant native trees present across the subject land are predominantly Yellow Box *Eucalyptus melliodora* and Blakely's Red Gum *Eucalyptus blakelyi* (the latter occurring mainly on higher ground in the east), with Cabbage Gum *Eucalyptus amplifolia* occurring on lower ground in the vicinity of the existing dwelling, one individual Apple Box *Eucalyptus bridgesiana* in the southeast corner of the subject land, and one individual Candlebark *Eucalyptus rubida* adjacent to the private access road in the southwest.

There is no native mid-layer.

The ground-layer is dominated by exotic species at 90% cover or greater. Occasional native species recorded were Common Couch *Cynodon dactylon* and Blue Couch *Digitaria didactyla* (both of which are regarded as weeds in some areas), Hairy Panic *Panicum effusum*, Swamp Dock *Rumex brownii*, Pigweed *Portulacca olearacea*, Clammy Goosefoot *Dysphania pumilio* and Spear Grasses *Austrostipa scabra* and *Austrostipa bigeniculata*, with Common Bog Rush *Juncus usitatus* in wetter areas.

4.2.2.2 Condition states

One condition states of PCT 3376 was identified within the subject land:

* Remnant trees.

Photo 1 PCT 3376, zone a – remnant trees

4.2.2.3 Justification of PCT selection

The PCT was identified in the first instance using the BioNet Vegetation Classification filter tool, on the basis of IBRA subregion (Monaro) and remnant tree species recorded during botanical survey.

Three PCTs received the equal highest number of matches (5). The profiles of each of these PCTs were reviewed and considered further):

- PCT 3376 *Southern Tableland Grassy Box Woodland.*
- PCT 3373 *Goulburn Tableland Box-Gum Grassy Forest.*
- PCT 3738 *Goulburn-Lithgow Tableland Hills Grassy Forest*.

Upon review of the scientific descriptions contained in the BioNet Vegetation Classification database, PCT 3376 is an excellent floristic and landscape match for remnant vegetation on the subject land. PCT 3373 is a similar community, but is more likely to contain a range of species that are not present on the subject land. PCT 3738 is described as being dominated by tree species not present on the subject land.

The high level of disturbance and floristic simplicity of the remnant vegetation limits the certainty that can be applied to assigning a PCT.

Regional vegetation mapping was therefore used to assist in verifying the findings of the classification tool. All stands of remnant vegetation within the subject land are currently mapped as PCT 3376 (refer to Chapter 2.2.1.1 above). This is consistent with the results of the classification tool.

4.2.2.4 Alignment with TECs

PCT 3376 is associated with the critically endangered ecological community: *White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions*.

Comparison of site data with the Final Determination of the NSW Scientific Committee to list the community under the BC Act confirms that vegetation within the subject land is part of this TEC.

4.2.2.5 Alignment with EPBC Act listed ECs

PCT 3376 is associated with the critically endangered community: *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland*.

Comparison of site data with Listing Advice provided by the Commonwealth Threatened Species Scientific Committee (TSSC) found that vegetation within the subject land does not meet the listing criteria for this community.

The TSSC states "*In order for an area to be included in the listed ecological community, a patch[1] must have a predominantly native understorey[2]*." Patches are included in the listing if they meet the following criteria:

- areas without native canopy, 0.1ha or greater in size, with the perennial ground layer dominated by native species, and containing at least 12 native non-grass species. At least one of the understorey species should be an important species (eg grazing-sensitive, regionally significant or uncommon, such as Kangaroo Grass or orchids).
- areas with native canopy that meet any of the ground layer criteria above.
- areas with native canopy, 2ha or greater in size, with a predominantly native understorey, and either natural regeneration of the canopy species, or 20 or more trees per hectare.

Native vegetation within the subject land contains a native canopy, but does not contain a predominantly native understorey. Based on the BAM-VIS plot data, the groundlayer contains 2.5%

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[1] *A patch is defined in the relevant EPBC Act Policy Statement as a contiguous area of the community where the understorey is predominantly native, or trees are no greater than 75m apart.*

[2] *Predominantly native is defined in the relevant EPBC Act Policy Statement as where at least 50% of the perennial vegetation cover in the ground layer is made of up native species.*

cover of native plants (being 10% of the perennial native groundlayer). Only three native non-grass species were recorded. No important understorey species were recorded.

4.2.3 Planted native trees

A row of non-local native trees has been planted along the private access road parallel to the southern boundary of the subject land. The majority of trees planted in this area are Paddy's River Box *Eucalyptus macarthurii* (34 trees). Also planted along the roadway are several individuals of Red Ironbark *Eucalyptus sideroxylon*.

Two individuals of Tasmanian Blue Gum *Eucalyptus globulus* have been planted on the southern side of the dwelling.

Paddy's River Box is a threatened species listed as 'endangered' under both the NSW BC Act and the Commonwealth EPBC Act. It is locally indigenous in the Southern Highlands, naturally occuring from the Moss Vale district to Kanangra-Boyd National Park (TBDC descriptive text). It has, however, been widely propagated and planted throughout the Southern Highlands and Southern Tablelands in farm windbreaks and shelter belts, around public parks and as roadside trees.

Photo 2 Planted trees along the private access road

4.3 Threatened ecological communities

Table 6 TECs within the subject land

TEC name	Profile ID (from TBDC)	BC Act status	EPBC Act status	Associated vegetation zones within the subject land	Area within subject land (ha)
White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions	10837	CE	-	3376a – remnant trees	0.71 (0.66ha to be removed and 0.05ha to be retained)

4.4 Vegetation zones

Vegetation across the subject land has been substantially disturbed through historic clearing, grazing and weed invasion (including introduction of pasture grasses).

The vegetation has been classed as two condition zones, based on provenance of tree canopy:

i. PCT 3376a – remnant trees (0.66 ha to be removed).

ii. Planted native trees (0.18 ha)

Patch size was identified using aerial images (Google 2022, and Nearmap, various dates up to 28th January 2023).

Refer to Table 7 (Vegetation zones and patch sizes). Refer to Figure 3 (Native vegetation and habitats) and Figure 2 (Location map).

Table 7 Vegetation **zones and patch sizes**

Vegetation zone ID	PCT ID number and name	Condition / other defining feature	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
3376a	3376: Southern Tableland Grassy Box Woodland	Remnant trees	0.66	☐ <5 ha ☐ 5–24 ha ☒ 25–100 ha ☐ >100 ha	1	1	1	BAM-VIS Plot 1
planted native trees	n/a	Planted non-local native trees	0.18	☐ <5 ha ☐ 5–24 ha ☒ 25–100 ha ☐ >100 ha	n/a	n/a	n/a	n/a

4.5 Vegetation integrity (vegetation condition)

4.5.1 Vegetation integrity survey plots

One plot has been sampled within the remnant vegetation zone, in accordance with BAM Table 3. Vegetation floristics and structure within each group of trees included within the zone is relatively consistent, such that no additional plots are warranted.

4.5.2 Scores

Table 8 Vegetation integrity scores

Vegetation zone ID	Composition condition score	Structure condition score	Function condition score (where relevant)	Vegetation integrity score	Hollow bearing trees present?
3376a – remnant trees	15.5	19.5	44	23.7	Yes

4.5.3 Use of benchmark data

Standard condition benchmarks within the BAM-Calculator (as at 31st May 2023) were used to assess the vegetation integrity attributes of each vegetation zone.

5. Habitat suitability for threatened species

5.1 Identification of threatened species for assessment

5.1.1 Ecosystem credit species

Table 9 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 1. Geographic limitations 2. Habitat constraints 3. Vagrant species	Vegetation zone ID species retained within, including PCT ID	Sensitivity to gain class
		BC Act	EPBC Act						
Regent Honeyeater (foraging)	*Anthochaera phrygia*	CE	CE	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	n/a	3376a	High
Dusky Woodswallow	*Artamus cyanopterus cyanopterus*	V	-	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	n/a	3376a	Moderate
Australasian Bittern	*Botaurus poiciloptilus*	E	E	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	n/a	3376a	Moderate
Glossy Black Cockatoo (foraging)	*Calyptorhynchus lathami*	V	V	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No	Reason 2 – habitat constraints (further detail provided below this table).	n/a	High

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment 1. Geographic limitations 2. Habitat constraints 3. Vagrant species	Vegetation zone ID species retained within, including PCT ID	Sensitivity to gain class
		BC Act	EPBC Act						
Speckled Warbler	*Chthonicola sagittata*	V	-	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	n/a	3376a	High
Brown Treecreeper (eastern subspecies)	*Climacteris picumnus victoriae*	V	-	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	n/a	3376a	High
Spotted-tailed Quoll	*Dasyurus maculatus*	V	E	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	n/a	3376a	High
Black-necked Stork	*Ephippiorhynchus asiaticus*	E	-	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No	Reason 2 – habitat constraints (further detail provided below this table).	n/a	Moderate
Black Falcon	*Falco subniger*	V	-	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	n/a	3376a	Moderate
Little Lorikeet	*Glossopsitta pusilla*	V	-	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	n/a	3376a	High

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment 1. Geographic limitations 2. Habitat constraints 3. Vagrant species	Vegetation zone ID species retained within, including PCT ID	Sensitivity to gain class
		BC Act	EPBC Act						
White-bellied Sea-Eagle (foraging)	*Hieraaetus morphnoides*	V	-	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	n/a	3376a	High
White-throated Needletail	*Hirundapus caudacutus*	-	V	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	n/a	3376a	High
Swift Parrot (foraging)	*Lathamus discolor*	E	CE	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	n/a	3376a	Moderate
Hooded Robin (south-eastern form)	*Melanodryas cucullata cucullata*	V	-	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	n/a	3376a	Moderate
Large Bent-wing Bat (foraging)	*Miniopterus orianae oceanensis*	V	-	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	n/a	3376a	High
Scarlet Robin	*Petroica boodang*	V	-	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	n/a	3376a	Moderate

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment 1. Geographic limitations 2. Habitat constraints 3. Vagrant species	Vegetation zone ID species retained within, including PCT ID	Sensitivity to gain class
		BC Act	EPBC Act						
Flame Robin	*Petroica phoenicea*	V	-	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	n/a	3376a	Moderate
Grey-headed Flying-fox (foraging)	*Pteropus poliocephalus*	V	V	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	n/a	3376a	High
Diamond Firetail	*Stagonopleura guttata*	V	-	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes	n/a	3376a	Moderate

5.1.1.1 Predicted ecosystem credit species excluded from assessment:

The following species were excluded from assessment on the basis of habitat constraints:

* Glossy Black Cockatoo (foraging) – the subject land does not contain *Allocasuarina* or *Casuarina* species.
* Black-necked Stork – the subject land does not contain swamps or wetlands and is not within 300m of swamps or wetlands.

5.1.1.2 Ecosystem credit species added to assessment:

No ecosystem credit species were added to the BAM-Calculator generated list for assessment.

5.1.2 Species credit species

Table 10 Predicted flora species credit species

Common name	Scientific name	Listing status		Sources	Species retained for further assessment?	Reason for exclusion from further assessment 1. Geographic limitations 2. Habitat constraints 3. Microhabitats	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act				
Pale Pomaderris	*Pomaderris pallida*	V	V	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No	Reason 1 – geographic limitations (further detail provided below this table).	n/a

5.1.2.1 Predicted flora species credit species excluded from assessment:

The following species were excluded from assessment on the basis of geographic limitations:

* Pale Pomaderris – the subject land is not south of Queanbeyan.

5.1.2.2 Predicted flora species credit species excluded from assessment:

No flora species credit species were added to the BAM-Calculator list for assessment.

Table 11 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 1. Geographic limitations 2. Habitat constraints 3. Vagrant species 4. Microhabitats	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act					
Regent Honeyeater (breeding)	*Anthochaera phrygia*	CE	CE	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No	2 – Habitat constraints (further detail provided below this table).	n/a
Swift Parrot (breeding)	*Lathamus discolor*	E	CE	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No	2 – Habitat constraints (further detail provided below this table).	n/a
Yellow-spotted Tree Frog	*Litoria castanea*	CE	E	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No	4 – Habitat degraded such that microhabitats are not available (further detail provided below this table)	n/a
Large Bent-winged Bat (breeding)	*Miniopterus orianae oceanensis*	V	-	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☒ Current survey	No	2 - Habitat constraints (further detail provided below this table)	n/a
Canberra Grassland Earless Dragon	*Tympanocryptis lineata*	CE	E	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No	4 – Habitat degraded such that microhabitats are not available (further detail provided below this table)	n/a

5.1.2.3 Predicted fauna species credit species excluded from assessment:

The following three species have been removed from the BAM-Calculator generated list for assessment on the basis of habitat constraints:

* Regent Honeyeater (breeding) – the subject land is not part of an important mapped area;
* Swift Parrot (breeding) – the subject land is not part of an important mapped area;
* Large Bent-winged Bat (breeding) – the subject land does not contain caves, tunnels, mines or other structures known or suspected to be used for breeding.

The following two species have been removed from the BAM-Calculator generated list for further assessment on the basis of the habitat being degraded such that microhabitats are not available:

* Yellow- spotted Tree Frog – TBDC descriptive text states: "*Require large permanent ponds or slow flowing 'chain-of-ponds' streams with abundant emergent vegetation such as bulrushes and aquatic vegetation*." The subject land contains two farm dams with almost no emergent vegetation. The dams are not within areas of native vegetation.
* Canberra Grassland Earless Dragon – TBDC descriptive text states: "*Restricted to a small number of Natural Temperate Grassland sites dominated by wallaby grasses (*Nothodanthonia *spp.), spear grasses (*Austrostipa *spp.), Poa Tussock (*Poa sieberiana*), Red Grass (*Bothriochloa macra*), and occasionally Kangaroo Grass (*Themeda australis*). Introduced pasture grasses occur at many of the sites supporting this species, which has also been captured in secondary grassland*". The description indicates that introduced pasture grasses can be present within Natural Temperate Grassland habitat. The description does not suggest that predominantly introduced pasture (that does not meet the minimum criteria for classification as native vegetation) would provide habitat. The TBDC also states: "*In addition to tussocks, partially embedded surface rocks, and spider and insect holes are used for shelter. These are important micro-habitat elements within the grassland habitat*." The subject land does not contain surface rock.

5.1.2.4 Fauna species credit species added to the assessment:

No fauna species credit species were added to the BAM-Calculator generated list for assessment.

5.2 Presence of candidate species credit species

No candidate species credit species require further assessment.

Paddy's River Box *Eucalyptus macarthurii* is a species credit species. However, it has been planted on the subject land for aesthetic reasons. It Is not part of the local PCT. Impacts upon planted vegetation on the subject land have been assessed in accordance with BAM Appendix D in which:

* BAM Chapter 4 (assessing native vegetation, threatened ecological communities and vegetation integrity) and Chapter 5 (assessing the habitat suitability for threatened species) are not required to be applied;
* BAM Section 8.4 (mitigate and manage impacts on biodiversity values) must be applied.

5.3 Threatened species surveys

No targeted threatened species surveys are required.

5.4 Expert reports

No Expert Reports have been used or relied upon for this assessment.

5.5 More appropriate local data (where relevant)

No local data has been used in this assessment.

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

No species credit fauna species are known or assumed to use the subject land.

6. Identifying prescribed impacts

Table 12 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	☐Yes / ☒No	The subject land does not contain geological features of significance. The nearest rock features are approximately 5km to the east. The nearest karst is more than 20km to the east.	n/a
Human-made structures	☒Yes / ☐No	Existing sheds are clustered near the existing dwelling and are in regular use for current farming activities.	There are no threatened entities associated with or likely to be dependent upon these features. The only microchiropteran bat predicted to occur on the subject land is the Large Bent-wing Bat, which typically roosts in caves and requires very specific conditions to be met for nursery caves which would not be met by a shed.
Non-native vegetation	☒Yes / ☐No	Exotic vegetation consists of exotic pasture, and landscaped areas around the existing dwelling.	This vegetation is not likely to be of value for any threatened species.
Habitat connectivity	☐Yes / ☒No	Habitats within the subject land are isolated and highly fragmented and do not form part of a wildlife movement corridor.	n/a
Waterbodies, water quality and hydrological processes	☒Yes / ☐No	The land is fairly level and sits within a broad plain drained by mostly ephemeral upper catchment tributaries to Kenmore Creek. The land contains two moderate-sized farm dams.	There are no threatened entities associated with or likely to be dependent upon these features or hydrological processes.
Wind turbine strikes (wind farm development only)	☐Yes / ☒No	n/a	n/a
Vehicle strikes	☒Yes / ☐No	Subdivision would increase traffic into and through the subject land.	All native fauna present within the subject land could be considered part of the TEC present.

Stage 2: Impact assessment (biodiversity values and prescribed impacts)

7. Avoid and minimise impacts

7.1 Avoid and minimise direct and indirect impacts

7.1.1 Project location

The proposal is to rezone the subject property to enable residential development.

The property is subject to a variety of planning constraints, related to its long and narrow shape, a high pressure gas line and optic fibre cable running across the northwest, design specifications for the subdivision to meet RFS requirements, engineering requirements for stormwater management, and lot yield requirements to achieve financial feasibility.

Biodiversity values are limited to the remnant and planted native trees scattered across the subject land. The distribution of trees and lack of supporting understorey does not practicably enable, nor warrant, retention of trees within a dedicated conservation reserve.

The proposal, therefore, is to set aside land for biodiversity conservation in areas which can more practicably be used for this purpose, given other site constraints and feasibility considerations.

Refer to Figure 4 (Subdivision layout).

7.1.2 Project design

A series of subdivision layouts have been prepared and considered during the planning and design phase of the project.

The final design offers the following features to avoid and minimise impacts on biodiversity:

* Re-positioning of the entrance road, enabling retention of native trees along the western part of the southern boundary (including retention of seven individuals of *Eucalyptus macarthurii*).
* Re-positioning of the eastern boundary road (moving it to the west), enabling retention of native trees in private lots along the eastern boundary. Encumbered lots would have a restriction placed on title pertaining to the retention of specified trees.
* Access to the neighbouring property to the east would be via a Right of Carriageway from the new subdivision road. This enables retention of the group of native trees within a road reserve in the southeastern corner, with a private access formed through the trees. The access would be designed in consultation with an Arborist to minimise and mitigate impacts.
* Retention of native trees, where practicable, on boundaries within private lots. Encumbered lots would have a restriction placed on title pertaining to the retention of specified trees.

* Designation of revegetation zones for compensatory replanting (with a combined area of approximately 0.89ha). Replanting works are discussed further in Chapter 8.4 (mitigating residual impacts).

Refer to Figure 4 (Subdivision layout).

7.1.3 Project implementation

Implementation of the project would involve the following measures to avoid and minimise impacts on biodiversity:

* Implementation of a protocol for tree removal from the property. Refer to Chapter 8.4.1 for further detail.

7.2 Avoid and minimise prescribed impacts

7.2.1 Project location

7.2.1.1 Vehicle strikes

The proposal is to rezone the subject property to enable residential development. This would result in creation of 93 new residential lots with a corresponding increase in the number of vehicles entering and driving through the subject land.

The existing condition and location of the subject land does not suggest that vehicle strikes would be a significant issue. There are no specific locations of particular concern to be avoided or managed.

The project location has not been modified for the purpose of addressing vehicle strikes.

7.2.2 Project design

7.2.2.1 Vehicle strikes

A series of subdivision layouts have been prepared and considered during the planning and design phase of the project.

The final design offers the following features to avoid and minimise impacts on vehicle strikes:

* The two primary revegetation zones would be located in the northwest and southeast corners of the subject land, such that they would not be crossed by roads or driveways;
* Vegetated buffer zones along the southern boundary would similarly not be crossed by roads or driveways;
* The vegetated buffer along the western boundary would be divided by the access road to the subdivision. Planting in this area should be restricted to trees only to discourage ground fauna using this area and to facilitate good visibility for drivers.

7.2.3 Project implementation

7.2.3.1 Vehicle strikes

Implementation of the project would involve the following measures to avoid and minimise the risk of vehicle strike on native fauna:

* The vegetated buffer along the western boundary would be divided by the access road to the subdivision. Planting in this area would be restricted to trees only to discourage ground fauna using this area and to facilitate good visibility for drivers. Refer to Chapter 8.4.2 for further detail.

7.3 Other measures considered

A series of alternate subdivision layouts have been prepared and considered during the planning and design phase of the project. Specific measures considered which were not able to be implemented include:

* Retention of the entire row of trees planted along the southern boundary. These trees are not on the actual boundary, but are set approximately 7m north of the boundary, on the northern side of the current shared access road. The extent of land that would be lost to subdivision for their retention (in addition to losses related to existing service infrastructure) reduced the lot yield below that required for financial feasibility. It was not possible to retain all of these trees in the rear of private lots due to Rural Fire Service (RFS) road access specifications. It was also considered that, as the trees are planted and are species that can readily be propagated, the impact can effectively be mitigated through seed collection and planting elsewhere on the property.
* Retention of a patch of mature remnant trees in a public reserve in the central part of the subject land, north of the existing dwelling. As for the above, the extent of land that would be lost to subdivision for their retention reduced the lot yield below that required for financial feasibility. There were additional implications for bushfire risk management on adjacent lots. It was considered that, as the ecological community is present in an extremely simplified and degraded form, the impact can effectively be mitigated through revegetation in other parts of the property. The northwestern and southwestern revegetation zones provide opportunity to plant native vegetation with greater vegetation integrity that that being removed.

7.4 Summary of measures to avoid and minimise impacts

Table 13 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 and 5)	Timing	Responsibility
Subdivision design to enable retention of trees within private lots.	Minimise loss of native trees.	development application stage.	Development application proponent
Consultation with an Arborist to design the right of carriageway access through the patch of trees in the southeastern corner	Minimise loss of native trees	construction certificate stage.	Development application proponent
Placement of a restriction on title of relevant lots to protect certain specified trees.	Minimise loss of native trees	construction certificate stage.	Development application proponent
Subdivision design to create areas set aside for revegetation (0.89ha)	Enables mitigation to compensate locally for the loss of native vegetation on the property.	development design stage.	Development application proponent
Implementation of a tree removal protocol. Refer to Chapter 8.4.1.	Avoid and minimise impacts on native fauna that may be present at the time of clearing.	during tree clearing.	Construction Manager
Selection and placement of plants in revegetated zones on either side of the access road to the subdivision to be chosen to maintain visibility and minimise risk of fauna collisions. Refer to Chapter 8.4.2.	Minimise risk of vehicle collision with native fauna.	construction certificate stage	Development application proponent

8. Impact assessment

8.1 Direct impacts

8.1.1 Residual direct impacts

The extent of residual direct impacts on native vegetation is shown on Figure 4 (Subdivision layout).

Table 14 Summary of residual direct impacts

Direct impact (Describe the impact on PCT/TEC/EC or threatened species and their habitat)	**BC Act status**	**EPBC Act status**	**SAII entity**	**Project phase/timing of impact** (e.g. construction, operation, rehabilitation)	**Extent** (ha, number of individuals)
PCT 3376/CEEC box-gum woodland	CE	-	Yes	construction	0.66 ha
Paddys River Box *Eucalyptus macarthurii*	E	E	No	construction	26 individuals to be removed, 8 individuals to be retained.

8.1.2 Change in vegetation integrity score

Table 15 Impacts to vegetation integrity

Vegetation zone	**PCT ID**	**Management zone**	**Area** (ha)	**Before development**				**After development**				**Change**
				Composition	**Structure**	**Function**	**VI score**	**Composition**	**Structure**	**Function**	**VI score**	**Change in VI score**
3376a	3376	remove	0.66	15.5	19.5	44	23.7	0	0	0	0	-23.7

8.2 Indirect impacts

Table 16 Summary of residual indirect impacts

Indirect impact (Describe impact, e.g. transport of weeds and pathogens form 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**
Inadvertent physical damage to adjacent vegetation	Potential impact on retained trees (remnant and planted).	n/a	n/a	n/a	construction	low risk with implementation of tree protection measures.
Reduced viability of habitat due to edge effects	The development would not extend or create new edges to native vegetation or habitats.	n/a	n/a	n/a	n/a	n/a
Reduced viability of habitat due to noise, dust or light spill	Impact on retained trees.	n/a	n/a	ongoing	construction, occupation	negligible increase in existing impact.
Spread of diseases and weeds	Impact on retained trees.	n/a	n/a	ongoing risk	construction, occupation	negligible increase in existing risk.
Loss of food and shelter for fauna	No further indirect impact.	n/a	n/a	n/a	n/a	n/a
Loss of breeding habitat	No further indirect impact.	n/a	n/a	n/a	n/a	n/a
Trampling of threatened flora species	Not relevant.	n/a	n/a	n/a	n/a	n/a
Inhibition of nitrogen fixation and increased soil salinity	Not relevant.	n/a	n/a	n/a	n/a	n/a

Indirect impact (Describe impact, e.g. transport of weeds and pathogens form 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**
Fertiliser drift	Reduced threat to retained trees with cessation of farming practices.	n/a	n/a	n/a	n/a	n/a
Rubbish dumping	No impact.	n/a	n/a	n/a	n/a	n/a
Wood collection	Removal of fallen timber beneath trees retained within private lots	n/a	n/a	n/a	n/a	negligible increase in existing impact
Removal of rocks	Not relevant.	n/a	n/a	n/a	n/a	n/a
Increase in predators	Increased cat ownership may result in additional cats roaming in nearby areas.	n/a	n/a	ongoing	occupation	slight increase in existing risk.
Increase in pest animal populations	No impact.	n/a	n/a	n/a	n/a	n/a
Changed fire regime	Change of use to residential can increase fire risk from arson and accidents, but also reduce risk of agricultural grassfires.	n/a	n/a	n/a	occupation	potential for changed risk and type of fires to vegetation in the surrounding area.
Disturbance to specialist breeding and foraging habitat	Not relevant.	n/a	n/a	n/a	n/a	n/a

8.3 Prescribed impacts

8.3.1 Vehicle strikes

Table 17 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)	**SAII entity**	**Likelihood**	**Estimated vehicle strike rates**	**Consequences**
Protected fauna that are part of Box-Gum Woodland TEC	No	low risk	low risk	not likely to be a significant issue.

8.4 Mitigating residual impacts – management measures and implementation

Mitigation measures are proposed to minimise and compensate for impacts of the subdivision in accordance with best practice. Recommended measures include:

* Implementation of a tree removal protocol to avoid injury to individual animals at the time of clearing – refer to Chapter 8.4.1 below.
* Revegetation of reserves within the subject land to include box-gum woodland species appropriate to the conditions and compatible with other uses of the reserves – refer to Chapter 8.4.2 below.
* Collection of propagules from planted individuals of Paddy's River Box *Eucalyptus macarthurii* within the subject land, for propagation and replanting within the subdivision, or in other conservation projects.

8.4.1 Tree Removal Protocol

1. An ecologist shall be engaged to clearly identify hollow-bearing trees and significant habitat trees on site with coloured tape or similar immediately prior (within 2 weeks) to commencement of tree removal.
2. Removal of identified trees shall occur during the period from December to April, to avoid the main breeding period of birds and microchiropteran bats, and the winter hibernation/torpor period of microchiropteran bats.
3. Identified trees shall initially be 'bumped' using machinery to encourage any roosting fauna to evacuate on their own accord. 'Bumping' shall be repeated at 1 minute intervals for approximately 5 minutes per tree. Care shall be taken to place the machinery such that it is not likely to be hit by falling branches.

4. Any hollow sections of trees or limbs that are found to be hollow shall be left on the ground until the next working day before relocating, to provide further opportunity for fauna to evacuate.
5. Hollow sections shall be placed on the ground in the revegetation areas to provide habitat for native fauna and niche areas for revegetation.
6. Any injured native fauna shall be rescued and transferred to the care of WIRES or an equivalent wildlife rescue agency. In the event that native fauna requires medical treatment by a vet, or long-term care by a wildlife rescue agency, all costs shall be covered by the proponent for the development. Note that microchiropteran bats carry lethal diseases and should not be handled by untrained and unvaccinated persons.

8.4.2 Revegetation zones

A revegetation plan shall be prepared prior to issue of a construction certificate.

The plan shall seek to re-establish a box-gum grassy woodland community in the northwestern and southeastern corners of the subject land. Additional box-gum grassy woodland species shall be used as appropriate in vegetated buffers along boundaries, in stormwater management areas, and as roadside trees.

The plan shall be prepared in consultation with Council's environment and biodiversity department, to the satisfaction of Council.

8.4.3 Paddy's River Box *Eucalyptus macarthurii*

Seed shall be collected from as many of the individual *Eucalyptus macarthurii* trees present along the private access road as possible. The seed shall be propagated by a native plant nursery and then planted as tubestock within the subdivision (having regard to the future size of the trees).

It is recommended that at least 30 tubestock are planted to compensate for the 26 individuals to be removed (noting that this species is not a natural part of the local PCT, and that the priority for revegetation zones is regeneration of the natural PCT).

Surplus tubestock should be offered to Council, or used in a revegetation project within the species natural distribution (Southern Highlands).

8.5 Adaptive management strategy for uncertain impacts (where relevant)

There are no significant uncertain impacts likely to result from the subdivision and subsequent development. An adaptive management strategy is not warranted.

9. Serious and irreversible impacts

9.1 Assessment for serious and irreversible impacts on biodiversity values

Table 18 Entities at risk of an SAII

Common name	Scientific name	Reason for inclusion in assessment
Box-Gum Woodland	*White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions*	Included in current list of entities at risk of an SAII and is likely to be impacted by the proposal

9.1.1 Additional impact assessment provisions for TECs at risk of an SAII

9.1.1.1 Box-Gum Woodland

1. Actions to avoid and minimise direct and indirect impacts

Refer to Chapter 7.1 of the BDAR.

2. Current status (excluding impacts of the proposal)

Table 19 Current status – Box-Gum Woodland

Criteria	Data/ information	Data sources	Details of data deficiency, assumptions, reasons for low confidence in information (e.g. TBDC indicates data is unknown or deficient)
Current total geographic extent (ha) of the TEC in NSW	250,729 ha	NSW TSSC Conservation Assessment (Tozer & Simpson, 2020).	Low confidence due to uncertainty in mapping, and rate of ongoing clearing since mapping.

Criteria	Data/ information	Data sources	Details of data deficiency, assumptions, reasons for low confidence in information (e.g. TBDC indicates data is unknown or deficient)
Estimated reduction in geographic extent of the TEC since 1970	93%	NSW TSSC Conservation Assessment (Tozer & Simpson, 2020).	Low confidence, for reasons stated above.
Extent of reduction in ecological function, describing the degree of environmental degradation or disruption to biotic processes (Principle 2) SAII Principle 2 is selected in the TBDC - <50 individuals or <250 individuals where threats are known. TBDC description states that the TEC "*has been drastically reduced in area and highly fragmented because of clearance for cropping and pasture improvement*", and "*The condition of remnants ranges from relatively good to highly degraded, such as paddock remnants with weedy understories and only a few hardy natives left*." The TBCD states that intact stands are rare. The NSW TSSC Conservation Assessment (Tozer & Simpson, 2020) states "*it has undergone a very large historical reduction in geographic distribution (since approximately 1750) and has experienced disruption of biotic processes of relative severity >90% over more than 90% of its distribution since 1750*."			
Evidence of restricted geographic distribution (Principle 3) based on the TEC's geographic range in NSW – not applicable			
Extent of occurrence (ha)			
Area of occupancy (ha)			
Number of threat-defined locations			

3. Impact assessment

Table 20 Impact assessment – Box-Gum Woodland

Criteria	Data/ information	Data sources	Details of data deficiency, assumptions, reasons for low confidence in information (e.g. TBDC indicates data is unknown or deficient)
Impact on the geographic extent of the TEC (Principles 1 and 3)			
Area of TEC to be impacted by the proposal (ha)	0.66 ha	N/A	N/A
Area of TEC to be impacted by the proposal as a % of the current geographic extent in NSW (%)	total = 0.000003%	N/A	N/A
Direct/indirect impacts likely as a result of the proposal to contribute to loss of flora/fauna species characteristic of the TEC.	No impacts likely to result in further loss of flora/fauna species characteristic of the TEC.	N/A	N/A
Impacts likely to contribute to further environmental degradation or disruption of biotic processes (Principle 2)			
Remaining extent of isolated areas of TEC (ha)	~40 ha of woodland	Based on woodland patch size of ~40 ha calculated using GIS and aerial imagery.	Reasonable confidence within accuracy limits of GIS.
Average distance between remaining remnants – remnant is retained (m)	approximately 50m.	Measured using GIS and aerial imagery.	Reasonable confidence within accuracy limits of GIS.
Average distance between remaining remnants – remnant is removed (m)	Approx 20m.	Measured using GIS and aerial imagery.	Reasonable confidence within accuracy limits of GIS.
Estimated maximum dispersal distance of species associated with the TEC (km)	Substantially greater than extent of fragmentation within the subject land and surrounding areas.	Aerial imagery. Author's general knowledge of ecology.	Reasonable confidence given the existing condition and fragmentation of vegetation within the

Criteria	Data/ information	Data sources	Details of data deficiency, assumptions, reasons for low confidence in information (e.g. TBDC indicates data is unknown or deficient)
			subject land. Species currently able to persist must be reasonably mobile or have good dispersal ability across fragmented landscapes.
Area to perimeter ratio of remaining remnants (ratio)	no change.	Aerial imagery.	High confidence based on recent high resolution aerial imagery and site inspections.
Vegetation integrity analysis			
Vegetation Zone a (Composition score)	15.5	N/A	N/A
Vegetation Zone a (Structure score)	19.5	N/A	N/A
Vegetation Zone a (Function score)	44	N/A	N/A

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 21 Impacts that do not require an offset – planted native vegetation

Vegetation zone	PCT name	TEC	Impact area (ha)	TEC Association	Entity at risk of an SAII?	Current VI score
Planted native trees	n/a	n/a	0.18	n/a	No	n/a

Table 22 Impacts that require an offset – ecosystem credits

Vegetation zone	PCT name	TEC	Impact area (ha)	Current VI score	Future VI score	Change in VI score	Biodiversity risk weighting	Number of ecosystem credits required
PCT 3376 (remnant trees)	Southern Tableland Grassy Box Woodland	*White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions*	0.66	23.7	0	-23.7	2.5	10
							Total credits	10

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

No species credits are required for this project.

Paddy's River Box *Eucalyptus macarthurii* is a species credit species. However, it has been planted on the subject land for aesthetic reasons. It Is not part of the local PCT. Impacts upon planted vegetation on the subject land have been assessed in accordance with BAM Appendix D in which:

* BAM Chapter 4 (assessing native vegetation, threatened ecological communities and vegetation integrity) and Chapter 5 (assessing the habitat suitability for threatened species) are not required to be applied;
* BAM Section 8.4 (mitigate and manage impacts on biodiversity values) must be applied.

10.1.3 Indirect and prescribed impacts

Table 23 Summary of proposed offsets for residual indirect and prescribed impacts

Residual indirect or prescribed impact (identified in Table 28 after mitigation)	**Proposed offset** (additional biodiversity credit requirement and/or other conservation measures)
indirect impacts on retained trees (inadvertent damage during construction, risk of disease, changed fire regime)	There is a low risk of impact. The project would include compensatory tree planting on the property. No further offset is proposed.
indirect impacts on habitat associated with retained trees (noise, dust and light spill, wood collection, predators)	There would be a negligible increase in existing impacts. The project would include compensatory revegetation of habitats in the northwestern and southeastern corners of the property. No further offset is proposed.
Vehicle strikes	Unlikely impact. No offset proposed.

10.2 Impacts that do not need further assessment

Table 24 Impacts that do not need further assessment for ecosystem credits

Impact	**Location within subject land**	**Justification why no further assessment is required**
Loss of exotic grassland	throughout most of subject land	not native vegetation

11. Biodiversity credit report

Refer to Appendix E (Credit reports).

11.1 Ecosystem credits

Table 25 Ecosystem credit class and matching credit profile

Eco-system credit	Attributes shared with matching credits						
	PCT name	**PCT vegetation class**	**PCT vegetation formation**	**Associated TEC or EC**	**Offset trading group** (BAM Section 10.2, Tables 4 & 5)	**Hollow bearing trees present?**	**IBRA subregion** (in which proposal is located)
3376	Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion	Southern Tableland Grassy Woodlands	Grassy Woodlands	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions. This includes PCT's: 74, 75, 83, 250, 266, 267, 268, 270, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 286, 298, 302, 312, 341, 342, 347, 350, 352, 356, 367, 381, 382, 395, 401, 403, 421, 433, 434, 435, 436, 437, 451, 483, 484, 488, 492, 496, 508, 509, 510, 511, 528, 538, 544, 563, 567, 571, 589, 590, 597, 599, 618, 619, 622, 633, 654, 702, 703, 704, 705, 710, 711, 796, 797, 799, 847, 851, 921, 1099, 1303, 1304, 1307, 1324, 1329, 1330, 1332, 1383, 1606, 1608, 1611, 1691, 1693, 1695, 1698, 3314, 3359, 3363, 3373, 3376, 3387, 3388, 3394, 3395, 3396, 3397, 3398, 3399, 3406, 3415, 3533, 4147, 4149, 4150	Yes	Monaro

11.2 Species credits

Not relevant.

12. References

Tozer M. and Simpson C. 2020. *Conservation Assessment of White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland*. NSW Threatened Species Scientific Committee.

13. Figures

Figure 1 Site map

Aerial image is from Nearmap (09/03/2023).

The entire map area is within the Monaro IBRA subregion and within Goulburn Mulwaree Local Government Area.

The subject property is the entirety of Lot 2 DP 569505.

Figure 2 Location map

Aerial image is from Google Satellite ©2023.

The entire map area is within the Monaro IBRA subregion and within Goulburn Mulwaree Local Government Area

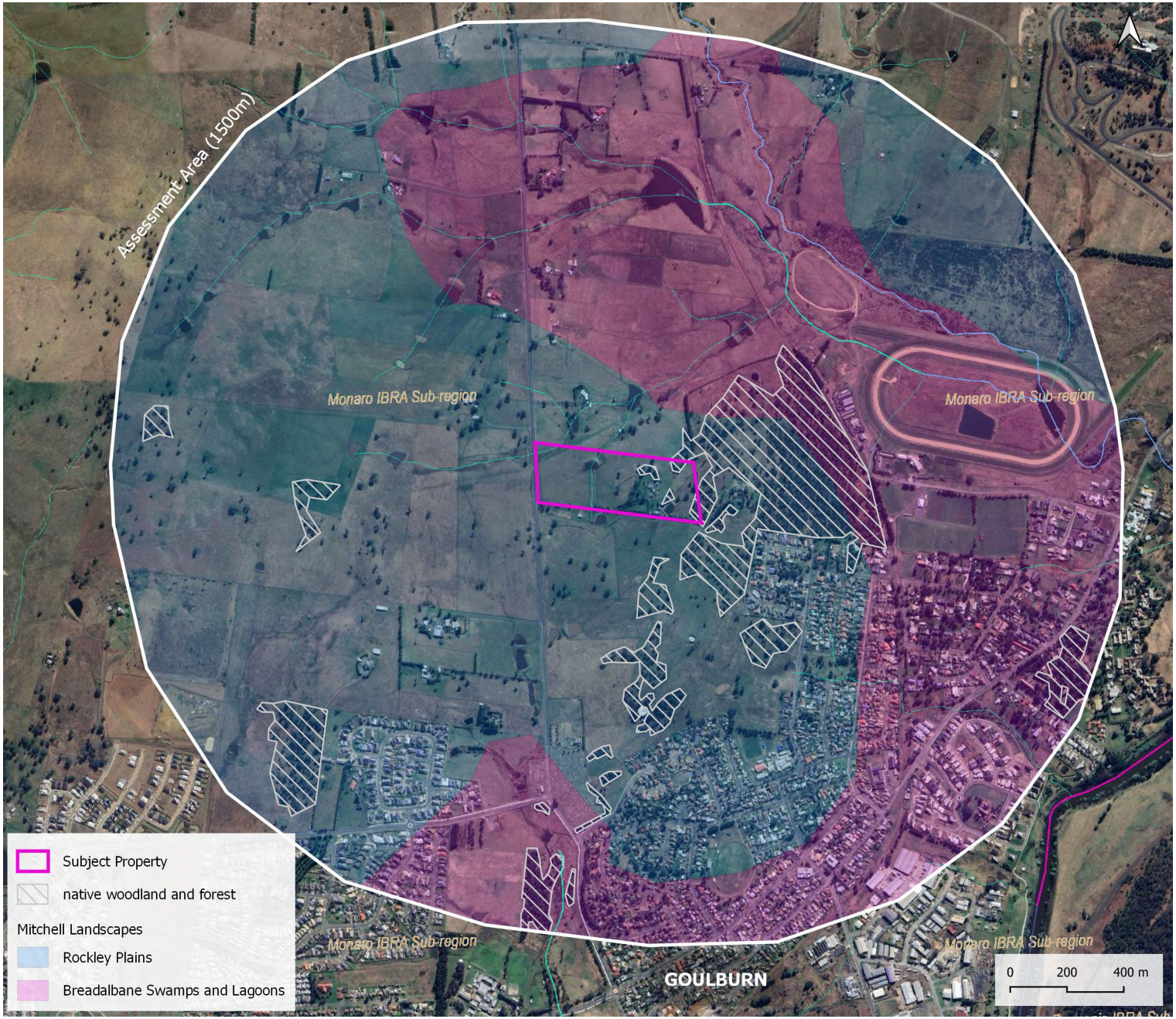

Figure 3 Native vegetation & habitats

Underlying aerial image is from Nearmap (28/01/2023).

Areas not shaded do not contain native vegetation

Figure 4 Subdivision layout

Base plan prepared by SOWDES Pty Ltd (1 November 2022)

Figure 5 Field survey locations

Underlying aerial image is from Nearmap (28/01/2023).

BAM-VIS plot is 50m x 20m (red dot indicates the start of the transect, being the end where the 20x20m plot is located).

Figure 6 Thresholds for assessment and off-setting

Underlying aerial image is from Nearmap (28/01/2023).

Appendix A: BDAR requirements compliance

Table 26 Assessment of compliance with BDAR minimum information requirements

BDAR section	BAM ref.	BAM requirement	Chapter ref. in the BDAR
Introduction	Chapters 2 and 3	**Information**	
		Introduction to the biodiversity assessment including:	–
		☒ brief description of the proposal	Ch 1.1.1
		☒ identification of subject land boundary, including: ☒ operational footprint ☒ construction footprint indicating clearing associated with temporary/ancillary construction facilities and infrastructure	Ch 1.1.3
		☒ general description of the subject land	Ch 1.1.3
		☒ sources of information used in the assessment, including reports and spatial data	Ch 1.1.4 & Ch 1.5
		☒ identification and justification for entering the BOS	Ch 1.2
		Maps and tables	
		☒ Map of the subject land boundary showing the final proposal footprint, including the construction footprint for any clearing associated with temporary/ancillary construction facilities and infrastructure	Figure 4

BDAR section	BAM ref.	BAM requirement	Chapter ref. in the BDAR
Landscape	Sections 3.1 and 3.2, Appendix E	**Information**	
		Identification of site context components and landscape features, including:	–
		☒ general description of subject land topographic and hydrological setting, geology and soils	Ch 1.1.3 Ch 3.2
		☒ per cent native vegetation cover in the assessment area (as described in BAM Section 3.2)	Ch 3.3
		☒ IBRA bioregions and subregions (as described in BAM Subsection 3.1.3(2.))	Ch 3.2.1
		☒ rivers and streams classified according to stream order (as described in BAM Subsection 3.1.3(3.) and Appendix E)	Ch 3.2.2
		☒ wetlands within, adjacent to and downstream of the site (as described in BAM Subsection 3.1.3(3.))	Ch 3.2.2
		☒ connectivity of different areas of habitat (as described in BAM Subsection 3.1.3(5–6.))	Ch 3.2.3
		☒ karst, caves, crevices, cliffs, rocks and other geological features of significance and for vegetation clearing proposals, soil hazard features (as described in BAM Subsections 3.1.3(7.) and 3.1.3(12.))	Ch 3.2.4
		☐ areas of outstanding biodiversity value occurring on the subject land and assessment area (as described in BAM Subsection 3.1.3(8–9.)) – *not applicable*	Ch 3.2.5
		☐ any additional landscape features identified in any SEARs for the proposal – *not applicable*	Ch 3.2.7
		☒ NSW (Mitchell) landscape on which the subject land occurs	Ch 3.2.6
		☒ details of field reconnaissance undertaken to confirm the extent and condition of landscape features and native vegetation cover (as described in Operational Manual Stage 1 Section 2.4)	Ch 2.1
		Maps and tables	
		☒ Site Map ☒ Property boundary ☒ Boundary of subject land ☒ Cadastre of subject land (including labelling of Lot and DP or section plan if relevant) ☒ Landscape features identified in BAM Subsection 3.1.3	Figure 1
		☒ Location Map ☒ Digital aerial photography at 1:1,000 scale or finer	Figure 2

BDAR section	BAM ref.	BAM requirement	Chapter ref. in the BDAR
		☒ Boundary of subject land ☒ Assessment area (i.e. the subject land and either 1500 m buffer area or 500 m buffer for linear development) ☒ Landscape features identified in BAM Subsection 3.1.3 ☒ Additional detail (e.g. local government area boundaries) relevant at this scale	
		Landscape features identified in BAM Subsection 3.1.3 and to be shown on the Site Map and/or Location Map include:	–
		☒ IBRA bioregions and subregions ☒ rivers, streams and estuaries ☐ wetlands and important wetlands – *none relevant* ☒ connectivity of different areas of habitat ☐ karst, caves, crevices, cliffs, rocks and other geological features of significance and if required, soil hazard features – *none relevant* ☐ areas of outstanding biodiversity value occurring on the subject land and assessment area – *none relevant* ☐ any additional landscape features identified in any SEARs for the proposal – *none relevant* ☒ NSW (Mitchell) landscape on which the subject land occurs	Figure 1; & Figure 2
		Data	
		☒ All report maps as separate jpeg files	–
		Individual digital shape files of – *cannot be uploaded to BOAMS – files can be provided upon request.*	–
		☐ subject land boundary	–
		☐ assessment area (i.e. subject land and 1500 m buffer area) boundary	–
		☐ cadastral boundary of subject land	–
		☐ areas of native vegetation cover	–
		☐ landscape features	–

BDAR section	BAM ref.	BAM requirement	Chapter ref. in the BDAR
Native vegetation	Chapter 4, Appendix A and Appendix H	**Information**	
		☒ Identify native vegetation extent within the subject land, including cleared areas and evidence to support differences between mapped vegetation extent and aerial imagery (as described in BAM Section 4.1(1–3.) and Subsection 4.1.1)	Ch 4.1 & Figure 3
		☒ Provide justification for all parts of the subject land that do not contain native vegetation (as described in BAM Subsection 4.1.2)	Ch 4.1.2
		☒ 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)	Ch 2.2.1
		☒ Describe the systematic field-based floristic vegetation survey undertaken in accordance with BAM Section 4.2	Ch 2.2.3
		☐ Where relevant, describe the use of more appropriate local data, provide reasons that support the use of more appropriate local data and include the written confirmation from the decision-maker that they support the use of more appropriate local data (as described in BAM Subsection 1.4.2 and Appendix A) – *not relevant*	
		For each PCT within the subject land, describe:	–
		☒ PCT name and ID	Ch 4.2 Table 5
		☒ vegetation class	Ch 4.2 Table 5
		☒ extent (ha) within subject land	Ch 4.2 Table 5
		☒ evidence used to identify a PCT including any analyses undertaken, references/sources, existing vegetation maps (BAM Section 4.2(1–3.))	Ch 4.2.2.3
		☒ plant species relied upon for identification of the PCT and relative abundance of each species	Ch 4.2.2.3 & Appendix C
		☒ if relevant, TEC status including evidence used to determine vegetation is the TEC (BAM Subsection 4.2.2(1–2.))	Ch 4.2.2.4 & 4.2.2.5
		☒ estimate of per cent cleared value of PCT (BAM Subsection 4.2.1(5.))	Ch 4.2 Table 5
		Describe the vegetation integrity assessment of the subject land, including:	–

BDAR section	BAM ref.	BAM requirement	Chapter ref. in the BDAR
		☒ identification and mapping of vegetation zones (as described in BAM Subsection 4.3.1)	Ch 4.4 & Figure 3
		☒ description of vegetation zones within the subject land (as described in Operational Manual Stage 1 Table 2 and Subsection 3.3.2)	Ch 4.4
		☒ area (ha) of each vegetation zone	Ch 4.4 Table 7
		☒ assessment of patch size (as described in BAM Subsection 4.3.2)	Ch 4.4 Table 7
		☒ survey effort (i.e. number of vegetation integrity survey plots) as described in BAM Subsection 4.3.4(1–2.)	Ch 4.4 Table 7
		☒ use of relevant benchmark data from BioNet Vegetation Classification (as described in BAM Subsection 4.3.3(5.))	Ch 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): - *not relevant*	–
		☐ identify the PCT or vegetation class for which local benchmark data will be applied	
		☐ identify published sources of local benchmark data (if benchmarks obtained from published sources)	
		☐ describe methods of local benchmark data collection (if reference plots used to determine local benchmark data)	
		☐ provide justification for use of local data rather than BioNet Vegetation Classification benchmark values	
		☐ provide written confirmation from the decision-maker that they support the use of local benchmark data	
		Maps and tables	
		☒ Map of native vegetation extent within the subject land at scale not greater than 1:10,000 including identification of all areas of native vegetation including areas that are ground cover only, cleared areas (as described in BAM Section 4.1(1–3.)) and all parts of the subject land that do not contain native vegetation (BAM Subsection 4.1.2)	Figure 3
		☒ Map of PCTs within the subject land (as described in BAM Section 4.2(1.))	Figure 3
		☒ Map of vegetation zones within the subject land (as described in BAM Subsection 4.3.1)	Figure 3
		☒ Map the location of floristic vegetation survey plots and vegetation integrity survey plots relative to PCT boundaries	Figure 5

BDAR section	BAM ref.	BAM requirement	Chapter ref. in the BDAR
		☒ Map of TEC distribution on the subject land and table of TEC listing, status and area (ha) –	Figure 3 & Ch 4.3 Table 6
		☒ 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 7
		Table of current vegetation integrity scores for each vegetation zone within the site and including:	–
		☒ composition condition score	Ch 4.5.3 Table 8
		☒ structure condition score	
		☒ function condition score	
		☒ presence of hollow bearing trees	
		Data	
		☒ All report maps as separate jpeg files	–
		☒ Plot field data (MS Excel format)	Appendix C
		☒ Plot field datasheets	Appendix C
		Digital shape files of: - *cannot be uploaded to BOAMs – files can be provided upon request*	–
		☐ PCT boundaries within subject land	–
		☐ TEC boundaries within subject land	–
		☐ vegetation zone boundaries within subject land	–
		☐ floristic vegetation survey and vegetation integrity plot locations	–
Threatened species	Chapter 5	**Information**	
		Identify ecosystem credit species likely to occur on the subject land, including:	–
		☒ list of ecosystem credit species derived from the BAM-C (as described in BAM Subsection 5.1.1 and Section 5.2(1.))	Ch 5.1.1 Table 9
		☒ 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)	Ch 5.1.1.1
		☐ justification for addition of any ecosystem credit species to the list – *not relevant*	Ch 5.1.1.2
		Identify species credit species likely to occur on the subject land, including:	–

BDAR section	BAM ref.	BAM requirement	Chapter ref. in the BDAR
		☒ list of species credit species derived from the BAM-C (as described in BAM Subsection 5.1.1)	Ch 5.1.2 Tables 10 & 11
		☒ 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)	Ch 5.1.2.1 & Ch 5.1.2.3
		☒ 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)	Ch 5.1.2.3
		☐ justification for addition of any species credit species to the list – *not relevant*	Ch 5.1.2.2 & Ch 5.1.2.4
		From the list of candidate species credit species, identify:	–
		☐ species assumed present within the subject land (if relevant) (as described in BAM Subsection 5.2.4(2.a.)) – *not relevant* ☐ 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.)) – *not relevant* ☐ species for which targeted surveys are to be completed to determine species presence (BAM Subsection 5.2.4(2.b.)) - *not relevant* ☐ species for which an expert report is to be used to determine species presence (BAM Subsection 5.2.4(2.c.)) - *not relevant*	Ch 5.2
		Present the outcomes of species credit species assessments from:	–
		☐ threatened species survey (as described in BAM Section 5.2.4) - *not required*	Ch 5.3
		☐ 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) – *not relevant*	
		Where survey has been undertaken include detailed information on:	–
		☒ survey method and effort (as described in BAM Section 5.3)	Ch 2.3 & 2.4; Figure 5
		☐ 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 - *not required*	Ch 2.3 & Ch 2.4
		☐ 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 - *not required*	Ch 5.3
		☒ survey personnel and relevant experience	Declarations - xii

BDAR section	BAM ref.	BAM requirement	Chapter ref. in the BDAR
		☒ describe any limitations to surveys and how these were addressed/overcome	Ch 2.6
		Where an expert report has been used in place of survey (as described in BAM Section 5.3, Box 3), include: - *not relevant*	–
		☐ justification of the use of an expert report ☐ identify the expert, provide evidence of their expert credentials and departmental approval of expert status ☐ all requirements of Box 3 have been addressed in the expert report	
		Where use of local data is proposed (BAM Subsection 1.4.2): - *not relevant*	–
		☐ identify relevant species ☐ identify data to be amended ☐ identify source of information for local data, e.g. published literature, additional survey data, etc. ☐ justify use of local data in preference to VIS Classification or TBDC data	
		☐ provide written confirmation from the decision-maker that they support the use of local data	
		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: - *not relevant*	-
		☐ the unit of measure for each species is documented	
		for species assessed by area:	
		☐ the polygon includes the extent of suitable habitat for the target species within the subject land (as described in BAM Subsection 5.2.5)	
		☐ 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	
		for species assessed by counts of individuals: - *not relevant*	–
		☐ the number of individual plants present on the subject land (as described in BAM Subsection 5.2.5(3.))	
		☐ the method used to derive this number (i.e. threatened species survey or expert report) and evidence-based justification for the approach taken	
		☐ 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	

BDAR section	BAM ref.	BAM requirement	Chapter ref. in the BDAR
		☐ Identify the biodiversity risk weighting for each species credit species identified as present within the subject land (as described in BAM Section 5.4) – *not relevant*	-
		Maps and tables	
		☒ Table showing ecosystem credit species in accordance with BAM Subsection 5.1.1, and identifying:	Table 9
		☒ the ecosystem credit species removed from the list	Ch 5.1.1.1
		☒ the sensitivity to gain class of each species	Table 9
		☒ Table detailing species credit species in accordance with BAM Section 5.2 and identifying:	Tables 10 & 11
		☒ 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	Ch 5.1.2.1 & Ch 5.1.2.3
		☐ the candidate species credit species not recorded on the subject land as determined by targeted survey, expert report or important habitat map - *not relevant*	-
		☐ 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) – *not relevant*	-
		☐ 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) – *not relevant*	-
		Data	
		☐ Digital shape files of suitable habitat identified for survey for each candidate species credit species – *not relevant*.	-
		☒ Survey locations including GPS coordinates of any plots, transects, grids	locations shown on Figure 5
		☐ Digital shape files of each species polygon including GPS coordinates of located individuals – *not relevant*	-
		☐ Species polygon map in jpeg format – *not relevant*	-
		☐ Expert reports and any supporting data used to support conclusions of the expert report – *not relevant*	
		☒ Field datasheets detailing survey information including prevailing conditions, date, time, equipment used, etc.	Appendix C

BDAR section	BAM ref.	BAM requirement	Chapter ref. in the BDAR
Prescribed impacts	Chapter 6	**Information**	
		Identify potential prescribed biodiversity impacts on threatened entities, including:	–
		☐ karst, caves, crevices, cliffs, rocks and other geological features of significance (as described in BAM Subsection 6.1.1) – *not relevant* ☒ occurrences of human-made structures and non-native vegetation (as described in BAM Subsection 6.1.2) ☐ corridors or other areas of connectivity linking habitat for threatened entities (as described in BAM Subsection 6.1.3) - *not relevant* ☒ waterbodies or any hydrological processes that sustain threatened entities (as described in BAM Subsection 6.1.4)	Ch 6 Table 12
		☐ 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) – *not relevant*	
		☒ 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) –	
		☒ Identify a list of threatened entities that may be dependent upon or may use habitat features associated with any of the prescribed impacts –	Table 12
		☒ 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)	Table 12
		Where the proposed development is for a wind farm: – *not relevant*	–
		☐ 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)	
		☐ provide details of targeted survey for candidate species of wind farm developments undertaken in accordance with BAM Subsection 6.1.5(2–3.)	
		☐ 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.))	

BDAR section	BAM ref.	BAM requirement	Chapter ref. in the BDAR
		Where the proposal may result in vehicle strike: –	–
		☒ identify a list of threatened fauna or protected fauna species that are part of a TEC and at risk of vehicle strike due to the proposal	Table 12
		Maps and tables	
		☒ Map showing location of any prescribed impact features (i.e. karst, caves, crevices, cliffs, rocks, human-made structures, etc.) – *waterbodies, vegetation and structures are clear on the aerial image base for Figure 1.*	Figure 1
		☐ Map showing location of potential vehicle strike locations – *no specific locations identified.*	
		☐ 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) – *not relevant*	
		Data	
		☐ Digital shape files of prescribed impact feature locations – *features shown on underlying aerial image, not available as shape files*	
		☒ Prescribed impact features map in jpeg format -	Figure 1
Avoid and minimise impacts	Chapter 7	**Information**	
		Demonstration of efforts to avoid and minimise impacts on biodiversity values (including prescribed impacts) associated with the proposal location in accordance with Chapter 7, including an analysis of alternative:	Ch 7
		☒ modes or technologies that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed mode or technology –	Ch 7.1.2
		☐ routes that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed route – *not relevant*	
		☐ alternative locations that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed location – *not relevant*	Ch 7.1.1
		☒ 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	Ch 7.1.1 & 7.2.1
		☒ 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)	Ch 7.1.2 & 7.2.2

BDAR section	BAM ref.	BAM requirement	Chapter ref. in the BDAR
		☒ 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.))	Ch 7.1 & 7.2
		☒ Detail measures or options considered but not implemented because they are not feasible and/or practical (e.g. due to site constraints)	Ch 7.3
		Maps and tables	
		☒ Table of measures to be implemented to avoid and minimise the impacts of the proposal, including action, outcome, timing and responsibility	Table 13
		☐ Map of alternative footprints considered to avoid or minimise impacts on biodiversity values; and of the final proposal footprint, including construction and operation – *not applicable*	
		☒ Maps demonstrating indirect impact zones where applicable - *adjacent lands shown on Figure 1*	Figure 1
		Data	
		Digital shape files of: -	–
		☐ alternative and final proposal footprint - *cannot be uploaded to BOAMs – file can be provided upon request*	-
		☐ direct and indirect impact zones - *not applicable*	–
		☒ Maps in jpeg format -	-
Assessment of impacts	Chapter 8, Sections 8.1 and 8.2	**Information**	
		☒ Determine the impacts on native vegetation and threatened species habitat, including a description of direct impacts of clearing of native vegetation, threatened ecological communities and threatened species habitat (as described in BAM Section 8.1)	Ch 8.1
		Assessment of indirect impacts on vegetation and threatened species and their habitat including (as described in BAM Section 8.2):	Ch 8.2
		☒ description of the nature, extent, frequency, duration and timing of indirect impacts of the proposal	Table 16
		☒ documenting the consequences to vegetation and threatened species and their habitat including evidence-based justifications	Table 16
		☒ reporting any limitations or assumptions, etc. made during the assessment	Ch 2.6
		☒ identification of the threatened entities and their habitat likely to be affected –	Ch 10.1
		Assessment of prescribed biodiversity impacts (as described in BAM Section 8.3) including:	Ch 8.3

BDAR section	BAM ref.	BAM requirement	Chapter ref. in the BDAR
		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 – *not relevant*	
		☐ human-made structures - *not relevant*	
		☐ non-native vegetation - *not relevant*	
		☐ connectivity of different areas of habitat of threatened species that facilitates the movement of those species across their range - *not relevant*	
		☐ movement of threatened species that maintains their life cycle - *not relevant*	
		☐ water quality, waterbodies and hydrological processes that sustain threatened species and threatened ecological communities - *not relevant*	
		☐ assessment of the impacts of wind turbine strikes on protected animals - *not relevant*	
		☒ assessment of the impacts of vehicle strikes on threatened species of animals or on animals that are part of a TEC	Ch 8.3.1
		☒ evaluate the consequences of prescribed impacts	Ch 8.3.1
		☒ describe impacts that are uncertain	throughout relevant sections & Ch 8.5
		☒ document limitations to data, assumptions and predictions	throughout relevant sections
		Maps and tables	
		☒ Table showing change in vegetation integrity score for each vegetation zone as a result of identified impacts	Table 22
		Data	
		N/A	–
Mitigation and management of impacts	Chapter 8, Sections 8.4 and 8.5	**Information**	
		Identification of measures to mitigate or manage impacts in accordance with the recommendations in BAM Sections 8.4 and 8.5 including:	Ch 8.4
		☒ techniques, timing, frequency and responsibility – *to the extent appropriate for a planning proposal. Further detail should be provided at the development application stage.*	Ch 8.4

BDAR section	BAM ref.	BAM requirement	Chapter ref. in the BDAR
		☒ identify measures for which there is risk of failure ☒ evaluate the risk and consequence of any residual impacts	
		☐ document any adaptive management strategy proposed – *none proposed at this planning proposal stage*	Ch 8.5
		Identification of measures for mitigating impacts related to:	
		☒ displacement of resident fauna (as described in BAM Subsection 8.4.1(2.)) ☒ indirect impacts on native vegetation and habitat (as described in BAM Subsection 8.4.1(3.)) ☒ mitigating prescribed biodiversity impacts (as described in BAM Subsection 8.4.2)	Ch 8.4
		☐ Details of the adaptive management strategy proposed to monitor and respond to impacts on biodiversity values that are uncertain (BAM Section 8.5) - *none proposed at this planning proposal stage*	
		Maps and tables	
		☐ Table of measures to be implemented before, during and after construction to mitigate and manage impacts of the proposal, including action, outcome, timing and responsibility - *detail to be provided at the development application stage*	
		Data	
		N/A	–
Impact summary	Chapter 9	**Information**	
		Identification and assessment of impacts on TECs and threatened species that are at risk of a serious and irreversible impacts (SAII, in accordance with BAM Section 9.1) including: -	Ch 9.1
		☒ addressing all criteria in Subsection 9.1.1 for each TEC listed as at risk of an SAII present on the subject land	
		☒ for each TEC, report the extent of the TEC in NSW	
		☐ addressing all criteria in Subsection 9.1.2 for each threatened species at risk of an SAII present on the subject land - *not relevant*	
		☐ for each threatened species, report the population size in NSW	
		☒ documenting assumptions made and/or limitations to information ☒ documenting all sources of data, information, references used or consulted ☒ clearly justifying why any criteria could not be addressed	

BDAR section	BAM ref.	BAM requirement	Chapter ref. in the BDAR
		☒ Identification of impacts requiring offset in accordance with BAM Section 9.2	Ch10.1 Table 22
		☒ Identification of impacts not requiring offset in accordance with BAM Subsection 9.2.1(3.)	Ch10.1 Table 21
		☒ Identification of areas not requiring assessment in accordance with BAM Section 9.3	Figure 6
		Maps and tables	
		☒ Map showing the extent of TECs at risk of an SAII within the subject land	Figure 3
		☐ Map showing location of threatened species at risk of an SAII within the subject land – *not relevant*	
		Map showing location of:	
		☒ impacts requiring offset	Figure 6
		☒ impacts not requiring offset	Figure 6
		☒ areas not requiring assessment	Figure 6
		Data	
		Digital shape files of: - *files not able to be uploaded to BOAMS – shape files can be provided upon request.*	
		☐ extent of TECs at risk of an SAII within the subject land	
		☐ location of threatened species at risk of an SAII within the subject land – *not relevant*	
		☐ boundary of impacts requiring offset	
		☐ boundary of impacts not requiring offset	
		☐ boundary of areas not requiring assessment	
		☒ Maps in jpeg format -	Figures 3 and 6
Impact summary	Chapter 10	**Information**	
		Ecosystem credits and species credits that measure the impact of the development on biodiversity values, including:	–
		☒ future vegetation integrity score for each vegetation zone within the subject land (Equation 25 and Equation 26 in BAM Appendix H) ☒ change in vegetation integrity score (BAM Subsection 8.1.1) ☒ number of required ecosystem credits for the direct impacts of the proposal on each vegetation zone within the subject land (BAM Subsection 10.1.2)	Ch 10.1 Table 22
		☒ biodiversity risk weighting for each	Ch 10.1 Table 22

BDAR section	BAM ref.	BAM requirement	Chapter ref. in the BDAR
		☒ number of required species credits for each candidate threatened species that is directly impacted on by the proposal (BAM Subsection 10.1.3) – *not relevant*	
		Maps and tables	
		☒ Table of PCTs requiring offset and the number of ecosystem credits required	Table 22
		☒ Table of threatened species requiring offset and the number of species credits required – *not relevant*	
		Data	
		☐ Submitted proposal in the BAM Calculator – *this is a preliminary BDAR for a planning proposal*	
Biodiversity credit report	Chapter 10	**Information**	
		☒ Description of credit classes for ecosystem credits and species credits at the development or clearing site or land to be biodiversity certified (BAM Section 10.2)	Ch 11.1 – Table 25
		☒ BAM credit report in pdf format	Appendix E
		Maps and tables	
		☒ Table of credit class and matching credit profile	Table 25
		Data	
		☒ BAM credit report in pdf format	Appendix E

Appendix B: Matters of national environmental significance

MNES relevant to the project:

Native vegetation within the subject land is a plant community type associated with *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland*, which is listed as critically endangered under the EPBC Act. However, vegetation within the subject land does not meet the minimum condition criteria to be included within the EPBC Act listing. Refer to Ch 4.2.2.5.

Thirty-four individuals of the endangered tree Paddy's River Box *Eucalyptus macarthurii* have been planted along the private access road in the south of the subject land. The species is not local to the area and is not naturally part of a local plant community type.

Six of the threatened fauna species predicted to occur (ecosystem credit species) are listed as threatened under the Commonwealth EPBC Act (refer to Ch 5.1.1 and Table 9):

* Regent Honeyeater (foraging) *Anthochaera phrygia*;
* Australasian Bittern *Botaurus poiciloptilus*;
* Spotted-tailed Quoll *Dasyurus maculatus*;
* White-throated Needletail *Hirundapus caudacutus*;
* Swift Parrot (foraging) *Lathamus discolor*;
* Grey-headed Flying-fox (foraging) *Pteropus poliocephalus*.

These six species are mobile and wide-ranging and do not reside or breed within the subject land, based on a combination of lack of records, lack of resources and habitat constraints.

No other threatened species are known or likely to use the subject land.

A number of migratory bird species listed under the EPBC Act are known to occur in the region. Many of these species could fly over the subject land on occasions, and could opportunistically use features present.

It is not likely, however, that any migratory species would use the subject land regularly or be reliant upon it in any way. The proposed subdivision and subsequent development would not be likely to affect any migratory species listed under the EPBC Act

Measures to avoid and minimise impacts on MNES:

Measures to avoid and minimise impacts on biodiversity and MNES are described in Chapter 7 of this BDAR.

Impacts to MNES:

The proposed subdivision would result in a loss of approximately 0.66 ha of native woodland providing theoretical habitat for the Six predicted MNES ecosystem credit species. Refer to Chapters 8.1 and 8.2.

The proposal would additionally require removal of 26 of individuals of Paddy's River Box *Eucalyptus macarthurii*.

Mitigation measures relevant to MNES:

Mitigation measures are discussed in Chapter 8.4.

Final offset requirements for MNES:

Based on current BAM-Calculator outputs, impacts on predicted ecosystem credit species would be offset through retirement of 10 ecosystem credits (PCT 3376).

Loss of Paddy's River Box would be compensated through collection of seed of individuals present for propagation and replanting within the property and/or in other appropriate conservation projects.

Refer to Chapter 10.1.

Appendix C: Vegetation survey data

Table 27 Vegetation survey data and locations

plot	pct	area	patchsize	condition class	zone	easting	northing	bearing	compTree	compShrub	compGrass	compForbs	compFerns	compOther	strucTree	strucShrub	strucGrass	strucForbs	strucFerns	strucOther	funLargeTrees	funHollowtrees	funLitterCover	funLenFallenLogs	funTreeStem5to9	funTreeStem10to19	funTreeStem20to29	funTreeStem30to49	funTreeStem50to79	funTreeRegen	funHighThreatExotic	Plot-based vegetation survey?	Vegetation integrity survey?
1	3376	0.66	40	remnant trees	55	750668	6155298	273	2	0	3	3	0	0	12.5	0	2.2	0.3	0	0	4	2	15	12	x	x	x	✓	n/a	x	3.2	☒ Yes ☐ No	☒ Yes ☐ No

E: 750668 N: 6155298 55H

BAM Plot – Field Survey Form

Site Sheet no:

Survey Name	Plot Identifier	Recorders
44 Middle Arm	1	R Hogan + D Clarke.

Date	Zone	Datum	IBRA region	Photo #	Zone ID
29/3/23	– –			✓	Local.

Easting	Northing	Plot Dimensions (e.g. 20 x 20 (in 20 x 50))	Orientation of midline from the 0 m point.
-34.713665	149.737125	20x20 2x50	273° W

Likely Vegetation Class	Confidence: H M L
grassy woodland	

Plant Community Type	EEC:	Confidence: H M L
box-gum	✓	

Record easting and northing from the plot marker. If applicable, orient picket so that perforated rib points along direction of midline.
Dimensions (Shape) of 0.04 ha base plot inside 0.1 ha FA plot should be identified, magnetic bearing taken along midline.

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	2
	Shrubs	0
	Grasses etc.	3
	Forbs	3
	Ferns	0
	Other	0
Sum of Cover of native vascular plants by growth form group	Trees	12.5
	Shrubs	0
	Grasses etc.	2.2
	Forbs	0.3
	Ferns	0
	Other	0
High Threat Weed cover %		3.2

This table may be completed after entering data into available tools. It is not required while in the field.

BAM Attribute (20 x 50 m plot)	Stem Classes and Hollows		
dbh	Euc*	Non Euc	Hollows†
80 + cm	I		II (2)
50 – 79 cm	III		
30 – 49 cm	II		Hollows 20cm+
20 – 29 cm			—
10 – 19 cm			
5 – 9 cm			
< 5 cm			This size class records tree regeneration
Length of logs (m) (≥10 cm diameter, >50 cm in length)			total 12m

Record **living** eucalypt* (Euc*) and **living native** non-eucalypt (Non Euc) stems separately

Data needed is presence only (tick) unless a 'large tree' for that veg class.

* includes all species of *Eucalyptus*, *Corymbia*, *Angophora*, *Lophostemon* and *Syncarpia*

† For **hollows** count only the presence of a stem containing hollows, not the count of hollows in that stem. Only count as 1 stem per tree where tree is multi-stemmed. The hollow-bearing stem may be a dead stem.

Each size class is noted as present by the **living tree stems** only. Depending on the Vegetation Class, DBH values and counts may be needed for a size class. For a **multi-stemmed tree**, only the largest living stem is included in the count/estimate if it is required by the large tree category for that vegetation class.
Hollows at least 20cm across are recorded for the purposes of habitat of some threatened species.

BAM Attribute (1 x 1 m plots)	Litter cover (%)	Bare ground cover (%)	Cryptogam cover (%)	Rock cover (%)
Subplot score (% in each)	10 5 10 20 30			
Average of the 5 subplots	15%			

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots located on alternate sides and 5 m from the plot midline at the locations 5, 15, 25, 35, and 45 m along the midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Within these 1 m x 1 m plots assessors may also record the cover of rock, bare ground and cryptogam soil crusts. Collection of these data is optional - the data do not currently contribute to assessment scores, they hold potential value for future vegetation integrity assessment attributes and benchmarks, and for enhancing PCT description.

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type		Landform Element		Landform Pattern		Microrelief	
Lithology		Soil Surface Texture		Soil Colour		Soil Depth	
Slope		Aspect		Site Drainage		Distance to nearest water and type	

Plot Disturbance	Severity code	Age code
Clearing (inc. logging)		
Cultivation (inc. pasture)		
Soil erosion		
Firewood / CWD removal		
Grazing (identify native/stock)		
Fire damage		
Storm damage		
Weediness		
Other		

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Free Text Section for brief site description

remnant native eucalypts with exotic grass understorey and exotic shrubs (scattered Boxthorn)

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

Free Text Section for brief site description
Plot in a generally poor condition with highly degraded groundlayer. Long-term history of cattle grazing. Some remnant trees. No native midstorey. Groundcover was mostly exotic. Note the two yellow highlighted species below – these were dead – likely sprayed with herbicide but may regrow in time.

400 m^2 plot: Sheet 2_ of 3_	Survey Name	Plot Identifier	Recorders
Date: 29/3/2023	44 Middle Arm Rd, Middle Arm	001	Dan Clarke

	GF Code	*Species name*	N, E or HTE	Cover	Abund	Stratum
		NATIVES				
TG	T	*Eucalyptus melliodora*	N	5	1	UPPER
TG	T	*Eucalyptus blakelyi*	N	7.5	1	UPPER
	G	**Dactylis glomerata*	E	10	500	GROUND
	G	**Paspalum dilatatum*	HTE	1	200	GROUND
	F	**Hypochaeris radicata*	E	0.5	1000	GROUND
	F	**Plantago lanceolata*	E	0.1	100	GROUND
	F	**Modiola caroliniana*	E	0.1	50	GROUND
	S	**Lycium ferocissimum*	HTE	2	10	MID
	F	**Cirsium vulgare*	E	0.1	10	GROUND
	F	**Brassica rapa*	E	0.1	20	GROUND
	G	**Eleusine indica*	E	5	500	GROUND
	F	**Taraxacum officinale*	E	0.25	500	GROUND
FG	F	*Rumex brownii*	N	0.1	10	GROUND
GG	G	*Panicum effusum*	N	0.1	50	GROUND
	F	**Hypericum perforatum*	HTE	0.1	50	GROUND
	F	**Rumex acetosella*	E	0.1	100	GROUND
	F	**Echium plantagineum*	E	0.1	200	GROUND
	V	**Cyperus eragrostis*	HTE	0.1	20	GROUND
	G	**Bromus catharticus*	E	1	200	GROUND
	F	**Sonchus oleraceus*	E	0.1	10	GROUND
	G	**Lolium perenne*	E	2	500	GROUND
	F	**Malva parviflora*	E	0.1	20	GROUND
	F	**Solanum chenopodioides*	E	0.1	1	GROUND
FG	F	*Portulaca oleracea*	N	0.1	10	GROUND
	G	**Avena sativa*	E	0.1	10	GROUND
	F	**Polygonum aviculare*	E	0.1	100	GROUND
	G	**Digitaria sanguinalis*	E	1	250	GROUND
GG	G	*#Cynodon dactylon*	NLN	2	20	GROUND
	F	**Paronychia brasiliana*	E	0.1	20	GROUND
	F	**Conyza* sp.	E	0.1	1	GROUND
	F	**Amaranthus viridis*	E	0.1	1	GROUND
GG	G	*Digitaria didactyla*	N	0.1	10	GROUND
FG	F	*Dysphania pumilio*	N	0.1	10	GROUND

Preliminary botanical survey – 18th October 2022

General findings:

The main trend regarding vegetation onsite was that of remnant native trees (with exotic plantings) existing over a groundlayer dominated by exotic species.

The paddocks on site have been improved for agriculture and very little native components remain in the groundlayer.

Remnant canopy trees observed, with some location information, consisted of:

* *Eucalyptus mellidora* (Yellow Box) – spread across most of the site. Some trees are quite large;
* *Eucalyptus blakelyi* (Blakely's Red Gum) – mostly occurring in the south-east corner of the site and eastern boundary-area, on higher ground but with some trees closer to the house onsite.
* 1 x *Eucalyptus bridgesiana* (Apple Box), in the south-east corner of the site;
* *Eucalyptus amplifolia* (Cabbage Gum) – located on lower ground to the east, north-east and north of the house.

There were some instances of planted eucalypts onsite, consisting of:

* 2 x *Eucalyptus globulus* (Tasmanian Blue Gum) (south of the house at OP3)
* 2 x *Eucalyptus* – (Ironbark) – to the north of the house in an inner fenced area. These were in very poor health. They are tentatively identified as non-local *E. leucoxylon* (Red-flowered Yellow Gum).

Adjoining the southern boundary, a row of *Eucalyptus macarthurii* (Paddys River Box) is planted on the neighbouring land with branches overhanging the site.

Other instances of planted native vegetation include advanced shrubs of *Dodonaea viscosa* subsp. *angustifolia*, planted near the house (a local species in this area). These appeared to be in poor condition with all leaves purple in colour. Some *Acacia baileyana* (Cootamundra Wattle) were growing at OP5. A planted *Brachychiton populneus* (Kurrajong) was also in the immediate grounds of the house.

Rows of exotic conifers have been planted in a triangle formation to the south / south-east of the house, identified as *Cupressus leylandii* (Leyland Cypress).

The open grassland areas are in very poor condition in terms of presence of native grasses and forbs. Exotic species were strongly dominant, always with over 90% cover. The main species included **Dactylis glomerata* (Cocksfoot Grass), *Lolium perenne* (Rye Grass), *Bromus catharticus* (Prairie Grass), Festuca pratensis (Blue Fescue), *Phalaris aquatica* (Phalaris) and *Trifolium subterraneum* (Subterraneum Clover).

Native groundlayer species were seldom observed but included *Austrostipa scabra* (Spear Grass) and *A. bigeniculata*, as well as *Juncus usitatus* (Common Big Rush) on the dam fringes.

Spot surveys results:

Observation Point: 1	
GPS: 750529, 6155189 (MGA55)	
Natives:	Exotic / Non-local natives
Eucalyptus mellidora	**Cupressus x leylandii*
	**Lolium rigidum*
	**Bromus catharticus*
	**Arctotheca calendula*
	**Lycium ferocissimum*
	**Hordeum leporinum*
Comments: Remnant trees on access driveway overlying exotic vegetation. No discernible native groundlayer.	

Observation Point: 2	
GPS: 750495, 6155149 (MGA55)	
Natives:	Exotic / Non-local natives
None observed	**Cupressus x leylandii*
	**Bromus catharticus*
	**Festuca pratensis*
	**Trifolium subterraneum*
	**Dactylis glomerata*
Comments: No observable native components	

Observation Point: 3	
GPS: 750551, 6155143 (MGA55)	
Natives:	Exotic / Non-local natives
	#*Eucalyptus globulus* (planted)
	#*Eucalyptus macarthurii* (planted)
	**Bromus catharticus*
	**Arctotheca calendula*
	**Modiola caroliniana*
	**Sonchus oleraceus*
	**Trifolium subterraneum*
	**Trifolium glomeratum*
Comments: On southern boundary at shed. Planted *Eucalyptus macarthurii* overhangs boundary. No discernible native components.	

Observation Point: 4
GPS: 750587, 6155177 (MGA55)

Natives:	Exotic / Non-local natives
Eucalyptus melliodora	**Bromus catharticus*
Eucalyptus blakelyi (in distance)	**Dactylis glomerata*
	**Lycium ferocisissimum*
	**Hordeum leporinum*
	**Hypochaeris radicata*
	**Echium plantagineum*

Comments: in south-eastern area, just north of dam wall. No discernible native groundlayer.

Observation Point: 5
GPS: 750597, 6155121 (MGA55)

Natives:	Exotic / Non-local natives
Austrostipa scabra	**Bromus catharticus*
Juncus usitatus	**Dactylis glomerata*
	**Avena sativa*
	**Bromus hordeaceus*
	#Acacia baileyana
	**Echium plantagineum*
	**Onopordum acanthium*

Comments: Southern boundary at dam. Only minor native groundlayer <5% cover

Observation Point: 6
GPS: 750693, 6155104 (MGA55)

Natives:	Exotic / Non-local natives
Eucalyptus blakelyi	**Bromus catharticus*
Eucalyptus bridgesiana	**Dactylis glomerata*
Austrostipa bigeniculata	**Avena sativa*
	**Bromus hordeaceus*
	**Hypochaeris radicata*
	**Lycium ferocissimum*
	**Lolium perenne*

Comments: Groundlayer less than 5% native cover.

Observation Point: 7
GPS: 750706, 6155155 (MGA55)

Natives:	Exotic / Non-local natives
Eucalyptus blakelyi	**Bromus catharticus*
Eucalyptus melliodora	**Dactylis glomerata*
	**Avena sativa*
	**Nassella trichotoma*
	**Hypochaeris radicata*

	**Lycium ferocissimum*
	**Lolium perenne*

Comments: Exotic groundlayer.

Observation Point: 8
GPS: 750705, 6155217 (MGA55)

Natives:	Exotic / Non-local natives
Eucalyptus blakelyi	**Bromus catharticus*
	**Dactylis glomerata*
	**Hordeum leporinum*
	**Cirsium vulgare*
	**Plantago lanceolata*
	**Lycium ferocissimum*
	**Lolium perenne*

Comments: Exotic groundlayer.

Observation Point: 9
GPS: 750699, 6155301 (MGA55)

Natives:	Exotic / Non-local natives
Schoenus apogon	**Paspalum dilatatum*
	**Dactylis glomerata*
	**Avena sativa*
	**Plantago lanceolata*
	**Bromus hordeaceus*
	**Phalaris aquatica*

Comments: North-east corner of site. Native groundlayer less than 5%.

Observation Point: 10
GPS: 750662, 6155289 (MGA55)

Natives:	Exotic / Non-local natives
Eucalyptus amplifolia	**Phalaris aquatica*
Eucalyptus melliodora	**Dactylis glomerata*
	**Plantago lanceolata*
	**Nassella trichotoma*
	**Taraxacum officinale*
	**Lycium ferocissimum*
	**Lolium perenne*
	**Trifolium subterraneum*

Comments: Lower ground – boggy. Exotic groundlayer

Observation Point: 11	
GPS: 750592, 6155314 (MGA55)	
Natives:	Exotic / Non-local natives
Eucalyptus amplifolia	**Lolium perenne*
Eucalyptus melliodora	**Dactylis glomerata*
	**Avena sativa*
	**Bromus catharticus*
	**Hypochaeris radicata*
Comments: No discernible native groundlayer	

Observation Point: 12	
GPS: 750585, 6155255 (MGA55)	
Natives:	Exotic / Non-local natives
Eucalyptus melliodora	**Trifolium subterraneum*
Eucalyptus blakelyi	**Arctotheca calendula*
	**Modiola caroliniana*
	**Bromus catharticus*
	**Cirsium vulgare*
	**Plantago lanceolata*
Comments: Close to rear-house grounds – north-east of house	

Observation Point: 13	
GPS: 750534, 6155253 (MGA55)	
Natives:	Exotic / Non-local natives
Eucalyptus melliodora	**Photinia glabra*
	**Bromus catharticus*
	**Rumex crispus*
	**Cenchrus clandestinus*
	**Trifolium subterraneum*
Comments: Northern side of house – small copse of remnant trees and regenerating saplings.	

Observation Point: 14	
GPS: 750509, 6155273 (MGA55)	
Natives:	Exotic / Non-local natives
Eucalyptus amplifolia	*#Eucalyptus leucoxylon?* (planted)
Eucalyptus melliodora	**Cupressus x leylandii*
	**Bromus catharticus*

	**Lycium ferocissimum* **Lolium perenne*

Comments: No discernible native groundlayer.

Observation Point: 15	
GPS: 750441, 6155278 (MGA55)	
Natives:	Exotic / Non-local natives
Eucalyptus melliodora	**Bromus catharticus* **Dactylis glomerata* **Hordeum leporinum* **Plantago lanceolata* **Trifolium subterraneum* **Lolium perenne* **Avena sativa*

Comments: No discernible native groundlayer

Observation Point: 16	
GPS: 750389, 6155351 (MGA55)	
Natives:	Exotic / Non-local natives
None observed	**Lolium perenne* **Dactylis glomerata* **Festuca pratensis* **Paspalum dilatatum* **Hypochaeris radicata*

Comments: No discernible native groundlayer. Heavy cattle compaction to soil.

Observation Point: 17	
GPS: 750339, 6155330 (MGA55)	
Natives:	Exotic / Non-local natives
Juncus usitatus	**Lolium perenne* **Dactylis glomerata* **Arctotheca calendula* **Hordeum leporinum* **Trifolium subterraneum* **Plantago lanceolata*

Comments: Dam in western half of site. Fringing native groundlayer.

Observation Point: 18
GPS: 750223, 6155364 (MGA55)

Natives:	Exotic / Non-local natives
None observed	**Lolium perenne*
	**Dactylis glomerata*
	**Eragrostis tenuifolia*
	**Trifolium subterraneum*
	**Plantago lanceolata*

Comments: North-western area of site. No discernible native groundlayer.

Observation Point: 19
GPS: 750175, 6155315 (MGA55)

Natives:	Exotic / Non-local natives
None observed	**Lolium perenne*
	**Dactylis glomerata*
	**Festuca pratensis*
	**Plantago lanceolata*

Comments: No discernible native groundlayer

Observation Point: 20
GPS: 750194, 6155243 (MGA55)

Natives:	Exotic / Non-local natives
None observed	**Lolium perenne*
	**Dactylis glomerata*
	**Festuca pratensis*
	**Hypochaeris radicata*

Comments: No discernible native groundlayer.

Observation Point: 21
GPS: 750330, 6155198 (MGA55)

Natives:	Exotic / Non-local natives
None observed	**Lolium perenne*
	**Dactylis glomerata*
	**Hypochaeris radicata*
	**Trifolium subterraneum*
	**Festuca pratensis*

Comments: No discernible native groundlayer.

Observation Point: 22
GPS: 750428, 6155220 (MGA55)

Natives:	Exotic / Non-local natives
Eucalyptus melliodora	**Lolium perenne*
	**Dactylis glomerata*
	**Festuca pratensis*
	**Bromus catharticus*
	**Cenchrus clandestinus*

Comments: No discernible native groundlayer.

Observation Point: 23
GPS: 750479, 6155223 (MGA55)

Natives:	Exotic / Non-local natives
Eucalyptus melliodora	**Lolium perenne*
	**Hordeum leporinum*
	**Avena sativa*
	**Hypochaeris radicata*
	#*Cynodon dactylon*

Comments: Some *Cynodon dactylon* present comprising about 5% cover.

Observation Point: 24
GPS: 750480, 6155186 (MGA55)

Natives:	Exotic / Non-local natives
Eucalyptus melliodora	**Bromus catharticus*

Comments: Remnant trees over exotic groundlayer in house grounds.

Observation Point: 25
GPS: 750494, 6155206 (MGA55)

Natives:	Exotic / Non-local natives
Eucalyptus melliodora	#*Brachychiton populneus*
	#*Dodonaea viscosa* subsp. *angustifolia*
	**Trifolium subterraneum*
	**Bromus catharticus*
	**Plantago lanceolata*
	**Fraxinus* cv.
	**Lolium perenne*
	**Elaeagnus pungens*
	**Sorbus sp.*

Comments: No discernible native groundlayer.

Observation Point: 26	
GPS: 750551, 6155851 (MGA55)	
Natives:	Exotic / Non-local natives
None observed	*Deciduous trees (unidentified)
	**Acer palmatum*
	**Bromus catharticus*
	**Modiola caroliniana*
	**Hypochaeris radicata*
	**Trifolium subterraneum*
Comments: Immediate house grounds. No discernible native groundlayer.	

Appendix D: Fauna survey data

Fauna survey results:

* Stick nests were observed in two trees. The nests were in the order of 30cm and 40cm diameter, and characteristic of structures made by a raven or magpie. One of the nests was showing evidence of deterioration.
* Galahs, Noisy Miners and Starlings were observed accessing hollows in trees.
* Scratchings consistent with a Common Brushtail Possum were observed on the trunk of one hollow-bearing tree.
* Two of the amphibians were recorded beneath ground debris such as corrugated iron (Brown-striped Frog and Spotted Grass Frog), and two were heard calling from dams (Common Eastern Froglet & Smooth Toadlet).

Table 28 Fauna species recorded within the subject land.

Common Name	Family and Scientific Name	Observation method
MAMMALS		
	Macropodidae	
Eastern Grey Kangaroo	*Macropus giganteus*	Observed
	Muridae	
* House Mouse	*Mus musculus*	Observed sheltering underground debris during ground debris searches
BIRDS		
	Anatidae	
Pacific Black Duck	*Anas superciliosa*	Observed
Australian Wood Duck	*Chenonetta jubata*	Observed
	Threskiornidae	
Straw-necked Ibis	*Threskiornis spinicollis*	Observed
	Falconidae	
Nankeen Kestrel	*Falco cenchroides*	Observed
	Rallidae	
Purple Swamphen	*Porphyrio porphyrio*	Heard calling
	Cacatuidae	
Yellow-tailed Black Cockatoo	*Calyptorhynchus funereus*	Heard calling
Galah	*Eolophus roseicapillus*	Observed
	Psittacidae	
Crimson Rosella	*Platycercus elegans*	Observed
Eastern Rosella	*Platycercus eximius*	Observed
Red-rumped Parrot	*Psephotus haematonotus*	Observed
	Cuculidae	
Fan-tailed Cuckoo	*Cacomantis flabelliformis*	Observed
	Halcyonidae	
Laughing Kookaburra	*Dacelo novaeguineae*	Heard calling

Common Name	Family and Scientific Name	Observation method
	Maluridae	
Superb Fairy-wren	*Malurus cyaneus*	Observed
	Acanthizidae	
Brown Thornbill	*Acanthiza pusilla*	Observed
Yellow-rumped Thornbill	*Acanthiza chrysorrhoa*	Observed
	Pardalotidae	
Striated Pardalote	*Pardalotus striatus*	Heard
	Meliphagidae	
Red Wattlebird	*Anthochaera carunculata*	Observed
Noisy Miner	*Manorina melanocephala*	Observed
	Pachycephalidae	
Golden Whistler	*Pachycephala pectoralis*	Observed
	Artamidae	
Grey Butcherbird	*Cracticus torquatus*	Observed
Australian Magpie	*Cracticus tibicen*	Observed
Pied Currawong	*Strepera graculina*	Observed
	Rhipiduridae	
Grey Fantail	*Rhipidura albiscapa*	Observed
Willie Wagtail	*Rhipidura leucophrys*	Heard calling
	Corvidae	
Australian Raven	*Corvus coronoides*	Observed
	Monarchidae	
Magpie-lark	*Grallina cyanoleuca*	Observed
	Timaliidae	
Silvereye	*Zosterops lateralis*	Observed
	Sturnidae	
* Common Starling	*Sturnus vulgaris*	Observed
AMPHIBIANS		
	Limnodynastidae	
Brown-striped Frog	*Limnodynastes peronii*	Observed
Spotted Grass Frog	*Limnodynastes tasmaniensis*	Observed
	Myobatrachidae	
Common Eastern Froglet	*Crinia signifera*	Heard calling
Smooth Toadlet	*Uperoleia laevigata*	Heard calling

Appendix E: Credit reports

Attached (reports dated 31st May 2023):

* Credits summary report
* Biodiversity credit report (Like-for-like)
* Candidate threatened species report
* Predicted species report.

BAM Credit Summary Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00039155/BAAS17090/23/00039156	proposed residential subdivision	14/04/2023
Assessor Name	Report Created	BAM Data version *
Rebecca Hogan	31/05/2023	58
Assessor Number	BAM Case Status	Date Finalised
BAAS17090	Open	To be finalised
Assessment Revision	Assessment Type	BOS entry trigger
0	Part 4 Developments (Small Area)	BOS Threshold: Area clearing threshold

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Ecosystem credits for plant communities types (PCT), ecological communities & threatened species habitat

Zone	Vegetation zone name	TEC name	Current Vegetation integrity score	Change in Vegetation integrity (loss / gain)	Area (ha)	Sensitivity to loss (Justification)	Species sensitivity to gain class	BC Act Listing status	EPBC Act listing status	Biodiversity risk weighting	Potential SAII	Ecosystem credits

Southern Tableland Grassy Box Woodland												
1	3376_remnant_trees	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Ri	23.7	23.7	0.66	Population size	High Sensitivity to Gain	Critically Endangered Ecological Community	Not Listed	2.50	True	10
											Subtotal	**10**
											Total	**10**

Species credits for threatened species

Vegetation zone name	Habitat condition (Vegetation Integrity)	Change in habitat condition	Area (ha)/Count (no. individuals)	Sensitivity to loss (Justification)	Sensitivity to gain (Justification)	BC Act Listing status	EPBC Act listing status	Potential SAII	Species credits

BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment Id
00039155/BAAS17090/23/00039156

Proposal Name
proposed residential subdivision

BAM data last updated *
14/04/2023

Assessor Name
Rebecca Hogan

Assessor Number
BAAS17090

BAM Data version *
58

Proponent Names

Report Created
31/05/2023

BAM Case Status
Open

Assessment Revision
0

Assessment Type
Part 4 Developments (Small Area)

Date Finalised
To be finalised

BOS entry trigger
BOS Threshold: Area clearing threshold

* 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
White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Ri	Critically Endangered Ecological Community	3376-Southern Tableland Grassy Box Woodland

Species
Nil

Additional Information for Approval

PCT Outside Ibra Added

None added

PCTs With Customized Benchmarks

PCT
No Changes

Predicted Threatened Species Not On Site

Name
Calyptorhynchus lathami / Glossy Black-Cockatoo
Ephippiorhynchus asiaticus / Black-necked Stork

Ecosystem Credit Summary (Number and class of biodiversity credits to be retired)

BAM Biodiversity Credit Report (Like for like)

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	HBT Cr	No HBT Cr	Total credits to be retired
3376-Southern Tableland Grassy Box Woodland	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Ri	0.7	10	0	10

3376-Southern Tableland Grassy Box Woodland

Like-for-like credit retirement options

Name of offset trading group	Trading group	Zone	HBT	Credits	IBRA region
White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Ri This includes PCT's:	-	3376_remnant_trees	Yes	10	Monaro, Bungonia, Crookwell, Kybeyan-Gourock, Monaro, Murrumbateman, Snowy Mountains and South East Coastal Ranges. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	74, 75, 83, 250, 266, 267, 268, 270, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 286, 298, 302, 312, 341, 342, 347, 350, 352, 356, 367, 381, 382, 395, 401, 403, 421, 433, 434, 435, 436, 437, 451, 483, 484, 488, 492, 496, 508, 509, 510, 511, 528, 538, 544, 563, 567, 571, 589, 590, 597, 599, 618, 619, 622, 633, 654, 702, 703, 704, 705, 710, 711, 796, 797, 799, 847, 851, 921, 1099, 1303, 1304, 1307, 1324, 1329, 1330, 1332, 1383, 1606, 1608, 1611, 1691, 1693, 1695, 1698, 3314, 3359, 3363, 3373, 3376, 3387, 3388, 3394, 3395, 3396, 3397, 3398, 3399, 3406, 3415, 3533, 4147, 4149, 4150					

Species Credit Summary

BAM Biodiversity Credit Report (Like for like)

No Species Credit Data

Credit Retirement Options

Like-for-like credit retirement options

BAM Candidate Species Report

Proposal Details

Assessment Id 00039155/BAAS17090/23/00039156	Proposal Name proposed residential subdivision	BAM data last updated * 14/04/2023
Assessor Name Rebecca Hogan	Report Created 31/05/2023	BAM Data version * 58
Assessor Number BAAS17090	Assessment Type Part 4 Developments (Small Area)	BAM Case Status Open
Assessment Revision 0	Date Finalised To be finalised	BOS entry trigger BOS Threshold: Area clearing threshold

* 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

Threatened species Manually Added

None added

Threatened species assessed as not on site

Refer to BAR for detailed justification

Common name	Scientific name	Justification in the BAM-C
Canberra Grassland Earless Dragon	Tympanocryptis lineata	Habitat degraded
Large Bent-winged Bat	Miniopterus orianae oceanensis	Habitat constraints
Pale Pomaderris	Pomaderris pallida	Refer to BAR
Regent Honeyeater	Anthochaera phrygia	Habitat constraints
Swift Parrot	Lathamus discolor	Habitat constraints
Yellow-spotted Tree Frog	Litoria castanea	Habitat degraded

BAM Predicted Species Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00039155/BAAS17090/23/00039156	proposed residential subdivision	14/04/2023
Assessor Name	Report Created	BAM Data version *
Rebecca Hogan	31/05/2023	58
Assessor Number	Assessment Type	BAM Case Status
BAAS17090	Part 4 Developments (Small Area)	Open
Assessment Revision	BOS entry trigger	Date Finalised
0	BOS Threshold: Area clearing threshold	To be finalised

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Threatened species reliably predicted to utilise the site. No surveys are required for these species. Ecosystem credits apply to these species.

Common Name	Scientific Name	Vegetation Types(s)
Australasian Bittern	Botaurus poiciloptilus	3376-Southern Tableland Grassy Box Woodland
Black Falcon	Falco subniger	3376-Southern Tableland Grassy Box Woodland
Brown Treecreeper (eastern subspecies)	Climacteris picumnus victoriae	3376-Southern Tableland Grassy Box Woodland
Diamond Firetail	Stagonopleura guttata	3376-Southern Tableland Grassy Box Woodland
Dusky Woodswallow	Artamus cyanopterus cyanopterus	3376-Southern Tableland Grassy Box Woodland
Flame Robin	Petroica phoenicea	3376-Southern Tableland Grassy Box Woodland
Grey-headed Flying-fox	Pteropus poliocephalus	3376-Southern Tableland Grassy Box Woodland
Hooded Robin (south-eastern form)	Melanodryas cucullata cucullata	3376-Southern Tableland Grassy Box Woodland
Large Bent-winged Bat	Miniopterus orianae oceanensis	3376-Southern Tableland Grassy Box Woodland
Little Lorikeet	Glossopsitta pusilla	3376-Southern Tableland Grassy Box Woodland
Regent Honeyeater	Anthochaera phrygia	3376-Southern Tableland Grassy Box Woodland

Scarlet Robin	Petroica boodang	3376-Southern Tableland Grassy Box Woodland
Speckled Warbler	Chthonicola sagittata	3376-Southern Tableland Grassy Box Woodland
Spotted-tailed Quoll	Dasyurus maculatus	3376-Southern Tableland Grassy Box Woodland
Swift Parrot	Lathamus discolor	3376-Southern Tableland Grassy Box Woodland
White-bellied Sea-Eagle	Haliaeetus leucogaster	3376-Southern Tableland Grassy Box Woodland
White-throated Needletail	Hirundapus caudacutus	3376-Southern Tableland Grassy Box Woodland

Threatened species Manually Added

None added

Threatened species assessed as not within the vegetation zone(s) for the PCT(s)

Common Name	Scientific Name	Plant Community Type(s)
Black-necked Stork	Ephippiorhynchus asiaticus	3376-Southern Tableland Grassy Box Woodland
Glossy Black-Cockatoo	Calyptorhynchus lathami	3376-Southern Tableland Grassy Box Woodland

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
Black-necked Stork	Ephippiorhynchus asiaticus	Habitat constraints
Glossy Black-Cockatoo	Calyptorhynchus lathami	Habitat constraints