BIODIVERSITY DEVELOPMENT ASSESSMENT REPORT

RESIDENTIAL SUBDIVISION

LOT 340 DP13010

99 TAIT STREET CROOKWELL

Prepared by:

Fraser Ecological
ABN – 797 637 40114

665 The Scenic Road
Macmasters Beach NSW 2251

Mob: 0423238193
Ph: 02 4382 2962
Email: alohafraser@gmail.com

Site Details:	99 Tait Street Crookwell
Prepared by:	***Alex Fraser B.Sc., G.Cert.EnvMgt&Sus.*** ***BAAS18156 Accredited Assessor*** ***Fraser Ecological Pty Ltd*** **A**BN – 797 637 40114 M: 0423238193 Email: alohafraser@gmail.com
Prepared for:	Darjeeling Pastoral, c/o Civil Development Solutions
Reference No.	BDAR Rev A
Document Status & Date:	6th February 2025

Abbreviations

Abbreviation	Meaning
AOBV	Areas of Outstanding Biodiversity Value
BAM	Biodiversity Assessment Methodology
BC Act	*Biodiversity Conservation Act 2016*
BDAR	Biodiversity Development Assessment Report
DCP	Development Control Plan
DEC	Department of Environment and Conservation
DECC	Department of Environment and Climate Change
DECCW	Department of Environment, Climate Change and Water
DEE	Department of Environment and Energy
EEC	Endangered Ecological Community
EP&A Act	*Environmental Planning and Assessment Act 1979*
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
Ha	Hectare
LEP	Local Environmental Plan
LGA	Local Government Area
MU	Map Unit
NPWS	NSW National Parks and Wildlife Service
OEH	Office of Environment and Heritage
PCT	Native vegetation classification system approved by the NSW Plant Community Type Control Panel
PFC	Projected Foliage Cover
SAII	Serious and Irreversible Impacts
TBCD	Threatened Biodiversity Data Collection
TEC	Threatened Ecological Community

CONTENTS

TABLES

FIGURES

Abbreviation	Meaning
AOBV	Areas of Outstanding Biodiversity Value
AWTS	Aerated Wastewater Treatment System
APZ	Asset Protection Zone (Bushfire Protection)
BAM	Biodiversity Assessment Methodology
BAM - C	Biodiversity Assessment Method Calculator
BC Act	*Biodiversity Conservation Act 2016*
BDAR	Biodiversity Development Assessment Report
BOS	Biodiversity Offsets Scheme
DA	Development Application
DCP	Development Control Plan
DEC	Department of Environment and Conservation
DECC	Department of Environment and Climate Change
DPIE	NSW Department of Planning, Industry and Environment (formerly OEH)
DEE	Department of Environment and Energy
EEC	Endangered Ecological Community
EP&A Act	*Environmental Planning and Assessment Act 1979*
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
Ha	Hectare
HTE	High Threat Exotic
LEP	Local Environmental Plan
LGA	Local Government Area
MU	Map Unit
NPWS	NSW National Parks and Wildlife Service
OEH	Office of Environment and Heritage
PCT	Native vegetation classification system approved by NSW Plant Community Type Control Panel
PFC	Projected Foliage Cover
SAII	Serious and Irreversible Impacts
SEPP	State Environmental Planning Policy
TBCD	Threatened Biodiversity Data Collection
TEC	Threatened Ecological Community

GLOSSARY

Acronym/ Term	Definition
Accredited Biodiversity Assessor	Individuals accredited by the Department of Planning, Industry and Environment (DPIE) to apply the Biodiversity Assessment Method.
Biodiversity credit report	The report produced by the Credit Calculator that sets out the number and class of biodiversity credits required to offset the remaining adverse impacts on biodiversity values at a development site, or on land to be biodiversity certified.
Biodiversity Offsets	Management actions that are undertaken to achieve a gain in biodiversity values on areas of land in order to compensate for losses to biodiversity from the impacts of development.
Biodiversity values	The composition, structure and function of ecosystems, including threatened species, populations and ecological communities, and their habitats.
Ecosystem credit	The class of biodiversity credit that relates to a vegetation type and the threatened species that are reliably predicted by that vegetation type (as a habitat surrogate).
Locality	A 1500m buffer area surrounding the Subject Land
Native Vegetation	Means any of the following types of plants native to New South Wales: (a) trees (including any sapling or shrub), (b) understorey plants, (c) groundcover (being any type of herbaceous vegetation), (d) plants occurring in a wetland.
Proposal	The development, subdivision, activity or action proposed.
SAII entity	Species and ecological communities that are likely to be the subject of serious and irreversible impacts (SAIIs)
Species credit	The class of biodiversity credit that relate to threatened species that cannot be reliably predicted to use an area of land based on habitat surrogates. Species that

	require species credits are listed in the Threatened Biodiversity Data Collection.
Subject Land	The footprint of the proposed development.
Subject Properties	99 Tait Street Crookwell

EXECUTIVE SUMMARY

Fraser Ecological has been engaged to prepare a Biodiversity Development Assessment Report (BDAR) for a residential subdivision development ('the Proposal' or 'the Project') at 99 Tait Street Crookwell located in the Upper Lachlan Shire Council LGA.

This BDAR has been prepared in accordance with the Office of Environment and Heritage (OEH) (2020) Biodiversity Assessment Method (BAM). The Biodiversity Offset Scheme (BOS) applies to the Proposal, as it would require clearing of native vegetation that is mapped on the Biodiversity Values Map (BVM). Note, this is a 'streamlined assessment', in accordance with Appendix C of the BAM ('Streamlined assessment module – Small area').

The development impact area is a highly modified area that was formerly the site an existing orchard. The vegetation within study area has been modified through the establishment of improved pasture and some amenity plantings such as windrows/hedgerows that include both exotic and native tree species.

The site is predominantly existing cleared land that is dominated by introduced exotic species that does not form part of a derived native grassland. A full list of exotic species recorded on site is provided below.

Overall, the vegetation is considered to be in poor condition with low native species diversity and high weed invasion. It has low native resilience and low ability to regenerate from the native soil seedbank.

There are 3 rows of planted trees which include the following species:

- *Eucalyptus mannifera* (Brittle Gum) - planted native species
- *Eucalyptus aggregata* (Black Gum) - planted native species
- *Eucalyptus elata* (River Peppermint) - planted native species
- *Eucalyptus scoparia* (Wallangarra White Gum) - planted native species
- *Cupressus macrocarpa* (Monterey Cypress) - planted exotic species
- *Quercus robur* (English Oak) - planted exotic species

The following introduced environmental weed species were recorded on-site:

- *Pinus radiata**
- *Axonopus fissifolius*
- *Briza maxima*
- *Cenchrus clandestinus*
- *Chloris gayana*
- *Cirsium vulgare*

- *Conyza bonariensis*
- *Dichelachne crinita*
- *Eragrostis curvula ssp. curvula*
- *Erigeron sumatrensis*
- *Holcus lanatus*
- *Hypochaeris radicata*
- *Modioloa caroliana*
- *Paspalum dilatatum*
- *Paspalum urvillei*
- *Phalaris aquatica*
- *Phytolacca octandra*
- *Plantago lanceolata*
- *Rumex sp*
- *Setaria gracilis*
- *Secale cerelae*
- *Sida rhombifolia*
- *Sonchus oleraceus*
- *Sporobolus fertilis*
- *Trifolium repens*
- *Senecio madagascariensis*
- *Sporobolus fertilis*
- *Holcus lanatus**
- *Onopordum acanthium**
- *Taraxacum officinale*
- *Datura ferox*
- *Bromus catharticus*
- *Medicago arabica*
- *Silybum marianum*
- *Modiola caroliniana*
- *Polygonum aviculare*
- *Dactylis glomerata*
- *Hirschfeldia incana*
- *Nassella trichotoma **

*Out of the exotic species recorded, four are listed as State Priority Weeds under the Biosecurity Act. The three State Priority Weeds are also Weeds of National Significance (WoNS). State and Regional Priority Weeds are required to be managed as detailed in the South-East Regional Strategic Weed Management Plan (NSW Local Land Services 2017) to comply with the General Biosecurity Duty that all land owners/managers and persons who deal with weeds are required to fulfil under the Biosecurity Act.

The NSW SVTM does not map any native vegetation on the subject land.

The NSW SVTM broadly identifies the locality as consisting of a plant community type (PCT) PCT 3374 - Goulburn Tableland Peppermint Grassy Forest as occurring on some of the neighbouring properties.

The planted Eucalyptus species occurring on-site are not consistent with the PCT classification (from the BIONET vegetation classification). **Of the species listed above only planted *Eucalyptus mannifera* (Brittle Gum), are consistent with a local vegetation community.** No native understorey species were recorded on-site.

Overall the subject vegetation occurring on-site is not consistent with a native vegetation community, despite plantings of some eucalypt species that are locally indigenous.

However, based upon the geology/ soil landscapes and locally vegetation community occurrences we have entered/assigned the vegetation occurring on-site into the BAM calculator as PCT 3374 - Goulburn Tableland Peppermint Grassy Forest.

The site does not contain derived native grasslands as defined under the Biodiversity Assessment Methodology (BAM 2020).

The following Vegetation Integrity Score (VIS) was determined:

PCT	Vegetation Zone	Composition Condition Score	Structure Condition Score	Function Condition Score	Vegetation Integrity Score
PCT 3374	Vegetation Zone 1 (0.47ha)	9.4	32.3	48	24.4

To assist the consent authority, the guidance document Guidance to assist a decision-maker to determine a serious and irreversible impact includes criteria that enable the application of the four principles set out in clause 6.7 of the BC Regulation to identify the species and ecological communities that are likely to be the subject of serious and irreversible impacts. No SAII entities occur on the Subject Land.

As a precautionary measure, it has been assumed that 0.47ha PCT 3307 will require removal, despite the trees not being remnant and are planted. As result the following ecosystem credits (4) will need to be retired:

PCT	Vegetation Zone	Composition Condition Score	Structure Condition Score	Function Condition Score	Vegetation Integrity Score	Number of biodiversity credits required
PCT 3374	Vegetation Zone 1	9.4	32.3	48	24.4	4

Twenty (20) trees along the western boundary, at the rear of proposed lots 546, 550, 549 & 548 are unaffected by this stage of the subdivision and are suitable for retention.

A Vegetation Management Plan can be provided at prior to the release of the Subdivision Certificate to address any native revegetation works requested by Council as part of their conditions of consent.

1 INTRODUCTION

Fraser Ecological has been engaged to provide a Biodiversity Development Assessment Report (BDAR) for the proposed subdivision development at at 99 Tait Street Crookwell located in the Upper Lachlan Shire Council LGA.

Refer to Figures 1-4 for the location & aerial maps showing property boundaries.

The subject site itself is not on the NSW Department of Environment's Sensitive Biodiversity Values Map (https://www.environment.nsw.gov.au/biodiversity/biodiversity-values-map.htm). However, Council considers the area of planted native tree removal exceeds the BOS area clearing threshold and is trigger this requirement for this assessment.

BAM plot/ quadrat surveys were undertaken on the 6th November 2024.

1.1 Description of the site and proposal

The Subject Land size is approximately 6.85 hectares (Figures 1-4).

The site is identified as 'Cloverleigh Fields', 99 Tait Street, Crookwell and is zoned R2 – Low Density Residential pursuant to Upper Lachlan Local Environmental Plan (ULLEP) 2010, map amendment 02. Stage 05 of the subdivision is the proposed establishment of 50 residential lots across lots 321, 322 & 430, including a 1508m² drainage reserve (proposed lot 517), 2270m² community reserve (proposed lot 501), access roads & upgrading part of McDonald Street.

One hundred & thirty-four (134) trees were identified as having potential to be impacted by the proposed development (Arboricultural Impact Assessment prepared by Concept Arbor Consulting dated 17th November 2023).

The surveys for this report were undertaken on the 6th November 2024.

The site was subject to a previous DA approval (Lots 537 – 546) for DA/75/2004 (refer to Figure 7).

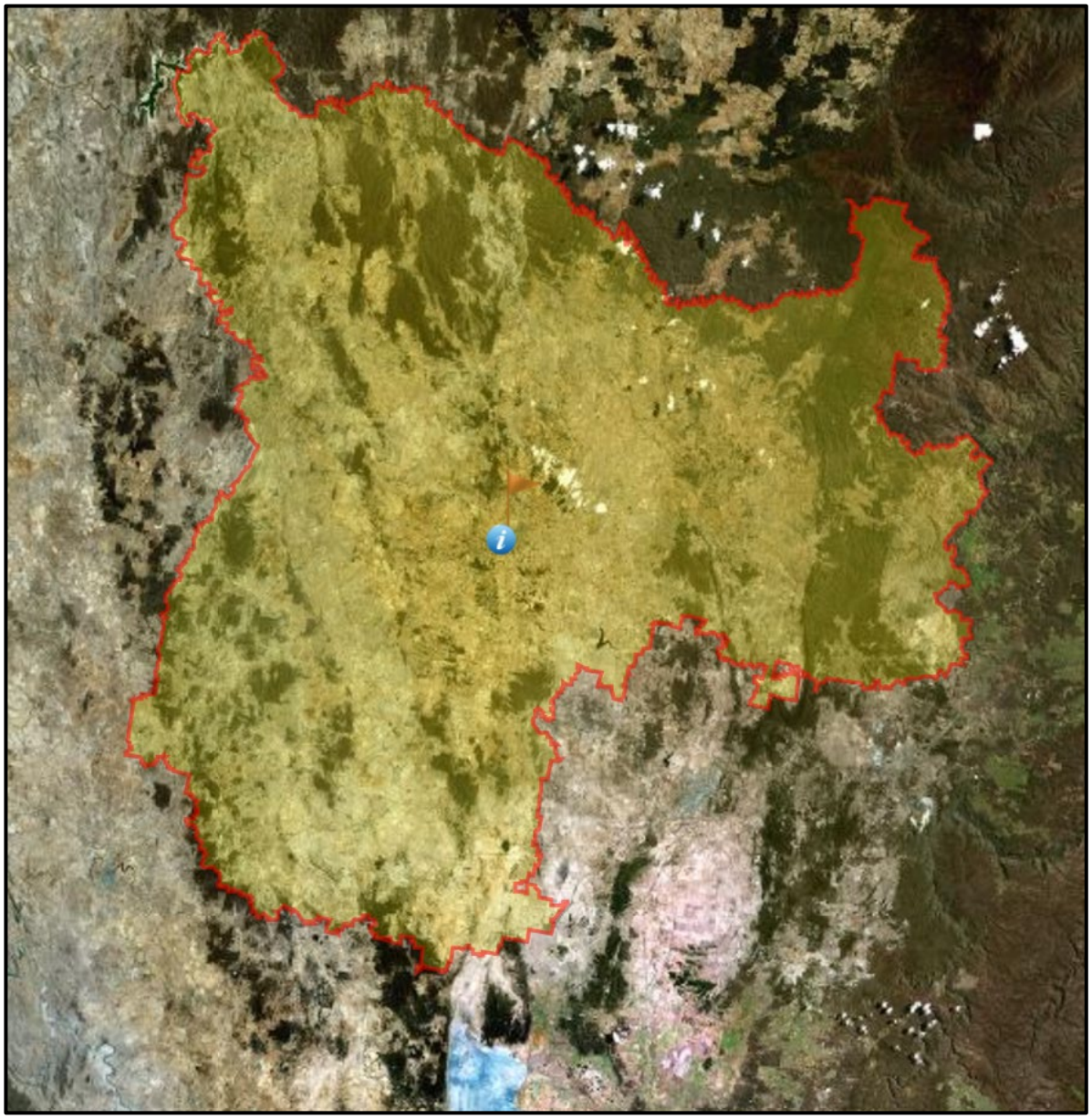


Figure 1: The study area and wider locality within the Upper Lachlan Council LGA (Source: SIX maps.com).

Figure 2: Cadastral map of the subject site (Source: SIX maps.com)

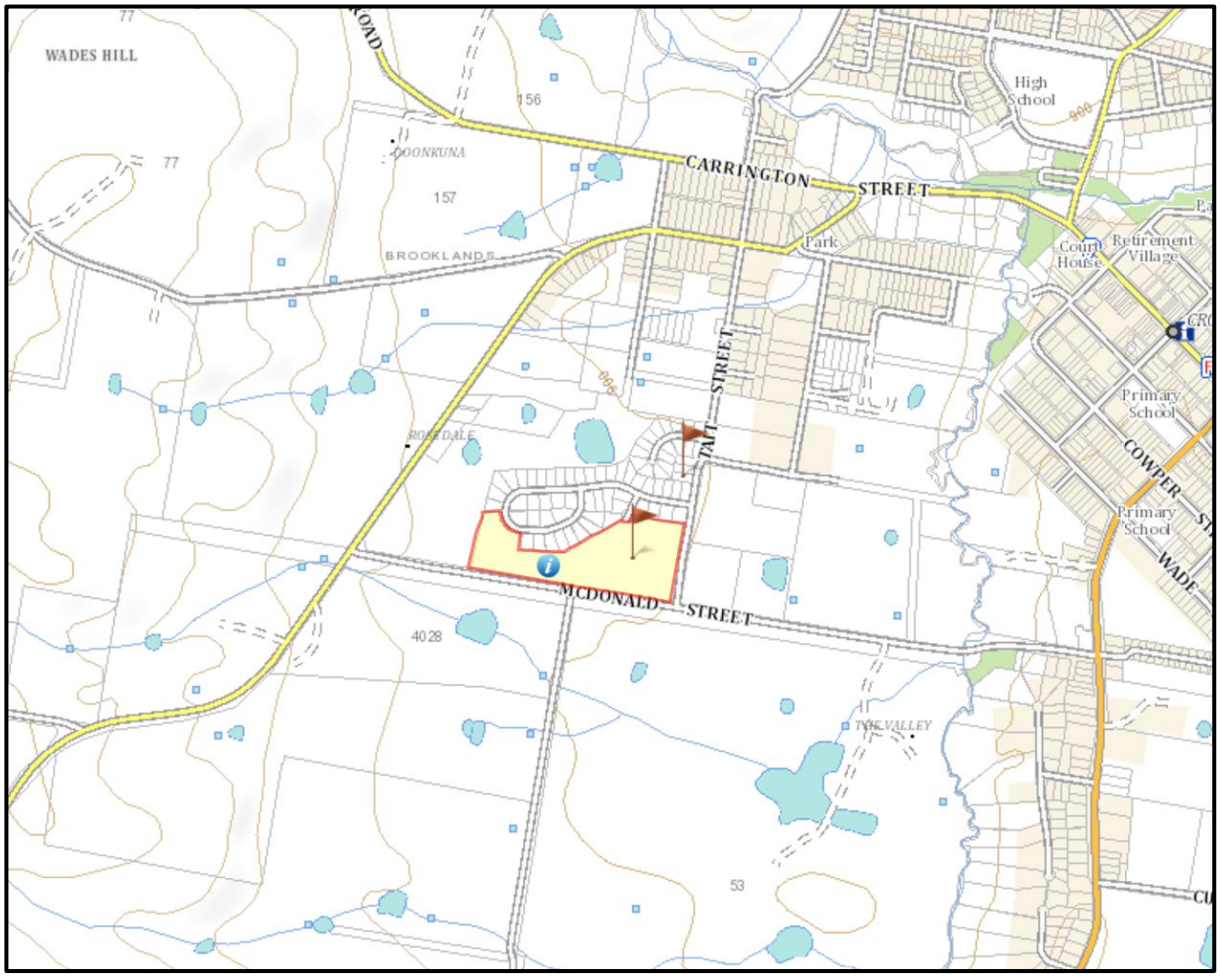


Figure 3: The subject site shown on aerial imagery (Source: Nearmap.com)

Figure 4: The Subject Land shown on aerial imagery

Figure 5: Close up aerial map of the site where trees are proposed for removal

Figure 6: DCCEEW Sensitive Biodiversity Values Map (accessed 24/11/2024) - the site is not SBV mapped

Figure 7: Previously approved subdivision layout

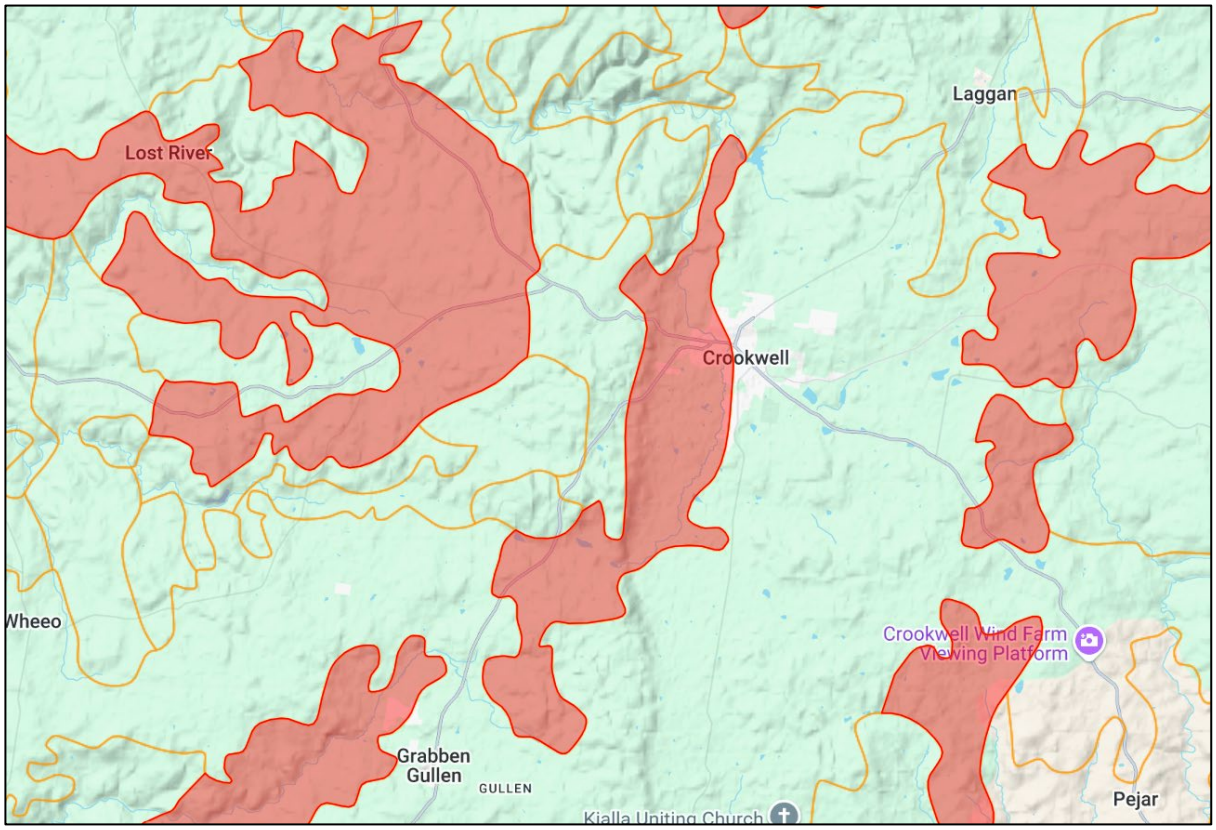


Figure 8: Soil Landscape mapping (Soil Conservation Service of NSW) undertaken by Chapman and Murphy (1994) accessed via EPSADE V.2

1.1.1 Database Searches

The following database searches were undertaken, in order to compile a list of threatened flora and fauna species predicted to occur in the area:

- Review of threatened fauna and flora records within a 10 km radius of the site, contained in the OEH Atlas of NSW Wildlife (NSW BioNet).
- Review of the MNES records within a 10 km radius of the site, using the Commonwealth Department of Environment and Energy (DEE), EPBC Act Protected Matters Search Tool.

1.1.2 Vegetation Mapping

Southeast NSW Native Vegetation Classification and Mapping (NSW OEH 2011 update)- SCIVI. VIS_ID 2230

Classification and descriptions of native vegetation types of southeast NSW (including the South Coast and parts of the eastern tablelands), and map of extant distribution of these veg types at 1:100 000 interpretation scale. Based on the South Coast - Illawarra Vegetation Integration (SCIVI) Project, which aimed to integrate many previous vegetation classification and mapping works to produce a single regional classification and map plus information on regional conservation status of vegetation types, to inform the South Coast and Illawarra Regional Strategies. Vegetation classification based on a compilation of ~ 8,500 full-floristic field survey sites from previous studies. Classified vegetation types referred to previous studies. Distribution of veg types was mapped by spatial interpolation (modelling) from classified sites, using a hybrid decision-tree/expert system. Final model was cut to \'extant\' boundaries using a compiled coverage of aerial photograph interpretation (API) of woody and wetland vegetation boundaries. A total of 189 vegetation types were identified, and types related to Endangered Ecological Communities are highlighted.; VIS_ID 2230.

NSW State Vegetation Type Map (Department of Planning and Environment 2022)

The State Vegetation Type Map (SVTM) is a regional-scale map of NSW Plant Community Types. This map represents the current extent of each Plant Community Type, Vegetation Class and Vegetation Formation, across all tenures in NSW. Further, a SVTM map of pre-clearing is also available separately here. This map is updated periodically as part of the Integrated BioNet Vegetation Data program to improve quality and alignment to the NSW vegetation classification hierarchy.

It is accessed via the following link:

https://datasets.seed.nsw.gov.au/dataset/nsw-state-vegetation-type-map

We have also used GIS mapping to overlay vegetation layers on top of the subject site and proposed development impact area.

This release represents the first state-wide vegetation coverage using the NSW vegetation classification hierarchy, including the revised eastern NSW PCT classification C1.1. The "M1" in the version release number (C1.1.M1), represents the first map release against PCT master list version C1.1

This coverage supersedes pre-release versions (v1.1 and v1.1.1) and 7 individual prior regional coverages including: Sydney Metropolitan Area Mapping, SVTM Border Rivers Gwydir – Namoi, SVTM Central West – Lachlan, SVTM Riverina – Murray, SVTM Western, SVTM Central Tablelands, and SVTM Upper Hunter.

Limitations on Use: This mapping data may be used as a guide to the occurrence and distribution of Plant Community Types, Vegetation Classes, and Vegetation Formations, before and after clearing.

Users of these maps should note the following issues which will be address in future SVTM versions:

- PCT attribution errors – corrected as better information becomes available Spatial errors or omissions (eg, gaps and slithers or mapping linework inaccuracies)
- Eastern NSW PCT classification topologies differ from central and western NSW classification topologies
- Some PCTs mapped as part of earlier regional coverages have since been discontinued
- Some PCTs approved in BioNet have not been mapped due to technical issues
- Spatial and data gaps and discontinuities may occur at the edges of former regional coverages.
- Pre-clearing coverage for central NSW is not currently available

Map data may be downloaded, viewed within the SEED Map Viewer, or accessed via the underlying ArcGIS REST Services or WMS for integration in GIS or business applications.

The Trees Near Me NSW app provides quick access to view the map using a mobile device or desktop. Download the app from Google Play or the App Store, or access the web site at https://treesnearme.app.

1.1.3 Literature Review

Information sources reviewed included, but were not necessarily limited to:

- Aerial Photograph Interpretation (API);
- Relevant guidelines, including:
    - OEH *Biodiversity Assessment Method*, 2017 No 469
    - *NSW Guide to Surveying Threatened Plants* (OEH, 2016)
    - *'Species credit' threatened bats and their habitats: NSW survey guide for the Biodiversity Assessment Method* (OEH, 2018)
    - *Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities* (Department of Environment and Conservation (DEC), 2004)
- OEH Threatened Species, Populations and Ecological Communities website
- Commonwealth DEE Species, Profile and Threats Database;
- OEH Threatened Species, Populations and Ecological Communities website
- Commonwealth DEE Species, Profile and Threats Database;
- Threatened species survey and assessment guidelines: field survey methods for fauna: Amphibians (DEC 2009);
- NSW Guideline to Surveying Threatened Plants (OEH 2016b);
- Operational Manual for BioMetric 3.1. (DECCW 2011);
- Survey guidelines for Australia's threatened birds. Guidelines for detecting birds listed as threatened under the Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth of Australia 2010a);
- Survey guidelines for Australia's threatened bats. Guidelines for detecting bats listed as threatened under the Environment Protection and Biodiversity Conservation Act 1999(Commonwealth of Australia 2010b);
- Survey guidelines for Australia's threatened frogs. Guidelines for detecting frogs listed as threatened under the Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth of Australia 2010c);
- Survey guidelines for Australia's threatened mammals. Guidelines for detecting
- mammals listed as threatened under the Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth of Australia 2011);
- Survey guidelines for Australia's threatened orchids.

- Guidelines for detecting bats listed as ‘threatened’ under the Environment Protection and Biodiversity Conservation Act 1999(Commonwealth of Australia 2013).

Relevant data and literature reviewed in preparation of this report included:

- Relevant State and Commonwealth Databases:
- DPE Biodiversity Values Map v16 (DPE 2024a)
- NSW BioNet. The website of the Atlas of NSW Wildlife (DPE 2024b)
- NSW BioNet. Threatened Biodiversity Data Collection (DPE 2024c)
- NSW BioNet. Vegetation Classification System (DPE 2024d)
- NSW Government Spatial Services: Six Maps Clip & Ship (NSW Government Spatial Services 2024)
- NSW Scientific Committee Final Determinations for:
- Southern Highlands Shale Woodlands in the Sydney Basin Bioregion – endangered ecological community listing (NSW Scientific Committee 2011).
- Native vegetation of southeast NSW: a revised classification and map for the coast and eastern tablelands (Tozer et al. 2010).
- Biodiversity Assessment Method Calculator Version 1.4.0.00 (DIE 2024f);
- Biodiversity Assessment Method (DPIE 2020a);
- Threatened Species Survey and Assessment: Guidelines for developments and activities. Working Draft (DEC 2004);
- Surveying threatened plants and their habitats - NSW survey guide for the Biodiversity Assessment Method (DPIE 2020b);
- ‘Species credit' threatened bats and their habitats: NSW survey guide for the Biodiversity Assessment Method (OEH 2018a);
- Guidance to assist a decision-maker to determine a serious and irreversible impact (DPIE 2019a); and
- Biodiversity Offsets and Agreement Management System (BOAMS).

It was not possible to determine with certainty all the fauna that utilise habitats in the subject site. This is because of the likely seasonal occurrences of some fauna species, the occasional occurrence of vagrant species, and because some species are difficult to detect because of their timid or cryptic behaviour. Therefore, in addition to targeted fauna surveys, investigations comprised an assessment of fauna habitats present on site and an indication of their potential to support native wildlife populations and, in particular, threatened species.

Section 4.2 outlines the reasoning behind why no targeted fauna surveys were considered necessary for the proposed development. This mainly because no candidate 'species credit' species will be affected by the proposal as potential habitat is absent.

A suite of Flora Species Credit species was identified within the BAMC (DPIE 2021c) and NSW Wildlife Atlas (DPIE 2021d) as having the potential to occur within the Subject Land (Table 14).

In accordance with Section 3.3 of the Surveying threatened plants and their habitats - NSW survey guide for the Biodiversity Assessment Method (DPIE 2020h), surveys targeted the most suitable habitat within the Study Area for candidate threatened flora and fauna species, using information collected from the TBDC (DPE, 2024c), the DPIE threatened species profile website (DPE, 2022d) and knowledge other threatened species within the site's locality.

The Study Area was surveyed using systematic parallel transects. Parallel field traverses were separated by 5 to 10 m for orchids, herbs and forbs, 10 to 15 m for sub-shrubs, and 10 to 20 m for species in all other life forms (shrubs and trees).

In accordance with Section 3.3 of the Surveying threatened plants and their habitats - NSW survey guide for the Biodiversity Assessment Method (DPIE 2020h), surveys targeted the most suitable habitat within the Study Area for candidate threatened flora and fauna species, using information collected from the TBDC (DPE, 2024c), the DPIE threatened species profile website (DPE, 2024d) and knowledge other threatened species within the site's locality.

It was confirmed that none of the candidate species or their habitats were present on the Subject Land.

1.1.4 Other sources and consultant reports

A desktop survey was performed to ensure all relevant documentation is considered when preparing the plan. Documents and other information resources utilised include:

- Aerial photographs (Google Maps, NearMaps & DPI Land Information)
- NSW Land and Property Information SIX Maps Viewer (https://maps.six.nsw.gov.au/)

- The Southeast NSW Native Vegetation Classification and Mapping (NSW OEH 2010) mapped using QGIS software overlaid with cadastral boundaries obtained from the NSW Planning Portal database collection
- Soil Landscapes of the Sydney 1:100,000 Sheet (Chapman and Murphy 1989) using the Espade Version 2.0 managed by the NSW Office of Environment and Heritage accessed 7/9/24
- Development Layout Plans prepared by Civil Development Solutions dated August 2024 (Appendix A)
- Arboricultural Impact Assessment prepared by Concept Arbor Consulting dated 17th November 202

2 LANDSCAPE FEATURES

2.1 IBRA Bioregions, Subregions and Mitchell Landscapes

Dominant landscape forms have been used to divide Australia into bioregions. The site is within the **NSW South Eastern Highlands IBRA region** and the **Crookwell IBRA Subregion.**

Mitchell Landscapes are used to describe areas in NSW in a broad sense and group together areas with relatively homogenous geomorphology, soils and broad vegetation types and are mapped at a scale of 1:250000.

The subject site is within the 'Rockley Plains' Landscape (Figure 9). This landscape region has an estimated cleared fraction of 0.54 and has 'over-cleared' land status.

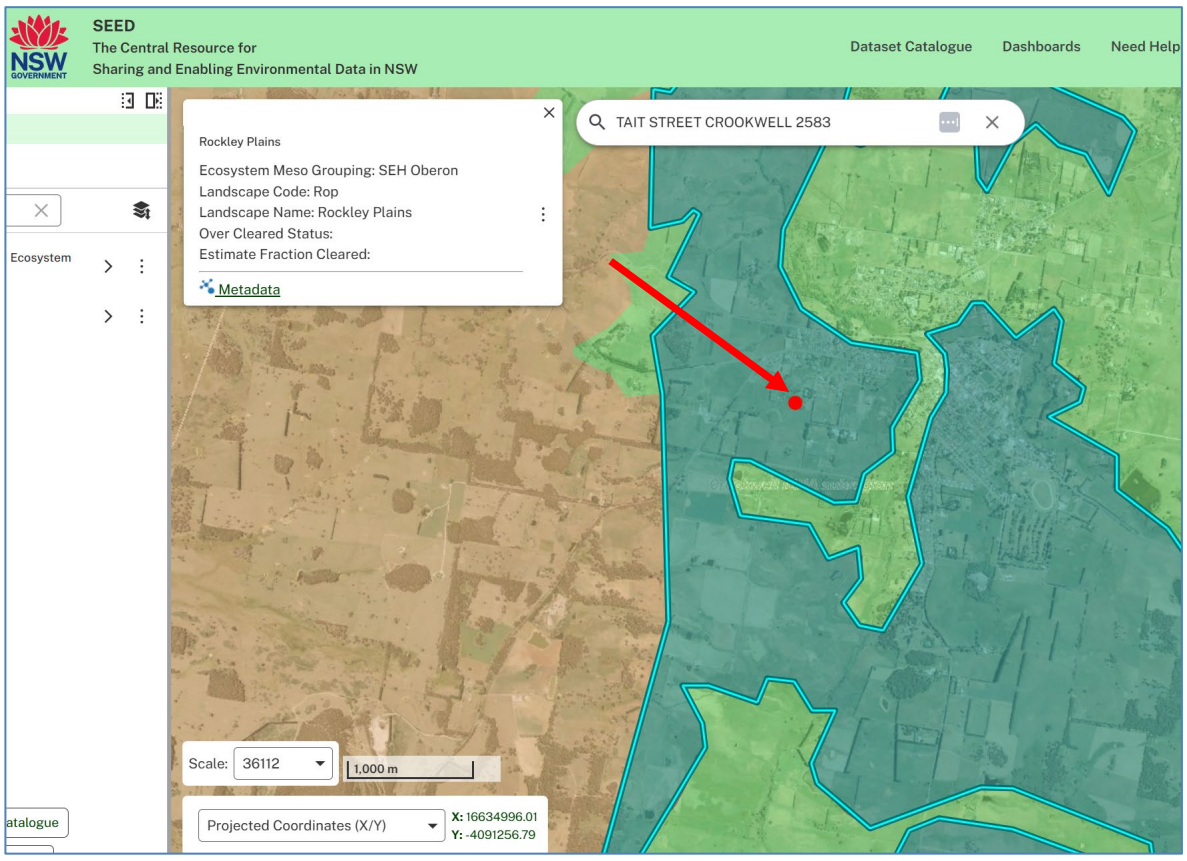


Figure 9: Location of site within the 'Rockley Plains' Mitchell Landscape (red arrow)

2.2 Native Vegetation Extent

All areas of native vegetation cover, within the site and within a 1,500 m buffer area surrounding the site, have been mapped; refer to Figure 10. It is estimated, from this mapping, that the native vegetation cover would be less than 15% provided within the BDAR manual and this was used in the BAM Offsets calculator (Section 6).

Figure 10: 1500m buffer area of the site

2.3 Wetland, Rivers, Streams and Estuaries

No significant wetlands, rivers, streams and estuaries are present within the subject land.

2.4 Connectivity Features

The biodiversity value of corridor networks is well known. Landscapes that retain more connections between patches of otherwise isolated areas of vegetation are more likely to maintain more numerous and more diverse populations of various plant and animal species (Lindenmayer and Fischer, 2006). Conversely, a lack of landscape connectivity can have a range of negative impacts on species populations (Lindenmayer and Fischer, 2006). It is thought that if existing remnants are left to persist without sufficient immigration to maintain genetic diversity, continued losses of biodiversity are certain (Parker *et al.* 2008).

The proposed development will not fragment bushland or significantly impact upon the corridor function of bushland on site as trees will be retained around the development site.

2.5 Areas of Geological Significance and Soil Hazard Features

Not present.

2.6 Areas of Outstanding Biodiversity Value

Under the BC Act, the Minister for the Environment may declare Areas of Outstanding Biodiversity Value (AOBV). These are special areas that contain irreplaceable biodiversity values that are considered important to NSW, Australia or globally.

No listed AOBV occur within the site or within a 1,500 m buffer around the site.

2.7 Site Context

2.7.1 Patch Size

Patch size is used to describe an area of intact native vegetation, that includes native vegetation with a gap of less than 100 m from the next area of moderate to good condition native vegetation. This gap is less than or equal to 30 m for non-woody ecosystems.

The patch size for the vegetation on-site is less than 30 hectares.

3 NATIVE VEGETATION

3.1 Plant Community Types

3.1.1 Native plant species recorded on site

The development impact area is a highly modified area that was formerly the site an existing orchard (refer to Figure 13 that shows old aerial imagery of the site). The vegetation within study area has been modified through the establishment of improved pasture and some amenity plantings such as windrows/hedgerows that include both exotic and native tree species.

The site is predominantly existing cleared land that is dominated by introduced exotic species that does not form part of a derived native grassland. A full list of exotic species recorded on site is provided below.

Overall, the vegetation is considered to be in poor condition with low native species diversity and high weed invasion. It has low native resilience and low ability to regenerate from the native soil seedbank.

There are 3 rows of planted trees which include the following species:

- *Eucalyptus mannifera* (Brittle Gum) - planted native species
- *Eucalyptus aggregata* (Black Gum) - planted native species
- *Eucalyptus elata* (River Peppermint) - planted native species
- *Eucalyptus scoparia* (Wallangarra White Gum) - planted native species
- *Cupressus macrocarpa* (Monterey Cypress) - planted exotic species
- *Quercus robur* (English Oak) - planted exotic species

Refer to photographs provided on the following pages.

The tree numbering system is provided within the Arboricultural Impact Assessment prepared by Concept Arbor Consulting dated 17th November 2023 - refer to Section 8.1 for further details).

The following introduced environmental weed species were recorded on-site:

- *Pinus radiata**
- *Axonopus fissifolius*
- *Briza maxima*
- *Cenchrus clandestinus*

- *Chloris gayana*
- *Cirsium vulgare*
- *Conyza bonariensis*
- *Dichelachne crinita*
- *Eragrostis curvula ssp. curvula*
- *Erigeron sumatrensis*
- *Holcus lanatus*
- *Hypochaeris radicata*
- *Modioloa caroliana*
- *Paspalum dilatatum*
- *Paspalum urvillei*
- *Phalaris aquatica*
- *Phytolacca octandra*
- *Plantago lanceolata*
- *Rumex sp*
- *Setaria gracilis*
- *Secale cerelae*
- *Sida rhombifolia*
- *Sonchus oleraceus*
- *Sporobolus fertilis*
- *Trifolium repens*
- *Senecio madagascariensis*
- *Sporobolus fertilis*
- *Holcus lanatus**
- *Onopordum acanthium**
- *Taraxacum officinale*
- *Datura ferox*
- *Bromus catharticus*
- *Medicago arabica*
- *Silybum marianum*
- *Modiola caroliniana*
- *Polygonum aviculare*
- *Dactylis glomerata*
- *Hirschfeldia incana*
- *Nassella trichotoma **

*Out of the exotic species recorded, four are listed as State Priority Weeds under the Biosecurity Act. The three State Priority Weeds are also Weeds of National Significance (WoNS). State and Regional Priority Weeds are required to be managed as detailed in the South-East Regional Strategic Weed Management Plan (NSW Local Land Services 2017) to comply with the General Biosecurity Duty that all land owners/managers and persons who deal with weeds are required to fulfil under the Biosecurity Act.

4.3 Plant Community Types (PCTs) and PCT selection

The NSW SVTM does not map any native vegetation on the subject land.

The NSW SVTM broadly identifies the locality as consisting of a plant community type (PCT) PCT 3374 - Goulburn Tableland Peppermint Grassy Forest as occurring on some of the neighbouring properties (Figure 11).

We have provided the full PCT report from the BioNet vegetation classification system to determine any consistencies between the planted native vegetation and remnant vegetation communities occurring in the surrounding area (refer to the full report provided on the following pages).

The planted Eucalyptus species occurring on-site are not consistent with the PCT classification (from the BIONET vegetation classification) which states that this vegetation community that usually comprises of the following:

- A sparse to mid-dense canopy almost always includes *Eucalyptus dives*, with occasional associates *Eucalyptus dalrympleana or Eucalyptus macrorhyncha*.

- The shrub layer is sparse to very sparse and commonly includes scattered *Hibbertia obtusifolia and Melichrus urceolatus*, occasionally with *Acacia dealbata or Daviesia latifolia*.

- The grassy ground layer almost always includes *Poa sieberiana*, commonly with *Microlaena stipoides, Rytidosperma pallidum, Themeda triandra and occasional Rytidosperma racemosum*.

- Common forbs include *Gonocarpus tetragynus, Lomandra filiformis, Hydrocotyle laxiflora, Hypericum gramineum, Scleranthus biflorus, Hardenbergia violacea, Viola betonicifolia, and the small subshrub Hovea linearis*.

Of the species listed above only planted *Eucalyptus mannifera* (Brittle Gum), are consistent with a local vegetation community.

No native understorey species were recorded on-site.

Overall the subject vegetation occurring on-site is not consistent with a native vegetation community, despite plantings of some eucalypt species that are locally indigenous.

However, based upon the geology/ soil landscapes and locally vegetation community occurrences we have entered/assigned the vegetation occurring on-site into the BAM calculator as PCT 3374 - Goulburn Tableland Peppermint Grassy Forest.

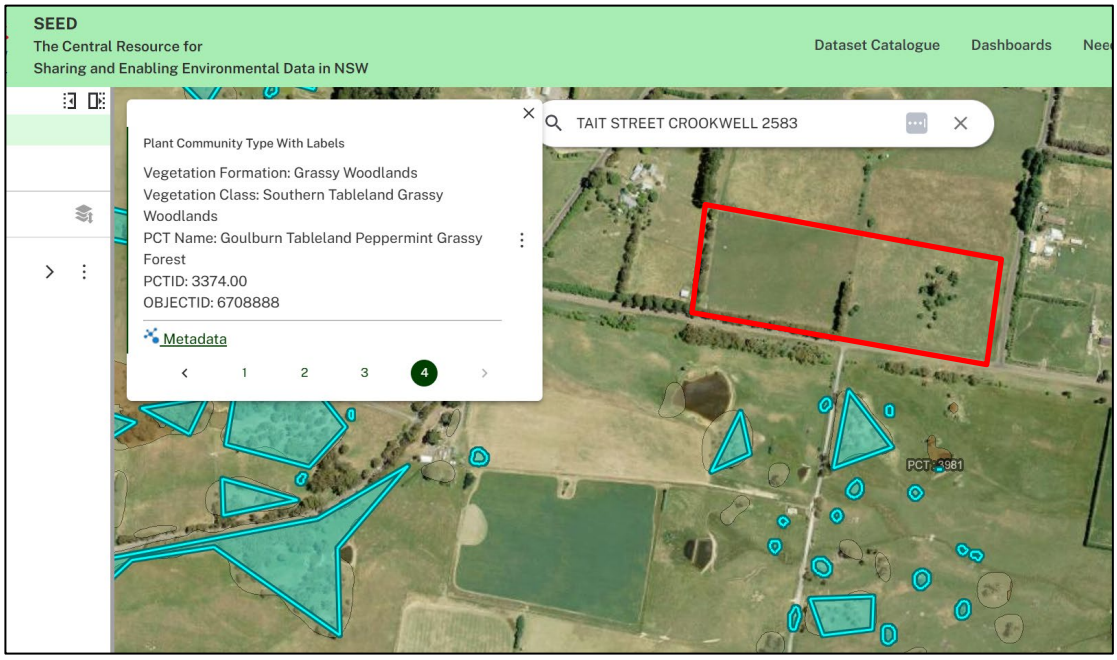


Figure 11: NSW State Vegetation Type Map for the subject site (Source: Department of Climate Change, Energy, the Environment and Water 2024 – SEED Mapping viewer)

3.1.2 Plot-based Floristic Vegetation Surveys

Plot-based floristic vegetation surveys were conducted, in accordance with s.5.2.1.9 of the BAM, by Jesse McIvor and Alex Fraser on the 6/11/24 and their location is shown in Figure 12.

One 20 m x 20 m plot was sampled for the presence of flora species. The plot was carefully examined to identify all flora species present. Searches continued until it was confident that all flora species within a plot were detected. Data collected for each species included:

- Stratum and layers in which each species occurs
- Growth form for each species
- Scientific and common name for each species
- Percentage foliage cover (PFC) across the plot, of each species rooted in or overhanging the plot
- Abundance rating for each species

Plant Community Types (PCTs) on the site were identified according to the NSW PCT classification described in the BioNet Vegetation Classification.

Plot data is provided in Appendix B.

Figure 12: Location of BAM Plot Vegetation Zone 1 (red) and backup BAM Plot Vegetation Zone 2 (blue) Note: Only one BAM plot was required for the vegetation zone size

Photograph 1: BAM Plot midline of Vegetation Zone 1 (view north)

Photograph 2: BAM Plot midline of Vegetation Zone 1 (view south)

Photograph 3: BAM Plot midline of Vegetation Zone 2 – back up plot (view north)

Photograph 4: BAM Plot midline of Vegetation Zone 2 – back up plot (view south)

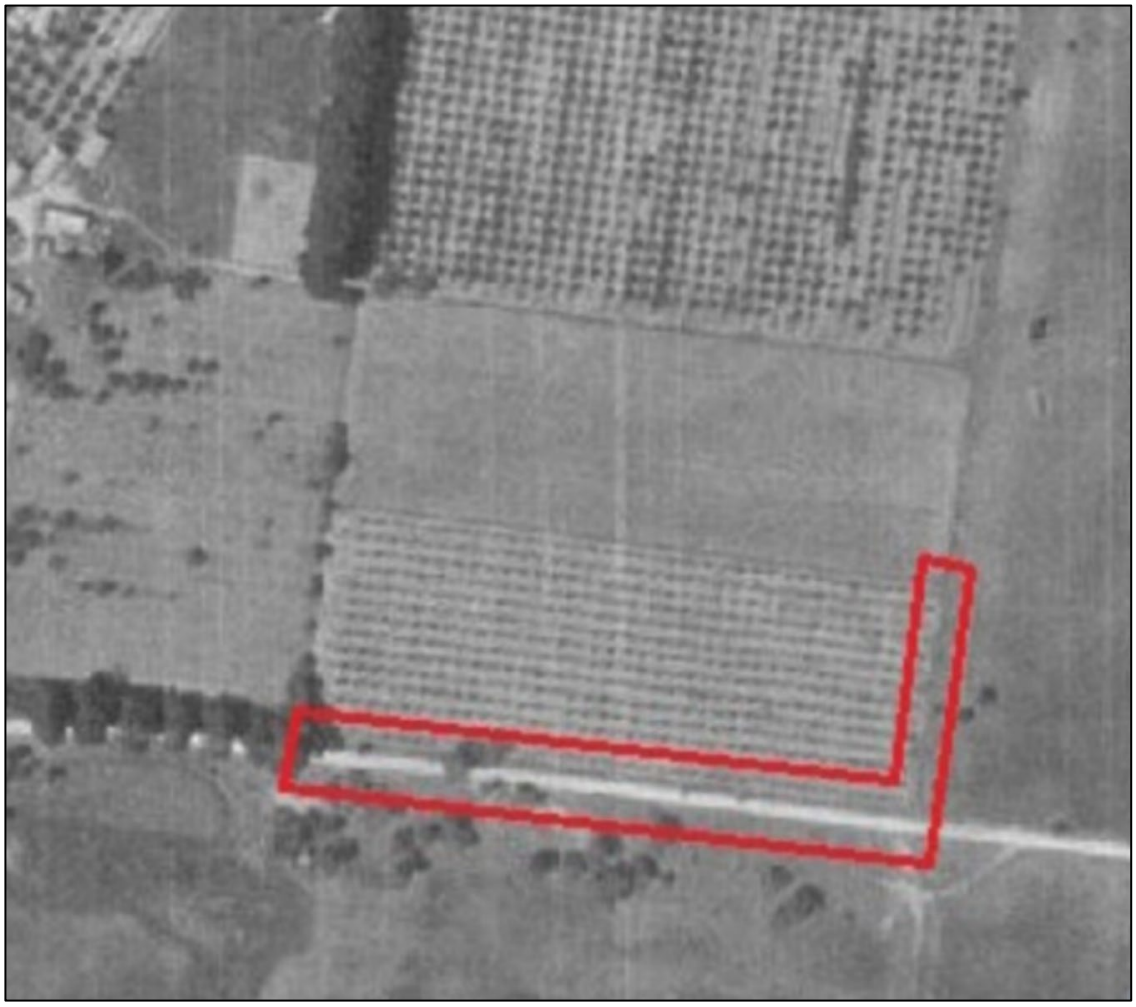


Figure 13: 1962 aerial imagery of the site (source: SIX Maps)

Photograph 5: view eastwards across the subject property

Photograph 6: View north along the subject property

Photograph 7: View east across the subject property

Photograph 8: View north-east from the roadside towards the east and extent of the subject property

3.2 Vegetation Integrity Assessment

3.2.1 Vegetation Zones

For the purposes of the BAM, a vegetation zone is an area of native vegetation on the site that is the same PCT and has a similar broad condition state. The assigned vegetation zones for the PCT 3320 occurring on the site are described below (Figure 14).

Figure 14: Location of vegetation zone and field validated PCT 3320 extent (shown in red)

3.2.2 Patch Sizes

A patch size area has been assigned to each vegetation zone, as a class. Patch size classes are provided in Table 3-1.

Table 3-1: Patch Size Classes

PCT	Vegetation Zone	Patch Size Class
PCT 3374	Vegetation Zone 1	30ha

3.2.3 Vegetation Integrity Scores

Each vegetation zone identified on the site has been surveyed to obtain a quantitative measure for each zone, of the composition, structure and function attributes listed in Table 3 of the BAM. These attributes are listed below:

- Growth form groups used to assess composition and structure:
  - Tree
  - Shrub
  - Grass and grass like
  - Forb
  - Fern
  - Other
- Attributes used to assess function:
  - Number of large trees
  - Tree regeneration
  - Tree stem size class
  - Total length of fallen logs
  - Litter cover
  - High threat exotic vegetation cover
  - Hollow-bearing trees

Plot-base surveys were conducted, in accordance with s.5.3.4 of the BAM, by an accredited ecologist (Jesse McIvor and Alex Fraser). Survey plots were established around a central 50 m transect and included:

- One 400 m² (20 m x 20 m) plot to assess the composition and structure attributes listed above.
- One 1000 m² (20 m x 50 m) plot to assess the function attributes: number of large trees, stem size class, tree regeneration and length of logs.
- Five 1 m² sub-plots to assess average litter cover (and other optional groundcover components).

See previous Figure 11 for plot location. Plot data is provided in Appendix B. Table 3-2 details the vegetation integrity scores for each vegetation zone.

Table 3-2: Vegetation Integrity Scores

PCT	Vegetation Zone	Composition Condition Score	Structure Condition Score	Function Condition Score	Vegetation Integrity Score
PCT 3374	Vegetation Zone 1 (0.47ha)	9.4	32.3	48	24.4

4 THREATENED SPECIES

4.1 Ecosystem Credit Species

Ecosystem credit species are those where the likelihood of occurrence of the species or elements of the species' habitat, can be predicted by vegetation surrogates and landscape features, or for which targeted survey has a low probability of detection. The Threatened Biodiversity Data Collection (TBCD) has identified several ecosystem credit species as requiring assessment as shown on below.

Table 3: Ecosystem credit species to be considered from the BAM – C

Common Name	Scientific Name	Vegetation Types(s)
Black Falcon	Falco subniger	3374-Goulburn Tableland Peppermint Grassy Forest
Black-chinned Honeyeater (eastern subspecies)	Melithreptus gularis gularis	3374-Goulburn Tableland Peppermint Grassy Forest
Brown Treecreeper (eastern subspecies)	Climacteris picumnus victoriae	3374-Goulburn Tableland Peppermint Grassy Forest
Diamond Firetail	Stagonopleura guttata	3374-Goulburn Tableland Peppermint Grassy Forest
Dusky Woodswallow	Artamus cyanopterus cyanopterus	3374-Goulburn Tableland Peppermint Grassy Forest
Flame Robin	Petroica phoenicea	3374-Goulburn Tableland Peppermint Grassy Forest
Gang-gang Cockatoo	Callocephalon fimbriatum	3374-Goulburn Tableland Peppermint Grassy Forest
Grey-headed Flying-fox	Pteropus poliocephalus	3374-Goulburn Tableland Peppermint Grassy Forest
Large Bent-winged Bat	Miniopterus orianae oceanensis	3374-Goulburn Tableland Peppermint Grassy Forest
Little Eagle	Hieraaetus morphnoides	3374-Goulburn Tableland Peppermint Grassy Forest
Little Lorikeet	Glossopsitta pusilla	3374-Goulburn Tableland Peppermint Grassy Forest
Painted Honeyeater	Grantiella picta	3374-Goulburn Tableland Peppermint Grassy Forest
Rosenberg's Goanna	Varanus rosenbergi	3374-Goulburn Tableland Peppermint Grassy Forest

Common Name	Scientific Name	Vegetation Types(s)
Scarlet Robin	Petroica boodang	3374-Goulburn Tableland Peppermint Grassy Forest
South-eastern Glossy Black-Cockatoo	Calyptorhynchus lathami lathami	3374-Goulburn Tableland Peppermint Grassy Forest
South-eastern Hooded Robin	Melanodryas cucullata cucullata	3374-Goulburn Tableland Peppermint Grassy Forest
Southern Whiteface	Aphelocephala leucopsis	3374-Goulburn Tableland Peppermint Grassy Forest
Speckled Warbler	Chthonicola sagittata	3374-Goulburn Tableland Peppermint Grassy Forest
Spotted Harrier	Circus assimilis	3374-Goulburn Tableland Peppermint Grassy Forest
Spotted-tailed Quoll	Dasyurus maculatus	3374-Goulburn Tableland Peppermint Grassy Forest
Varied Sittella	Daphoenositta chrysoptera	3374-Goulburn Tableland Peppermint Grassy Forest
White-bellied Sea-Eagle	Haliaeetus leucogaster	3374-Goulburn Tableland Peppermint Grassy Forest
White-throated Needletail	Hirundapus caudacutus	3374-Goulburn Tableland Peppermint Grassy Forest
Yellow-bellied Sheathtail-bat	Saccolaimus flaviventris	3374-Goulburn Tableland Peppermint Grassy Forest

4.2 Species Credit Species (Candidate Species)

Species credit species (or candidate species) are those where the likelihood of occurrence of the species or elements of suitable habitat for the species, cannot be confidently predicted by vegetation surrogates and landscape features and can be reliably detected by survey. The TBDC has identified several candidate species as requiring assessment as provided on the following page.

In accordance with S.6.5.1.1. a species survey must be undertaken for all species credit species identified as likely to occur on the site based upon the application of Steps 1-3 in Section 6.4. Based upon the low quality of fauna habitat proposed for removal, no species credit species are likely to occur on-site. Therefore, no targeted fauna surveys were considered necessary.

No hollow-bearing trees are proposed for removal. No significant fauna habitat is present on the Subject Land.

The site is mowed/slashed often as part of routine property maintenance and the habitat is highly degraded for native plant species.

It is not mapped under the Important Area habitat mapping.

Table 5 on the following page shows species credit species to be considered for this assessment and justification for their exclusion for further assessment.

As previously noted, the majority of the study area has previously been cleared for agricultural practices, with woodland and forest vegetation now limited to rows of isolated paddock trees.

The historic clearing and land degradation from agricultural practices, the matrix of woodland patches and cleared areas only supports habitat for a limited range of native vertebrate fauna species, including birds and microbats.

The remnant trees below the site function as a habitat corridor for mobile species including microchiropteran bats, flying foxes and variety of common bird species.
The Myrtataceace group of trees occurring downslope of the site provide nectar through flowering blossoms and direct extraction from the trunk for a variety of fauna including Grey-headed Flying Fox, birds and gliders.

There are a variety of nectar feeding species that utilise flowering blossoms are transient through the site and generally rely upon the flowering times.

The vegetation surrounding the site provides foraging and sheltering habitat for woodland bird species and generalist birds of agricultural habitats, although the smaller size of the remnants and general lack of connectivity may influence the suite of species.

Common birds found in these woodland habitats include White-throated Treecreeper (*Cormobates leucophaea*), Buff-rumped and Yellow Thornbill *(Acanthiza reguloides* and *Acanthiza nana*), Striated Pardalote (*Pardalotus striatus*), Grey Shrike-thrush (*Colluricincla harmonica*), Willy Wagtail (*Rhipidura leucophrys*), Yellow-faced Honeyeater (*Lichenostomus chrysops*), White-naped Honeyeater (*Melithreptus lunatus*), Crimson Rosella (*Platycercus elegans*), Magpie Lark (*Grallina cyanoleuca*) and Australian Magpie (*Gymnorhina tibicen*).

A total of 15 bird species were recorded across the study area during surveys. The species of birds recorded largely comprised common, widespread species in wooded agricultural landscapes in south eastern Australia.

The birds observed during the surveys (including incidental sightings) were flying moderate to short distances between trees, perching or moving between patches of vegetation. Sightings largely comprised scattered individuals or small groups (<5 individuals), apart from a sighting of relatively large flocks (>30 individuals) of Common Starlings and larger groups (~10-20 individuals) of Sulphur-crested Cockatoos and Galahs.

In addition to large flocks of Common Starlings, the following pest mammal species were detected:

- European Fox (Vulpes vulpes);
- European Hare (Lepus europaeus); and
- European Rabbit (Oryctolagus cuniculus).

No hollow-bearing trees or raptor nests are present on-site.

Table 4: Fauna habitat assessment

TOPOGRAPHY				
Flat ✓	Gentle ✓	Moderate ✓	Steep	Drop-offs
VEGETATION STRUCTURE				
Closed Forest	Open Forest ✓	Woodland	Heath	Grassland ✓
DISTURBANCE HISTORY				
Fire	Under-scrubbing ✓	Cut and fill works - Drainage culvert		
Tree clearing	Grazing			
SOIL LANDSCAPE				
DEPTH:	Deep	Moderate ✓	Shallow	Skeletal
TYPE:	Clay ✓	Loam ✓	Sand	Organic
VALUE:	Surface foraging	Sub-surface foraging	Denning/burrowing	
WATER RETENTION:	Well Drained ✓	Damp / Moist ✓	Water logged	Swamp / Soak
ROCK HABITAT				
CAVES:	Large	Small	Deep	Shallow
CREVICES:	Large	Small	Deep	Shallow
ESCARPMENTS:	Winter / late sunny aspects		Shaded winter / late aspects	
OUTCROPS:	High Surface Area Hides	Med. Surface Area Hides	Low Surface Area Hides	
SCATTERED / ISOLATED:	High Surface Area Hides	Med. Surface Area Hides	Low Surface Area Hides ✓	
FEED RESOURCES				
FLOWERING TREES:	Eucalypts ✓	Corymbias	Melaleucas	
	Banksias	Acacias		
SEEDING TREES:	Allocasuarinas	Conifers		
WINTER FLOWERING EUCALYPTS:	*C. maculata*	*E. crebra*	*E. globoidea*	*E. sideroxylon*
	E. squamosa	*E. grandis*	*E. multicaulis*	*E. scias*
	E. robusta	*E. tereticornis*	*E. agglomerata*	*E. siderophloia*
FLOWERING PERIODS:	Autumn	Winter	Spring	Summer
OTHER:	Mistletoe	Figs / Fruit	Sap / Manna	Termites
FOLIAGE PROTECTION				
UPPER STRATA:	Dense	Moderate ✓	Sparse	
MID STRATA:	Dense	Moderate	Sparse ✓	
PLANT / SHRUB LAYER:	Dense	Moderate	Sparse ✓	
GROUNDCOVERS:	Dense	Moderate ✓	Sparse	
HOLLOWS / LOGS				
TREE HOLLOWS:	Large	Medium	Small	
TREE HOLLOW TYPES	Spouts / branch	Trunk	Broken Trunk	Basal Cavities	Stags
GROUND HOLLOWS:	Large	Medium	Small	
VEGETATION DEBRIS				
FALLEN TREES:	Large	Medium	Small	
FALLEN BRANCHES:	Large	Medium	Small	
LITTER:	Deep	Moderate	Shallow ✓	
HUMUS:	Deep	Moderate	Shallow	
DRAINAGE CATCHMENT				
WATER BODIES	Wetland(s)	Soak(s)	Dam(s)	Drainage line(s) ✓	Creek(s)	River(s)
RATE OF FLOW:	Still	Slow	Rapid	
CONSISTENCY:	Permanent	Perennial	Ephemeral	
RUNOFF SOURCE:	Urban / Industrial	Parkland	Grazing	Natural ✓
RIPARIAN HABITAT:	High quality	Moderate quality	Low quality	Poor quality
ARTIFICIAL HABITAT				

STRUCTURES:	Sheds	Infrastructure	Equipment
SUB-SURFACE	Pipe / culvert(s)	Tunnel(s)	Shaft(s)
FOREIGN MATERIALS:	Sheet	Pile / refuse	

Table 5: Candidate species justification exclusion table

Table 4: Candidate species assessment (justification for exclusion/ inclusion)

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution	Habitat and Ecology	Habitat Constraints	Optimal Survey (Months)	SAII Entity?	Likely to occur on-site and biodiversity credits required?
Miniopterus orianae oceanensis	*Large Bent-winged Bat*	Vulnerable	-	Eastern Bentwing-bats occur along the east and north-west coasts of Australia.	Caves are the primary roosting habitat, but also use derelict mines, storm-water tunnels, buildings and other man-made structures. 1 Form discrete populations centred on a maternity cave that is used annually in spring and summer for the birth and rearing of young. 2 Maternity caves have very specific temperature and humidity regimes. 3 At other times of the year, populations disperse within about 300 km range of maternity caves. 4 Cold caves are used for hibernation in southern Australia. 5 Breeding or roosting colonies can number from 100 to 150,000 individuals. 6 Hunt in forested areas, catching moths and other flying insects above the tree tops.	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	Dec-Feb	Yes	The site does not occur within two kilometres of rocky areas containing caves, overhangs, escarpments, outcrops, or crevices, or within two kilometres of old mines or tunnels. No biodiversity credits required
Litoria castanea	*Yellow-spotted Tree Frog*	Critically Endangered	Critically Endangered	Historically, this species occurred in two separate highland ranges: on the New England Tableland, and on the southern and central tablelands from Bathurst to Bombala. Following the chytrid virus pandemic in the 1970s, this species went unrecorded for 30 years and was believed to be extinct, until it was rediscovered in 2009 on the Southern Tablelands. This population - near Yass - remains the only known extant site of the species.	Require large permanent ponds or slow flowing 'chain-of-ponds' streams with abundant emergent vegetation such as bulrushes and aquatic vegetation. 1 Adults are active during spring and summer and bask on sunny days.2 Move and forage at night on grassy banks or float on the water's surface. 3 Males call at night from the open water and breeding generally occurs during or following rain. 4 Eggs are laid amongst aquatic vegetation. 5 Shelter during autumn and winter under fallen timber, rocks, other debris or thick vegetation.	n/a	Nov-Dec	Yes	Suitable habitat is absent No biodiversity credits required

4.3 Description of Impacts

4.3.1 Serious and irreversible impacts

Species and ecological communities with a 'very high' biodiversity risk weighting will be a potential serious and irreversible impact (SAII). These 'potential SAII entities' are identified within the BAM calculator (DPE 2020).

The determination of serious and irreversible impacts on biodiversity values is to be made by the consent authority in accordance with the principles set out in the BC Regulation.

To assist the consent authority, the guidance document Guidance to assist a decision-maker to determine a serious and irreversible impact includes criteria that enable the application of the four principles set out in clause 6.7 of the BC Regulation to identify the species and ecological communities that are likely to be the subject of serious and irreversible impacts.

No SAII entities occur in the Subject Land.

4.3.2 Potential Direct Impacts

Vegetation and habitat removal

The development impact area is a highly modified area that comprises of paddocks dominated by exotic pastureland and planted trees along the boundaries.

As a precautionary measure, it has been assumed that 0.47ha PCT 3307 will require removal, despite the trees not being remnant and are planted.

A Vegetation Management Plan can be provided at prior to the release of the Subdivision Certificate to address any native revegetation works.

The Arboricultural Impact Assessment prepared by Concept Arbor Consulting dated 17th November 2023 identifies the following vegetation impacts as follows:

- In its current form, the proposed subdivision will require the removal of eighty (85) trees along the McDonald Street on the south-western boundary to facilitate access to proposed lots 537 – 546 as well as the upgrade of McDonald Street and associated infrastructure.
- The required construction is approximately 1.5m from the trees; using the diameters of the larger trees in this grove, the encroachment is approximately 40% on the southern side and is within the structural root zones of some of the trees.
- A further twenty-nine (29) trees that dissect proposed lots 532 – 536 would require removal to establish building envelopes that meet the required setbacks. Of the trees requiring removal, four (4) are dead and displayed no evidence of habitat; the rest have been allocated a medium retention value.
- The trees are not remnant; they appear to have been planted as a wind break sometime in the early to mid-1970's. Looking at historical photographs, the trees appear around 1973 & are clearly visible by the late 1980's.
- Twenty (20) trees along the western boundary, at the rear of proposed lots 546, 550, 549 & 548 are unaffected by this stage of the subdivision and are suitable for retention.

Overall, the condition of the vegetation community that will be impacted by the proposed development is in poor condition. It has low native resilience and low ability to regenerate from the native soil seedbank.

An assessment of significance ('5 part test') was not required in accordance with Section 7.3 of the Biodiversity Conservation Act 2016 (BC Act) and Section 5.7 of the Environmental Planning and Assessment Act 1979 (EP&A Act) as a precautionary measure.

No hollow-bearing trees are proposed for removal.

The native vegetation community is in poor condition which is reflected in the low Vegetation Integrity Score.

The site does not contain derived native grasslands as defined under the Biodiversity Assessment Methodology (BAM 2020).

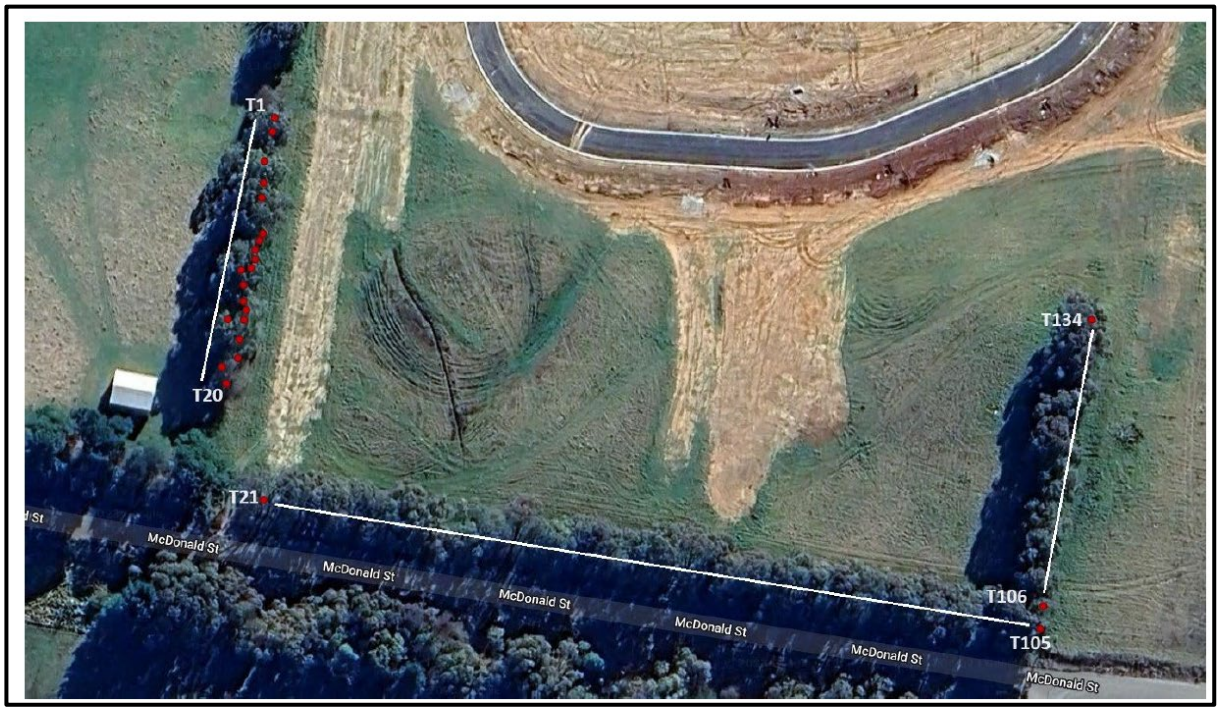


Figure 15: Tee location plan

Risk of runoff, erosion and sedimentation, during construction

Surface water quality may be affected during construction activities. Construction activities could potentially encourage soil erosion and increase the sediment loads in downstream areas. Further, accidental leaks/spills of oil, fuel, cement or other substances entering watercourses could pollute surface waters.

The Construction Environment Management Plan (CEMP) that provided prior to the release of the Construction Certificate will address these issues.

Temporary noise, dust, light and vibration disturbance, during construction work

Impacts of noise, dust, light and vibration upon fauna are difficult to predict. Potential impacts may include effects on predator-prey interactions and changes to mating and nesting behaviour.

The Construction Environment Management Plan (CEMP) that provided prior to the release of the Construction Certificate will address these issues.

Minor hydrological changes

Hard surfaces created as a result of construction typically cause some hydrological changes; however, in this case, hydrological changes are expected to be very minor. All water run-off will be directed to the urban stormwater management system.

4.3.3 Indirect impacts

Indirect impacts occur when the proposal or activities relating to the construction or operation of the proposal affect native vegetation, threatened ecological communities and threatened species habitat beyond the Subject Site.

Impacts may also result from changes to land-use patterns, such as an increase in vehicular access and human activity on native vegetation, threatened ecological communities and threatened species habitat (Table 5.1.2 below).

Table 5.1.2 Indirect impacts, extent and duration and consequences

Indirect Impact	Extent and duration	Threatened species, threatened ecological communities and their habitats likely to be affected.	Consequences of the impacts for the bioregional persistence of the threatened species, threatened ecological communities and their habitats.
(a) inadvertent impacts on adjacent habitat or vegetation	The proposed development may lead to enhanced weed infiltration into adjacent habitat by enhanced edge effects. This impact is likely to be restricted the immediate area surrounding the indicative development footprint to a couple of metres.	Nil	Edge effects will not be created and increase weed intensity and reduce vegetation integrity.
(b) reduced viability of adjacent habitat due to edge effects	The proposed development may lead to enhanced weed infiltration into adjacent habitat by enhanced edge effects. This impact is likely to be restricted the immediate area surrounding the indicative development footprint to a couple of metres.	Nil	Edge effects will not be created and increase weed intensity and reduce vegetation integrity.
(c) reduced viability of adjacent habitat due to noise, dust or light spill	The proposed works are unlikely to significantly exacerbate any of these issues which are all currently in effect within surrounding lots, or otherwise unlikely to occur within the Subject Site.	Nil	Nil

Indirect Impact	Extent and duration	Threatened species, threatened ecological communities and their habitats likely to be affected.	Consequences of the impacts for the bioregional persistence of the threatened species, threatened ecological communities and their habitats.
(d) transport of weeds and pathogens from the site to adjacent vegetation	The proposed development may lead to enhanced weed infiltration into adjacent habitat by enhanced edge effects. This impact is likely to be restricted the immediate area surrounding the indicative development footprint to a couple of metres. Active weed control efforts will be undertaken prior to and post construction.	Nil	Edge effects will not be created and increase weed intensity and reduce vegetation integrity.
(e) increased risk of starvation, exposure and loss of shade or shelter	This issue is unlikely to occur on the Subject Site. It is unlikely that any threatened fauna relies on habitat within the Subject Site, such that the proposed impacts will lead to increased risks from starvation, exposure, shade and shelter. All habitat resources removed will be replaced through implementation of the recommendations outlined in this report.	Nil	Nil
(f) loss of breeding habitats	Only one tree with a hollow spout is proposed for removal. No caves will be impacted by the proposal.	Nil	The implementation of the actions prescribed in this report should see an increase in the availability of potential habitat for these threatened species within the Subject Site.

Indirect Impact	Extent and duration	Threatened species, threatened ecological communities and their habitats likely to be affected.	Consequences of the impacts for the bioregional persistence of the threatened species, threatened ecological communities and their habitats.
(g) trampling of threatened flora species	This issue is not likely to affect the Subject Site. No threatened flora species were identified within the Subject Site.	Nil	Nil
(h) inhibition of nitrogen fixation and increased soil salinity	This issue is not likely to affect the Subject Site.	Nil	Nil
(i) fertiliser drift	This issue is not likely to affect the Subject Site.	Nil	Nil
(j) rubbish dumping	This issue is not likely to affect the Subject Site.	Nil	Nil
(k) wood collection	This issue is not likely to significantly affect the Subject Site.	Nil	Nil
(l) bush rock removal and disturbance	No bush rock occurs on-site.	Nil	Nil
(m) increase in predatory species populations	It is unlikely that the proposed works will influence or alter predatory species populations.	Nil	Nil
(n) increase in pest animal populations	It is unlikely that the proposed works will influence or alter pest species populations.	Nil	Nil
(o) increased risk of fire	This issue is not relevant to the Subject Site as there is little identified bushfire hazard.	Nil	Nil
(p) disturbance to specialist breeding and foraging	There is no specialist breeding or foraging habitat on the Subject Site. The site contains a	Nil	Nil

Indirect Impact	Extent and duration	Threatened species, threatened ecological communities and their habitats likely to be affected.	Consequences of the impacts for the bioregional persistence of the threatened species, threatened ecological communities and their habitats.
habitat, e.g. beach nesting for shorebirds.	stand of mixed, nectar producing canopy trees which can provide intermittent nectar resources for several threatened fauna species.		

4.3.4 Prescribed and Uncertain Impacts

This list of impacts includes all of those impacts on biodiversity values not caused by direct vegetation clearing or development that have been prescribed by the Biodiversity Conservation Regulation 2017 (Table 5.1.3).

Table 5.1.3 Potential Prescribed or Uncertain Impacts of the Proposed Action

Will there be impacts on any of the following	Yes/No	If Yes, must address all of the assessment questions from section 9.2.1 of the BAM
Species or ecological communities associated with karst, caves, crevices, cliffs and other features of geological significance	No	n/a
Habitat of threatened species or ecological communities associated with rocks	No	n/a
Habitat of threatened species or ecological communities associated with human made structures	No	n/a
Habitat of threatened species or ecological communities associated with non-native vegetation	No	n/a
Connectivity of different areas of habitat of threatened species that facilitates the movement of those species across their range	Yes	Habitat connectivity continues to exist across the site. It is unlikely that the small area of impact will interrupt connectivity for any threatened fauna or flora species.
Movement of threatened species that maintains their life cycle	Yes	Habitat connectivity continues to exist across the site. It is unlikely that the small area of impact will interrupt movement of any threatened fauna or
Water quality, water bodies and hydrological processes that sustain threatened species and threatened ecological communities (including subsidence or upsidence resulting from underground mining or other development)	No	n/a
Wind turbine strikes on protected animals	No	n/a

Will there be impacts on any of the following	Yes/No	If Yes, must address all of the assessment questions from section 9.2.1 of the BAM
Vehicle strikes on threatened species of animals or on animals that are part of a TEC	Yes	n/a

4.4 Avoidance of Impacts

The Arboricultural Impact Assessment prepared by Concept Arbor Consulting dated 17th November 2023 identifies the following vegetation impacts as follows:

- Twenty (20) trees along the western boundary, at the rear of proposed lots 546, 550, 549 & 548 are unaffected by this stage of the subdivision and are suitable for retention.

Overall, the condition of the vegetation community that will be impacted by the proposed development is in poor condition. It has low native resilience and low ability to regenerate from the native soil seedbank.

4.5 Minimisation of Impacts

Several mitigation measures are proposed to minimise potential impacts; these are summarised in Table 5-1. These include measures to be implemented in the pre-construction, construction and post-construction phases. It is considered that these measures would serve to minimise any potential direct or indirect impacts.

Action	Outcome/measure	Risk/ consequence of residual impacts	Timing	Responsibility
Project location	The location of the proposed development has been positioned in order to avoid and minimise the potential resulting impacts on biodiversity values within the Subject Site, where possible.	Risk = low Consequence = Harm to native vegetation and native fauna	Pre-construction phase	Proponent
Project design	The proposed development has been designed to avoid and minimise impacts on native vegetation and habitat where possible within the Subject Site. Where this is not possible, mitigation measures have been designed and recommended to reduce potential ecological impact. While there will be some impact on native vegetation, this falls above the Biodiversity Offset Scheme threshold. The design of the proposed development includes the retention of a significant area of existing bushland without disturbance. This area of retained bushland will allow for the implementation of mitigation measures that will aim to reduce any ecological impact resulting from the proposed development.	Risk = low Consequence = Harm to native vegetation and native fauna	Pre-construction phase	Proponent
Tree protection	Australian Standard 4970 (2009) Protection of Trees on Development Sites (AS-4970) outlines that a Tree Protection Zone (TPZ) is the principal means of	Risk = low Consequence = Harm to native vegetation and native fauna. Proliferation of	Pre-construction phase	

Action	Outcome/measure	Risk/ consequence of residual impacts	Timing	Responsibility
	protecting trees on development sites. It is an area isolated from construction disturbance so that the tree remains viable. Ideally, works should be avoided within the TPZ. A Minor Encroachment is less than 10% of the TPZ and is outside the SRZ. A Minor Encroachment is considered acceptable by AS-4970 when it is compensated for elsewhere and contiguous within the TPZ. A Major Encroachment is greater than 10% of the TPZ or inside the SRZ. Major Encroachments generally require root investigations undertaken by non-destructive methods or the use of tree sensitive construction methods..	weeds.		
Avoidance of hollow-bearing trees	No hollow-bearing trees occur within the proposed development footprint.	Risk = low Consequence = Loss of fauna habitat. Loss of native vegetation.	Construction phase	Proponent
Avoidance of woody debris	Woody debris within the development footprint should be relocated, by the proponent to the area of native vegetation in the northern extent of the Subject Site.	Risk = low Consequence = Loss of fauna habitat.	Construction phase	Proponent
Erosion and sedimentation	Appropriate erosion and sediment control must be erected and maintained at all times during construction. As minimum such measures should comply with the relevant industry guidelines such as 'the Blue Book' (Landcom 2004).	Risk = low Consequence = Degradation of vegetation,	Construction phase	Construction Contractor
Erosion protection fencing	Temporary fencing should be erected around the extent of native vegetation to be retained in order to minimise any disturbance resulting from the proposed construction works.	Risk = high Consequence = Permanent damage or degradation of vegetation.	Construction phase	Construction Contractor
Storage and Stockpiling (Soil and Materials)	Allocate all storage, stockpile and laydown sites away from any native vegetation that is planned to be retained. Avoid importing any soil from outside the site as this can introduce weeds and pathogens to the site.	Risk = moderate Consequence = Harm to native vegetation and native fauna	Construction phase	Construction Contractors
Weed eradication and suppression	All priority weeds should be eradicated across all areas of the Subject Site. Very low weed invasion was recorded on-site. Any weeds should be continually supressed and prevented from re-establishing within retained native vegetation.	Risk = moderate Consequence = Harm to native vegetation and native fauna habitat.	Construction phase and Post-construction phase	Proponent

Action	Outcome/measure	Risk/ consequence of residual impacts	Timing	Responsibility
Stormwater	The proposed development is unlikely to result in significant changes to stormwater runoff so it is expected there will be no exacerbated impact on native species of flora and fauna. Stormwater flow from future indicative building footprints and hard surfaces will be directed to newly installed water storage tanks. Prior to any release, all stormwater is to be piped through any tanks that may be required by the regulating authorities.	Risk = low Consequence = Harm to native vegetation and native fauna habitat.	Post-construction phase	Proponent Construction Architect
Wastewater	All sewerage produced on site will be contained in with the new wastewater treatment area. The certified sprinkler system will eliminate any adverse effects to the local ecology. Trees will be retained in this area.	Risk = low Consequence = Harm to native vegetation and native fauna habitat.	Post-construction phase	Proponent

5 IMPACT SUMMARY

5.1 Impacts Which Require an Offset

Tables 5.1 and 5.2 provide a summary of the impacts that require an offset, under the BAM.

Table 5-1: Vegetation Zones Requiring an Offset

PCT	Vegetation Zone	Composition Condition Score	Structure Condition Score	Function Condition Score	Vegetation Integrity Score	Number of biodiversity credits required
PCT 3374	Vegetation Zone 1	9.4	32.3	48	24.4	4

Table 5-2: Threatened Species Requiring an Offset

Species	Area of Impacted Habitat	Number of Species Credits Required
NIL	NIL	0

5.2 Impacts Not Requiring an Offset

N/A

5.3 Identification of Areas Not Requiring Assessment

N/A

6 BIBLIOGRAPHY

Cropper, S. (1993). *Management of Endangered Plants*. CSIRO Publications, East Melbourne, Victoria.

Department of Environment and Resource Management (2011). *National recovery plan for the large-eared pied bat Chalinolobus dwyeri*. Report to the Department of Sustainability, Environment, Water, Population and Communities, Canberra.

DEC (2004). *Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities.* Working Draft November 2004.

DEWHA (2013). *Matters of National Environmental Significance Significant Impact Guidelines 1.1 Environment Protection and Biodiversity Conservation Act 1999*. Commonwealth of Australia.

Harden, G. (ed) (2002). *Flora of New South Wales, Volume 2*. Revised edition. New South Wales University Press, NSW.

Harden, G. (ed) (2000). *Flora of New South Wales, Volume 1*. Revised edition. New South Wales University Press, NSW.

Harden, G. (ed) (1993). *Flora of New South Wales, Volume 4*. New South Wales University Press, NSW.

Harden, G. (ed) (1992). *Flora of New South Wales, Volume 3.* New South Wales University Press, NSW.

Morcombe, M. and Stewart, D. (2010). *The Michael Morcombe eGuide to the Birds of Australia*. PDA Solutions Pty Ltd.

NSW Office of Water (2012). *Guidelines for Riparian Corridors on Waterfront Land*. July 2012.

NSW Scientific Committee (2012) *Listing guidelines version 1.3, January 2012. Guidelines for interpreting listing criteria for species, populations and ecological communities under the NSW Threatened Species Conservation Act*.

OEH (2016). *NSW Guide to Surveying Threatened Plants* (OEH, 2016)

OEH (2017). *Biodiversity Assessment Method*, 2017 No 469.

OEH (2017). *Guidance to Assist a Decision-maker to Determine a Serious and Irreversible Impact.*

OEH (2018a) *Saving NSW Threatened Species*, accessed June-September 2018. <http://www.environment.nsw.gov.au/threatenedspecies/>.

OEH (2018b) *Atlas of NSW Wildlife (BioNET)*, accessed June-September 2018. <http://www.bionet.nsw.gov.au/>.

OEH (2018c) *Six Maps*, accessed June-September 2018. <http://maps.six.nsw.gov.au/apps/channels_3.5/?config=vegetation>.

OEH (2018d). *'Species credit' threatened bats and their habitats: NSW survey guide for the Biodiversity Assessment Method*. 3 October 2018

Robinson, L. (2003). *Field Guide to the Native Plants of Sydney*. 3rd ed. Kangaroo Press, Cammeray NSW.

Robinson, M. (1998). *A Field Guide to Frogs of Australian*. New Holland Publishers (Australia Pty Ltd).

Rose, H. & Rose, C. (2012). *Grasses of Coastal NSW*. Department of Primary Industries, NSW.

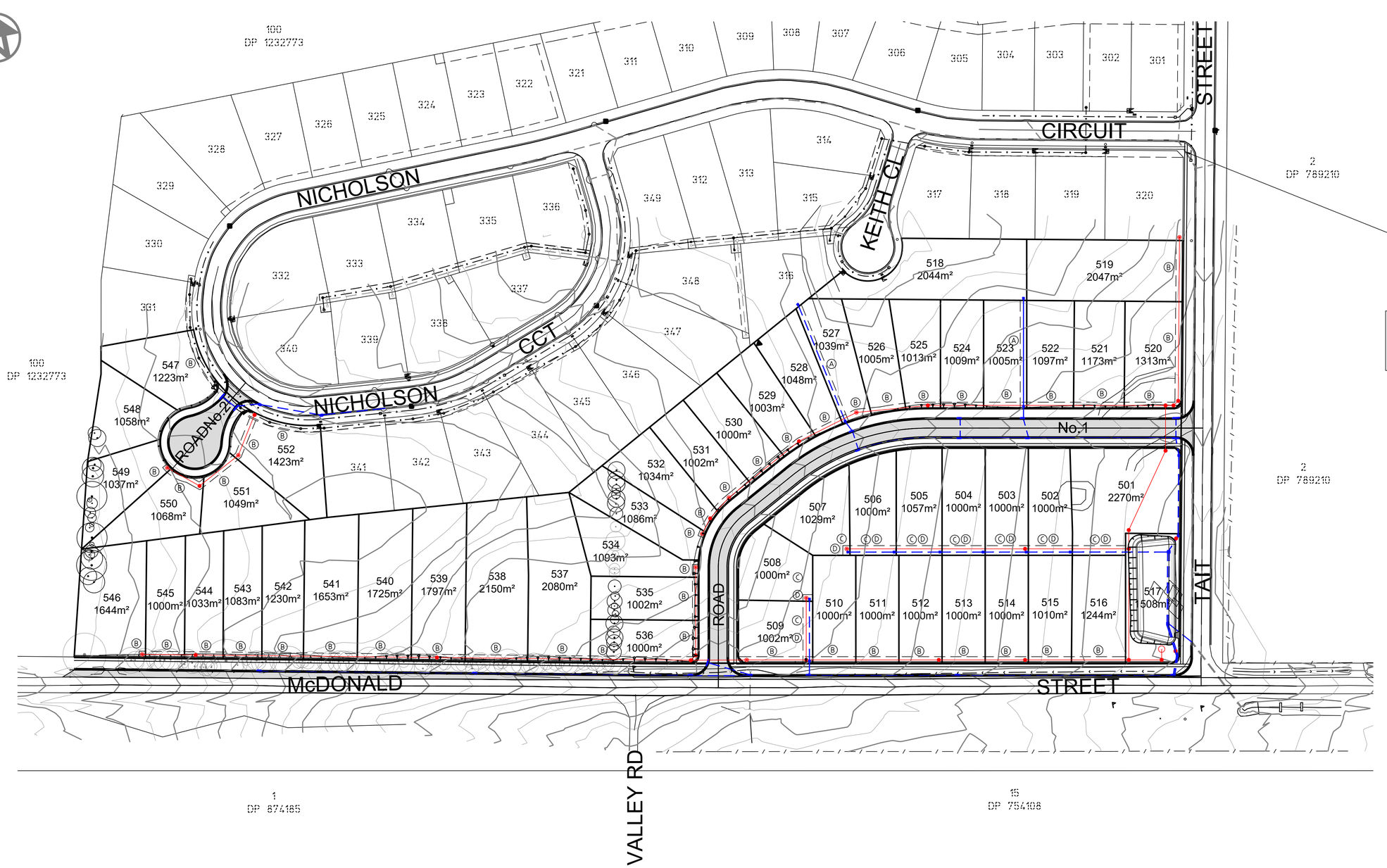
Richardson, F.J., Richardson, R.G. and Shepherd, R.C.H. (2016). *Weeds of the South-East: An Identification Guide for Australia*. 3rd Edition. R.G and F.J. Richardson, Meredith Vic.

Scotts, D. (2003). *Key habitats and corridors for forest fauna: A landscape framework for conservation in north-east New South Wales*. NSW NPWS Occasional Paper 32, NSW National Parks and Wildlife Service, Sydney.

Triggs, B. (2004). *Tracks, Scats and Other Traces: a Field Guide to Australian Mammals.* Oxford University Press, Australia.

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

APPENDIX A SITE PLANS



NOTE:

LOT 501 TO BE DEDICATED TO COUNCIL AS PUBLIC RESERVE.
LOT 517 TO BE DEDICATED TO COUNCIL AS DRAINAGE RESERVE.

LEGEND

- PAVEMENT
- CONCRETE PAVING

FOR DETAILS REFER SHEET 8.

- TREE TO BE REMOVED
- EXISTING TREE

NOTES

1. FOR LEGEND AND GENERAL NOTES REFER TO SHEET 1
2. FOR TYPICAL ROAD CROSS SECTIONS REFER TO SHEET 8.
3. THESE DRAWINGS ARE SOLELY FOR SUBDIVISION CIVIL CONSTRUCTION PURPOSES ONLY AND SHALL NOT BE USED FOR THE DESIGN OF INDIVIDUAL DWELLINGS OR BUILDINGS ON ANY OF THE LOTS SHOWN HEREON.
4. ANY VARIATION TO THE APPROVED DESIGN AS SHOWN ON THESE PLANS MUST BE FIRSTLY REFERRED TO CIVIL DEVELOPMENT SOLUTIONS PRIOR TO ANY AGREEMENTS OR ARRANGEMENTS BEING MADE WITH COUNCIL INSPECTORS.
5. THESE PLANS ARE TO BE READ AT A1 SIZE.
6. THESE PLANS ARE TO BE READ IN CONJUNCTION WITH THE SAFETY IN DESIGN RISK REGISTER PREPARED BY CDS.
7. SURVEY PROVIDED BY LANDTEAM.

DIAL BEFORE YOU DIG www.1100.com.au

- Ⓐ EASEMENT TO DRAIN WATER 3 WIDE (PROPOSED)
- Ⓑ EASEMENT TO DRAIN SEWAGE 3 WIDE (PROPOSED)
- Ⓒ EASEMENT TO DRAIN WATER 4.5 WIDE (PROPOSED)
- Ⓓ EASEMENT TO DRAIN SEWAGE 4.5 WIDE (PROPOSED)

UTILITY SERVICES NOTE

No utility service investigations have been undertaken for this project. The presence, exact location, nature and size of utility services must be confirmed by field inspection, prior to the commencement of any excavations, earthworks or roadworks. The contractor is to obtain the relevant utility plans from Dial Before You Dig Ph:1100, all recommendations made by the service authority are to be followed. Caution to be exercised whilst working in the vicinity of all services.

revision	revision details	date	drawn
A	Initial Issue	18/04/24	JC
B	Council Amendments	26/08/24	JC

Civil Development Solutions
ABN 74 160 361 446
Civil Engineering, Development and Project Consultants
Unit 9, 44-48 Bowral Street,
BOWRAL NSW 2576
P: 4862-1277
E: admin@cdsolutions.com.au
www.cdsolutions.com.au

WINGECARRIBEE SHIRE COUNCIL DA: ----

LOT 350, DP 1301003
TAIT STREET,
CROOKWELL

client: DARJEELING PASTORAL

CONCEPT OVERALL SITE PLAN

SCALE: 1:1000 (0 5 10 20 30 40 50 100 METRES)

designed: J.C.	A1 sheet	revision B	
drawn: J.C.	Job Drawing Number 2124 CE05		
checked: R.A.			
datum: A.H.D.			
date: 18/04/24	sheet 1	sheets 15	

X:\JOBS\2124TAITSTCROOKWELL\CAD\2124_CE05.dwg

APPENDIX B PLOT DATA

BAM Field Data Summary

Survey Name		Date	Zone ID	Recorders	
99 Tait Street Crookwell		11/06/2024	1	Jesse McIvor	
Zone: 56	**Datum:**	**Plot ID:**	**Plot dimensions:** 50x20 m		**Photo #:**
Easting: 174045	**Northing: 6180746**	**IBRA region: South Eastern Highlands**	**Midline bearing from 0 m:**		
Vegetation Class: Grassy Woodlands					Confidence H M L
Plant Community Type: 3374 - Goulburn Tableland Peppermint Grassy Forest			**EEC: No**		Confidence H M L

Record easting and northing at 0m on midline. Dimensions (Shape) of 0.04ha base plot.

BAM Attribute (400m² Plot)	Sum Values	
	Count of Native Richness	Cover (%)
Trees	3	20
Shrubs	0	
Grasses etc.	0	
Forbs	0	
Ferns	0	
Other	0	
High threat weed cover		0

Cover: 0.1, 0.2, 0.3 1,2,3,……,10, 15, 20, 25, ….. 100% (foliage cover).

Note on Determining Cover %

- 0.1% ≈ 63x63 cm (or a circle about 71 cm diameter)

- 0.5% ≈ 1.4 x 1.4m,

- 2% ≈ 2 x 2m,

- 5% ≈ 4 x 5m, 25% 10 x 10m.

BAM Attribute (1000m² Plot)		
DBH	**#Tree Stems Count**	**#Stems with Hollows**
80 + cm	3	
50 – 79 cm	2	
30 – 49 cm	3	
20 – 29 cm	2	
10 – 19 cm		
5 – 9 cm		
<5 cm		
Length of logs (m) (≥ 10 cm diameter, >50cm in length)	**Tally: 0**	**Total:** 0

Counts apply when the number of tree stems within a size class is ≤ 10. Estimate can be used when > 10 (eg. 10, 20, 30….100, 200). For a multi-stemmed tree, only the largest living stem is included in the count / estimate. Tree stems must be living.

For hollows, count only the presence of a stem containing hollows. For a multi-stemmed tree, only the largest stem is included in the count/estimate. Stems may be dead and may be shrubs.

BAM Attribute (1 x 1 m plots)																				
	Litter cover (%)					Bare ground cover (%)					Cryptogam cover (%)					Rock cover (%)				
Subplot score	5	15	25	35	45	5	15	25	35	45	5	15	25	35	45	5	15	25	35	45
	25	5	5	10	15															
Mean (5 plots)	12																			

Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10cm in diameter)

BAM 400m² Plot - Species List

400m² Plot	Survey Name	Plot ID	Recorders
Date: 6/11/2024	99 Tait Street Crookwell	**1**	Jesse McIvor

GF Code	Top 3 native species in each growth form group: full species name mandatory. All other native and exotic species: full species name where practicable	N, E or HTE	Cover	Abund	Stratum	Voucher	Photo #
TT	*Eucalyptus mannifera (Brittle Gum) - planted native species*	N	10	3			
TT	*Eucalyptus aggregata (Black Gum) - planted native species*	N	5	3			
TT	*Eucalyptus elata (River Peppermint) - planted native species*		5	4			
	Cenchrus clandestinus	E	70	100+			
	Taraxacum officinale	E	5				
	Datura ferox	E	0.5				
	Bromus catharticus	E	10				
	Medicago arabica	E	5				
	Silybum marianum	E	2				
	Modiola caroliniana	E	2				
	Polygonum aviculare	E	0.5				
	Dactylis glomerata	E	10				
	Plantago lanceolata	E	5				
	Hirschfeldia incana	E	2				
	Nassella trichotoma (cylindrical tussock grass)	E	5				

N: native, **E**:exotic, **HTE**: high threat exotic, **GF** – circle code if 'top 3'

Cover: 0.1, 0.2, 0.3….. 1,2,3,……,10, 15, 20, 25, ….. 100% (foliage cover). *Note: 0.1% cover is approx.. 63x63 cm or a circle about 71 cm diameter, 0.5% approx. 1.4 x 1.4m, 2% cover is approx. 2 x 2m, 5% = 4 x 5m, 25% 10 x 10m*
Abundance: 1, 2, 3, ….10, 20, 30, ….. 100, 200,…., 1000
Stratum: E – emergent, C – canopy, M – mid-storey / sub canopy, S – shrub layer, G – ground layer

APPENDIX C QUALIFICATION, LICENSING AND CERTIFICATION

Alexander Fraser

alohafraser@gmail.com | 0423238193 | 665 The Scenic Rd Macmasters Beach, NSW 2251

Key skills

- 12+ years private ecological consulting (Fraser Ecological Consulting)
- 15 + years local government ecological assessment for DAs (Hornsby Shire Council – current employer)
- 10 + years Land & Environment Court expert witness experience
- 2 years state government ecological assessment (NSW OEH)
- High level botanical field identification skills, plot surveys and project management
- Fauna survey and field assistant experience
- Biodiversity Assessment Reporting (BDAR) preparation and Stewardship Site (BSAR) under the NSW BOS Credit Scheme

Qualifications

Bachelor Environmental Science (Honours) Southern Cross University

Certificate 3 Natural Area Restoration

Certificate 3 Vertebrate Animal Pest Control (NSW DPI, Orange)

NPWS Scientific Licence - S10445

Animal Ethics Authority - 11/4299

Accredited under the Biodiversity Assessment Methodology - BAM (Accreditation No. BAAS18156)

Practising member of NSW Ecological Consultants Association (ECA)

Summary

Alex Fraser (Principal Ecologist, Fraser Ecological) has extensive experience in DA related ecological assessment as both an assessor (Hornsby Shire Council) and private consultancy (Fraser Ecological) which actively and currently involve a wide array projects. Fraser Ecological is based locally on the Central Coast, however, project experience extends to South Coast, Blue Mountains, Mid-north Coast and mainly in the Sydney Basin Bioregion.

Previous work roles include ecological consulting for Parsons Brinckerhoff (large infrastructure), NPWS threatened species unit (biodiversity surveys), former NSW Department of Climate Change/ OEH (SIS DGRs and major projects assessment) and Hornsby Shire Council (DA assessment officer) have focussed primarily on ecological survey, development assessment, project management and policy development for consent authorities.

Alex offers high level botanical ID and field survey skills which includes targeted surveys and BAM plot surveys. Fraser Ecological has extensive experience in the preparation of over 15 BDARs under the new BC Act 2016 BOS credit trading scheme. Alex has experience dealing with consent authorities including Council, Crown Lands, Metropolitan Land Council, RFS, Biodiversity Conservation Trust and Department of Planning for major projects including SSDI proposals.

Fraser Ecological has established a wide network of ecological specialists including the Royal Botanic Gardens and Australian Museum as well academic institutions for expert advice when required. Alex is a current member of the North Sydney Regional Land Managers Group that includes staff from Central Coast Council, Northern Beaches, Ku-ring-gai Council, Hornsby Council (HSC), NPWS and Crown Lands) as project manager developing the Natural Area Recreation Strategy for HSC. Current main role at Council is development assessment and review of Flora and Fauna Reports and Biodiversity Assessment Reports.

Fraser Ecological has been engaged by various Councils (Central Coast, Ku-ring-gai, Liverpool City, Blacktown City Council, Hornsby Shire Council and Hawkesbury City Council) to undertake biodiversity assessments for major civil works projects. He is continuously providing biodiversity assessments for private clients for a range od development proposals across coastal and western NSW. We have also undertaken threatened flora and fauna species survey and monitoring for the NSW OEH Save our Species grants.

Key skills:

- Targeted flora and fauna surveys
- BAM plots in accordance with the BAM
- Ecological monitoring & Opportunity and Constraints mapping
- Preparation of BDARs, BAM calculator and credit reporting
- Retirement of credits for approved projects via BCT and brokers
- Establishment of stewardship sites and other offset packages
- Expert witness reporting and attendance in the LAEC
- Compliance investigations and auditing
- Preparation of Vegetation Management Plans
- Preparation of Nestbox Monitoring Plans

ECA

ECOLOGICAL CONSULTANTS ASSOCIATION of NSW Inc

2024

PRACTISING MEMBER

CERTIFICATE OF ACCREDITATION AS A BIODIVERSITY ASSESSMENT METHOD ASSESSOR under the *Biodiversity Conservation Act 2016* (NSW)

BAM Assessor		
Alex FRASER		
Accreditation number	**Accreditation date (Date of issue)**	**Expiry Date of**
BAAS18156	October 18, 2024	October 17, 2027

The person named above is accredited under section 6.10 of the *Biodiversity Conservation Act 2016* (NSW) (**BC Act**) as a Biodiversity Assessment Method Assessor to apply the Biodiversity Assessment Method in connection with the preparation of biodiversity stewardship site assessment reports, biodiversity development assessment reports and biodiversity certification assessment reports pursuant to Part 6 of the BC Act.

The accreditation is in force until and including the Expiry Date. The accreditation is subject to the conditions set out in the *Accreditation Scheme for the Application of the Biodiversity Assessment Method*, under the BC Act, and the conditions specified on the reverse of this certificate.

STEEN GYRN

Senior Team Leader, Accreditation and Training
Biodiversity and Conservation Division | Department of Climate Change, Energy, the Environment and Water

NOTES

- DCCEEW maintains a register of Accredited Biodiversity Assessment Method (BAM) Assessors accessible from the DCCEEW website.
- The BAM Assessor's accreditation expires on the Expiry Date unless renewed in accordance with the *Accreditation Scheme for the Application of the Biodiversity Assessment Method*. It is the BAM Assessor's responsibility to monitor the Expiry Date of their accreditation, and apply for any renewal with sufficient time for the application to be processed prior to the Expiry Date.
- Words and expressions used in this accreditation instrument and which are also used in the Act have the same meaning.

SUMMARY OF CONDITIONS UNDER SCHEME

The following are conditions of all accreditations granted under the Scheme:

1. an accredited person must prepare Biodiversity Assessment Reports (and conduct surveys and other activities in connection with the preparation of such reports) in accordance with:
   a. the Biodiversity Assessment Method Manual,
   b. the Credit Calculator Operational Manual,
   c. Accredited Person Code of Conduct.
   d. this Scheme,
   e. any guidance materials published by the Department of Climate Change, Energy, the Environment and Water in connection with preparation of Biodiversity Assessment Reports or the application of the BAM
   f. any accreditation requirements notified by the Department of Climate Change, Energy, the Environment and Water to the accredited assessor from time to time.
2. an accredited person must maintain a detailed and up to date working knowledge of, and comply with, all relevant legislation.
3. an accredited person must maintain records of surveys and assessments, including field data sheets and targeted flora and fauna surveys, undertaken and used as part of the preparation of a Biodiversity Assessment Report, for at least ten years after certification of the relevant Biodiversity Assessment Report.
4. all records required to be kept by an accredited person must be in legible form, or in a form that can be readily reduced to a legible form.
5. an accredited person must provide to the Department of Climate Change, Energy, the Environment and Water any information related to biodiversity assessment reports required to be provided by all accredited persons, or by a group of accredited persons, by way of a notice specified on a website maintained by it, in the form and within the time frames required in that notice.
6. an accredited person must comply with any scientific licence conditions relating to survey records.
7. an accredited person must possess, or operate under, an appropriate scientific licence as required for the type work, they are completing in the Biodiversity Offsets Scheme.

Note. Information that the Environment Agency Head (EAH) may require to be provided may include information collected during the application of the BAM such as site specific survey data.

Note. In addition to the conditions above, accredited persons must comply with obligations under the BC Act and regulations, including Part 6 Division 3 of the BC Act. Failure to comply with any of the conditions above may result in the EAH exercising the power to vary, suspend or cancel that accreditation under Part 5 of this Scheme.

ADDITIONAL CONDITIONS TO WHICH THIS ACCREDITATION IS SUBJECT

Nil

Issued by the Department of Climate Change, Energy, the Environment and Water
4 Parramatta Square,12 Darcy Street | Locked Bag 5022, Parramatta NSW 2124
Email: info@environment.nsw.gov.au Website: dcceew.nsw.gov.au

APPENDIX D BAM SUMMARY REPORTS

BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment Id
00054865/BAAS18156/25/00054868

Proposal Name
99 TAIT STREET CROOKWELL

BAM data last updated *
28/10/2024

Assessor Name
Alex FRASER

Assessor Number
BAAS18156

BAM Data version *
Current classification (live - default) (80)

Proponent Names
Richard Anderson

Report Created
07/02/2025

BAM Case Status
Finalised

Assessment Revision
0

BOS entry trigger
BOS Threshold: Area clearing threshold

Assessment Type
Part 4 Developments (Small Area)

Date Finalised
07/02/2025

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

Potential Serious and Irreversible Impacts

Name of threatened ecological community	Listing status	Name of Plant Community Type/ID
Nil		

Species
Nil

Additional Information for Approval

BAM Biodiversity Credit Report (Like for like)

PCT Outside Ibra Added

None added

PCTs With Customized Benchmarks

PCT
No Changes

Predicted Threatened Species Not On Site

Name
No Changes

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

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	HBT Cr	No HBT Cr	Total credits to be retired
3374-Goulburn Tableland Peppermint Grassy Forest	Not a TEC	0.5	0	4	4

BAM Biodiversity Credit Report (Like for like)

3374-Goulburn Tableland Peppermint Grassy Forest

Like-for-like credit retirement options

Class	Trading group	Zone	HBT	Credits	IBRA region
Southern Tableland Grassy Woodlands This includes PCT's: 303, 312, 350, 654, 703, 705, 731, 1330, 3366, 3367, 3368, 3370, 3372, 3373, 3374, 3376, 3377	Southern Tableland Grassy Woodlands >=70% and <90%	3374_Poor	No	4	Crookwell, Bungonia, Inland Slopes, Kanangra, Monaro, Murrumbateman, Oberon and Orange. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Species Credit Summary

No Species Credit Data

Credit Retirement Options

Like-for-like credit retirement options

BAM Biodiversity Credit Report (Variations)

Proposal Details

Assessment Id

00054865/BAAS18156/25/00054868

Proposal Name

99 TAIT STREET CROOKWELL

BAM data last updated *

28/10/2024

Assessor Name

Alex FRASER

Assessor Number

BAAS18156

BAM Data version *

Current classification (live - default) (80)

Proponent Name(s)

Richard Anderson

Report Created

07/02/2025

BAM Case Status

Finalised

Assessment Revision

0

BOS entry trigger

BOS Threshold: Area clearing threshold

Assessment Type

Part 4 Developments (Small Area)

Date Finalised

07/02/2025

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

Potential Serious and Irreversible Impacts

Name of threatened ecological community	Listing status	Name of Plant Community Type/ID
Nil		

Species
Nil

Additional Information for Approval

PCT Outside Ibra Added

None added

BAM Biodiversity Credit Report (Variations)

PCTs With Customized Benchmarks

PCT
No Changes

Predicted Threatened Species Not On Site

Name
No Changes

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

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	HBT Cr	No HBT Cr	Total credits to be retired
3374-Goulburn Tableland Peppermint Grassy Forest	Not a TEC	0.5	0	4	4.00

3374-Goulburn Tableland Peppermint Grassy Forest

Like-for-like credit retirement options

Class	Trading group	Zone	HBT	Credits	IBRA region
Southern Tableland Grassy Woodlands This includes PCT's: 303, 312, 350, 654, 703, 705, 731, 1330, 3366, 3367, 3368, 3370, 3372, 3373, 3374, 3376, 3377	Southern Tableland Grassy Woodlands >=70% and <90%	3374_Poor	No	4	Crookwell,Bungonia, Inland Slopes, Kanangra, Monaro, Murrumbateman, Oberon and Orange. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Variation options

Formation	Trading group	Zone	HBT	Credits	IBRA region

	Grassy Woodlands	Tier 2 or higher threat status	3374_Poor	No	4	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

Credit Retirement Options

Like-for-like options

BAM Candidate Species Report

Proposal Details

Assessment Id 00054865/BAAS18156/25/00054868	Proposal Name 99 TAIT STREET CROOKWELL	BAM data last updated * 28/10/2024
Assessor Name Alex FRASER	Report Created 07/02/2025	BAM Data version * Current classification (live - default) (80)
Assessor Number BAAS18156	Assessment Type Part 4 Developments (Small Area)	BAM Case Status Finalised
Assessment Revision 0	BOS entry trigger BOS Threshold: Area clearing threshold	Date Finalised 07/02/2025

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

List of Species Requiring Survey

Name	Presence	Survey Months

Threatened species Manually Added

None added

Threatened species assessed as not on site

Refer to BAR for detailed justification

Common name	Scientific name	Justification in the BAM-C
Large Bent-winged Bat	Miniopterus orianae oceanensis	Habitat constraints
Yellow-spotted Tree Frog	Litoria castanea	Habitat degraded

BAM Credit Summary Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00054865/BAAS18156/25/00054868	99 TAIT STREET CROOKWELL	28/10/2024
Assessor Name	Report Created	BAM Data version *
Alex FRASER	07/02/2025	Current classification (live - default) (80)
Assessor Number	BAM Case Status	Date Finalised
BAAS18156	Finalised	07/02/2025
Assessment Revision	BOS entry trigger	Assessment Type
0	BOS Threshold: Area clearing threshold	Part 4 Developments (Small Area)

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

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

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

Goulburn Tableland Peppermint Grassy Forest												
1	3374_Poor	Not a TEC	24.4	24.4	0.47	PCT Cleared - 81%	Low Sensitivity to Gain			1.50		4
											Subtotal	**4**
											Total	**4**

Species credits for threatened species

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

BAM Predicted Species Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00054865/BAAS18156/25/00054868	99 TAIT STREET CROOKWELL	28/10/2024
Assessor Name	**Report Created**	**BAM Data version ***
Alex FRASER	07/02/2025	Current classification (live - default) (80)
Assessor Number	**Assessment Type**	**BAM Case Status**
BAAS18156	Part 4 Developments (Small Area)	Finalised
Assessment Revision	**BOS entry trigger**	**Date Finalised**
0	BOS Threshold: Area clearing threshold	07/02/2025

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

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

Common Name	Scientific Name	Vegetation Types(s)
Black Falcon	Falco subniger	3374-Goulburn Tableland Peppermint Grassy Forest
Black-chinned Honeyeater (eastern subspecies)	Melithreptus gularis gularis	3374-Goulburn Tableland Peppermint Grassy Forest
Brown Treecreeper (eastern subspecies)	Climacteris picumnus victoriae	3374-Goulburn Tableland Peppermint Grassy Forest
Diamond Firetail	Stagonopleura guttata	3374-Goulburn Tableland Peppermint Grassy Forest
Dusky Woodswallow	Artamus cyanopterus cyanopterus	3374-Goulburn Tableland Peppermint Grassy Forest
Flame Robin	Petroica phoenicea	3374-Goulburn Tableland Peppermint Grassy Forest
Gang-gang Cockatoo	Callocephalon fimbriatum	3374-Goulburn Tableland Peppermint Grassy Forest
Grey-headed Flying-fox	Pteropus poliocephalus	3374-Goulburn Tableland Peppermint Grassy Forest
Large Bent-winged Bat	Miniopterus orianae oceanensis	3374-Goulburn Tableland Peppermint Grassy Forest

Little Eagle	Hieraaetus morphnoides	3374-Goulburn Tableland Peppermint Grassy Forest
Little Lorikeet	Glossopsitta pusilla	3374-Goulburn Tableland Peppermint Grassy Forest
Painted Honeyeater	Grantiella picta	3374-Goulburn Tableland Peppermint Grassy Forest
Rosenberg's Goanna	Varanus rosenbergi	3374-Goulburn Tableland Peppermint Grassy Forest
Scarlet Robin	Petroica boodang	3374-Goulburn Tableland Peppermint Grassy Forest
South-eastern Glossy Black-Cockatoo	Calyptorhynchus lathami lathami	3374-Goulburn Tableland Peppermint Grassy Forest
South-eastern Hooded Robin	Melanodryas cucullata cucullata	3374-Goulburn Tableland Peppermint Grassy Forest
Southern Whiteface	Aphelocephala leucopsis	3374-Goulburn Tableland Peppermint Grassy Forest
Speckled Warbler	Chthonicola sagittata	3374-Goulburn Tableland Peppermint Grassy Forest
Spotted Harrier	Circus assimilis	3374-Goulburn Tableland Peppermint Grassy Forest
Spotted-tailed Quoll	Dasyurus maculatus	3374-Goulburn Tableland Peppermint Grassy Forest
Varied Sittella	Daphoenositta chrysoptera	3374-Goulburn Tableland Peppermint Grassy Forest
White-bellied Sea-Eagle	Haliaeetus leucogaster	3374-Goulburn Tableland Peppermint Grassy Forest
White-throated Needletail	Hirundapus caudacutus	3374-Goulburn Tableland Peppermint Grassy Forest
Yellow-bellied Sheathtail-bat	Saccolaimus flaviventris	3374-Goulburn Tableland Peppermint Grassy Forest

Threatened species Manually Added

None added

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

Refer to BAR for detailed justification

Common Name	Scientific Name	Justification in the BAM-C

BAM Vegetation Zones Report

Proposal Details

Assessment Id
00054865/BAAS18156/25/00054868

Assessment name
99 TAIT STREET CROOKWELL

BAM data last updated *
28/10/2024

Assessor Name
Alex FRASER

Report Created
07/02/2025

BAM Data version *
Current classification (live - default) (80)

Assessor Number
BAAS18156

Assessment Type
Part 4 Developments (Small Area)

BAM Case Status
Finalised

Assessment Revision
0

BOS entry trigger
BOS Threshold: Area clearing threshold

Date Finalised
07/02/2025

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

Vegetation Zones

#	Name	PCT	Condition	Area	Minimum number of plots	Management zones
1	3374_Poor	3374-Goulburn Tableland Peppermint Grassy Forest	Poor	0.47	1	