Lot 10 DP1218866, Murrumbateman, NSW

Biodiversity Development Assessment Report

Final – April 2020
Prepared for Pixiu Holdings Pty Ltd

Document Information

Report for:	Pixiu Holdings Pty Ltd
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Capital Ecology project no.:	2876

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- The landholders

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Executive Summary

Pixiu Holdings Pty Ltd (Pixiu Holdings) is currently progressing the planning and approval process for the subdivision of Lot 10 DP1218866, Murrumbateman, NSW (the 'proposed development' of the 'subject land'). Capital Ecology Pty Ltd (Capital Ecology) has been commissioned by Pixiu Holdings to complete the necessary biodiversity surveys and prepare this Biodiversity Development Assessment Report (BDAR) to identify and assess the significance of the impacts that the proposed development will have on the biodiversity values of the subject land.

Scope

Although general biodiversity values are identified and considered, the primary purpose of this BDAR is to present the results of Capital Ecology's application of the NSW Biodiversity Assessment Method (BAM) to assess the significance of the impacts of the proposed development on biota listed as threatened under the NSW *Biodiversity Conservation Act 2016* (BC Act). This BDAR also includes assessment of the potential impacts of the proposed development on Matters of National Environmental Significance (MNES) listed pursuant to the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Survey overview

The following five ecological surveys were performed by Capital Ecology between 28 August 2019 and 18 November 2019:

- a biodiversity assessment;
- a Striped Legless Lizard *Delma impar* tile survey;
- a Golden Sun Moth *Synemon plana* survey;
- a tree habitat assessment; and
- a threatened bird survey.

Vegetation and potential flora/fauna habitat were surveyed and mapped in accordance with the BAM, Striped Legless Lizards were surveyed via a 10 week program of tile grid surveys, Golden Sun Moths were surveyed via four belt transect surveys through potential habitat, each tree was surveyed for signs of fauna breeding in hollows or nests, and threatened birds were surveyed via random meanders through likely habitat and opportunistic observations.

Native vegetation

The subject land supports one Plant Community Type (PCT); PCT1330 - Yellow Box – Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion.

The subject land has been substantially to entirely modified by its current and past land use, which has primarily been agriculture (grazing and cropping). This has led to extensive clearing of the native woody overstorey, midstorey, and shrubstorey across the entirety of the subject land. Four mature remnant trees persist in the subject land. The remainder of the woody vegetation is a mix of planted native and exotic species.

The subject land shows evidence of pasture improvement and/or sown crops. One small patch along the north-west boundary has retained a native dominant groundstorey. Several patches contain a mixed native and exotic groundstorey with no clear dominance. The remainder of the subject land has a groundstorey almost entirely composed of exotic grasses and herbaceous weeds.

Threatened ecological communities

No part of the subject land supports an EPBC Act or BC Act listed threatened ecological community.

Threatened species

The subject land has been substantially to entirely modified by its current and past land uses. These activities have substantially degraded the habitat value for native flora and fauna, including threatened species. Targeted surveys for Striped Legless Lizard and Golden Sun Moth did not record any individuals. One of the remnant trees contains functional hollows, which at the time of surveys supported a nest of Common Starlings. This tree is unlikely to support habitat for the threatened fauna species that have the potential to occur in the locality. Additional field surveys confirmed that no threatened flora species occur in the subject land, and that the subject land does not contain any habitat currently occupied or of potential significance to any threatened fauna species.

Impacts

The proposed development will impact a maximum area of 18.57 ha of vegetation, 4.58 ha of which meets the BC Act definition of native vegetation. The remainder is highly modified exotic pasture. The proposed development will not impact any threatened ecological community (TEC) or threatened species.

The proposed development will not result in any other direct impacts on native vegetation or habitat.

The subject land does not contain any vegetation with a vegetation integrity score that requires offsetting for impacts on a TEC or ecosystem credit species, nor does it support habitat of potential significance to any species credit species. Accordingly, biodiversity risk weighting is not of relevance to the subject land.

While the subject land does support a PCT associated with a TEC listed as a potential SAII entity, the vegetation has been degraded to the extent that it no longer meets the BC Act definition for the listed TEC. As such, the subject land does not support any ecological community listed as a SAII entity. In addition, the subject land does it contain habitat of potential significance to any threatened flora or fauna species listed as a SAII entity. Accordingly, the proposed development will not result in a SAII on any BC Act listed entity.

The proposed development is unlikely to result in biodiversity impacts that are unforeseen or uncertain.

Commonwealth EPBC Act

The proposed development is unlikely to have a significant impact on an EPBC Act listed MNES given the subject land does not:

- support any EPBC Act listed ecological communities;
- support any EPBC Act listed flora species; or

- contain habitat of potential importance to EPBC Act listed threatened or migratory fauna species.

Accordingly, EPBC Act referral is unwarranted and is not recommended.

Credit calculations

The subject land does not support vegetation with a vegetation integrity score high enough for its clearance to generate ecosystem credits. Accordingly, the proposed development does not generate an ecosystem credit obligation.

The subject land does not support habitat of potential significance to any species credit species. Accordingly, the proposed development does not generate a species credit obligation.

1 Introduction

Pixiu Holdings Pty Ltd (Pixiu Holdings) is currently progressing the planning and approval process for the subdivision of Lot 10 DP1218866, Murrumbateman, NSW (the 'proposed development' of the 'subject land'). Capital Ecology Pty Ltd (Capital Ecology) has been commissioned by Pixiu Holdings to complete the necessary biodiversity surveys and prepare this Biodiversity Development Assessment Report (BDAR) to identify and assess the significance of the impacts that the proposed development will have on the biodiversity values of the subject land.

Although general biodiversity values are identified and considered, the primary purpose of this BDAR is to present the results of Capital Ecology's application of the NSW Biodiversity Assessment Method (BAM) (NSW Government 2017a[1]) to assess the significance of the impacts of the proposed development on biota listed as threatened under the NSW *Biodiversity Conservation Act 2016* (BC Act). This BDAR also includes assessment of the potential impacts of the proposed development on Matters of National Environmental Significance (MNES) listed pursuant to the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

1.1 Subject Land

The subject land for this BDAR encompasses the entirety of Lot 10 DP1218866, Murrumbateman, NSW, much of which will be impacted by the proposed development (refer to Figure 1 and Figure 2). Located in the Yass Valley Local Government Area (LGA), pursuant to the *Yass Valley Local Environment Plan 2013* (LEP), the subject land is zoned[2] 'RU4 Primary Production Small Lots' with minimum lot size[3] of 'AB2 = 16 ha'. The subject land is approximately 18.57 ha (185,650 m^2) in size and, as shown in Figure 1 and Figure 2, is bordered by:

- Murrumbateman Road to the east, beyond which is partially cleared agricultural land; and
- partially cleared agricultural land to the north, south and west.

The entirety of Lot 10 DP1218866 is characterised by highly modified agricultural land, with a mix of low diversity native and exotic areas. The subject land is not identified on the Yass Valley LEP Natural Resources Biodiversity Map[4].

The topography across the subject land is generally flat, with the elevation ranging from approximately 580 m Australian Height Datum (AHD) along the northern boundary to 600 m AHD along the southern boundary.

One ephemeral drainage line flows through the subject land, later joining Murrumbateman Creek 5 km to the north (refer to Figure 3). The drainage line has no fringing vegetation and was dry at the time of survey; it is only likely to convey water following substantial rain events. There are two small farm dams in the subject land, both of which held very little water at the start of the surveys for this assessment (August 2019) and were completely dry by late November 2019.

[1] NSW Government (2017a). *Biodiversity Assessment Method*. NSW Office of Environment and Heritage. Published LW 25 August 2017.
[2] Yass Valley Local Environment Plan 2013. *Land Zoning Map - Sheet LZN_005C.*
[3] Yass Valley Local Environment Plan 2013. *Lot Size Map - Sheet LSZ_005C.*
[4] Yass Valley Local Environment Plan 2013. *Natural Resources Biodiversity Map - Sheet NRB_005.*

The subject land was historically part of a much larger operating sheep farm until the 1960s and has since been used for smaller-scale farming practices. Extensive clearing of the native woody overstorey, midstorey, and shrubstorey, together with intensive set-stocking has modified the subject land such that very little remains of the original (pre-European) vegetation. The subject land now supports only four remnant eucalypts and a small patch of degraded yet native dominant pasture. The remaining woody vegetation is composed of a few planted native trees, together with the extensive wind breaks of planted exotic trees.

The small patch of native dominant groundstorey vegetation along the north-west boundary supports the native grasses Wallaby Grasses *Rytidosperma* spp*.,* Weeping Grass *Microlaena stipodies,* and Tall Spear Grass *Austrostipa bigeniculata*, with a diversity of exotic grasses and weed species. The groundstorey across the remainder of the subject land shows evidence of intensive and prolonged historical pasture improvement and cropping (i.e. the presence of Clovers *Trifolium* spp. and Perennial Ryegrass *Lolium perenne*). The groundstorey across the entirety of the subject land lacks all but the most disturbance tolerant of native forbs and is predominantly composed of exotic grasses and herbaceous weeds.

The subject land is currently used as rotational grazing pasture for a few horses.

The built infrastructure on the subject land includes the current residence and farm sheds, along with the existing boundary fences and internal paddock fences which are in a generally fair and functional condition.

Capital Ecology (2019)[5] previously undertook a preliminary investigation into the biodiversity values of the subject land. Described in further detail in this BDAR, the preliminary investigation identified the key ecological values which are likely/unlikely to occur in the subject land, these being the following.

- Highly modified vegetation across the subject land which has been historically cleared, intensively grazed, and cultivated/pasture improved. The vegetation is characterised by a low diversity native or exotic dominant groundstorey, an absent midstorey and shrubstorey, a few scattered remnant trees, and scattered planted native and exotic trees.
- A highly modified grassy groundstorey, dominated by either disturbance tolerant native grasses or exotic grasses and herbaceous weeds, with the potential to constitute habitat for the Striped Legless Lizard *Delma impar* (EPBC Act and BC Act vulnerable) and/or the Golden Sun Moth *Synemon plana* (EPBC Act critically endangered and BC Act endangered).
- Four mature remnant eucalypt trees. These trees are likely to provide a nectar resource, and potentially nesting sites, to a variety of common native birds and arboreal mammals (i.e. insectivorous bats, Sugar Glider *Petaurus breviceps* etc.). However, it is unlikely that the Superb Parrot *Polytelia swainsonii* or any of the other threatened woodland birds or bats would choose to nest in these trees.
- The vegetation across the entirety of the subject land has been modified to the extent that it is unlikely to support any the threatened flora species which have the potential to occur in the locality (refer Figure 2).

[5] Capital Ecology (2019). *Potential subdivision of Lot 10 DP1218866, Murrumbateman – Preliminary Ecological Advice*. 5 March 2019. Prepared for Pixiu Holdings Pty Ltd. Project no. 2870.

1.2 Proposed Development

As shown in Figure 2, the proposed development aims to subdivide the subject land into nine residential lots and includes all of the associated roads and infrastructure required to service those lots.

The total direct impact area from the proposed development will be approximately 4.46 ha, calculated as the clearance required to create:

- nine building envelopes between 3,500 m^2 and 5,820 m^2, including550 m^2 effluent disposal areas;
- a new public road stub;
- internal driveways (assuming 4.5 m wide clearance); and
- internal fences (assuming 2 m wide clearance).

However, for the purposes of this BDAR, it is assumed that the proposed development will clear all vegetation in the subject land, the exception being that all of the four mature remnant trees will be retained (refer to Figure 5).

It is important to note that the aerial imagery used for all figures in this BDAR is sourced from New South Wales Land and Property Information (NSW LPI). This imagery is estimated to be approximately 10 years old. A number of the trees and shrubs in the subject land have been cleared since the NSW LPI imagery was captured. The vegetation and habitat mapping as shown throughout this BDAR reflect what is currently present in the subject land. As a result, there are instances where the mapping and NSW LPI imagery do not match. In these instances, the vegetation and habitat mapping performed for this BDAR supersedes the imagery.

1.3 Commonwealth and State Assessment and Approval Processes

1.3.1 Commonwealth Environment Protection and Biodiversity Conservation Act 1999

The EPBC Act is the key Commonwealth Government legislation for the protection and conservation of Australia's environment and biodiversity. The EPBC Act provides the legislative framework for the assessment and approval mechanism requiring that proposed 'actions' to be assessed in terms of their potential to impact upon 'Matters of National Environmental Significance' (MNES). MNES currently listed under the EPBC Act are:

- world heritage properties;
- national heritage places;
- wetlands of international importance (listed under the Ramsar Convention);
- threatened species and ecological communities;
- migratory species (protected under international agreements);
- Commonwealth marine areas;
- the Great Barrier Reef Marine Park;

- nuclear actions (including uranium mining); and
- a water resource, in relation to coal seam gas development and large coal mining development.

Where a potential impact on a MNES may occur as a result of a proposed action, the significance of that impact must be assessed. Guidelines for determining whether an impact is significant are provided by the Department of the Environment and Energy (Commonwealth of Australia 2013[6]). If it is determined that a proposed action will, or is likely to, have a significant impact on a MNES, the action must be referred to the Commonwealth Minister for the Environment. The Department will then consider the referred action and the Minister (or his/her Delegate) will make a decision regarding whether the action requires assessment and approval under the EPBC Act and associated conditions and controls.

The following website provides further information regarding the EPBC Act referral and approval process: http://www.environment.gov.au/epbc/index.html

1.3.2 NSW Biodiversity Conservation Act 2016

The *NSW Biodiversity Conservation Act 2016* (BC Act) commenced on 25 August 2017, the purpose of which is *"to maintain a healthy, productive and resilient environment for the greatest well-being of the community, now and into the future, consistent with the principles of ecologically sustainable development"* (BC Act Part 1, Section 1.3). The BC Act outlines the NSW framework for addressing impacts on biodiversity from development and clearing. Supported by the NSW Biodiversity Conservation Regulation 2017 (BC Regulation), the BC Act establishes a framework to avoid, minimise and offset impacts on biodiversity from development through the Biodiversity Offsets Scheme (BOS).

1.3.2.1 NSW Biodiversity Offset Scheme

The BOS creates a transparent, consistent and scientifically based approach to biodiversity assessment and offsetting for all types of development that are likely to have a significant impact on biodiversity. The BOS aims to ensure a no-net-loss outcome for biodiversity by applying a framework which requires that impacts are first avoided and minimised, and where this cannot be fully achieved, residual impacts must be offset. The BOS also establishes Biodiversity Stewardship Agreements (BSAs), which are voluntary in-perpetuity agreements entered into by landholders, to secure and manage offset sites for biodiversity conservation. The two key elements of the BOS are as follows.

1. A developer, landholder etc. who undertakes an activity (i.e. development, clearing, other impact) which generates a credit obligation must retire the necessary credits to offset their activity.
2. A landholder who establishes a biodiversity stewardship site on their land generates credits which may be sold to developers or landholders who require those credits to offset their credit obligation.

[6] Commonwealth of Australia (2013). *Matters of National Environmental Significance - Significant Impact Guidelines 1.1. Environment Protection and Biodiversity Conservation Act 1999*. Commonwealth Department of the Environment.

Under the BC Act, the BOS is triggered for proposed development or clearing which:

- will involve clearance of native vegetation (including trees, understorey plants, groundcover plants, and wetland plants) or a prescribed impact (as set out in clause 6.1 of the BC Regulation) on land identified on the Biodiversity Values Map; and/or
- will exceed the native vegetation clearance threshold for the smallest minimum lot size associated with the subject land; and/or
- may significantly impact one or more BC Act listed entities (i.e. threatened species or ecological communities).

1.3.2.2 NSW Biodiversity Assessment Method

The NSW Biodiversity Assessment Method (BAM) is the assessment manual that outlines how an accredited person (i.e. a BAM Assessor) assesses impacts on biodiversity at development sites or assesses the biodiversity values of stewardship sites. The BAM is a scientific document that provides:

- a consistent (standard) method for the assessment of the biodiversity values of a proposed development site, major project site, or vegetation clearing site, or stewardship site;
- guidance on how a proponent (i.e. developer, landholder) can avoid and/or minimise potential biodiversity impacts, or assessment of the management requirements at a proposed biodiversity stewardship site and the likely improvement in biodiversity values that are predicted to occur over time; and
- the number and class of biodiversity credits that need to be offset to achieve a standard of 'no net loss' of biodiversity values for a development site, or the number and class of biodiversity credits to be generated by a proposed stewardship site.

The BAM is supported by the online BAM Calculator, into which a BAM Assessor enters the data from desktop and field investigations to determine the number and class of biodiversity credits generated:

- as an obligation for development/clearance, this obligation must be addressed by the proponent to secure approval for the development/clearance; or
- by the establishment and management of a biodiversity stewardship site, these credits being a commodity that may be sold.

The BAM determines the following two types of credits on both development/clearance sites and stewardship sites.

- Ecosystem credits, these are credits generated for impacts on, or conservation of:
  - threatened ecological communities; and
  - threatened species habitat for species that can be reliably predicted to occur within a given plant community type (PCT) (referred to in the BAM as 'ecosystem credit species').
- Species credits, these are credits generated for impacts on, or conservation of, individuals and/or the habitat of threatened species which cannot be reliably predicted to occur in a given PCT (referred to in the BAM as 'species credit species').

The BAM Assessor documents the results of the biodiversity assessment in a Biodiversity Assessment Report (BAR), of which there are the following three types.

- Biodiversity Development Assessment Report (BDAR). A BDAR is developed to assess the likely biodiversity impacts of a development or vegetation clearing proposal.
- Biodiversity Certification Assessment Report (BCAR). A BCAR is developed to assess the likely biodiversity impacts of conferring biodiversity certification over a specific area of land.
- Biodiversity Stewardship Site Assessment Report (BSSAR). A BSSAR is developed to assess the likely biodiversity conservation gain of establishing a specific area of land as a biodiversity stewardship site under a formal Biodiversity Stewardship Agreement.

1.4 Biodiversity Development Assessment Report

As prescribed under Part 6, Division 3, Section 6.12 of the BC Act, a BDAR is –

> *"a report prepared by an accredited person in relation to proposed development or activity that would be authorised by a planning approval, or proposed clearing that would be authorised by a vegetation clearing approval, that:*
>
> *(a) assesses in accordance with the biodiversity assessment method the biodiversity values of the land subject to the proposed development, activity or clearing, and*
>
> *(b) assesses in accordance with that method the impact of proposed development, activity or clearing on the biodiversity values of that land, and*
>
> *(c) sets out the measures that the proponent of the proposed development, activity or clearing proposes to take to avoid or minimise the impact of the proposed development, activity or clearing, and*
>
> *(d) specifies in accordance with that method the number and class of biodiversity credits that are required to be retired to offset the residual impacts on biodiversity values of the actions to which the biodiversity offsets scheme applies."*

A BDAR prepared applying the BAM by an accredited BAM Assessor must accompany any development application for which the BOS is triggered. As detailed previously, the BOS is triggered for a proposed development which:

- will involve clearance of native vegetation (including trees, understorey plants, groundcover plants, and wetland plants) or a prescribed impact (as set out in clause 6.1 of the BC Regulation) on land identified on the Biodiversity Values Map; and/or
- will exceed the native vegetation clearance threshold for the smallest minimum lot size associated with the subject land; and/or
- may significantly impact one or more BC Act listed entities (i.e. threatened species or ecological communities).

With regard to the above, the minimum lot size designation for the subject land is 'AB2 = 16 ha'(LEP Lot Size Map - Sheet LSZ_005C). Therefore, in accordance with Part 7, Clause 7.2 of the BC Regulation, as the proposed development will involve a minimum assumed clearance of 4.46 ha of BC Act 'native

vegetation' (defined in Part 5A of the *Local Land Services Act 2013* as plant species indigenous to NSW), a BDAR is required to assess the impacts of the proposed development.

The BAM provides a standard method for assessing the impacts of a development/clearance proposal. This theme should carry over to the resulting BDAR such that it is as concise as possible whilst still addressing all of the relevant elements of the BAM in order to provide a complete assessment of the proposed development. The size of the BDAR should reflect the complexity of the subject land's biodiversity values and the scale and nature of the proposed development.

1.4.1 Objectives and Format

Developed to reflect the format of the BAM, this BDAR comprises the following two broad parts.

- Part 1 – Biodiversity Assessment (BAM Stage 1), includes assessment of the:
  - landscape context;
  - native vegetation, threatened ecological communities (TECs), vegetation integrity;
  - threatened species and
  - habitat suitability for threatened species.
- Part 2 – Impact Assessment (BAM Stage 2), details the:
  - proposed measures to avoid, minimise and mitigate biodiversity impacts;
  - residual impacts (direct and indirect) of the proposed development; and
  - offset requirements relevant to the proposed development.

1.4.2 Technical Resources and Qualifications

This BDAR has been prepared by the following technical personnel:

- Robert Speirs – Director / Principal Ecologist

  BAppSc (Ecology), DipPM, MEIANZ, CEnvP-E, Accredited BAM Assessor (No: BAAS17089)
  Robert was project manager for this assessment and completed or closely supervised all field surveys, data entry, GIS mapping, BAM credit calculations, and report preparation.

- Dr Sam Reid – Consultant Ecologist

  BSc (Hons), PhD, MEIANZ
  Sam undertook field surveys, data entry, GIS mapping, and report preparation.

- Shannon Thompson – Field Ecologist

  BSc
  Shannon undertook field surveys, data entry, GIS mapping, and report preparation.

- Kristi Lee – Field Ecologist

  BSc
  Kristi undertook field surveys and data entry.

- Jesse Murphy – Field Ecologist

  BSc
  Jesse undertook field surveys and data entry.

All surveys for this assessment were undertaken in accordance with the following.

- Capital Ecology's (Robert Speirs – Principal Investigator) Animal Research Authority (ARA) granted under the NSW Animal Research Act 1985 by the NSW Department of Primary Industries Secretary's Animal Care and Ethics Committee (TRIM 15/2046).
- Capital Ecology's NSW Scientific Licence issued by the NSW Office of Environment and Heritage under s 132 C of the NSW National Parks and Wildlife Act 1974 (SL101623).

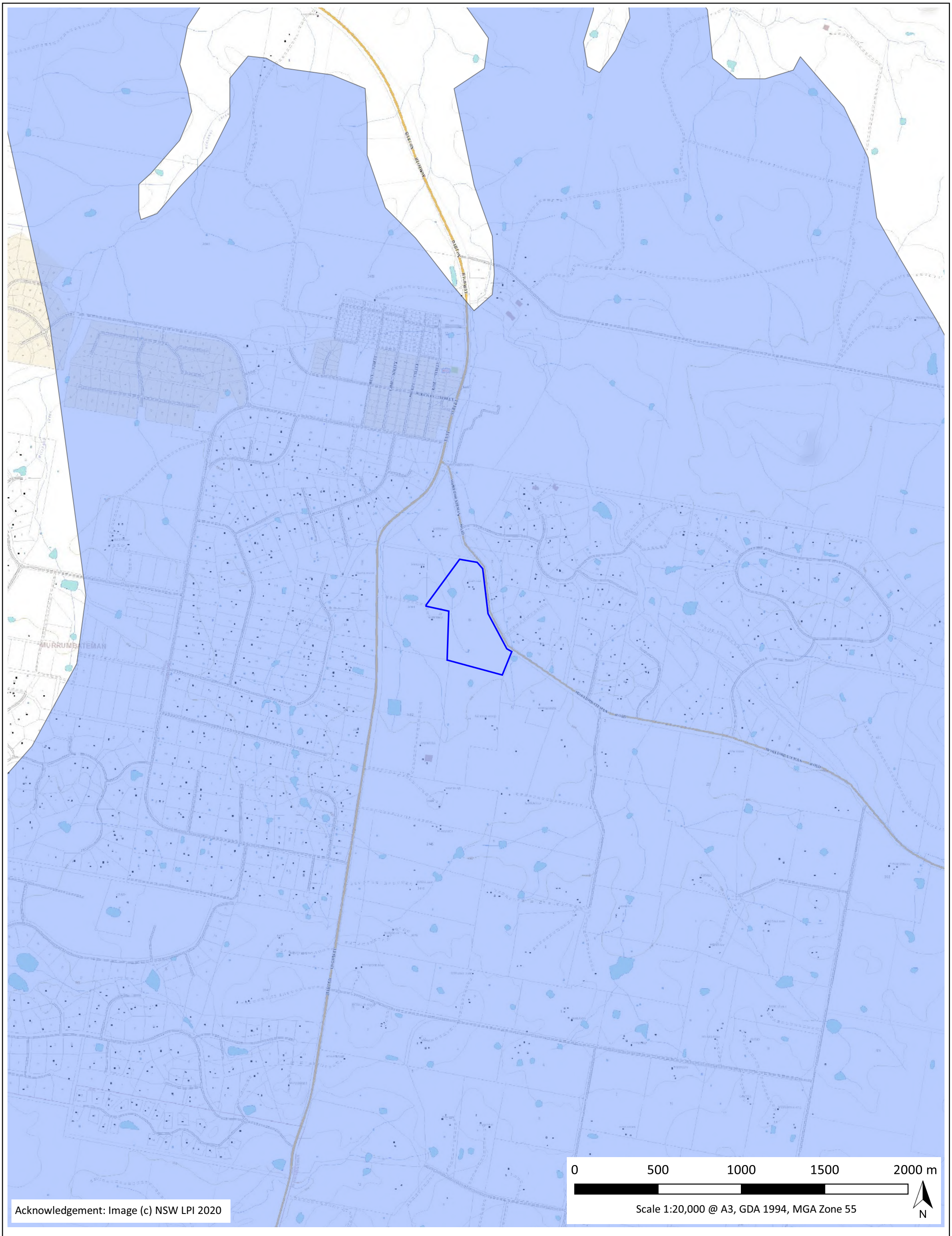

Figure 1. Locality Plan

Capital Ecology Project No: 2876
Drawn by: S. Thompson
Date: 6 February 2020

Legend

Subject Land

Mitchell Landscape v3

Doura Volcanics

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Figure 2. Proposed Development Layout

Capital Ecology Project No: 2876
Drawn by: S. Thompson
Date: 6 February 2020

2 Part 1 – Biodiversity Assessment (BAM Stage 1)

Part 1 of this BDAR provides an assessment of the biodiversity values of the subject land as set out in Stage 1 of the BAM.

2.1 Landscape Context

As detailed in Chapter 4 of the BAM, a range of landscape features must be identified where they occur in the subject land or within the assessment area surrounding the subject land. These features may contain/support biodiversity values that are important for the site context of the subject land, or for informing the likely habitat suitability of the subject land. Table 1 outlines the landscape features and overall landscape context of relevance to the subject land.

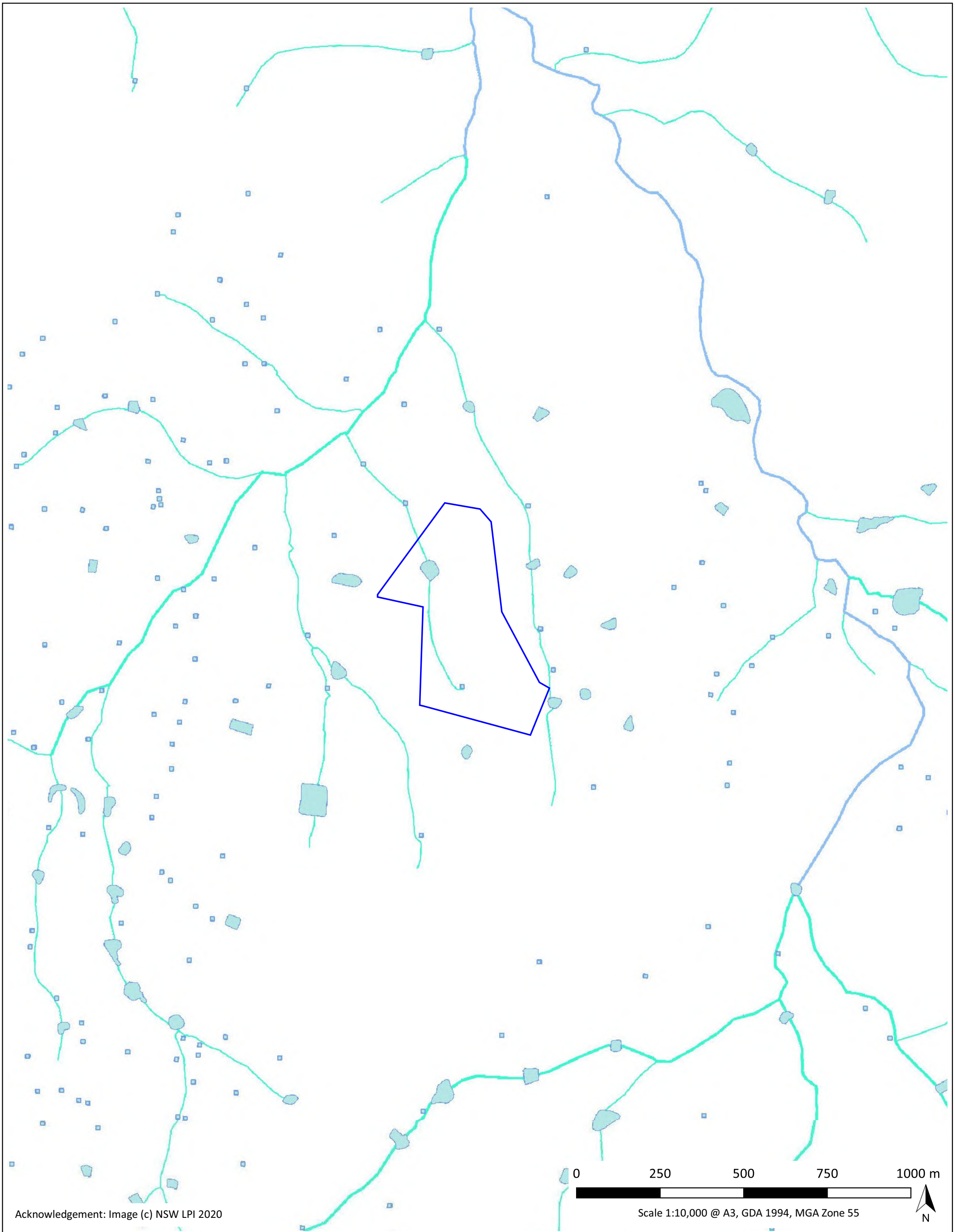
Table 1. Landscape Features

Landscape Feature	Description	Figure Reference
IBRA bioregion	The subject land is located in the **South East Highlands** IBRA bioregion.	-
IBRA subregion	The subject land is located in the **Murrumbateman** IBRA subregion.	-
BioNet NSW landscapes (Mitchell landscapes)	The subject land contains one Mitchell Landscape: **Doura Volcanics**.	Figure 1
Rivers, streams and estuaries (Strahler[7] stream order)	One 1st order tributary (defined based on the NSW LPI Hydrology Map and as per Appendix 3 of the BAM) originates in the subject land, later joining Murrumbateman Creek approximately 4.6 km to the north. This drainage line has no fringing vegetation. At the time of survey, the drainage line was dry, and it is only likely to convey water following substantial rain events. There are two small farm dams in the subject land, both of which held very little water at the start of the surveys (August 2019) and were completely dry from late November 2019. The tributary is unlikely to provide habitat of value to aquatic flora or fauna as it rarely experiences substantial or prolonged water flows. The lack of fringing vegetation indicates that the tributary is unlikely to be of significance to terrestrial fauna or be otherwise important for habitat connectivity. The dams are unlikely to provide habitat of value to aquatic flora or fauna but may be of some limited value to common native waterbirds and reptiles.	Figure 2 Figure 3
Wetlands (important wetlands)	The subject land does not contain any important wetlands as listed in the Directory of Important Wetlands in Australia (DIWA) or coastal wetlands protected under *State Environmental Planning Policy No 14*.	-
Connectivity	Before European settlement the whole of the subject land would have been characterised by a single woody PCT. The subject land has been substantially to entirely modified by its current and past land uses, which have primarily been agricultural (grazing and cropping). This has involved extensive clearing of the native woody overstorey, midstorey, and shrubstorey across the entirety of the subject land, with the exception of four mature remnant trees.	Figure 4 Figure 4

[7] Strahler, AN (1952). *Hypsometric (area-altitude) analysis of erosional topology*. Geological Society of America Bulletin 63 (11): 1117–1142.

Landscape Feature	Description	Figure Reference
	The subject land supports a small patch of native dominant groundstorey vegetation along the north-west boundary. This patch supports the native grasses Wallaby Grasses *Rytidosperma* spp., Weeping Grass *Microlaena stipodies*, and Tall Spear Grass *Austrostipa bigeniculata*, as well as a diversity of exotic grasses and weed species. The groundstorey across the remainder of the subject land shows evidence of historical pasture improvement and cropping (i.e. the presence of Clovers *Trifolium spp*. and Perennial Ryegrass *Lolium perenne*). The groundstorey across the entirety of the subject land lacks all but the most disturbance tolerant of native forbs and is predominantly composed of exotic grasses and herbaceous weeds. The subject land is bordered by partially or entirely cleared agricultural land to the north, south, east, and west. Murrumbateman township is located approximately 0.5 km to the north. While much of the native overstorey has been removed throughout the locality, two substantial patches of remnant woody vegetation occur within 1.5 km to 3 km of the subject land. Whilst only four scattered remnant trees have been retained in the subject land, these trees are likely to provide an important stepping-stone function for native fauna moving through the locality. The cleared areas are dominated by exotic grasses and weeds which may be of some limited habitat value to a variety of native birds, reptiles, and herbivorous mammals.	
Areas of geological significance and soil hazard	The subject land does not contain/support any karst, caves, crevices, cliffs or other areas/features of geological significance. There are no hazard soil features. Note: this does not refer to soil contamination resulting from anthropological land uses or activities.	-
Areas of outstanding biodiversity value	The subject land does not support or occur near any declared area of outstanding biodiversity value (AOBV).	-
Percent native vegetation cover (buffer area)	A 1,500 m buffer was applied to the subject land resulting in an overall buffer area of 1,006.6 ha. This buffer area contains both woody PCTs (i.e. woodland, dry sclerophyll forest) and non-woody PCTs (i.e. natural grassland). Accordingly, the following two categories of native vegetation were defined to identify the total are of native vegetation in the buffer. 1. Woody vegetation – The areas which have a woody PCT and retain remnant woody vegetation or woody regrowth. 2. Non-woody vegetation – The areas which either: a. have a natural grassland PCT and retain at least a substantial proportionate cover (i.e. > 35%) of native groundstorey species; or b. have a woody PCT from which the woody vegetation has been cleared, yet at least a substantial proportionate cover (i.e. > 35%) of native groundstorey species remains (often referred to as derived or secondary grassland). Native vegetation cover was first identified and mapped via interpretation of the available aerial imagery (NSW LPI). The presence of remnant canopy trees, cultivation patterns in paddocks, abnormally green and/or uniform groundstorey vegetation etc., were important factors considered during aerial interpretation. Field reconnaissance was then undertaken to ground truth and refine the mapping where possible. This field reconnaissance involved driving the publicly accessible roads within	Figure 4

Landscape Feature	Description	Figure Reference
	the buffer area and making observations across paddocks etc. from the roadside. 1. Woody vegetation cover – 75.3 ha (7.48%) of the buffer area was determined to support native woody vegetation cover. 2. Non-woody vegetation cover – 27.9 ha (2.77%) of the buffer area was determined to support native non-woody vegetation cover. ↓ Total native vegetation cover – the total area of native vegetation cover in the buffer area is 103.2 ha (10.25%). This falls into the <30 cover class in the BAM Calculator.	



Acknowledgement: Image (c) NSW LPI 2020

Scale 1:10,000 @ A3, GDA 1994, MGA Zone 55

Figure 3. Hydrology

Legend

Subject Land

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Date: 6 February 2020

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Legend

Subject Land

Landscape Context

1500m Buffer from Study Area

1500m Buffer - Woody Native Vegetation

1500m Buffer - Non-woody Native Vegetation

Acknowledgement: Image (c) NSW LPI 2020

0 375 750 1125 1500 m

Scale 1:15,000 @ A3, GDA 1994, MGA Zone 55

N

Figure 4. Site Map

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Date: 6 February 2020

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2.2 Native Vegetation, Threatened Ecological Communities and Vegetation Integrity

As per the BC Act, native vegetation is defined according to Part 5A of the Local Land Services Act 2013 (LLS Act), which states:

> *"(1) For the purposes of this Part, native vegetation means any of the following types of plants native to New South Wales:*
>
> *(a) trees (including any sapling or shrub or any scrub),*
>
> *(b) understorey plants,*
>
> *(c) groundcover (being any type of herbaceous vegetation),*
>
> *(d) plants occurring in a wetland.*
>
> *(2) A plant is native to New South Wales if it was established in New South Wales before European settlement. The regulations may authorise conclusive presumptions to be made of the species of plants native to New South Wales by adopting any relevant classification in an official database of plants that is publicly accessible."*

As per this definition, planted vegetation which comprises plant species native to NSW, regardless of whether or not the species are indigenous to the specific region and/or PCT of the subject land, is classified as native vegetation.

The Commonwealth Government[8,9], ACT Government[10], and previous NSW Government[11] assessment guidelines for the temperate grassland and woodland PCTs of the NSW/ACT Southern Tablelands region each declare vegetation as native dominant if 50% or more of the perennial groundlayer is composed of native species. However, no such threshold is defined by the BAM, and the former Office of Environment and Heritage have advised (Tobi Edmonds pers. comm., September 2018) that the criteria for use in determining native vs. exotic dominance must be more stringent than the previously applied 50/50 rule. It is understood that this is due to the potential for seasonal variation and/or assessor disparity to substantially alter the BAM mapping result. For example, a patch of vegetation that is classified as 55% native in one season may be classified as 45% native in another.

With regard to the above, for the purposes of this BDAR (and the supporting BAM assessment):

1. 'Native vegetation' is defined as any plant, naturally occurring or planted, which is native to NSW.

2. Exotic vegetation is defined as any plant which is not native to NSW.

[8] Commonwealth of Australia (2006). *Policy Statement 3.5: White Box – Yellow Box – Blakely's Red Gum grassy woodlands and derived native grasslands*. Commonwealth Department of Environment and Heritage.
[9] Commonwealth of Australia (2016). *Approved conservation advice for the Natural Temperate Grassland of the South Eastern Highlands (NTG–SEH) ecological community*.
[10] ACT Government (2010). *Survey guidelines for determining lowland vegetation classification and condition in the ACT*. Environment and Sustainable Development Directorate – Conservation Planning and Research.
[11] NSW Government (2014). *BioBanking Assessment Methodology 2014*. NSW Government Office of Environment and Heritage.

3. A polygon of vegetation is 'native vegetation' if:

    a. 35% (i.e. approximately one-third) or more of the perennial groundlayer comprises species native to NSW; and/or

    b. species native to NSW are present in one or more of the other strata.

2.2.1 Vegetation Survey and Mapping Methods

The vegetation throughout the entirety of the subject land was surveyed and mapped in accordance with the BAM. Vegetation survey dates and survey effort are detailed in Table 2. The methodology involved the following.

- Mapping of the on-ground boundaries of the Plant Community Types (PCTs).
- Stratification of each PCT into vegetation zones reflecting the broad condition state of vegetation.
- The completion of a series of surveys to measure the composition, structure, and function attributes of the vegetation.

These steps are described in more detail below. The full BAM and supplementary resources are available online via the OEH website https://www.environment.nsw.gov.au/biodiversity/assessmentmethod.htm.

It is important to note that the information and data collected during vegetation survey and mapping (Section 2.2.2.1 to 2.2.2.4) were also used to assess the subject land for the presence/ absence of habitat constraints and/or microhabitats for ecosystem credits species (Section 2.3.3) and species credit species (Section 2.3.4).

Table 2. Vegetation survey dates and survey effort

Task	Method	Date	Personnel	Survey effort
PCT and Zone mapping (from preliminary report - Capital Ecology, 2019)	Random meander	4/03/2019	1 person	2 hours
Vegetation Assessment	BAM plot	8/11/2019	2 people	8 hours
Tree habitat assessment	Tree survey	12/11/2019	1 person	2 hours

2.2.1.1 Plant Community Type (PCT) mapping

The on-ground boundaries of each of the Plant Community Types (PCTs) present in the subject land were mapped by marking boundaries directly onto high resolution orthorectified aerial photograph field maps. The PCTs and their characteristics are provided in the NSW Vegetation Information System (VIS) https://www.environment.nsw.gov.au/research/Vegetationinformationsystem.htm.

The PCTs were identified, and their boundaries defined, based on the:

- presence, species, growth form and density of remnant canopy trees and/or stags or stumps of these;
- presence and species of midstorey shrubs and trees;

- floristic composition of the groundstorey; and
- the landscape position and other geographical features (elevation, aspect, soils, apparent hydrology).

2.2.1.2 Vegetation zone definition and mapping

The mapped PCTs were further divided into vegetation zones based on the structure, floristic composition and overall condition ('condition state') of the vegetation. The vegetation zones were mapped in the field and then digitised using GIS which provided accurate calculations of the total area of each vegetation zone in the subject land.

2.2.1.3 Survey plots/transects

A series of a BAM plots (i.e. vegetation assessment survey plot/transect sets) were completed to adequately sample each vegetation zone. As illustrated in Diagram 8 from NSW Government (2018[12]), each BAM Plot involved:

a. one 20 x 20 m (400 m^2) plot, used to assess the composition and structure attributes;

b. one 20 x 50 m plot (1,000 m^2) plot, used to assess the function attributes; and

c. five 1 m^2 sub-plots, used to assess average little cover (and other optional groundcover components) for the plot.

All BAM plot locations were selected randomly within the vegetation zone, by marking on a map and walking to the location. BAM plot locations were spread throughout the entire subject land (refer to Figure 5). The information collected during this process was subsequently used to determine the condition of the vegetation present in the subject land.

The minimum number of BAM plots completed in each vegetation zone of the subject land classified as BC Act native vegetation was determined as per the minimum required plot numbers specified in Table 4 of the BAM.

As stated in Section 5.1.1.5 of the BAM:

> *'areas that are not native vegetation (i.e. land not included in native vegetation extent) do not require further assessment in the BAM except where:*
>
> *(a) they are proposed for restoration as part of an offset (refer to Stage 3)*
>
> *(b) they are assessed as habitat for threatened species according to Section 6.4.*

However, plots were completed in zones which did not meet the definition of BC Act 'native vegetation' (i.e. PCT1330 Zone 3, refer to Figure 5). Surveying all zones ensured that the vegetation composition (including an accurate determination of BC Act native vegetation presence/absence) and potential threatened species habitat were accurately assessed across all of the vegetation condition types present in the subject land. As shown in Figure 5, a total of six plots were completed across three vegetation zones.

[12] NSW Government (2018). *Biodiversity Assessment Method Operational Manual – Stage 1*. State of New South Wales and Office of Environment and Heritage.

It is important to highlight that only those zones which are classified as BC Act native vegetation and/or threatened species habitat are subsequently used to determine the impact of the proposed development (refer to Section 3.2).

2.2.1.4 Tree habitat assessment

All of the mature remnant trees (i.e. >20 cm DBH) present in the subject land were assessed for the presence of functional hollows and/or large stick nests. Particular attention was given to observations on fauna nesting in the hollows or in large stick nests. The location of each mature remnant tree was recorded via hand-held GPS and the following data was taken:

- tree number;
- tree species;
- diameter at breast height DBH (cm);
- approximate height (m); and
- characteristics of hollows and other habitat values such as nests, mistletoe etc.

The data collected during this process was used to determine the number of hollow-bearing trees in each vegetation zone.

2.2.2 BAM Targeted Survey Methods

A number of threatened flora and fauna species were identified by the BAM as potentially occurring in the subject land (refer Section 2.3.3 and Section 2.3.4). Some of these species were excluded from further consideration based on factors such as geographical constraints or the absence of important habitat features. Survey dates and survey effort for targeted surveys undertaken for the remaining species considered to have the potential to occur in the subject land are detailed in Table 3. Weather conditions for survey dates are detailed in

Table 4. In total, 42.5-person hours were spent on site during the development of this BDAR.

Table 3. Flora and fauna survey dates and survey effort

Task	Method	Date	Personnel	Survey effort
Striped Legless Lizard tile survey	45 x 20 m tile grids, checked once a week for 10 weeks	5/09/2019 19/09/2019 26/09/2019 2/10/2019 8/10/2019 16/10/2019 21/10/2019 29/10/2019 7/11/2019 12/11/2019 18/11/2019	2 people 2 people 2 people 2 people 2 people 2 people 2 people 2 people 2 people 2 people 2 people	3 hours 2 hours 1.5 hours 2 hours 2 hours 2 hours 2 hours 2 hours 2 hours 1.5 hours 2 hours
Golden Sun Moth survey	Belt Transect Survey	31/10/2019 12/11/2019 18/11/2019	1 person 1 person 2 people	1.25 hours 1.25 hours 1.5 hours

Task	Method	Date	Personnel	Survey effort
		29/11/2019	2 people	2 hours
Threatened bird survey	Random meander throughout likely habitat	12/11/2019	1 person	1.25 hours
	Opportunistic observations	26/09/2019 31/10/2019 8/11/2019 12/11/2019	2 people 1 person 2 people 1 person	2 hours 1 hour 4 hours 1.25 hours
Tree habitat assessment	Tree survey	12/11/2019	2 people	2 hours

Table 4. Survey weather conditions

Date	Temperature Min-Max °C	Cloud (8th) @ 9am	Wind @ 9pm	Rain since 9am on previous day
26/07/2019	-1.5 – 13.8	0	22 km/h	0 mm
4/03/2019	13.6 – 34.1	0	7	0
5/09/2019	1.5 – 21.2	8	7	0
19/09/2019	10.0 – 20.1	8	2	0
26/09/2019	4.4 – 18.2	7	4	0
2/10/2019	1.8 – 24.7	0	Calm	0
8/10/2019	8.4 – 18.7	0	28	0
16/10/2019	7.8 – 24.8	1	9	0
21/10/2019	3.1 – 26.7	0	7	0
29/10/2019	5.6 – 27.4	0	Calm	0
31/10/2019	7.0 – 31.7	0	6	0
7/11/2019	11.3 – 19.4	0	39	0
8/11/2019	12.7 – 18.8	1	35	0
12/11/2019	5.8 – 26.6	0	39	0
18/11/2019	6.8 – 27	0	17	0
29/11/2019	12.6 – 33.1	0	2	0

Data Source: Australian Bureau of Meteorology - Canberra Airport (station 070351).

2.2.2.1 Striped Legless Lizard tile survey

A program of roof tile surveys was undertaken in accordance with both the Commonwealth Government survey guidelines (Commonwealth of Australia 2011[13]) and the ACT Government survey guidelines (ACT Government 2015[14]).

As per the ACT Government survey guidelines, tiles were placed in grids of 50 (10 rows of 5) with 5 m spacing. One grid is required per 3 ha of potential habitat for sites under 30 ha. As the study area contains approximately 12 ha of potential habitat, four grids were required. Therefore, 200 tiles were placed for the survey. The location of each grid was chosen to spatially separate the grids as much as

[13] Commonwealth of Australia (2011). *Environment Protection and Biodiversity Conservation Act 1999 referral guidelines for the vulnerable striped legless lizard, Delma impar – EPBC Act policy statement 3.28.*
[14] ACT Government (2015b). *Survey Guidelines for Striped Legless Lizard*. Conservation, Planning and Research, Environment and Sustainable Development Directorate.

practicable to obtain an adequate coverage of the study area whilst still ensuring grids were placed in locations with appropriate Striped Legless Lizard habitat characteristics. Where possible, grids were placed in open grassland with a well-defined grass tussock structure. No grids were placed in the eastern portion of the study area due to the high level of tree cover and lack of a well-defined grass tussock structure. The location of each corner of the grid was marked with a GPS (accurate +/- 3 m) and each tile was assigned a unique number (refer to Figure 8).

Following a two week 'settling in' period, each tile was checked once per week for 10 weeks. Surveys commenced on 18 September 2019 and were completed on 22 November 2019. All tiles were checked between 0730 hrs and 1130 hrs, with the exact timing of each check chosen to reflect the weather conditions. In this regard, checks were timed to occur when the tiles were warm to the touch, but not hot. Start time, finish time, and weather conditions were recorded for each check.

If found, each Striped Legless Lizard would have had the following data recorded.

- Location (tile number).
- Snout-to-vent (SVL) length (mm).
- Total length (mm).
- Tail condition (Full/Regrowth).
- Other relevant biometrics (markings, colour, age, etc.).
- A macro photograph of the dorsal head scales. This photo was taken as the dorsal head scales of Striped Legless Lizard are unique to each individual and can therefore be used to determine the number of unique captures across the 10-week survey period.

Once processed, a captured Striped Legless Lizard would be released beside the tile of capture, allowing it to move back beneath the tile or to a tussock adjacent to the tile. All other vertebrate fauna found under the tiles were visually identified to species level.

2.2.2.2 Golden Sun Moth survey

A program of four targeted Golden Sun Moth (GSM) surveys was undertaken in accordance with the following guidelines:

- *Background Paper to EPBC Act Policy Statement 3.12 - Significant Impact Guidelines for the Critically Endangered Golden Sun Moth (Synemon plana)*[15]; and
- the ACT Government Conservation Research Unit's survey guidelines (ACT Government 2014)[16].

Each survey involved one ecologist walking transects approximately 50-100 m apart across the estimated extent of potential habitat (refer to Figure 9). All male GSM flights observed (usually up to 20 m ahead or to either side of the ecologist), are marked via a hand-held GPS.

[15] Commonwealth of Australia (2009). *Background Paper to EPBC Act Policy Statement 3.12 - Significant Impact Guidelines for the Critically Endangered Golden Sun Moth (Synemon plana)*. Department of Environment, Water, Heritage and the Arts.

[16] ACT Government (2014). *Survey Guidelines for Golden Sun Moth*. Conservation, Planning and Research, Environment and Sustainable Development Directorate.

On each survey day, moths were confirmed to be flying in the ACT region via pre-survey checks of known habitat and/or email and phone communication with other ecologists conducting GSM surveys in the region.

The details of the four survey days and relevant survey conditions are provided in Table 5. In summary, the targeted surveys were undertaken during good to optimal survey conditions on days when moderate to high numbers of GSM were confirmed to be flying.

A GPS track was recorded for each survey; these are illustrated in Figure 9. As shown on Figure 9, effort was made to vary the alignment of the transects between surveys in order to achieve the best possible coverage of the subject land. Whilst the surveys are primarily focused on recording male GSM flights, the ecologist also examined the ground for female moths and pupal cases, particularly in the areas considered to have the highest potential for GSM occurrence.

Table 5. Golden Sun Moth survey conditions.

Date: 31/10/2019 (Survey 1)				**Observer/s:** SR
Survey Site: Murrumbateman				
Time	**Air Temp.**	**Wind**	**Cloud cover**	**Other weather information**
Start: 1400	29.9	15 W	1/8	Warm and relatively still with small gusts.
Finish: 1520	30.5	20 NNW	1/8	
General site notes: Very good conditions. No GSM recorded. Males confirmed flying near Yass and via ACT GSM email forum.				
Date: 12/11/2019 (Survey 2)				**Observer/s:** ST, KL
Survey Site: Murrumbateman				
Time	**Air Temp.**	**Wind**	**Cloud cover**	**Other weather information**
Start: 0830	20.2	30 NNW	1/8	Becoming windy and cloudy.
Finish: 0940	23.8	35 NNW	8/8	
General site notes: Sub-optimal conditions. No GSM recorded. Males confirmed flying near Yass and via ACT GSM email forum.				
Date: 18/11/2019 (Survey 3)				**Observer/s:** ST, JM
Survey Site: Murrumbateman				
Time	**Air Temp.**	**Wind**	**Cloud cover**	**Other weather information**
Start: 1250	18.5	43 WNW	1/8	Light to strong breeze with strong gusts. Site is very dry.
Finish: 1330	19.7	33 WNW	1/8	
General site notes: No GSM recorded. Males confirmed flying near Gungahlin.				
Date: 29/11/2019 (Survey 4)				**Observer/s:** ST
Survey Site: Murrumbateman				
Time	**Air Temp.**	**Wind**	**Cloud cover**	**Other weather information**
Start: 1230	30.4	32 NW	1/8	Very dry conditions.
Finish: 1330	30	17 N	1/8	
General site notes: Good conditions. No GSM observed. Males observed flying at Yarralumla Brickworks and near QBN Nature Reserve, NSW.				

2.2.2.3 Threatened bird survey and flora search

Based on the location and the ecological community present, the subject land was preliminarily assessed as having the potential to support EPBC Act and/or BC Act listed threatened bird species and threatened flora species.

Some threatened bird species are identified by the BAM as a species credit species (refer Section 2.3.4), which is a species for which presence/absence and habitat value cannot be reliably predicted by location, vegetation type, and vegetation condition. Accordingly, where potential habitat is present, targeted surveys are required to determine the species credit value of the subject land for these species. As previously noted, the only habitat features remaining in the subject land of potential habitat value to birds listed as species credit species are the four retained mature remnant eucalypt trees. Accordingly, in addition to the tree habitat assessment completed for these trees (refer Section 2.2.1.4), these four trees were observed during each visit to the subject land to determine whether they are being utilised by listed bird species.

Several threatened flora species are identified as candidate species by the BAM (refer Section 2.3.4.). However, given the land use history, degree of vegetation modification, and the sensitivity of these species to habitat degradation, it is highly unlikely that any threatened flora species persists on the subject land. Accordingly, targeted surveys were not conducted for threatened flora, instead opportunistic observations were made through the remainder of the survey program.

An inventory of all species identified in the subject land was commenced during the preliminary field inspection and supplemented across all the subsequent surveys undertaken. These inventories are presented in Appendix B (flora) and Appendix C (fauna). Maintaining an inventory in this manner ensures that the maximum possible diversity of species is recorded, and if present, any significant species are flagged.

2.2.2.4 Fauna nesting survey

As mentioned in Section 2.2.1.4, all of the mature remnant trees (i.e. >20 cm DBH) present in the subject land were assessed for fauna habitat features. During the assessment, trees were inspected for the presence of large stick nests and/or signs of fauna nesting in hollows (e.g. individuals in hollows, scratch/chew marks, birds 'on station'). Particular attention was given to any signs of species credit species (Table 14) breeding in these trees.

2.2.3 Vegetation Survey and Mapping Results

2.2.3.1 Plant Community Type (PCT) mapping

Before European settlement the entire study area would have been characterised by an open woodland PCT. As shown in Figure 5 and detailed in Table 6, based on the landscape position and plant species present in the subject land and surrounds, only the open grassy woodland PCT 'PCT1330 Yellow Box – Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands' is considered to occur in the study area. In its climax form this community would have been characterised by an open canopy dominated by Yellow Box *Eucalyptus melliodora* and Blakely's Red Gum *E. blakelyi*, sparse or absent mid and shrubstorey, together with a defined grassy groundcover supporting a high diversity of native forbs.

Table 6. PCTs recorded in the subject land

PCT	PCT name	PCT description	Occurrence in subject land	TEC status Commonwealth / NSW	PCT % cleared
1330	Yellow Box – Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands	This community occurs on soils of moderate to high fertility and generally moderate depth, on undulating terrain between 500 m and 900 m on the tablelands. In its climax form this community would have been characterised by an open canopy dominated by Yellow Box and Blakely's Red Gum, sparse or absent mid and shrubstorey, together with a defined grassy groundcover supporting a high diversity of native forbs.	This PCT was mapped across the entire subject land.	Critically Endangered (Commonwealth) and Endangered (NSW) when occurring in a condition consistent with the listing criteria of the TEC.	94%

2.2.3.2 Vegetation zones

As illustrated in Figure 5, PCT1330 was determined to comprise the following three discernible vegetation zones.

- PCT1330 Zone 1 – No canopy, native dominant groundstorey, low native forb diversity.
- PCT1330 Zone 2 – No canopy, mixed native and exotic groundstorey, low native forb diversity.
- PCT1330 Zone 3 – No canopy, exotic dominant groundstorey, low native forb diversity.

As shown in Table 7 to Table 9, PCT1330 Zones 1 and 2 meet the definition of BC Act 'native vegetation'. As described in Section 2.2.3.4, PCT1330 Zones 1 and 2 require assessment to determine their vegetation integrity scores and the impact associated with the proposed development. PCT1330 Zone 3 is dominated by exotic grasses and herbaceous weeds (i.e. > 65% perennial exotic) and does not contain a cover of native trees and/or shrubs. As per Chapter 5 of the BAM, this zone does not require assessment to determine a vegetation integrity score unless it is determined to be threatened species habitat. As detailed in Table 14 and Section 2.3.4, PCT1330 Zone 3 is not identified as habitat for threatened species and therefore does not require assessment to determine a vegetation integrity score.

Table 7. PCT1330 Zone 1 results summary

	PCT1330 Zone 1
Description	Native Derived Grassland Overstorey, midstorey, and shrubstorey entirely absent. Low diversity native groundstorey dominated by Weeping Grass *Microlaena stipoides,* Wallaby Grasses *Rytidosperma* spp., and Tall Speargrass *Austrostipa bigeniculata,* as well as a diversity of exotic grasses and herbs.
Area – subject land	0.71 ha
BAM plots assessed	1.
Overstorey Species	None.
Overstorey Cover	0%.
Overstorey Regeneration	No.
Perennial Groundlayer	57% native.
Significant Weeds	Chilean Needle Grass *Nassella neesiana*
EPBC Act and/or BC Act listed TEC	No.
BC Act Native Vegetation	Yes.

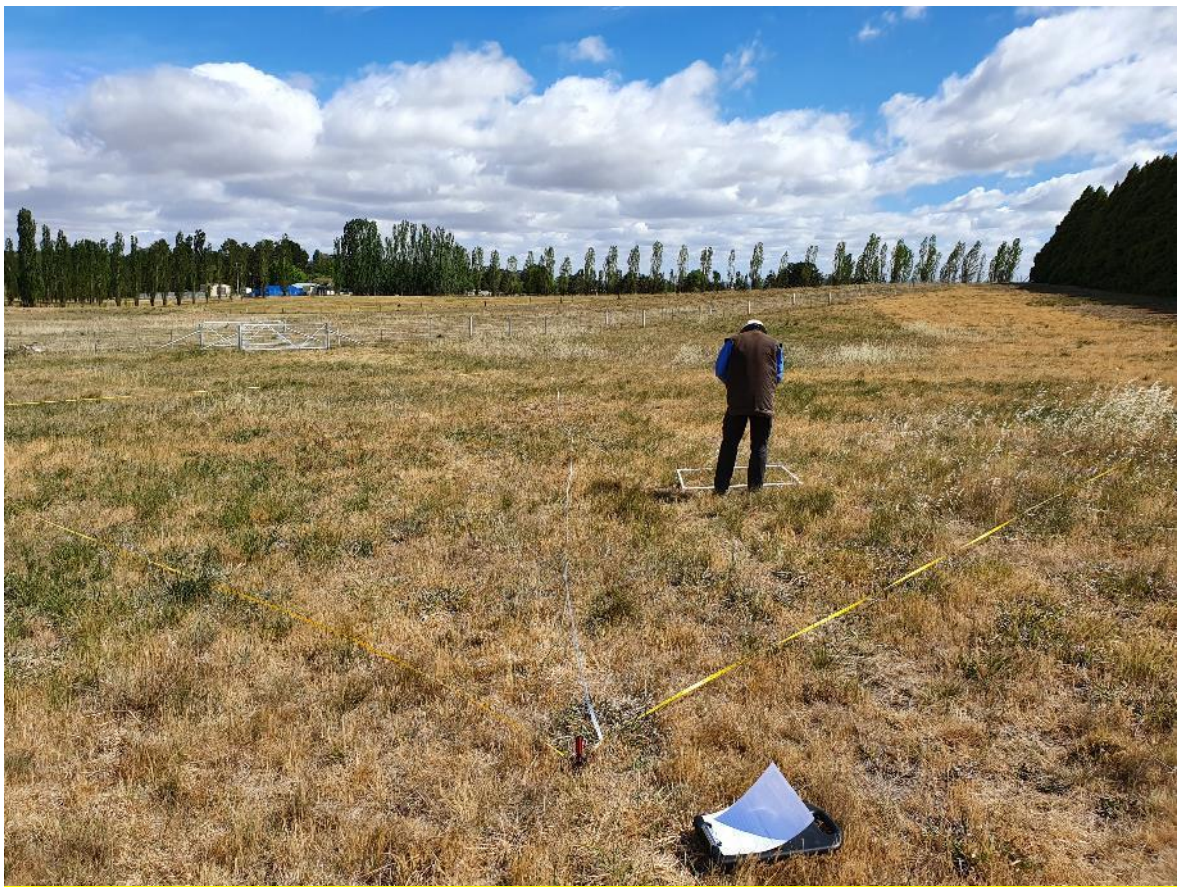

Table 8. PCT1330 Zone 2 results summary

	PCT1330 Zone 2
Description	Mixed Native and Exotic Pasture Overstorey almost entirely cleared. Midstorey and shrubstorey entirely absent. Mixed native and exotic groundlayer, comprising of disturbance tolerant native perennial grasses, and exotic perennial grasses and herbs. Evidence of historic cultivation and pasture improvement. Currently grazed by horses.
Area – subject land	3.75 ha.
BAM plots assessed	2.
Overstorey Species	Scattered remnant *E. melliodora* and *E. blakelyi*. Scattered planted *E. rubida.*
Overstorey Cover	<5%.
Overstorey Regeneration	No.
Perennial Groundlayer	0 - 17% native (average 25%)
Significant Weeds	Chilean Needle Grass, Paterson's Curse *Echium plantagineum*
EPBC Act and/or BC Act listed TEC	No.
BC Act Native Vegetation	Yes.

Table 9. PCT1330 Zone 3 results summary

	PCT1330 Zone 3
Description	Sown Exotic Pasture Overstorey, midstorey, and shrubstorey almost entirely absent. Low diversity exotic groundlayer dominated by exotic perennial grasses and herbs. Evidence of historic cultivation and pasture improvement. Currently grazed by horses.
Area – subject land	14.11 ha.
BAM plots assessed	3.
Overstorey Species	Scattered remnant *E. melliodora* and *E. blakelyi*. Scattered planted *E. rubida.* Planted exotic trees border the subject land as wind breaks.
Overstorey Cover	<5%.
Overstorey Regeneration	No.
Perennial Groundlayer	0.1 – 0.7% native.
Significant Weeds	Paterson's Curse
EPBC Act and/or BC Act listed TEC	No.
BC Act Native Vegetation	No.

2.2.3.3 Patch size

As defined in the BAM, patch size is -

"an area of intact native vegetation that:

a) occurs on the development site or biodiversity stewardship site, and

b) includes native vegetation that has a gap of less than 100m from the next area of moderate to good condition native vegetation (or ≤30m for non-woody ecosystems).

Patch size may extend onto adjoining land that is not part of the development site or biodiversity stewardship site."

Where intact vegetation is defined as –

"vegetation where all tree, shrub, grass and/or forb structural growth form groups expected for a plant community type are present"

As detailed below, none of the native vegetation in the subject land meets the definition of intact vegetation as it lacks some or all of the structural growth form groups expected of the PCT.

- PCT1330 Zone 1 lacks an overstorey, midstorey, shrubstorey, and regeneration of the overstorey.
- PCT1330 Zone 2 lacks an overstorey, midstorey, shrubstorey, and regeneration of the overstorey.
- PCT1330 Zone 3 lacks an overstorey, midstorey, shrubstorey, regeneration of the overstorey, and native groundstorey.

2.2.3.4 Vegetation integrity scores

Zones which meet the definition of BC Act 'native vegetation' and which occur in the subject land are used to determine vegetation integrity scores and the impact associated with the proposed development (refer to Figure 6). Zones which do not meet the definition of BC Act native vegetation do not require further assessment in the BAM except where:

(a) they are proposed for restoration as part of an offset; or

(b) they are assessed as habitat for threatened species.

The groundstorey of PCT1330 Zone 1 is marginally dominated by native perennial grasses. PCT1330 Zone 2 has a mixed groundstorey of native and exotic species with a native composition substantially lower than 35% (i.e. average 25%). As such, only PCT1330 Zone 1 meets the definition of BC Act native vegetation.

PCT1330 Zones 2 and 3 have a groundstorey clearly dominated by exotic grasses and forbs (i.e. > 65% perennial exotic) and do not contain a cover of native trees and/or shrubs. As detailed in Table 14 and Section 2.3.4.2, PCT1330 Zones 2 and 3 are not identified as habitat for threatened species. Therefore, as per Chapter 5 of the BAM, these zones do not require assessment to determine a vegetation integrity score. Table 9 presents the results of the BAM plot assessments and details the composition, structure, function, and resulting vegetation integrity score for PCT1330 Zone1.

Table 10. Vegetation integrity scores

	PCT1330 Zone 1
PCT	1330
Zone (condition class)	1
Description	- No canopy - Native dominant (marginally) - Low diversity
Patch size (ha)	0
Area (ha) in the subject land	0.71 ha
BAM plots assessed in the subject land	1
Composition condition score	5.4
Structure condition score	50.6
Function condition score	7.9
Current vegetation integrity score	**12.9**

2.2.3.5 Tree habitat assessment results

As shown in Figure 5 and detailed in Appendix D, the subject land contains four mature remnant trees. Two Yellow Box *Eucalyptus melliodora* are located along the southern boundary, and two Blakely's Red Gum *E. blakelyi* are located along the western boundary. One Blakely's Red Gum (tree #1) contains two functional hollows, one medium and one small. A pair of Common Starlings *Sturnus vulgaris* were observed nesting in the medium hollow during the field surveys.

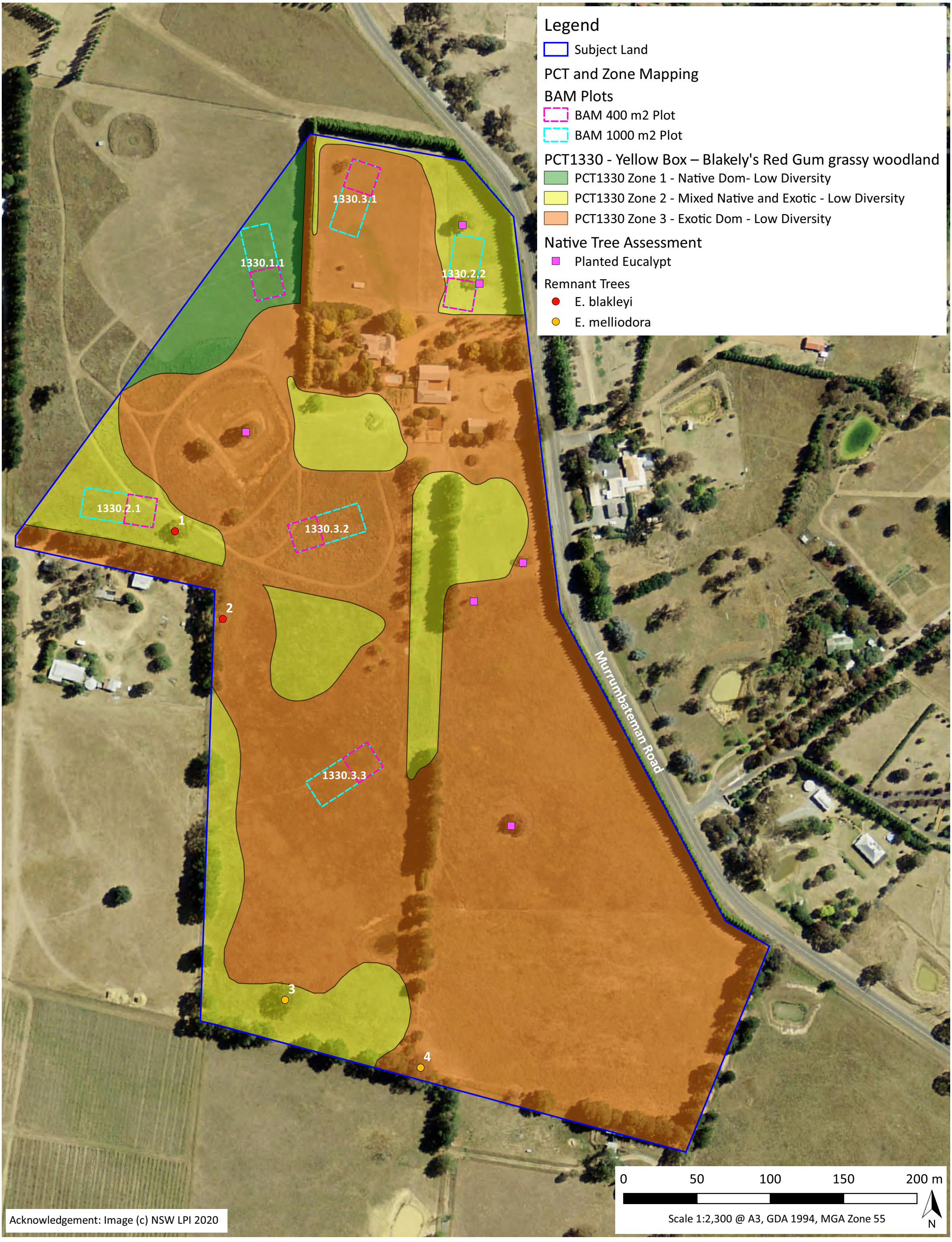

Figure 5. BAM Vegetation Mapping and Survey

Capital Ecology Project No: 2876
Drawn by: S. Thompson
Date: 13 February 2020

Figure 6. BC Act Native Vegetation

Capital Ecology Project No: 2876
Drawn by: S. Thompson
Date: 6 February 2020

2.2.4 Threatened Ecological Communities

2.2.4.1 Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)

The following two EPBC Act critically endangered listed threatened ecological communities have the potential to occur in the locality: Natural Temperate Grassland of the South Eastern Highlands (Natural Temperate Grassland); and White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland (Box-Gum Woodland).

Natural Temperate Grassland of the South Eastern Highlands – listed as critically endangered pursuant to the EPBC Act

Description – As detailed in Commonwealth of Australia (2016), the Natural Temperate Grassland threatened ecological community is characterised by grassy vegetation dominated by moderately tall (25–50cm) to tall (50–100cm), dense to open tussock grasses in the genera *Rytidosperma*, *Austrostipa*, *Bothriochloa*, *Poa* and *Themeda*. Up to 70% of all plant species may be forbs. The community may be treeless or contain up to 10% cover of trees, shrubs or sedges. Natural Temperate Grassland occurs within the biogeographical region of the South East Highlands in valleys influenced by cold air drainage and in broad plains.

Presence in the subject land – Absent – No part of the subject land supports, or historically supported, grassland ecological communities. As such, the subject land does not support this TEC.

White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland – listed as critically endangered pursuant to the EPBC Act

Description – The White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland TEC is characterised by a species-rich understorey of native tussock grasses, herbs and scattered shrubs (where shrub cover comprises less than 30% cover), and a dominance or prior dominance of White Box and/or Yellow Box and/or Blakely's Red Gum trees. This TEC occurs along the western slopes and tablelands of the Great Dividing Range from southern Queensland through New South Wales and the Australian Capital Territory to Victoria.

To determine whether a patch meets the criteria for the community, the vegetation must be assessed against the flowchart provided in Policy Statement 3.5: White Box – Yellow Box – Blakely's Red Gum grassy woodlands and derived native grasslands (Commonwealth of Australia 2006). An assessment of the vegetation in the subject land against this flowchart is provided below.

1. *Is, or was previously, at least one of the most common overstorey species White Box, Yellow Box or Blakely's Red Gum?*

   Yes – Two remnant Yellow Box and two remnant Blakely's Red Gum were recorded in the subject land. Both species are considered to have historically been dominant or co-dominant across the whole of the subject land.

2. *Does the patch have a predominantly native understorey?*

   PCT1330 Zone 1 supports a predominantly native understorey.

   PCT1330 Zones 2 and 3 do not support a predominantly native understorey.

3. *Is the patch 0.1 ha (1000 m^2) or greater is size with 12 or more native understorey species present (excluding grasses)? There must be at least one important species.*

Or

Is the patch 2 ha or greater in size with an average of 20 or more mature trees per hectare, or is there natural regeneration of the dominant overstorey eucalypts?

No – PCT1330 Zone 1 does not support the floristic diversity, mature trees, or overstorey regeneration to meet the listing criteria for this TEC.

Presence in the subject land – Absent – The subject land would have once supported this TEC, however all strata have been modified and degraded such that all areas are dominated by exotic grasses and herbaceous weeds, and/or lack the floristic diversity to meet the listing criteria for this TEC. As such, the subject land does not support this TEC.

In light of the above, the subject land does not support either of the EPBC Act listed threatened ecological communities with the potential to occur in the locality.

2.2.4.2 Biodiversity Conservation Act 2016 (NSW)

Two BC Act listed ecological communities have the potential to occur in the subject land:

- White Box – Yellow Box – Blakely's Red Gum Woodland' (BC Act Box-Gum Woodland); and
- Tablelands Snow Gum, Black Sallee, Candlebark and Ribbon Gum Grassy Woodland in the South Eastern Highlands, Sydney Basin, South East Corner and NSW South Western Slopes Bioregions; and

BC Act Box-Gum Woodland

Description – This community, listed as endangered in NSW, is described below, together with an assessment of its presence and condition in the subject land.

The below description is extracted from the NSW Final Determination for the TSC Act endangered listed ecological community White Box – Yellow Box – Blakely's Red Gum Woodland) (NSW Scientific Committee 2002, gazetted 15 March 2002[17]).

> *White Box Yellow Box Blakely's Red Gum Woodland is found on relatively fertile soils on the tablelands and western slopes of NSW and generally occurs between the 400 and 800 mm isohyets extending from the western slopes, at an altitude of c. 170m to c. 1200 m, on the northern tablelands (Beadle 1981). The community occurs within the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands and NSW South Western Slopes Bioregions.*
>
> *White Box Yellow Box Blakely's Red Gum Woodland includes those woodlands where the characteristic tree species include one or more of the following species in varying proportions and combinations - Eucalyptus albens (White Box), Eucalyptus melliodora (Yellow Box) or Eucalyptus blakelyi (Blakely's Red Gum). Grass and herbaceous species generally characterise the ground layer. In some locations, the tree overstorey may be absent as a result of past clearing or thinning and at these locations only an understorey may be present. Shrubs are generally sparse or absent, though they may be locally common.*

[17] NSW Scientific Committee (2002). *Final Determination for the TSC Act endangered listed ecological community White Box – Yellow Box – Blakely's Red Gum Woodland*. Gazetted 15 March 2002.

Although the final determination does not provide specific listing criteria against which to assess a patch of vegetation, a useful key is provided in Identification Guidelines for Endangered Ecological Communities – White Box Yellow Box Blakely's Red Gum Woodland (Box-Gum Woodland) (NPWS 2002[18]), which draws its information from the final determination. As described in the final determination and the associated key, the definition for the BC Act Box-Gum Woodland TEC is extremely broad. In effect, any land for which the climax community is Box-Gum Woodland that has not been cultivated, become a stock camp, or otherwise been entirely modified, is likely to meet the minimum definition of the BC Act listed TEC.

Presence in the subject land – Absent – The subject land would have once supported this TEC, however all strata have been modified and degraded such that all areas are dominated by exotic grasses and herbaceous weeds, and/or lack the structure or floristic diversity to meet the listing criteria for this TEC. As such, the subject land does not meet the criteria for this TEC under the BC Act.

BC Act Tablelands Snow Gum, Black Sallee, Candlebark and Ribbon Gum Grassy Woodland

Description – This community, listed as endangered in NSW, is described below, together with an assessment of its presence and condition in the subject land.

The below description is extracted from the NSW *Final Determination for the TSC Act endangered listed ecological community Tablelands Snow Gum, Black Sallee, Candlebark and Ribbon Gum Grassy Woodland in the South Eastern Highlands, Sydney Basin, South East Corner and NSW South Western Slopes Bioregions* (NSW Scientific Committee 2011, gazetted 10 June 2011[19]).

> *Tablelands Snow Gum, Black Sallee, Candlebark and Ribbon Gum Grassy Woodland typically forms an open-forest, woodland or open woodland that transitions into grassland at low tree cover. The canopy is dominated by Eucalyptus pauciflora (Snow Gum), E. rubida (Candlebark), E. stellulata (Back Sallee) and E. viminalis (Ribbon Gum), either as single species or in combinations. A shrub layer may be present and sub-shrubs are often a component of the ground stratum; characteristic species include Hymenanthera dentata and Melichrus urceolatus. The ground layer is dominated by grasses and other herbaceous species including Themeda australis, Poa spp., Austrostipa spp., Austrodanthonia spp., Leptorhynchos squamatus, Chrysocephalum apiculatum, and Asperula conferta. This community may also occur as secondary grassland where the dominant trees have been removed but the ground stratum remains.*
>
> *The ecological community mainly occurs on valley floors, margins of frost hollows, footslopes and undulating hills between approximately 600 and 1400 m in altitude. It occurs on a variety of substrates including granite, basalt, metasediments and Quaternary alluvium. The ecological community occurs as a part of a mosaic of native vegetation communities including swamps, bogs, wetlands, grasslands and sclerophyll forests.*

The final determination does not provide specific listing criteria against which to assess a patch of vegetation, however the presence of the key canopy eucalypts and a native dominated ground stratum are described as the key characteristics of the community. The final determination also states that the community may also occur as secondary grassland. In this regard, based on the final

[18] NSW Government (2002*). Identification Guidelines for Endangered Ecological Communities - White Box Yellow Box Blakely's Red Gum Woodland (Box-Gum Woodland).* NSW National Parks and Wildlife Service

[19] NSW Scientific Committee (2011). *Final Determination for the TSC Act endangered listed ecological community Tablelands Snow Gum, Black Sallee, Candlebark and Ribbon Gum Grassy Woodland in the South Eastern Highlands, Sydney Basin, South East Corner and NSW South Western Slopes Bioregions*. Gazetted 10 June 2011.

determination, a logical interpretation of the minimum criteria for a patch to constitute the listed community is that the patch must:

1. support a canopy which is dominated by the key eucalypt species and occurs in at least moderately intact condition; or
2. where the canopy has been cleared, the ground stratum remains in at least moderately intact condition (i.e. native dominated with moderate to high diversity).

Presence in the subject land – Absent – The dominant tree species in the subject land are not characteristic of the BC Act Tablelands Snow Gum, Black Sallee, Candlebark and Ribbon Gum Grassy Woodland TEC. As such, the subject land does not support vegetation which meets the criteria for this community under the BC Act

In light of the above, the subject land does not support either of the BC Act listed threatened ecological communities with the potential to occur in the locality.

2.2.5 High Threat Weeds

Table 11 lists the high threat weeds which were recorded in the subject land.

Table 11. High threat weeds

Species Name	Common Name	Status
Grass		
Eragrostis curvula	African lovegrass	AP
Nassella neesiana	Chilean Needle Grass	WoNS, LM
Nassella trichotoma	Serrated Tussock	WoNS, C

Table key.

- WoNS - (Commonwealth) Weed of National Significance.
- Regional Priority Weed in the South East Local Land Services region under the NSW *Biosecurity Act 2015*.
  - P = Prevention.
  - E = Eradication.
  - C = Containment.
  - AP = Asset Protection.
  - LM = Species subject to Local Management programs.

2.3 Habitat Suitability for Threatened Species

2.3.1 Fauna Habitat

The habitat features in the subject land were identified during the field surveys and assessed regarding their potential value to native fauna species, both threatened and common species. The fauna habitat features of the subject land are described in Table 12. It is important to note that the information presented in Table 12 is also used to assess the presence/absence of habitat constraints and/or microhabitats for ecosystem credits species (Section 2.3.3) and species credit species (Section 2.3.4).

Table 12. Fauna habitat features

Habitat Feature	Description	Relevant Native Fauna Species/Assemblages
Remnant eucalypts	Historic clearing has removed approx. 95% of the native overstorey across the subject land, retaining only four remnant trees. One remnant Blakely's Red Gum (tree# 1) contains two hollows (one small, one medium), that at the time of survey contained a nesting pair of Common Starlings. The three remaining remnant trees do not contain functional hollows, large stick nests, or mistletoe. The midstorey and shrubstorey are entirely absent (Appendix D, Figure 5).	All remnant trees are likely to provide a foraging resource for a variety of birds and marsupials when in flower, potentially including threatened species. The one hollow bearing Blakely's Red Gum may have limited value to hollow dependant native fauna. The remaining remnant trees are currently unlikely to be of value to hollow dependant fauna.
Other native vegetation (i.e. native grasses and forbs)	The natural midstorey and shrubstorey are entirely absent throughout the subject land. The small native patch of derived grassland/pasture (PCT1330 Zone 1) has very low diversity and almost no native forbs.	The absent midstorey and shrubstorey are likely to limit the habitat value of the subject land for most of the region's threatened woodland birds and marsupials, which generally prefer to inhabit vegetation where such features are more intact.
Exotic pasture	The majority of the subject land supports a highly modified pasture groundstorey dominated by exotic grasses and forbs (refer to Figure 5).	The exotic dominant pasture would provide a limited grazing resource for common birds, reptiles and herbivorous mammals. The groundstorey possesses a complex tussock structure across most of the subject land. This structure has the potential to support native grassland reptiles such as snakes, skinks, and potentially the Striped Legless Lizard *Delma impar* and/or Olive Legless Lizard *D. inornata*. Open areas are likely to provide a hunting resource for raptors and other predatory birds.
Creeks, streams, dams	One ephemeral drainage line originates in the subject land. This drainage line has no fringing vegetation. At the time of survey, the drainage line was dry and is only likely to convey water following substantial rain events. There are two small farm dams in the subject land, both of which held a small amount of water at the beginning of survey and were dry on completion of surveys.	The ephemeral drainage line is unlikely to provide habitat of value to aquatic flora or fauna as it rarely experiences substantial or prolonged water flows. The dams are unlikely to provide habitat of value to aquatic flora or fauna, however they may be of some limited value to common native water birds (e.g. Australian Wood Duck *Chenonetta jubata*) and reptiles (e.g. Eastern Long-necked Turtle *Chelodina longicollis*).

2.3.2 Threatened Biodiversity Data Collection

2.3.2.1 Definitions of conservation significance

The conservation significance of a species, population or community is determined by its current listing pursuant to Commonwealth and/or State legislation and associated policy, more specifically:

- National – Listed as threatened (critically endangered, endangered, vulnerable or conservation dependent) pursuant to the EPBC Act; and
- State (NSW) – Listed as threatened (endangered or vulnerable) pursuant to the BC Act.

Species listed as 'migratory' under the EPBC Act are also considered where relevant.

2.3.2.2 Database and literature review

Information regarding the suitability of the habitat in the subject land for threatened species was obtained from the Threatened Biodiversity Data Collection (TBDC), BioNet (e.g. the profile of a threatened species), and through the BAM Calculator. This information is used to assess the presence/absence of habitat constraints and/or microhabitats for species flagged by the BAM as ecosystem credits species (Section 2.3.3) and species credit species (Section 2.3.4).

In addition, a database search and literature review were completed to inform likelihood of occurrence assessments and provide useful background information for this assessment. This review included obtaining:

- a list of threatened species (flora and fauna), threatened populations and threatened ecological communities (TECs) listed pursuant to the EPBC Act with the potential to occur in the subject land obtained using the Department of the Environment and Energy's online EPBC Act Protected Matters Search Tool (PMST) on 23 July 2019 and updated on 13 February 2020; and
- ecological point data from the NSW Wildlife Atlas (BioNet), downloaded on 28 January 2019 and updated on 13 February 2020, providing a list of threatened species which have previously been recorded in the broad locality of the subject land (i.e. within 10 km) (refer to Figure 7).

Literature referred to during the conduct of the surveys for this study and/or during the preparation of this BDAR is listed under References.

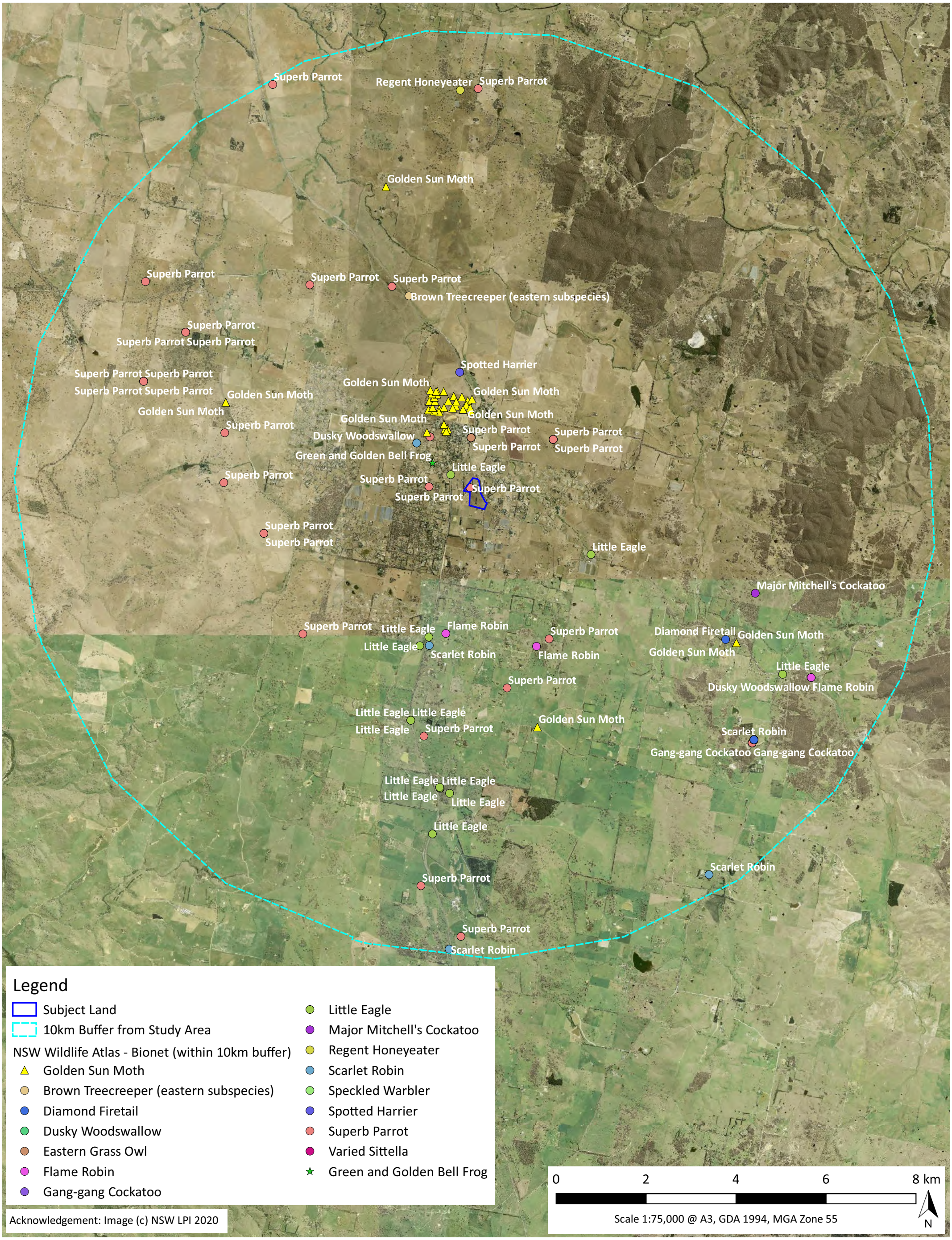

Figure 7. NSW Wildlife Atlas (Within 10km Buffer)

Capital Ecology Project No: 2876
Drawn by: S. Thompson
Date: 13 February 2020

2.3.3 Habitat Suitability for Ecosystem Credit Species

Threatened species classified as ecosystem credit species and identified by the BAM as potentially occurring in the subject land are listed in Table 13. The value of the habitat in the subject land for ecosystem credit species is determined based on the type and condition (i.e. vegetation integrity) of the vegetation present together with the landscape context (refer Section 2.1). The likelihood of these species occurring in the subject land is determined based the presence/absence of specific habitat constraints, geographic limitations, and vagrancy. Information regarding habitat constraints, geographic limitations, and vagrancy were obtained from the TBDC, BioNet (e.g. the profile of a threatened species), and through the BAM Calculator.

Table 13. Predicted ecosystem credit species identified by the BAM as potentially occurring in the subject land.

Species	NSW (BC Act) listing status	National (EPBC Act) listing status	Presence	Justification for exclusion
Anthochaera phrygia Regent Honeyeater (Foraging)	Critically Endangered	Critically Endangered	Yes – assumed	-
Artamus cyanopterus cyanopterus Dusky Woodswallow	Vulnerable	-	Yes – assumed	-
Chthonicola sagittata Speckled Warbler	Vulnerable	-	Yes – assumed	-
Climacteris picumnus victoriae Brown Treecreeper (eastern subspecies)	Vulnerable	-	Yes – assumed	-
Dasyurus maculatus Spotted-tailed Quoll	Vulnerable	Endangered	Yes – assumed	-
Glossopsitta pusilla Little Lorikeet	Vulnerable	-	Yes – assumed	-

Species	NSW (BC Act) listing status	National (EPBC Act) listing status	Presence	Justification for exclusion
Haliaeetus leucogaster White-bellied Sea-Eagle (Foraging)	Vulnerable	-	No – habitat constraint.	The TBDC list the following habitat constraints: • within 1 km of a rivers, lakes, large dams or creeks, wetlands and coastlines; and The subject land is not within 1 km of a rivers, lakes, large dams or creeks, wetlands and coastlines. As such, the absence of this habitat constraint removes this species as an ecosystem credit species.
Melanodryas cucullata cucullata Hooded Robin (south-eastern form)	Vulnerable	-	Yes – assumed	-
Miniopterus orianae oceanensis Large Bent-winged Bat (Foraging)	Vulnerable	-	Yes – assumed	-
Petroica boodang Scarlet Robin	Vulnerable	-	Yes – assumed	-
Petroica phoenicea Flame Robin	Vulnerable	-	Yes – assumed	-
Phascolarctos cinereus Koala (Foraging)	Vulnerable	Vulnerable	Yes – assumed	-
Polytelis swainsonii Superb Parrot (Foraging)	Vulnerable	Vulnerable	Yes – confirmed	Superb Parrots were recorded both flying over and foraging within the subject land on 31 October and 8 November 2019.
Stagonopleura guttata Diamond Firetail	Vulnerable	-	Yes – assumed	-

2.3.4 Habitat Suitability for Species Credit Species

2.3.4.1 Candidate species credit species

Threatened species classified as species credit species and identified by the BAM as potentially occurring in the subject land are listed in Table 14. The value of the habitat in the subject land for species credit species is determined based on the type and condition (i.e. vegetation integrity) of the vegetation present together with the landscape context (refer Section 2.1). The likelihood of these species occurring in the subject land is determined based the presence/absence of specific habitat constraints, microhabitat requirements, geographic limitations, vagrancy, species records (BioNet and ecological reports), and/or the results of targeted surveys. Information regarding habitat constraints, microhabitat requirements, geographic limitations, and vagrancy were obtained from the TBDC, BioNet (e.g. the profile of a threatened species), and through the BAM Calculator. A summary of the findings from each targeted survey is given in Section 2.3.4.2.

Table 14. Candidate species credit species identified by the BAM as potentially occurring in the subject land.

Species	NSW (BC Act) listing status	National (EPBC Act) listing status	Habitat requirements	Presence	Justification for exclusion
Ammobium craspedioides Yass Daisy	Vulnerable	Vulnerable	The Yass Daisy is a perennial herb that bears large yellow flowerheads, with each flowerhead supported by a 30-60 cm stem. It is found from Crookwell (north of Goulburn) to near Wagga Wagga, with most populations occurring in the Yass District. The Yass Daisy occurs in dry forest, Box-Gum Woodland and secondary derived grassland of these communities. It tolerates light grazing and areas that are irregularly mown or slashed. Flowering occurs from October to November.	No – habitat degraded, surveyed	The species was not recorded during field surveys. The subject land has been grazed over a prolonged period and is disturbed to the extent that it is unlikely to support this species.

Species	NSW (BC Act) listing status	National (EPBC Act) listing status	Habitat requirements	Presence	Justification for exclusion
Anthochaera phrygia Regent Honeyeater (Breeding)	Critically Endangered	Critically Endangered	This species inhabits dry open forest and woodland (particularly Box-Ironbark woodland and riparian forests of River Sheoak) that have significantly large numbers of mature trees, high canopy cover, and abundance of mistletoes. The species breeds in Box-Ironbark and other temperate woodlands, and in riparian gallery forest dominated by River Sheoak. The species usually nests in tall mature eucalypts, Sheoaks, or mistletoe haustoria. There are only three known key breeding regions: north-east Victoria (Chiltern-Albury) and NSW (Capertee Valley and the Bundarra-Barraba region).	No – habitat constraint, habitat degraded	Field surveys did not record any Box-Ironbark woodland, River Sheoak, or mistletoe. The vast majority of the subject land has been historically cleared. As a result, there are very few mature trees and the canopy cover is very low. As such, the subject land lacks the microhabitat features required for this species to breed. The habitat is therefore degraded to the extent that the species is unlikely to utilise the subject land for breeding.
Aprasia parapulchella Pink-tailed Legless Lizard	Vulnerable	Vulnerable	This species inhabits sloping, open woodland areas with predominantly native grassy ground layers, particularly those dominated by Kangaroo Grass. Sites are typically well-drained, with rocky outcrops or scattered, partially buried rocks. The TBDC lists *'rocky areas or within 50 m of rocky areas'* as a habitat constraint.	No – habitat constraint	The subject land does not support rocky areas and is not within 50 m of rocky areas. In addition, the groundstorey across the whole of the subject land is clearly dominated by exotic grasses and forbs. As such, the subject land lacks the habitat constraints and microhabitat features required to support this species. The species is therefore unlikely to occur in the subject land.

Species	NSW (BC Act) listing status	National (EPBC Act) listing status	Habitat requirements	Presence	Justification for exclusion
Delma impar Striped Legless Lizard	Vulnerable	Vulnerable	The Striped Legless Lizard is patchily distributed in grasslands of south-eastern NSW, the ACT, north-eastern, central and south-western Victoria, and south-eastern South Australia. Most areas where the species persists are thought to have had low to moderate levels of agricultural disturbance in the past and it has been suggested that ploughing in particular may be incompatible with the survival of the species. Until recently, the species was thought to inhabit only native grasslands dominated by species such as Tall Speargrass and Kangaroo Grass. In recent years, surveys have revealed the Striped Legless Lizard in many sites dominated by exotic grasses such as Phalaris, Serrated Tussock and Flatweed. They have also been found in several secondary grassland sites, generally within two kilometres of primary grassland.	No – surveyed	The species was not detected during a full program of targeted surveys.
Grevillea iaspicula Wee Jasper Grevillea	Critically Endangered	Endangered	This species grows on rocky limestone outcrops and around sink holes and cave entrances. The species occurs in open woodland dominated by White Box *E. Albens* and Apple Box *E. bridgesiana.* The Wee Jasper Grevillea is found only in the Wee Jasper area and on the shores of Lake Burrinjuck.	No – habitat constraint, geographical limitations	The subject land does not contain rocky limestone outcrops. The species has not been recorded within 10 kms of the subject land and is not known to occur in the locality.

Species	NSW (BC Act) listing status	National (EPBC Act) listing status	Habitat requirements	Presence	Justification for exclusion
Haliaeetus leucogaster White-bellied Sea-Eagle (Breeding)	Vulnerable	-	This species nests requires large living or dead mature trees within suitable vegetation within 1km of a substantial water source such as rivers, lakes, large dams or creeks, wetlands, and/or coastlines.	No – habitat constraint, surveyed	The vast majority of the subject land has been historically cleared. As a result, there are no appropriately sized mature trees and the canopy cover is very low. As such, the subject land lacks the required microhabitat features to support breeding habitat for this species. In addition, a tree habitat assessment did not record any large stick nests and targeted bird surveys did not detect the species.
Litoria booroolongensis Booroolong Frog	Endangered	Endangered	This species lives along permanent streams with some fringing vegetation cover such as ferns, sedges or grasses. Adults occur on or near cobble banks and other rock structures within stream margins and shelter under rocks or amongst vegetation near the ground on the stream edge. Eggs are laid in submerged rock crevices and tadpoles grow in slow-flowing connected or isolated pools.	No – habitat degraded	The subject land supports one tributary and two small farm dams, all of which were dry at the time of surveys and lack native fringing vegetation. The subject land does not contain potential habitat for the species as it lacks streams, rivers, other suitable waterbodies, and riparian habitat.

Species	NSW (BC Act) listing status	National (EPBC Act) listing status	Habitat requirements	Presence	Justification for exclusion
Miniopterus orianae oceanensis Large Bent-winged Bat (Breeding)	Vulnerable	-	Caves are the primary roosting habitat, but the species also use derelict mines, storm-water tunnels, buildings, and other man-made structures. The species forms discrete populations centred on a maternity cave that is used annually in spring and summer for the birth and rearing of young. Maternity caves have very specific temperature and humidity regimes. Breeding or roosting colonies can number from 100 to 150,000 individuals. The TBDC list the following breeding habitat constraint, *'Cave, tunnel, mine, culvert or other structure known or suspected to be used for breeding including species records with microhabitat code "IC - in cave", observation type code "E nest-roost", with numbers of individuals >500.'*	No – habitat constraint	The subject land does not contain potential breeding habitat (caves, tunnels, mines, culverts, etc.). The subject land therefore land lacks the breeding habitat features required for this species.
Myotis macropus Southern Myotis	Vulnerable	-	The Southern Myotis occurs from the north-west of Australia, across the top-end and south to western Victoria. It is rarely found more than 100 km inland, except along major rivers. The species roosts close to water in caves, hollow-bearing trees, man-made structures (bridges, culverts etc) and in dense foliage. Colonies occur close to water bodies, ranging from rainforest streams to large lakes and reservoirs. The species catches aquatic insects and small fish with their large hind claws, and also catches flying insects.	No – habitat constraint	There are no suitable major water bodies in the subject land or vicinity and the species is not known to venture far from such habitat features.

Species	NSW (BC Act) listing status	National (EPBC Act) listing status	Habitat requirements	Presence	Justification for exclusion
Petaurus norfolcensis Squirrel Glider	Vulnerable	-	West of the Great Diving Range, this species inhabits mature or old growth Box, Box-Ironbark woodlands, and River Red Gum forest. It prefers mixed species stands with a shrub or Acacia midstorey. The species relites on large old trees with hollows for breeding and nesting. These trees are also critical for movement and typically need to be closely connected (i.e. no more than 50 m apart).	No – habitat degraded	The vast majority of the subject land has been historically cleared. As a result, there are very few mature trees and the canopy cover is very low. The midstorey and shrubstorey are entirely absent. A tree habitat assessment found one hollow-bearing Blakely's red Gum, containing a nesting pair of Common Starlings. As such, the subject land lacks the microhabitat features required for this species. The habitat is therefore degraded to the extent that the species is unlikely to utilise the subject land.
Phascolarctos cinereus Koala (Breeding)	Vulnerable	Vulnerable	This species inhabits eucalypt woodlands and forests, feeding on the foliage of more than 70 eucalypt species and 30 non-eucalypt species. Home range size varies with quality of habitat, ranging from less than 2 hectares to several hundred hectares in size. The TBDC lists areas identified via survey as 'important habitat' as a habitat constraint for breeding for this species. 'Important' habitat' is defined by the density of Koalas and quality of habitat as determined by on-site survey.	No – habitat constraint, habitat degraded, surveyed	The vast majority of the subject land has been historically cleared. As a result, there are very few mature trees and the canopy cover is very low. A survey of the few remaining remnant trees did not detect any sign that the Koala is currently, or has recently, been present in the subject land (i.e. presence of individuals, scratches, etc.). As such, it is unlikely that the species is currently breeding in the subject land.
Polytelis swainsonii Superb Parrot (Breeding)	Vulnerable	Vulnerable	Found mainly in open, tall riparian River Red Gum forest or woodland. Often found in farmland including grazing land with patches of remnant vegetation. Breeds in hollow branches of tall eucalypt trees within nine kilometres of feeding areas.	No – surveyed	Superb Parrot were recorded both flying over and foraging within the subject land. Individuals were not observed inspecting the single hollow bearing tree. This tree has limited potential habitat value for this species and contained nesting Common Starlings at the time of surveys.

Species	NSW (BC Act) listing status	National (EPBC Act) listing status	Habitat requirements	Presence	Justification for exclusion
Prasophyllum petilum Tarengo Leek Orchid	Endangered	Endangered	The Tarengo Leek Orchid occurs on relatively fertile soils in grassy woodland or natural grassland. The species is intolerant of grazing and this is considered to be the key reason it has been found only within cemeteries and Travelling Stock Routes, land from which grazing has been restricted.	No – habitat degraded	The species is highly intolerant of stock grazing and the subject land has been pasture improved and grazed intensively over an extended period (many decades). The habitat in the subject land has been degraded to the extent that it is highly unlikely to support this species.
Swainsona recta Small Purple-pea	Endangered	Endangered	The Small Purple-pea occurs in the grassy understorey of woodlands and open forests dominated by Blakely's Red Gum, Yellow Box, Candlebark and Bundy. The species grows in association with understorey dominants that include Kangaroo Grass, Poa tussocks and spear-grasses. Plants die back in summer, surviving as rootstocks until they shoot again in autumn. The species is intolerant of grazing but generally tolerant of fire, which also enhances germination by breaking the seed coat and reducing competition from other species.	No – habitat degraded	The species has not been recorded within 10 km of the subject land and it was not detected during surveys. The species is highly intolerant of stock grazing and the subject land has been pasture improved and grazed intensively over an extended period (many decades). The habitat in the subject land has been degraded to the extent that it is highly unlikely to support this species.
Swainsona sericea Silky Swainson-pea	Vulnerable	-	This species is found in Natural Temperate Grassland and Snow Gum *Eucalyptus pauciflora* Woodland on the Monaro, and in Box-Gum Woodland in the Southern Tablelands and South West Slopes. It is sometimes found in association with Cypress-pines *Callitris* spp..	No – habitat degraded	The groundstorey across the whole of the subject land is highly degraded, is either currently cultivated or has been historically cultivated, and has been subjected to prolonged intensive stock grazing. As detailed in the TBDC, weeds, grazing and clearing for agricultural purposes are key threats to the Silky Swainson-pea. The habitat in the subject land has been degraded to the extent that it is highly unlikely to support this species.

Species	NSW (BC Act) listing status	National (EPBC Act) listing status	Habitat requirements	Presence	Justification for exclusion
Synemon plana Golden Sun Moth	Endangered	Critically Endangered	Wallaby grass (Rytidosperma sp), Chilean needlegrass (Nassella nessiana) or Serrated Tussock (Nassella trichotoma))	No – surveyed	The species was not detected during a full program of targeted surveys.
Thesium australe Austral Toadflax	Vulnerable	Vulnerable	Found in very small to large populations scattered across eastern NSW, along the coast, and from the Northern to Southern tablelands. Austral Toadflax is a root parasite that takes water and some nutrients from other plants, especially Kangaroo Grass. It is often found in damp sites in association with Kangaroo Grass but it is also found on other grass species at inland sites. Occurs on clay soils in grassy woodlands or coastal headlands.	No – habitat degraded	The species is highly intolerant of stock grazing and the subject land has been pasture improved and grazed intensively over an extended period (many decades). The habitat in the subject land has been degraded to the extent that it is highly unlikely to support this species. The subject land does not support any Kangaroo Grass.

2.3.4.2 BAM targeted survey results

Targeted surveys were completed to confirm the occurrence and/or habitat potential for the species credit species flagged by the BAM as having the potential to occur in the relevant PCT of the subject land. The results of these surveys are provided below.

Striped Legless Lizard

No Striped Legless Lizard individuals were recorded during the survey program between 19 September 2019 and 18 November 2019. All grids were placed in areas with suitable habitat characteristics, notably areas with a well-defined grass tussock structure (refer to Figure 8).

A number of non-target herpetofauna were observed during the survey program including: Olive Legless Lizard *Delma inornata*; Delicate Skink *Lampropholis delicata*; Garden Skink *Lampropholis guichenoti*; Rainbow Skink Carlia tetradactyla; and Spotted Marsh Frog *Limnodynastes tasmaniensis.* Common Dwarf Skink *Menetia greyii*; and Three-toed Skink *Hemiergis decresiensis*. The full survey results and a summary of recorded species are attached as Appendix E.

Olive Legless Lizards were recorded a total of 11 times in grids 1, 2, and 4. Seven live captures and one sloughed skin were recorded in Grid 1, one live capture was recorded at Grid 2, and three live captures were recorded at Grid 4. Grid 1 was located within a patch containing a groundstorey dominated by native grasses with a well-defined grass tussock structure. Grids 2 and 4 were both located in areas dominated by a groundstorey of exotic grasses with well-defined tussock structure.

The Olive Legless Lizard can be distinguished from the Striped Legless Lizard by several key characteristics, such as nostril scale configuration, the number of pre-anal scales, the presence of a distinctive white eye ring, presence of stripes and/or colouration, and size. All live legless lizards captured possessed characteristics clearing defining them as the Olive Legless Lizard.

The distribution of the Olive Legless Lizard often overlaps that of the closely related Striped Legless Lizard, and the two species have been recorded on several occasions occurring in micro-sympatry (R. Speirs pers. obs). Given that so many Olive Legless Lizards and other non-target herpetofauna were recorded during the survey program, it is highly likely that if the Striped Legless Lizard occurs in the subject land it would have been recorded.

In light of the above, it is concluded that the subject land does not support the Striped Legless Lizard.

Golden Sun Moth

The subject land supports a degraded groundstorey containing the known Golden Sun Moth food species Wallaby Grasses and Chilean Needle Grass. As such the subject land contains habitat characteristics that are marginally suitable to support Golden Sun Moth.

Notwithstanding the above, as shown in Figure 9, no Golden Sun Moths were detected across the program of four surveys completed between 31 October 2019 and 29 November 2019. Surveys were conducted across the entire subject land during suitable survey conditions when Golden Sun Moth activity was confirmed at other ACT/NSW reference sites (Table 5).

In light of the above, it is concluded that the subject land does not support the Golden Sun Moth.

Threatened flora

A total of 41 flora species were recorded in the subject land during the field survey, comprising 14 native species and 27 exotic species (Appendix B). No threatened species were recorded in the subject land.

As detailed in Table 14, all of the threatened flora species credit species flagged by the BAM are considered highly unlikely to occur in the subject land.

Threatened fauna

A total of 25 fauna species were recorded in the subject land during the diurnal field surveys, comprising 22 native species and 3 exotic species (Appendix C).

As detailed in Table 14, the majority of the threatened fauna species credit species flagged by the BAM were considered unlikely to occur in the subject land.

Superb Parrots were recorded both flying over and foraging within the subject land on 31 October and 8 November 2019 respectively. The four mature remnant trees retained in the subject land were assessed and determined to be unlikely to be utilised as breeding habitat for the Superb Parrot.

No other threatened fauna species were recorded in the subject land during field surveys.

Figure 8. Striped Legless Lizard Survey

Capital Ecology Project No: 2876
Drawn by: S. Thompson
Date: 6 February 2020

Figure 9. Golden Sun Moth Survey

Capital Ecology Project No: 2876
Drawn by: S. Thompson
Date: 6 February 2020

capital ecology

3 Part 2 – Impact Assessment (BAM Stage 2)

Part 2 of this BDAR provides an assessment of the impacts of the proposed development as set out in Stage 2 of the BAM.

3.1 Avoidance, Minimisation and Mitigation of Impacts on Biodiversity Values

In accordance with Chapter 8 of the BAM, a proponent is required to demonstrate that all reasonable and practicable measures have been employed to avoid, minimise and mitigate the impacts of a project on biodiversity values. This section outlines the measures that have been incorporated into the project design or will be implemented during construction and/or occupation of the proposed development.

3.1.1 Development location and design

As described throughout this BDAR, the subject land has been historically modified and degraded. As a result, the majority of the native overstorey, midstorey, shrubstorey, and groundstorey has been previously cleared, with very little remnant vegetation persisting on the subject land. The proposed development has been designed to not impact any of the four remaining remnant trees. The proposed development will also retain most of the planted trees and will largely avoid the native patch of PCT1330 Zone 1. As shown in Figure 2 and Figure 5, the proposed development will instead primarily impact the portions of the subject land where the vegetation condition and habitat values are poorest.

3.1.2 Construction

The key potential risk to the biodiversity values of the subject land and adjoining areas during construction of the proposed development is the facilitated spread of high threat weeds within the locality and/or the introduction of new weeds. The following weed management measures will be implemented during construction.

- Appropriate vehicle hygiene will be maintained. Vehicles and machinery entering the subject land will be clean of weed seed or propagules.
- Only sterile materials such as hessian/jute or rice straw will be used for soil stabilisation or similar purposes.
- High threat weeds will be prevented from establishing on newly created road verges, landscaped areas, and other open space.

Best practice sediment and erosion control, such as the use of sediment traps, sediment interception ponds, silt fences and haybale fences, will be implemented as required to minimise the flow of water and associated material into the surrounding areas and water sources.

3.1.3 Occupation

Ongoing weed control in the subject land will be the responsibility of the owners of the newly created lots. Owners of newly created lots will be encouraged to use local native plant species for landscaping, and to re-establish all strata where practicable (i.e. groundcover, midstorey shrubs, and canopy trees). This will create fauna habitat complexity which will discourage urban adapted species and encourage small woodland birds and other native fauna to visit or traverse the subject land.

Any future landscaping for the proposed development (subdivision and creation of lots) in areas of the subject land outside of the newly created lots will incorporate local native plant species.

3.2 Biodiversity Impacts of Proposed Development

3.2.1 Clearance and other direct impacts on native vegetation and habitat

As shown in Figure 2, the total direct impact area from the proposed development will be approximately 4.46 ha, calculated as the clearance required to create:

- nine building envelopes between 3,500 m^2 and 5,820 m^2, including550 m^2 effluent disposal areas;
- a new public road stub;
- internal driveways (assuming 4.5 m wide clearance); and
- internal fences (assuming 2 m wide clearance).

For the purposes of this BDAR, it is assumed that the proposed development will clear all vegetation in the subject land but will retain all four remnant trees.

This will result in the clearance of:

- 0.71 ha (0.02 ha of direct clearance) of PCT1330 Zone 1 – low diversity, native dominant groundstorey (BC Act native vegetation);
- 3.78 ha (0.31 ha of direct clearance) of PCT1330 Zone 2 – low diversity, mixed native and exotic groundstorey (BC Act native vegetation); and
- 14.08 ha (4.11 ha of direct clearance) of PCT1330 Zone 3 – low diversity, exotic dominant pasture.

In total, the proposed development will result in the clearance of 4.49 ha (0.33 ha of direct clearance) of BC Act native vegetation. The proposed development will not result in any other direct impacts on native vegetation or threatened species habitat.

3.2.2 Indirect impacts on native vegetation and habitat

The potential indirect impacts of the proposed development include:

- weed introduction and/or spread during construction; and
- sedimentation of receiving waterways (i.e. tributaries) from construction of roads, houses and other infrastructure.
- introduction of feral or domesticated pests as a result of increased human occupation in the area.

As noted above, appropriate weed monitoring and control will occur during construction to manage the potential impacts of high threat weeds. Similarly, appropriate site-based sediment and erosion controls will be implemented to prevent sedimentation of receiving waterways.

The proposed development is unlikely to result in any other indirect impacts on native vegetation or habitat.

3.2.3 Biodiversity risk weighting

The biodiversity risk weighting (Section 6.6 of the BAM) is a tool used in the BOS to mitigate the risk in offsetting the loss of vegetation, threatened entities and/or their habitat. The biodiversity risk weighting does this by increasing the quantum of credits required at an impact site. The biodiversity risk weighting is derived from two components:

- sensitivity to loss – based on threat status under legislation or evidence-based information that suggests the entity is at an increased risk of loss; and
- sensitivity to potential gain – based on life history characteristics and ecological information for a species.

The subject land does not contain any vegetation with a vegetation integrity score that requires offsetting for impacts on a TEC or ecosystem credit species, nor does it support habitat of potential significance to any species credit species. Accordingly, biodiversity risk weighting is not of relevance to the subject land.

3.2.4 Prescribed biodiversity impacts

As described in Section 8.2 of the BAM, some types of projects may have impacts on biodiversity values in addition to, or instead of, impacts from clearing vegetation and/or loss of habitat. For many of these impacts the biodiversity values may be difficult to quantify, replace or offset, making avoiding and minimising impacts critical. Clause 6.1 of the BC Regulation identifies the following as impacts that are 'prescribed biodiversity impacts' that must be assessed using the BOS.

> *(a) impacts of development on the habitat of threatened species or ecological communities associated with:*
>
> > *(i) karst, caves, crevices, cliffs and other geological features of significance;*
> >
> > *(ii) rocks;*
> >
> > *(iii) human made structures;*
> >
> > *(iv) non-native vegetation;*
>
> *(b) impacts of development on the connectivity of different areas of habitat of threatened species that facilitates the movement of those species across their range;*
>
> *(c) impacts of development on movement of threatened species that maintains their life cycle;*
>
> *(d) impacts of development on water quality, water bodies and hydrological processes that sustain threatened species and threatened ecological communities (including from subsidence or upsidence resulting from underground mining);*
>
> *(e) impacts of wind turbine strikes on protected animals; and*
>
> *(f) impacts of vehicle strikes on threatened species or on animals that are part of a TEC.*

The subject land does not contain any of the above habitat features, nor does the proposed development have the potential to cause or contribute to any of the above listed prescribed biodiversity impacts.

3.2.5 Serious and irreversible impacts

The guidance to assist a decision maker to determine a serious and irreversible impact (NSW Government 2017b[20]) provides a list of threatened species and ecological communities which are likely to be the subject of serious and irreversible impacts (SAII). The potential for a project to impact these SAII entities must be assessed in the BDAR.

While the subject land does support a PCT associated with a TEC listed as a potential SAII entity, the vegetation has been degraded to the extent that it no longer meets the BC Act definition for the listed TEC. As such, the subject land does not support any ecological community listed as a SAII entity. In addition, the subject land does it contain habitat of potential significance to any threatened flora or fauna species listed as a SAII entity. Accordingly, the proposed development will not result in a SAII on any BC Act listed entity.

3.2.6 Adaptive management for uncertain impacts

The proposed development is unlikely to result in biodiversity impacts that are unforeseen or uncertain.

3.3 Requirements

3.3.1 Commonwealth EPBC Act – Referral

The proposed development is unlikely to have a significant impact on an EPBC Act listed MNES given the subject land does not:

- support any EPBC Act listed ecological communities;
- support any EPBC Act listed flora species; or
- contain habitat of potential importance to EPBC Act listed threatened or migratory fauna species.

In light of the above, EPBC Act referral is unwarranted and is not recommended.

3.3.2 NSW Biodiversity Conservation Act – Offset Requirements

The BAM Calculator is the tool for quantifying the offset requirements for a project, the output being expressed as ecosystem credits and species credits. The results of the BAM credit calculations completed for the proposed development are provided below and are detailed in Appendix E.

3.3.2.1 Ecosystem credit requirements

The results of the BAM credit calculations completed for the proposed development are provided in Table 15. As shown in Table 15, the vegetation zones in the subject land do not have a vegetation integrity score sufficient for their clearance to result in generation of ecosystem credits, as outlined in Section 10.3.1.1 of the BAM, these being:

- *(a) a vegetation integrity score of ≥15 where the PCT is representative of an endangered or critically endangered ecological community, or*

[20] NSW Government (2017b). *Guidance to assist a decision-maker to determine a serious and irreversible impact.* State of New South Wales and Office of Environment and Heritage

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

Accordingly, the proposed development does not generate an ecosystem credit obligation.

Table 15. Ecosystem credit requirements

PCT & Vegetation Zone	Vegetation Integrity Score	Proposed Clearance Area (ha)	Credits Required
PCT1330 Zone 1	12.9	0.71	0
PCT1330 Zone 2	N/A - Exotic	N/A	N/A
PCT1330 Zone 3	N/A - Exotic	N/A	N/A

3.3.2.2 Species credit requirements

As detailed herein, the subject land does not support habitat of potential significance to any species credit species. Accordingly, the proposed development does not generate a species credit obligation.

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Yass Valley Local Environment Plan 2013.

- *Land Zoning Map - Sheet LZN_005C.*
- *Lot Size Map - Sheet LSZ_005C.*
- *Natural Resources Biodiversity Map - Sheet NRB_005.*

Appendices

Appendix A. BAM Plot/Transect Scores

PCT code	Veg. Zone	Plot No.	Composition (species richness)					
			Tree	Shrub	Grass & grass like	Forb	Fern	Other
1330	1	1	0	0	3	0	0	0
	2	1	0	0	4	0	0	0
		2	0	0	0	0	0	0
	3	1	0	0	0	1	0	0
		2	0	0	0	1	0	0
		3	0	0	3	0	0	0

PCT code	Veg. Zone	Plot No.	Structure (% cover)					
			Tree	Shrub	Grass & grass like	Forb	Fern	Other
1330	1	1	0	0	50	0	0	0
	2	1	0	0	17	0	0	0
		2	0	0	0	0	0	0
	3	1	0	0	0	0.1	0	0
		2	0	0	0	0.1	0	0
		3	0	0	0.8	0	0	0

PCT code	Veg. Zone	Plot No.	Function									
			Stem classes					No. of large trees	Hollow bearing trees	Litter cover	Coarse woody debris	High threat weed cover
			Regen.	5-9	10-19	20-29	30-49					
1330	1	1	No	-	-	-	-	0	0	21	0	20
	2	1	No	-	-	-	-	0	0	20	0	20
		2	No	-	-	-	-	0	0	20	0	35
	3	1	No	-	-	-	-	0	0	92	0	70
		2	No	-	-	-	-	0	0	39	0	0
		3	No	-	-	-	-	0	0	76	0	65

Appendix B. Recorded Flora Species

Flora Species Recorded by Plot and Percent Cover

Scientific Name	Common Name	Plot Number					
		1330.1.1	1330.2.1	1330.2.2	1330.3.1	1330.3.2	1330.3.3
Exotic							
Acetosella vulgaris	Sheep's Sorrel	3.0					
Aira sp.	Hair-grass	0.5			1.0		
Avena sp.	Wild Oats	3.0	5.0	1.0		10.0	0.2
Bromus sp.	Brome Grass	2.0		5.0	5.0	5.0	10.0
Cerastium sp.	Mouse-ears				10.0		
Cirsium vulgare	Spear Thistle						0.1
Conyza sp.	Fleabane					0.1	
Dactylis glomerata	Cock's Foot	1.0	20.0	3.0			
Echium plantagineum	Paterson's Curse			0.1		0.5	2.0
Erodium botrys	Long Stocksbill	1.0		2.0		1.0	
Erodium sp.	Stork's-bill						0.1
Holcus lanatus	Yorkshire Fog	1.0			2.0	10.0	
Hypochaeris radicata	Flatweed	2.0	2.0	2.0	1.0	30.0	0.5
Lolium perenne	Perennial Ryegrass	1.0	2.0			1.0	0.5
Nassella neesiana	Chilean Needle Grass	2.0		20.0			
Paspalum dilatatum	Paspalum Grass	15.0	20.0	15.0	70.0		65.0
Phalaris aquatica	Phalaris				2.0	3.0	0.1
Plantago lanceolata	Plantain / Lamb's Tongue			5.0			
Sonchus sp.	Milk/Sow Thistle					0.5	
Trifolium sp.	Clover	1.0	1.0				

Scientific Name	Common Name	Plot Number					
		1330.1.1	1330.2.1	1330.2.2	1330.3.1	1330.3.2	1330.3.3
Vulpia sp.	Rat's Tail Fescue	5.0		15.0	20.0	15.0	10.0
Native							
Austrostipa bigeniculata	Tall Speargrass	10.0	5.0				
Elymus scaber	Common Wheat Grass		2.0				
Juncus australis	Austral Rush						0.5
Juncus filicaulis	Pinrush						0.1
Microlaena stipoides	Weeping Grass	20.0	5.0				
Rumex brownii	Swamp Dock				0.1	0.1	
Rytidosperma sp.	Wallaby Grass	20.0	5.0				0.1

Flora Species Recorded in the Subject land

Scientific name	Common name
Exotic	
Acetosella vulgaris	Sheep's Sorrel
Aira sp.	Hair-grass
Avena sp.	Wild Oats
Bromus sp.	Brome Grass
Cerastium sp.	Mouse-ears
Cirsium vulgare	Spear Thistle
Conyza sp.	Fleabane
Cynodon dactylon	Couch Grass
Dactylis glomerata	Cock's Foot
Echium plantagineum	Paterson's Curse
Eragrostis curvula	African lovegrass
Erodium botrys	Long Stocksbill
Erodium sp.	Stork's-bill
Fraxinus angustifolia	Claret Ash
Hirschfeldia incana	Buchan Weed
Holcus lanatus	Yorkshire Fog
Hypochaeris radicata	Flatweed
Lolium perenne	Perennial Ryegrass
Nassella neesiana	Chilean Needle Grass
Nassella trichotoma	Serrated Tussock
Paronychia brasiliana	Brazilian Whitlow
Paspalum dilatatum	Paspalum Grass
Phalaris aquatica	Phalaris
Plantago lanceolata	Plantain / Lamb's Tongue
Salix sp.	Willow
Setaria parviflora	Pidgeon Grass
Sonchus sp.	Milk/Sow Thistle
Trifolium sp.	Clover
Vulpia sp.	Rat's Tail Fescue
Native	
Austrostipa bigeniculata	Tall Speargrass
Bothriochloa macra	Red-leg Grass
Chloris truncata	Windmill Grass
Cynoglossum suaveolens	Sweet Hounds-tongue
Elymus scaber	Common Wheat Grass
Eucalyptus blakelyi	Blakely's Red Gum
Eucalyptus melliodora	Yellow Box
Eucalyptus rubida	Candlebark

Scientific name	Common name
Juncus australis	Austral Rush
Juncus filicaulis	Pinrush
Microlaena stipoides	Weeping Grass
Panicum effusum	Hairy Panic
Rumex brownii	Swamp Dock
Rytidosperma sp.	Wallaby Grass

Appendix C. Recorded Fauna Species

Class	Scientific name	Common name	BC Act status
Amphibia	*Limnodynastes tasmaniensis*	Spotted Marsh Frog	Protected
Aves	*Acanthiza chrysorrhoa*	Yellow-rumped Thornbill	Protected
Aves	*Acridotheres tristis*	Indian Myna	-
Aves	*Anthochaera carunculata*	Red Wattlebird	Protected
Aves	*Cacatua galerita*	Sulphur-crested Cockatoo	Protected
Aves	*Calyptorhynchus funereus*	Yellow-tailed Black-cockatoo	Protected
Aves	*Coracina novaehollandiae*	Black-faced Cuckoo-shrike	Protected
Aves	*Corvus coronoides*	Australian Raven	Protected
Aves	*Dacelo novaeguineae*	Laughing Kookaburra	Protected
Aves	*Eolophus roseicapilla*	Galah	Protected
Aves	*Grallina cyanoleuca*	Magpie-lark	Protected
Aves	*Gymnorhina tibicen*	Australian Magpie	Protected
Aves	*Hirundo neoxena*	Welcome Swallow	Protected
Aves	*Lalage sueurii*	White-winged Triller	Protected
Aves	*Polytelis swainsonii*	Superb Parrot	**Vulnerable**
Aves	*Psephotus haematonotus*	Red-rumped Parrot	Protected
Aves	*Strepera graculina*	Pied Currawong	Protected
Aves	*Sturnus vulgaris*	Common Starling	-
Aves	*Threskiornis spinicollis*	Straw-necked Ibis	Protected
Mammalia	*Lepus capensis*	Brown Hare	-
Mammalia	*Macropus giganteus*	Eastern Grey Kangaroo	Protected
Reptilia	*Carlia tetradactyla*	Southern Rainbow Skink	Protected
Reptilia	*Delma inornata*	Olive Legless Lizard	Protected
Reptilia	*Lampropholis delicata*	Delicate Skink	Protected
Reptilia	*Lampropholis guichenoti*	Garden Skink	Protected

Appendix D. Tree Habitat Assessment Results

Tree	Species Name	Common Name	Remnant/ Planted	DBH (cm)	Height (m)	Hollows			Notes
						S	M	L	
1	*E. blakelyi*	Blakely's Red Gum	Remnant	70	8	1	1	-	Common Starlings observed nesting in medium tree hollow.
2	*E. blakelyi*	Blakely's Red Gum	Remnant	50	8	-	-	-	
3	*E. melliodora*	Yellow Box	Remnant	80	10	-	-	-	3x medium sticknest (likely corvid).
4	*E. melliodora*	Yellow Box	Remnant	60	7	-	-	-	

Appendix E. Targeted Striped Legless Lizard Survey Results

CHECK	GRID	DATE	TEMP (°C)	CLOUD	TILE_ID	SVL (mm)	Total L (mm)	SPECIES	COMMONNAME	OBS_TYPE	ABUNDANCE	NOTES
1	4	19/09/2019	17	6/8	-	-	-	*Lampropholis guichenoti*	Garden Skink	Individual	1	
2	2	26/09/2019	9-12	3/8	-	-	-	*Limnodynastes tasmaniensis*	Spotted Marsh Frog	Individual	1	Frog
	2				-	-	-	-	Unidentified Skink	Individual	1	
	3				-	-	-	*Limnodynastes tasmaniensis*	Spotted Marsh Frog	Individual	1	Frog
	4				-	-	-	*Lampropholis delicata*	Delicate Skink	Individual	1	
3	2	2/10/2019	18	Fine	-	-	-	*Limnodynastes tasmaniensis*	Spotted Marsh Frog	Individual	1	
	2				-	-	-	-	Unidentified Skink	Individual	1	
	3				-	-	-	-	Unidentified Skink	Individual	1	Too quick to ID
4		8/10/2019	9.5-10	Fine	-							Cool. No fauna recorded.
5	1	16/10/2019	18.5-22	6/8	D4	-	-	*Delma inornata*	Olive Legless Lizard	Individual	1	Not captured. *D. inornata* based on no stripes, yellow throat, olive colouring)
	1				A5	-	-	*Delma inornata*	Olive Legless Lizard	Individual	1	*D. inornata* - White ring around eye very distinct.
	2				D5	-	-	*Delma inornata*	Olive Legless Lizard	Individual	1	Not captured. *D. inornata* based on appearance.
	4				C3	-	-	*Delma inornata*	Olive Legless Lizard	Individual	1	Not captured. *D. inornata* based on appearance.
6		21/10/2019	9.5	Fine	-							Fine, sunny, cool. No fauna recorded.
7	1	29/10/2019	15-18	Fine	C4	-	-	*Delma inornata*	Olive Legless Lizard	Individual		Gravid female, sheading skin.
	1				-	-	-	-	Unidentified Skink	Individual		Very quick
8	1	7/11/2019	15.5	2/8	-	-	-	*Delma inornata*	Olive Legless Lizard	Individual	1	
	2				-	-	-	*Carlia tetradactyla*	Rainbow Skink	Individual	2	
	3				-	-	-	*Carlia tetradactyla*	Rainbow Skink	Individual	1	
	4				-	-	-	*Lampropholis delicata*	Delicate Skink	Individual	2	1x Juvenile
9	1	12/11/2019	20.2-23.3	3/8	-	-	-	*Delma inornata*	Olive Legless Lizard	Individual	3	
	1				-	-	-	*Delma inornata*	Olive Legless Lizard	Skin	1	
	4				-	-	-	*Delma inornata*	Olive Legless Lizard	Individual	1	
10	4	18/11/2019	10.5-11	2/8	-	-	-	*Delma inornata*	Olive Legless Lizard	Individual	1	

Summary of species recorded during targeted Striped Legless Lizard survey

Species	Common Name	Total Captures
Carlia tetradactyla	Rainbow Skink	3
Delma inornata	Olive Legless Lizard	11
Lampropholis delicata	Delicate Skink	3
Lampropholis guichenoti	Garden Skink	1
Limnodynastes tasmaniensis	Spotted Marsh Frog	3
-	Unidentified Skink	3
	Total	**24**

Appendix F. BAM Summary Reports

BAM Vegetation Zones Report

Proposal Details

Assessment Id
00019123/BAAS17089/20/00019124

Assessment name
Lot 10 DP1218866 - Murrumbateman - NSW

BAM data last updated *
26/11/2019

Assessor Name

Report Created
03/04/2020

BAM Data version *
22

Assessor Number

Assessment Type
Part 4 Developments (General)

BAM Case Status
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.

Assessment Revision
0

Date Finalised
03/04/2020

Vegetation Zones

#	Name	PCT	Condition	Area	Minimum number of plots	Management zones
1	1330_Zone1	1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion	Zone1	0.71	1	
2	1330_Zone2	1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion	Zone2	3.75	2	

3	1330_Zone3	1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion	Zone3	14.11	3	

BAM Predicted Species Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00019123/BAAS17089/20/00019124	Lot 10 DP1218866 - Murrumbateman - NSW	26/11/2019
Assessor Name	**Report Created**	**BAM Data version ***
	03/04/2020	22
Assessor Number	**Assessment Type**	**BAM Case Status**
	Part 4 Developments (General)	Finalised
	Assessment Revision	**Date Finalised**
	0	03/04/2020

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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)
Brown Treecreeper (eastern subspecies)	Climacteris picumnus victoriae	1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
Diamond Firetail	Stagonopleura guttata	1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
Dusky Woodswallow	Artamus cyanopterus cyanopterus	1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
Flame Robin	Petroica phoenicea	1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
Hooded Robin (south-eastern form)	Melanodryas cucullata cucullata	1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
Koala	Phascolarctos cinereus	1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
Large Bent-winged Bat	Miniopterus orianae oceanensis	1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
Little Lorikeet	Glossopsitta pusilla	1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
Regent Honeyeater	Anthochaera phrygia	1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion

Scarlet Robin	Petroica boodang	1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
Speckled Warbler	Chthonicola sagittata	1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
Spotted-tailed Quoll	Dasyurus maculatus	1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion
Superb Parrot	Polytelis swainsonii	1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion

Threatened species not within the area of these PCT's

Common Name	Scientific Name	Vegetation Types(s)
White-bellied Sea-Eagle	Haliaeetus leucogaster	1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion

BAM Candidate Species Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00019123/BAAS17089/20/00019124	Lot 10 DP1218866 - Murrumbateman - NSW	26/11/2019
Assessor Name	**Report Created**	**BAM Data version ***
	03/04/2020	22
Assessor Number	**Assessment Type**	**BAM Case Status**
	Part 4 Developments (General)	Finalised
	Assessment Revision	**Date Finalised**
	0	03/04/2020

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List of Species Requiring Survey

Name	Presence	Survey Months
Delma impar Striped Legless Lizard	No (surveyed)	Jan Feb Mar Apr May Jun **Jul Aug Sep Oct Nov Dec**
Polytelis swainsonii Superb Parrot	No (surveyed)	Jan Feb Mar Apr May Jun **Jul Aug Sep Oct Nov** Dec
Synemon plana Golden Sun Moth	No (surveyed)	Jan Feb Mar Apr May Jun **Jul Aug Sep Oct Nov Dec**

List of Species Not On Site

Name
Ammobium craspedioides Yass Daisy
Aprasia parapulchella Pink-tailed Legless Lizard
Grevillea iaspicula Wee Jasper Grevillea
Litoria booroolongensis Booroolong Frog

BAM Candidate Species Report

Thesium australe Austral Toadflax
Miniopterus orianae oceanensis Large Bent-winged Bat
Myotis macropus Southern Myotis
Petaurus norfolcensis Squirrel Glider
Phascolarctos cinereus Koala
Prasophyllum petilum Tarengo Leek Orchid
Swainsona recta Small Purple-pea
Swainsona sericea Silky Swainson-pea
Anthochaera phrygia Regent Honeyeater
Haliaeetus leucogaster White-bellied Sea-Eagle

BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment Id
00019123/BAAS17089/20/00019124

Proposal Name
Lot 10 DP1218866 - Murrumbateman - NSW

BAM data last updated *
26/11/2019

Assessor Name

Assessor Number

BAM Data version *
22

Proponent Names
Pixiu Holdings Pty Ltd

Report Created
03/04/2020

BAM Case Status
Finalised

Assessment Revision
0

Assessment Type
Part 4 Developments (General)

Date Finalised
03/04/2020

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Potential Serious and Irreversible Impacts

Nil

Nil

Additional Information for Approval

PCTs With Customized Benchmarks

No Changes

BAM Biodiversity Credit Report (Like for like)

Predicted Threatened Species Not On Site

Name
Haliaeetus leucogaster / White-bellied Sea-Eagle

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

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	Number of credits to be retired
1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion	Not a TEC	18.6	0.00

1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion

Like-for-like credit retirement options

Class	Trading group	HBT	IBRA region
Southern Tableland Grassy Woodlands This includes PCT's: 303, 312, 654, 680, 705, 1330, 1334, 1501	Southern Tableland Grassy Woodlands >=90%	No	Murrumbateman, Bondo, Crookwell, Inland Slopes, Monaro, Murrumbateman and Snowy Mountains. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

BAM Biodiversity Credit Report (Like for like)

Species Credit Summary

No Species Credit Data

BAM Biodiversity Credit Report (Variations)

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00019123/BAAS17089/20/00019124	Lot 10 DP1218866 - Murrumbateman - NSW	26/11/2019
Assessor Name	Assessor Number	BAM Data version *
		22
Proponent Name(s)	Report Created	BAM Case Status
Pixiu Holdings Pty Ltd	03/04/2020	Finalised
Assessment Revision	Assessment Type	Date Finalised
0	Part 4 Developments (General)	03/04/2020

* 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

Nil

Nil

Additional Information for Approval

PCTs With Customized Benchmarks

No Changes

BAM Biodiversity Credit Report (Variations)

Predicted Threatened Species Not On Site

Name
Haliaeetus leucogaster / White-bellied Sea-Eagle

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

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	Number of credits to be retired
1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion	Not a TEC	18.6	0.00

1330-Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion

Like-for-like credit retirement options

Class	Trading group	HBT	IBRA region
Southern Tableland Grassy Woodlands This includes PCT's: 303, 312, 654, 680, 705, 1330, 1334, 1501	Southern Tableland Grassy Woodlands >=90%	No	Murrumbateman,Bondo, Crookwell, Inland Slopes, Monaro, Murrumbateman and Snowy Mountains. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Variation options

Formation	Trading group	HBT	IBRA region

	Grassy Woodlands	Tier 2 or higher	No	IBRA Region: South Eastern Highlands, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Species Credit Summary

No Species Credit Data

BAM Credit Summary Report

Proposal Details

Assessment Id
00019123/BAAS17089/20/00019124

Proposal Name
Lot 10 DP1218866 - Murrumbateman - NSW

BAM data last updated *
26/11/2019

Assessor Name

Report Created
03/04/2020

BAM Data version *
22

Assessor Number

BAM Case Status
Finalised

Date Finalised
03/04/2020

Assessment Revision
0

Assessment Type
Part 4 Developments (General)

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

Zone	Vegetation zone name	Vegetation integrity loss / gain	Area (ha)	Constant	Species sensitivity to gain class (for BRW)	Biodiversity risk weighting	Potential SAII	Ecosystem credits
Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion								
1	1330_Zone1	12.9	0.7	0.25	High Sensitivity to Potential Gain	2.50		0
2	1330_Zone2	4.2	3.8	0.25	High Sensitivity to Potential Gain	2.50		0

3	1330_Zone3	0.2	14.1	0.25	High Sensitivity to Potential Gain	2.50		0
							Subtotal	**0**
							Total	**0**

Species credits for threatened species

Vegetation zone name	Habitat condition (HC)	Area (ha) / individual (HL)	Constant	Biodiversity risk weighting	Potential SAII	Species credits

Biodiversity payment summary report

Assessment Id	Payment data version	Assessment Revision	Report created
00019123/BAAS17089/20/00019124		0	03/04/2020

Assessor Name	Assessor Number	Proposal Name	BAM Case Status
		Lot 10 DP1218866 - Murrumbateman - NSW	Finalised

Assessment Type	Date Finalised
Part 4 Developments (General)	03/04/2020

PCT list

Price calculated	PCT common name	Credits
Yes	**1330 -** Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion	0

Species list

Price calculated	Species	Credits

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

IBRA sub region	PCT common name	Threat status	Offset trading group	Risk premium	Administrative cost	Methodology adjustment factor	Price per credit	No. of ecosystem credits	Final credits price
								Subtotal (excl. GST)	**$0.00**

Biodiversity payment summary report

Biodiversity payment summary report

	GST	**$0.00**
	Total ecosystem credits (incl. GST)	**$0.00**

Species credits for threatened species

Species profile ID	Species	Threat status	Price per credit	Risk premium	Administrative cost	No. of species credits	Final credits price

No species available

	Grand total	**Contact BCT for pricing**

Biodiversity payment summary report