Biodiversity Assessment Report

56 Hilldowns Road, Kalkite

John Sacco Enterprise Pty Ltd

8 April 2022

Final

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The preparation of this report has been in accordance with the brief provided by the Client and has relied upon the data and results collected at or under the times and conditions specified in the report. All findings, conclusions or commendations contained within the report are based only on the aforementioned circumstances. The report has been prepared for use by the Client and no responsibility for its use by other parties is accepted by Cumberland Ecology.

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Glossary

Term/Abbreviation	Definition
AOBV	Area of Outstanding Biodiversity Value
APZ	Asset Protection Zone
BAM	Biodiversity Assessment Method 2020
BAM-C	Biodiversity Assessment Method Calculator
BC Act	NSW Biodiversity Conservation Act 2016
BC Regulation	NSW Biodiversity Conservation Regulation 2017
Biosecurity Act	NSW Biosecurity Act 2015
BOS	Biodiversity Offsets Scheme
CEEC	Critically Endangered Ecological Community
DA	Development Application
DAWE	Commonwealth Department of Agriculture, Water and the Environment
DBH	Diameter at Breast Height
DPE	NSW Department of Planning and Environment
EEC	Endangered Ecological Community
EP&A Act	NSW Environmental Planning and Assessment Act 1979
EPBC Act	Commonwealth Environment Protection and Biodiversity Conservation Act 1999
GPS	Global Positioning System
ha	Hectare
IBRA	Interim Biogeographic Regionalisation for Australia
KAR	Koala Assessment Report
km	Kilometre
KPoM	Koala Plan of Management
LGA	Local Government Area
MNES	Matters of National Environmental Significance
NRAR	Natural Resources Access Regulator
NSW	New South Wales
OEH	NSW Office of Environment and Heritage
OWRC	Other Weed of Regional Concern
PCT	Plant Community Type
RMS	Random Meander Survey
SAII	Serious and Irreversible Impact
SEPP	State Environmental Planning Policy
SRDCP	Snowy River Development Control Plan 2013

Term/Abbreviation	Definition
SRLEP	Snowy River Local Environmental Plan
Subject site	56 Hilldowns Road, Kalkite (Lot 5 DP529579 and Lot 190 DP756727) (**Figure1**)
TBDC	Threatened Biodiversity Data Collection
TEC	Threatened Ecological Community
The client	Sacco Enterprise
the project	Rezoning and subdivision of the subject site
VRZ	Vegetated Riparian Zone
WM Act	NSW Water Management Act 2000
WoNS	Weed of National Significance

1. Introduction

1.1. Purpose

Cumberland Ecology has been commissioned by Gyde Consulting on behalf of Sacco Enterprise Pty Ltd (the client) to prepare a Biodiversity Assessment Report (BAR) to support a planning proposal for land located at 56 Hilldowns Road, Kalkite NSW (the 'subject site') which comprises Lot 5 DP529579 and Lot 190 DP756727 (see **Figure 1**). The planning proposal seeks to change the zoning of the subject site to facilitate future subdivision and development of the subject site. Further details of the project are provided in ***Section 1.3***.

The purpose of this report is to address the ecological considerations described in the NSW Department of Planning and Environment's (DPE) Guide to Preparing Planning Proposals by describing current biodiversity values of the subject site and providing a high level assessment of the potential impacts of the planning proposal on flora and fauna (DPIE 2018).This assessment considers the biodiversity values of the subject site to describe the potential impacts to biodiversity. Particular attention is focussed on threatened species, populations and communities that are listed under the New South Wales (NSW) *Biodiversity Conservation Act 2016* (BC Act) and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The specific objectives of this report are to:

- Describe the vegetation communities on the subject site;
- Describe fauna habitats and fauna usage of the subject site;
- Identify any threatened species, populations or ecological communities (as listed under the BC Act and/or EPBC Act) existing on the subject site;
- Assess the likelihood of occurrence of threatened species, populations or communities (as listed under the BC Act and/or EPBC Act) within the subject site;
- Describe potential future ecological assessment requirements that may apply at the Development Application (DA) stage;
- Provide a high level assessment of the potential impact of the likely future development on threatened communities, flora and fauna; and
- Where relevant, recommend mitigation measures to reduce the impacts of the planning proposal and subsequent development on biodiversity values.

1.2. Description of the Subject Site

The subject site is located at 56 Hilldowns Road, Kalkite NSW and comprises Lot 5 in DP529579 and Lot 190 in DP756727. The site is located wholly within the Snowy Monaro Local Government Area (LGA). The subject site is situated within the residential suburb of Kalkite, located approximately 8 km north of Jindabyne. The subject site currently zoned as RU1 – Primary Production under the *Snowy River Local Environment Plan 2013* (SRLEP) surrounded by vacant, largely vegetated lots to the north, east and south, and Lake Jindabyne immediately to the west. The subject site is split into three parts by a hairpin turn of Kalkite Road – Hilldowns Road also cutting through the western portion. The subject site contains native bushland largely confined to the central and

eastern portions that is part of a north-south running vegetated corridor. Exotic vegetation in the form of planted exotic trees around the dwelling is also present on the lower reaches of the subject site and along the road in the central areas of the subject site. The majority of the subject site contains exotic-dominated grassland.

The location of the subject site is shown on **Figure 1**.

1.3. Description of the Project

Gyde Consulting are acting on behalf of Jon Sacco Enterprise Pty Ltd for submission of a rezoning planning proposal to Snowy Monaro Council for the subject site. The planning proposal is for the rezoning of the subject site from areas on the western side of RU1 – Primary Production to areas of RU5, B1, RE1, SP2 and SP3 (**Figure 2**). It is anticipated that the rezoning and subsequent subdivision will yield approximately 214 lots ranging from 600 m^2 to over 84 ha.

1.4. Relevant Legislation

1.4.1. Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*

Under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), any action (which includes a development, project or activity) that is considered likely to have a significant impact on Matters of National Environmental Significance (MNES) (including nationally threatened ecological communities and species and listed migratory species) must be referred to the Commonwealth Minister for the Environment. The purpose of the referral is to allow a decision to be made about whether an action requires approval on a Commonwealth level. If an action is considered likely to have a significant impact on MNES, it is declared a "controlled action" and Commonwealth approval is required.

As the subject site does not contain threatened entities listed under the EBPC Act, it is unlikely that a referral to the Commonwealth will be required to accompany future DAs.

1.4.2. NSW *Environmental Planning and Assessment Act 1979*

The NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) is the overarching planning legislation in NSW that provides for the creation of planning instruments that guide land use. The EP&A Act also provides for the protection of the environment, including the protection and conservation of native fauna and flora species. This includes threatened species, populations and ecological communities, and their habitats, as listed under the BC Act and NSW *Fisheries Management Act 1994*.

1.4.3. NSW *Biodiversity Conservation Act 2016*

The BC Act is the key piece of legislation in NSW relating to the protection and management of biodiversity and threatened species. The purpose of the BC Act is to maintain a healthy, productive and resilient environment for the greatest well-being of the community, now and into the future, consistent with the principles of ecologically sustainable development. The BC Act is supported by regulations, including the *Biodiversity Conservation Regulation 2019* (BC Regulation).

The BC Act introduced the Biodiversity Offsets Scheme (BOS) as a means for assessing biodiversity impacts. The BOS is intended to simplify biodiversity assessment and improve biodiversity outcomes by creating consistent assessment requirements to measure the likely biodiversity loss of development proposals and gains in biodiversity value achieved at offset sites through active management.

The BOS applies to local development (assessed under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act)) that is likely to significantly affect threatened species. A significant affect may occur as follows:

- It is likely to significantly affect threatened species or ecological communities, or their habitats, according to the test of significance in Section 7.3 of the BC Act;
- It exceeds the biodiversity offsets scheme threshold according to Clause 7.1 of the BC Regulation, with the thresholds being:
    - The clearing of native vegetation of an area above a prescribed threshold based on the minimum lot size; or
    - The clearing of native vegetation, or other prescribed action, on land included on the Biodiversity Values Map.
- It is carried out in a declared area of outstanding biodiversity value (AOBV).

If a project triggers one of the above thresholds, assessment according to the BOS is required, which involves the preparation of a Biodiversity Assessment Development Report (BDAR) in accordance with the Biodiversity Assessment Method (BAM). A preliminary assessment of the project against these thresholds is provided in ***Section 4.4.2.1***.

1.4.4. NSW *Water Management Act 2000*

The objectives of the *Water Management Act 2000* (WM Act) are to provide for the sustainable and integrated management of the water systems of NSW and to protect, enhance and restore water sources, associated ecosystems and ecological processes. The WM Act provides clear arrangements for controlling land-based activities that affect the quality and quantity of the state's water resources. The subject site contains two mapped 1st order watercourses in the central and western portions. Lake Jindabyne, located adjacent to the western boundary of the subject site is also a mapped watercourse to which the WM Act applies.

1.4.5. State Environmental Planning Policy (Koala Habitat Protection) 2020

State Environmental Planning Policy (Koala Habitat Protection) 2020 (Koala SEPP 2020) applies to the Snowy Monaro LGA as of 17 March 2021. Although Koala SEPP 2020 has been replaced by *State Environmental Planning Policy (Koala Habitat Protection) 2021* (Koala SEPP 2021), as the subject site is currently zoned as RU1 the Koala SEPP 2021 states that the Koala SEPP 2020 applies to the subject site.

Should the Planning Proposal for the subject site be approved resulting in rezoning, Koala SEPP 2021 will apply to future DAs.

1.4.6. Snowy Monaro Regional Council Provisions

For the preparation of this report, relevant plans and guidelines for the Snowy Monaro LGA have also been reviewed. These include local provisions with specific details included in the sections below.

1.4.6.1. Terrestrial Biodiversity Mapping

The subject site contains areas included on the Terrestrial Biodiversity map of the SRLEP. These areas are likely associated with the mapped native vegetation in the central and eastern portions of the subject site. The objective of this clause is to protect native flora and fauna, and their habitats, and for the protection and conservation of the ecological processes necessary for their continued existence.

1.4.6.2. Riparian Land and Watercourses

The subject site contains areas included on the Riparian Land and Watercourse map of the SRLEP. These mapped areas are likely associated with the riparian corridor of Lake Jindabyne and the mapped 1st order watercourses in the central and western portions of the subject site. The objective of this clause is to maintain:

- Water quality within watercourses;
- The stability of the bed and banks of watercourses;
- Aquatic and riparian habitats; and
- Ecological processes within watercourses and riparian areas.

1.4.6.3. Wetlands

The subject site is in close proximity to areas included on the Wetlands map of the SRLEP. These mapped areas are associated with Lake Jindabyne adjacent the subject site. The objective of this clause is to ensure that wetlands are preserved and protected from the impacts of development. According to the SRLEP, proposed development must be design so as to not have adverse effect on the following:

- The condition and significance of the existing native fauna and flora on the land;
- The provision and quality of habitats on the land for indigenous and migratory species; and
- The surface and groundwater characteristics of the land, including water quality, natural water flows and salinity.

1.4.6.4. Snowy River Development Control Plan 2013

The Snowy River Development Control Plan 2013 (SRDCP) together with the SRLEP is the primary environmental planning instrument applying to the subject site (Snowy River Council 2013). The key objective of the SRDCP is to provide controls for all development to encourage environmental sustainability and biodiversity. The SRDCP also provides controls to reflect best practice in landscaping, tree preservation, recycling and waste management and water management.

2. Methodology

2.1. Desktop Assessment

2.1.1. Database Analysis

Database analysis was conducted for the locality using the BioNet Atlas (EES 2022a) and the EPBC Protected Matters Search Tool (DAWE 2022). The locality is defined as the area within a 5 km radius of the subject site. The BioNet Atlas search facility was used to generate records of threatened flora and fauna species and populations listed under the BC Act and/or EPBC Act within the locality of the subject site. The abundance, distribution and age of records generated within the search areas provided supplementary information for the assessment of occurrence of those threatened species within the subject site. The Protected Matters Search Tool generated a list of potentially occurring EPBC Act listed entities within the locality.

The following databases and map tools were also interrogated to provide additional information on the biodiversity values associated with the subject site:

- BioNet Vegetation Classification database (EES 2022b);
- Existing vegetation mapping available from the Compilation of Biometric Vegetation Mapping prepared for the South East Local Land Services (EcoLogical Australia 2015);
- NSW BioNet Threatened Biodiversity Data Collection (EES 2022a); and
- Biodiversity Values Map and Threshold Tool.

2.1.2. Identification of Ecosystem and Species Credit Species

In addition to the BioNet Atlas search and using benchmark data for the surrounding landscape, the Biodiversity Assessment Method Calculator (BAM-C) was used to generate a list of threatened flora and fauna species for the subject site, known as ecosystem credit species and species credit species according to the Biodiversity Assessment Method (BAM). These ecosystem credit species and species credit species are indicative of the type of threatened flora and fauna that have the potential to occur within the subject site and which will require further assessment at the DA stage of future developments in the subject site.

2.2. Field Surveys

2.2.1. Flora Survey

A flora survey of the subject site was conducted on 3-5 November 2021 by a botanist and an ecologist from Cumberland Ecology. The flora survey consisted of the following:

- Three random meander surveys across the subject site to compile a species list and to map vegetation communities;
- Targeted searches for threatened flora species identified as being present within the locality and having the potential to be present in the subject site; and
- Taking photographs of vegetation to provide a visual documentation of Plant Community Types (PCTs) present and their condition.

The locations of flora surveys within the subject site are shown in **Figure 3**.

2.2.1.1. Vegetation Mapping

Previous vegetation mapping of the subject site prepared by the former Office of Environment and Heritage (OEH) and DPIE were reviewed prior to the survey in order to determine vegetation communities that could occur within the subject site (EcoLogical Australia 2015). The vegetation within the subject site was ground-truthed by Cumberland Ecology via three random meander surveys (RMS). RMS1 was conducted in the western portion of the subject site, RMS2 in the central portion and RMS3 in the eastern portion (see **Figure 3**). Flora species encountered during the random meander surveys were recorded to compile a species list for the subject site. Vegetation community boundaries were made using a hand-held Global Positioning System (GPS) and mark-up of aerial photographs. The data collected was analysed and the resultant information was synthesised using a Geographic Information System (GIS) to produce a vegetation map of the subject site.

Identification of the PCTs occurring within the subject site was guided by the findings of the flora survey. The data collected during surveys of the subject site was analysed in conjunction with a review of the PCTs held within the Bionet Vegetation Information System (VIS) Classification Database. Consideration was given to the occurrence of PCTs within the South Eastern Highlands Interim Biogeographic Regionalisation for Australia Bioregion (IBRA) and Monaro IBRA Sub-regions.

The location of the random meander surveys are shown on **Figure 3**.

2.2.1.2. Threatened Flora Surveys

During the flora surveys, a targeted search was undertaken for any threatened flora species known from the locality in conjunction with the random meander surveys described above. The survey tracks are shown in **Figure 3**.

2.2.2. Fauna Habitat Assessment

Fauna habitat assessments were conducted in the subject site by an ecologist between the 3-5 November 2021. The subject site was assessed for groundcover, shrub/understory cover, canopy cover and tree hollows, as well as other habitat features such as bush rock, fallen trees and signs of fauna use such as scats, scratches and scrapings.

The nature and extent of fauna habitats in the subject site were assessed and areas where fauna species could reside or forage were identified. This included consideration of important indicators of habitat condition and complexity including the occurrence of microhabitats such as tree hollows, fallen logs, bush rock and wetland areas such as creeks and soaks.

An assessment of the structural complexity of vegetation, the age structure of the vegetation and the nature and extent of human disturbance throughout the subject site was also undertaken and considered. Tree hollows were used as a general indication of habitat quality for arboreal fauna and hollow-dwelling birds and bats. Any hollows observed during surveys were recorded and the general vegetation condition and tree maturity was used to predict whether trees on site were likely to contain hollows.

During the habitat assessment, any fauna species seen or heard calling were recorded.

2.2.3. Survey Limitations

The subject site was easily accessible, and the random meander survey transects was conducted within the extent of native vegetation. The weather conditions at the time of the flora surveys were generally favourable for plant growth and production of features required for identification of most species. Shrubs, grasses, herbs and creepers were readily identifiable in most instances. Despite this, it is expected that not all flora species present within the subject site would have been recorded during surveys. However, it is probable that the vast majority of species, and all of the endemic, native species present at the time of the survey were recorded and it is considered that sufficient information has been collected to satisfactorily assess issues including conservation significance of the flora, condition and viability of bushland and likely impact on native vegetation. An assessment of the threatened species recorded within a 5 km radius of the subject site was undertaken to supplement the threatened flora survey.

No targeted fauna surveys were undertaken for this assessment, which relied on database analysis, fauna habitat assessment and incidental observations. In general, opportunistic observations of fauna provide a "snapshot" of some of the fauna present on site that was active during time of the surveys. The data produced by the surveys is intended to be indicative of the types of species that could occur and not an absolute census of all vertebrate fauna species occurring within the subject site. Therefore, not all fauna utilising the subject site are likely to have been recorded during surveys. However, database searches were undertaken to supplement the fauna surveys and the combination of these techniques is considered appropriate for assessing the habitat values of the site for threatened fauna within the subject site.

3. Results

3.1. Vegetation Communities

Existing vegetation mapping available from the Compilation of Biometric Vegetation Mapping indicates that Snow Gum – Mountain Gum Woodland, Snow Gum – Candle Gum Woodland and various native grassland communities are present on the subject site. A number of these communities are described as conforming to various threatened communities listed under the BC Act and/or EPBC Act. Surveys by Cumberland Ecology for this assessment refined the existing vegetation mapping of the subject site and identified the following vegetation communities:

- Snow Gum – Mountain Gum Open Forest;
- Snow Gum – Candle Bark Woodland;
- Snow Gum – Candle Bark Woodland (Grassland);
- Exotic Woody Vegetation; and
- Exotic Dominated Grassland.

The area of each of these communities present in the subject site are provided in **Table 1** and the distribution of these communities within the subject site is shown in **Figure 4.** Several dams and areas identified as Cleared Lands were also recorded within the subject site and are shown in **Table 1** and on **Figure 4**. Descriptions of each of the vegetation communities are provided below.

Table 1 Extent of vegetation communities within the subject site

Vegetation Community	PCT	BC Act Status	EPBC Act Status	Area
Snow Gum - Candle Bark Woodland	1191	CEEC	-	7.93
Snow Gum - Candle Bark Woodland (Grassland)	1191	-	-	3.81
Snow Gum - Mountain Gum Open Forest	1196	EEC	-	1.14
Exotic Woody Vegetation	-	-	-	0.20
Exotic Dominated Grassland	-	-	-	62.46
Cleared Land	-	-	-	0.60
Dam	-	-	-	0.03
Total				**76.17**

Key: CEEC = Critically Endangered Ecological Community, EEC = Endangered Ecological Community

3.1.1. Snow Gum - Candle Bark woodland on broad valley flats of the tablelands and slopes, South Eastern Highlands Bioregion

Plant Community Type: 1191

Vegetation Formation: Grassy Woodlands

Vegetation Class: Subalpine Woodlands

Percent Cleared Value: 95%

BC Act Status: Critically Endangered

EPBC Act Status: Not Listed

The Snow Gum - Candle Bark woodland is situated on the lower shallower slopes of the subject site. The onsite representation of this community is consistent with the general description in that it occurs as open woodland with grassland patches characterised by sparse tree cover (EES 2022b). Specifically, the canopy species present on site include *Eucalyptus pauciflora* (Snow Gum), *Eucalyptus rubida* subsp. *rubida* (Candlebark) with infrequent occurrences of *Eucalyptus dalrympleana* subsp. *dalrympleana* (Mountain Gum). The shrub layer was sparse though it included the native species *Dillwynia prostrata* (Matted Parrot-pea) and *Pimelea pauciflora*. The groundcover for the most part was exotic but in some areas it included the native grasses *Themeda triandra* (Kangaroo Grass), *Poa sieberiana* var. *sieberiana* (Snow Grass) and *Austrostipa scabra* subsp. *falcata*. The native forbs present include *Dichondra repens* (Kidney Weed), *Rumex brownii* (Swamp Dock), *Viola betonicifolia*, *Ajuga australis* (Austral Bugle), *Vittadinia muelleri, Geranium solanderi* (Native Geranium), *Asperula conferta* (Common Woodruff), *Acaena ovina* (Acaena) and *Crassula sieberiana* (Australian Stonecrop).

A photograph of this community within the subject site is shown as **Photograph 1.**

Photograph 1 Snow Gum – Candle Bark Woodland within the subject site

3.1.1.1. Alignment with Threatened Ecological Communities

Within the BioNet Vegetation Classification, this PCT is associated with two Threatened Ecological Communities (TEC), including Monaro Tableland Cool Temperate Grassy Woodland in the South Eastern Highlands Bioregion, and Werriwa Tablelands Cool Temperate Grassy Woodland in the South Eastern Highlands and South East Corner Bioregions, both of which are listed as CEECs under the BC Act but not under the EPBC Act. This vegetation community within the subject site has been assessed as conforming to the Monaro Tableland Cool Temperate Grassy Woodland in the South Eastern Highlands Bioregion TEC listing under the BC Act.

Monaro Tableland Cool Temperate Grassy Woodland in the South Eastern Highlands Bioregion occurs within the locality and the vegetation within the subject site closely conforms to the features identified in the final determination for the community (NSW Scientific Committee 2019). Floristic characters used to distinguish these areas were the prevalence of *Eucalyptus pauciflora* (Snow Gum) and *Eucalyptus rubida* sp. *rubida* (Candlebark), the generally sparse understorey of locally indigenous shrubs including *Acacia dealbata* (Silver Wattle) and *Pimelea pauciflora*, and occurrence of characteristic native grasses and forbs such as Themeda triandra (Kangaroo Grass), *Poa sieberiana* var. *sieberiana* (Snowgrass), *Hydrocotyle laxiflora* (Stinking Pennywort) and *Poa labillardierei* (Tussock). In addition, the subject site is located on the slopes and low rises of the undulating tablelands of the Southern Tablelands and falls within the characteristic elevation range of 700-1200 m above sea level, receives 600-800 mm of average annual rainfall and averages annual maximum temperatures of between 22.5 – 25.5°C, which are identifying parameters for the occurrence of this community as identified in the final determination (NSW Scientific Committee 2019).

This vegetation community was determined to be more in line with the TEC Monaro Tableland Cool Temperate Grassy Woodland in the South Eastern Highlands Bioregion rather than the TEC Werriwa Tablelands Cool Temperate Grassy Woodland in the South Eastern Highlands and South East Corner Bioregions due to the presence and abundance of diagnostic species, including *Poa labillardierei* (Tussock), *Ajuga australis* (Austral Bugle), *Geranium solanderi* (Native Geranium), *Hydrocotyle laxiflora* (Stinking Pennywort), *Viola betonicifolia* (Native Violet) and *Acacia dealbata* (Silver Wattle) (NSW Scientific Committee 2019).

3.1.2. Snow Gum - Candle Bark woodland on broad valley flats of the tablelands and slopes, South Eastern Highlands Bioregion (Grassland)

Plant Community Type: 1191

Vegetation Formation: Grassy Woodlands

Vegetation Class: Subalpine Woodlands

Percent Cleared Value: 95%

BC Act Status: Critically Endangered

EPBC Act Status: Not Listed

The community is likely to be derived from Snow Gum - Candle Bark woodland on broad valley flats of the tablelands and slopes, South Eastern Highlands Bioregion because the woodland can occur as secondary grassland where trees have been removed but the understorey composition remains largely intact. The

composition can be difficult to separate from natural temperate grassland, however landscape cues such as the presence of *Eucalyptus pauciflora* (Snow Gum) in a similar landscape position can be used as a guide (EES 2022b). Due to this uncertainty, it is difficult to provide definitive conservation status. Nonetheless, this community best conforms to PCT 1191 as described in ***Section 3.1.1***.

Snow Gum – Candle Gum Woodland (Grassland) is situated for the most part around the rocky outcrops present on site. The community includes the native grass species *Poa labillardierei* (Tussock), *Poa sieberiana* var. *sieberiana* (Snow Grass), *Austrostipa scabra* subsp. *falcata* and *Eragrostis benthamii*. The native forbs present include *Ajuga australis* (Austral Bugle), *Geranium solanderi* (Native Geranium), *Wahlenbergia multicaulis* (Tadgell's Bluebell), *Asperula conferta* (Common Woodruff) and *Acaena ovina* (Acaena). Other native species present include *Swainsona monticola*, *Oxalis exilis* and *Hardenbergia violacea* (False Sarsparilla).

A photograph of this community within the subject site is shown as **Photograph 2.**

Photograph 2 Snow Gum - Candlebark Woodland (Grassland) within the subject site

3.1.2.1. Alignment with Threatened Ecological Communities

Within the BioNet Vegetation Classification, this PCT is associated with two threatened ecological communities, including Monaro Tableland Cool Temperate Grassy Woodland in the South Eastern Highlands Bioregion, and Werriwa Tablelands Cool Temperate Grassy Woodland in the South Eastern Highlands and South East Corner Bioregions, both of which are listed CEECs under the BC Act but not the EPBC Act. This vegetation community within the subject site has been assessed as conforming to the Monaro Tableland Cool Temperate Grassy Woodland in the South Eastern Highlands Bioregion TEC listing under the BC Act.

Although no canopy or shrub layers were present, trees may be absent from this community as a consequence of tree removal under pastoral management and grazing by domestic stock and still conform to the TEC listing (NSW Scientific Committee 2019).

In common with the woodland form, this vegetation community was determined to be more in line with the TEC Monaro Tableland Cool Temperate Grassy Woodland in the South Eastern Highlands Bioregion rather than the TEC Werriwa Tablelands Cool Temperate Grassy Woodland in the South Eastern Highlands and South East Corner Bioregions due to the presence and abundance of diagnostic species, including *Poa labillardierei* (Tussock), *Ajuga australis* (Austral Bugle), *Geranium solanderi* (Native Geranium), *Hydrocotyle laxiflora* (Stinking Pennywort) and *Viola betonicifolia* (Native Violet).

3.1.3. Snow Gum - Mountain Gum shrubby open forest of montane areas, South Eastern Highlands Bioregion and Australian Alps Bioregion

Plant Community Type: 1196

Vegetation Formation: Grassy Woodlands

Vegetation Class: Subalpine Woodlands

Percent Cleared Value: 95%

BC Act Status: Endangered

EPBC Act Status: Not Listed

Snow Gum - Mountain Gum shrubby open forest is situated on the higher steeper slopes of the subject site. The onsite representation of this community is consistent with the general description in that it has an open canopy of eucalypts with sparse mid-story shrubs and understory shrubs and a dense groundcover of herbs and grasses (EES 2022b). Specifically, the canopy species present are dominated by *Eucalyptus pauciflora* (Snow Gum) with infrequent occurrences of *Eucalyptus dalrympleana* subsp. *dalrympleana* (Mountain Gum) and *Eucalyptus rubida* subsp. *rubida* (Candlebark). The shrub layer in places is diverse and includes the native species *Acacia dealbata* subsp. *subalpina* (Silver Wattle), *Acrothamnus maccraei*, *Bossiaea buxifolia*, *Dillwynia prostrata* (Matted Parrot-pea), *Leucopogon fraseri*, *Pimelea pauciflora*, *Cryptandra amara* (Bitter Cryptandra) and *Daviesia mimosoides* subsp. *mimosoides*. The groundcover for the most part was exotic but in some areas, it includes *Poa sieberiana* var. *sieberiana* (Snow Grass), *Euphrasia collina*, *Stellaria pungens* (Prickly Starwort), *Asplenium flabellifolium* (Necklace Fern), *Viola betonicifolia*, *Calotis scabiosifolia var. integrifolia* (Rough Burr Daisy), *Geranium solanderi* (Native Geranium), *Asperula conferta* (Common Woodruff), *Acaena ovina* (Acaena), *Vittadinia muelleri, Crassula sieberiana* (Australian Stonecrop) and *Cymbonotus lawsonianus* (Beard's Ear).

A photograph of this community within the subject site is shown as **Photograph 3.**

Photograph 3 Snow Gum - Mountain Gum Woodland within the subject site

3.1.3.1. Alignment with Threatened Ecological Communities

Within BioNet Vegetation Classification, this PCT is associated with Tableland Basalt Forest in the Sydney Basin and South Eastern Highlands Bioregions which is listed as an EEC under the BC Act but not the EPBC Act. This vegetation community within the subject site has been assessed as conforming to the Tableland Basalt Forest in the Sydney Basin and South Eastern Highlands Bioregions TEC listing under the BC Act.

Specifically, Tableland Basalt Forest in the Sydney Basin and South Eastern Highlands Bioregions occurs within the locality and the vegetation within the subject site closely conforms to the features identified in the final determination for the community (NSW Scientific Committee 2011). Floristic characters used to distinguish these areas were the prevalence of *Eucalyptus dalrympleana* subsp. *dalrympleana* (Mountain Gum) and *Eucalyptus pauciflora* (White Sally), the generally sparse understorey of locally indigenous shrubs, and occurrence of characteristic native grasses and forbs such as *Dichondra repens* (Kidney Weed), *Einadia nutans* (Climbing Saltbush), *Geranium solanderi* (Native Geranium), *Poa sieberiana* var. *sieberiana, Poa labillardierei* (Tussock) and *Stellaria pungens* (Prickly Starwort).

In addition, the subject site is located on undulating or hilly terrain in South Eastern Bioregion falls within the characteristic elevation range for this community of approximately 600-900 m above sea level and receives 750-1100 mm of average annual rainfall, as identified in the final determination for this TEC (NSW Scientific Committee 2011).

3.1.4. Exotic Woody Vegetation

Plant Community Type: N/A

Vegetation Formation: N/A

Vegetation Class: N/A

Percent Cleared Value: N/A

BC Act Status: Not listed

EPBC Act Status: Not listed

The Exotic Woody Vegetation community for the most part includes the planted exotic trees around the dwelling on the lower reaches of the subject site and along the road in the central areas of the subject site. The tree species present in this community include *Pinus* spp. (Pines), *Pyrus communis* (Pear) and *Populus nigra* (Lombardy Poplar). The understorey is Exotic Dominated Grassland (refer to ***Section 3.1.5***).

This community does not comprise a defined native vegetation unit and does not conform to a listing under the BC Act or EPBC Act.

A photograph of this community within the subject site is shown as **Photograph 4.**

Photograph 4 Exotic Woody Vegetation within the subject site

3.1.5. Exotic Dominated Grassland

Exotic Dominated Grassland on the subject site occurs in the form of pastureland that has been highly modified from the original vegetation over a number of generations of landowners. It is the dominant community on the subject site covering 62.46 ha. The exotic species present include *Lolium perenne* (Perennial Ryegrass), *Hordeum marinum* (Sea Barley Grass), *Bromus molliformis* (Soft Broome), *Trifolium arvense* var. *arvense* (Haresfoot Clover), *Trifolium campestre* (Hop Clover) and *Trifolium repens* (White Clover), *Aira caryophyllea* (Silver Hairgrass), *Cerastium vulgare* (Mouse-ear Chickweed), *Erodium cicutarium* (Common Crowfoot), *Hypericum perforatum* (St. Johns Wort), *Taraxacum officinale* (Dandelion) and *Verbascum virgatum* (Twiggy Mullein).

This community does not comprise a defined native vegetation unit and does not conform to a listing under the BC Act or EPBC Act.

A photograph of this community within the subject site is shown as **Photograph 5.**

Photograph 5 Exotic Dominated Grassland within the subject site

3.2. Flora

3.2.1. General Species

A total of 82 species were recorded within the subject site during field surveys, including 47 native species (57%) and 35 exotic species (43%). Of the native species recorded in subject site, the most frequently recorded plant family was Poaceae (eight species), followed by Fabaceae and Asteraceae (six species) families. Of the

exotic species recorded in the subject site, the most frequently recorded plant family was Poaceae (10 species), followed by Fabaceae and Asteraceae (five species). A total species list for the subject site is provided in **Appendix A**.

3.2.2. Significant Weeds

The subject site contains a small number of significant weeds with one exotic species listed as a regional priority weed under the South East Regional Strategic Weed Management Plan 2017 – 2022 (LLS (South East) 2017) under the NSW *Biosecurity Act 2015 (Local Land Services 2019)* as well as three species listed as high threat weeds in accordance with the BAM. Significant weeds that are present within the subject site are shown in **Table 2**.

Table 2 Significant weeds within the subject site

Family	Scientific Name	Common Name	High Threat Weed	Biosecurity Act Status	WoNS
Asteraceae	*Arctotheca calendula*	Capeweed	-	-	-
Asteraceae	*Hypochaeris radicata*	Catsear	-	-	-
Asteraceae	*Onopordum acanthium*	Scotch Thistle	-	-	-
Asteraceae	*Sonchus asper*	Prickly Sowthistle	-	-	-
Asteraceae	*Taraxacum officinale*	Dandelion	-	-	-
Brassicaceae	*Brassica* spp.	Brassica	-	-	-
Brassicaceae	*Capsella bursapastoris*	Shepherd's Purse	-	-	-
Caryophyllaceae	*Cerastium vulgare*	Mouse-ear Chickweed	-	-	-
Caryophyllaceae	*Petrorhagia dubia*	-	-	-	-
Caryophyllaceae	*Spergularia rubra*	Sandspurry	-	-	-
Clusiaceae	*Hypericum perforatum*	St. Johns Wort	Yes	RP	-
Fabaceae (Faboideae)	*Medicago polymorpha*	Burr Medic	-	-	-
Fabaceae (Faboideae)	*Trifolium arvense* var. *arvense*	Haresfoot Clover	-	-	-
Fabaceae (Faboideae)	*Trifolium campestre*	Hop Clover	-	-	-
Fabaceae (Faboideae)	*Trifolium pratense*	Red Clover	-	-	-
Fabaceae (Faboideae)	*Trifolium repens*	White Clover	-	-	-
Geraniaceae	*Erodium cicutarium*	Common Crowfoot	-	-	-
Malaceae	*Cydonia oblonga*	Quince	-	-	-

Family	Scientific Name	Common Name	High Threat Weed	Biosecurity Act Status	WoNS
Malvaceae	*Malva neglecta*	Dwarf Mallow	-	-	-
Oxalidaceae	*Malva neglecta*	Creeping Oxalis	-	-	-
Plantaginaceae	*Plantago lanceolata*	Lamb's Tongues	-	-	-
Poaceae	*Aira caryophyllea*	Silvery Hairgrass	-	-	-
Poaceae	*Anthoxanthum odoratum*	Sweet Vernal Grass	-	-	-
Poaceae	*Avena barbata*	Bearded Oats	-	-	-
Poaceae	*Bromus catharticus*	Praire Grass	-	-	-
Poaceae	*Bromus hordeaceus*	Soft Brome	-	-	-
Poaceae	*Bromus molliformis*	Soft Brome	-	-	-
Poaceae	*Festuca rubra*	Red Fescue	-	-	-
Poaceae	*Hordeum marinum*	Sea Barley Grass	-	-	-
Poaceae	*Lolium perenne*	Perennial Ryegrass	-	-	-
Poaceae	*Poa annua*	Winter Grass	-	-	-
Polygonaceae	*Acetosella vulgaris*	Sheep Sorrel	Yes	-	-
Rosaceae	*Rosa rubiginosa*	Sweet Briar	Yes	-	-
Salicaceae	*Populus nigra*	Lombardy Poplar	-	-	-
Scrophulariaceae	*Verbascum virgatum*	Twiggy Mullein	-	-	-

Key: RP = Regional Priority, WoNS = Weed of National Significance

3.3. Fauna

3.3.1. General Species

Twenty-four (24) vertebrate fauna species have been recorded from the subject site during surveys, including 23 native and one exotic species (the European Rabbit). A fauna species list for the subject site is provided in **Table 3**.

Table 3 Fauna species list

Family	Scientific Name	Common Name
Acanthizidae	*Acanthiza nana*	Yellow Thornbill
Acanthizidae	*Acanthiza pusilla*	Brown Thornbill
Acanthizidae	*Sericornis frontalis*	White-browed Scrubwren
Alcedinidae	*Dacelo novaeguineae*	Laughing Kookaburra
Artamidae	*Cracticus torquatus*	Grey Butcherbird
Artamidae	*Gymnorhina tibicen*	Australian Magpie

Family	Scientific Name	Common Name
Artamidae	*Strepera graculina*	Pied Currawong
Cacatuidae	*Cacatua galerita*	Sulphur-crested Cockatoo
Cacatuidae	*Cacatua sanguinea*	Little Corella
Cacatuidae	*Eolophus roseicapilla*	Galah
Campephagidae	*Coracina novaehollandiae*	Black-faced Cuckoo-shrike
Corvidae	*Corvus coronoides*	Australian Raven
Hirundinidae	*Hirundo neoxena*	Welcome Swallow
Leporidae	*Oryctolagus cuniculus*	European Rabbit
Macropodidae	*Macropus giganteus*	Eastern Grey Kangaroo
Meliphagidae	*Meliphaga lewinii*	Lewin's Honeyeater
Motacillidae	*Anthus novaeseelandiae*	Australasian Pipit
Oriolidae	*Oriolus sagittatus*	Olive-backed Oriole
Pachycephalidae	*Pachycephala rufiventris*	Rufous Whistler
Pardalotidae	*Pardalotus punctatus*	Spotted Pardalote
Psittaculidae	*Platycercus elegans*	Crimson Rosella
Rhipiduridae	*Rhipidura albiscapa*	Grey Fantail
Rhipiduridae	*Rhipidura leucophrys*	Willie wagtail
Sturnidae	*Sturnus vulgaris*	Common Starling

3.3.2. Fauna Habitat

The majority of the subject site is comprised of exotic-dominated grassland which has limited value for native fauna. However, this vegetation community contains rocky escarpments which offer potential habitat for native species. The areas of Snow Gum - Candle Bark woodland and Snow Gum - Mountain Gum shrubby open forest contain logs, nests and hollow-bearing trees which are likely utilised by native species. This vegetation may provide habitat in the form of hollows, and fruits and nectar for foraging for threatened species. The existing dwellings within the subject land are inhabited and well-maintained however sheds are present which may provide potential habitat for microchiropteran bats and native birds.

Habitat features recorded within the subject land include the following:

- Tree hollows – providing roosting and shelter for birds, arboreal mammals and microchiropteran bats. These are found throughout the wooded vegetation within the subject site;
- Rock piles/rocky escarpment – providing shelter for reptiles, amphibians and small mammals. These are scattered throughout both the native and exotic-dominated grassland within the subject site;
- Rubbish pile – providing shelter for reptiles and small mammals. These occur within the subject site in the form of a tyre pile and old abandoned car;

- Log/log piles – providing shelter for reptiles, small mammals and amphibians. Logs are scattered throughout the wooded vegetation within the subject site;
- Roof cavities - providing potential roosting habitat for microchiropteran bats and native birds. These are confined to the sheds within the subject site;
- Dams – providing shelter for amphibians and reptiles. Two dams are present in the central northern portion of the subject site;
- Nests – providing breeding habitat for native birds. Nests are scattered throughout the wooded native vegetation and in the abandoned car within the subject site; and
- Nectar-producing trees - foraging habitat for insects, blossom-dependant birds, arboreal mammals and megachiropteran bats (flying-foxes). These are found in the wooded native vegetation within the subject site.

3.4. Threatened Species

No threatened flora or fauna species were recorded during these surveys. However, the BAM-C was used to generate a list of potentially occurring species which will require further assessment at the DA stage of future developments. The following criteria have been utilised in the BAM-C to predict the threatened species requiring further assessment:

- IBRA subregion: South Eastern Highlands;
- Associated PCTs: 1191 and 1196;
- Percent native vegetation cover in the assessment area: 100%;
- Patch size / class: 101 ha; and
- Credit type: Ecosystem and/or species.

Based on the above variables, the BAM-C generated a list of 14 ecosystem credit species and 16 species credit species. These totals include five dual credit species, which are considered as ecosystem credit species for their foraging habitat and as species credit species for their breeding/important habitat. Ecosystem credit species and species credit species are assessed further in ***Section 3.4.1*** and ***Section 3.4.2***, respectively.

3.4.1. Ecosystem Credit Species

Table 4 lists the predicted ecosystem credit species generated by the BAM-C for the native vegetation zones within the subject site. Note that the exact number of species retained for assessment following consideration of habitat constraints, geographic limitations, vagrancy and quality of microhabitat will be determined at the DA stage of future developments.

Table 4 Ecosystem credit species generated for the subject site

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Sensitivity to Gain Class	Relevant PCT / Vegetation Zone	Retained in Assessment?
Artamus cyanopterus	Dusky Woodswallow	V	Not listed	Moderate	1191 (Woodland)	Yes
					1191 (Grassland)	
					1196	
Callocephalon fimbriatum	Gang-gang Cockatoo	V	Not listed	Moderate	1191 (Woodland)	Yes
					1191 (Grassland)	
					1196	
Daphoenositta chrysoptera	Varied Sittella	V	Not listed	Moderate	1191 (Woodland)	Yes
					1191 (Grassland)	
					1196	
Dasyurus maculatus	Spotted-tailed Quoll	V	E	High	1191 (Woodland)	Yes
					1191 (Grassland)	
					1196	
Falsistrellus tasmaniensis	Eastern False Pipistrelle	V	Not listed	High	1191 (Woodland)	Yes
					1191 (Grassland)	
					1196	
Haliaeetus leucogaster	White-bellied Sea-Eagle	V	Not listed	High	1191 (Woodland)	Yes
					1191 (Grassland)	
					1196	
Hieraaetus morphnoides	Little Eagle	V	Not listed	Moderate	1191 (Woodland)	Yes

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Sensitivity to Gain Class	Relevant PCT / Vegetation Zone	Retained in Assessment?
					1191 (Grassland)	
					1196	
Hirundapus caudacutus	White-throated Needletail	Not listed	V	High	1191 (Woodland)	Yes
					1191 (Grassland)	
					1196	
Miniopterus orianae oceanensis	Large Bent-winged Bat	V	Not listed	High	1191 (Woodland)	Yes
					1191 (Grassland)	
					1196	
Petaurus volans	Yellow-bellied Glider	V	Not listed	High	1191 (Woodland)	Yes
					1191 (Grassland)	
					1196	
Petroica boodang	Scarlet Robin	V	Not listed	Moderate	1191 (Woodland)	Yes
					1191 (Grassland)	
					1196	
Petroica phoenicea	Flame Robin	V	Not listed	Moderate	1191 (Woodland)	Yes
					1191 (Grassland)	
					1196	
Phascolarctos cinereus	Koala	V	V	High	1191 (Woodland)	Yes
					1191 (Grassland)	
					1196	

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Sensitivity to Gain Class	Relevant PCT / Vegetation Zone	Retained in Assessment?
Varanus rosenbergi	Rosenberg's Goanna	V	Not listed	High	1191 (Woodland) 1191 (Grassland) 1196	Yes

3.4.2. Species Credit Species

Table 5 lists the flora and fauna species credit species generated by the BAM-C as predicted to occur within the native vegetation zones within the subject site. Note that under Section 5.2.3 of the BAM, species credit species can be excluded from further assessment if an assessment of habitat constraints and microhabitats determines that the habitat within the subject land is substantially degraded such that the species credit species is unlikely to occur. This assessment will be conducted at the DA stage of future developments. For the purpose of this report, all species have been retained.

Table 5 Species credit species predicted for the subject site

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Relevant PCT	Sensitivity to Gain Class	Retained in Assessment?
Flora						
Calotis glandulosa	Mauve Burr-daisy	V	V	1191, 1196	Moderate	Yes
Eucalyptus aggregata	Black Gum	V	V	1191, 1196	High	Yes
Leucochrysum albicans var. tricolor	Hoary Sunray	-	E	1191, 1196	Moderate	Yes
Monotoca rotundifolia	Trailing Monotoca	E	-	1191, 1196	High	Yes
Thesium australe	Austral Toadflax	V	V	1191, 1196	Moderate	Yes
Fauna						
Callocephalon fimbriatum	Gang-gang Cockatoo (Breeding)	V	-	1191, 1196	Moderate	Yes
Haliaeetus leucogaster	White-bellied Sea-Eagle (Breeding)	V	-	1191, 1196	High	Yes
Hieraatus morphnoides	Little Eagle (Breeding)	V	-	1191, 1196	Moderate	Yes
Litoria verreauxii alpina	Alpine Tree Frog	E	V	1191, 1196	High	Yes
Miniopterus orianae oceanensis	Large Bent-winged Bat (Breeding)	V	-	1191, 1196	Very High	Yes
Petauroides volans	Greater Glider	-	V	1191, 1196	High	Yes
Petroica rodinogaster	Pink Robin	V	-	1191, 1196	High	Yes
Phascolarctos cinereus	Koala (Breeding)	V	V	1191, 1196	High	Yes
Pseudomys fumeus	Smoky Mouse	CE	E	1191, 1196	High	Yes
Pseudophryne corroboree	Southern Corroboree Frog	CE	CE	1191, 1196	Very High	Yes

3.5. Biodiversity Values Map

The subject site currently has areas mapped on the Biodiversity Values Map as of 29 March 2022. These areas comprise approximately 1.86 haha of the subject site and occurs in on the eastern side of the subject site corresponding roughly to a patch woodland (see **Figure 5**). Future impacts to these areas will automatically trigger entry into the BOS and require offsetting under the BAM (see ***Section 4.4.2***) As the Biodiversity Values Map is subject to regular updates, it would need to be consulted during the DA process.

4. Discussion

4.1. Potential Ecological Impacts

This chapter considers the potential ecological impacts of potential future development on the biodiversity values within the subject site. Although no vegetation removal or other ecological impacts are proposed as part of this rezoning application, the ecological impacts of future development will likely involve the direct disturbance of vegetation and associated habitat loss as well as indirect impacts. The exact impacts are unknown at this stage and will need to be assessed at the DA stage for future development of the subject site. Accordingly, this section provides a relatively high-level discussion of likely future impacts only.

4.1.1. Direct impacts

The direct impacts of future developments will likely include the clearing of vegetation and removal of associated habitat to allow for the construction of residential dwellings, associated bushfire Asset Protection Zones (APZs) and a powerline easement. Under the current indicative layout plan (see **Figure 2**), it is unlikely that this will require the entire removal of vegetation within the subject site, and it anticipated that areas of native vegetation will be retained. The extent of impacts of future developments is unknown at this stage and will need to be further assessed in a relevant biodiversity impact assessment report which will accompany future DAs for the subject site.

4.1.1.1. Potential Vegetation Removal

It is expected that earthworks and construction of new dwellings will be required following the approval of the planning proposal. This will likely result in localised soil disturbance, and the removal of vegetation and associated habitat within the subject site. However, the extent of vegetation removal will need to be assessed at the DA stage for future developments, once exact impact footprints are known.

4.1.1.2. Fauna Habitat Removal

Future developments will likely require the removal of nectar-producing trees and shrubs, hollow-bearing trees and logs which may constitute foraging, roosting and breeding habitat for native birds, arboreal mammals, microchiropteran bats and megachiropteran bats (flying-foxes). Future developments may result in the removal of habitat features currently present within the subject site. However, the extent of fauna habitat removal will need to be assessed at the DA stage for future developments, once exact impact footprints are known.

4.1.1.3. Koala Habitat Removal

The subject site does not contain Koala feed tree species listed under Schedule 2 of Koala SEPP 2020, however it does contain Koala feed tree species listed in Schedule 2 of Koala SEPP 2021, including *Eucalyptus dalrympleana* (Mountain Gum), *Eucalyptus rubida* (Candlebark) and *Eucalyptus pauciflora* (Snow Gum). As outlined previously, the Koala SEPP 2020 currently applies to the subject site, however future development will be assessed under the Koala SEPP 2021. Future development may result in some removal of Koala tree species listed under the Koala SEPP 2021. However, the extent of Koala habitat removal will need to be assessed at the DA stage for future developments, once exact impact footprints are known.

4.1.1.4. Impact to Riparian Land and Mapped Watercourses

The subject site contains two unnamed mapped 1st order watercourses in the central and western portions. Riparian corridors consist of the following components (DPI 2018):

- The channel which comprises the bed and banks of the watercourse (to the highest bank); and
- The vegetated riparian zone (VRZ) adjoining the channel.

The width of the VRZ is required to be measured from the top of the highest bank on both sides of the watercourse (DPI 2018). As a 1st order stream, the VRZ buffer is required to be 10 m either side of the top of the bank of the unnamed watercourses. Although located outside of the subject site, Lake Jindabyne is classed as a 3rd order watercourse and therefore requires a VRZ buffer of 30 m from the bank. The exact impact to each mapped watercourse and its associated VRZs will need to be assessed at the DA stage for future developments, once exact impact footprints are known.

4.1.2. Indirect Impacts

The indirect impacts of the future development are anticipated to occur throughout and immediately adjacent to the subject site.

4.1.2.1. Edge Effects

Edge effects are impacts that occur at the interface between natural habitats, especially forests and disturbed or developed land (Yahner 1988). When an edge is created between woodland and a cleared area, changes to ecological processes within the vegetation can extend between 10 m and 100 m from the edge (Yahner 1988). These include microclimatic changes in light, temperature, humidity and wind, which can favour a suite of different species and therefore cause significant changes to the ecology of the patch (Lindenmayer and Fischer 2006). Edge effects can also result from the increase in noise and artificial light from a project.

4.1.2.2. Construction Impacts

A number of indirect impacts relevant to the construction phase of the future development have the potential to impact the remaining ecological values of the subject site, such as those relating to dust, noise, light and erosion. These are considered below.

i. Noise

Noise can affect animal physiology and behaviour, and if it becomes an ongoing stress, it can be injurious to an animal's energy budget, reproductive success and long-term survival. There are other potential impacts that include habitat loss through avoidance, reduced reproductive success and a retreat away from favourable habitats (AMEC 2005).

It is likely that most animal species will habituate to the periodic noise disturbance (AMEC 2005), and the construction phases of future development are likely to cause only temporary disturbance only to occurring fauna. It is unlikely that noise levels will have a significant, long-term, impact on any wildlife populations.

ii. Dust

Future construction activities have the ability to generate dust, which may result in negative consequences on the ecological values of the subject site. Dust pollution can lead to a decrease in habitat quality which has the potential to extend the area of impact beyond the direct footprint of future developments. With regard to the habitats within the subject site, dust generated by future developments may impact native woody vegetation, resulting in the loss of health of retained individuals, as well as individuals directly surrounding the subject site.

While future development will have some effect on the surrounding environment, the impacts from dust are likely to be minimal and restricted to the construction phase. Any minimal increase in dust levels is expected to be localised to the subject site and immediate surrounds, and due to its temporary nature, is unlikely to have significant, long-term impact on existing biodiversity.

iii. Light

Future development has the potential to increase the level of artificial light in the natural environment. Increased light levels may adversely impact wildlife by direct glare, chronic or periodic increased illumination and temporary unexpected fluctuations in light levels (Saleh 2007, Longcore and Rich 2010).

While future development will have some effect on the surrounding environment, the impacts from light pollution are likely to be minimal. Any minimal increase in light levels is expected to be localised to the subject site and immediate surrounds. Light pollution from the future developments is unlikely to have a significant or long-term impact on any fauna species as it is expected that local species will become habituated to the increased light levels.

iv. Sedimentation and Erosion

During the construction phase of the future development, the retained vegetation has potential to be impacted by sedimentation and erosion. Cutting and filling of the subject site for foundations is likely to increase potential erosion. Eroded sediment can smother retained vegetation if appropriate control measures are not implemented. Smothering can reduce regeneration of groundcover species and enter drainage lines. Sediment and eroded material can also contain weed matter and nutrients, and movement of this material into the retained vegetation can facilitate the spread of weeds. Increased weed invasion can result in changes to community composition. With the implementation of appropriate sediment control methods, the risk of sedimentation is considered to be minor and manageable.

4.2. Avoidance and Minimisation

4.2.1. Project Considerations for Avoidance

There are a range of measures that should be considered to avoid and minimise impacts on biodiversity values from future development of the subject site. Some of the key considerations made when designing the proposed rezoning layout to minimise ecological impacts are set out below:

4.2.1.1. Conservation Values of TECs

The subject site has a history of agricultural usage and much the original woodland vegetation has been either removed or modified throughout the site. Exotic-dominated grassland areas are highly weed invaded and so are likely to be extremely difficult to restore for conservation. This influenced the considerations for avoidance.

Monaro Tableland Cool Temperate Grassy Woodland in the South Eastern Highlands Bioregion and Tableland Basalt Forest in the Sydney Basin and South Eastern Highlands Bioregions are listed as a CEEC and as a EEC respectively under the BC Act. Accordingly, the occurrences of these TECs in the subject site are considered to be of high biodiversity value. These TECs have been drastically reduced in area and are highly fragmented due largely to clearance for cropping and pasture improvement.

When considering the conservation value of the occurrences of these TECs within the subject site, detailed consideration was given to the condition of the various forms each TEC on site. The highest value areas of the Monaro Tableland Cool Temperate Grassy Woodland in the South Eastern Highlands Bioregion TEC are considered to be the areas of woodland, and the grassland form is of lower conservation significance. Tableland Basalt Forest in the Sydney Basin and South Eastern Highlands Bioregions occurs only occurs in a wooded condition state and therefore, the entirety of this community in the subject site is considered to be of high biodiversity value. Therefore, for both communities the areas of woodland that occur within the subject site are considered to be of higher retention value.

The remainder of the Monaro Tableland Cool Temperate Grassy Woodland TEC in the subject site lacks canopy and is subject to influences of weed infestations by exotic grasses. These areas, although they conform to the final determination of the Monaro Tableland Cool Temperate Grassy Woodland CEEC, are of lesser conservation significance than the existing woodland patches based on the lack of canopy vegetation and limited fauna habitat value they provide. The remainder of the site comprises a mix of exotic woody vegetation, exotic dominated grassland and cleared lands that is generally considered to be of low biodiversity value.

Therefore, the rezoning layout has located the areas of lowest density within the patch of both TECs containing canopy trees that is of highest biodiversity so as to minimise potential future development impacts.

4.2.1.2. Zoning of the Land

The subject site is currently zoned RU1 – Primary Production. The objectives of the RU1 zoned land do not include conservation, as set out below:

- *To encourage sustainable primary industry production by maintaining and enhancing the natural resource base;*
- *To encourage diversity in primary industry enterprises and systems appropriate for the area;*
- *To minimise the fragmentation and alienation of resource lands;*
- *To minimise conflict between land uses within this zone and land uses within adjoining zones;*
- *To promote tourism, educational and recreational development and living opportunities that are compatible with agricultural activities and the environmental, historical and cultural values of the zone; and*

- *To ensure that development maintains and protects scenic values and rural landscape characteristics of the zone through compatible, small-scale development.*

Notwithstanding the objectives of the zone, consideration has been made to design a rezoning layout that maximises the retention of the areas with highest value TECs on site, which comprises the areas containing canopy trees, while still allowing for feasible, functional future developments appropriate to both current and future zoning.

4.2.1.3. No Go Option

The 'no go' option for the project would maintain current vegetation of the TECs on site but would not enable any management actions. Under a no-go option, the current areas of mapped Monaro Tableland Cool Temperate Grassy Woodland and Tableland Basalt Forest would remain and trees in the areas containing canopy would continue to grow and potentially develop habitat features such as hollows. The subject site will likely continue to be impacted by grazing cattle and the growth of the weed infestations would likely continue, suppressing the understorey of areas of regenerating Monaro Tableland Cool Temperate Grassy Woodland and Tableland Basalt Forest even further than current conditions. There would be no requirement for replanting or weed management. Therefore, over time, there is potential for the extent of the existing TECs areas to be reduced and for the native vegetation to continue to degrade via weed invasion, edge effects, etc.

4.2.1.4. Alternative Layouts

The client has undertaken extensive communication with Cumberland Ecology in designing the rezoning layout. As a consequence, the client has altered the design layout multiple times. In the original design layout, the entire subject site was proposed to contain small, high density lots which would have resulted in a greater impact to the areas of TECs in the eastern portion of the subject site. After consultation with Cumberland Ecology and other consultants, the proposed layout has been altered to include larger, low density lots in these ecologically sensitive areas, instead restricting the higher density lots to the western portion of the subject site which contains areas considered as containing lower biodiversity values in the form of grassland.

4.2.2. Avoidance Measures

4.2.2.1. Project Location and Design

Considering the factors outlined above, when determining the design of the final rezoning, the project designers have sought to avoid and minimise direct impacts on native vegetation and habitat by:

- Zoning of areas containing the most sensitive biodiversity values to RU1 to allow for maximum retention potential, namely in the central and western portions of the subject site;
- Amendments to the overall rezoning design to achieve an increased retention potential of TECs compared to earlier iterations of the rezoning layout;
- Implementation of a suite of mitigation measures as part of the project (**Sections 4.3**), to minimise the impacts on biodiversity, including:
    - Inductions;

- Access Restrictions;
- Erosion, Sedimentation and Pollution Control;
- Pre-clearance surveys and clearance supervision;
- Landscaping and Understory Replanting; and
- Weed Control Measures.

Considering the factors outlined above, when determining the location and design of the rezoning, the client has sought to avoid and minimise direct impacts on native vegetation and habitat by locating the proposed smaller, higher density lots in the western portion of the subject site containing areas of lowest biodiversity value (ie. Exotic-dominated Grassland), whilst locating the larger, lower density lots in the eastern portion of the subject site which contains the majority of the TECs, thereby minimising the potential impact of future development on areas of higher biodiversity values.

4.3. Mitigation Measures

As demonstrated in previous chapters, the subject site provides potential foraging, breeding or roosting habitat for threatened species. As a result, there will be a need to implement measures to minimise impacts to these entities. This section outlines proposed mitigation measures for the project. These measures will be described in further detail within the relevant biodiversity assessment at the DA stage.

4.3.1. Inductions

Site inductions should be given by the civil contractor to ensure all site workers and visitors are aware of ecological issues associated with the subject site and the location of any restricted access areas.

4.3.2. Access Restrictions

To avoid unnecessary removal or damage to vegetation to be retained adjacent to the rezoning area, the clearing area should be clearly demarcated and signed to ensure no vegetation beyond these boundaries is removed. Clearing works and equipment should be excluded from areas outside the clearing area.

4.3.3. Erosion, Sedimentation and Pollution Control

To reduce sedimentation on the construction site, erosion control measures should be implemented. This includes minimising the amount of exposed soils on the site at any given time. All soil stockpiles should be adequately covered when not in use to prevent erosion through heavy rainfall.

Sediment fences should be established around the perimeter of the development area to prevent the impacts of sedimentation on adjoining vegetation and the adjacent drainage line. During development, precautions should be taken to ensure that no pollution, such as petrochemical substances or water containing suspended solids, escapes the construction site. Pollution traps and efficient removal of pollution to an off-site location would help to minimise pollution impacts.

4.3.4. Pre-clearing and Clearing Surveys

Pre-clearing surveys should be undertaken by a suitably qualified ecologist if trees are to be removed as a result of future development. Pre-clearing surveys should include the provision of a report following the completion of a pre-clearing survey, detailing the location and type of each habitat feature.

To minimise impacts to native fauna species, clearing should be undertaken in the following two-stage process under the supervision of a suitably qualified ecologist:

- The initial phase of clearing should involve clearing around identified habitat features and leaving the features overnight; and
- The second stage should involve clearing of the habitat features left overnight followed by an inspection.

Provisions should be made to protect any immobile native fauna during clearing activities by the following means:

- All persons working on the vegetation clearing should be briefed about the possible fauna present and should avoid injuring any present;
- Animals disturbed or dislodged during the clearance but not injured should be assisted to move to the adjacent bushland; and
- If animals are injured during the vegetation clearance, appropriate steps should be taken to humanely treat the animal.

4.3.5. Landscaping and Understorey Replanting

Landscaping presents an opportunity for revegetation of the subject site with characteristic species of the Monaro Tableland Cool Temperate Grassy Woodland in the South Eastern Highlands Bioregion and Tableland Basalt Forest in the Sydney Basin and South Eastern Highlands Bioregions TECs. For any landscaping works to be undertaken, it is recommended that characteristic species of those communities listed in the final determination be utilised where possible.

All plants to be planted should be of local provenance (if possible, from within a 10 km radius of the subject site) and sourced from nurseries that specialise in growing seedlings of native plants with seed sourced from bushland within the locality. This is to avoid planting of cultivars that are human created, and not genetically representative of species as they naturally occur in the locality. All plants should be disease and pest-free, hardened off and well-watered at the time of planting. All plants are to be provided in a healthy condition. They must have good root development and a sturdy shoot system.

This type of landscaping will provide habitat values in the longer term for locally native fauna groups including small birds, microchiropteran bats, arboreal mammals and reptiles.

4.3.6. Weed Control Measures

Significant weed species occurring within the subject site should be managed in order to prevent further spread. As such, it is recommended that all exotic vegetation removed from the subject site should be disposed

of appropriately as identified in the Regional Strategic Weed Management Plan. Specific weed management practices must be applied to the significant weeds listed in **Table 2**.

4.4. Future Assessment Requirements

4.4.1. EPBC Act Requirements

Threatened species, populations and communities listed under the EPBC Act that are considered to be directly or indirectly impacted by the proposed development should be assessed in accordance with the *Matters of National Environmental Significance Significant Impact Guidelines 1.1* (DoE, 2013). If a development is considered to significantly impact any MNES, then a referral would be required to be submitted. Based on the known ecological values of the subject site, it is unlikely that future developments would result in a significant impact to MNES since it does not contain vegetation that conforms to any EPBC Act listing. However, future development may impact threatened fauna and flora which are listed under the EPBC Act, in which case a referral to the Commonwealth may be required. Any future DAs will need to consider impacts to threatened species and populations listed under the EPBC Act.

4.4.2. BC Act Requirements

To determine the type of assessment required for a future development under Part 4 (Local Development) of the EP&A Act, it is necessary to determine whether the proposed development triggers the Biodiversity Offset Scheme (BOS). As outlined previously, for the proposed development to trigger the BOS, it would need to be considered as likely to significantly affect threatened species, which could occur as follows:

- It is likely to significantly affect threatened species or ecological communities, or their habitats, according to the test of significance in Section 7.3 of the BC Act;
- It exceeds the biodiversity offsets scheme threshold according to Clause 7.1 of the BC Regulation, with the thresholds being:
    - The clearing of native vegetation of an area above a prescribed threshold based on the minimum lot size; or
    - The clearing of native vegetation, or other prescribed action, on land included on the Biodiversity Values Map.
- It is carried out in a declared area of outstanding biodiversity value (AOBV).

As no development plans are proposed at this stage of the planning proposal, no tests of significance, for TECs or potentially occurring threatened species, in accordance with Section 7.3 of the BC Act has been undertaken for this assessment. As such, any future DA lodged for the future development of the subject site would need to prepare a test of significance in accordance with Section 7.3 of the BC Act in the event that the BOS was not triggered by another mechanism.

The subject site comprises lots which all have a minimum lot size ranging from 0.06 – 8.46 ha. Based on the areas of clearing thresholds outlined within the BC Regulation, and reproduced in **Table 6**, the BOS would be

triggered if future development cleared between ≥0.25 and ≥0.5 ha of native vegetation, depending on lot size. Therefore, it is likely that future DAs could potentially trigger entry into the BOS by this mechanism.

Table 6 Area of clearing thresholds

Minimum Lot Size of Land	Area of Clearing
Less than 1 hectare	0.25 hectares or more
Less than 40 hectares but not less than 1 hectare	0.5 hectares or more
Less than 1,000 hectares but not less than 40 hectares	1 hectare or more
1,000 hectares or more	2 hectares or more

As previously described, the subject site currently has areas mapped on the Biodiversity Values Map as of 29 March 2022. The BOS would be triggered by this mechanism if impacts to areas included on the Biodiversity Values Map occur. As the Biodiversity Values Map is subject to regular updates, it would need to be consulted during the DA process.

The subject site is not currently mapped as an AOBV. Therefore, the BOS is not currently triggered by this mechanism. Although unlikely to be included in the near future, the list of AOBVs would need to be consulted during the DA process.

4.4.2.1. Offsetting Requirements

The BOS provides a framework to avoid, minimise and offset impacts on biodiversity from development and clearing, and to ensure land that is used to offset impacts is secured in-perpetuity. Developers and landholders who undertake development or clearing, generating a credit obligation that must be retired to offset their activity following approval by the consent authority. Under the BAM, there are two types of credits on development sites:

- Ecosystem credits, which measure the offset requirement for impacts on threatened ecological communities, threatened species habitat for species that can be reliably predicted to occur with a plant community type, and other plant community types generally; and
- Species credits, which measure the offset requirement for impacts on threatened species individuals or area of habitat.

Once the consent authority has issued the approval or consent that includes the final credit obligation of ecosystem and/or species credits, the obligation can be satisfied as follows:

- The retirement of the required number and class of like-for-like biodiversity credits;
- The retirement of the required biodiversity credits in accordance with the variation rules;
- The funding of a biodiversity conservation action that would benefit the relevant threatened species or ecological community and that is equivalent to the cost of acquiring the required like-for-like biodiversity credits as determined by the offsets payment calculator referred to in Section 6.32 of the BC Act; and

- The payment under section 6.30 of the BC Act of an amount into the Biodiversity Conservation Fund determined in accordance with the offsets payment calculator to satisfy the requirement to retire biodiversity credits.

Should the BOS be triggered by future development, this process will be followed to ensure appropriate offsetting is undertaken.

4.4.3. WM Act Requirements

The subject site contains two 1st order unnamed watercourses in the central and western portions which require a VRZ buffer of 10 m either side of each bank. The subject site is also in proximity to Lake Jindabyne which constitutes a 3rd order watercourse under the WM Act and therefore requires a VRZ buffer of 30 m from the bank. The *Guidelines for controlled activities on waterfront land* (DPI 2018) permits non-riparian corridor works or development within the outer 50% of the VRZ if deemed suitable. Non-riparian uses, such as Asset Protection Zones (APZs) are allowed within the outer 50% of the VRZ, so long as offsets are provided in accordance with the averaging rule (DPI 2018). Non-riparian corridor works or development is considered suitable for cleared land, where an averaging rule is applied to ensure no net reduction in corridor width. However, developments that contain existing native vegetation along the riparian corridor should seek to maintain the required VRZ width in accordance with the minimum requirements. Therefore, future DAs will be required to consider the VRZ of each mapped watercourse.

4.4.4. State Environmental Planning Policy (Koala Habitat Protection) 2020

Under Koala SEPP 2020 and Koala SEPP 2021, DAs impacting Koalas or Koala Habitat must be accompanied by a Koala Assessment Report (KAR). Additionally, Koala Plans of Management (KPoM) are required for sites impacting core Koala habitat.

In the case of the subject site, no Koala feed trees listed in Schedule 2 of Koala SEPP 2020 were recorded as part of this assessment and therefore, no KAR will be required at this stage of the project. Should rezoning occur and Koala SEPP 2021 apply however, a KAR may be required for future DAs as some trees listed under Schedule 2 of Koala SEPP 2021 were recorded as part of this assessment.

As the nearest Koala records are more than 10 km to the south with no recent sightings or records of a resident population (including breeding females and young), it is unlikely that the subject site contains core koala habitat and therefore, it is unlikely that a KPoM will be required for future DAs.

4.4.5. Snowy Monaro Regional Council Requirements

4.4.5.1. Terrestrial Biodiversity Mapping

The mapped native vegetation in the central and eastern portions of the subject site are included on the Terrestrial Biodiversity map of the SRLEP. Any future DAs will be required to be consistent with this clause to ensure that consent authorities can be satisfied that a proposed development has been designed to not have any adverse impact on the ecological values of the areas mapped as Terrestrial Biodiversity on the subject site. Additionally, appropriate measures must be implemented as part of the development design process to be consistent with the avoid, minimise and mitigate hierarchy.

4.4.5.2. Riparian Land and Watercourse

The riparian corridor of Lake Jindabyne and the mapped 1st order watercourses in the central and western portions of the subject site are mapped on the Riparian Land and Watercourse map of the SRLEP. Any future DAs will be required to be consistent with this clause to ensure that consent authorities can be satisfied that a proposed development has been designed to not have any adverse impact on the hydrological values on the subject site. Additionally, appropriate measures must be implemented as part of the development design process to be consistent with the avoid, minimise and mitigate hierarchy.

4.4.5.3. Wetlands

The subject site is in close proximity to Lake Jindabyne which is mapped on the Wetlands map of the SRLEP. These mapped areas are associated with the waterbody of Lake Jindabyne adjacent the subject site. The objective of this clause is to ensure that wetlands are preserved and protected from the impacts of development. Any future DAs will be required to be consistent with this clause to ensure that consent authorities can be satisfied that a proposed development has been designed to avoid or minimise any direct or indirect impacts to both the hydrological characteristic of the wetland and quality of the wetland as a habitat for existing native flora and fauna species. Additionally, appropriate measures must be implemented as part of the development design process to be consistent with the avoid, minimise and mitigate hierarchy.

4.4.5.4. Snowy River Shire Development Control Plan 2013

The SRDCP provides control measures regarding the environmental sustainability and protection of biodiversity of the subject site, including landscaping, tree preservation, recycling and waste management and water management. Any future DAs will be required to be consistent with the objectives of the SRDCP.

5. Conclusion

This report supports a planning proposal seeking to amend the SRLEP to change the zoning of the subject site from entirely RU1 – Primary Production to a mixture of RU1 – Primary Production, RU5 Village, B1-Neighbourhood Centre, RE1 – Public Recreation, SP2 – Infrastructure (Drainage) and SP3 – Tourist to facilitate future subdivision and development of the subject site. The biodiversity values of the subject site and potential ecological impacts of future development practisers have been assessed at a high level.

The subject site currently contains 11.74 ha of two conditions of PCT 1196 Snow Gum - Candle Bark woodland, consistent with Monaro Tableland Cool Temperate Grassy Woodland in the South Eastern Highlands Bioregion, listed as a CEEC under the NSW BC Act, as well as 1.14 ha of PCT 1191 Snow Gum - Mountain Gum shrubby open forest, consistent with Tableland Basalt Forest in the Sydney Basin and South Eastern Highlands Bioregions, listed as an EEC under the NSW BC Act. The remainder of the subject site is comprised of Exotic Woody Vegetation (0.2 ha), Exotic Dominated Grassland (62.46 ha), Cleared Land (0.6 ha) and Dams (0.03 ha).

The wooded areas of PCTs 1196 and 1191 vegetation in the eastern portion of the subject site comprise potential habitat for several threatened fauna species as part of a broader habitat range. Furthermore, the subject site contains Koala use tree species and therefore constitutes koala habitat under the Koala SEPP 2021. Any works occurring within the above- areas of habitat should be accompanied by the suite of mitigation measures proposed to minimise the impacts on biodiversity values as described in ***Section 4.2*** and ***Section 4.3***. The impacts of the future development and the implementation of appropriate mitigation measures will need to be re-evaluated at the DA stage of the project.

The proposed rezoning layout plan has attempted to minimise ecological impacts by locating higher density lots in the western portion of the subject site containing the lowest biodiversity value, whilst locating the lower density lots in the western portion of the subject land which contains the highest biodiversity value, including the two TECs. Nevertheless, the exact extent of impacts of future developments is unknown at this stage and will need to be further assessed in a relevant biodiversity impact assessment report which will accompany future DAs for the subject site.

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APPENDIX A :
Flora Species List

Family	Scientific Name	Exotic	Common Name	RMS1	RMS2	RMS3
Apiaceae	*Hydrocotyle laxiflora*		Stinking Pennywort		X	X
Aspleniaceae	*Asplenium flabellifolium*		Necklace Fern			X
Asteraceae	*Arctotheca calendula*	*	Capeweed	X		
Asteraceae	*Calotis scabiosifolia* var. *integrifolia*		Rough Burr-daisy			X
Asteraceae	*Cassinia aculeata subsp. aculeata*					X
Asteraceae	*Chrysocephalum semipapposum* subsp. *semipapposum*		Common Everlasting	X		
Asteraceae	*Cymbonotus lawsonianus*		Bear's Ear			X
Asteraceae	*Hypochaeris radicata*	*	Catsear		X	
Asteraceae	*Onopordum acanthium*	*	Scotch Thistle	X	X	X
Asteraceae	*Senecio quadridentatus*		Cotton Fireweed		X	X
Asteraceae	*Sonchus asper*	*	Prickly Sowthistle	X		
Asteraceae	*Taraxacum officinale*	*	Dandelion	X		X
Asteraceae	*Vittadinia muelleri*			X	X	X
Brassicaceae	*Brassica spp.*	*	Brassica	X		
Brassicaceae	*Capsella bursapastoris*	*	Shepherd's Purse	X	X	
Campanulaceae	*Wahlenbergia multicaulis*		Tadgell's Bluebell	X		
Caryophyllaceae	*Cerastium vulgare*	*	Mouse-ear Chickweed		X	X
Caryophyllaceae	*Petrorhagia dubia*	*		X	X	X
Caryophyllaceae	*Spergularia rubra*	*	Sandspurry	X	X	
Caryophyllaceae	*Stellaria pungens*		Prickly Starwort			X
Chenopodiaceae	*Einadia nutans*		Climbing Saltbush		X	

Family	Scientific Name	Exotic	Common Name	RMS1	RMS2	RMS3
Clusiaceae	*Hypericum perforatum*	*	St. Johns Wort	X	X	X
Convolvulaceae	*Convolvulus erubescens*		Pink Bindweed		X	
Convolvulaceae	*Dichondra repens*		Kidney Weed		X	
Crassulaceae	*Crassula sieberiana*		Australian Stonecrop		X	X
Ericaceae	*Acrothamnus maccraei*					X
Ericaceae	*Leucopogon fraseri*					X
Fabaceae (Faboideae)	*Bossiaea buxifolia*					X
Fabaceae (Faboideae)	*Daviesia mimosoides* subsp. *mimosoides*					X
Fabaceae (Faboideae)	*Dillwynia prostrata*		Matted Parrot-pea		X	X
Fabaceae (Faboideae)	*Hardenbergia violacea*		False Sarsaparilla	X		X
Fabaceae (Faboideae)	*Medicago polymorpha*	*	Burr Medic		X	
Fabaceae (Faboideae)	*Swainsona monticola*			X		X
Fabaceae (Faboideae)	*Trifolium arvense* var. *arvense*	*	Haresfoot Clover	X	X	X
Fabaceae (Faboideae)	*Trifolium campestre*	*	Hop Clover			X
Fabaceae (Faboideae)	*Trifolium pratense*	*	Red Clover	X		
Fabaceae (Faboideae)	*Trifolium repens*	*	White Clover		X	X
Fabaceae (Mimosoideae)	*Acacia dealbata* subsp. *subalpina*		Silver Wattle		X	X
Geraniaceae	*Erodium cicutarium*	*	Common Crowfoot	X		X
Geraniaceae	*Geranium solanderi*		Native Geranium	X	X	X
Haloragaceae	*Gonocarpus tetragynus*		Poverty Raspwort			X
Juncaceae	*Juncus filicaulis*				X	

Family	Scientific Name	Exotic	Common Name	RMS1	RMS2	RMS3
Lamiaceae	*Ajuga australis*		Austral Bugle	X	X	
Lomandraceae	*Lomandra longifolia* var. *longifolia*		Spiny-headed Mat-rush			X
Malaceae	*Cydonia oblonga*	*	Quince		X	
Malvaceae	*Malva neglecta*	*	Dwarf Mallow	X		
Myrtaceae	*Eucalyptus dalrympleana* subsp. *dalrympleana*		Mountain Gum			X
Myrtaceae	*Eucalyptus pauciflora*		White Sally	X	X	X
Myrtaceae	*Eucalyptus rubida subsp. rubida*		Candlebark	X	X	X
Orobanchaceae	*Euphrasia collina*					X
Oxalidaceae	*Oxalis corniculata*	*	Creeping Oxalis	X		
Oxalidaceae	*Oxalis exilis*			X	X	
Plantaginaceae	*Plantago lanceolata*	*	Lamb's Tongues	X		
Poaceae	*Aira caryophyllea*	*	Silvery Hairgrass	X	X	X
Poaceae	*Anthoxanthum odoratum*	*	Sweet Vernal Grass	X		
Poaceae	*Austrostipa scabra*		Speargrass		X	
Poaceae	*Austrostipa scabra* subsp. *falcata*		Rough Speargrass	X		
Poaceae	*Avena barbata*	*	Bearded Oats	X	X	
Poaceae	*Bromus catharticus*	*	Praire Grass	X		
Poaceae	*Bromus hordeaceus*	*	Soft Brome	X		
Poaceae	*Bromus molliformis*	*	Soft Brome	X		X
Poaceae	*Eragrostis benthamii*			X		
Poaceae	*Festuca asperula*		Graceful Fescue	X		

Family	Scientific Name	Exotic	Common Name	RMS1	RMS2	RMS3
Poaceae	*Festuca rubra*	*	Red Fescue	X		
Poaceae	*Hordeum marinum*	*	Sea Barley Grass		X	
Poaceae	*Lolium perenne*	*	Perennial Ryegrass	X	X	
Poaceae	*Panicum effusum*		Hairy Panic			X
Poaceae	*Poa annua*	*	Winter Grass	X	X	
Poaceae	*Poa labillardierei*		Tussock	X		X
Poaceae	*Poa sieberiana* var. *sieberiana*		Snowgrass	X	X	X
Poaceae	*Themeda triandra*		Kangaroo Grass		X	
Polygonaceae	*Acetosella vulgaris*	*	Sheep Sorrel	X	X	
Polygonaceae	*Rumex brownii*		Swamp Dock		X	
Rhamnaceae	*Cryptandra amara*		Bitter Cryptandra			X
Rosaceae	*Acaena ovina*		Acaena	X		X
Rosaceae	*Rosa rubiginosa*	*	Sweet Briar		X	
Rubiaceae	*Asperula conferta*		Common Woodruff	X	X	X
Rubiaceae	*Galium gaudichaudii*		Rough Bedstraw		X	
Salicaceae	*Populus nigra*	*	Lombardy Poplar		X	X
Scrophulariaceae	*Verbascum virgatum*	*	Twiggy Mullein	X	X	X
Thymelaeaceae	*Pimelea pauciflora*				X	X
Violaceae	*Viola betonicifolia*		Native Violet		X	X

FIGURES

Legend

Subject Site

Lot Boundaries

Data Source:
NSW Government Spatial Services
SIX Maps 'Clip and Ship'
Snowy Monaro LGA

Coordinate System: MGA Zone 56 (GDA 94)

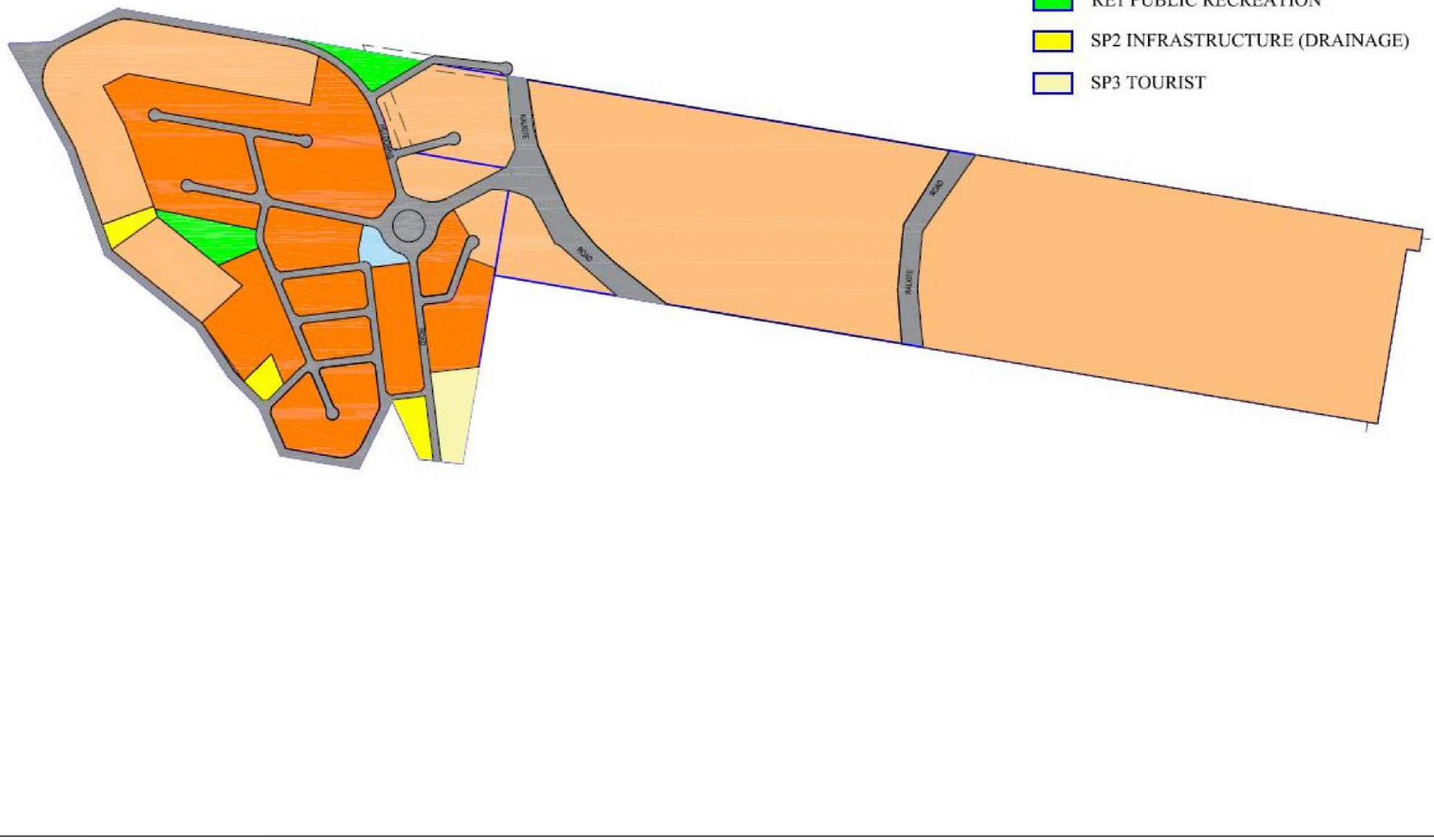
cumberland ecology

0 100 200 300 400 m

I:\...\21258\Figures\RP1\20220404\Figure 1. Location

Figure 1. Location of the subject site

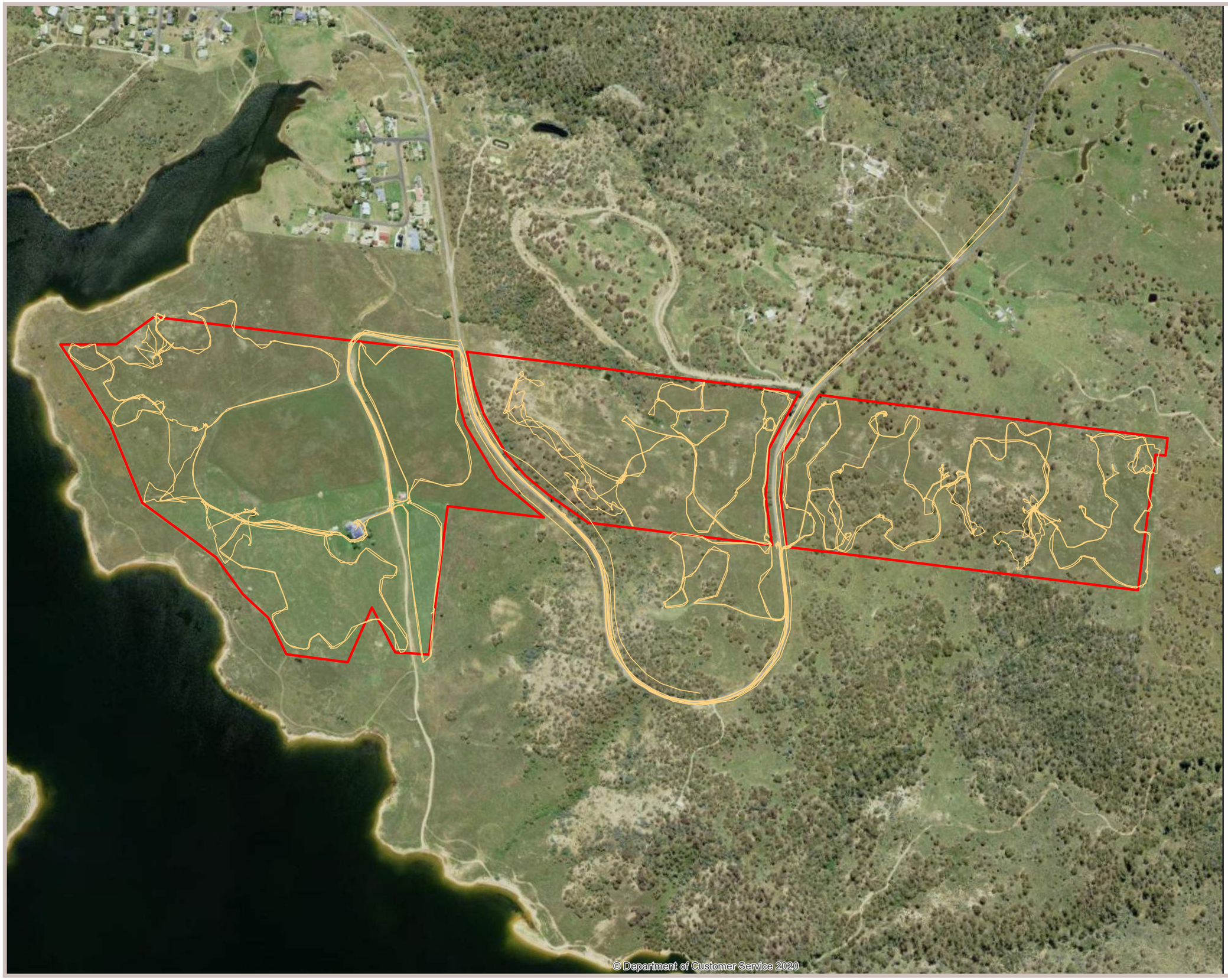
SHEET 9 OF 9



I:\...\21258\Figures\RP1\20220404\Figure 2. Proposed rezoning layout

Coordinate System: MGA Zone 56 (GDA 94)

Figure 2. Proposed rezoning layout



Legend

Subject Site

Random Meander Survey Tracks

Data Source:
NSW Government Spatial Services
SIX Maps 'Clip and Ship'
Snowy Monaro LGA

Coordinate System: MGA Zone 56 (GDA 94)

cumberland ecology

0 50 100 150 200 m

I:\...\21258\Figures\RP1\20220404\Figure 3. Survey locations

Figure 3. Survey locations

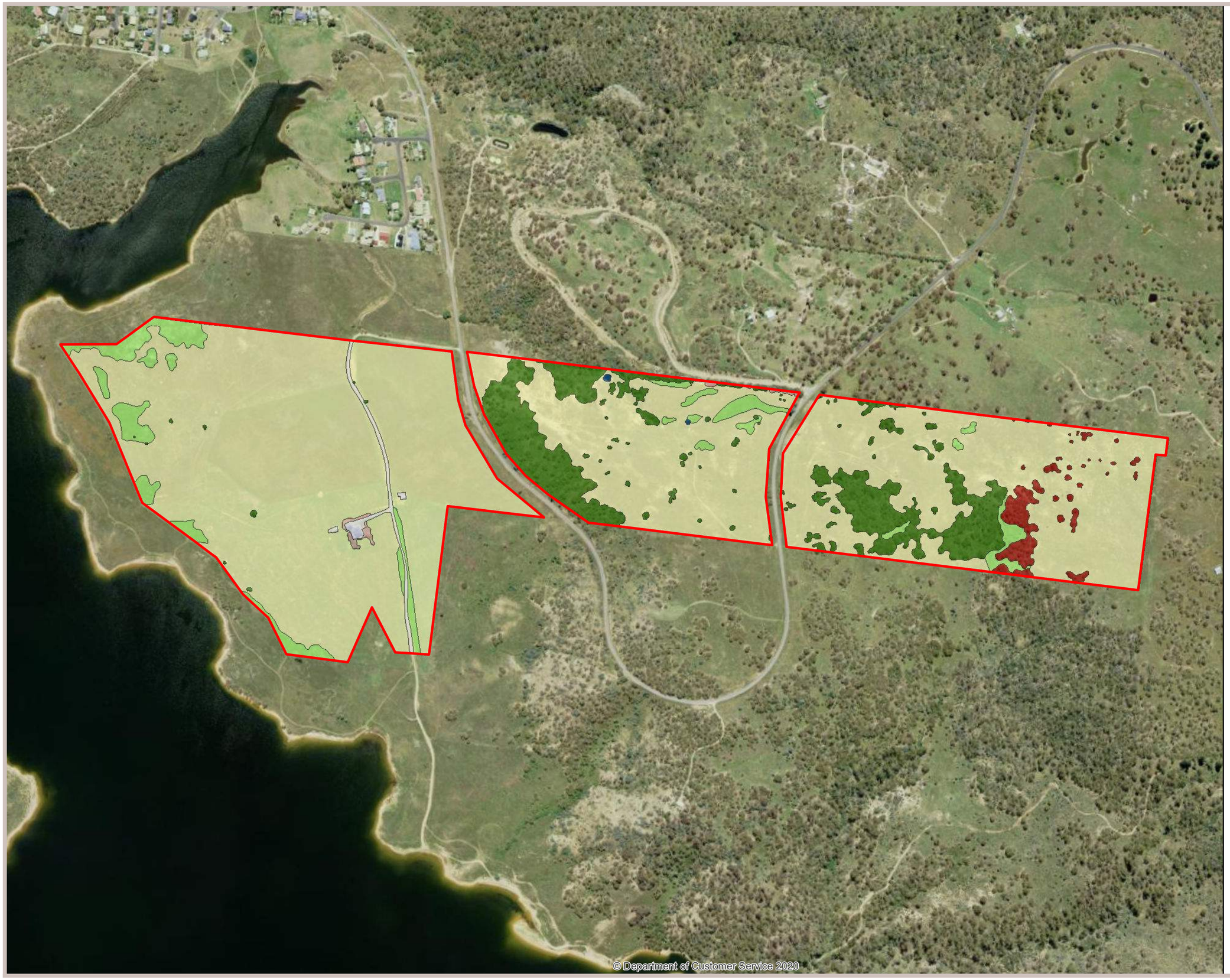


Figure 4. Vegetation communities within the subject site

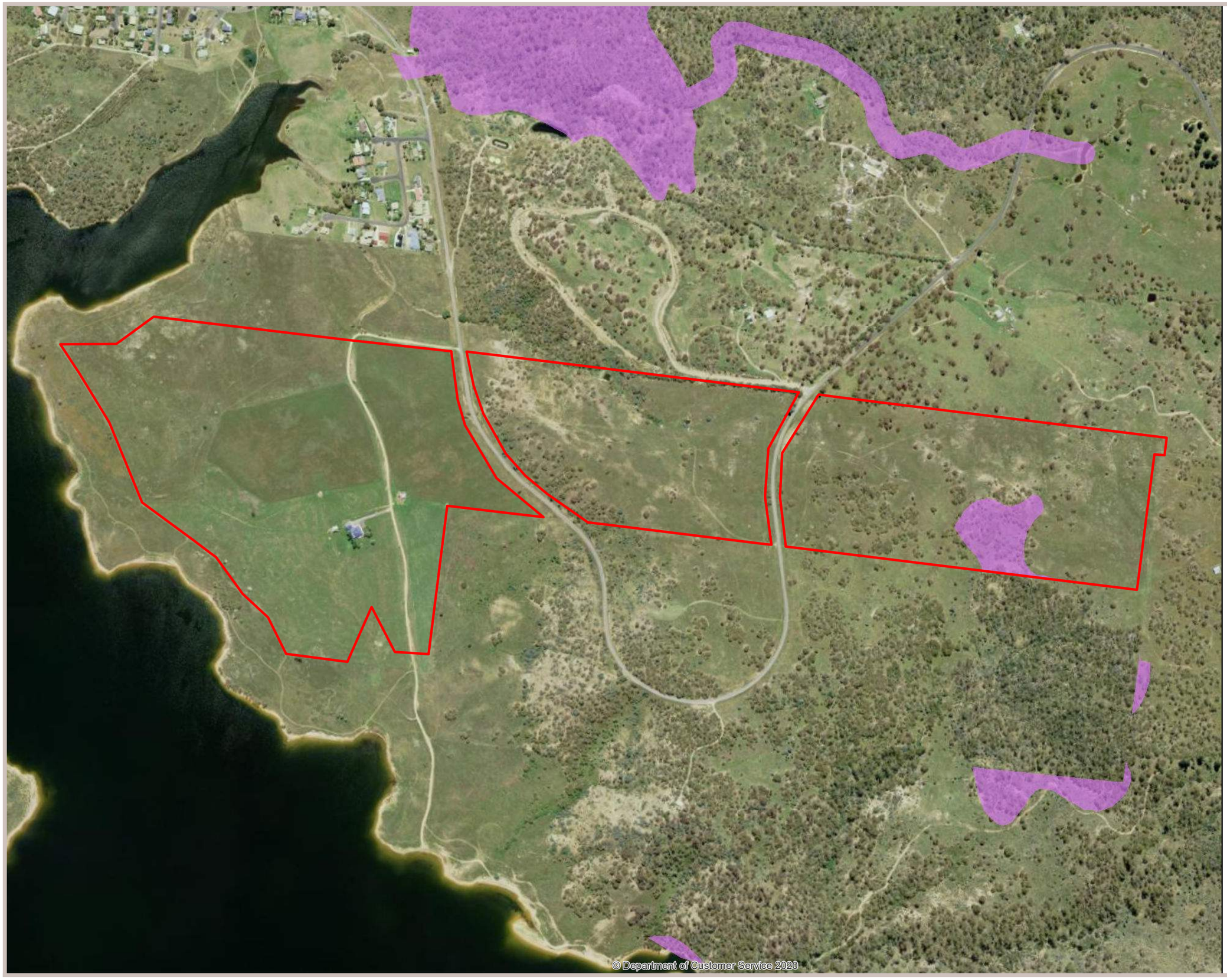


Figure 5. Biodiversity Values Map