



Mount Buller Sustainable Water Security
Project – Off-stream Storage
Native Vegetation Offset Strategy

FINAL REPORT

Prepared for the Mount Buller and Mount Stirling Alpine Resort Management Board

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Glossary

Alpine Bogs	Both the EPBC Act threatened ecological community (Alpine Sphagnum Bogs and Associated Fens) and the FFG Act threatened community (Alpine Bog Community)
BAG	Biodiversity Assessment Guidelines
CaLP Act	Victorian <i>Catchment and Land Protection Act 1994</i>
CBD	Central Business District
CMA	Catchment Management Authority
DELWP	Victorian Government Department of Environment, Land, Water and Planning
DEPI	Victorian Government Department of Environment and Primary Industries, now DELWP
DSE	Victorian Government Department of Sustainability and Environment, now DELWP
EPBC Act	Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i>
EVC	Ecological Vegetation Class
FFG Act	Victorian <i>Flora and Fauna Guarantee Act 1988</i>
FIS	Flora Information System
GBEUs	General Biodiversity Equivalence Units
GIS	Geographic Information System
HEMAMP	Hydrological and Ecological Monitoring and Adaptive Management Program
offset area/site	The proposed 262-hectare Mount Stirling offset area
PCF	Project Construction Footprint for the proposed Mount Buller Water Storage
priority species	Five target species lacking modelled habitat in the offset area, according to field assessment
project	The Mount Buller Sustainable Water Security Project, including the water storage and ancillary infrastructure
RMB	Mount Buller and Mount Stirling Alpine Resort Management Board
SBEUs	Specific Biodiversity Equivalence Units
target species	Seven species lacking modelled habitat in the offset area, according to the desktop assessment
threatened	Species or ecological community listed as critically endangered, endangered or vulnerable under the EPBC Act, FFG Act or DELWP Advisory List
VBA	DELWP's Victorian Biodiversity Atlas
VFD	Victorian Fauna Database
water storage	The proposed 100 megalitre water storage at Mount Buller

Summary

The Mount Buller and Mount Stirling Alpine Resort Management Board (the RMB) commissioned Biosis Pty Ltd to prepare an offset strategy for native vegetation removal associated with the proposed construction of a 100 megalitre (ML) water storage and ancillary infrastructure at Mount Buller. The offset strategy has been prepared to address offset requirements under the Biodiversity Assessment Guidelines (DEPI 2013).

A total of 5.278 hectares of remnant patch vegetation would be removed for construction of the water storage and ancillary infrastructure. For the purposes of determining offset requirements, a further 0.898 hectares of native vegetation has been assumed lost, to account for the potential drying of downslope Alpine Bogs, which may occur if all mitigation measures fail. The native vegetation that would be removed or assumed lost has a strategic biodiversity score of 0.968. A general offset of 1.102 general units, with a minimum strategic biodiversity score of 0.774 is required. Specific habitat offsets will be required for 18 rare or threatened species.

To locate potential offset sites within the resorts (Mount Buller and Mount Stirling), species habitat importance maps were interrogated. This process identified an area around the summit and upper slopes of Mount Stirling, encompassing 262 hectares, that has the highest density of mapped important habitat for species requiring offsets. The offset site was analysed by the Victorian Department of Environment, Land, Water and Planning (DELWP) native vegetation support team using estimated gain scores and a preliminary Offset Site Report was produced, providing an estimate of the specific biodiversity equivalence units (SBEUs) that could be achieved through the protection and management of the site.

The preliminary DELWP Offset Site Report indicated that there was a shortfall in the area of modelled habitat (and hence, SBEUs) at the proposed Mount Stirling offset site for seven of the 18 species. To address the SBEU shortfalls, Biosis undertook field surveys of the proposed offset site with the aim of gathering field data to support a potential alternative offset arrangement, to be considered by DELWP.

The field surveys produced the following outcomes:

- Native vegetation mapping, quality assessments and gain scoring resulted in the estimated gain scores for all habitat zones being revised upwards.
- Upwardly revised gain scores mean that the proposed offset site now provides sufficient SBEUs for two of the seven target species that were formerly lacking sufficient SBEUs.
- Survey data demonstrate that the offset site has potential to generate sufficient additional SBEUs for four of the remaining five target species.
- Four of the seven target species were confirmed to be present within the offset site.
- The offsite site still lacks sufficient SBEUs for one target species: Fog Club-sedge *Isolepis montivaga*.

An additional offset site would be required to provide sufficient SBEUs for Fog Club-sedge, which is typically found in wet depressions in alpine and sub-alpine areas. Alternatively, modelled habitat and specific offsets for Fog Club-sedge are available at Falls Creek Alpine Resort.

1. Introduction

1.1 Project background

The Mount Buller and Mount Stirling Alpine Resort Management Board (the RMB) commissioned Biosis Pty Ltd to prepare an offset strategy for native vegetation removal associated with the proposed construction of a 100 megalitre (ML) water storage and ancillary infrastructure at Mount Buller (the project). The project would be within the Mount Buller Alpine Resort (the Resort), approximately 150 kilometres northeast of the Melbourne CBD, Victoria. The proposed site (known as the 'Control Centre') is located on a gently to moderately sloping plateau 700 metres east of the Mount Buller summit and 250 metres west of Mount Buller Village (Figure 1).

The Project Construction Footprint (PCF) would be located between the final section of the unsealed Mount Buller Summit Road and the Summit Nature Walking Track. The proposed PCF extends beyond the water storage to include roads, stockpile areas and extensions of variable shape and length for ancillary infrastructure leading to and from the water storage. The PCF incorporates a section of the Mount Buller Summit Road and areas currently occupied by the Boggy Creek ski lift and a number of buildings (including the Control Centre building).

An ecological assessment of the site, including a habitat hectare assessment, was completed by GHD in late 2013 and early 2014 (Biosis and GHD 2016). The total construction footprint for the proposed water storage would be 10.347 hectares, requiring the direct removal of 5.278 hectares of native vegetation (Figure 2; Appendix 1). For the purposes of determining offset requirements, a further 0.898 hectares of native vegetation has been assumed lost, to account for the potential drying and indirect loss of downslope Alpine Bogs, which may occur if all mitigation measures fail. The implications associated with potential indirect impacts, which could manifest as vegetation loss or changes to native vegetation structure and composition, are documented in the Hydrological and Ecological Monitoring and Adaptive Management Program (HEMAMP) developed for the project (Biosis and GHD 2017).

This offset strategy outlines how the RMB will meet the project's native vegetation offset requirements. A preliminary desktop investigation in September 2015 identified the potential for an offset site at Mount Stirling to meet the offset requirements of the water storage project. Field surveys of Mount Stirling in February 2016 confirmed and updated the findings of the preliminary desktop assessment. The findings of the desktop and field investigations are presented in this offset strategy. The strategy is not a detailed offset management plan and deals only with strategic level information required by the responsible authority to make a decision about the project's planning permit application.

1.2 Permitted clearing and offsets

The Biodiversity Assessment Guidelines are incorporated into the Victoria Planning Provisions and all planning schemes in Victoria (DEPI 2013). The purpose of the Guidelines is to guide how impacts to biodiversity should be considered when assessing a planning permit application to remove, destroy or lop native vegetation. The objective for permitted clearing of native vegetation in Victoria is "no net loss in the contribution made by native vegetation to Victoria's biodiversity" (DEPI 2013 p.5). All planning permit applications to remove native vegetation are assigned to a risk-based pathway determined by the location and extent of proposed clearing. The risk-based pathway will dictate the information to be provided in a planning permit application and the decision guidelines that DELWP will use to assess the permit application.

Removal of native vegetation for the Mount Buller water storage project is on the high risk-based pathway, meaning that an offset strategy must be prepared at the permit application stage to describe how a compliant offset will be secured (Clause 52.17-3 of the Alpine Resorts Planning Scheme; DELWP 2015b). A detailed assessment of the implications for the project under the Guidelines was undertaken by Biosis and GHD (2016).

When a permit for the removal of native vegetation is granted, offsets must be secured to achieve a no net loss outcome for biodiversity. The offset requirements include the type of offset required (*general* or *specific*), the amount of gain that must be achieved (in biodiversity equivalence units) and the attributes the offset must have (e.g. vicinity, strategic biodiversity score, species habitat).

1.3 Offsets in Victoria's alpine resorts

Development at Mount Buller and other Victorian alpine resorts, and the consequent removal of native vegetation, may require both *general* and *specific* offsets under the Biodiversity Assessment Guidelines (DEPI 2013). General offsets can be obtained through third party credit purchases provided the offsets are located in the same catchment area and meet the minimum strategic biodiversity score (SBS) requirements. The use of a third party provider for general offsets is considered an efficient way of dealing with low risk vegetation clearing applications in Victoria's alpine resorts.

For more complex or extensive vegetation clearing proposals, such as the Mount Buller water storage project, *specific* offsets for impacts to rare and threatened species are required. Finding and securing specific offsets is challenging in the resorts. Specific offset requirements are driven by two factors. First, the clearing application must be on the moderate or high risk-based pathway. Second, the amount of proposed clearing that intersects modelled important species habitat must be above the proportional threshold set by DELWP. Specific offsets can be secured anywhere in Victoria provided the offset site also supports modelled habitat for the species requiring offsetting. Where modelled species habitat does not occur at the offset site, an alternative offset arrangement may be put forward provided that it provides an equivalent outcome for the species impacted (DELWP 2015a).

Many alpine and sub-alpine species are naturally restricted to the Victoria Alps bioregion and high levels of endemism exist in certain habitat types. DELWP's habitat importance models reflect this restricted distribution, which means that most specific offsets can only be secured in alpine environments. The restriction in scope for finding a sufficient number of SBEUs and then being able to secure the offset sites means that offsets can only be achieved on public land contained in the resorts, the Alpine National Park or State Forest in the Victorian Alps bioregion. The scope for generating enough SBEUs in the resorts remains untested at a strategic level and security arrangements have historically been unclear for offsets on Crown land. There has been some progress in securing offsets in alpine resorts with recent advice from the Victorian government providing several options to allow for offsetting in the resorts (DELWP 2015c; DELWP 2016).

The proposed policy setting for securing offsets sets out several options to achieve specific offsets in alpine resorts:

- Securing suitable offsets with modelled habitat in the alpine resorts and registering agreements under Section 18B of the *Crown Land (Reserves) Act 1978* (Vic).
- Using master planning to map and describe protected offsets areas.
- Using local planning scheme mechanisms to secure offsets under the *Planning and Environment Act 1987* (Vic).
- Purchasing specific offsets from a public land trading scheme set up by the Victorian government.

In practical terms, this means specific offsets triggered by clearing applications, such as the Mount Buller water storage project, can be allocated in the alpine resorts by protection and management of habitat for rare or threatened species. The registration and trading of specific offsets must be undertaken in accordance with the standards of Victoria's Native Vegetation Credit Register. The ability to generate enough SBEUs based on current habitat importance mapping to achieve "no net loss" can only be resolved on a case by case basis where highly restricted modelled habitat occurs.

1.4 Objectives

This offset strategy aims to demonstrate how the no net loss objective of the permitted clearing regulations can be achieved for the water storage project under an alternative offset arrangement. The objectives of this strategy are to:

- Describe the general and specific offsets required for the native vegetation removed or assumed lost for the proposed water storage and ancillary infrastructure at Mount Buller.
- Outline options for achieving the general and specific biodiversity equivalence unit requirements for the project and how these offsets will be secured to make a contribution to Victoria's biodiversity that is equivalent to the contribution made by the native vegetation being removed or assumed lost.

2. Proposed vegetation removal and offsets required

2.1 Clearing site details

The proposed Project Construction Footprint (PCF) is located on Crown land that is permanently reserved for the purpose of the Mount Buller Alpine Resort, known as Crown Allotment 5A, Section A (SPI 5A-A\PP2370), Parish of Changue East, County of Wonangatta. The RMB is the public land manager. The PCF is within the:

- Victorian Alps Bioregion
- Goulburn River Basin
- Management area of Goulburn Broken Catchment Management Authority.

2.2 Proposed vegetation removal

The total PCF for the proposed water storage and ancillary infrastructure would be 10.347 hectares, requiring the direct removal of 5.278 hectares of native vegetation (Figure 2). This vegetation is divided among two Ecological Vegetation Classes (EVCs): 5.1938 hectares of Alpine Grassy Heathland (EVC 1004) and 0.0846 hectares of Sub-Alpine Woodland (EVC 43). For the purposes of determining offset requirements, a further 0.898 hectares of Sub-alpine Wet Heathland (EVC 210) has been assumed lost, to account for the potential drying and indirect loss of downslope Alpine Bogs, which may occur if all mitigation measures fail. The 6.177 hectares of native vegetation that would be removed or assumed lost has a strategic biodiversity score (SBS) of 0.968.

2.3 Offsets requirements

A general offset of 1.102 general units, with a minimum SBS of 0.774 is required. Specific habitat offsets will be required for 18 rare or threatened species. A summary of the offsets required by DELWP for the proposed vegetation removal is provided below in Table 1. See Appendix 1 for the detailed Biodiversity Impact and Offset Requirements (BIOR) report provided by DELWP.

Table 1 Summary of the DELWP BIOR report (see Appendix 1)

Attribute	Outcome
Vegetation Parameters	
Remnant patches	6.177 ha
Scattered trees	0
Risk-based pathway	High
Location risk	C
Strategic biodiversity score	0.968
General Offset Requirements	
General offset amount (GBEUs)	1.102
Vicinity	Goulburn Broken CMA or Mount Buller Alpine Resort
Minimum strategic biodiversity score	0.774
Specific Offsets Requirements (SBEUs)	
Alpine Bog Skink	7.446
Alpine Marsh-marigold	2.312
Alpine Stackhousia	1.218
Broad-leaf Flower-rush	6.442
Carpet Sedge	8.400
Felted Buttercup	1.274
Fog Club-sedge	7.337
Green Billy-buttons	7.172
Gunn's Alpine Buttercup	8.468
Mossy Knawel	6.059
Mountain Aciphyll	7.896
Mountain Daisy	8.332
Mountain Wallaby-grass	5.955
Planarian	0.796
Snow Aciphyll	7.212
Sticky Fleabane	5.650
Tussock Woodrush	8.391
Veined Plantain	6.636

3. Achieving offsets

3.1 Approach to identifying offset sites

The specific offset requirements for this project cannot be achieved through purchase of credits via a third party credit provider as most species requiring offsets are restricted to Crown land in the Victorian Alps bioregion. On this basis, and in light of recent advice from DELWP that provides a mechanism to secure offsets within alpine resorts, we have investigated the potential for undeveloped areas of the resorts to yield specific offsets.

To locate candidate offset sites, DELWP species habitat importance maps were interrogated in a GIS environment. This process identified a number of locations where important habitat for species requiring offsets are mapped (modelled) in the resorts. Two general locations were identified, including an area between the village and summit of Mount Buller in the developed ski-field, and a second area around the summit and upper slopes of Mount Stirling.

The Mount Buller location is significantly encumbered by existing land use and would be unlikely to meet the offset site eligibility criteria as a large scale offset site. The Mount Stirling location is undeveloped and has the highest potential to yield suitable offsets. Furthermore, the Mount Stirling location has previously been nominated as a potential resort offset site by the RMB and previous investigations, including some vegetation quality assessments, have been completed there (Biosis Research 2008a; Biosis Research 2008b).

On this basis, the Mount Stirling location was identified as the preferred candidate offset site. To capture the maximum number of species with mapped important habitat, the area with the highest density of modelled habitat was included for desktop and field assessments (Figure 3). This area encompasses 262 hectares of remnant native vegetation on and around the summit of Mount Stirling. The final offset area would be subject to refinement during finalisation of the offset management plan and is unlikely to be as large as the area examined for this offset strategy.

3.2 Offset site eligibility

Sites must comply with a number of criteria to be eligible as an offset. These criteria must be applied before gain is calculated. Offset site eligibility requires consideration of:

- Current and future land use at the offset site
- Existing offsets or agreements encumbering the offset site
- Threats to native vegetation condition
- Minimum security and management commitments.

3.2.1 Current and future land use

A proposed offset site is eligible if there is no current and future land use that is incompatible with managing native vegetation for conservation. Examples of incompatible uses are:

- Fuel reduction activities requiring the removal of logs or clearing of understorey
- Off-track horse-riding, cycling or vehicle use
- Infrastructure easements

- Areas with a public acquisition overlay or with approval to undertake activities that will damage native vegetation such as extractive industries
- Other ongoing uses that are likely to degrade or restrict improvement in vegetation condition.

There are no significant incompatible land uses identified as occurring within the proposed specific offset site at Mount Stirling. All recreational activities are restricted to a formalised track and trail network, which will be excluded from the offset area subject to the final offset management plan.

3.2.2 Existing offsets or agreements

An area of native vegetation is eligible to be an offset if it has not already been used to offset the clearance of native vegetation or species habitat. The area cannot be subject to a current agreement (with management obligations) under an incentive or grant program.

The proposed offset site at Mount Stirling has not been used previously for offsetting and is not subject to any other management agreements or funding arrangements, other than standard public land management obligations. It should be noted that the site has been nominated as an offset for previous projects at Mount Buller but these projects have not been approved and the offsets have not been allocated to the Mount Stirling site.

3.2.3 Threats to native vegetation condition

The landowner or manager of an offset site must also have the ability to control significant threats to the condition of native vegetation. Significant threats include:

- High levels of continued nutrient run-off
- Secondary salinity with a high likelihood of the effect increasing
- Continuing significant erosion which is uncontrollable without affecting native vegetation
- Significant invasion from pest animals such as Rabbits, Deer, Goats and Pigs
- Extensive die-back or other plant diseases
- Planned disturbance regimes such as fuel reduction burning or flooding.

As the land manager, the RMB has the capacity to undertake land management activities that address the threats listed above.

3.2.4 Minimum security and management commitments

Site gain results from commitments to protect, maintain and improve vegetation condition, where the commitments are higher than the landowner's or land manager's current legal management responsibilities. Four types of gain are typically recognised:

- Prior management gain
 - Applies to freehold land where remnant native vegetation has not been removed.
 - Acknowledges management undertaken by landowners on a freehold site since state-wide planning permit controls were introduced in 1989.
 - Not available on Crown land (DELWP 2016).
- Security gain
 - Refers to increased protection of native vegetation on a site through one of the following (DELWP 2015c):
 - Registration of a security agreement on the land title

- Transfer of freehold land to a secure Crown land reserve managed for conservation purposes
 - Reclassification of Crown land to a reservation managed for conservation purposes.
 - Available on Crown land for up to 10% of the current habitat hectare score (DELWP 2016).
- Maintenance gain
 - Avoiding the decline in vegetation condition that is predicted to occur over a 10-year period.
 - Agreeing to forgo currently allowed land uses and control threats that affect vegetation condition.
 - Available on Crown land by protecting against damage from recreational activities, which offers a gain of 2 (out of 100) habitat points per hectare (DELWP 2016).
- Improvement gain
 - Management commitments (beyond the landowner's current legal management obligations) that improve the current vegetation condition.
 - Typical actions include weed management, pest animal control, retaining logs, supplementary planting and revegetation.
 - Available on Crown land by eliminating environmental weeds, which offers a gain of 10 (out of 100) habitat points per hectare, and/or by controlling pest animals, which offers an additional gain of 10 (out of 100) habitat points per hectare.

The proposed Mount Stirling offset site is not eligible for prior management gain as it is Crown land (DELWP 2016). Site gain that can be achieved at the proposed offset site includes security gain through an agreement under the *Crown Land (Reserves) Act 1978* (Vic), maintenance gain by foregoing certain recreational activities in some areas and improvement gain through control of noxious weeds and pest animals above current duty of care obligations (DELWP 2016). More detail on how these gains would be achieved is provided in Section 5.2.

4. Desktop assessment

4.1 Desktop assessment methods

In September 2015, Biosis performed a desktop assessment of the proposed offset site to estimate the quantum of general and specific offsets that the proposed offset area could potentially yield. The desktop assessment relied on the following existing information and assumptions:

- DELWP's 2005 EVC modelling (Figure 3), which was used to partition the offset site into two broad habitat zones: Sub-alpine Treeless Vegetation (EVC 44) and Sub-alpine Woodland (EVC 43).
- Vegetation quality assessments performed by Biosis at Mount Stirling (Biosis Research 2008a; Biosis Research 2008b) and DELWP's modelled vegetation condition scores (NVR2013_COND_V2), which were used to estimate gain scores for the offset site.
- Based on advice from DELWP (DELWP 2015c), the available security gain from the offset site (Crown land) was assumed to be 10% of the current habitat score for the two habitat zones.

Spatial data, including estimated gain per hectare, were then submitted to DELWP's Native Vegetation Support Team to estimate the specific biodiversity equivalence offset units (SBEUs) available at the offset site.

4.2 Outcome of desktop assessment

Using existing information for Mount Stirling, the desktop assessment conservatively estimated that the following gain in habitat points would be available from the offset site (Appendix 2):

- 17.53 habitat points per hectare for the Sub-alpine Treeless Vegetation
- 13.70 habitat points per hectare for the Sub-alpine Woodland.

Importantly, these gain scores were estimated in September 2015 before receiving the latest advice from DELWP regarding offsets on Crown land (DELWP 2016). Based upon these estimated gains for the offset site, Biosis requested a preliminary Offset Site Report from DELWP, which suggested that the offset site could meet the vicinity and strategic biodiversity score requirements for the general offset. The report also suggested that the site could meet the modelled important habitat requirement for all species requiring specific offsets. However, the desktop assessment suggested that the offset site lacked sufficient SBEUs for seven species of these species, being:

- Alpine Stackhousia *Stackhousia pulvinaris* (DELWP advisory list: rare)
- Fog Club-sedge *Isolepis montivaga* (DELWP advisory list: rare)
- Green Billy-buttons *Craspedia aurantia* subsp. *jamesii* (DELWP advisory list: rare)
- Mossy Knawel *Scleranthus singuliflorus* (DELWP advisory list: rare)
- Mountain Wallaby-grass *Rytidosperma oreophilum* (DELWP advisory list: rare)
- Planarian *Spathula tryssa* (DELWP advisory list: vulnerable)
- Sticky Fleabane *Pappochroma nitidum* (DELWP advisory list: rare).

To overcome the SBEU shortfalls, an alternative offset arrangement is proposed herein. The alternative offset arrangement required field data from the offset site, accurate calculation of gains available from the offset site and an up-to-date Offset Site Report from DELWP. This was the aim of the field assessment.

5. Field assessment

5.1 Field assessment methods

The overall objective of the field assessment was to gather on-ground data (as opposed to modelled data) to support an alternative offset arrangement and any future offset management plan. The field assessment aimed to provide detailed mapping of habitat zones (HZs) within the offset site and determine (rather than estimate) the reasonable available gain from the offset site based on the latest advice from DELWP (2016).

In addition, the field assessment focussed on surveying suitable habitat for the following seven target species, each of which lacked sufficient modelled important habitat within the offset site (according to the desktop assessment):

- Alpine Stackhousia *Stackhousia pulvinaris*
- Fog Club-sedge *Isolepis montivaga*
- Green Billy-buttons *Craspedia aurantia* subsp. *jamesii*
- Mossy Knawel *Scleranthus singuliflorus*
- Mountain Wallaby-grass *Rytidosperma oreophilum*
- Planarian *Spathula tryssa*
- Sticky Fleabane *Pappochroma nitidum*.

An alternative offset arrangement would need to provide the same outcomes as a conventional offset arrangement for all species requiring specific offsets, including the seven target species listed above (DEPI 2013; DELWP 2015a). With this in mind, the field assessment investigated whether the Mount Stirling offset site supports a greater area of important habitat for the seven target species than suggested by DELWP's habitat importance models. The field assessment also allowed for accurate calculation (rather than estimation) of the offset site gain (security, maintenance and improvement gain) available per hectare, which in turn allowed for accurate calculation of SBEUs available for each species.

The field assessment was conducted over five days from 1-5 February 2016. It involved the following tasks:

- Mapping of native vegetation (EVCs) and habitat zones (HZs) within the offset site.
- Vegetation quality assessments for each habitat zone, following the habitat hectares method (DSE 2004).
- Native vegetation gain scoring, to calculate the offset gain (and hence, SBEUs) that can be achieved from each HZ within the offset site.
- Targeted surveys and mapping of habitat for the seven species lacking sufficient modelled habitat.
- An inventory of flora species recorded within the offset site.
- Incidental mapping of management issues, including weed infestations, erosion and damage caused by Deer.

5.1.1 Native vegetation mapping, quality assessments and gain scoring

Mapping of native vegetation within the proposed offset site was undertaken using Arc Collector software on a Samsung handheld GPS-capable tablet. The boundaries of EVCs were mapped primarily on the basis of floristics and EVC benchmarks maintained by DELWP.

Apart from some small areas occupied by tracks or huts, the entire 262 hectares of the proposed offset site supports native vegetation. A sampling protocol was adopted for the purposes of vegetation quality assessments because it was not feasible to collect vegetation quality data for the entire 262 hectares. Twenty vegetation quality sampling points were randomly located across the proposed offset site. Vegetation quality data were collected from within a 20-metre radius of each sampling point. Sampling points were wholly within one EVC and distributed across the proposed offset site such that each EVC had at least one sampling point. EVCs covering larger areas naturally had more sampling points than EVCs covering smaller areas. For example, seven sampling points were located within Sub-alpine Woodland (EVC 43), which covers more than 220 of the 262 hectares.

Where quality scores for one EVC differed substantially and it was possible to map the boundary between areas of the same EVC but different quality, separate HZs were identified. Areas belonging to the same EVC, with similar vegetation quality scores, were placed within the same habitat zone and assigned an average (mean) of their vegetation quality scores. This treatment of HZs simplified gain scoring for the proposed offset site and is likely to assist in future management of the offset site, since areas within the same HZ share the same management issues and requirements.

5.1.2 Targeted surveys and habitat mapping

Prior to targeted surveys being undertaken, we reviewed relevant biodiversity databases, such as the Flora Information System (FIS), Victorian Fauna Database (VFD) and Victorian Biodiversity Atlas (VBA), to determine the location of past records for the seven target species. The precise habitat requirements for each of the target species was also noted.

Early February would normally be considered an optimal time for detecting the six target flora species because it coincides with their flowering periods. However, due to unfavourable environmental conditions (lack of rainfall), the 2015-2016 summer was characterised by early flowering in many alpine and sub-alpine species. The conditions may have therefore been sub-optimal for detecting all six target flora species.

Planarian *Spathula tryssa* increases its population size markedly in summer, due to increased availability of food (Hay and Ball 1979). Summer is therefore an optimal time to search for this species. The Planarian retreats to damp and dark microhabitats (streams, wet depressions, the underside of rocks and inside rock crevices) during the hot and dry summer months. Targeted surveys for the Planarian therefore concentrated on these microhabitats.

5.2 Outcome of field assessment

5.2.1 Native vegetation mapping, quality assessments and gain scoring

The field assessment produced accurate mapping of EVCs within the offset site. Seven EVCs and eight HZs were defined (Figure 4). The habitat hectares scores and native vegetation gain scores for each HZ are summarised in Table 2 below. Appendices 3 and 4 provide a detailed breakdown of habitat hectares scores and native vegetation gain scores respectively.

Despite seven different EVCs being recorded within the proposed offset site, vegetation quality across HZs and even across EVCs was relatively uniformly, with the minimum and maximum habitat scores differing by less than 24 (out of 100) habitat points. The standard error for HZs with more than two sampling points was 2 to 3 (out of 100), indicating that each HZ had sampling points with similar scores.

Native vegetation gain scoring using contemporary field data and the latest advice from DELWP regarding offsets on Crown land (DELWP 2016) resulted in gain scores being revised upwards for all HZs (Table 2; Appendix 4). These revised gain scores are premised on the following commitments:

- Security gain (10% of the current habitat score):
 - Implementation of an agreement (e.g. under Section 18B of the Victorian *Crown Land (Reserves) Act 1978*) resulting in nature conservation being the primary land management objective within the offset area.
 - Nature conservation is currently not the primary objective of land management within the proposed offset area, as it is currently zoned Public Park and Recreation Zone (PPRZ) under the Alpine Planning Scheme.
- Maintenance gain (2 habitat points per hectare):
 - Protecting against damage from recreational activities by managing public access to the offset site (e.g. with fences and appropriate signage).
 - Passive recreation (e.g. cross-country skiing) would still be permitted within the offset area but more stringently controlled (e.g. through track and campsite rationalisation).
 - The main four-wheel drive tracks (Howqua Gap Trail, Stirling Trail and Clear Hills Track) have been excised from the proposed offset area where they are not covered by a tree canopy. Public access to these tracks will not be permitted during the snow season and during severely inclement weather (e.g. periods of heavy rainfall).
 - All other existing four-wheel drive tracks will be maintained for management purposes. They are currently groomed and mostly support native vegetation (such as grasses, herbs and low shrubs). They will continue to be groomed in the same manner, to maintain access along these tracks for management vehicles and cross-country skiers.
- Improvement gain (20 habitat points per hectare):
 - Implementing management actions including (but not necessarily limited to):
 - Eliminating all identified high threat weeds (such as Willows *Salix* spp., Blackberry *Rubus fruticosus* spp. agg. and St John's Wort *Hypericum perforatum* subsp. *veronese*), where elimination requires a reduction in cover to less than 1%.
 - Controlling pest animals, particularly through functional exclusion of introduced herbivores, such as Deer and Rabbits. A fence around the entire offset area is unlikely to be feasible or desirable from a management or ecological perspective, given that the proposed offset area is contiguous with native vegetation in the broader resort and into Alpine National Park. Fences will be placed around sensitive areas where required (e.g. Alpine Bogs) and functional exclusion will be maintained through a more intensive shooting, baiting and trapping regime.

Table 2 Average habitat hectares score and native vegetation gain score for each habitat zone

Habitat Zone ID	Habitat Zone (EVC Number and Name)	Photo	Area (ha)	Sampling Points	Average Habitat Hectares Score (/100)*	SE of Habitat Hectares Score (/100)*	Habitat Hectares	Estimated Gain Score per ha (/100)**	Actual Gain Score per ha (/100)***
A	42 Sub-alpine Shrubland	1	8.04	3	63.50	3	5.11	17.53	28.70
B	43 Sub-alpine Woodland - Burnt	2	172.44	4	71.75	2	123.73	13.70	29.20
C	43 Sub-alpine Woodland - Unburnt	3	49.09	3	77.33	2	37.96	13.70	29.70
D	156 Alpine Coniferous Shrubland	4	1.28	1	86.45	NA	1.10	17.53	30.60
E	210 Sub-alpine Wet Heathland	5	1.28	2	82.36	NA	1.05	17.53	30.20
F	917 Sub-alpine Wet Sedgeland	6	0.35	2	72.82	NA	0.26	17.53	29.30
G	1001 Alpine Grassland	7	1.10	1	63.27	NA	0.70	17.53	28.30
H	1004 Alpine Grassy Heathland	8	27.15	4	75.89	3	20.60	17.53	29.60

*Habitat hectares scores are averages and therefore expressed in decimals, even though decimal scores are not normally possible for treed EVCs like Sub-alpine Woodland. SE = Standard Error.

**Estimated gain scores were estimated during the desktop assessment.

***Actual gain scores were calculated from data collected during the field assessment.

Field data were submitted to DELWP's Native Vegetation Support Team for preparation of an Offset Site Report (Appendix 5). The Offset Site Report demonstrates that, as a result of upwardly revised gain scores, the proposed offset area provides sufficient SBEUs for two of the seven target species that were formerly lacking sufficient SBEUs under the desktop assessment:

- Alpine Stackhousia *Stackhousia pulvinaris*
- Mountain Wallaby-grass *Rytidosperma oreophilum*.

While targeted surveys and habitat mapping were conducted for Alpine Stackhousia and Mountain Wallaby-grass during the field assessment, detailed results for these two species are not presented in this report. The proposed offset area no longer lacks SBEUs for Alpine Stackhousia and Mountain Wallaby-grass, meaning that an alternative offset arrangement is no longer required for these two species.

Relying on modelled important habitat, the offset site still lacks sufficient SBEUs for the following five target species (referred to as priority species):

- Fog Club-sedge *Isolepis montivaga*
- Green Billy-buttons *Craspedia aurantia* subsp. *jamesii*
- Mossy Knawel *Scleranthus singuliflorus*
- Planarian *Spathula tryssa*
- Sticky Fleabane *Pappochroma nitidum*.

The lack of SBEUs for the above five species under a conventional offset arrangement justifies the need for targeted surveys and habitat mapping for these species.

5.2.2 Targeted surveys and habitat mapping

Results for each of the five priority species (those target species still lacking SBEUs) are discussed below. Overall, targeted surveys and habitat mapping produced the following results:

- Four of the original seven target species (including three of the five priority species still lacking SBEUs) were confirmed to be present within the offset site:
 - Fog Club-sedge *Isolepis montivaga* (Photo 9)
 - Green Billy-buttons *Craspedia aurantia* subsp. *jamesii* (Photo 10)
 - Mountain Wallaby-grass *Rytidosperma oreophilum* (Photo 11)
 - Sticky Fleabane *Pappochroma nitidum* (Photo 12).
- Survey data demonstrate that the offset site has potential to generate additional SBEUs for all five priority species.
- Despite targeted surveys finding Fog Club-sedge *Isolepis montivaga*, the offsite site still lacks sufficient important habitat (and hence, SBEUs) for this species.

As a general observation, we noticed that database records for threatened species tended to be centred around the summit of Mount Stirling, even though the summit does not provide the most suitable habitat for most of these species and, in some cases, the species were found elsewhere off the summit but not on the summit itself. This suggests that the geolocation for many botanical records collected from the Mount Stirling environs may have been placed generically at the summit of Mount Stirling and may not accurately represent the location for the record. This may have had consequences for the modelling of important habitat for these species.

5.2.2.1 Fog Club-sedge

Targeted surveys recorded Fog Club-sedge *Isolepis montivaga* on the margins of wet areas in Sub-alpine Wet Heathland and Sub-alpine Wet Sedgeland near the summit of Mount Stirling (Photo 9). The locations of our records correspond approximately with the modelled habitat for Fog Club-sedge (Figure 5a).

Habitat mapping identified Sub-alpine Wet Heathland, Sub-alpine Wet Sedgeland and drainage lines around the summit of Mount Stirling as important habitat for Fog Club-sedge. Surveyed habitat results were based upon:

- Recording Fog Club-sedge from areas of Sub-alpine Wet Heathland and Sub-alpine Wet Sedgeland.
- A vegetation comparison, which revealed that vegetation within the area of modelled habitat and areas with confirmed records showed no observable difference in type or quality from vegetation across the broader Sub-alpine Wet Heathland and Sub-alpine Wet Sedgeland HZs.
- Background research into the habitat requirements for Fog Club-sedge, which indicated a preference for wet depressions or track margins in alpine and sub-alpine areas (e.g. Walsh and Entwisle 1999).

Within the offset site, the area of modelled habitat for Fog Club-sedge is 10.13 hectares. The area of surveyed habitat is 5.56 hectares, 0.56 hectares of which overlaps with modelled habitat. Areas of surveyed habitat were assigned conservative habitat importance scores of 0.9 out of 1 (Appendix 6). The addition of new surveyed habitat (i.e. without including areas where surveyed habitat overlaps modelled habitat) would bring the total area of important habitat for Fog Club-sedge to 15.13 hectares. Applying the relevant gain scores to the total area of modelled and surveyed important habitat, the offset site should provide 4.114 SBEUs. This is not sufficient to meet the specific offset requirements for Fog Club-sedge. There will be a shortfall of 3.223 SBEUs (Appendix 6).

5.2.2.2 Green Billy-buttons

Green Billy-buttons *Craspedia aurantia* subsp. *jamesii* (formerly *Craspedia jamesii*) recently underwent taxonomic revision, which the National Herbarium of Victoria now accepts (Schmidt-Lebuhn and Milner 2013). Green Billy-buttons is no longer considered a distinct species. It is now considered a subspecies of *Craspedia aurantia*. Orange Billy-buttons *Craspedia aurantia* subsp. *aurantia* and Green Billy-buttons *Craspedia aurantia* subsp. *jamesii* were found widely distributed in many different HZs on Mount Stirling (Photo 10).

Habitat mapping identified Sub-alpine Wet Heathland, Sub-alpine Wet Sedgeland, Alpine Grassland and Alpine Grassy Heathland (HZs E, F, G and H) around the summit of Mount Stirling as important habitat for Green Billy-buttons (Figure 5b). Surveyed habitat results were based upon:

- Recording Green Billy-buttons from broad areas of grassland and open heath around the Mount Stirling summit.
- A vegetation comparison, which revealed that vegetation within the area of modelled habitat and areas with confirmed records showed no observable difference in type or quality from vegetation across the broader Alpine Grassland, Alpine Grassy Heathland, Sub-alpine Wet Heathland and Sub-alpine Wet Sedgeland HZs.
- Background research into the habitat requirements for Green Billy-buttons, which indicated a preference for grassland and open heathland in alpine and upper sub-alpine areas (e.g. Walsh and Entwisle 1999).

Within the offset site, the area of modelled habitat for Green Billy-buttons is 20.25 hectares. The area of surveyed habitat is 29.87 hectares, 11.46 hectares of which overlaps with modelled habitat. Areas of surveyed habitat were assigned conservative habitat importance scores of 0.9 out of 1 (Appendix 6). The addition of new surveyed habitat (i.e. without including areas where surveyed habitat overlaps modelled habitat) would

bring the total area of important habitat for Green Billy-buttons to 38.66 hectares. Applying the relevant gain scores to the total area of important habitat, the offset site should provide 10.359 SBEUs, enough to meet the specific offset requirements for Green Billy-buttons (Appendix 6).

5.2.2.3 Mossy Knawel

Targeted surveys did not record Mossy Knawel *Scleranthus singuliflorus*, despite important habitat for the species being modelled in the offset area. The closely related Twin-flower Knawel *Scleranthus biflorus* is widespread throughout the Alpine Grassland and Alpine Grassy Heathland surrounding the summit of Mount Stirling.

Habitat mapping identified Alpine Grassland and Alpine Grassy Heathland around the summit of Mount Stirling as important habitat for Mossy Knawel (Figure 5c). Surveyed habitat results were based upon:

- A vegetation comparison, which revealed that vegetation within the area of modelled habitat shows no observable difference in type or quality from vegetation across the broader Alpine Grassland and Alpine Grassy Heathland HZs.
- Background research into the habitat requirements for Mossy Knawel, which indicated a preference for Alpine Grassland and Alpine Grassy Heathland (e.g. Walsh and Entwisle 1999).

Within the offset site, the area of modelled habitat for Mossy Knawel is 15.19 hectares. The area of surveyed habitat is 28.24 hectares, 10.82 hectares of which overlaps with modelled habitat. Areas of surveyed habitat were assigned conservative habitat importance scores of 0.9 out of 1 (Appendix 6). The addition of new surveyed habitat (i.e. without including areas where surveyed habitat overlaps modelled habitat) would bring the total area of important habitat Mossy Knawel to 32.61 hectares. Applying the relevant gain scores to the total area of important habitat, the offset site should provide 8.736 SBEUs, enough to meet the specific offset requirements for Mossy Knawel (Appendix 6).

5.2.2.4 Planarian

Targeted surveys did not record Planarian *Spathula tryssa*, despite active searching in areas of modelled habitat and suitable habitat. The species is small and difficult to detect. Unfavourable seasonal conditions (low rainfall) may have further hindered searches, as suitable habitat includes the underside of rocks and inside rock crevices near streams, wet depressions and rock pools with relatively stable temperatures (Hay and Ball 1979).

Habitat mapping identified drainage lines, Sub-alpine Wet Heathland and Sub-alpine Wet Sedgeland around the summit of Mount Stirling as important habitat for Planarian (Figure 5d). Surveyed habitat results were based upon the following:

- Modelled habitat for Planarian within the offset area appears to be based around a 1994 VBA record for the species with 150-metre accuracy (record collected by Rosalind St Clair). The record is within 150 metres of a drainage line that matches the habitat requirements for Planarian. Based on our field assessment of this drainage line, we concluded that most major drainage lines within the offset area offer equally suitable habitat for Planarian. All areas within 5 metres of a major drainage line were therefore considered important Planarian habitat and given a conservative habitat importance score of 0.9 out of 1 (Appendix 6).
- Areas of Sub-alpine Wet Heathland and Sub-alpine Wet Sedgeland contain wet depressions and rock pools that are suitable Planarian habitat. These areas were assigned a conservative habitat importance score of 0.7 out of 1 to acknowledge that they were more exposed to the elements and therefore do not offer the same stable temperatures that Planarian requires (Appendix 6).

Overall, there are 0.56 hectares of modelled habitat for Planarian within the offset site. The area of surveyed habitat is 5.56 hectares, none of which overlaps with modelled habitat. The addition of new surveyed habitat would bring the total area of important habitat for Planarian to 6.13 hectares. Applying the relevant importance and gain scores to the total area of important habitat, the offset site should provide 1.550 SBEUs, enough to meet the specific offset requirements for Planarian (Appendix 6).

5.2.2.5 Sticky Fleabane

Targeted surveys recorded Sticky Fleabane *Pappochroma nitidum* (formerly *Erigeron nitidus*) in Alpine Grassy Heathland on the eastern side of the Mount Stirling summit (Photo 12).

Habitat mapping identified Alpine Grassland and Alpine Grassy Heathland around the summit of Mount Stirling as important habitat for Sticky Fleabane (Figure 5e). Surveyed habitat results were based upon:

- Recording Sticky Fleabane from areas of Alpine Grassy Heathland.
- A vegetation comparison, which revealed that vegetation within the area of modelled habitat and areas with confirmed records shows no observable difference in type or quality from vegetation across the broader Alpine Grassland and Alpine Grassy Heathland HZs.
- Background research into the habitat requirements for Sticky Fleabane, which indicated a preference for Alpine Grassland and Alpine Grassy Heathland (e.g. Walsh and Entwisle 1999).

Within the offset site, the area of modelled habitat for Sticky Fleabane is 5.06 hectares. The area of surveyed habitat is 28.24 hectares, 4.31 hectares of which overlaps with modelled habitat. Areas of surveyed habitat were assigned conservative habitat importance scores of 0.9 out of 1 (Appendix 6). The addition of new surveyed habitat (i.e. without including areas where surveyed habitat overlaps modelled habitat) would bring the total area of important habitat for Sticky Fleabane to 28.99 hectares. Applying the relevant gain scores to the total area of important habitat, the offset site should provide 7.733 SBEUs, enough to meet the specific offset requirements for Sticky Fleabane (Appendix 6).

5.2.3 Records of flora species and management issues

A list of all species recorded within the offset site is presented in Appendix 7.

The following management issues were noted during the field assessment:

- Several infestations of Blackberry *Rubus fruticosus* spp. agg. and Willow *Salix* spp. in drainage lines running off the East Summit Trail (Photo 13)
- Several infestations of Spear Thistle *Cirsium vulgare* and St John's Wort *Hypericum perforatum* subsp. *veronese* on a disturbed ridgeline northeast of the Geelong Grammar School hut (Photo 14)
- Track erosion east of the summit above Stanley Bowl (Photo 15)
- Damage caused by Deer (probably Sambar Deer) in select areas of burnt Sub-alpine Woodland and in most Sub-alpine Wet Heathland and Sub-alpine Wet Sedgeland HZs (Photo 16).

These management issues will be addressed by any future offset management plan.

6. Applying the alternative arrangements

6.1 Requirements for consideration of alternative offset arrangements

The Biodiversity Assessment Guidelines allow for alternative offset arrangements to be considered on a case by case basis (DEPI2013; DELWP 2015a). DELWP has provided requirements that must be met before alternative offset arrangements will be considered (DELWP 2015a). An assessment of the Mount Buller water storage project against these requirements is provided in Sections 6.1.1–6.1.3 (below). The assessment demonstrates that alternative offset arrangements should be considered for the Mount Buller water storage project.

6.1.1 Specific offsets cannot be obtained

Alternative offset arrangements are only for specific offsets and only when standard specific offsets cannot be obtained. Finding and securing specific offsets is challenging in Victoria's alpine resorts because many rare or threatened species are naturally restricted to the Victoria Alps bioregion.

The Mount Buller water storage project requires specific offsets for 18 rare or threatened species. These specific offsets are not available on the Native Vegetation Credit Register (NVCR). The offset requirements can only be achieved on public land contained in the resorts, the Alpine National Park or State Forest in the Victorian Alps bioregion.

The desktop assessment for the project's offset strategy (Section 4.2) identified the summit and surrounds of Mount Stirling as the most suitable site for meeting the offset requirements of the project. However, this offset site does not generate sufficient gain to meet the offset requirements for five rare or threatened species (the five priority species presented in Section 5.2.1). Thus, alternative offset arrangements should be considered.

6.1.2 Impacts minimised

Before alternative offset arrangements can be considered, steps must have been taken to avoid impacts on modelled habitat for rare/threatened species and minimise impacts on Victoria's biodiversity from the removal of native vegetation.

With this in mind, GHD, in consultation with Biosis and the RMB, has refined the design of the project (Biosis and GHD 2016). In comparison with the original project design, the new design:

- Avoids all direct impacts on Alpine Bogs.
- Reduces direct removal of native vegetation by more than 10%, from 5.919 hectares to 5.278 hectares.
- Avoids modelled habitat for:
 - Tadgell's Daisy *Brachyscome tadgellii*
 - Mount Buller Snow-gentian *Gentianella muelleriana* subsp. *willisiana*
 - Snowfield Groundsel *Senecio pinnatifolius* var. *alpinus*.
- Minimises removal of habitat for Broad-toothed Rat, Alpine Bog Skink and other fauna.
- Reduces indirect impacts on Alpine Bogs by incorporating mitigation measures, such as an environmental watering system.

The results of this redesign process are the primary means by which the project has avoided and/or minimised ecological impacts. The results have been achieved through an iterative process, involving (but not limited to):

- Realignment and narrowing of pipelines and access corridors
- Moving stockpile locations to existing disturbed areas of non-native vegetation in preference to areas of native vegetation
- Reducing the overall size of the PCF by almost one hectare.

6.1.3 Equivalent evidence-based outcomes

When compared with a conventional offset arrangement, an alternative offset arrangement must provide equivalent outcomes for the species for which specific offsets are required. An alternative offset arrangement does not allow for trading between offset types or species, where excess GBEUs or SBEUs can be generated at an offset site (DELWP 2015a). Rather, an alternative offset arrangement must demonstrate, with suitable evidence, that the proposed offset site supports habitat or populations that are not captured by DELWP's habitat importance models for the required rare or threatened species.

The proposed Mount Stirling offset site contains modelled important habitat for all 18 species for which specific offsets are required. However, the offset site lacks sufficient modelled habitat (and hence, SBEUs) for five of these species (the priority species). Targeted surveys and habitat mapping were conducted for these five species during five days of rigorous field assessment of the proposed Mount Stirling offset area.

The field assessment gathered evidence in support of an alternative offset arrangement, including:

- Records for three of the five priority species within the proposed offset site, suggesting that suitable habitat for these species should be extended beyond areas of modelled habitat.
- Maps of surveyed habitat for all five priority species, showing that suitable habitat for these species should be extended into areas adjacent to modelled habitat based on strong similarities in the type and quality of vegetation present.

Evidence from the field assessment demonstrates that sufficient additional important habitat (and hence, SBEUs) exist within the Mount Stirling offset area for four of the five priority species that lack sufficient SBEUs. The field assessment suggests that the offsite area still lacks sufficient important habitat (and hence, SBEUs) for Fog Club-sedge *Isolepis montivaga*. Specific offsets for this species will be secured elsewhere. Modelled habitat and specific offsets for Fog Club-sedge are available at Falls Creek Alpine Resort.

6.2 DELWP approval

We have relied on DELWP's guidance note (DELWP 2015a) and on advice from senior DELWP policy staff (DELWP 2015c; DELWP2016) to formulate the alternative offset arrangement within this offset strategy. This strategy attempts to achieve a no net loss to Victoria's biodiversity for the Mount Buller water storage project. If the Secretary of DELWP (or delegate) is satisfied with the alternative arrangement described herein, the alternative arrangement would form part of the planning approval (if granted) for the Mount Buller Sustainable Water Security Project.

7. Conclusion

Finding and securing specific offsets in Victoria's alpine resorts is challenging due to issues of:

- Restricted species distribution
- Land tenure (alpine resorts are public land)
- Limited survey effort away from developed areas in the resorts, thereby compromising the accuracy and completeness of DELWP's habitat importance maps
- Taxonomic revisions not captured in the database records used to construct DELWP's habitat models, thereby compromising the accuracy of habitat importance maps.

This offset strategy attempts to overcome these challenges by providing an alternative offset arrangement for the Mount Buller water storage project.

This strategy demonstrates that a proposed offset area of 262 hectares, encompassing the summit and upper slopes of Mount Stirling, would provide the following:

- An offset area that meets DELWP's offset eligibility criteria
- An excess in general biodiversity equivalence units (GBEUs) to meet the general offset requirements for the project
- Modelled important habitat for all of the 18 species requiring specific offsets
- An excess of specific biodiversity equivalence units (SBEUs) for 17 of the 18 species requiring specific offsets, if surveyed habitat from field assessments is accepted in addition to modelled habitat
- A shortfall of SBEUs for one of the species requiring specific offsets, Fog Club-sedge *Isolepis montivaga*.

Other locations within the Mount Buller and Mount Stirling Alpine Resorts or the offset program being scoped by Falls Creek Alpine Resort provide alternative options to secure the shortfall in specific offsets for Fog Club-sedge.

DELWP's approval of this alternative offset arrangement would be required before an offset management plan could be implemented. Under the offset management plan, offsets could be secured by registering agreements under Section 18B of the Victorian *Crown Land (Reserves) Act 1978*, by using master planning to map and describe protected offsets areas or by using local planning scheme mechanisms to secure offsets under the Victorian *Planning and Environment Act 1987*. A detailed offset management plan and final site mapping would be required as a permit condition to support this strategy.

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Figures

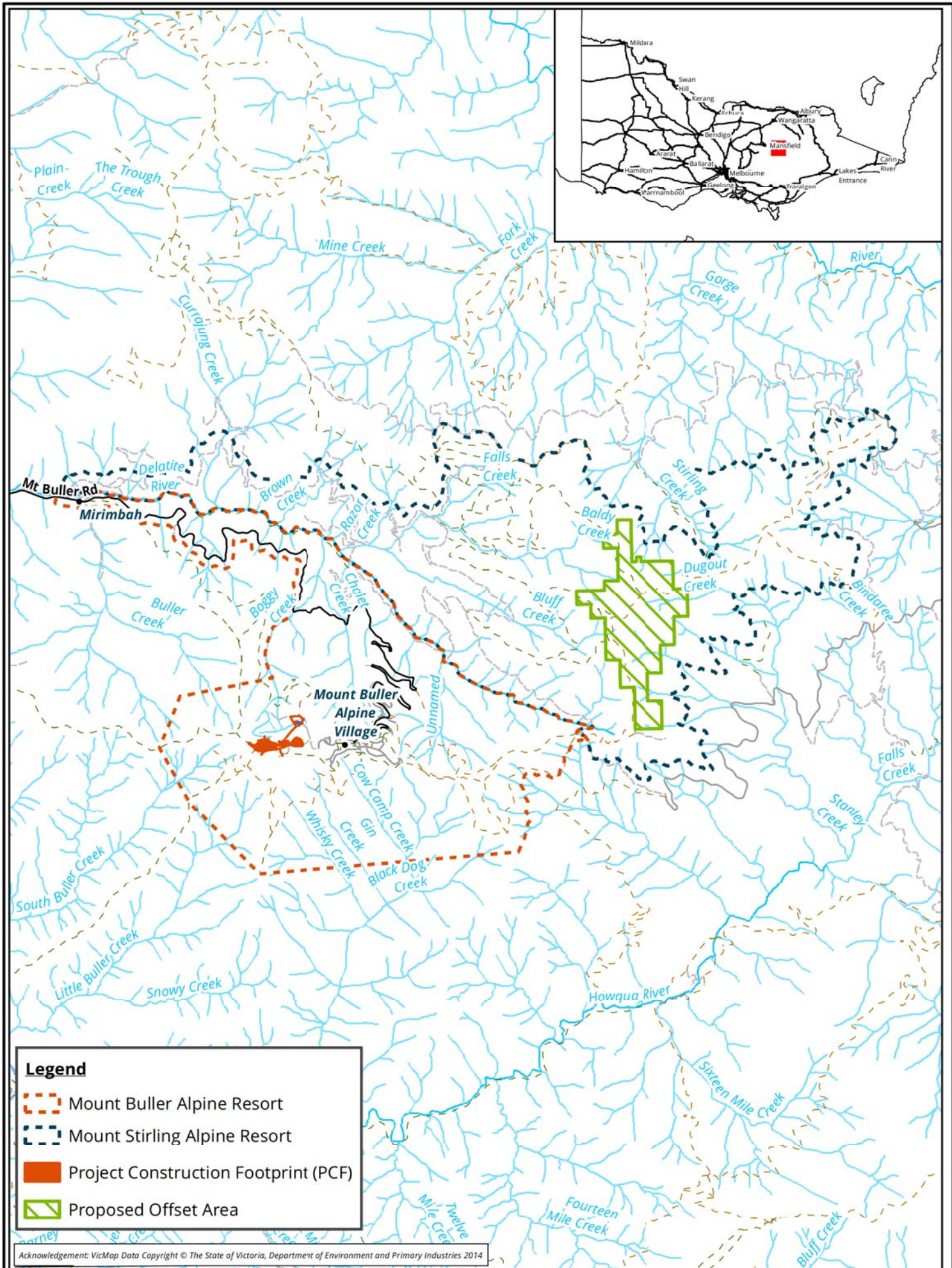
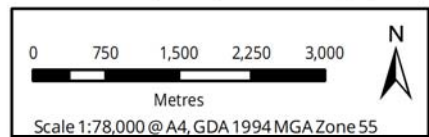


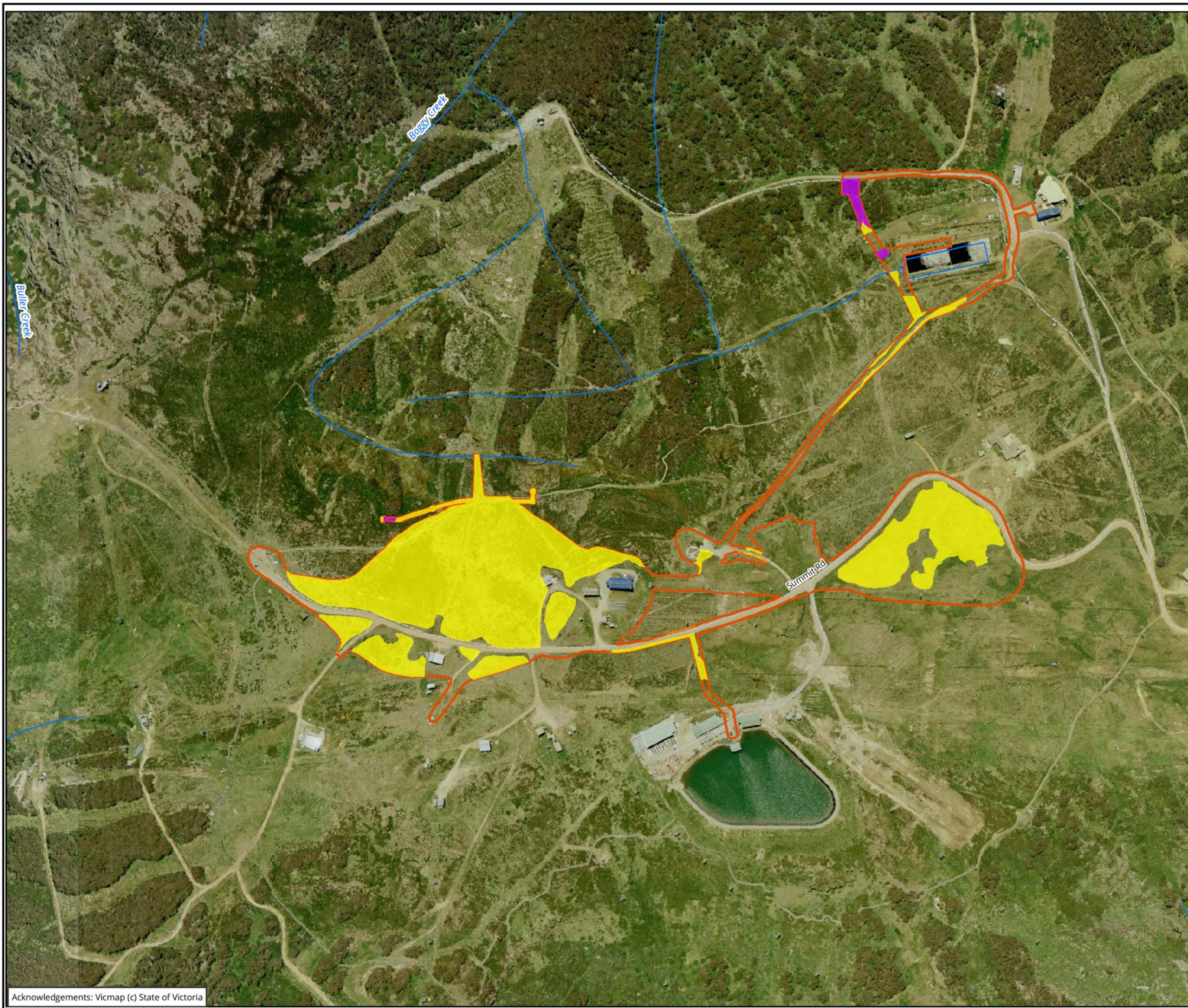
Figure 1: Location of the Mount Buller and Mount Stirling Alpine Resorts, Victoria.



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Checked by: MG, Drawn by: LH, Last edited by: Iharley
Location: P:\22600s\22610\Mapping\





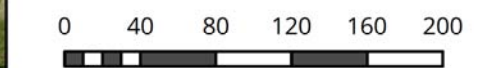
Legend

- Project Construction Footprint (PCF)

Ecological Vegetation Classes (GHD)

- EVC 1004 - Alpine Grassy Heathland
- EVC 43 - Sub-Alpine Woodland

Figure 2: The project construction footprint (PCF), Mount Buller, Victoria.



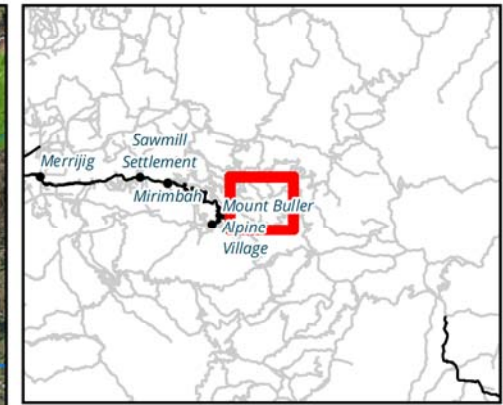
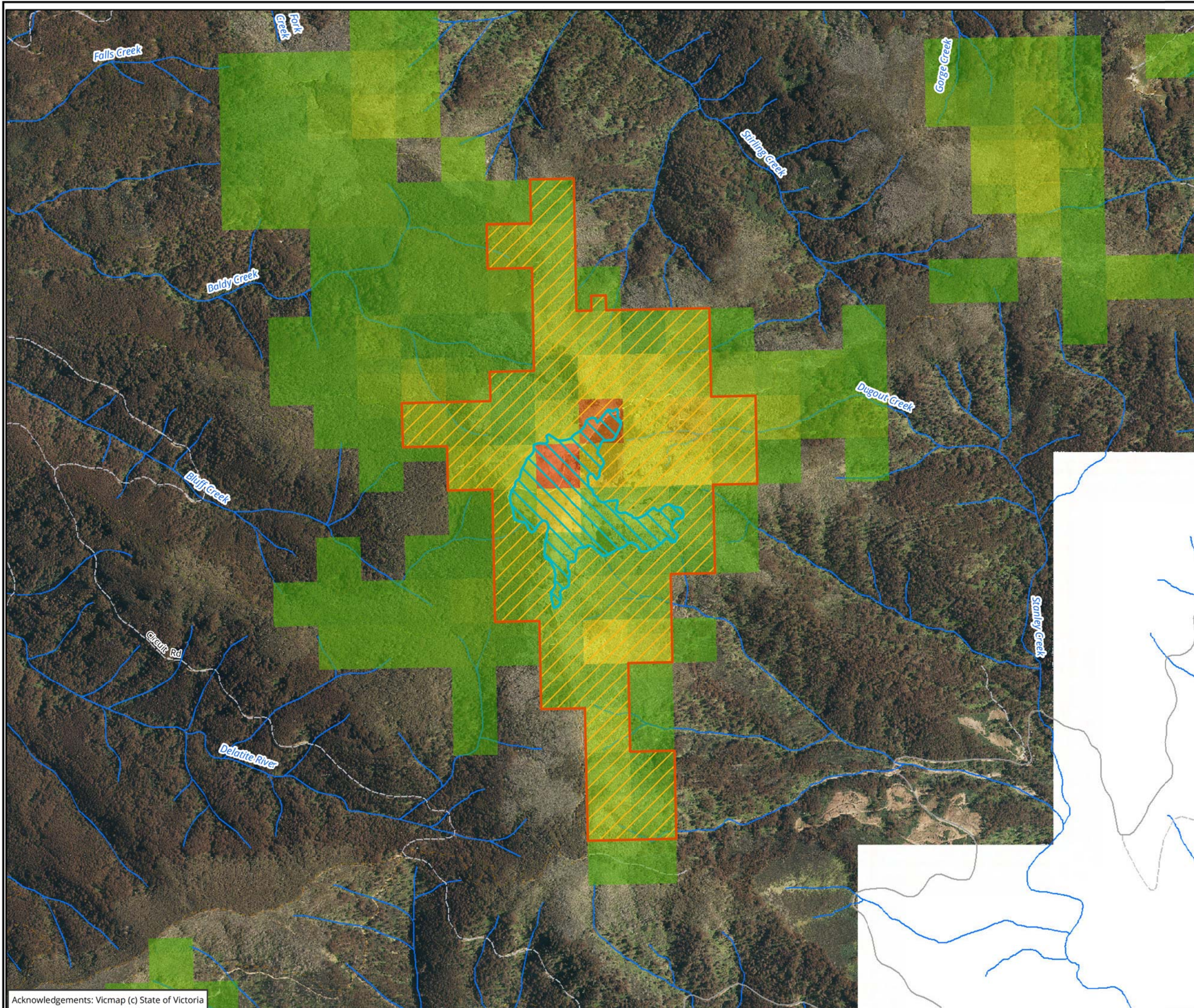
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 Coordinate System: GDA 1994 MGA Zone 55

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Legend

Proposed Offset Area

Modelled 2005 Ecological Vegetation Classes

HZ A - Sub-alpine Treeless Vegetation

HZ B - Sub-alpine Woodland

Modelled Habitat for Target Species
(No. of species for which habitat exists)

	0
	1
	2
	3
	4
	5
	6
	7
	8
	9
	13
	14

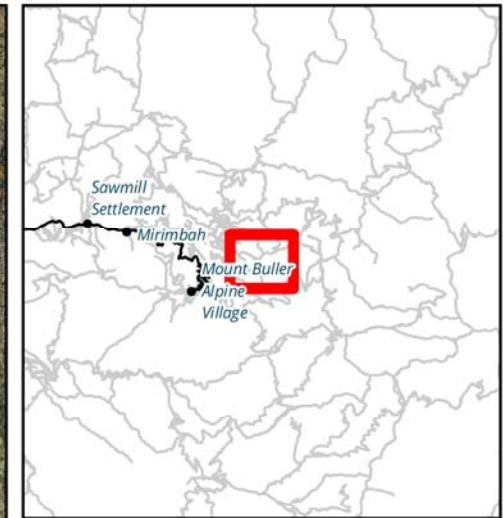
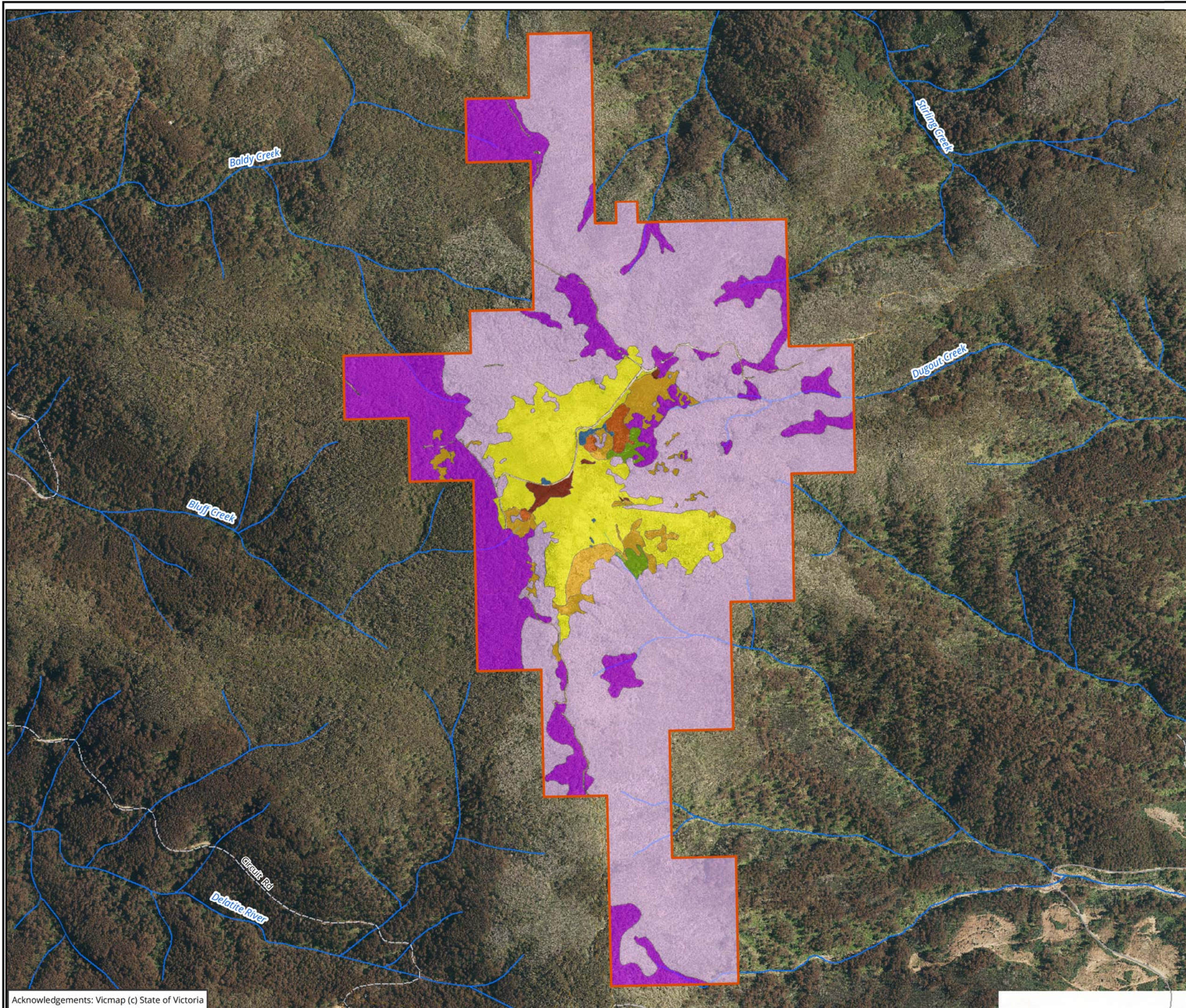
Figure 3: Modelled habitat for target species within the proposed offset area, Mount Stirling, Victoria.

0 180 360 540 720 900
Metres

Scale: 1:18,000 @ A3
Coordinate System: GDA 1994 MGA Zone 55

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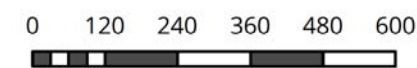
Legend

Proposed Offset Area

Ecological Vegetation Classes

- 42 Sub-alpine Shrubland
- 43 Sub-alpine Woodland - Burnt
- 43 Sub-alpine Woodland - Unburnt
- 156 Alpine Coniferous Shrubland
- 210 Sub-alpine Wet Heathland
- 917 Sub-alpine Wet Sedgeland
- 1001 Alpine Grassland
- 1004 Alpine Grassy Heathland

Figure 4: Ecological Vegetation Classes (EVCs) and Habitat Zones (HZs) within the proposed offset area, Mount Stirling, Victoria.

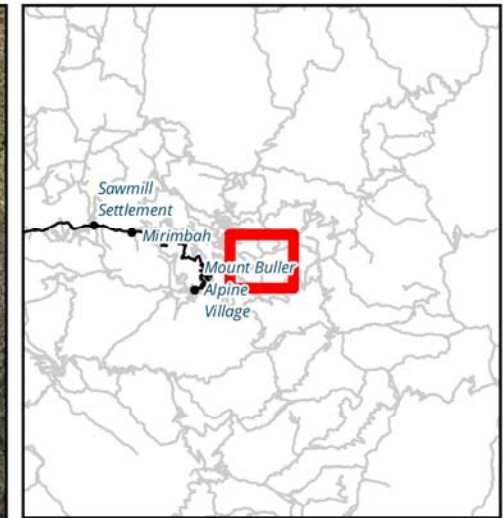
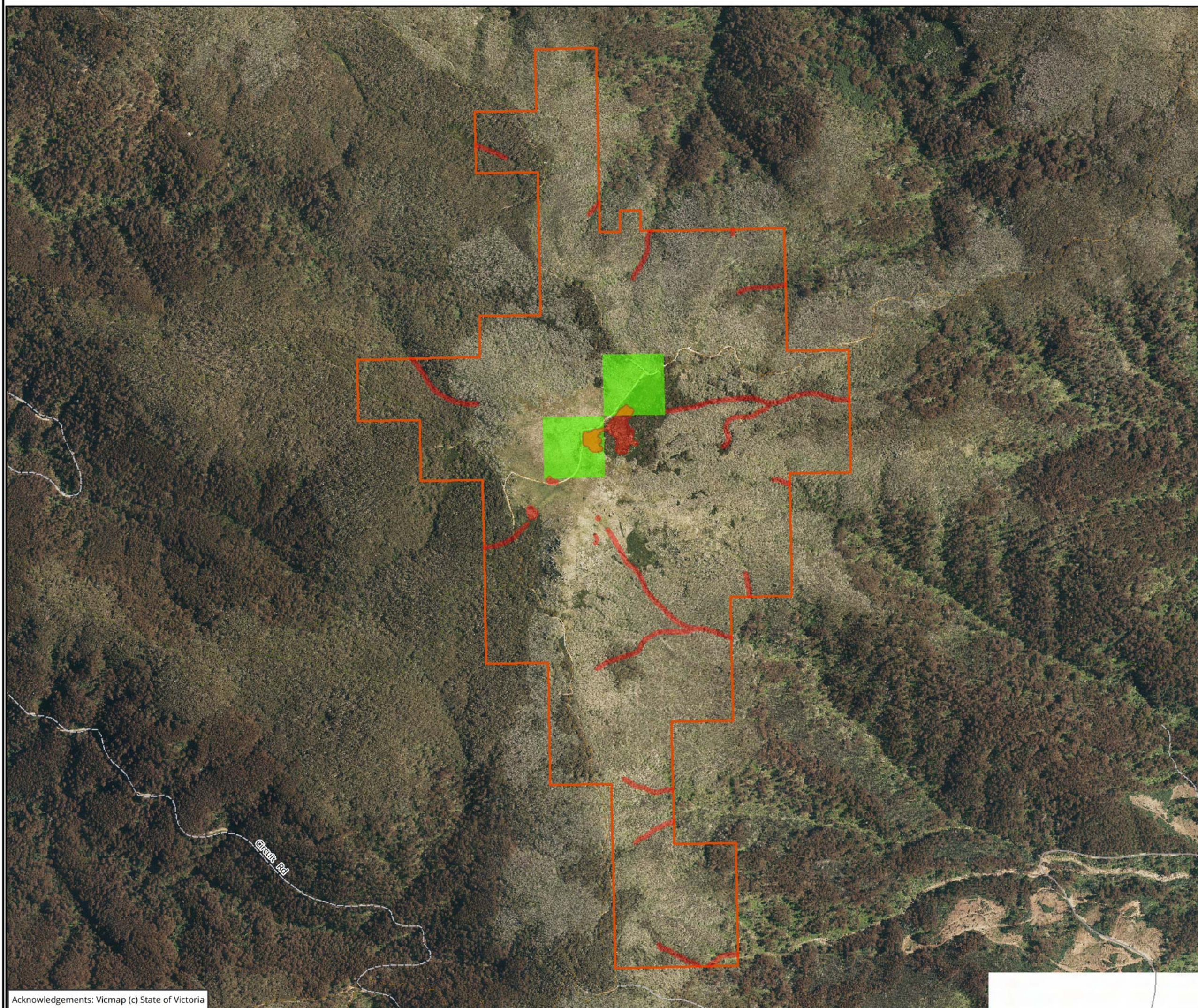


Metres
 Scale: 1:12,500 @ A3
 Coordinate System: GDA 1994 MGA Zone 55



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Matter: 22610,
 Date: 03 August 2016,
 Checked by: MG, Drawn by: LH, Last edited by: Iharley
 Location: P:\22600s\22610\Mapping\22610_OS_F4_EVCs_MtStirlingOffsetSite




Legend

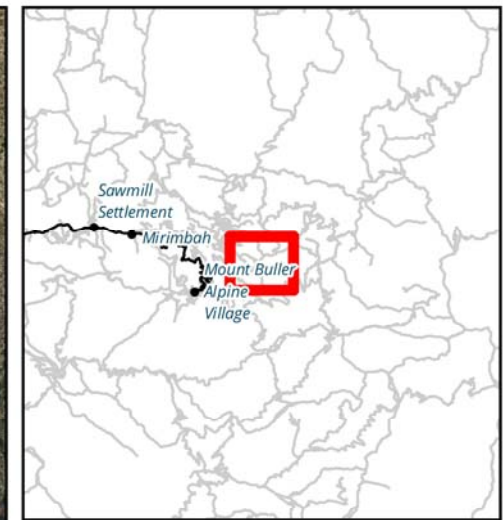
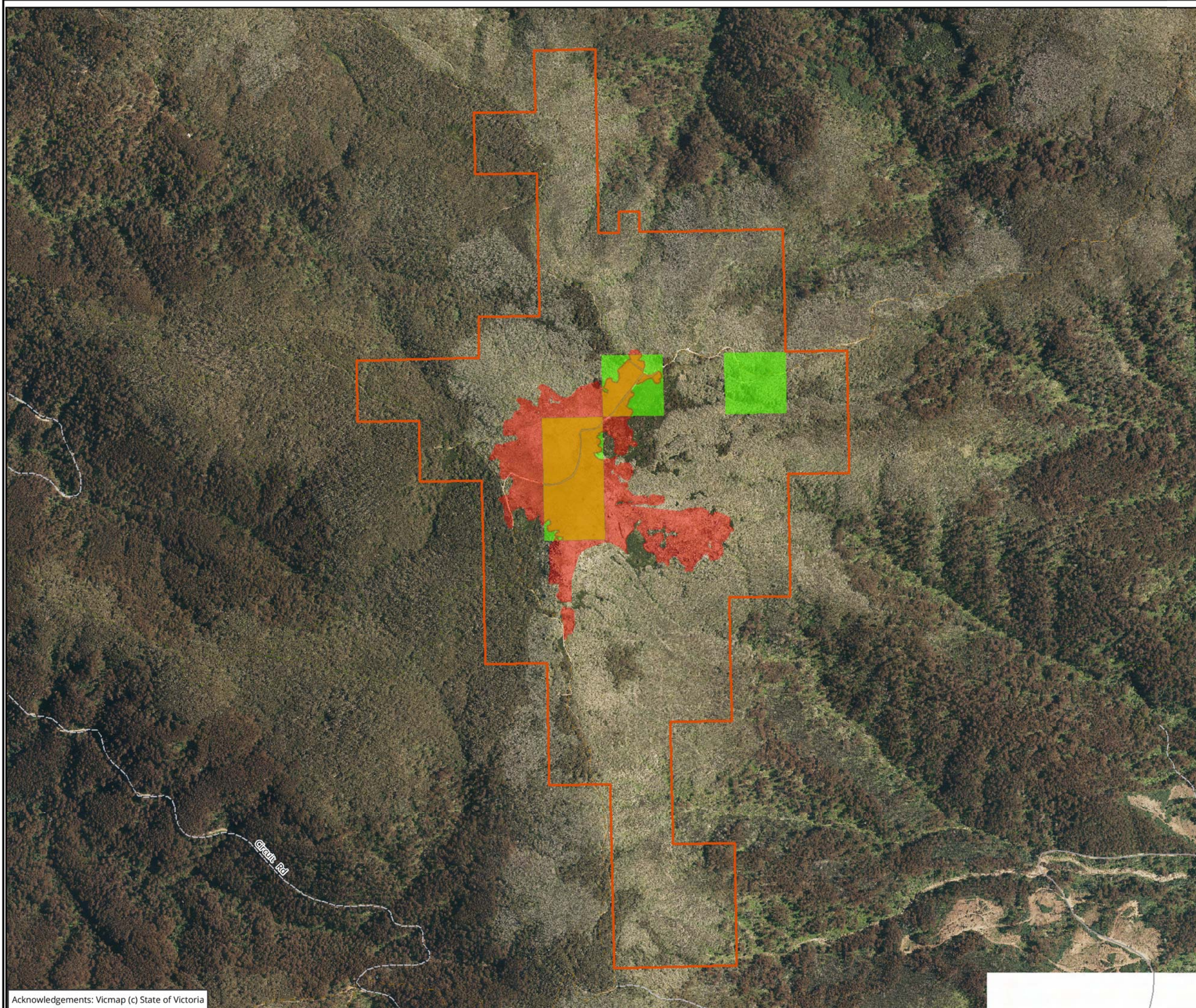
- Proposed Offset Area
- Surveyed Habitat (Biosis 2016)
- Modelled Habitat (DELWP 2013)
- Overlap between Modelled and Surveyed

Figure 5a: Modelled and surveyed habitat for Fog Club-sedge within the proposed offset area, Mount Stirling, Victoria.

0 120 240 360 480 600
 Metres
 Scale: 1:13,000 @ A3
 Coordinate System: GDA 1994 MGA Zone 55



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Legend

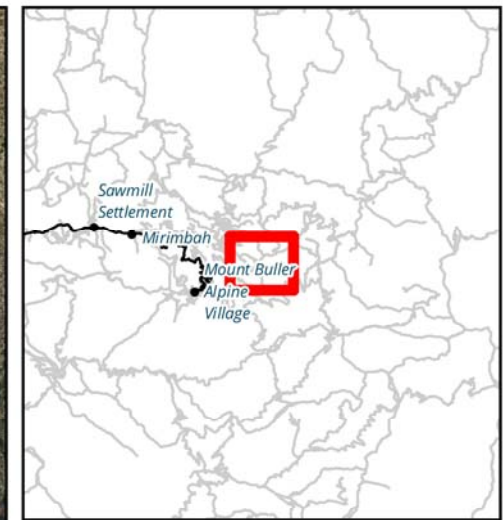
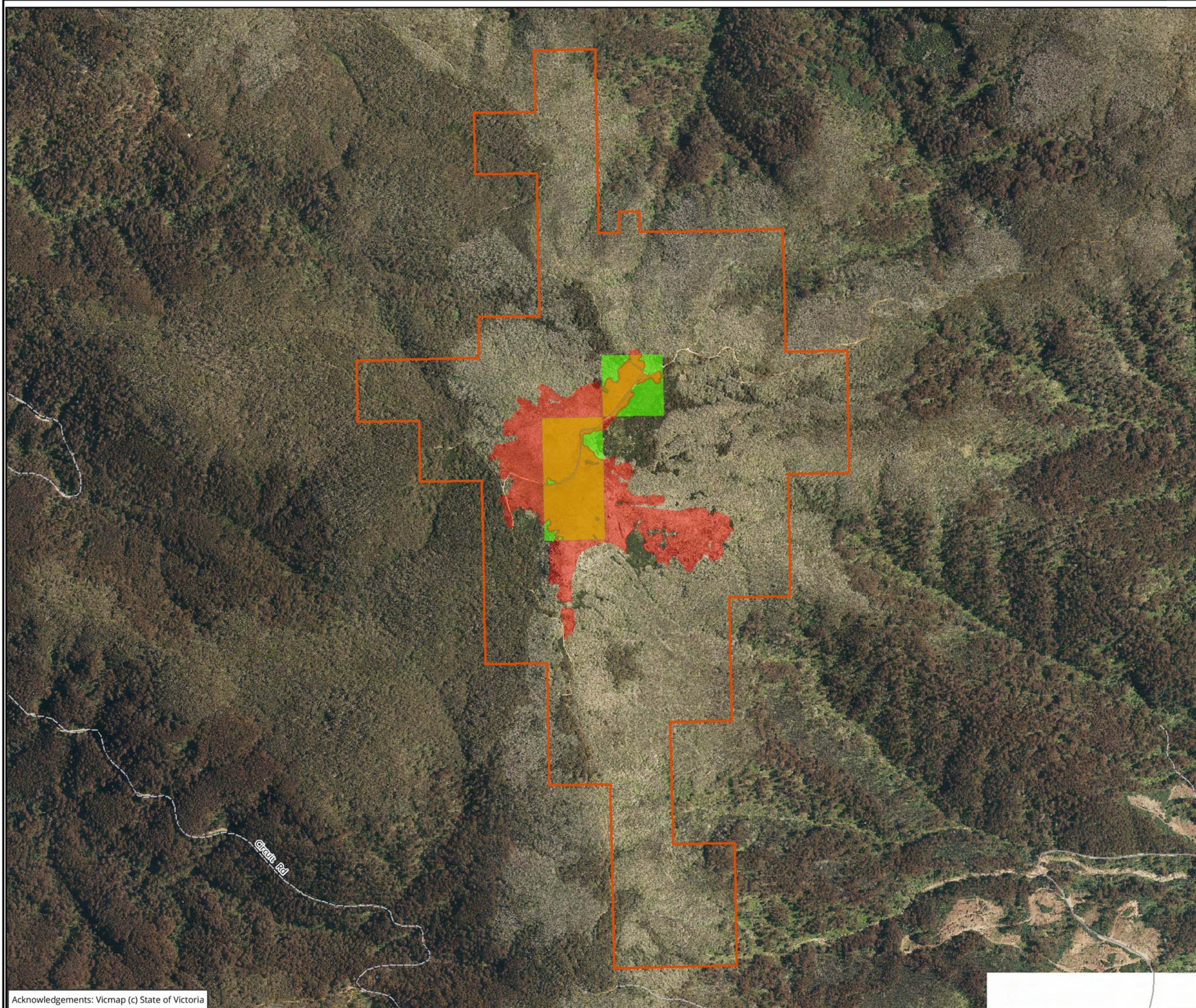
- Proposed Offset Area
- Surveyed Habitat (Biosis 2016)
- Modelled Habitat (DELWP 2013)
- Overlap between Modelled and Surveyed

Figure 5b: Modelled and surveyed habitat for Green Billy-buttons within the proposed offset area, Mount Stirling, Victoria.

0 120 240 360 480 600
 Metres
 Scale: 1:13,000 @ A3
 Coordinate System: GDA 1994 MGA Zone 55



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Legend

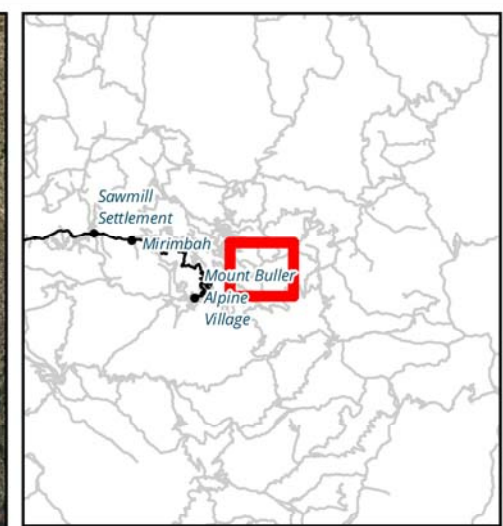
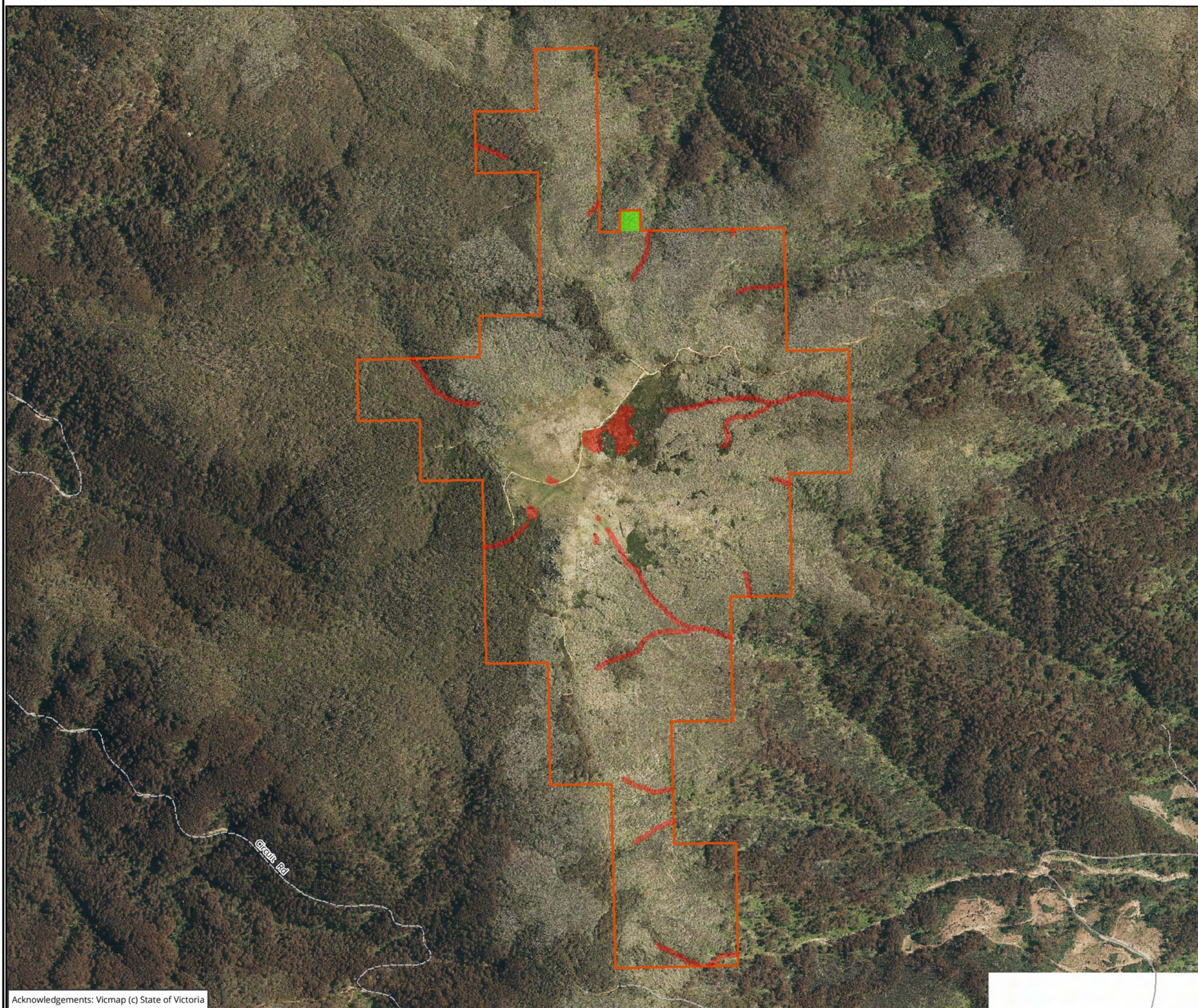
- Proposed Offset Area
- Surveyed Habitat (Biosis 2016)
- Modelled Habitat (DELWP 2013)
- Overlap between Modelled and Surveyed

Figure 5c: Modelled and surveyed habitat for Mossy Knawel within the proposed offset area, Mount Stirling, Victoria.

0 120 240 360 480 600
 Metres
 Scale: 1:13,000 @ A3
 Coordinate System: GDA 1994 MGA Zone 55



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Legend

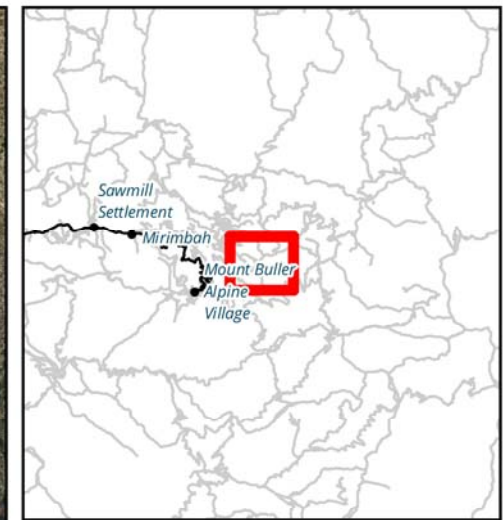
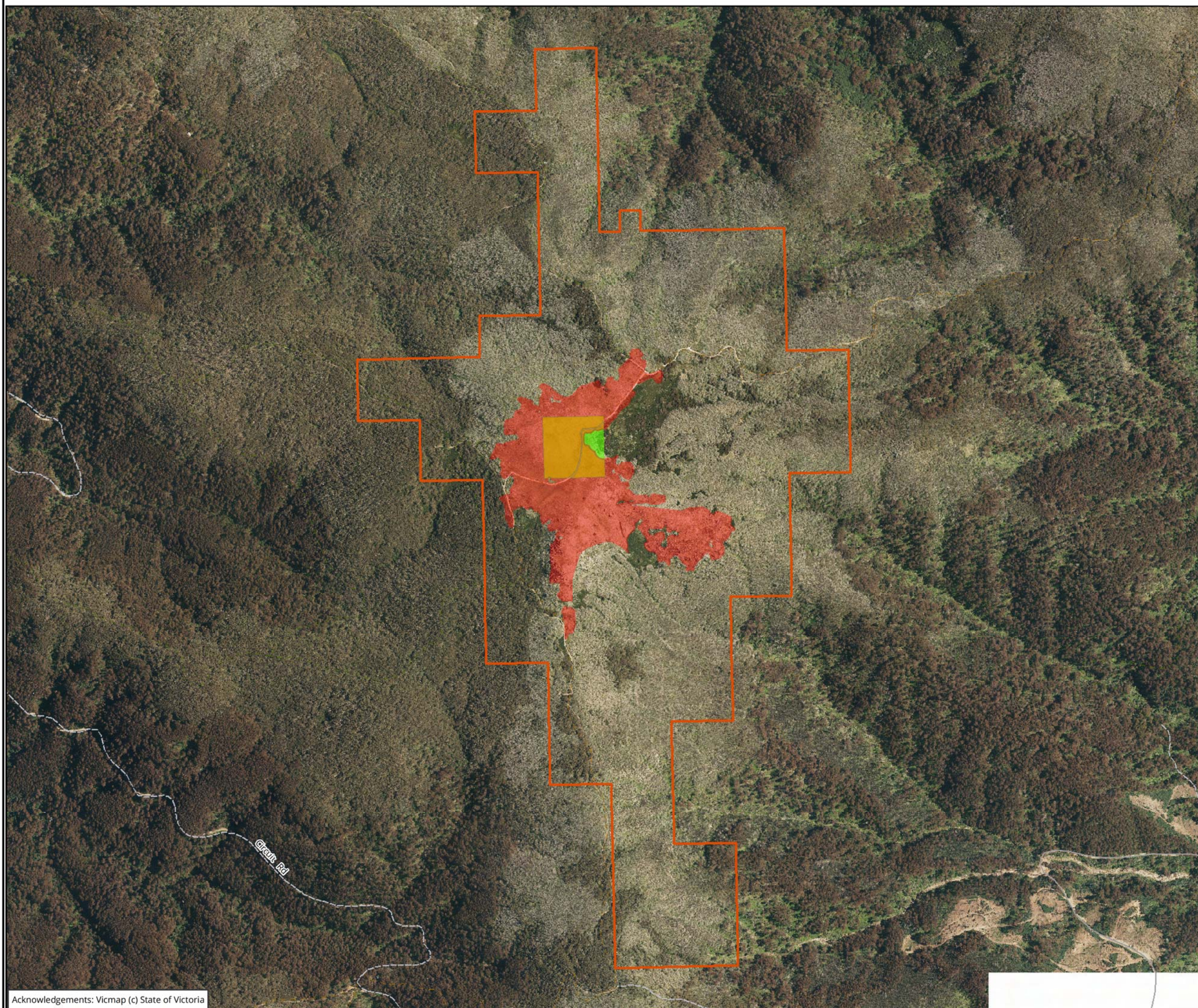
- Proposed Offset Area
- Surveyed Habitat (Biosis 2016)
- Modelled Habitat (DELWP 2013)

Figure 5d: Modelled and surveyed habitat for Planarian within the proposed offset area, Mount Stirling, Victoria.

0 120 240 360 480 600
 Metres
 Scale: 1:13,000 @ A3
 Coordinate System: GDA 1994 MGA Zone 55



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Legend

- Proposed Offset Area
- Surveyed Habitat (Biosis 2016)
- Modelled Habitat (DELWP 2013)
- Overlap between Modelled and Surveyed

Figure 5e: Modelled and surveyed habitat for Sticky Fleabane within the proposed offset area, Mount Stirling, Victoria.

0 120 240 360 480 600
 Metres
 Scale: 1:13,000 @ A3
 Coordinate System: GDA 1994 MGA Zone 55



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Photos



Photo 1: Sub-alpine Shrubland (Habitat Zone A).



Photo 2: Burnt Sub-alpine Woodland (Habitat Zone B).



Photo 3: Unburnt Sub-alpine Woodland (Habitat Zone C).



Photo 4: Alpine Coniferous Shrubland (Habitat Zone D).



Photo 5: Sub-alpine Wet Heathland (Habitat Zone E).



Photo 6: Sub-alpine Wet Sedgeland (Habitat Zone F).



Photo 7: Alpine Grassland (Habitat Zone G).



Photo 8: Alpine Grassy Heathland (Habitat Zone H).



Photo 9: Sub-alpine Wet Sedgeland, where Fog Club-sedge was recorded.



Photo 10: Green Billy-buttons, recorded in Alpine Grassy Heathland.



Photo 11: Mountain Wallaby-grass, recorded in Alpine Grassy Heathland.



Photo 12: Alpine Grassy Heathland, where Sticky Fleabane was recorded.



Photo 13: Blackberry infestation near the East Summit Trail.



Photo 14: Spear Thistle and St John's Wort infestation near the Geelong Grammar School hut.



Photo 15: Track erosion above Stanley Bowl.



Photo 16: Deer prints and wallow in burnt Sub-alpine Woodland near East Summit Trail.

Appendices

Appendix 1: Biodiversity impact and offset requirements (BIOR) report

Biodiversity impact and offset requirements report

This report **does not represent an assessment by DELWP** of the proposed native vegetation removal. It provides additional biodiversity information to support moderate and high risk-based pathway applications for permits to remove native vegetation under clause 52.16 or 52.17 of planning schemes in Victoria.

Date of issue: 20/04/2017
Time of issue: 10:27 am

DELWP ref: BIO_0354

Project ID	22610_VegClearing_scenario1 Mt Buller
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Summary of marked native vegetation

Risk-based pathway	High
Total extent	6.177 ha
Remnant patches	6.177 ha
Scattered trees	0 trees
Location risk	C
Strategic biodiversity score of all marked native vegetation	0.968

Biodiversity impact and offset requirements report

Offset requirements if a permit is granted

If a permit is granted to remove the marked native vegetation, a requirement to obtain a native vegetation offset will be included in the permit conditions. The offset must meet the following requirements:

Offset type	General offset
General offset amount (general biodiversity equivalence units)	1.102 general units
General offset attributes	
Vicinity	Goulburn Broken Catchment Management Authority (CMA) or Mount Buller Alpine Resort (Unincorporated) Council
Minimum strategic biodiversity score	0.774 ¹
Offset type	Specific offset(s)
Specific offset amount (specific biodiversity equivalence units) and attributes	7.446 specific units of habitat for Alpine Bog Skink 7.212 specific units of habitat for Snow Aciphyll 7.896 specific units of habitat for Mountain Aciphyll 8.332 specific units of habitat for Mountain Daisy 2.312 specific units of habitat for Alpine Marsh-marigold 8.400 specific units of habitat for Carpet Sedge 6.442 specific units of habitat for Broad-leaf Flower-rush 5.650 specific units of habitat for Sticky Fleabane 7.337 specific units of habitat for Fog Club-sedge 8.391 specific units of habitat for Tussock Woodrush 6.636 specific units of habitat for Veined Plantain 8.468 specific units of habitat for Gunn's Alpine Buttercup 1.274 specific units of habitat for Felted Buttercup 6.059 specific units of habitat for Mossy Knawel 1.218 specific units of habitat for Alpine Stackhousia 7.172 specific units of habitat for Green Billy-buttons 5.955 specific units of habitat for Mountain Wallaby-grass 0.796 specific units of habitat for Planarian

See Appendices 1 and 2 for details in how offset requirements were determined.

NB: values presented in tables throughout this document may not add to totals due to rounding

¹ Minimum strategic biodiversity score is 80 per cent of the weighted average score across habitat zones where a general offset is required

Biodiversity impact and offset requirements report

Next steps

Any proposal to remove native vegetation must meet the application requirements of the high risk-based pathway and it will be assessed under the high risk-based pathway.

If you wish to remove the marked native vegetation you are required to apply for a permit from your local council. Council will then refer your application to DELWP for assessment, as required. **This report is not a referral assessment by DELWP.**

The biodiversity assessment report from NVIM and this biodiversity impact and offset report should be submitted with your application for a permit to remove native vegetation you plan to remove, lop or destroy.

The Biodiversity assessment report generated by the tool within NVIM provides the following information:

- The location of the site where native vegetation is to be removed.
- The area of the patch of native vegetation and/or the number of any scattered trees to be removed.
- Maps or plans containing information set out in the *Permitted clearing of native vegetation – Biodiversity assessment guidelines*
- The risk-based pathway of the application for a permit to remove native vegetation

This report provides the following information to meet application requirements for a permit to remove native vegetation:

- Confirmation of the risk-based pathway of the application for a permit to remove native vegetation
- The strategic biodiversity score of the native vegetation to be removed
- Information to inform the assessment of whether the proposed removal of native vegetation will have a significant impact on Victoria's biodiversity, with specific regard to the proportional impact on habitat for any rare or threatened species.
- The offset requirements should a permit be granted to remove native vegetation.

Additional application requirements must be provided with an application for a permit to remove native vegetation in the moderate or high risk-based pathways. These include:

- A habitat hectare assessment report of the native vegetation that is to be removed
- A statement outlining what steps have been taken to ensure that impacts on biodiversity from the removal of native vegetation have been minimised
- An offset strategy that details how a compliant offset will be secured to offset the biodiversity impacts of the removal of native vegetation.

Refer to the *Permitted clearing of native vegetation – Biodiversity assessment guidelines* and for a full list and details of application requirements.

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For more information contact the DELWP Customer Service Centre 136 186

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Obtaining this publication does not guarantee that an application will meet the requirements of clauses 52.16 or 52.17 of the Victoria Planning Provisions or that a permit to remove native vegetation will be granted.

Notwithstanding anything else contained in this publication, you must ensure that you comply with all relevant laws, legislation, awards or orders and that you obtain and comply with all permits, approvals and the like that affect, are applicable or are necessary to undertake any action to remove, lop or destroy or otherwise deal with any native vegetation or that apply to matters within the scope of clauses 52.16 or 52.17 of the Victoria Planning Provisions.

Biodiversity impact and offset requirements report

Appendix 1 – Biodiversity impact of removal of native vegetation

Habitat hectares

Habitat hectares are calculated for each habitat zone within your proposal using the extent and condition scores in the GIS data you provided.

Habitat zone	Site assessed condition score	Extent (ha)	Habitat hectares
1-16-A	0.800	0.101	0.081
2-14-A	0.800	0.021	0.017
3-15-A	0.880	0.231	0.203
4-13-B	0.880	0.004	0.004
5-13-A	0.790	0.093	0.074
6-12-A	0.800	0.122	0.098
7-8-A	0.800	0.005	0.004
8-7-D	0.800	0.734	0.587
9-9-A	0.880	0.003	0.003
10-1-C	0.880	0.010	0.009
11-5-A	0.880	0.066	0.058
12-7-C	0.880	0.161	0.141
13-7-B	0.880	0.091	0.080
14-7-A	0.600	0.087	0.052
15-11-A	0.880	0.060	0.053
16-2-A	0.530	0.011	0.006
17-1-B	0.530	0.005	0.002
18-1-A	0.720	0.064	0.046
19-17-B	0.720	0.005	0.004
20-17-C	0.880	0.001	0.001
21-3-A	0.880	0.009	0.008
22-4-A	0.880	0.032	0.028
23-6-A	0.880	0.007	0.006
24-10-A	0.880	0.020	0.018
25-17-A	0.880	3.333	2.933
26-24-A	0.810	0.008	0.007
27-23-A	0.810	0.010	0.008
28-22-A	0.810	0.040	0.032
29-25-B	0.810	0.087	0.071

Biodiversity impact and offset requirements report

Habitat zone	Site assessed condition score	Extent (ha)	Habitat hectares
30-21-A	0.810	0.253	0.205
31-20-A	0.810	0.373	0.302
32-25-A	0.810	0.127	0.103
TOTAL			5.245

Impacts on rare or threatened species habitat above specific offset threshold

The specific-general offset test was applied to your proposal. The test determines if the proposed removal of native vegetation has a proportional impact on any rare or threatened species habitats above the specific offset threshold. The threshold is set at 0.005 per cent of the total habitat for a species. When the proportional impact is above the specific offset threshold a specific offset for that species' habitat is required.

The specific-general offset test found your proposal has a proportional impact above the specific offset threshold for the following rare or threatened species' habitats

Species number	Species common name	Species scientific name	Species type	Area of mapped habitat (ha)	Proportional impact (%)
12992	Alpine Bog Skink	<i>Pseudemoia cryodroma</i>	Dispersed	4.536	0.017 %
500113	Snow Aciphyll	<i>Aciphylla glacialis</i>	Dispersed	4.380	0.014 %
500114	Mountain Aciphyll	<i>Aciphylla simplicifolia</i>	Dispersed	5.000	0.005 %
500479	Mountain Daisy	<i>Brachyscome</i> sp. 3	Dispersed	5.165	0.024 %
500601	Alpine Marsh-marigold	<i>Psychrophila introloba</i>	Dispersed	1.450	0.006 %
500644	Carpet Sedge	<i>Carex jackiana</i>	Dispersed	5.218	0.009 %
500653	Broad-leaf Flower-rush	<i>Carpha nivicola</i>	Dispersed	3.904	0.016 %
501215	Sticky Fleabane	<i>Erigeron nitidus</i>	Dispersed	3.445	0.036 %
501781	Fog Club-sedge	<i>Isolepis montivaga</i>	Dispersed	4.468	0.026 %
502065	Tussock Woodrush	<i>Luzula alpestris</i>	Dispersed	5.218	0.006 %
502548	Veined Plantain	<i>Plantago alpestris</i>	Dispersed	4.059	0.011 %
502892	Gunn's Alpine Buttercup	<i>Ranunculus gunnianus</i>	Dispersed	5.218	0.013 %
502896	Felted Buttercup	<i>Ranunculus muelleri</i>	Dispersed	0.826	0.005 %
503064	Mossy Knawel	<i>Scleranthus singuliflorus</i>	Dispersed	3.643	0.019 %
503245	Alpine Stackhousia	<i>Stackhousia pulvinaris</i>	Dispersed	0.785	0.009 %
504647	Green Billy-buttons	<i>Craspedia jamesii</i>	Dispersed	4.468	0.010 %
504913	Mountain Wallaby-grass	<i>Rytidosperma oreophilum</i>	Dispersed	3.822	0.033 %
15052	Planarian	<i>Spathula tryssa</i>	Highly Localised - points only	0.458	5.925 %

Biodiversity impact and offset requirements report

Clearing site biodiversity equivalence score(s)

Where a habitat zone requires specific offset(s), the specific biodiversity equivalence score(s) for each species in that habitat zone is calculated by multiplying the habitat hectares of the habitat zone by the habitat importance score for each species impacted in the habitat zone.

Habitat zone	Habitat hectares	Habitat for rare or threatened species					Specific biodiversity equivalence score (SBES)
		Proportion of habitat zone with specific offset	Species number	Species common name	Species scientific name	Habitat importance score	
1-16-A	0.081	100.000 %	12992	Alpine Bog Skink	<i>Pseudemoia cryodroma</i>	0.970	0.079
1-16-A	0.081	100.000 %	500113	Snow Aciphyll	<i>Aciphylla glacialis</i>	0.970	0.079
1-16-A	0.081	100.000 %	500114	Mountain Aciphyll	<i>Aciphylla simplicifolia</i>	0.931	0.075
1-16-A	0.081	100.000 %	500479	Mountain Daisy	<i>Brachyscome</i> sp. 3	0.960	0.078
1-16-A	0.081	100.000 %	500601	Alpine Marsh-marigold	<i>Psychrophila introloba</i>	0.970	0.079
1-16-A	0.081	100.000 %	500644	Carpet Sedge	<i>Carex jackiana</i>	0.960	0.078
1-16-A	0.081	100.000 %	500653	Broad-leaf Flower-rush	<i>Carpha nivicola</i>	0.970	0.079
1-16-A	0.081	100.000 %	501781	Fog Club-sedge	<i>Isolepis montivaga</i>	0.970	0.079
1-16-A	0.081	100.000 %	502065	Tussock Woodrush	<i>Luzula alpestris</i>	0.960	0.078
1-16-A	0.081	100.000 %	502548	Veined Plantain	<i>Plantago alpestris</i>	0.960	0.078
1-16-A	0.081	100.000 %	502892	Gunn's Alpine Buttercup	<i>Ranunculus gunnianus</i>	0.970	0.079
1-16-A	0.081	100.000 %	503064	Mossy Knawel	<i>Scleranthus singuliflorus</i>	0.960	0.078
1-16-A	0.081	100.000 %	504647	Green Billy-buttons	<i>Craspedia jamesii</i>	0.950	0.077
2-14-A	0.017	100.000 %	12992	Alpine Bog Skink	<i>Pseudemoia cryodroma</i>	0.960	0.016
2-14-A	0.017	100.000 %	500113	Snow Aciphyll	<i>Aciphylla glacialis</i>	0.960	0.016
2-14-A	0.017	100.000 %	500114	Mountain Aciphyll	<i>Aciphylla simplicifolia</i>	0.930	0.016
2-14-A	0.017	100.000 %	500479	Mountain Daisy	<i>Brachyscome</i> sp. 3	0.950	0.016
2-14-A	0.017	100.000 %	500644	Carpet Sedge	<i>Carex jackiana</i>	0.950	0.016
2-14-A	0.017	100.000 %	500653	Broad-leaf Flower-rush	<i>Carpha nivicola</i>	0.960	0.016
2-14-A	0.017	100.000 %	501215	Sticky Fleabane	<i>Erigeron nitidus</i>	0.960	0.016
2-14-A	0.017	100.000 %	501781	Fog Club-sedge	<i>Isolepis montivaga</i>	0.960	0.016

Biodiversity impact and offset requirements report

Habitat zone	Habitat hectares	Habitat for rare or threatened species					Specific biodiversity equivalence score (SBES)
		Proportion of habitat zone with specific offset	Species number	Species common name	Species scientific name	Habitat importance score	
2-14-A	0.017	100.000 %	502065	Tussock Woodrush	Luzula alpestris	0.950	0.016
2-14-A	0.017	100.000 %	502548	Veined Plantain	Plantago alpestris	0.950	0.016
2-14-A	0.017	100.000 %	502892	Gunn's Alpine Buttercup	Ranunculus gunnianus	0.960	0.016
2-14-A	0.017	100.000 %	503064	Mossy Knawel	Scleranthus singuliflorus	0.960	0.016
2-14-A	0.017	100.000 %	504647	Green Billy-buttons	Craspedia jamesii	0.940	0.016
2-14-A	0.017	100.000 %	504913	Mountain Wallaby-grass	Rytidosperma oreophilum	0.910	0.015
2-14-A	0.017	86.048 %	15052	Planarian	Spathula tryssa	1.000	0.015
3-15-A	0.203	85.022 %	12992	Alpine Bog Skink	Pseudemoia cryodroma	0.967	0.167
3-15-A	0.203	85.022 %	500113	Snow Aciphyll	Aciphylla glacialis	0.967	0.167
3-15-A	0.203	85.022 %	500114	Mountain Aciphyll	Aciphylla simplicifolia	0.931	0.161
3-15-A	0.203	85.022 %	500479	Mountain Daisy	Brachyscome sp. 3	0.957	0.166
3-15-A	0.203	57.736 %	500601	Alpine Marsh-marigold	Psychrophila introloba	0.971	0.114
3-15-A	0.203	85.022 %	500644	Carpet Sedge	Carex jackiana	0.957	0.166
3-15-A	0.203	85.022 %	500653	Broad-leaf Flower-rush	Carpha nivicola	0.966	0.167
3-15-A	0.203	27.285 %	501215	Sticky Fleabane	Erigeron nitidus	0.960	0.053
3-15-A	0.203	85.022 %	501781	Fog Club-sedge	Isolepis montivaga	0.966	0.167
3-15-A	0.203	85.022 %	502065	Tussock Woodrush	Luzula alpestris	0.957	0.166
3-15-A	0.203	85.022 %	502548	Veined Plantain	Plantago alpestris	0.957	0.166
3-15-A	0.203	85.022 %	502892	Gunn's Alpine Buttercup	Ranunculus gunnianus	0.967	0.167
3-15-A	0.203	85.022 %	503064	Mossy Knawel	Scleranthus singuliflorus	0.960	0.166
3-15-A	0.203	85.022 %	504647	Green Billy-buttons	Craspedia jamesii	0.947	0.164
3-15-A	0.203	33.067 %	504913	Mountain Wallaby-grass	Rytidosperma oreophilum	0.910	0.061
4-13-B	0.004	100.000 %	12992	Alpine Bog Skink	Pseudemoia cryodroma	0.960	0.003

Biodiversity impact and offset requirements report

Habitat zone	Habitat hectares	Habitat for rare or threatened species					Specific biodiversity equivalence score (SBES)
		Proportion of habitat zone with specific offset	Species number	Species common name	Species scientific name	Habitat importance score	
4-13-B	0.004	100.000 %	500644	Carpet Sedge	Carex jackiana	0.950	0.003
4-13-B	0.004	100.000 %	502065	Tussock Woodrush	Luzula alpestris	0.940	0.003
4-13-B	0.004	100.000 %	502892	Gunn's Alpine Buttercup	Ranunculus gunnianus	0.950	0.003
4-13-B	0.004	100.000 %	504913	Mountain Wallaby-grass	Rytidosperma oreophilum	0.920	0.003
5-13-A	0.074	100.000 %	12992	Alpine Bog Skink	Pseudemoia cryodroma	0.960	0.071
5-13-A	0.074	48.066 %	500113	Snow Aciphyll	Aciphylla glacialis	0.960	0.034
5-13-A	0.074	48.066 %	500114	Mountain Aciphyll	Aciphylla simplicifolia	0.930	0.033
5-13-A	0.074	48.066 %	500479	Mountain Daisy	Brachyscome sp. 3	0.950	0.034
5-13-A	0.074	100.000 %	500644	Carpet Sedge	Carex jackiana	0.950	0.070
5-13-A	0.074	48.066 %	500653	Broad-leaf Flower-rush	Carpha nivicola	0.960	0.034
5-13-A	0.074	48.066 %	501215	Sticky Fleabane	Erigeron nitidus	0.960	0.034
5-13-A	0.074	48.066 %	501781	Fog Club-sedge	Isolepis montivaga	0.960	0.034
5-13-A	0.074	100.000 %	502065	Tussock Woodrush	Luzula alpestris	0.945	0.070
5-13-A	0.074	48.066 %	502548	Veined Plantain	Plantago alpestris	0.950	0.034
5-13-A	0.074	100.000 %	502892	Gunn's Alpine Buttercup	Ranunculus gunnianus	0.955	0.070
5-13-A	0.074	48.066 %	503064	Mossy Knawel	Scleranthus singuliflorus	0.960	0.034
5-13-A	0.074	48.066 %	504647	Green Billy-buttons	Craspedia jamesii	0.940	0.033
5-13-A	0.074	100.000 %	504913	Mountain Wallaby-grass	Rytidosperma oreophilum	0.915	0.068
5-13-A	0.074	48.066 %	15052	Planarian	Spathula tryssa	1.000	0.035
7-8-A	0.004	100.000 %	12992	Alpine Bog Skink	Pseudemoia cryodroma	0.950	0.004
7-8-A	0.004	100.000 %	500113	Snow Aciphyll	Aciphylla glacialis	0.960	0.004
7-8-A	0.004	100.000 %	500114	Mountain Aciphyll	Aciphylla simplicifolia	0.920	0.004
7-8-A	0.004	100.000 %	500479	Mountain Daisy	Brachyscome sp. 3	0.950	0.004
7-8-A	0.004	100.000 %	500644	Carpet Sedge	Carex jackiana	0.940	0.004

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Habitat zone	Habitat hectares	Habitat for rare or threatened species					Specific biodiversity equivalence score (SBES)
		Proportion of habitat zone with specific offset	Species number	Species common name	Species scientific name	Habitat importance score	
7-8-A	0.004	100.000 %	501781	Fog Club-sedge	Isolepis montivaga	0.950	0.004
7-8-A	0.004	100.000 %	502065	Tussock Woodrush	Luzula alpestris	0.940	0.004
7-8-A	0.004	100.000 %	502892	Gunn's Alpine Buttercup	Ranunculus gunnianus	0.950	0.004
7-8-A	0.004	100.000 %	503064	Mossy Knawel	Scleranthus singuliflorus	0.950	0.004
7-8-A	0.004	100.000 %	504647	Green Billy-buttons	Craspedia jamesii	0.930	0.004
7-8-A	0.004	100.000 %	504913	Mountain Wallaby-grass	Rytidosperma oreophilum	0.920	0.004
8-7-D	0.587	7.506 %	12992	Alpine Bog Skink	Pseudemoia cryodroma	0.956	0.042
8-7-D	0.587	3.217 %	500113	Snow Aciphyll	Aciphylla glacialis	0.960	0.018
8-7-D	0.587	96.714 %	500114	Mountain Aciphyll	Aciphylla simplicifolia	0.920	0.523
8-7-D	0.587	96.714 %	500479	Mountain Daisy	Brachyscome sp. 3	0.950	0.540
8-7-D	0.587	3.217 %	500601	Alpine Marsh-marigold	Psychrophila introloba	0.960	0.018
8-7-D	0.587	96.714 %	500644	Carpet Sedge	Carex jackiana	0.940	0.534
8-7-D	0.587	93.498 %	501215	Sticky Fleabane	Erigeron nitidus	0.950	0.522
8-7-D	0.587	96.714 %	501781	Fog Club-sedge	Isolepis montivaga	0.960	0.545
8-7-D	0.587	96.714 %	502065	Tussock Woodrush	Luzula alpestris	0.940	0.534
8-7-D	0.587	3.217 %	502548	Veined Plantain	Plantago alpestris	0.950	0.018
8-7-D	0.587	96.714 %	502892	Gunn's Alpine Buttercup	Ranunculus gunnianus	0.950	0.540
8-7-D	0.587	96.714 %	502896	Felted Buttercup	Ranunculus muelleri	0.960	0.545
8-7-D	0.587	93.498 %	503245	Alpine Stackhousia	Stackhousia pulvinaris	0.960	0.527
8-7-D	0.587	96.714 %	504647	Green Billy-buttons	Craspedia jamesii	0.930	0.528
8-7-D	0.587	96.714 %	504913	Mountain Wallaby-grass	Rytidosperma oreophilum	0.910	0.517
9-9-A	0.003	100.000 %	12992	Alpine Bog Skink	Pseudemoia cryodroma	0.950	0.002
9-9-A	0.003	100.000 %	500113	Snow Aciphyll	Aciphylla glacialis	0.960	0.002

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9-9-A	0.003	100.000 %	500114	Mountain Aciphyll	Aciphylla simplicifolia	0.920	0.002
9-9-A	0.003	100.000 %	500479	Mountain Daisy	Brachyscome sp. 3	0.950	0.002
9-9-A	0.003	100.000 %	500644	Carpet Sedge	Carex jackiana	0.940	0.002
9-9-A	0.003	100.000 %	501781	Fog Club-sedge	Isolepis montivaga	0.950	0.002
9-9-A	0.003	100.000 %	502065	Tussock Woodrush	Luzula alpestris	0.940	0.002
9-9-A	0.003	100.000 %	502892	Gunn's Alpine Buttercup	Ranunculus gunnianus	0.950	0.002
9-9-A	0.003	100.000 %	503064	Mossy Knawel	Scleranthus singuliflorus	0.950	0.002
9-9-A	0.003	100.000 %	504647	Green Billy-buttons	Craspedia jamesii	0.930	0.002
9-9-A	0.003	100.000 %	504913	Mountain Wallaby-grass	Rytidosperma oreophilum	0.920	0.002
10-1-C	0.009	100.000 %	12992	Alpine Bog Skink	Pseudemoia cryodroma	0.890	0.008
11-5-A	0.058	100.000 %	12992	Alpine Bog Skink	Pseudemoia cryodroma	0.946	0.055
11-5-A	0.058	100.000 %	500113	Snow Aciphyll	Aciphylla glacialis	0.951	0.055
11-5-A	0.058	100.000 %	500114	Mountain Aciphyll	Aciphylla simplicifolia	0.920	0.053
11-5-A	0.058	100.000 %	500479	Mountain Daisy	Brachyscome sp. 3	0.940	0.054
11-5-A	0.058	100.000 %	500644	Carpet Sedge	Carex jackiana	0.940	0.054
11-5-A	0.058	100.000 %	502065	Tussock Woodrush	Luzula alpestris	0.940	0.054
11-5-A	0.058	100.000 %	502548	Veined Plantain	Plantago alpestris	0.941	0.055
11-5-A	0.058	100.000 %	502892	Gunn's Alpine Buttercup	Ranunculus gunnianus	0.941	0.055
11-5-A	0.058	100.000 %	504913	Mountain Wallaby-grass	Rytidosperma oreophilum	0.900	0.052
12-7-C	0.141	0.102 %	12992	Alpine Bog Skink	Pseudemoia cryodroma	0.950	0.000
12-7-C	0.141	0.102 %	500113	Snow Aciphyll	Aciphylla glacialis	0.960	0.000
12-7-C	0.141	48.671 %	500114	Mountain Aciphyll	Aciphylla simplicifolia	0.920	0.063
12-7-C	0.141	48.671 %	500479	Mountain Daisy	Brachyscome sp. 3	0.950	0.065

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12-7-C	0.141	0.102 %	500601	Alpine Marsh-marigold	<i>Psychrophila introloba</i>	0.960	0.000
12-7-C	0.141	48.671 %	500644	Carpet Sedge	<i>Carex jackiana</i>	0.940	0.065
12-7-C	0.141	48.569 %	501215	Sticky Fleabane	<i>Erigeron nitidus</i>	0.950	0.065
12-7-C	0.141	48.671 %	501781	Fog Club-sedge	<i>Isolepis montivaga</i>	0.960	0.066
12-7-C	0.141	48.671 %	502065	Tussock Woodrush	<i>Luzula alpestris</i>	0.940	0.065
12-7-C	0.141	0.102 %	502548	Veined Plantain	<i>Plantago alpestris</i>	0.950	0.000
12-7-C	0.141	48.671 %	502892	Gunn's Alpine Buttercup	<i>Ranunculus gunnianus</i>	0.950	0.065
12-7-C	0.141	48.671 %	502896	Felted Buttercup	<i>Ranunculus muelleri</i>	0.960	0.066
12-7-C	0.141	48.569 %	503245	Alpine Stackhousia	<i>Stackhousia pulvinaris</i>	0.960	0.066
12-7-C	0.141	48.671 %	504647	Green Billy-buttons	<i>Craspedia jamesii</i>	0.930	0.064
12-7-C	0.141	48.671 %	504913	Mountain Wallaby-grass	<i>Rytidosperma oreophilum</i>	0.910	0.063
13-7-B	0.080	16.540 %	12992	Alpine Bog Skink	<i>Pseudemoia cryodroma</i>	0.960	0.013
13-7-B	0.080	16.616 %	500114	Mountain Aciphyll	<i>Aciphylla simplicifolia</i>	0.920	0.012
13-7-B	0.080	16.616 %	500479	Mountain Daisy	<i>Brachyscome</i> sp. 3	0.950	0.013
13-7-B	0.080	16.616 %	500644	Carpet Sedge	<i>Carex jackiana</i>	0.940	0.013
13-7-B	0.080	16.616 %	501215	Sticky Fleabane	<i>Erigeron nitidus</i>	0.950	0.013
13-7-B	0.080	16.616 %	501781	Fog Club-sedge	<i>Isolepis montivaga</i>	0.960	0.013
13-7-B	0.080	16.616 %	502065	Tussock Woodrush	<i>Luzula alpestris</i>	0.940	0.013
13-7-B	0.080	16.616 %	502892	Gunn's Alpine Buttercup	<i>Ranunculus gunnianus</i>	0.950	0.013
13-7-B	0.080	16.616 %	502896	Felted Buttercup	<i>Ranunculus muelleri</i>	0.960	0.013
13-7-B	0.080	16.616 %	503245	Alpine Stackhousia	<i>Stackhousia pulvinaris</i>	0.960	0.013
13-7-B	0.080	16.616 %	504647	Green Billy-buttons	<i>Craspedia jamesii</i>	0.930	0.012
13-7-B	0.080	16.616 %	504913	Mountain Wallaby-grass	<i>Rytidosperma oreophilum</i>	0.910	0.012

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		Proportion of habitat zone with specific offset	Species number	Species common name	Species scientific name	Habitat importance score	
14-7-A	0.052	19.227 %	12992	Alpine Bog Skink	<i>Pseudemoia cryodroma</i>	0.950	0.010
14-7-A	0.052	19.227 %	500113	Snow Aciphyll	<i>Aciphylla glacialis</i>	0.960	0.010
14-7-A	0.052	25.521 %	500114	Mountain Aciphyll	<i>Aciphylla simplicifolia</i>	0.920	0.012
14-7-A	0.052	25.521 %	500479	Mountain Daisy	<i>Brachyscome</i> sp. 3	0.950	0.013
14-7-A	0.052	19.227 %	500601	Alpine Marsh-marigold	<i>Psychrophila introloba</i>	0.960	0.010
14-7-A	0.052	25.521 %	500644	Carpet Sedge	<i>Carex jackiana</i>	0.948	0.013
14-7-A	0.052	6.295 %	501215	Sticky Fleabane	<i>Erigeron nitidus</i>	0.950	0.003
14-7-A	0.052	25.521 %	501781	Fog Club-sedge	<i>Isolepis montivaga</i>	0.952	0.013
14-7-A	0.052	25.521 %	502065	Tussock Woodrush	<i>Luzula alpestris</i>	0.948	0.013
14-7-A	0.052	19.227 %	502548	Veined Plantain	<i>Plantago alpestris</i>	0.950	0.010
14-7-A	0.052	25.521 %	502892	Gunn's Alpine Buttercup	<i>Ranunculus gunnianus</i>	0.958	0.013
14-7-A	0.052	25.521 %	502896	Felted Buttercup	<i>Ranunculus muelleri</i>	0.960	0.013
14-7-A	0.052	6.295 %	503245	Alpine Stackhousia	<i>Stackhousia pulvinaris</i>	0.960	0.003
14-7-A	0.052	25.521 %	504647	Green Billy-buttons	<i>Craspedia jamesii</i>	0.938	0.012
14-7-A	0.052	25.521 %	504913	Mountain Wallaby-grass	<i>Rytidosperma oreophilum</i>	0.918	0.012
15-11-A	0.053	71.461 %	12992	Alpine Bog Skink	<i>Pseudemoia cryodroma</i>	0.960	0.036
15-11-A	0.053	71.461 %	500113	Snow Aciphyll	<i>Aciphylla glacialis</i>	0.960	0.036
15-11-A	0.053	71.461 %	500114	Mountain Aciphyll	<i>Aciphylla simplicifolia</i>	0.930	0.035
15-11-A	0.053	71.461 %	500479	Mountain Daisy	<i>Brachyscome</i> sp. 3	0.950	0.036
15-11-A	0.053	71.461 %	500644	Carpet Sedge	<i>Carex jackiana</i>	0.940	0.035
15-11-A	0.053	71.461 %	501781	Fog Club-sedge	<i>Isolepis montivaga</i>	0.960	0.036
15-11-A	0.053	71.461 %	502065	Tussock Woodrush	<i>Luzula alpestris</i>	0.940	0.035

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Habitat zone	Habitat hectares	Habitat for rare or threatened species					Specific biodiversity equivalence score (SBES)
		Proportion of habitat zone with specific offset	Species number	Species common name	Species scientific name	Habitat importance score	
15-11-A	0.053	71.461 %	502892	Gunn's Alpine Buttercup	Ranunculus gunnianus	0.950	0.036
15-11-A	0.053	71.461 %	503064	Mossy Knawel	Scleranthus singuliflorus	0.960	0.036
15-11-A	0.053	71.461 %	504647	Green Billy-buttons	Craspedia jamesii	0.940	0.035
15-11-A	0.053	71.461 %	504913	Mountain Wallaby-grass	Rytidosperma oreophilum	0.930	0.035
16-2-A	0.006	100.000 %	12992	Alpine Bog Skink	Pseudemoia cryodroma	0.890	0.005
17-1-B	0.002	100.000 %	12992	Alpine Bog Skink	Pseudemoia cryodroma	0.890	0.002
18-1-A	0.046	47.921 %	12992	Alpine Bog Skink	Pseudemoia cryodroma	0.890	0.020
19-17-B	0.004	100.000 %	12992	Alpine Bog Skink	Pseudemoia cryodroma	0.923	0.003
19-17-B	0.004	100.000 %	500113	Snow Aciphyll	Aciphylla glacialis	0.922	0.003
19-17-B	0.004	100.000 %	500114	Mountain Aciphyll	Aciphylla simplicifolia	0.883	0.003
19-17-B	0.004	100.000 %	500479	Mountain Daisy	Brachyscome sp. 3	0.912	0.003
19-17-B	0.004	93.258 %	500601	Alpine Marsh-marigold	Psychrophila introloba	0.920	0.003
19-17-B	0.004	100.000 %	500644	Carpet Sedge	Carex jackiana	0.912	0.003
19-17-B	0.004	100.000 %	500653	Broad-leaf Flower-rush	Carpha nivicola	0.913	0.003
19-17-B	0.004	6.742 %	501215	Sticky Fleabane	Erigeron nitidus	0.950	0.000
19-17-B	0.004	100.000 %	501781	Fog Club-sedge	Isolepis montivaga	0.913	0.003
19-17-B	0.004	100.000 %	502065	Tussock Woodrush	Luzula alpestris	0.912	0.003
19-17-B	0.004	100.000 %	502548	Veined Plantain	Plantago alpestris	0.912	0.003
19-17-B	0.004	100.000 %	502892	Gunn's Alpine Buttercup	Ranunculus gunnianus	0.913	0.003
19-17-B	0.004	100.000 %	503064	Mossy Knawel	Scleranthus singuliflorus	0.913	0.003
19-17-B	0.004	100.000 %	504647	Green Billy-buttons	Craspedia jamesii	0.893	0.003

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19-17-B	0.004	6.742 %	504913	Mountain Wallaby-grass	Rytidosperma oreophilum	0.900	0.000
20-17-C	0.001	100.000 %	12992	Alpine Bog Skink	Pseudemoia cryodroma	0.920	0.001
20-17-C	0.001	100.000 %	500113	Snow Aciphyll	Aciphylla glacialis	0.920	0.001
20-17-C	0.001	100.000 %	500114	Mountain Aciphyll	Aciphylla simplicifolia	0.880	0.001
20-17-C	0.001	100.000 %	500479	Mountain Daisy	Brachyscome sp. 3	0.910	0.001
20-17-C	0.001	100.000 %	500601	Alpine Marsh-marigold	Psychrophila introloba	0.920	0.001
20-17-C	0.001	100.000 %	500644	Carpet Sedge	Carex jackiana	0.910	0.001
20-17-C	0.001	100.000 %	500653	Broad-leaf Flower-rush	Carpha nivicola	0.910	0.001
20-17-C	0.001	100.000 %	501781	Fog Club-sedge	Isolepis montivaga	0.910	0.001
20-17-C	0.001	100.000 %	502065	Tussock Woodrush	Luzula alpestris	0.910	0.001
20-17-C	0.001	100.000 %	502548	Veined Plantain	Plantago alpestris	0.910	0.001
20-17-C	0.001	100.000 %	502892	Gunn's Alpine Buttercup	Ranunculus gunnianus	0.910	0.001
20-17-C	0.001	100.000 %	503064	Mossy Knawel	Scleranthus singuliflorus	0.910	0.001
20-17-C	0.001	100.000 %	504647	Green Billy-buttons	Craspedia jamesii	0.890	0.001
21-3-A	0.008	100.000 %	12992	Alpine Bog Skink	Pseudemoia cryodroma	0.940	0.007
21-3-A	0.008	100.000 %	500113	Snow Aciphyll	Aciphylla glacialis	0.950	0.008
21-3-A	0.008	100.000 %	500114	Mountain Aciphyll	Aciphylla simplicifolia	0.910	0.007
21-3-A	0.008	100.000 %	500479	Mountain Daisy	Brachyscome sp. 3	0.930	0.007
21-3-A	0.008	100.000 %	500644	Carpet Sedge	Carex jackiana	0.930	0.007
21-3-A	0.008	100.000 %	502065	Tussock Woodrush	Luzula alpestris	0.930	0.007
21-3-A	0.008	100.000 %	502548	Veined Plantain	Plantago alpestris	0.940	0.007
21-3-A	0.008	100.000 %	502892	Gunn's Alpine Buttercup	Ranunculus gunnianus	0.940	0.007

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21-3-A	0.008	100.000 %	504913	Mountain Wallaby-grass	Rytidosperma oreophilum	0.890	0.007
22-4-A	0.028	100.000 %	12992	Alpine Bog Skink	Pseudemoia cryodroma	0.940	0.027
22-4-A	0.028	100.000 %	500113	Snow Aciphyll	Aciphylla glacialis	0.950	0.027
22-4-A	0.028	100.000 %	500114	Mountain Aciphyll	Aciphylla simplicifolia	0.912	0.026
22-4-A	0.028	100.000 %	500479	Mountain Daisy	Brachyscome sp. 3	0.932	0.026
22-4-A	0.028	100.000 %	500644	Carpet Sedge	Carex jackiana	0.932	0.026
22-4-A	0.028	100.000 %	502065	Tussock Woodrush	Luzula alpestris	0.932	0.026
22-4-A	0.028	100.000 %	502548	Veined Plantain	Plantago alpestris	0.940	0.027
22-4-A	0.028	100.000 %	502892	Gunn's Alpine Buttercup	Ranunculus gunnianus	0.940	0.027
22-4-A	0.028	100.000 %	504913	Mountain Wallaby-grass	Rytidosperma oreophilum	0.892	0.025
23-6-A	0.006	100.000 %	12992	Alpine Bog Skink	Pseudemoia cryodroma	0.950	0.006
23-6-A	0.006	100.000 %	500113	Snow Aciphyll	Aciphylla glacialis	0.950	0.006
23-6-A	0.006	100.000 %	500114	Mountain Aciphyll	Aciphylla simplicifolia	0.920	0.006
23-6-A	0.006	100.000 %	500479	Mountain Daisy	Brachyscome sp. 3	0.940	0.006
23-6-A	0.006	100.000 %	500644	Carpet Sedge	Carex jackiana	0.940	0.006
23-6-A	0.006	100.000 %	502065	Tussock Woodrush	Luzula alpestris	0.940	0.006
23-6-A	0.006	100.000 %	502548	Veined Plantain	Plantago alpestris	0.940	0.006
23-6-A	0.006	100.000 %	502892	Gunn's Alpine Buttercup	Ranunculus gunnianus	0.940	0.006
23-6-A	0.006	100.000 %	504913	Mountain Wallaby-grass	Rytidosperma oreophilum	0.900	0.006
24-10-A	0.018	100.000 %	12992	Alpine Bog Skink	Pseudemoia cryodroma	0.950	0.017
24-10-A	0.018	100.000 %	500113	Snow Aciphyll	Aciphylla glacialis	0.960	0.017
24-10-A	0.018	100.000 %	500114	Mountain Aciphyll	Aciphylla simplicifolia	0.920	0.016
24-10-A	0.018	100.000 %	500479	Mountain Daisy	Brachyscome sp. 3	0.950	0.017

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		Proportion of habitat zone with specific offset	Species number	Species common name	Species scientific name	Habitat importance score	
24-10-A	0.018	100.000 %	500644	Carpet Sedge	Carex jackiana	0.940	0.017
24-10-A	0.018	100.000 %	501781	Fog Club-sedge	Isolepis montivaga	0.950	0.017
24-10-A	0.018	100.000 %	502065	Tussock Woodrush	Luzula alpestris	0.940	0.017
24-10-A	0.018	100.000 %	502892	Gunn's Alpine Buttercup	Ranunculus gunnianus	0.950	0.017
24-10-A	0.018	100.000 %	503064	Mossy Knawel	Scleranthus singuliflorus	0.950	0.017
24-10-A	0.018	100.000 %	504647	Green Billy-buttons	Craspedia jamesii	0.930	0.017
24-10-A	0.018	100.000 %	504913	Mountain Wallaby-grass	Rytidosperma oreophilum	0.920	0.016
25-17-A	2.933	86.581 %	12992	Alpine Bog Skink	Pseudemoia cryodroma	0.960	2.438
25-17-A	2.933	86.581 %	500113	Snow Aciphyll	Aciphylla glacialis	0.959	2.436
25-17-A	2.933	86.581 %	500114	Mountain Aciphyll	Aciphylla simplicifolia	0.928	2.356
25-17-A	2.933	86.581 %	500479	Mountain Daisy	Brachyscome sp. 3	0.949	2.411
25-17-A	2.933	15.212 %	500601	Alpine Marsh-marigold	Psychrophila introloba	0.960	0.428
25-17-A	2.933	86.581 %	500644	Carpet Sedge	Carex jackiana	0.949	2.410
25-17-A	2.933	84.036 %	500653	Broad-leaf Flower-rush	Carpha nivicola	0.958	2.361
25-17-A	2.933	68.824 %	501215	Sticky Fleabane	Erigeron nitidus	0.959	1.936
25-17-A	2.933	86.343 %	501781	Fog Club-sedge	Isolepis montivaga	0.958	2.426
25-17-A	2.933	86.581 %	502065	Tussock Woodrush	Luzula alpestris	0.949	2.410
25-17-A	2.933	84.036 %	502548	Veined Plantain	Plantago alpestris	0.949	2.340
25-17-A	2.933	86.581 %	502892	Gunn's Alpine Buttercup	Ranunculus gunnianus	0.958	2.432
25-17-A	2.933	86.343 %	503064	Mossy Knawel	Scleranthus singuliflorus	0.958	2.425
25-17-A	2.933	86.343 %	504647	Green Billy-buttons	Craspedia jamesii	0.938	2.375

Biodiversity impact and offset requirements report

Habitat zone	Habitat hectares	Habitat for rare or threatened species					Specific biodiversity equivalence score (SBES)
		Proportion of habitat zone with specific offset	Species number	Species common name	Species scientific name	Habitat importance score	
25-17-A	2.933	71.369 %	504913	Mountain Wallaby-grass	Rytidosperma oreophilum	0.910	1.905
25-17-A	2.933	11.862 %	15052	Planarian	Spathula tryssa	1.000	0.348
26-24-A	0.007	100.000 %	12992	Alpine Bog Skink	Pseudemoia cryodroma	0.970	0.006
26-24-A	0.007	100.000 %	500113	Snow Aciphyll	Aciphylla glacialis	0.960	0.006
26-24-A	0.007	100.000 %	500114	Mountain Aciphyll	Aciphylla simplicifolia	0.920	0.006
26-24-A	0.007	100.000 %	500479	Mountain Daisy	Brachyscome sp. 3	0.940	0.006
26-24-A	0.007	100.000 %	500601	Alpine Marsh-marigold	Psychrophila introloba	0.960	0.006
26-24-A	0.007	100.000 %	500644	Carpet Sedge	Carex jackiana	0.950	0.006
26-24-A	0.007	100.000 %	500653	Broad-leaf Flower-rush	Carpha nivicola	0.950	0.006
26-24-A	0.007	100.000 %	502065	Tussock Woodrush	Luzula alpestris	0.940	0.006
26-24-A	0.007	100.000 %	502548	Veined Plantain	Plantago alpestris	0.950	0.006
26-24-A	0.007	100.000 %	502892	Gunn's Alpine Buttercup	Ranunculus gunnianus	0.950	0.006
27-23-A	0.008	100.000 %	12992	Alpine Bog Skink	Pseudemoia cryodroma	0.970	0.008
27-23-A	0.008	100.000 %	500113	Snow Aciphyll	Aciphylla glacialis	0.960	0.008
27-23-A	0.008	100.000 %	500114	Mountain Aciphyll	Aciphylla simplicifolia	0.920	0.007
27-23-A	0.008	100.000 %	500479	Mountain Daisy	Brachyscome sp. 3	0.940	0.007
27-23-A	0.008	100.000 %	500601	Alpine Marsh-marigold	Psychrophila introloba	0.960	0.008
27-23-A	0.008	100.000 %	500644	Carpet Sedge	Carex jackiana	0.950	0.008
27-23-A	0.008	100.000 %	500653	Broad-leaf Flower-rush	Carpha nivicola	0.950	0.008
27-23-A	0.008	100.000 %	502065	Tussock Woodrush	Luzula alpestris	0.940	0.007
27-23-A	0.008	100.000 %	502548	Veined Plantain	Plantago alpestris	0.950	0.008

Biodiversity impact and offset requirements report

Habitat zone	Habitat hectares	Habitat for rare or threatened species					Specific biodiversity equivalence score (SBES)
		Proportion of habitat zone with specific offset	Species number	Species common name	Species scientific name	Habitat importance score	
27-23-A	0.008	100.000 %	502892	Gunn's Alpine Buttercup	Ranunculus gunnianus	0.950	0.008
28-22-A	0.032	100.000 %	12992	Alpine Bog Skink	Pseudemoia cryodroma	0.970	0.031
28-22-A	0.032	100.000 %	500113	Snow Aciphyll	Aciphylla glacialis	0.960	0.031
28-22-A	0.032	100.000 %	500114	Mountain Aciphyll	Aciphylla simplicifolia	0.920	0.030
28-22-A	0.032	100.000 %	500479	Mountain Daisy	Brachyscome sp. 3	0.940	0.030
28-22-A	0.032	100.000 %	500601	Alpine Marsh-marigold	Psychrophila introloba	0.960	0.031
28-22-A	0.032	100.000 %	500644	Carpet Sedge	Carex jackiana	0.950	0.031
28-22-A	0.032	100.000 %	500653	Broad-leaf Flower-rush	Carpha nivicola	0.950	0.031
28-22-A	0.032	100.000 %	502065	Tussock Woodrush	Luzula alpestris	0.940	0.030
28-22-A	0.032	100.000 %	502548	Veined Plantain	Plantago alpestris	0.950	0.031
28-22-A	0.032	100.000 %	502892	Gunn's Alpine Buttercup	Ranunculus gunnianus	0.950	0.031
29-25-B	0.071	100.000 %	12992	Alpine Bog Skink	Pseudemoia cryodroma	0.963	0.068
29-25-B	0.071	100.000 %	500113	Snow Aciphyll	Aciphylla glacialis	0.960	0.068
29-25-B	0.071	100.000 %	500114	Mountain Aciphyll	Aciphylla simplicifolia	0.920	0.065
29-25-B	0.071	100.000 %	500479	Mountain Daisy	Brachyscome sp. 3	0.940	0.067
29-25-B	0.071	100.000 %	500601	Alpine Marsh-marigold	Psychrophila introloba	0.960	0.068
29-25-B	0.071	100.000 %	500644	Carpet Sedge	Carex jackiana	0.943	0.067
29-25-B	0.071	100.000 %	500653	Broad-leaf Flower-rush	Carpha nivicola	0.950	0.067
29-25-B	0.071	100.000 %	502065	Tussock Woodrush	Luzula alpestris	0.940	0.067
29-25-B	0.071	100.000 %	502548	Veined Plantain	Plantago alpestris	0.943	0.067
29-25-B	0.071	100.000 %	502892	Gunn's Alpine Buttercup	Ranunculus gunnianus	0.943	0.067

Biodiversity impact and offset requirements report

Habitat zone	Habitat hectares	Habitat for rare or threatened species					Specific biodiversity equivalence score (SBES)
		Proportion of habitat zone with specific offset	Species number	Species common name	Species scientific name	Habitat importance score	
30-21-A	0.205	100.000 %	12992	Alpine Bog Skink	<i>Pseudemoia cryodroma</i>	0.948	0.194
30-21-A	0.205	100.000 %	500113	Snow Aciphyll	<i>Aciphylla glacialis</i>	0.941	0.193
30-21-A	0.205	75.083 %	500114	Mountain Aciphyll	<i>Aciphylla simplicifolia</i>	0.911	0.140
30-21-A	0.205	100.000 %	500479	Mountain Daisy	<i>Brachyscome</i> sp. 3	0.921	0.189
30-21-A	0.205	100.000 %	500601	Alpine Marsh-marigold	<i>Psychrophila introloba</i>	0.941	0.193
30-21-A	0.205	100.000 %	500644	Carpet Sedge	<i>Carex jackiana</i>	0.928	0.190
30-21-A	0.205	75.083 %	500653	Broad-leaf Flower-rush	<i>Carpha nivicola</i>	0.941	0.145
30-21-A	0.205	100.000 %	502065	Tussock Woodrush	<i>Luzula alpestris</i>	0.918	0.188
30-21-A	0.205	75.083 %	502548	Veined Plantain	<i>Plantago alpestris</i>	0.941	0.145
30-21-A	0.205	100.000 %	502892	Gunn's Alpine Buttercup	<i>Ranunculus gunnianus</i>	0.928	0.190
31-20-A	0.302	100.000 %	12992	Alpine Bog Skink	<i>Pseudemoia cryodroma</i>	0.937	0.283
31-20-A	0.302	100.000 %	500113	Snow Aciphyll	<i>Aciphylla glacialis</i>	0.932	0.282
31-20-A	0.302	72.660 %	500114	Mountain Aciphyll	<i>Aciphylla simplicifolia</i>	0.905	0.199
31-20-A	0.302	100.000 %	500479	Mountain Daisy	<i>Brachyscome</i> sp. 3	0.918	0.277
31-20-A	0.302	63.049 %	500601	Alpine Marsh-marigold	<i>Psychrophila introloba</i>	0.922	0.176
31-20-A	0.302	100.000 %	500644	Carpet Sedge	<i>Carex jackiana</i>	0.919	0.278
31-20-A	0.302	72.660 %	500653	Broad-leaf Flower-rush	<i>Carpha nivicola</i>	0.935	0.205
31-20-A	0.302	36.951 %	501215	Sticky Fleabane	<i>Erigeron nitidus</i>	0.950	0.106
31-20-A	0.302	60.323 %	501781	Fog Club-sedge	<i>Isolepis montivaga</i>	0.935	0.170
31-20-A	0.302	100.000 %	502065	Tussock Woodrush	<i>Luzula alpestris</i>	0.915	0.277
31-20-A	0.302	72.660 %	502548	Veined Plantain	<i>Plantago alpestris</i>	0.930	0.204

Biodiversity impact and offset requirements report

Habitat zone	Habitat hectares	Habitat for rare or threatened species					Specific biodiversity equivalence score (SBES)
		Proportion of habitat zone with specific offset	Species number	Species common name	Species scientific name	Habitat importance score	
31-20-A	0.302	100.000 %	502892	Gunn's Alpine Buttercup	Ranunculus gunnianus	0.923	0.279
31-20-A	0.302	60.323 %	503064	Mossy Knawel	Scleranthus singuliflorus	0.935	0.170
31-20-A	0.302	60.323 %	504647	Green Billy-buttons	Craspedia jamesii	0.915	0.167
31-20-A	0.302	36.951 %	504913	Mountain Wallaby-grass	Rytidosperma oreophilum	0.900	0.100
32-25-A	0.103	100.000 %	12992	Alpine Bog Skink	Pseudemoia cryodroma	0.968	0.100
32-25-A	0.103	100.000 %	500113	Snow Aciphyll	Aciphylla glacialis	0.960	0.099
32-25-A	0.103	100.000 %	500114	Mountain Aciphyll	Aciphylla simplicifolia	0.928	0.095
32-25-A	0.103	100.000 %	500479	Mountain Daisy	Brachyscome sp. 3	0.948	0.098
32-25-A	0.103	22.165 %	500601	Alpine Marsh-marigold	Psychrophila introloba	0.960	0.022
32-25-A	0.103	100.000 %	500644	Carpet Sedge	Carex jackiana	0.943	0.097
32-25-A	0.103	100.000 %	500653	Broad-leaf Flower-rush	Carpha nivicola	0.952	0.098
32-25-A	0.103	77.835 %	501215	Sticky Fleabane	Erigeron nitidus	0.953	0.076
32-25-A	0.103	77.835 %	501781	Fog Club-sedge	Isolepis montivaga	0.953	0.076
32-25-A	0.103	100.000 %	502065	Tussock Woodrush	Luzula alpestris	0.942	0.097
32-25-A	0.103	100.000 %	502548	Veined Plantain	Plantago alpestris	0.948	0.098
32-25-A	0.103	100.000 %	502892	Gunn's Alpine Buttercup	Ranunculus gunnianus	0.950	0.098
32-25-A	0.103	77.835 %	503064	Mossy Knawel	Scleranthus singuliflorus	0.953	0.076
32-25-A	0.103	77.835 %	504647	Green Billy-buttons	Craspedia jamesii	0.933	0.075
32-25-A	0.103	77.835 %	504913	Mountain Wallaby-grass	Rytidosperma oreophilum	0.910	0.073

Biodiversity impact and offset requirements report

There are habitat zones in your proposal which are not habitat for the species above. A general offset is required for the(se) habitat zone(s).

The general biodiversity equivalence score for the habitat zone(s) is calculated by multiplying the habitat hectares by the strategic biodiversity score.

Habitat zone	Habitat hectares	Proportion of habitat zone with general offset	Strategic biodiversity score	General biodiversity equivalence score (GBES)
3-15-A	0.203	14.978 %	0.965	0.029
6-12-A	0.098	100.000 %	0.969	0.095
8-7-D	0.587	3.286 %	0.967	0.019
12-7-C	0.141	51.329 %	0.967	0.070
13-7-B	0.080	83.384 %	0.967	0.065
14-7-A	0.052	74.479 %	0.967	0.038
15-11-A	0.053	28.539 %	0.973	0.015
18-1-A	0.046	52.079 %	0.946	0.023
25-17-A	2.933	13.419 %	0.969	0.382

Biodiversity impact and offset requirements report

Mapped rare or threatened species' habitats on site

This table sets out the list of rare or threatened species' habitats mapped at the site beyond those species for which the impact is above the specific offset threshold. These species habitats do not require a specific offset according to the specific-general offset test.

Species number	Species common name	Species scientific name
11156	Mountain Pygmy-possum	<i>Burramys parvus</i>
11438	Broad-toothed Rat	<i>Mastacomys fuscus mordicus</i>
500009	Alpine Wattle	<i>Acacia alpina</i>
500157	Mueller's Bent	<i>Agrostis muelleriana</i>
500626	Alpine Sedge	<i>Carex blakei</i>
500633	Short Sedge	<i>Carex canescens</i>
500820	Snow Coprosma	<i>Coprosma nivalis</i>
501014	Thick Bent-grass	<i>Deyeuxia crassiuscula</i>
501101	Alpine Sundew	<i>Drosera arcturi</i>
501181	Mountain Willow-herb	<i>Epilobium sarmentaceum</i>
501309	Spinning Gum	<i>Eucalyptus perriniana</i>
501474	Mat Cudweed	<i>Euchiton traversii</i>
501475	Cliff Cudweed	<i>Euchiton umbricola</i>
502888	Eichler's Buttercup	<i>Ranunculus eichlerianus</i>
503463	Lilac Berry	<i>Trochocarpa clarkei</i>
503508	Milfoil Speedwell	<i>Derwentia nivea</i>
504780	Dusty Daisy-bush	<i>Olearia phlogopappa</i> var. <i>flavescens</i>
504815	Alpine Phebalium	<i>Phebalium squamulosum</i> subsp. <i>alpinum</i>
63907	Alpine Tree Frog	<i>Litoria verreauxii alpina</i>

Biodiversity impact and offset requirements report

Appendix 2 – Offset requirements detail

If a permit is granted to remove the marked native vegetation the permit condition will include the requirement to obtain a native vegetation offset.

To calculate the required offset amount required the biodiversity equivalence scores are aggregated to the proposal level and multiplied by the relevant risk multiplier.

Offsets also have required attributes:

- General offsets must be located in the same Catchment Management Authority (CMA) boundary or Local Municipal District (local council) as the clearing and must have a minimum strategic biodiversity score of 80 per cent of the clearing.²
- Specific offsets must be located in the same species habitat as that being removed, as determined by the habitat importance map for that species.

The offset requirements for your proposal are as follows:

Offset type	Clearing site biodiversity equivalence score	Risk multiplier	Offset requirements	
			Offset amount (biodiversity equivalence units)	Offset attributes
Specific	3.723 SBES	2	7.446 specific units	Offset must provide habitat for 12992, Alpine Bog Skink, <i>Pseudemoia cryodroma</i>
Specific	3.606 SBES	2	7.212 specific units	Offset must provide habitat for 500113, Snow Aciphyll, <i>Aciphylla glacialis</i>
Specific	3.948 SBES	2	7.896 specific units	Offset must provide habitat for 500114, Mountain Aciphyll, <i>Aciphylla simplicifolia</i>
Specific	4.166 SBES	2	8.332 specific units	Offset must provide habitat for 500479, Mountain Daisy, <i>Brachyscome</i> sp. 3
Specific	1.156 SBES	2	2.312 specific units	Offset must provide habitat for 500601, Alpine Marsh-marigold, <i>Psychrophila introloba</i>
Specific	4.200 SBES	2	8.400 specific units	Offset must provide habitat for 500644, Carpet Sedge, <i>Carex jackiana</i>
Specific	3.221 SBES	2	6.442 specific units	Offset must provide habitat for 500653, Broad-leaf Flower-rush, <i>Carpha nivicola</i>
Specific	2.825 SBES	2	5.650 specific units	Offset must provide habitat for 501215, Sticky Fleabane, <i>Erigeron nitidus</i>
Specific	3.669 SBES	2	7.337 specific units	Offset must provide habitat for 501781, Fog Club-sedge, <i>Isolepis montivaga</i>
Specific	4.195 SBES	2	8.391 specific units	Offset must provide habitat for 502065, Tussock Woodrush, <i>Luzula alpestris</i>
Specific	3.318 SBES	2	6.636 specific units	Offset must provide habitat for 502548, Veined Plantain, <i>Plantago alpestris</i>
Specific	4.234 SBES	2	8.468 specific units	Offset must provide habitat for 502892, Gunn's Alpine Buttercup, <i>Ranunculus gunnianus</i>
Specific	0.637 SBES	2	1.274 specific units	Offset must provide habitat for 502896, Felted Buttercup, <i>Ranunculus muelleri</i>
Specific	3.029 SBES	2	6.059 specific units	Offset must provide habitat for 503064, Mossy Knawel, <i>Scleranthus singuliflorus</i>
Specific	0.609 SBES	2	1.218 specific units	Offset must provide habitat for 503245, Alpine Stackhousia, <i>Stackhousia pulvinaris</i>

² Strategic biodiversity score is a weighted average across habitat zones where a general offset is required

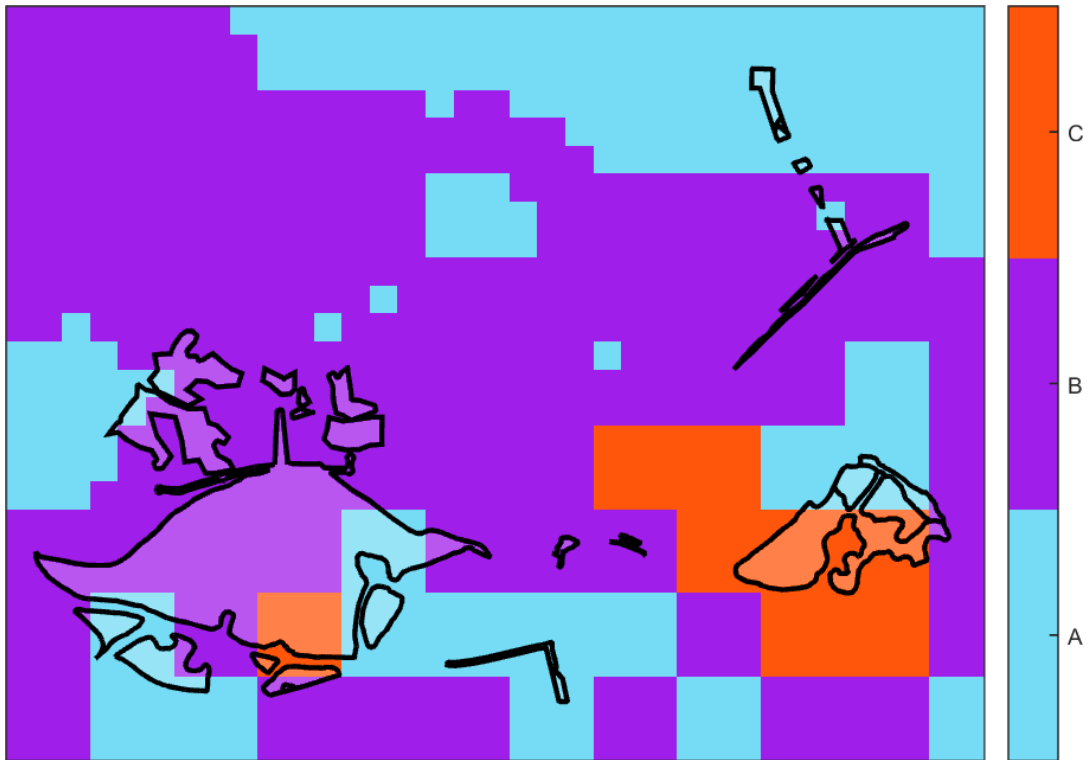
Biodiversity impact and offset requirements report

Offset type	Clearing site biodiversity equivalence score	Risk multiplier	Offset requirements	
			Offset amount (biodiversity equivalence units)	Offset attributes
Specific	3.586 SBES	2	7.172 specific units	Offset must provide habitat for 504647, Green Billy-buttons, <i>Craspedia jamesii</i>
Specific	2.978 SBES	2	5.955 specific units	Offset must provide habitat for 504913, Mountain Wallaby-grass, <i>Rytidosperma oreophilum</i>
Specific	0.398 SBES	2	0.796 specific units	Offset must provide habitat for 15052, Planarian, <i>Spathula tryssa</i>
General	0.735 GBES	1.5	1.102 general units	Offset must be within Goulburn Broken CMA or Mount Buller Alpine Resort (Unincorporated) Council Offset must have a minimum strategic biodiversity score of 0.774

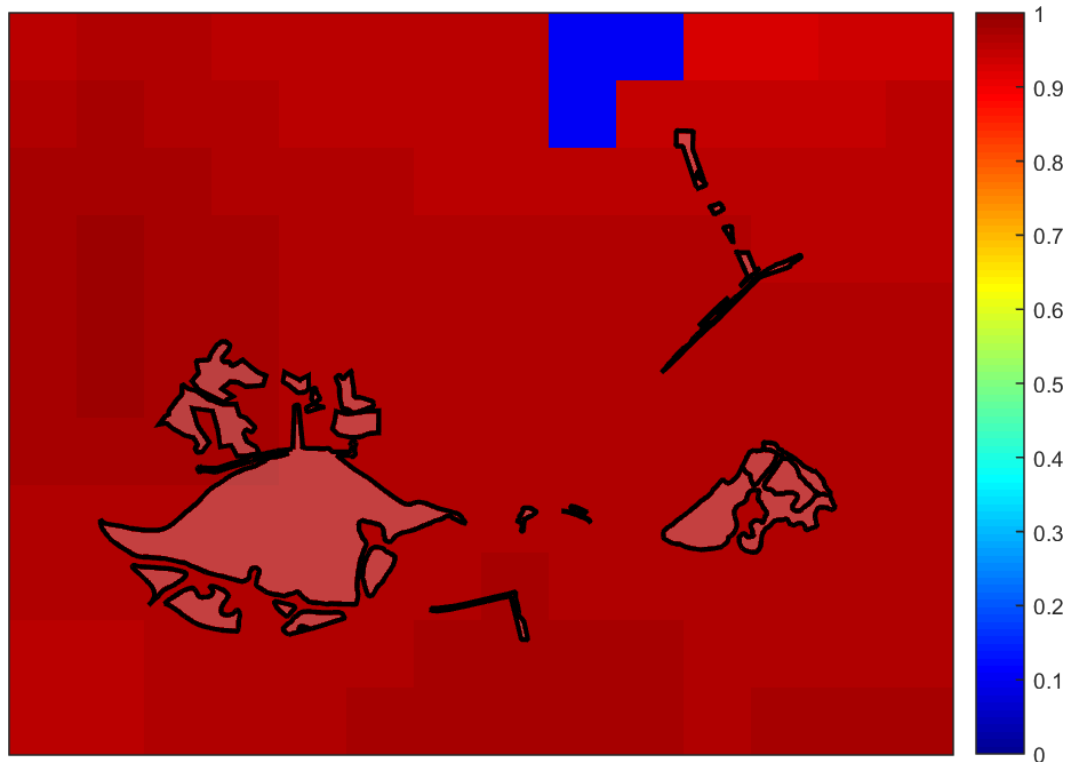
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Appendix 3 – Images of marked native vegetation

1. Native vegetation location risk map

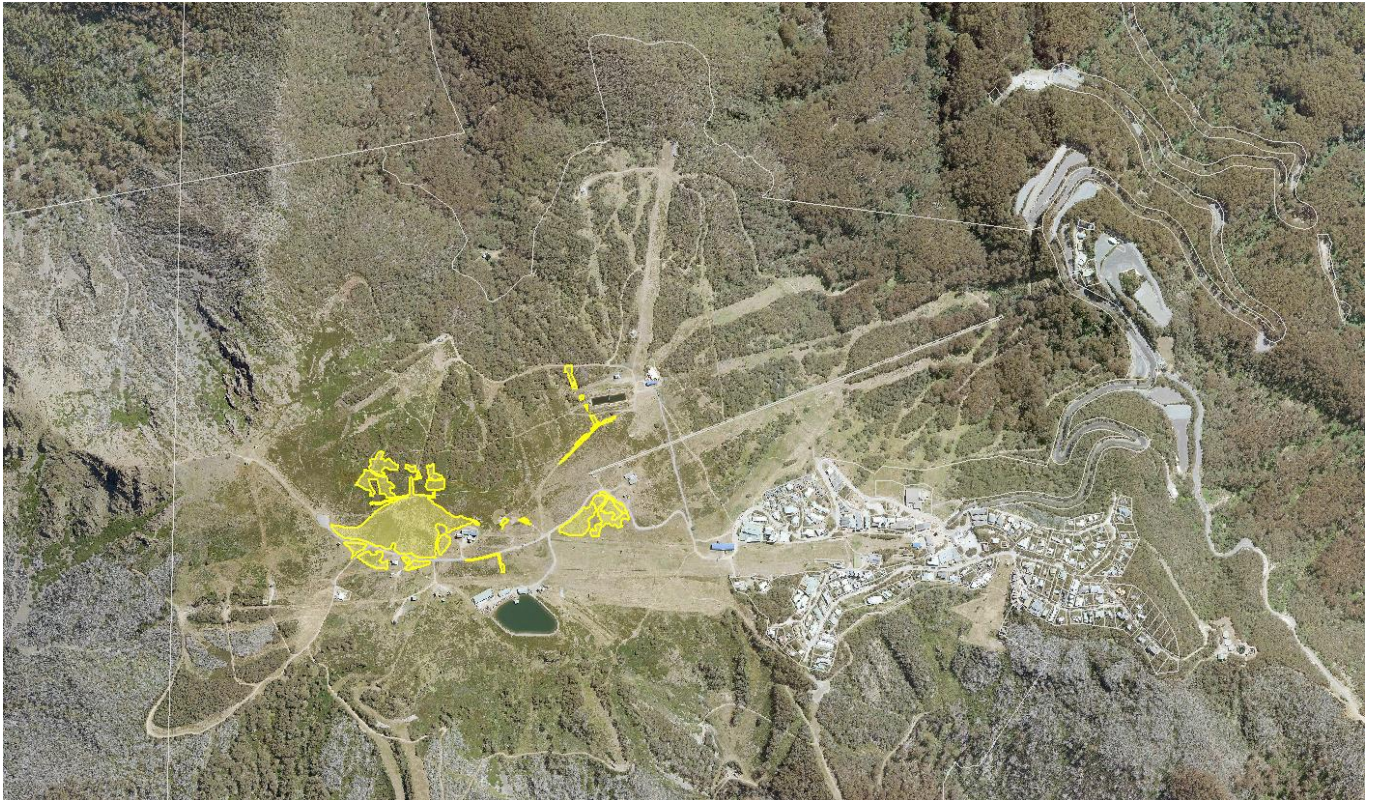


2. Strategic biodiversity score map



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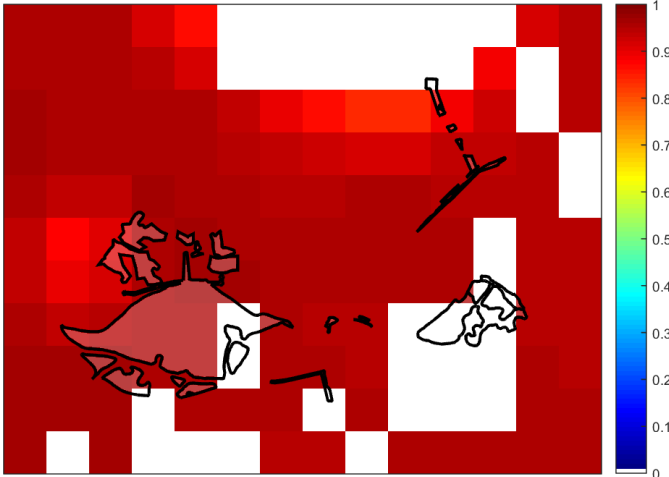
3. Aerial photograph showing marked native vegetation



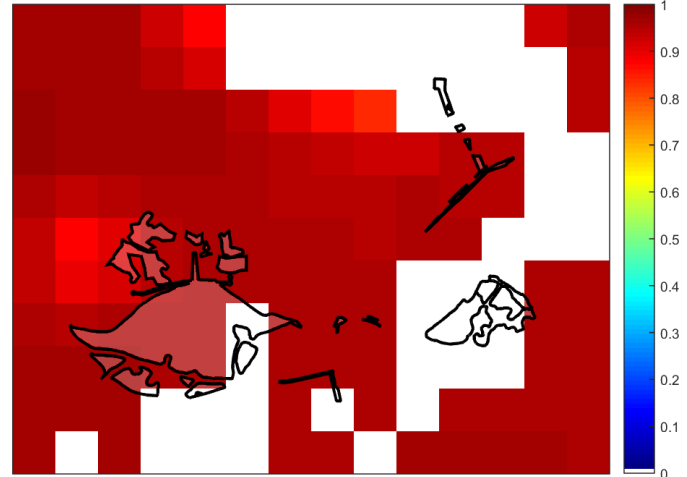
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4. Habitat importance maps

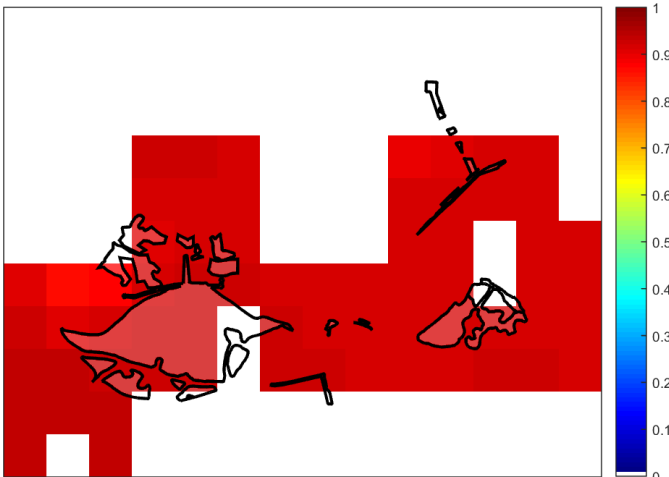
Alpine Bog Skink
Pseudemoia cryodroma
12992



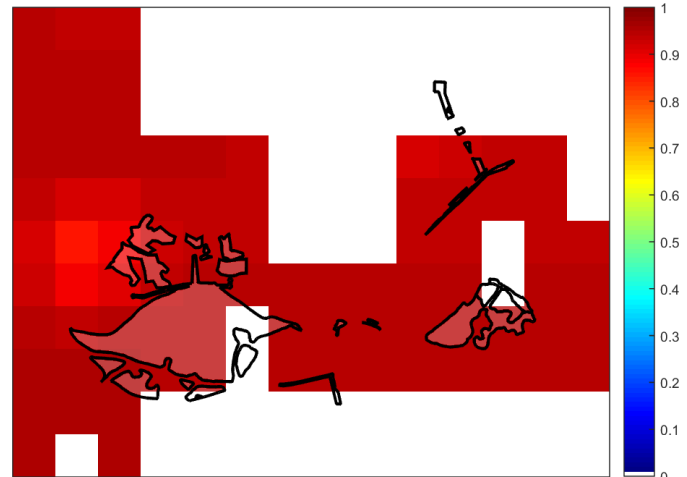
Snow Aciphyll
Aciphylla glacialis
500113



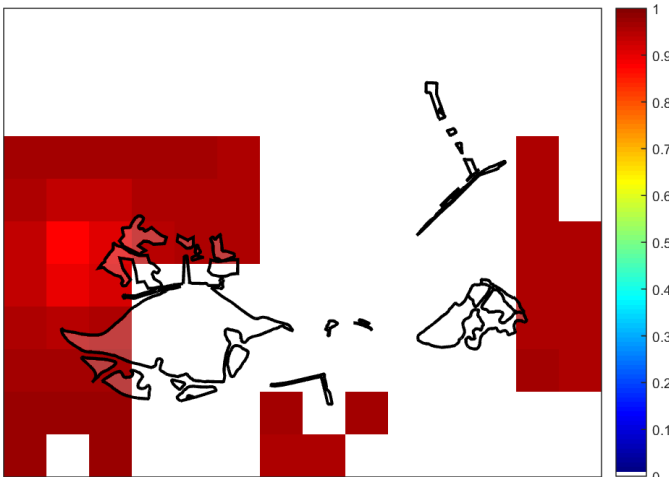
Mountain Aciphyll
Aciphylla simplicifolia
500114



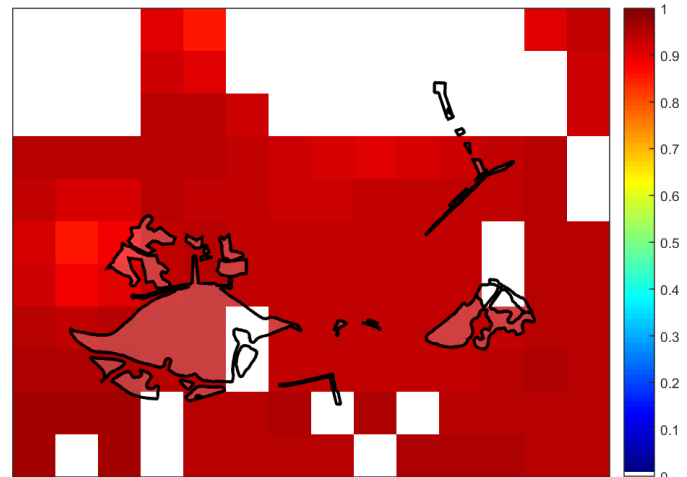
Mountain Daisy
Brachyscome sp. 3
500479



Alpine Marsh-marigold
Psychrophila introloba
500601

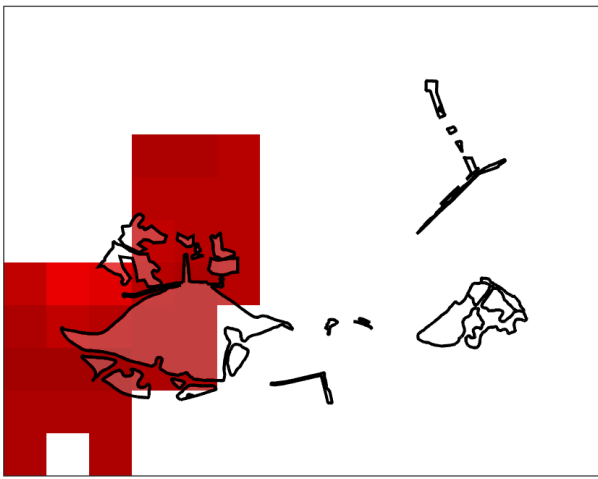


Carpet Sedge
Carex jackiana
500644

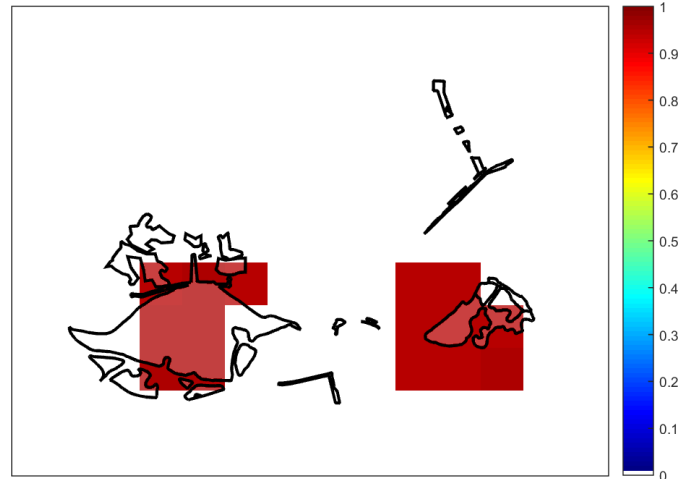


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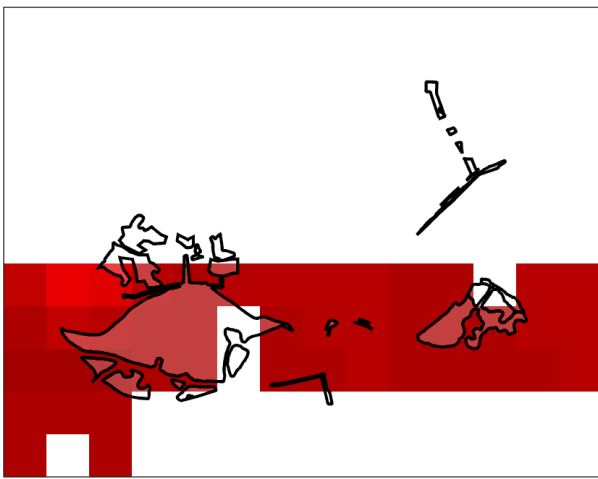
Broad-leaf Flower-rush
Carpha nivicola
500653



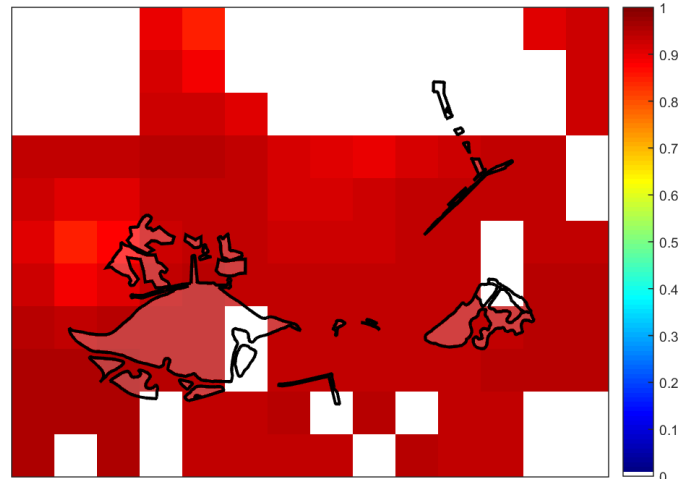
Sticky Fleabane
Erigeron nitidus
501215



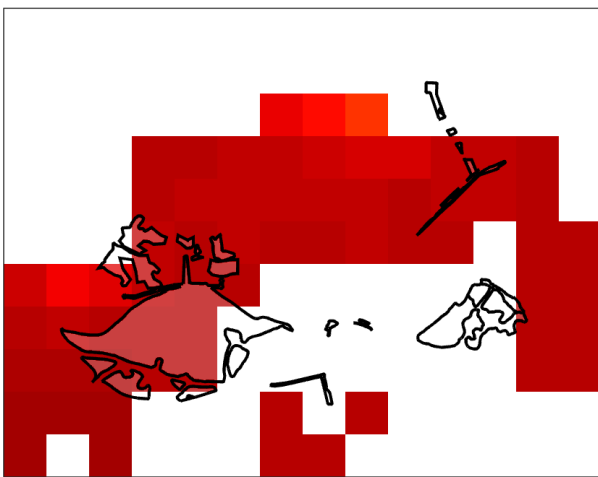
Fog Club-sedge
Isolepis montivaga
501781



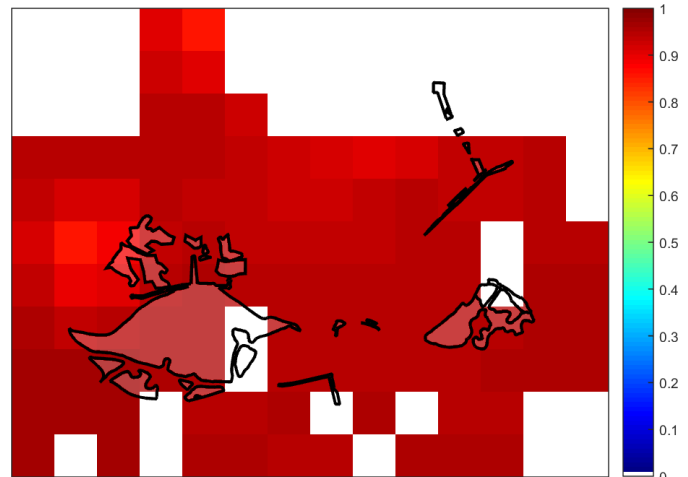
Tussock Woodrush
Luzula alpestris
502065



Veined Plantain
Plantago alpestris
502548

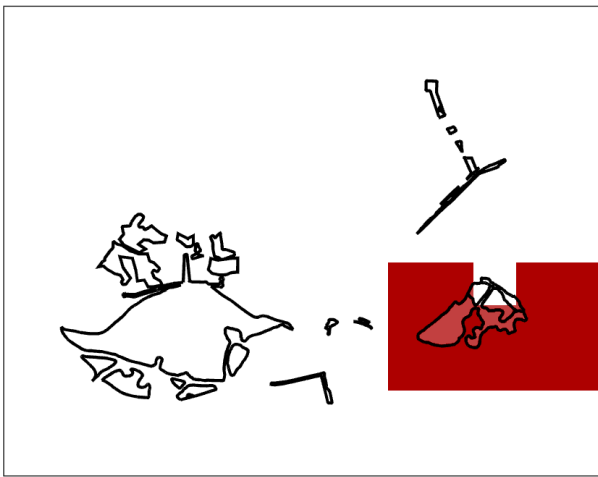


Gunn's Alpine Buttercup
Ranunculus gunnianus
502892

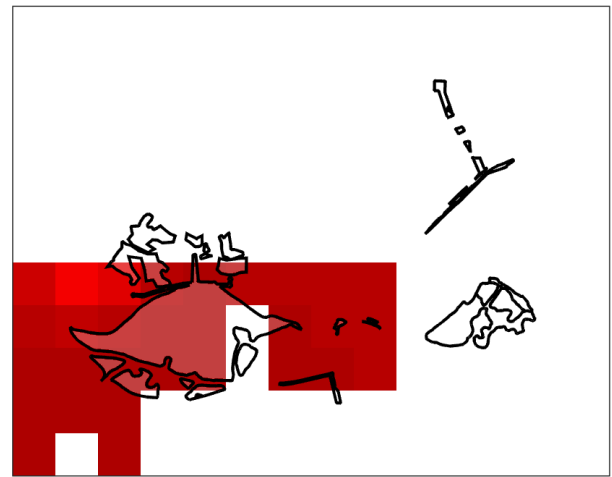


Biodiversity impact and offset requirements report

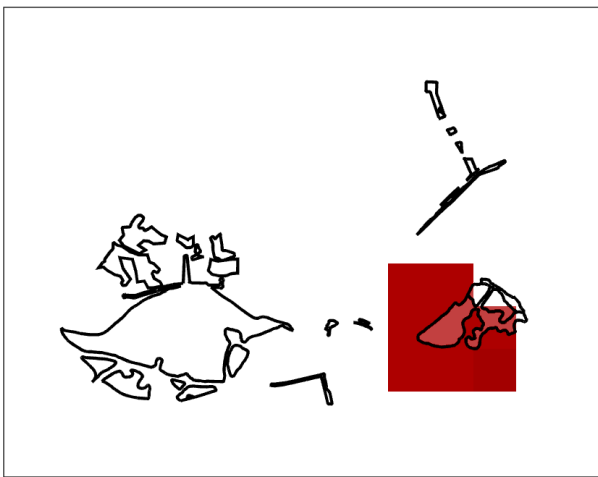
Felted Buttercup
Ranunculus muelleri
502896



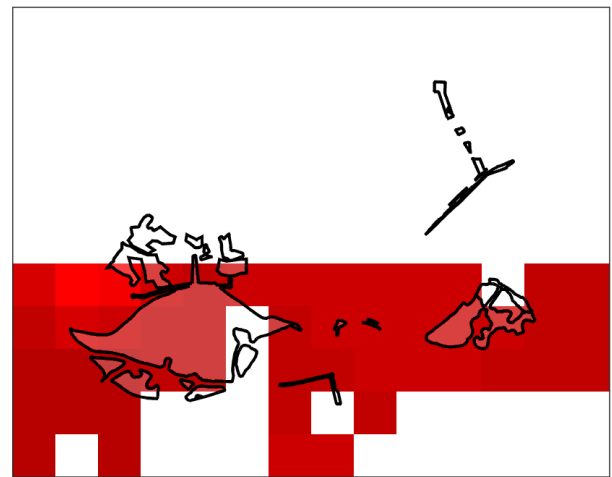
Mossy Knawel
Scleranthus singuliflorus
503064



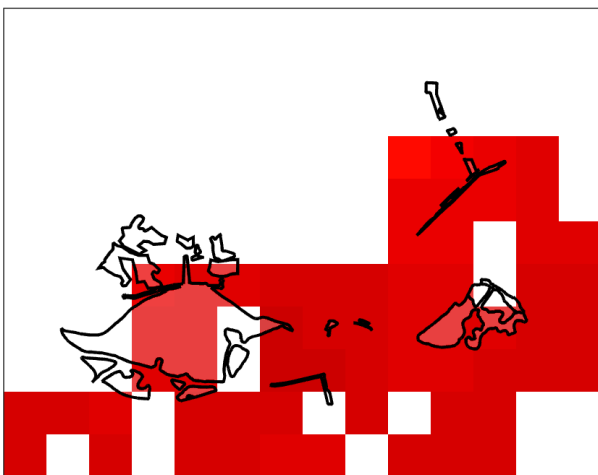
Alpine Stackhousia
Stackhousia pulvinaris
503245



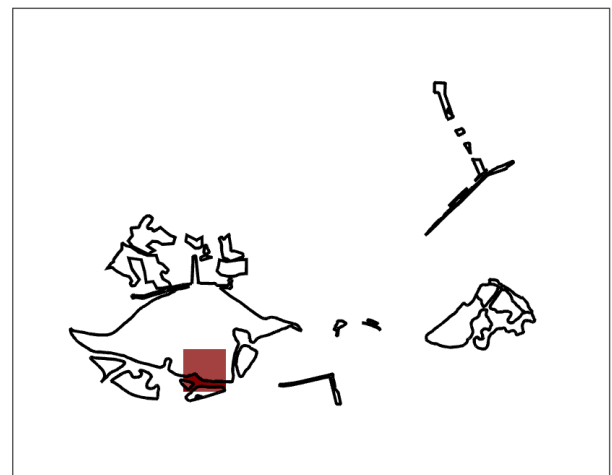
Green Billy-buttons
Craspedia jamesii
504647



Mountain Wallaby-grass
Rytidosperma oreophilum
504913



Planarian
Spathula tryssa
15052



Biodiversity impact and offset requirements report

Glossary

Condition score This is the site-assessed condition score for the native vegetation. Each habitat zone in the clearing proposal is assigned a condition score according to the habitat hectare assessment method. This information has been provided by or on behalf of the applicant in the GIS file.

Dispersed habitat A dispersed species habitat is a habitat for a rare or threatened species whose habitat is spread over a relatively broad geographic area greater than 2,000 hectares.

General biodiversity equivalence score The general biodiversity equivalence score quantifies the relative overall contribution that the native vegetation to be removed makes to Victoria's biodiversity. The general biodiversity equivalence score is calculated as follows:

$$\text{General biodiversity equivalence score} = \text{habitat hectares} \times \text{strategic biodiversity score}$$

General offset amount This is calculated by multiplying the general biodiversity equivalence score of the native vegetation to be removed by the risk factor for general offsets. This number is expressed in general biodiversity equivalence units and is the amount of offset that is required to be provided should the application be approved. This offset requirement will be a condition to the permit for the removal of native vegetation.

$$\text{Risk adjusted general biodiversity equivalence score} = \text{general biodiversity equivalence score} \times \text{clearing} \times 1.5$$

General offset attributes General offset must be located in the same Catchment Management Authority boundary or Municipal District (local council) as the clearing site. They must also have a strategic biodiversity score that is at least 80 per cent of the score of the clearing site.

Habitat hectares Habitat hectares is a site-based measure that combines extent and condition of native vegetation. The habitat hectares of native vegetation is equal to the current condition of the vegetation (condition score) multiplied by the extent of native vegetation. Habitat hectares can be calculated for a remnant patch or for scattered trees or a combination of these two vegetation types. This value is calculated for each habitat zone using the following formula:

$$\text{Habitat hectares} = \text{total extent (hectares)} \times \text{condition score}$$

Habitat importance score The habitat importance score is a measure of the importance of the habitat located on a site for a particular rare or threatened species. The habitat importance score for a species is a weighted average value calculated from the habitat importance map for that species. The habitat importance score is calculated for each habitat zone where the habitat importance map indicates that species habitat occurs.

Habitat zone Habitat zone is a discrete contiguous area of native vegetation that:

- is of a single Ecological Vegetation Class
- has the same measured condition.

Biodiversity impact and offset requirements report

Highly localised habitat A highly localised habitat is habitat for a rare or threatened species that is spread across a very restricted area (less than 2,000 hectares). This can also be applied to a similarly limited sub-habitat that is disproportionately important for a wide-ranging rare or threatened species. Highly localised habitats have the highest habitat importance score (1) for all locations where they are present.

Minimum strategic biodiversity score The minimum strategic biodiversity score is an attribute for a general offset. The strategic biodiversity score of the offset site must be at least 80 per cent of the strategic biodiversity score of the native vegetation to be removed. This is to ensure offsets are located in areas with a strategic value that is comparable to, or better than, the native vegetation to be removed. Where a specific and general offset is required, the minimum strategic biodiversity score relates only to the habitat zones that require the general offset.

Offset risk factor There is a risk that the gain from undertaking the offset will not adequately compensate for the loss from the removal of native vegetation. If this were to occur, despite obtaining an offset, the overall impact from removing native vegetation would result in a loss in the contribution that native vegetation makes to Victoria's biodiversity. To address the risk of offsets failing, an offset risk factor is applied to the calculated loss to biodiversity value from removing native vegetation.

Risk factor for general offsets = 1.5

Risk factor for specific offset = 2

Offset type The specific-general offset test determines the offset type required. When the specific-general offset test determines that the native vegetation removal will have an impact on one or more rare or threatened species habitat above the set threshold of 0.005 per cent, a specific offset is required. This test is done at the permit application level. A general offset is required when a proposal to remove native vegetation is not deemed, by application of the specific-general offset test, to have an impact on any habitat for any rare or threatened species above the set threshold of 0.005 per cent. All habitat zones that do not require a specific offset will require a general offset.

Proportional impact on species This is the outcome of the specific-general offset test. The specific-general offset test is calculated across the entire proposal for each species on the native vegetation permitted clearing species list. If the proportional impact on a species is above the set threshold of 0.005 per cent then a specific offset is required for that species.

Specific offset amount The specific offset amount is calculated by multiplying the specific biodiversity equivalence score of the native vegetation to be removed by the risk factor for specific offsets. This number is expressed in specific biodiversity equivalence units and is the amount of offset that is required to be provided should the application be approved. This offset requirement will be a condition to the permit for the removal of native vegetation.

Risk adjusted specific biodiversity equivalence score
= specific biodiversity equivalence score clearing × 2

Biodiversity impact and offset requirements report

Specific offset attributes	Specific offsets must be located in the modelled habitat for the species that has triggered the specific offset requirement.
Specific biodiversity equivalence score	<p>The specific biodiversity equivalence score quantifies the relative overall contribution that the native vegetation to be removed makes to the habitat of the relevant rare or threatened species. It is calculated for each habitat zone where one or more species habitats require a specific offset as a result of the specific-general offset test as follows:</p> $\textit{Specific biodiversity equivalence score} = \textit{habitat hectares} \times \textit{habitat importance score}$
Strategic biodiversity score	<p>This is the weighted average strategic biodiversity score of the marked native vegetation. The strategic biodiversity score has been calculated from the <i>Strategic biodiversity map</i> for each habitat zone.</p> <p>The strategic biodiversity score of native vegetation is a measure of the native vegetation's importance for Victoria's biodiversity, relative to other locations across the landscape. The <i>Strategic biodiversity map</i> is a modelled layer that prioritises locations on the basis of rarity and level of depletion of the types of vegetation, species habitats, and condition and connectivity of native vegetation.</p>
Total extent (hectares) for calculating habitat hectares	<p>This is the total area of the marked native vegetation in hectares.</p> <p>The total extent of native vegetation is an input to calculating the habitat hectares of a site and in calculating the general biodiversity equivalence score. Where the marked native vegetation includes scattered trees, each tree is converted to hectares using a standard area calculation of 0.071 hectares per tree. This information has been provided by or on behalf of the applicant in the GIS file.</p>
Vicinity	<p>The vicinity is an attribute for a general offset.</p> <p>The offset site must be located within the same Catchment Management Authority boundary or Local Municipal District as the native vegetation to be removed.</p>

Appendix 2: Desktop offset site gain scoring

Offset Zone			Sub-alpine Treeless Vegetation			Sub-alpine Woodland		
Land Tenure			Public			Public		
Security Arrangement			Agreement under Section 18B of the <i>Crown Land (Reserves) Act 1978</i> (Vic)					
Bioregion			Victorian Alps					
EVC Name			Sub-alpine Treeless Vegetation			Sub-alpine Woodland		
EVC Standardiser			1.36			1		
		Maximum	Current Condition	Maintenance Gain/ha	Improvement Gain/ha	Current Condition	Maintenance Gain/ha	Improvement Gain/ha
Scores	Large Trees	10	NA	NA		2	NA	
	Canopy Cover	5	NA	NA	NA	4	NA	NA
	Understorey	25	20	NA	5	15	NA	2.5
	Lack of Weeds	15	13		4	13		2
	Recruitment	10	10	NA	0	10	NA	0
	Organic Litter	5	5	NA	0	3	NA	2
	Logs	5	NA	NA	NA	5	NA	0
	Standardised Site Condition	75	65.28			NA		
	Landscape Context	25	20			20		
	Current Habitat Score	100	85.28			72		
Subtotals of Maintenance and Security Gains				NA	9		NA	6.5
Standardised Sum of Maintenance and Improvement Gain			12.24			6.5		
Prior Management Gain			NA			NA		
Security Gain			8.53			7.20		
Total Gain in Habitat Points/ha			17.53			13.70		

Appendix 3: Average habitat hectares scores

Habitat Zone ID			A	B	C	D	E	F	G	H
EVC #: Name			42 Sub-alpine Shrubland	43 Sub-alpine Woodland - Burnt	43 Sub-alpine Woodland - Unburnt	156 Alpine Coniferous Shrubland	210 Sub-alpine Wet Heathland	917 Sub-alpine Wet Sedgeland	1001 Alpine Grassland	1004 Alpine Grassy Heathland
	Max Score	Score	Score	Score	Score	Score	Score	Score	Score	Score
Site Condition	Large Old Trees	10	NA	2.50	5	NA	NA	NA	NA	NA
	Canopy Cover	5	NA	0	2.67	NA	NA	NA	NA	NA
	Understorey	25	8.33	15	15	20	15	15	15	15
	Lack of Weeds	15	15	14	13.67	15	15	15	11	13
	Recruitment	10	6.33	10	10	10	10	3	0	8.75
	Organic Matter	5	4.33	5	5	3	5	5	5	3.50
	Logs	5	0	4.25	5	NA	NA	NA	NA	NA
	Standardiser		1.25	1.00	1.00	1.36	1.36	1.36	1.36	1.36
	Total Site Score		42.50	50.75	56.33	65.45	61.36	51.82	42.27	54.89
Landscape Value	Patch Size	10	8	8	8	8	8	8	8	8
	Neighbourhood	10	8	8	8	8	8	8	8	8
	Distance to Core	5	5	5	5	5	5	5	5	5
	Total Landscape Score		21	21	21	21	21	21	21	21
HABITAT SCORE	100	63.50	71.75	77.33	86.45	82.36	72.82	63.27	75.89	
Habitat Zone area (ha)		8.04	172.44	49.09	1.28	1.28	0.35	1.10	27.15	
Habitat hectares (Hha)		5.11	123.73	37.96	1.10	1.05	0.26	0.70	20.60	

Appendix 4: Field-based offset site gain scoring

Gain score calculations follow DELWP's latest advice for offsets on Crown land (DELWP 2016). Condition scores follow habitat hectares scores (Appendix 3).

Habitat Zone		A			B			C			D			
Land Tenure		Public			Public			Public			Public			
Security Arrangement		Agreement under Section 18B of the <i>Crown Land (Reserves) Act 1978</i> (Vic)												
Bioregion		Victorian Alps												
EVC Name		Sub-alpine Shrubland			Sub-alpine Woodland – Burnt			Sub-alpine Woodland – Unburnt			Alpine Coniferous Shrubland			
EVC Standardiser*		1.25			1			1			1.36			
		Max.	CC	MG	IG	CC	MG	IG	CC	MG	IG	CC	MG	IG
Scores	Large Trees	10	NA	0		2.5	NA		5	0		NA	0	
	Tree Canopy Cover	5	NA	0	0	0	0	0	2.67	0	0	NA	0	0
	Understorey	25	8.33	1.60	0	15	2	0	15	2	0	20	1.47	0
	Lack of Weeds	15	15		8	14		10	13.67		10	15		7.35
	Recruitment	10	6.33	0	8	10	0	10	10	0	10	10	0	7.35
	Organic Litter	5	4.33	0	0	5	0	0	5	0	0	3	0	0
	Logs	5	NA	0	0	4.25	0	0	5	0	0	NA	0	0
	Standardised Site Condition	75	42.50			50.75			56.33			65.45		
	Landscape Context	25	21			21			21			21		
	Current Habitat Score	100	63.50			71.75			77.33			86.45		
Subtotals of Maintenance and Security Gains				1.60	16		2	20		2	20		1.47	14.71
Standardised* Sum of MG and IG				22			22			22			22	
Prior Management Gain				0			0			0			0	
Security Gain/ha				6.35			7.18			7.73			8.65	
Total Gain/ha				28.35			29.18			29.73			30.70	

CC = Current Condition; MG = Maintenance Gain per hectare; IG = Improvement Gain per hectare. *See standardisers fro site condition (Appendix 3).

Habitat Zone			E			F			G			H		
Land Tenure			Public											
Security Arrangement			Agreement under Section 18B of the <i>Crown Land (Reserves) Act 1978 (Vic)</i>											
Bioregion			Victorian Alps											
EVC Name			Sub-alpine Wet Heathland			Sub-alpine Wet Sedgeland			Alpine Grassland			Alpine Grassy Heathland		
EVC Standardiser*			1.36			1.36			1.36			1.36		
		Max.	CC	MG	IG	CC	MG	IG	CC	MG	IG	CC	MG	IG
Scores	Large Trees	10	NA	0		NA	0		NA	NA		NA	0	
	Tree Canopy Cover	5	NA	0	NA	NA	0	0	NA	NA	NA	NA	0	0
	Understorey	25	15	1.47	0	15	1.47	0	15	1.47	0	15	1.47	0
	Lack of Weeds	15	15		7.35	15		7.35	11		7.35	13		7.35
	Recruitment	10	10	0	7.35	3	0	7.35	0	0	7.35	8.75	0	7.35
	Organic Litter	5	5	0	0	5	0	0	5	0	0	3.5	0	0
	Logs	5	NA	0	NA	NA	0	0	NA	NA	NA	NA	0	0
	Standardised Site Condition	75	61.36			51.82			42.27			54.89		
	Landscape Context	25	21			21			21			21		
	Current Habitat Score	100	82.36			72.82			63.27			75.89		
Subtotals of Maintenance and Security Gains				1.47		1.47	14.71		1.47	14.71		1.47	14.71	
Standardised* Sum of MG and IG				22			22			22			22	
Prior Management Gain				0			0			0			0	
Security Gain/ha				8.24			7.28			6.33			7.59	
Total Gain/ha				30.30			29.34			28.39			29.65	

CC = Current Condition; MG = Maintenance Gain per hectare; IG = Improvement Gain per hectare. *See standardisers for site condition (Appendix 3).

Appendix 5: DELWP offset site report

Offset site report

This report provides information about native vegetation offset sites in accordance with the *Permitted clearing of native vegetation – Biodiversity assessment guidelines*. The information in this report is based on spatial information and site gain in habitat hectares, provided by the offset provider (or their representative), about the offset site to DELWP. Any changes to this input information will change the amount of offsets available at the offset site and will require this report to be reissued.

This report should be read in conjunction with the *Native vegetation offset market fact sheet* that provides information on how offsets are measured and categorised, and how they can be used to satisfy conditions on permits to remove native vegetation and traded as credits in the offset market.

Date of issue: 20/04/2017

DELWP ref: BIO_0355

Time of issue: 10:37 am

Project ID	21306_VegGains_Mt Sterling
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Summary of offset site

Total extent	260.728 ha
Remnant patches	260.728 ha
Revegetation	0.000 ha
Number of biodiversity class areas (BCAs)	121
Catchment Management Authority and Municipal district	Goulburn Broken CMA, North East CMA, Mount Stirling Alpine Resort (Unincorporated) Council

Summary of biodiversity equivalence units available at offset site

The offset site has the following general and specific biodiversity equivalence units.

General biodiversity equivalence units	70.200 general units*
Specific biodiversity equivalence units	64.828 specific units* of habitat for Mountain Pygmy-possum 41.778 specific units* of habitat for Broad-toothed Rat 64.686 specific units* of habitat for Alpine Bog Skink 60.474 specific units* of habitat for Alpine Wattle 73.430 specific units* of habitat for Snow Aciphyll 9.638 specific units* of habitat for Mountain Aciphyll 52.833 specific units* of habitat for Mueller's Bent 13.743 specific units* of habitat for Mountain Water-fern 21.257 specific units* of habitat for Mountain Daisy 31.786 specific units* of habitat for Alpine Marsh-marigold 33.682 specific units* of habitat for Alpine Sedge ...continued overleaf...

...continued from pag 1...

31.352 specific units* of habitat for Short Sedge
53.891 specific units* of habitat for Carpet Sedge
15.727 specific units* of habitat for Broad-leaf Flower-rush
2.688 specific units* of habitat for Snow Coprosma
5.576 specific units* of habitat for Brittle Bladder-fern
25.730 specific units* of habitat for Crag Wallaby-grass
9.672 specific units* of habitat for Keeled Bent-grass
19.799 specific units* of habitat for Thick Bent-grass
11.453 specific units* of habitat for Alpine Sundew
62.066 specific units* of habitat for Mountain Willow-herb
1.412 specific units* of habitat for Sticky Fleabane
67.931 specific units* of habitat for Spinning Gum
4.444 specific units* of habitat for Hairy Eyebright
11.497 specific units* of habitat for Mat Cudweed
43.979 specific units* of habitat for Cliff Cudweed
7.112 specific units* of habitat for Sky Lily
41.324 specific units* of habitat for Fir Clubmoss
2.785 specific units* of habitat for Fog Club-sedge
43.435 specific units* of habitat for Tussock Woodrush
1.465 specific units* of habitat for Spreading Clubmoss
14.094 specific units* of habitat for Tuft-rush
5.691 specific units* of habitat for Alpine Tuft-rush
28.533 specific units* of habitat for Veined Plantain
1.354 specific units* of habitat for Fine-leaf Snow-grass
13.962 specific units* of habitat for Strawberry Buttercup
32.955 specific units* of habitat for Eichler's Buttercup
41.183 specific units* of habitat for Gunn's Alpine Buttercup
2.785 specific units* of habitat for Felted Buttercup
4.219 specific units* of habitat for Mossy Knawel
1.427 specific units* of habitat for Alpine Stackhousia
18.769 specific units* of habitat for Lilac Berry
11.710 specific units* of habitat for Milfoil Speedwell
12.812 specific units* of habitat for Alpine Westringia
2.731 specific units* of habitat for Alpine Sunray
5.518 specific units* of habitat for Green Billy-buttons
63.423 specific units* of habitat for Dusty Daisy-bush
34.642 specific units* of habitat for Alpine Phebalium
10.919 specific units* of habitat for Mountain Wallaby-grass
28.286 specific units* of habitat for Royal Grevillea
12.603 specific units* of habitat for Alpine Tree Frog
0.164 specific units* of habitat for Planarian
0.167 specific units* of habitat for Mountain Forest Billy-buttons
0.467 specific units* of habitat for Alpine Trachymene
0.167 specific units* of habitat for Lilac Bitter-cress

*Note that some biodiversity equivalence units may be alternates. The use of any biodiversity equivalence units of one type within a BCA will result in a proportional reduction in biodiversity equivalence units of other types within that BCA.

NB: Values presented in tables throughout this document may not add to totals due to rounding.

Offset site report

Offset site details

Biodiversity equivalence units available and attributes by BCA

The biodiversity equivalence units and attributes for each BCA are as follows:

BCA	Offset type	Biodiversity equivalence units	Offset attributes
1	General	<div style="border: 2px solid red; padding: 5px;"> <i>Refer to accompanying Excel spreadsheet, which must be included with this report in any application – ‘BEU and attributes by BCA’ tab</i> </div>	Core
	Specific		the offset site scientific name

Site gain in habitat hectares

Site gain in habitat hectares is calculated for each biodiversity class area (BCA) in the offset site using the extent and site gain per hectare scores in the GIS data provided.

BCA	Site gain per hectare*	Extent (ha)	Site gain in habitat hectares
1	0.292	0.000	0.000
2	0.292	0.000	0.000
3	0.297	0.000	0.000
4	0.297	0.000	0.000
5	0.297	0.000	0.000
6	0.297	0.000	0.000
7	0.297	0.000	0.000
8	0.296	1.661	0.492
9	0.294	3.317	0.976
10	0.297	0.000	0.000
11	0.293	3.375	0.988
12	0.292	1.688	0.493
13	0.295	4.489	1.326
14	0.287	0.530	0.152
15	0.296	3.292	0.974
16	0.293	1.687	0.495
17	0.297	0.000	0.000
18	0.297	0.000	0.000
19	0.297	3.350	0.996
20	0.297	0.000	0.000
21	0.292	3.316	0.970
22	0.297	3.348	0.995
23	0.294	1.666	0.490
24	0.292	1.687	0.492

Offset site report

BCA	Site gain per hectare*	Extent (ha)	Site gain in habitat hectares
25	0.292	5.062	1.477
26	0.292	0.000	0.000
27	0.297	0.000	0.000
28	0.292	0.000	0.000
29	0.292	0.000	0.000
30	0.292	0.000	0.000
31	0.292	1.687	0.493
32	0.292	0.000	0.000
33	0.292	0.000	0.000
34	0.292	3.375	0.985
35	0.297	0.000	0.000
36	0.297	0.000	0.000
37	0.297	0.000	0.000
38	0.292	1.687	0.492
39	0.292	1.687	0.492
40	0.292	3.375	0.987
41	0.292	3.375	0.985
42	0.290	3.375	0.980
43	0.293	4.961	1.452
44	0.294	3.375	0.993
45	0.292	3.375	0.985
46	0.292	0.563	0.164
47	0.297	0.000	0.000
48	0.292	1.688	0.492
49	0.296	3.375	0.998
50	0.293	5.063	1.482
51	0.293	1.661	0.487
52	0.292	1.688	0.492
53	0.292	3.375	0.985
54	0.292	4.991	1.456
55	0.293	5.063	1.485
56	0.295	3.375	0.996
57	0.293	1.687	0.494
58	0.294	3.375	0.991
59	0.292	1.688	0.492
60	0.292	1.688	0.493
61	0.294	1.688	0.497
62	0.292	5.062	1.479

Offset site report

BCA	Site gain per hectare*	Extent (ha)	Site gain in habitat hectares
63	0.292	1.687	0.492
64	0.292	3.375	0.985
65	0.292	3.375	0.985
66	0.292	1.660	0.485
67	0.293	3.358	0.983
68	0.292	1.687	0.492
69	0.294	0.000	0.000
70	0.292	1.666	0.486
71	0.292	1.687	0.492
72	0.292	1.688	0.492
73	0.294	5.055	1.485
74	0.296	1.111	0.329
75	0.295	0.515	0.152
76	0.297	0.000	0.000
77	0.292	0.000	0.000
78	0.292	3.375	0.985
79	0.297	1.669	0.495
80	0.292	0.000	0.000
81	0.292	1.687	0.493
82	0.297	1.688	0.502
83	0.297	0.000	0.000
84	0.294	3.368	0.989
85	0.296	0.000	0.000
86	0.296	5.063	1.497
87	0.292	1.687	0.492
88	0.296	5.052	1.496
89	0.294	4.397	1.293
90	0.297	0.562	0.167
91	0.295	5.016	1.482
92	0.292	3.375	0.987
93	0.292	3.375	0.986
94	0.293	1.688	0.495
95	0.293	3.375	0.988
96	0.292	3.375	0.985
97	0.295	1.687	0.498
98	0.293	3.375	0.990
99	0.292	3.329	0.971
100	0.295	3.301	0.975

Offset site report

BCA	Site gain per hectare*	Extent (ha)	Site gain in habitat hectares
101	0.294	5.044	1.481
102	0.292	3.375	0.985
103	0.292	1.688	0.493
104	0.296	3.375	1.000
105	0.295	1.125	0.332
106	0.299	0.546	0.163
107	0.292	3.375	0.985
108	0.292	1.687	0.492
109	0.292	3.375	0.985
110	0.293	1.645	0.482
111	0.291	3.375	0.983
112	0.292	5.053	1.477
113	0.292	5.063	1.476
114	0.294	1.594	0.469
115	0.291	3.255	0.946
116	0.292	1.656	0.483
117	0.293	3.374	0.989
118	0.294	1.687	0.497
119	0.292	3.375	0.985
120	0.294	1.659	0.487
121	0.292	3.323	0.972
TOTAL			76.429

* This value has been calculated using the site gain per hectare values for each habitat zone as provided with the GIS file of the offset site. The site gain per hectare value for a BCA is calculated from the weighted average of site gain per hectare values for all habitat zones that intersect with the BCA.

Offset site report

Offset site biodiversity equivalence unit calculations by biodiversity class area

The general biodiversity equivalence units for the biodiversity class area are calculated by multiplying the site gain in habitat hectares by the strategic biodiversity score.

Where a BCA has specific units for one or more rare or threatened species, the specific biodiversity equivalence units for each BCA is calculated by multiplying the site gain in habitat hectares by the habitat importance score for each of these species.

BCA	Site gain in habitat hectares	Offset type	General offset attributes	Specific offset attributes		Biodiversity equivalence units*
			Strategic biodiversity score	Species number, Species common name, Species scientific name	Habitat importance score	
1	X.XXX		X.XXX	<div style="border: 2px solid red; padding: 5px; text-align: center;"> <p><i>Refer to accompanying Excel spreadsheet, which must be included with this report in any application – 'BEU calculations by BCA' tab</i></p> </div>		X.XXX General units Specific units
				Name, Species A Scientific Name		

*Note that biodiversity equivalence units within a BCA are alternates. The use of any biodiversity equivalence units of one type within a BCA will result in a proportional reduction in biodiversity equivalence units of other types within that BCA.

Next steps

Offset sites must meet eligibility criteria as outlined in the *Native vegetation gain scoring manual, version 1* available on the DELWP website and any other relevant requirements. Eligible offset sites that are intended to be banked or sold as credits must be registered on the native vegetation credit register. A habitat hectare assessment is required to be undertaken before any offset can be registered on the credit register.

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For more information contact the DELWP Customer Service Centre 136 186

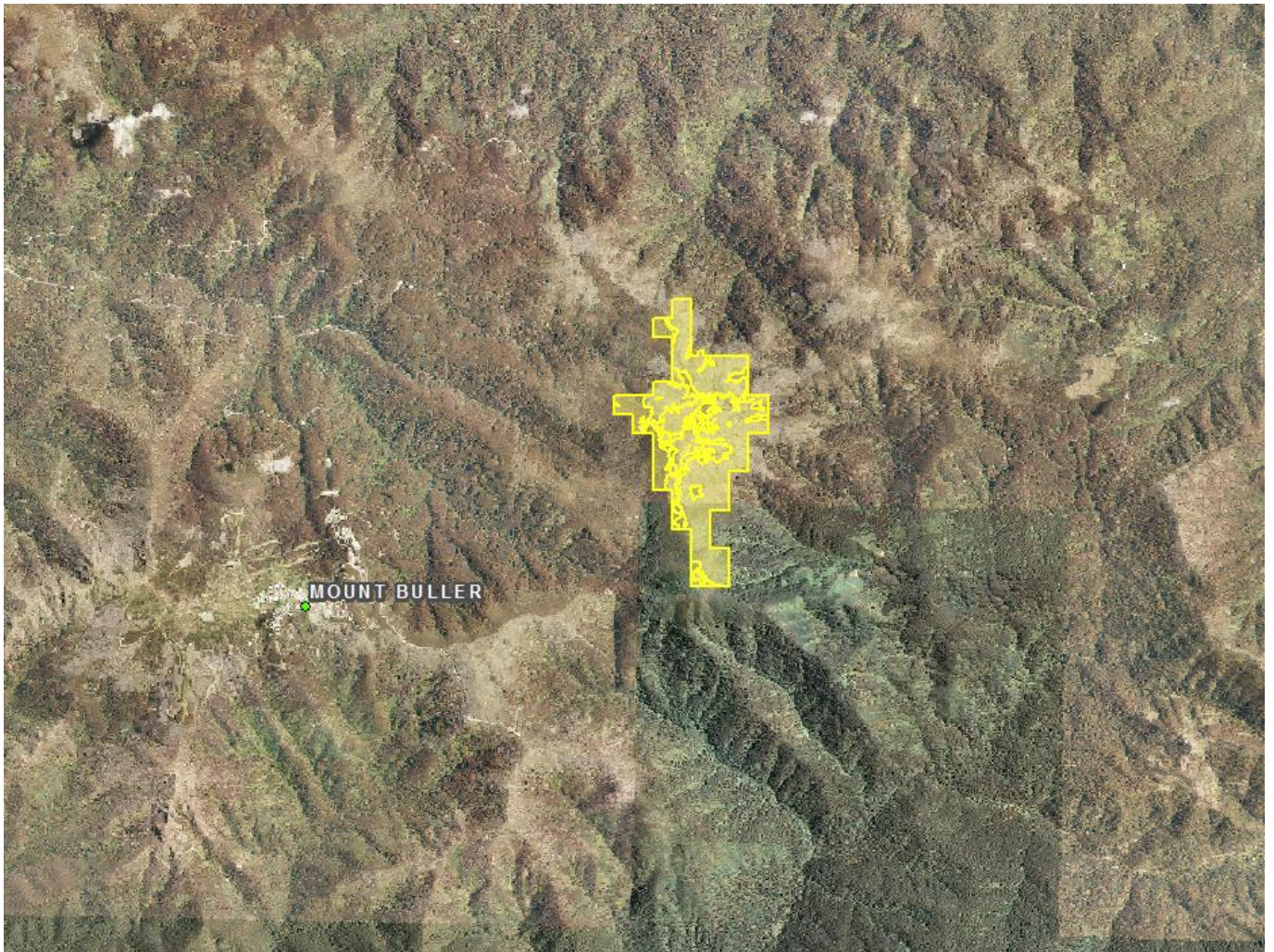
www.delwp.vic.gov.au

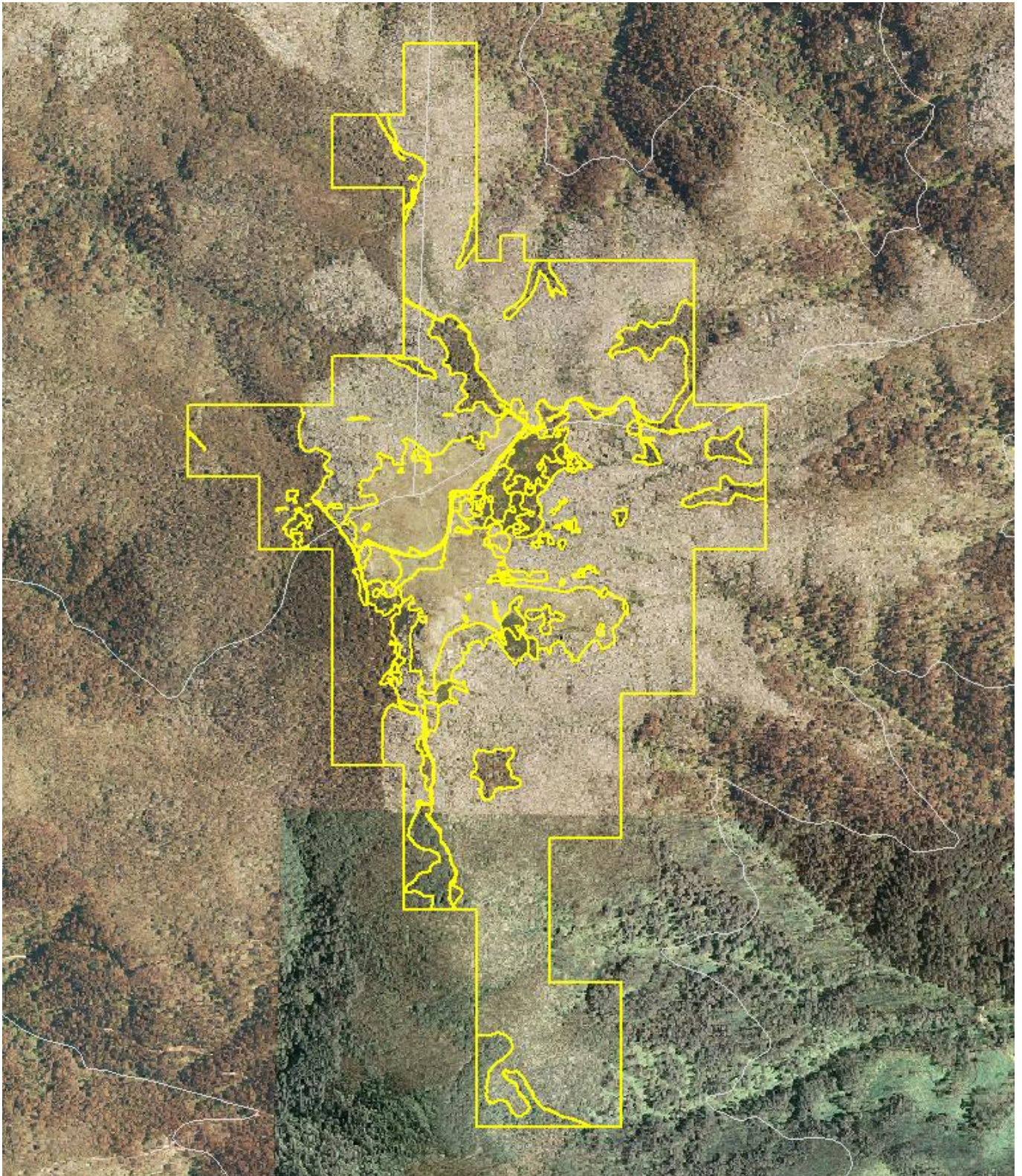
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Appendix 1 – Images of marked native vegetation

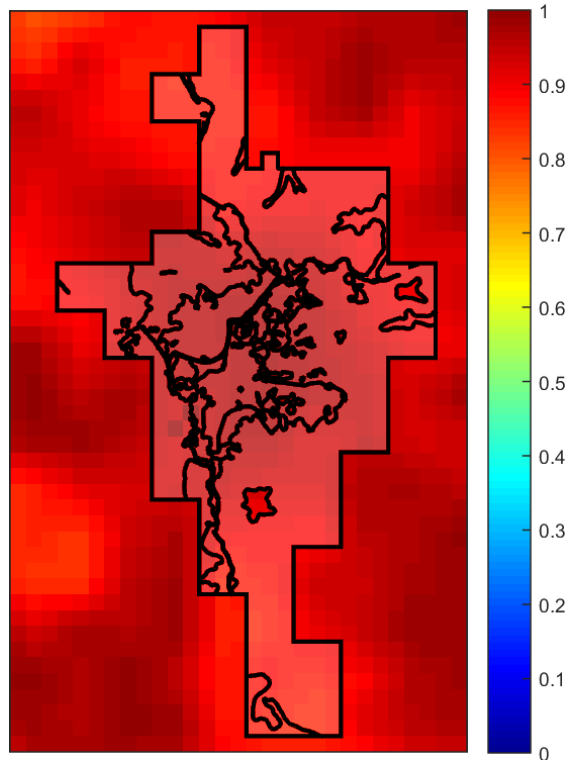
1. Aerial photograph showing marked native vegetation





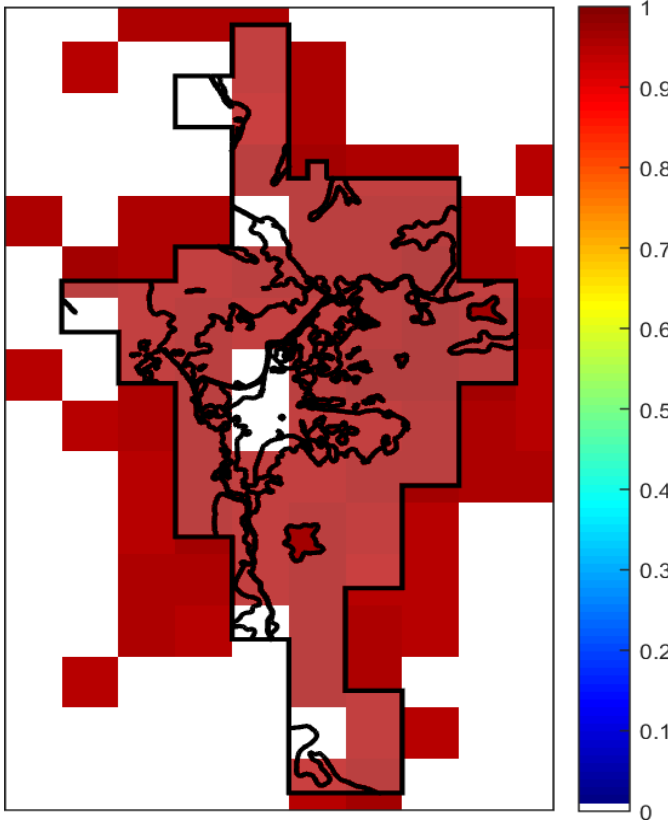
Offset site report

2. Strategic biodiversity score map

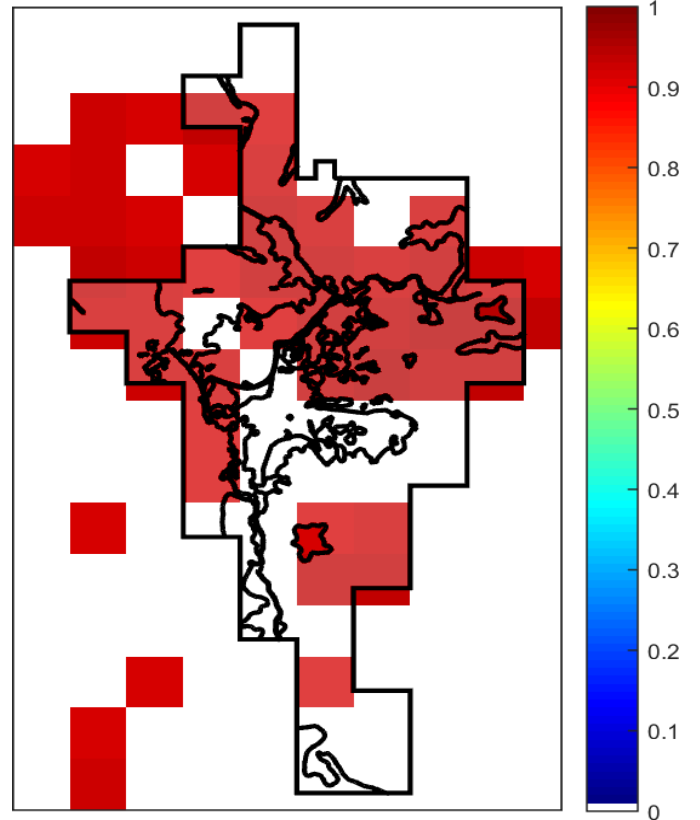


3. Habitat importance maps

Mountain Pygmy-possum
Burramys parvus
11156

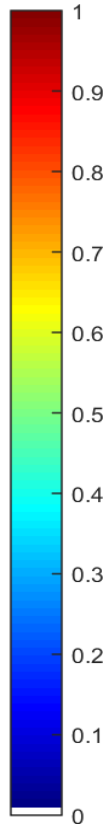
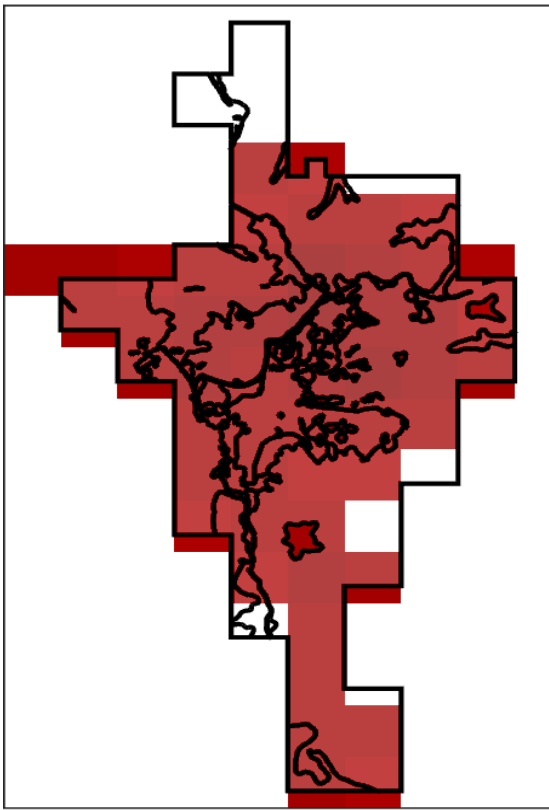


Broad-toothed Rat
Mastacomys fuscus mordicus
11438

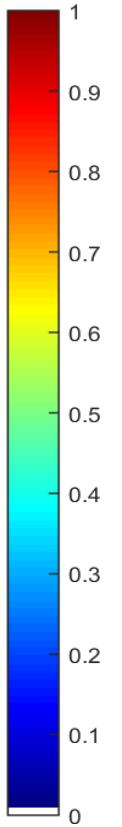
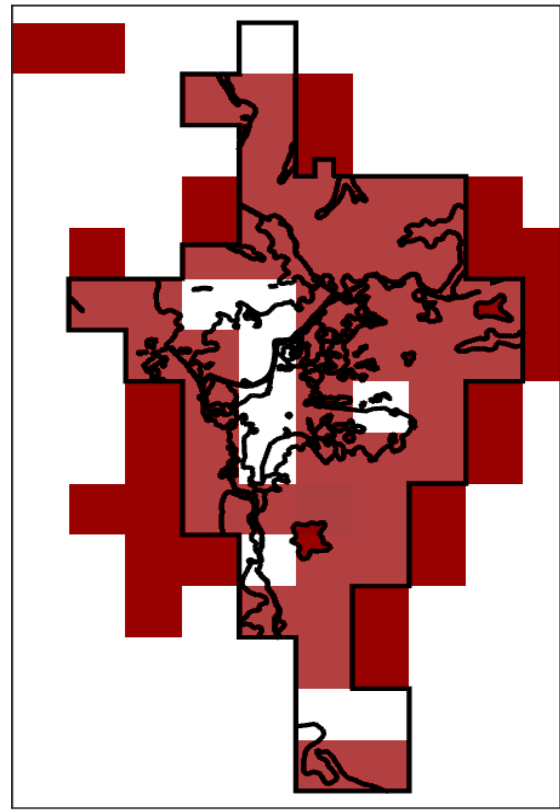


Offset site report

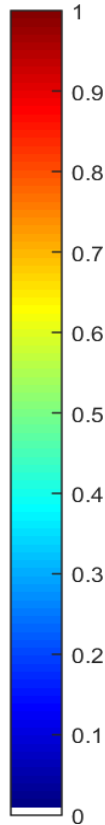
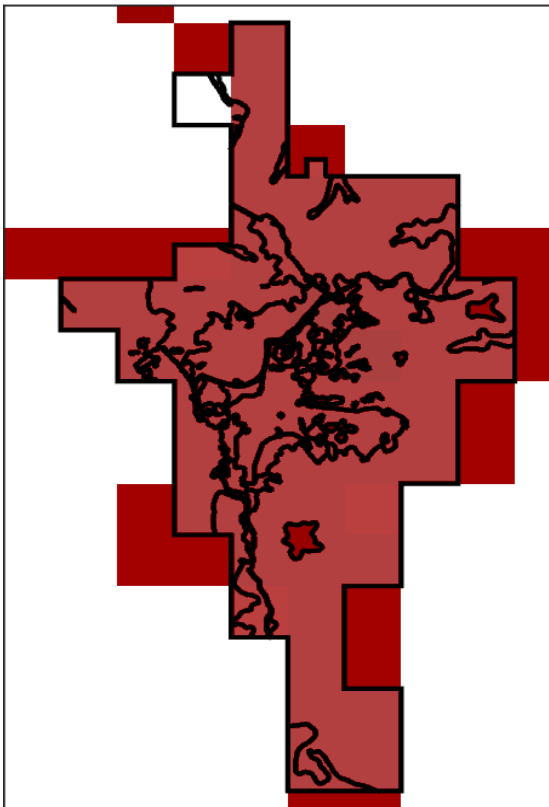
Alpine Bog Skink
Pseudemoia cryodroma
12992



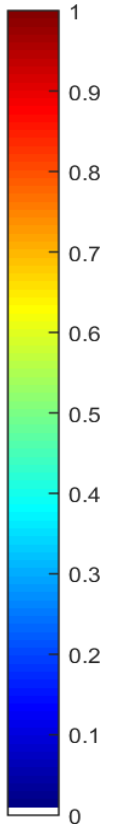
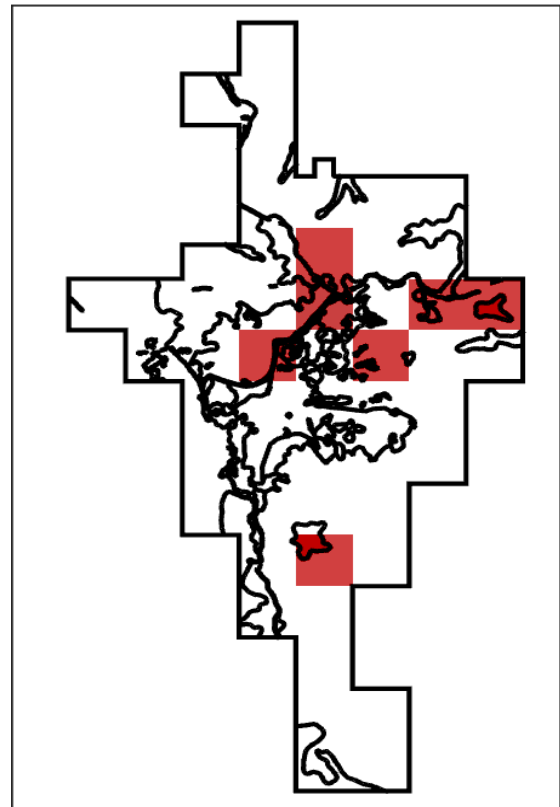
Alpine Wattle
Acacia alpina
500009



Snow Aciphyll
Aciphylla glacialis
500113

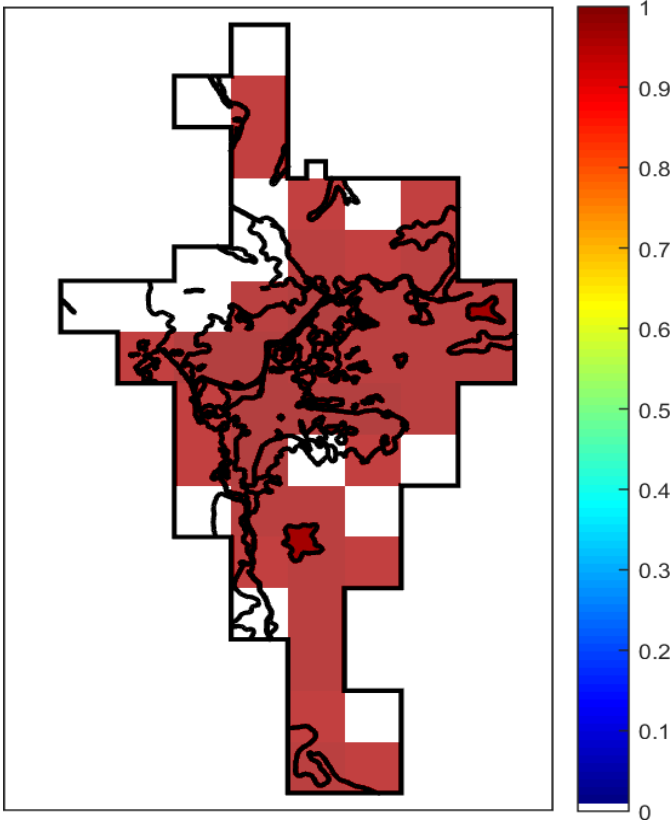


Mountain Aciphyll
Aciphylla simplicifolia
500114

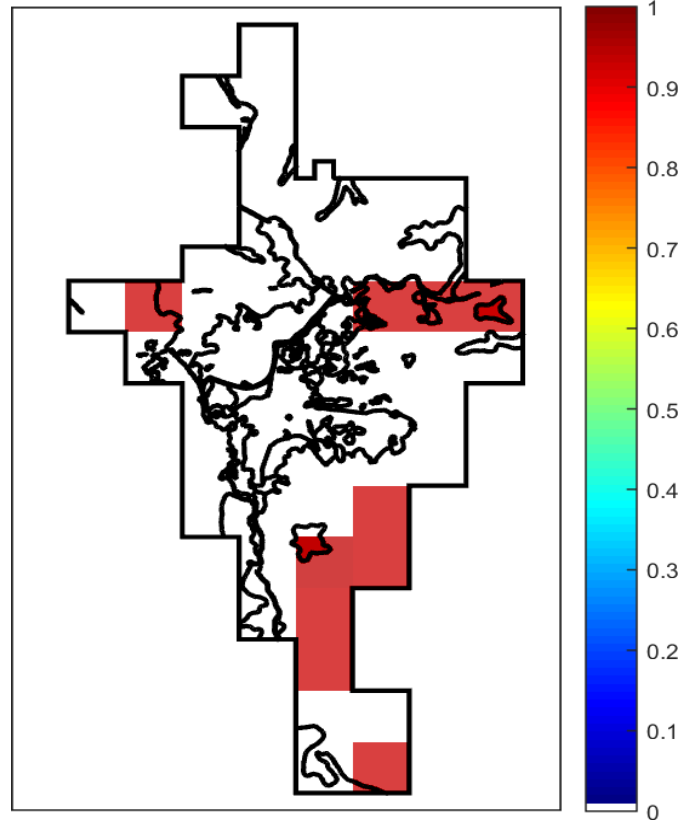


Offset site report

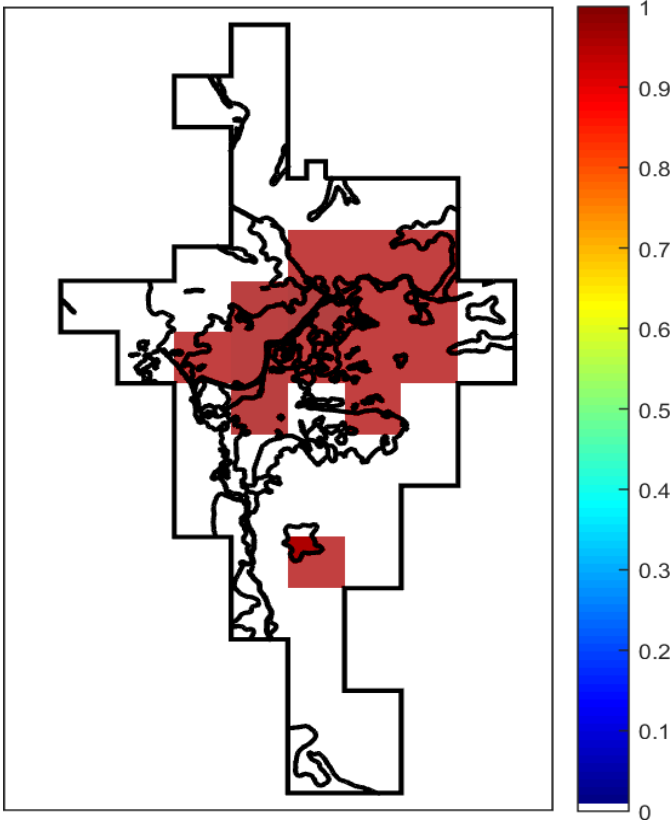
Mueller's Bent
Agrostis muelleriana
500157



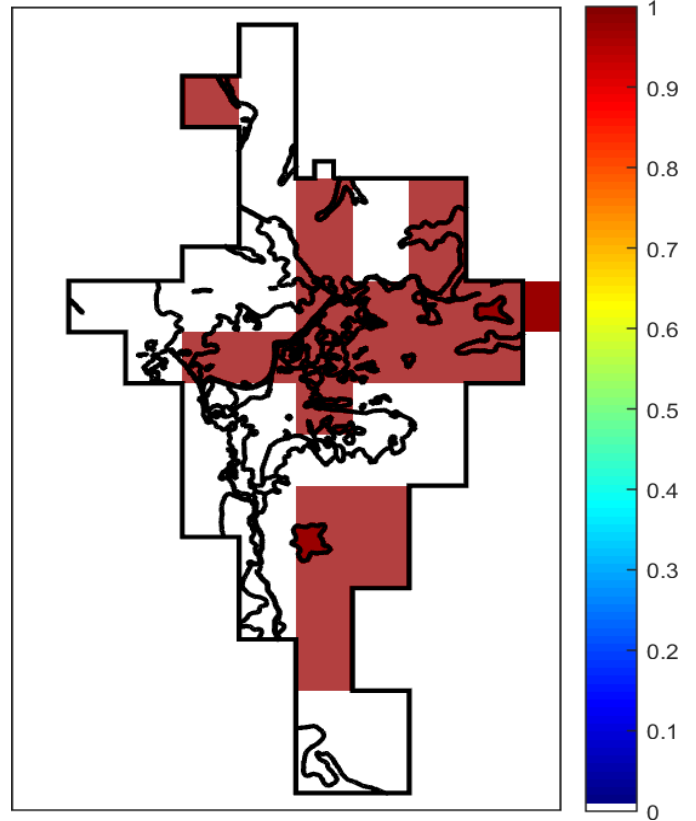
Mountain Water-fern
Blechnum vulcanicum
500412



Mountain Daisy
Brachyscome sp. 3
500479

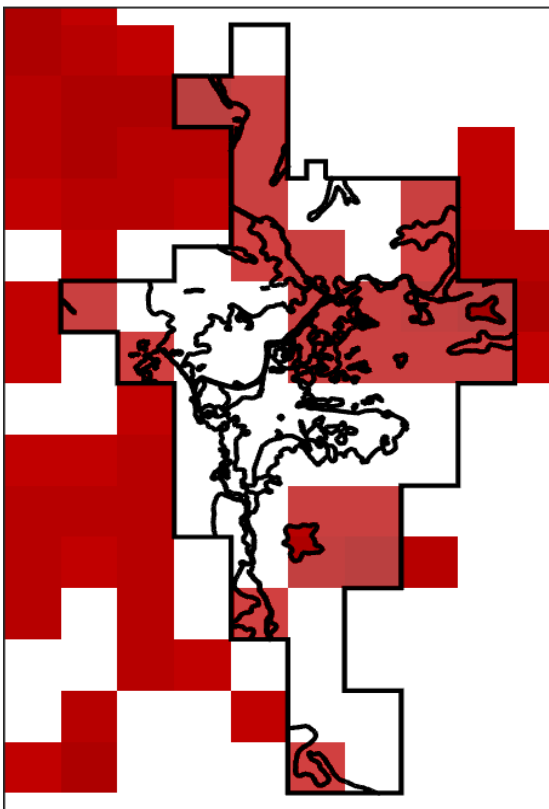


Alpine Marsh-marigold
Psychrophila introloba
500601

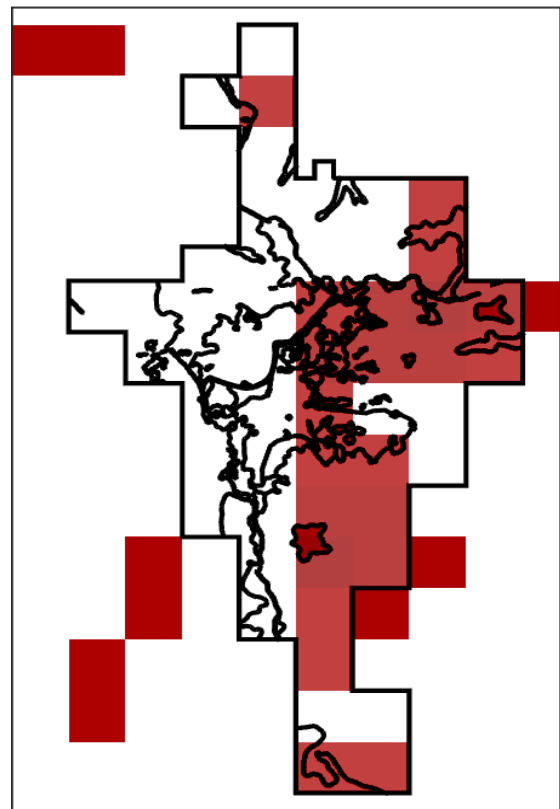


Offset site report

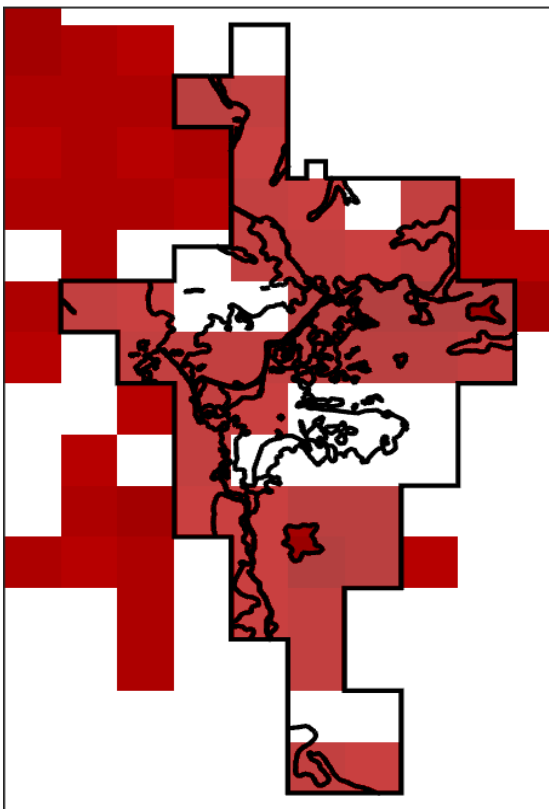
Alpine Sedge
Carex blakei
500626



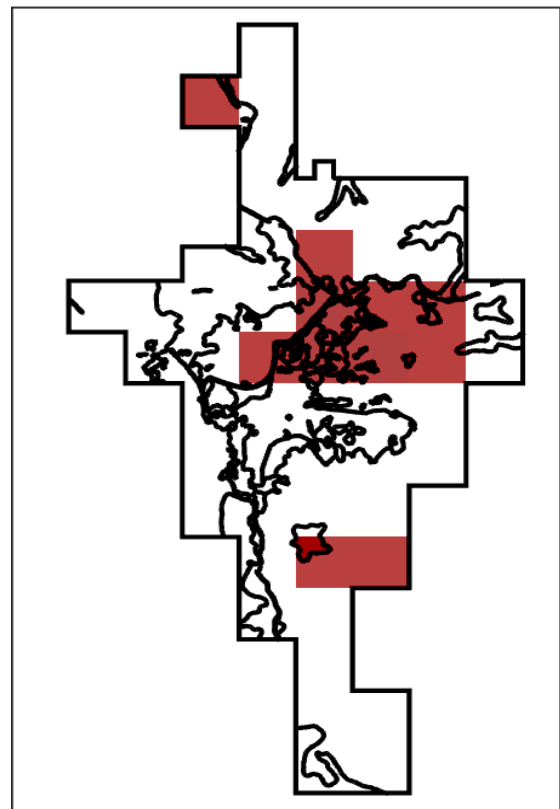
Short Sedge
Carex canescens
500633



Carpet Sedge
Carex jackiana
500644

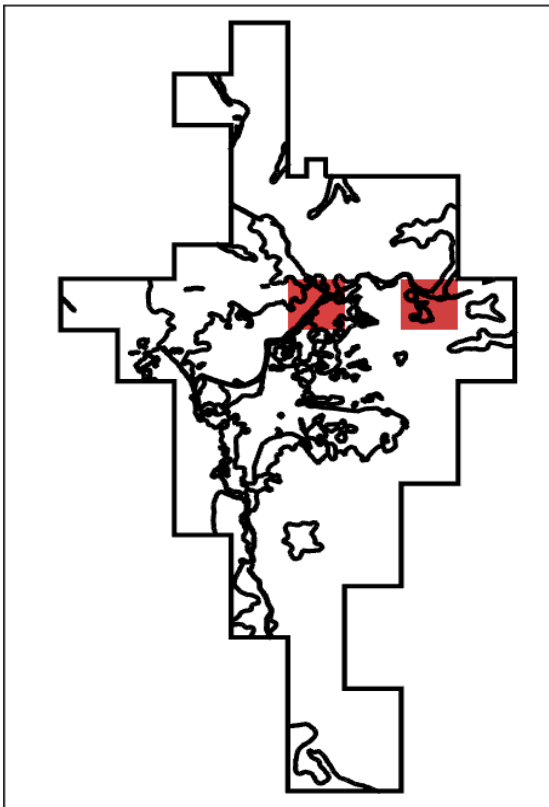


Broad-leaf Flower-rush
Carpha nivicola
500653

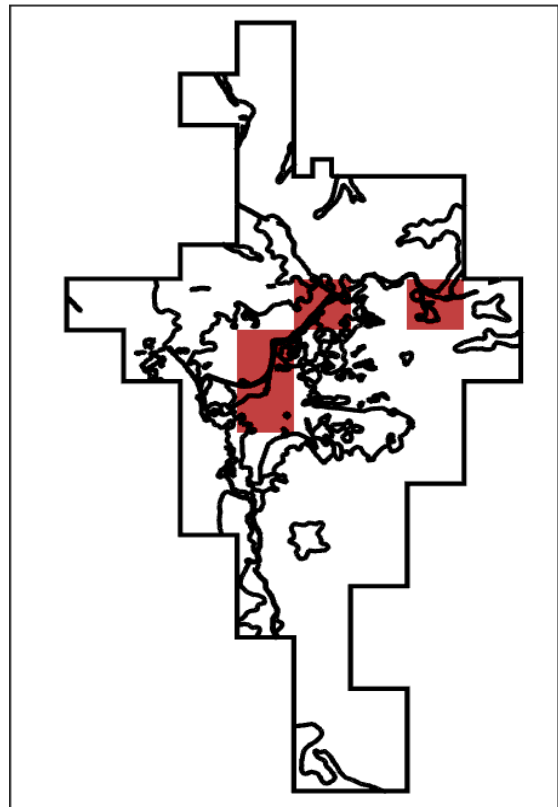


Offset site report

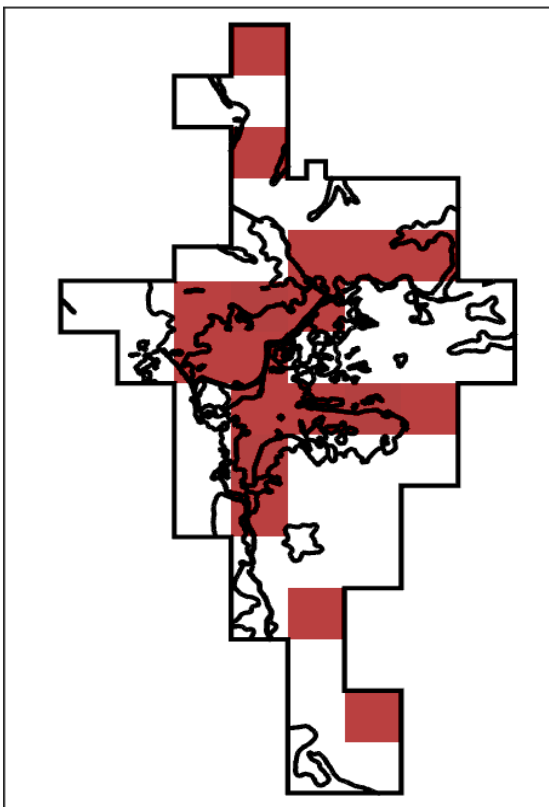
Snow Coprosma
Coprosma nivalis
500820



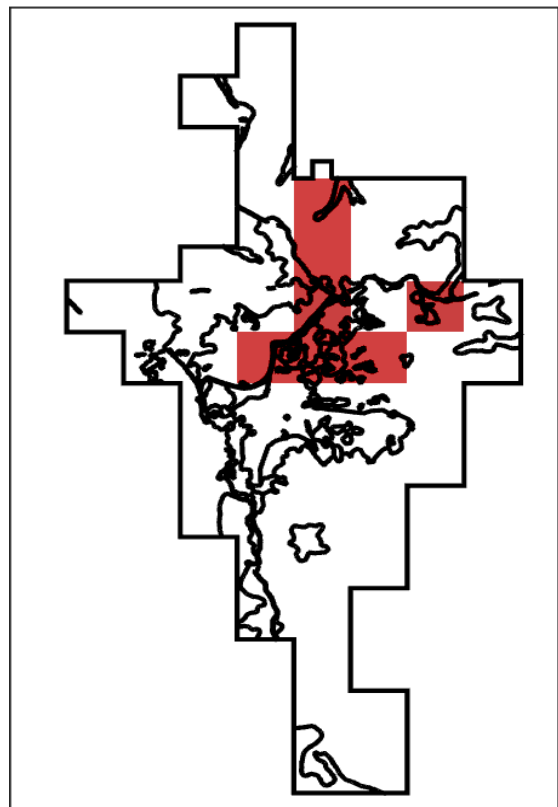
Brittle Bladder-fern
Cystopteris tasmanica
500944



Crag Wallaby-grass
Rytidosperma alpicola
500959

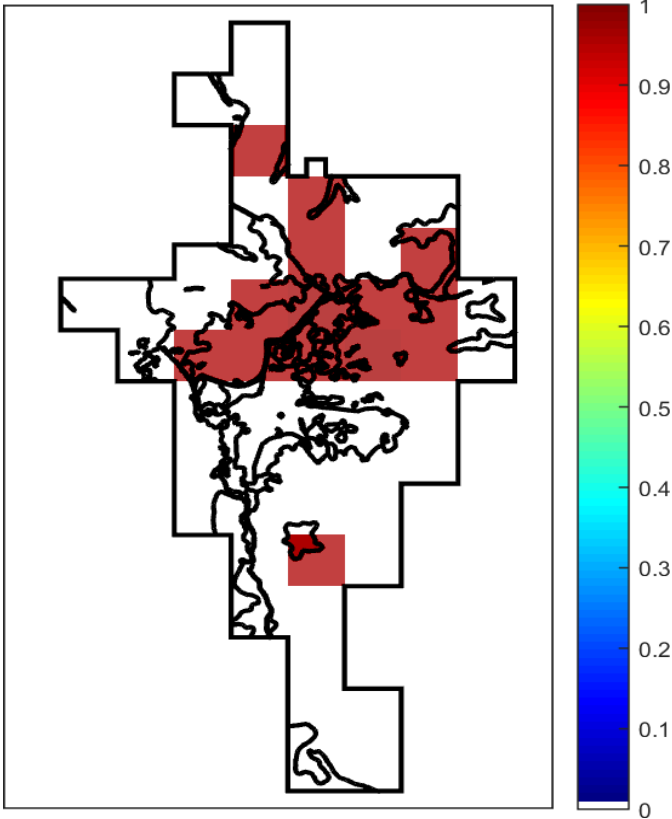


Keeled Bent-grass
Deyeuxia carinata
501012

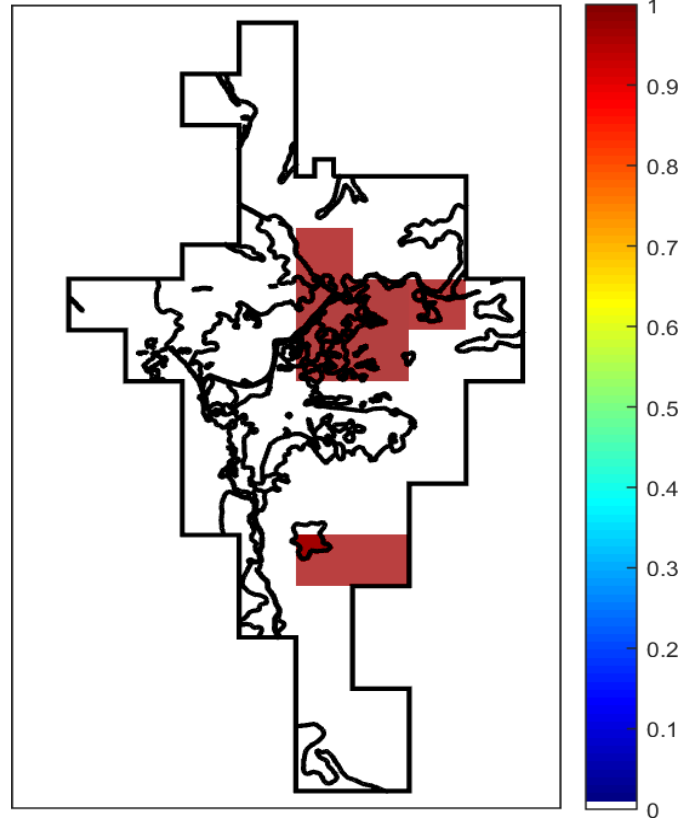


Offset site report

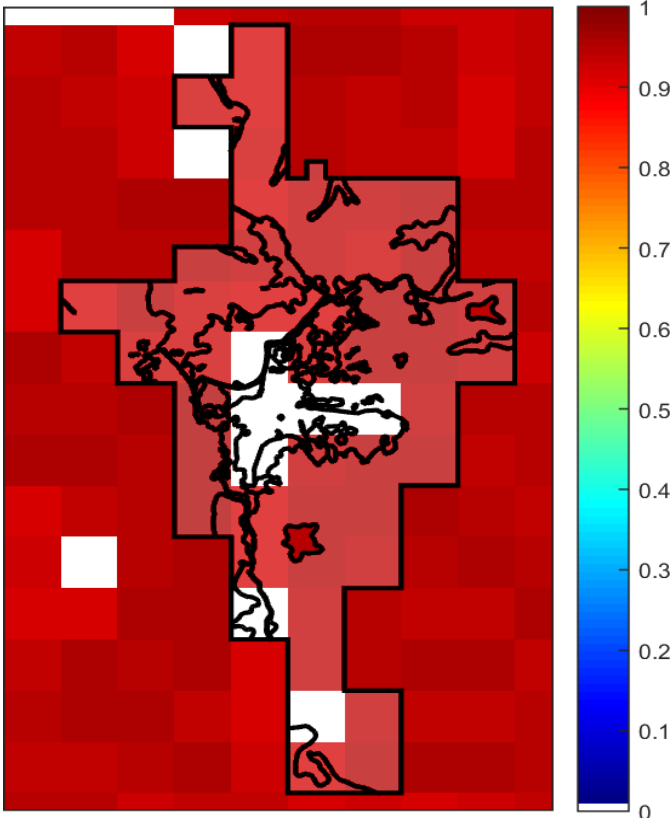
Thick Bent-grass
Deyeuxia crassiuscula
501014



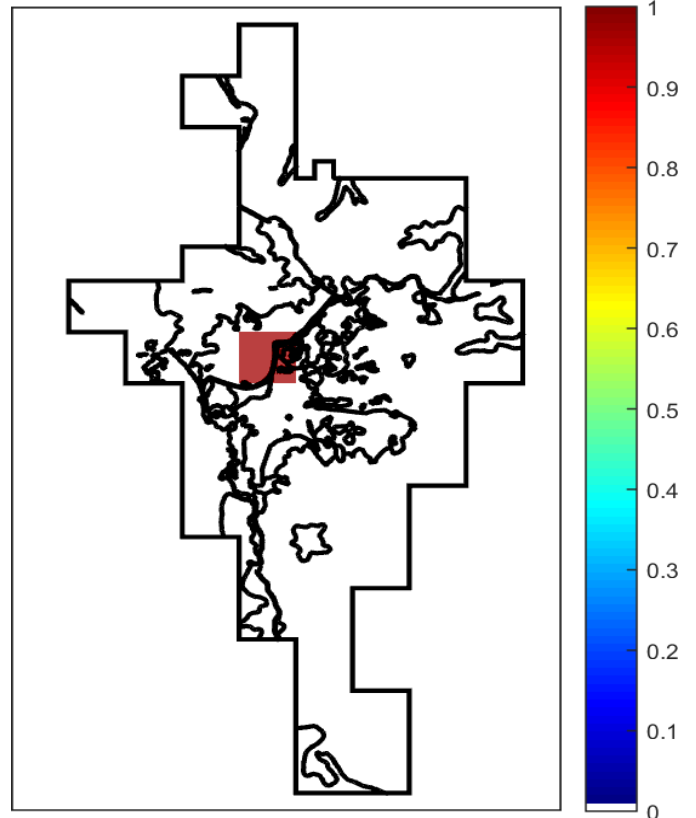
Alpine Sundew
Drosera arcturi
501101



Mountain Willow-herb
Epilobium sarmentaceum
501181

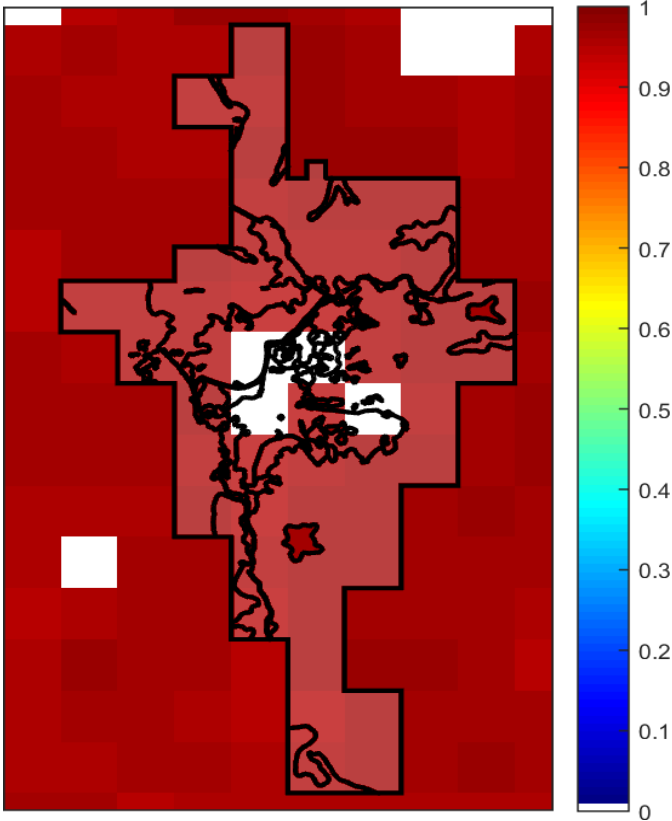


Sticky Fleabane
Erigeron nitidus
501215

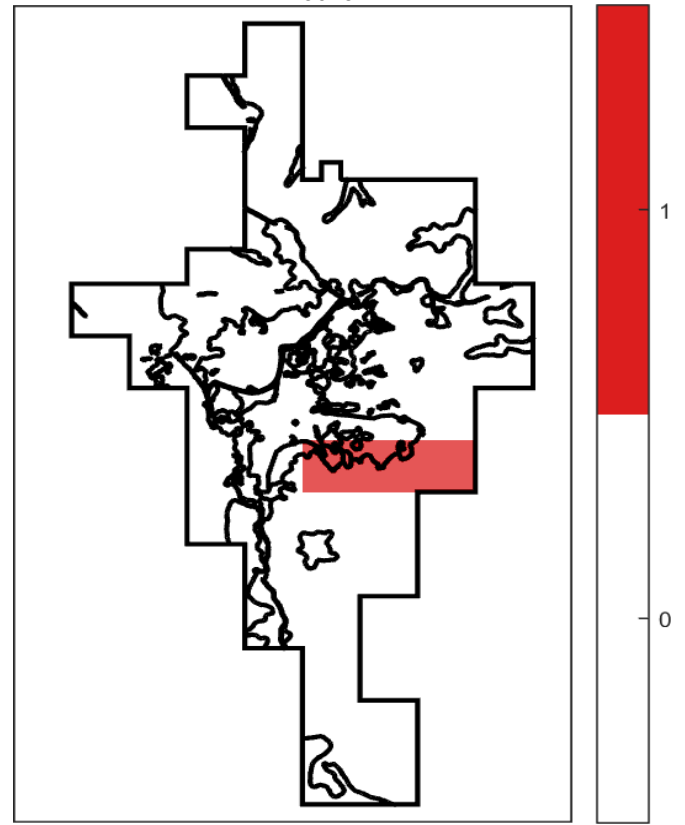


Offset site report

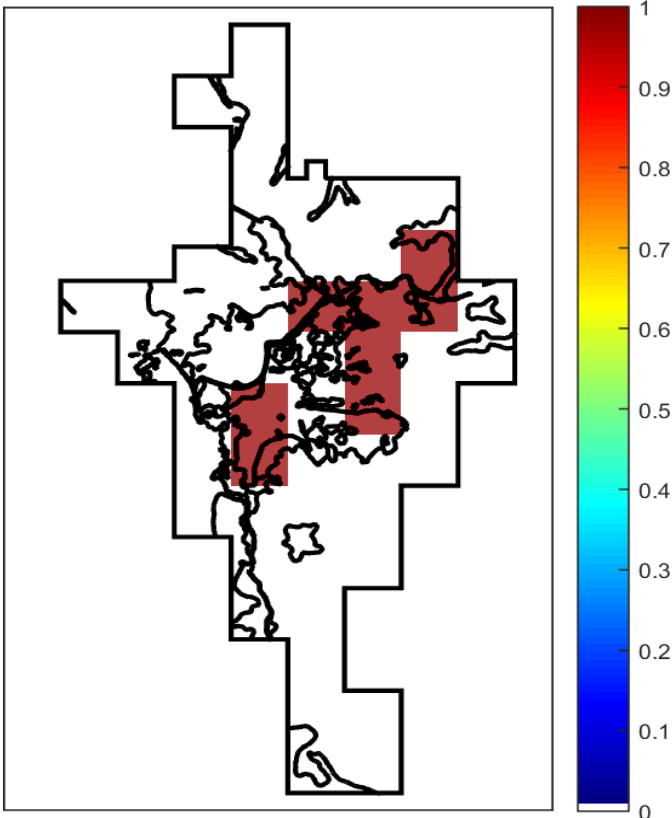
Spinning Gum
Eucalyptus perriniana
501309



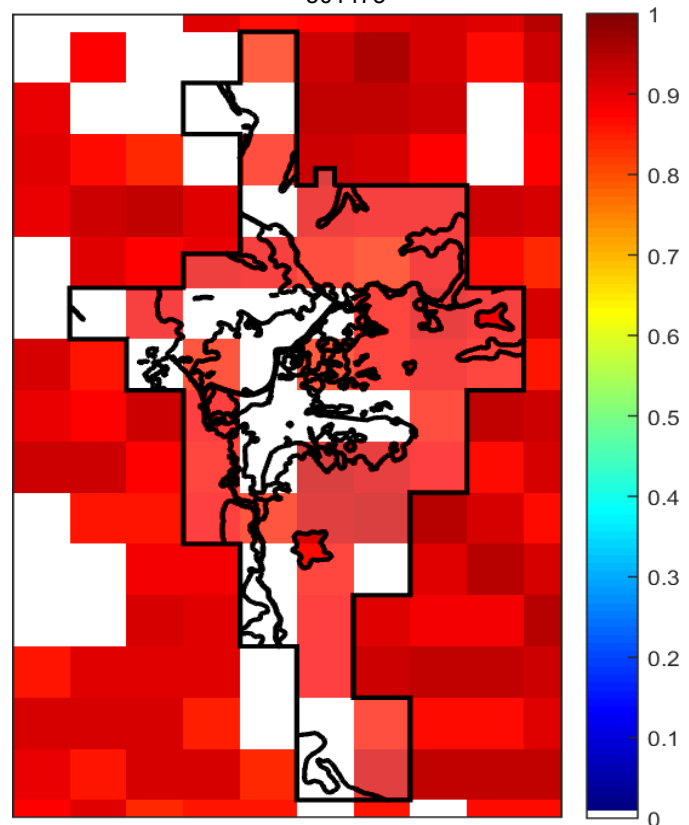
Hairy Eyebright
Euphrasia lasianthera
501342



Mat Cudweed
Euchiton traversii
501474

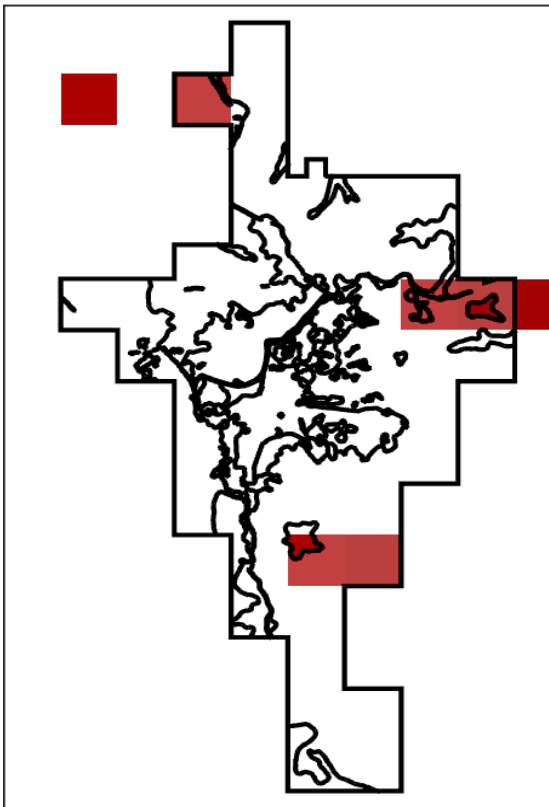


Cliff Cudweed
Euchiton umbricola
501475

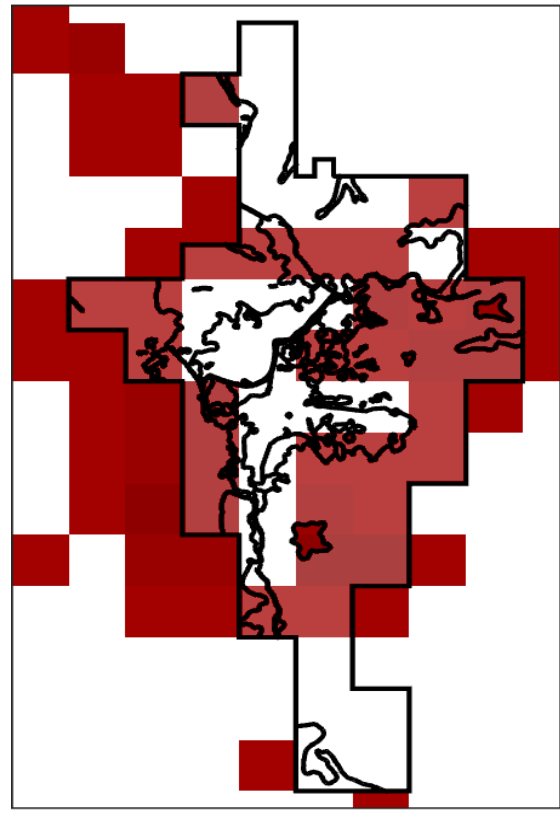


Offset site report

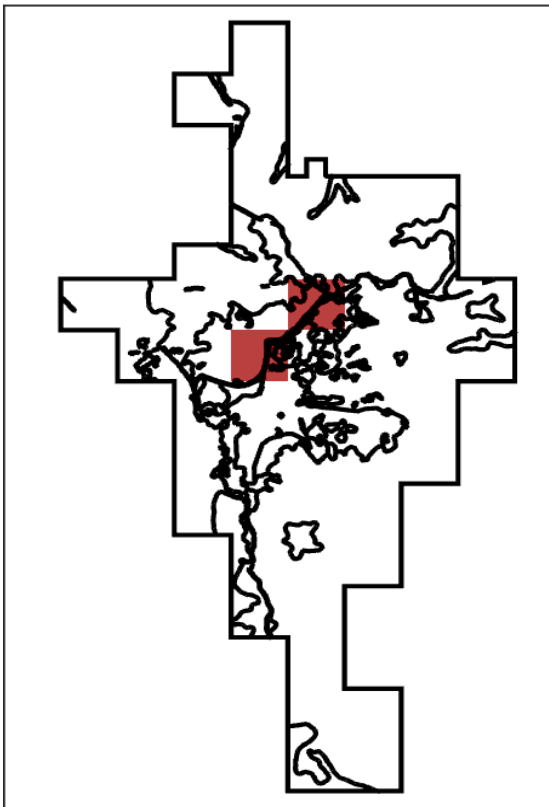
Sky Lily
Herpolirion novae-zelandiae
501658



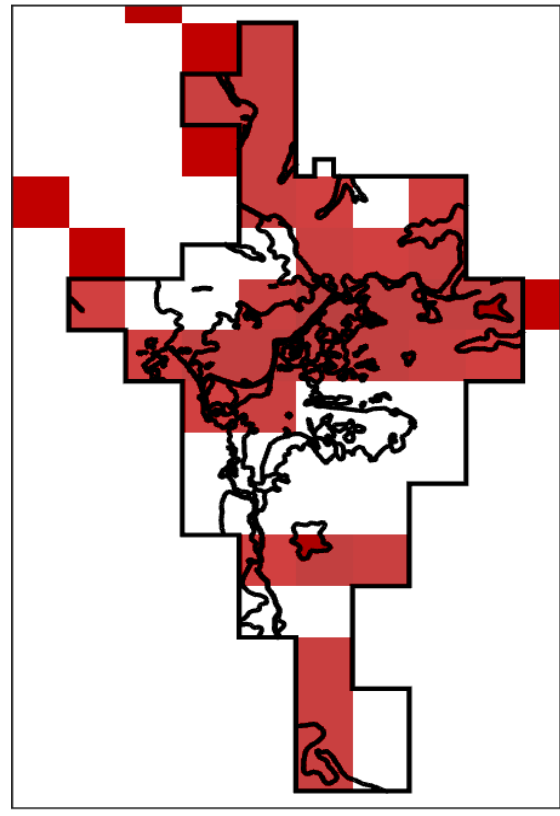
Fir Clubmoss
Huperzia australiana
501709



Fog Club-sedge
Isolepis montivaga
501781

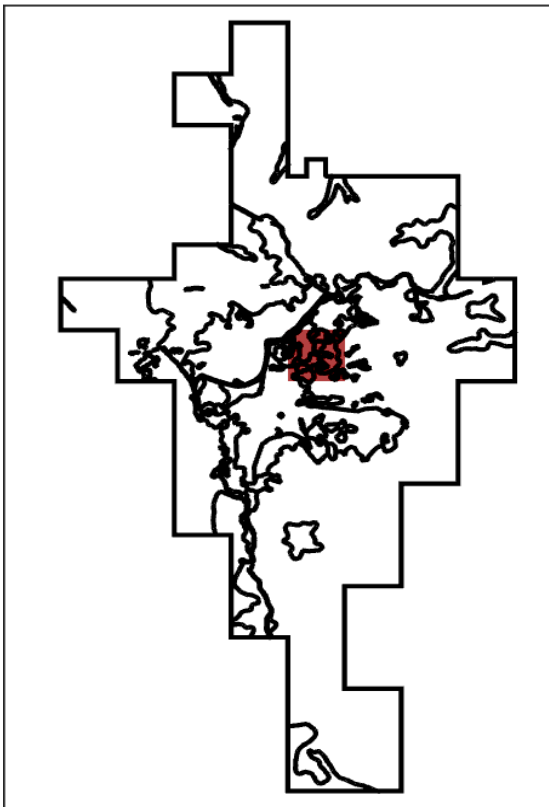


Tussock Woodrush
Luzula alpestris
502065

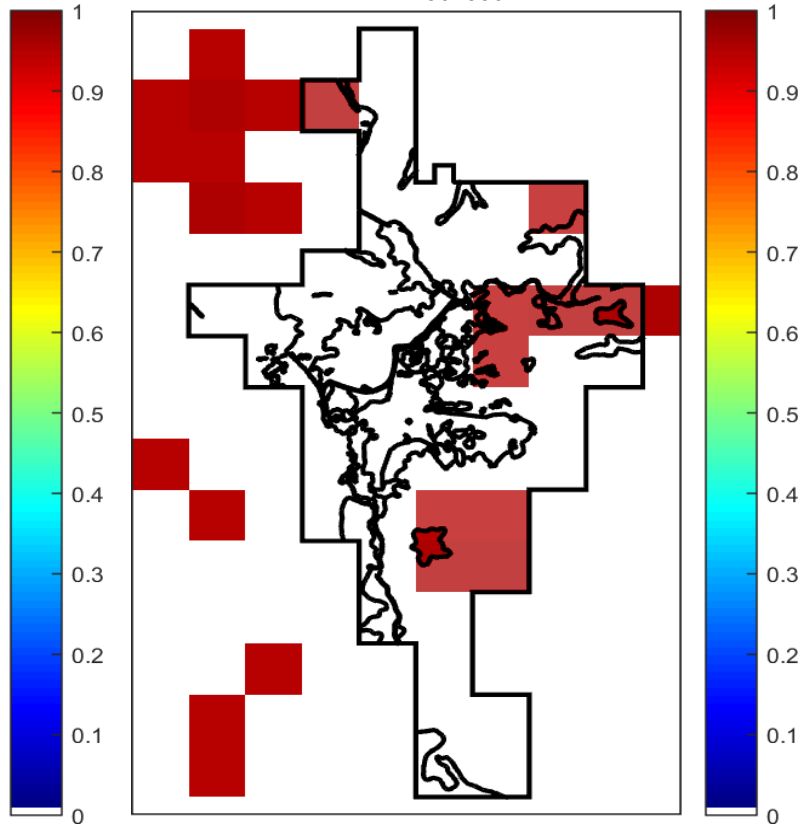


Offset site report

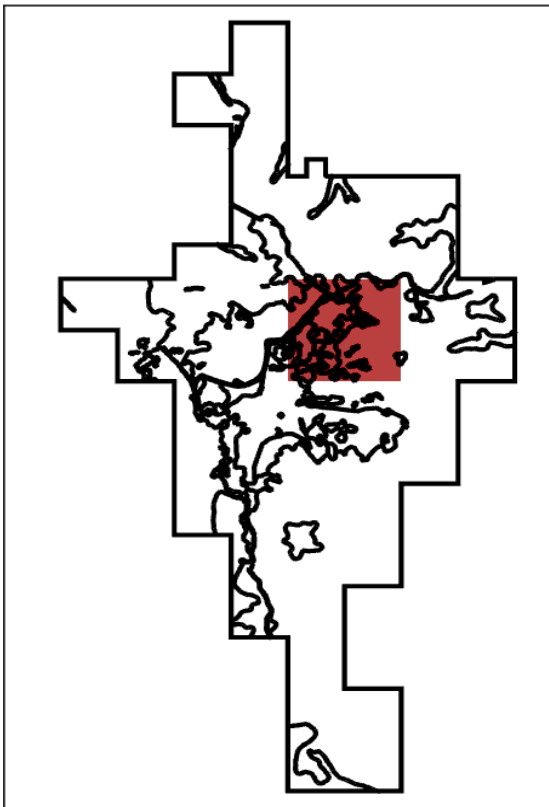
Spreading Clubmoss
Lycopodium scariosum
502082



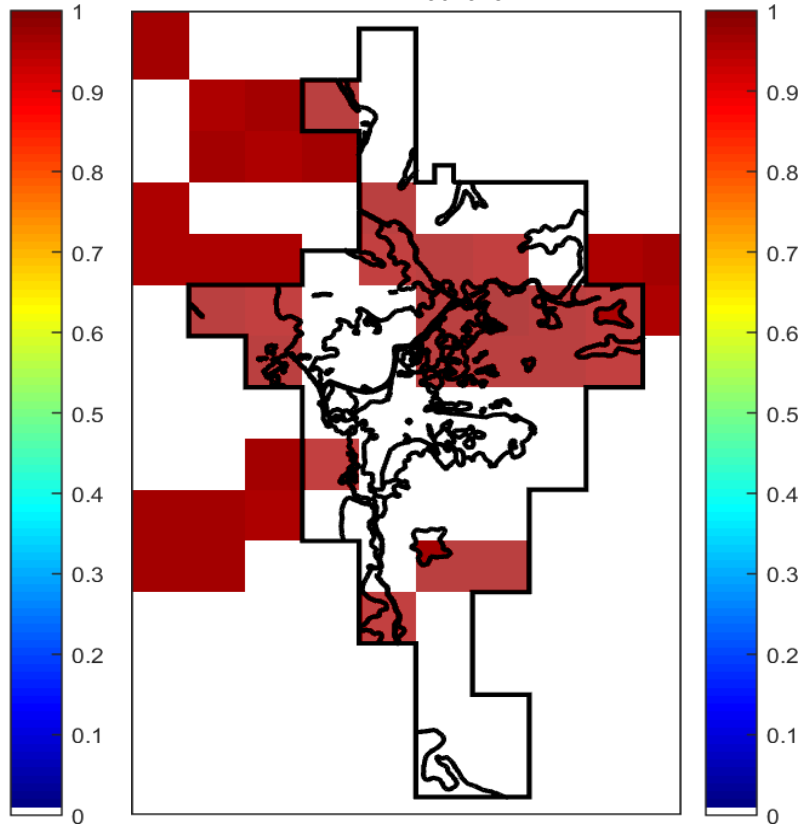
Tuft-rush
Oreobolus oxycarpus subsp. oxycarpus
502356



Alpine Tuft-rush
Oreobolus pumilio subsp. pumilio
502357

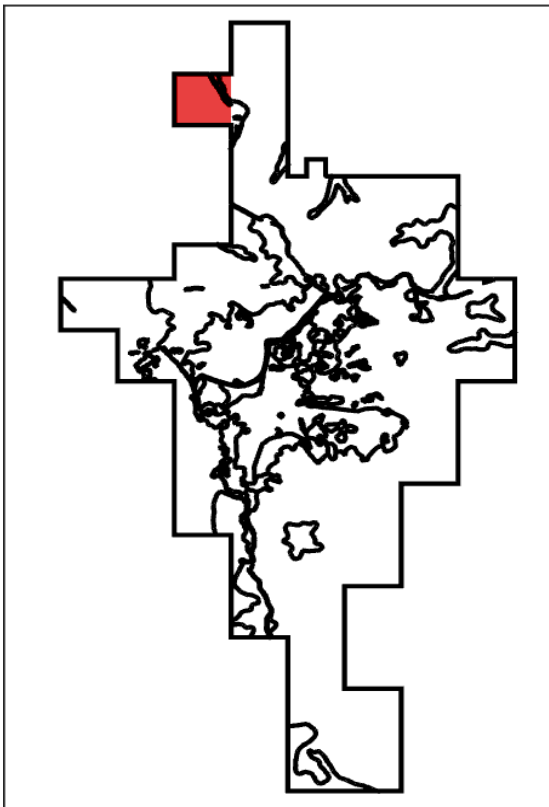


Veined Plantain
Plantago alpestris
502548

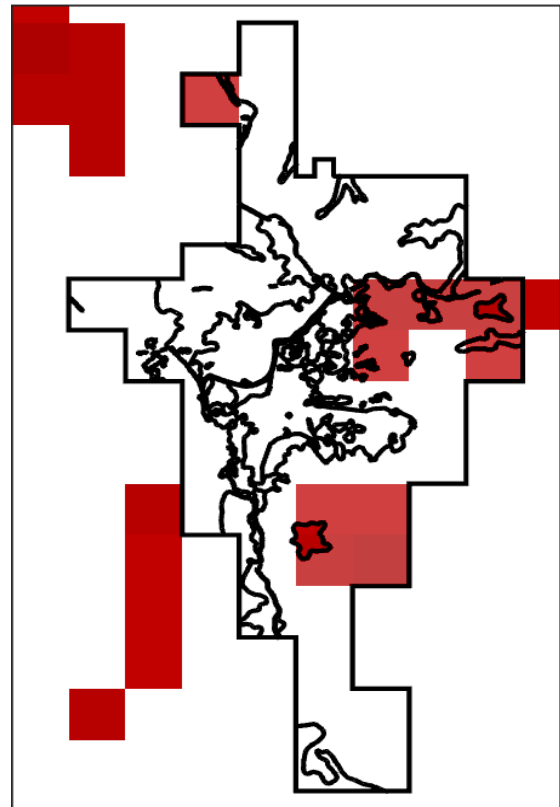


Offset site report

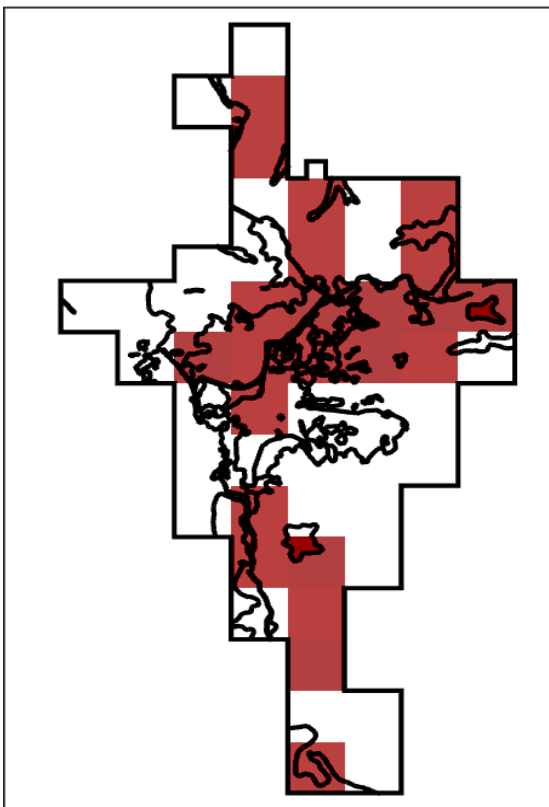
Fine-leaf Snow-grass
Poa clivicola
502585



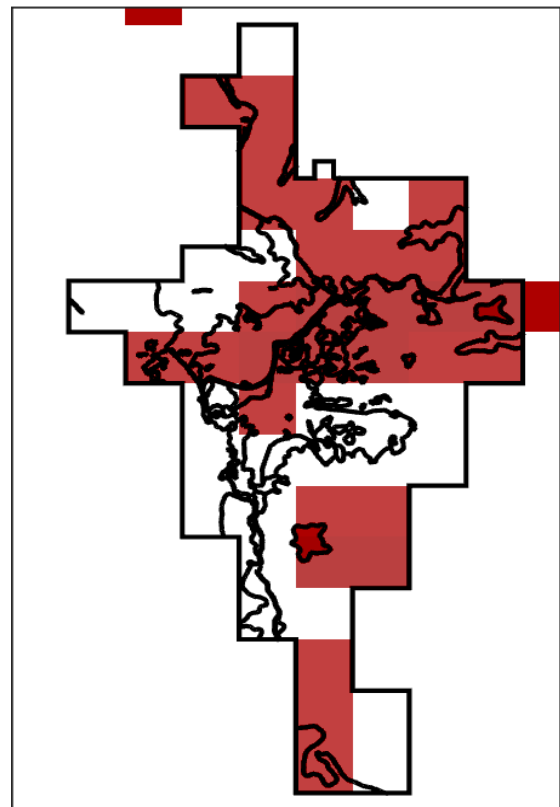
Strawberry Buttercup
Ranunculus collinus
502887



Eichler's Buttercup
Ranunculus eichlerianus
502888

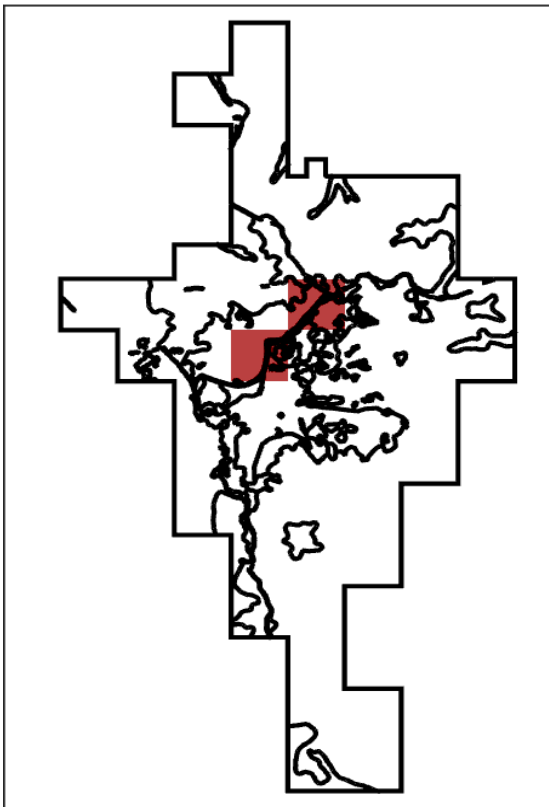


Gunn's Alpine Buttercup
Ranunculus gunnianus
502892

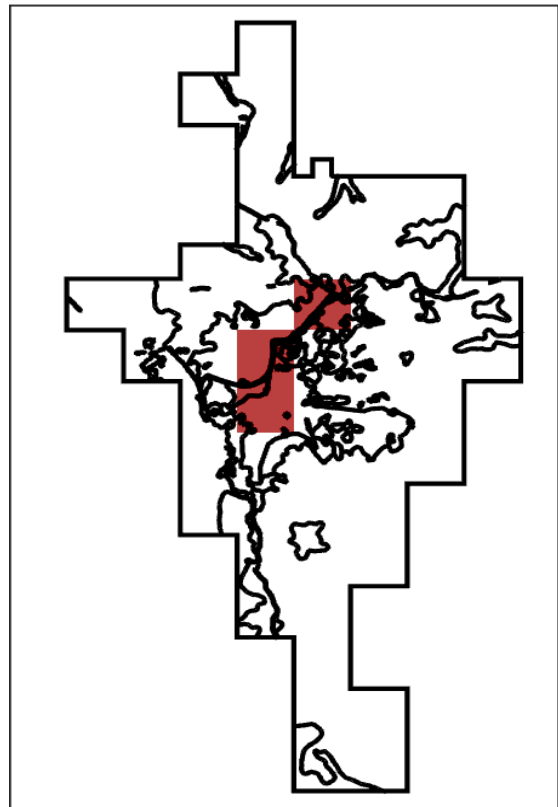


Offset site report

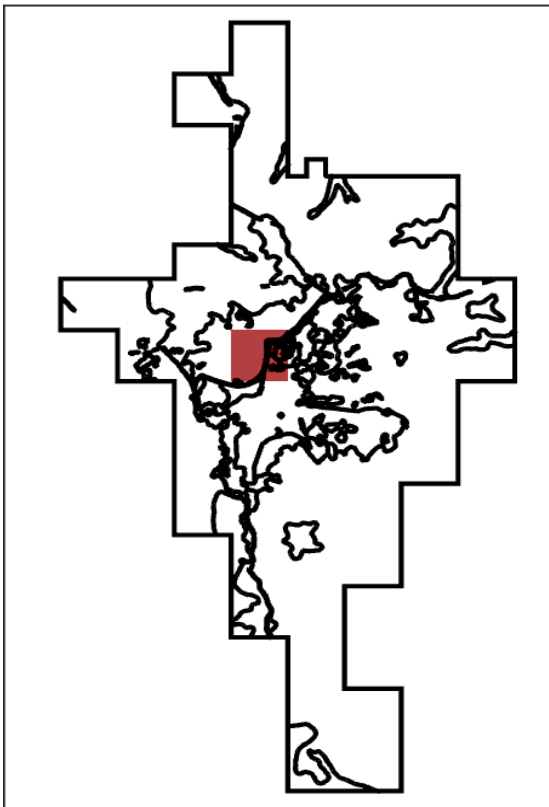
Felted Buttercup
Ranunculus muelleri
502896



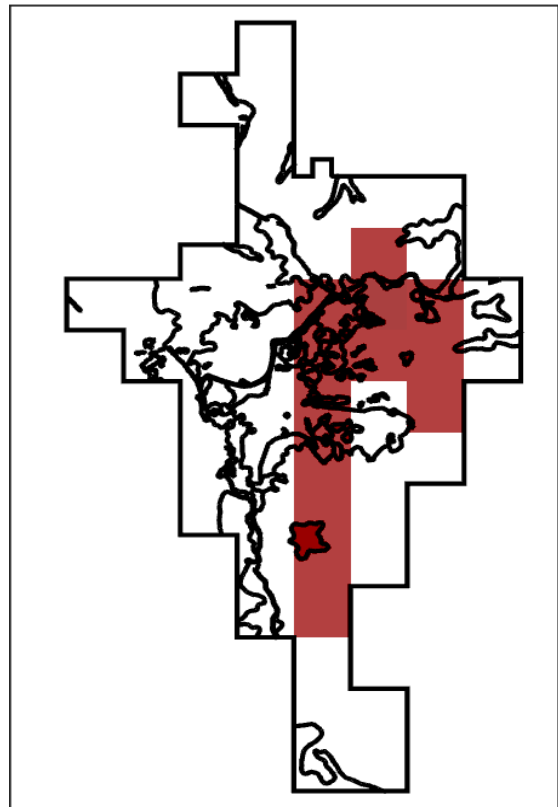
Mossy Knawel
Scleranthus singuliflorus
503064



Alpine Stackhousia
Stackhousia pulvinaris
503245

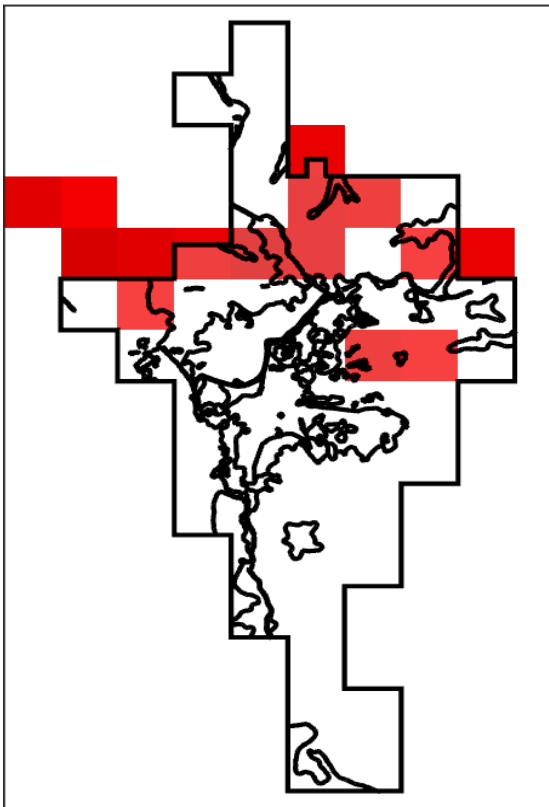


Lilac Berry
Trochocarpa clarkei
503463

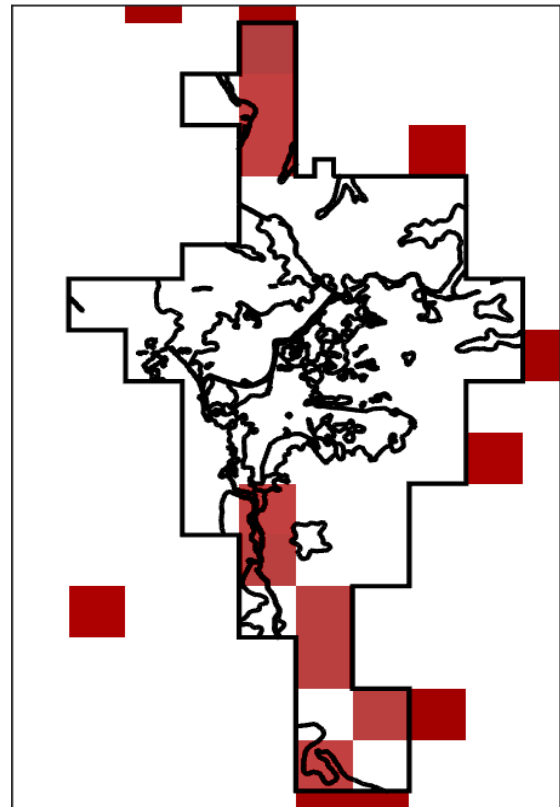


Offset site report

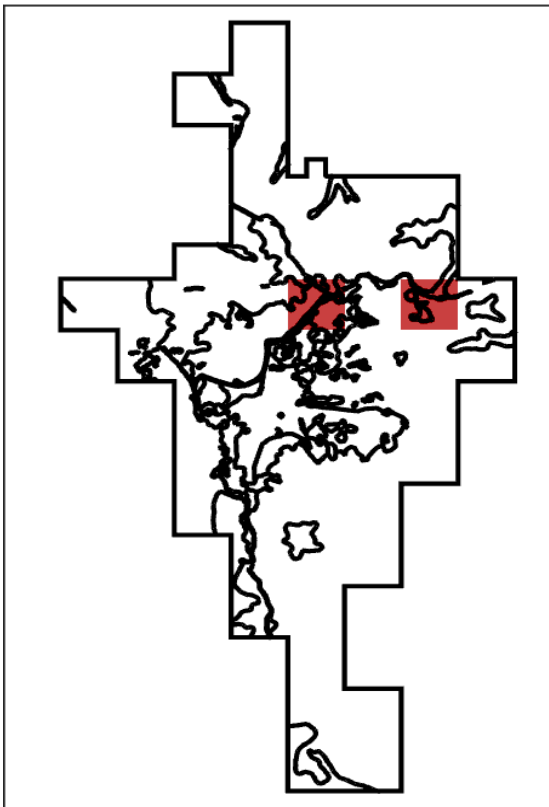
Milfoil Speedwell
Derwentia nivea
503508



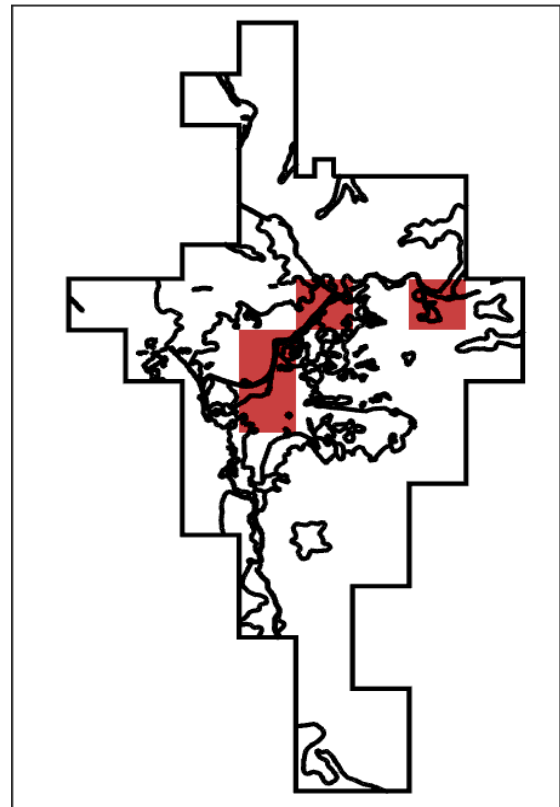
Alpine Westringia
Westringia senifolia
503572



Alpine Sunray
Leucochrysum alpinum
504582

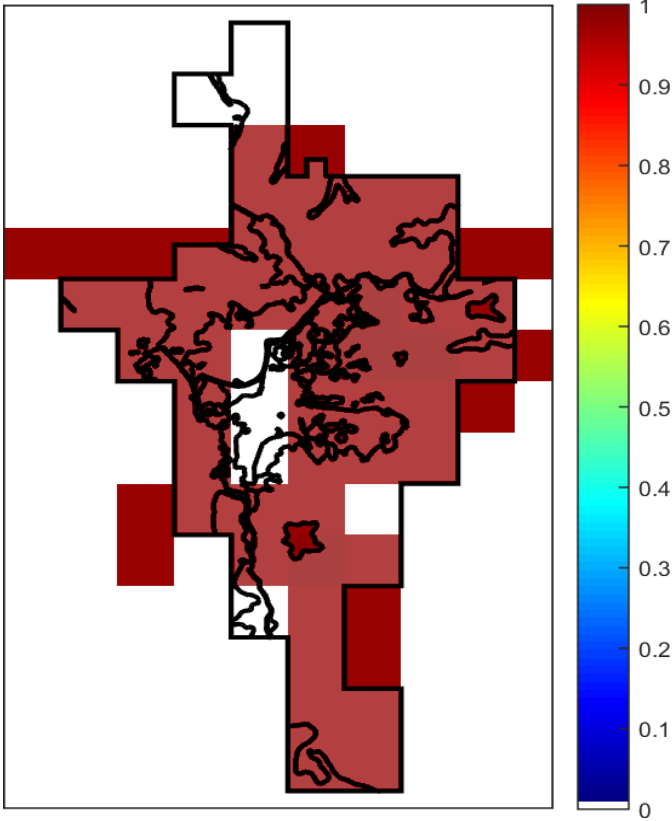


Green Billy-buttons
Craspedia jamesii
504647

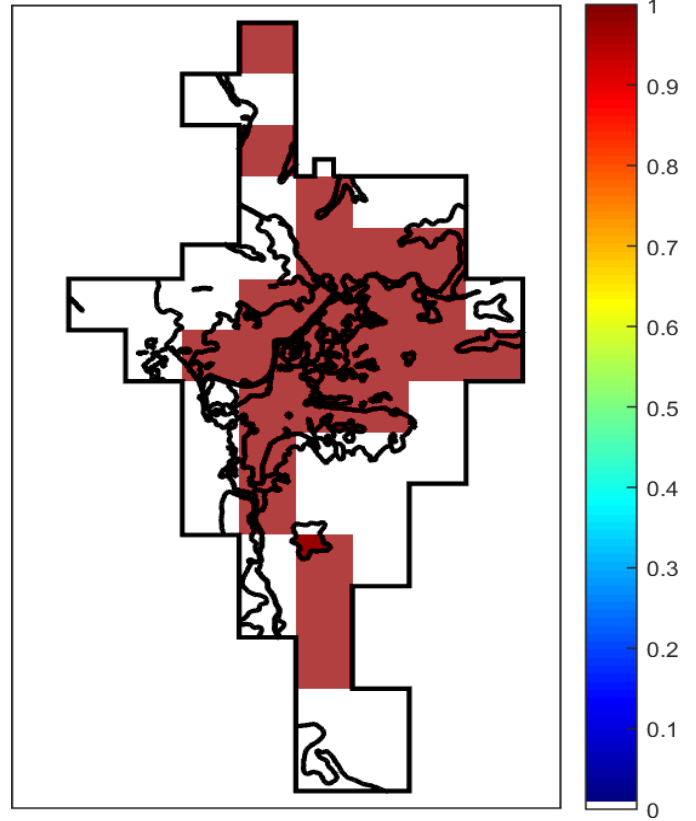


Offset site report

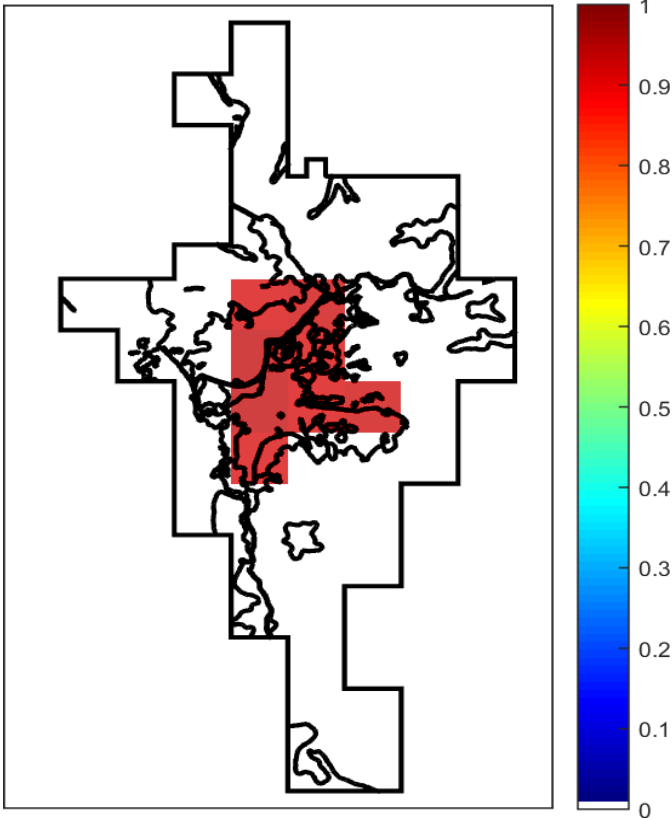
Dusty Daisy-bush
Olearia phlogopappa var. *flavescens*
504780



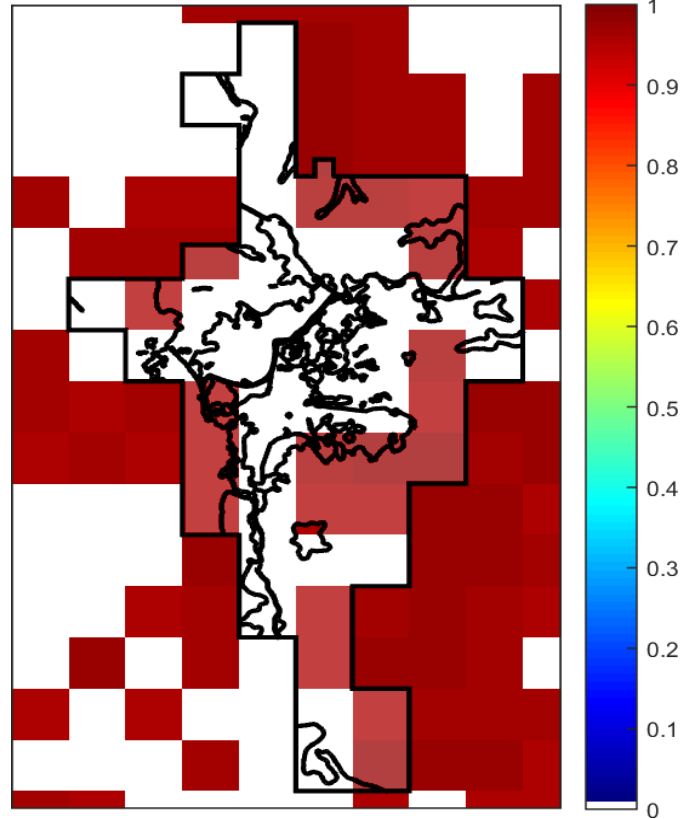
Alpine Phebalium
Phebalium squamulosum subsp. *alpinum*
504815



Mountain Wallaby-grass
Rytidosperma oreophilum
504913

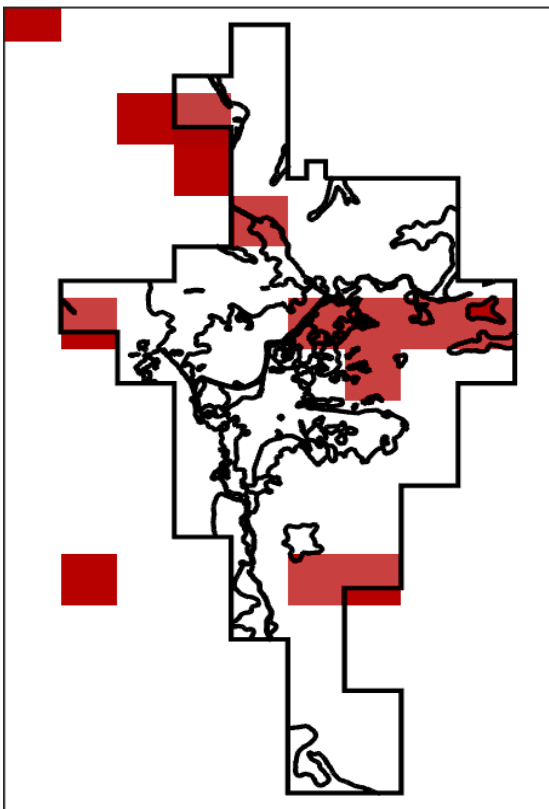


Royal Grevillea
Grevillea victoriae subsp. *victoriae*
505486

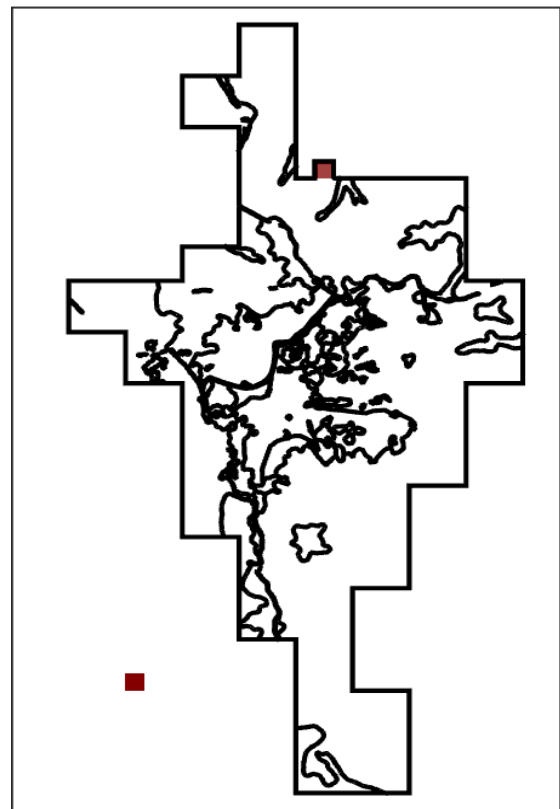


Offset site report

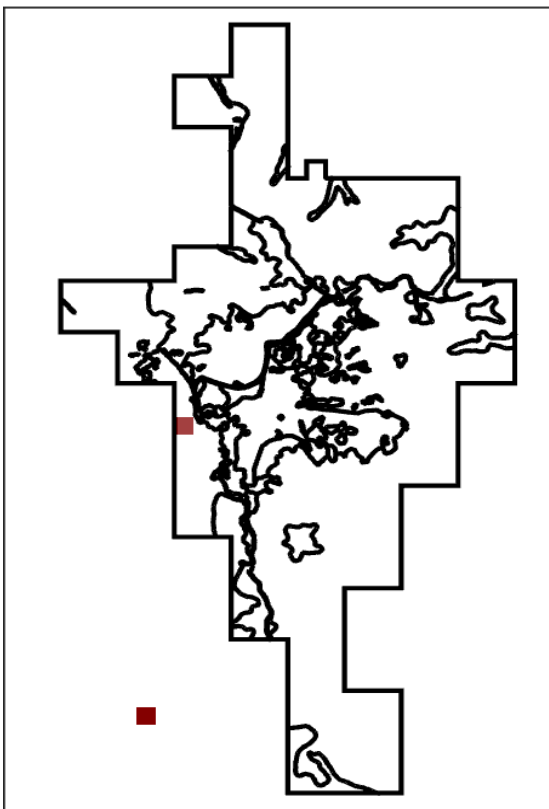
Alpine Tree Frog
Litoria verreauxii alpina
63907



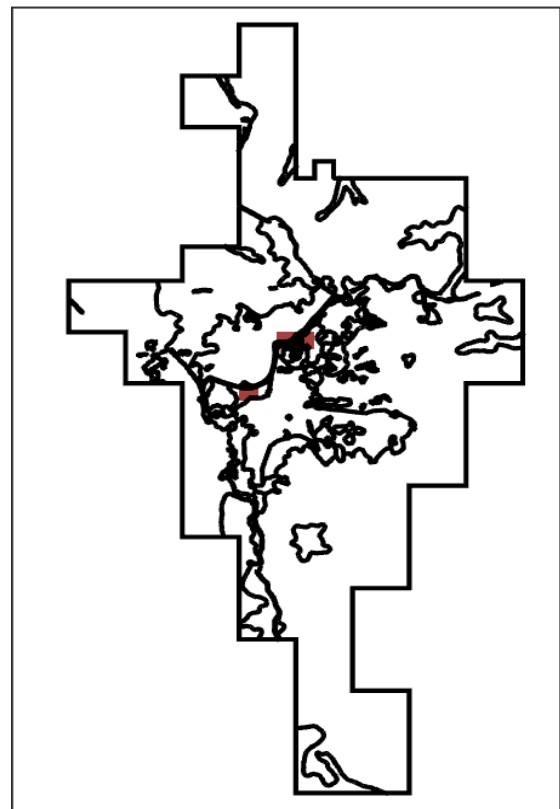
Planarian
Spathula tryssa
15052



Mountain Forest Billy-buttons
Craspedia sp. 1
504641

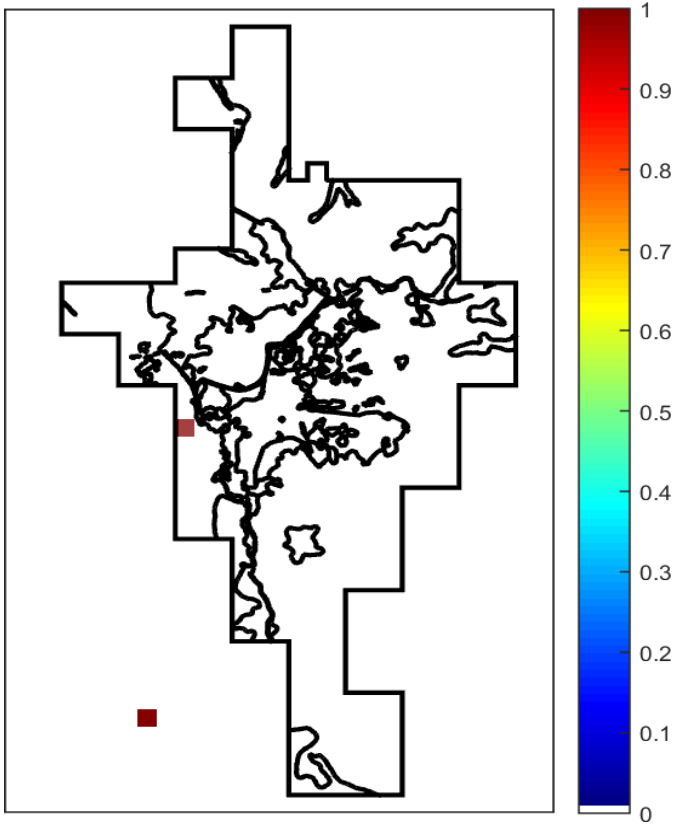


Alpine Trachymene
Trachymene humilis subsp. breviscapa
505003



Offset site report

Lilac Bitter-cress
Cardamine lilacina s.s.
505027



Offset site report

Glossary

Alternate offset types	Offset types within a biodiversity class area (BCA) are alternates. The use of one offset type will result in the proportional reduction of all other offset types within the BCA. For example, in a BCA that has 1 general unit and 2 specific units for a particular rare or threatened species, if all of the general units are used (100 per cent) there will be no specific units remaining, as these specific units will also reduce by 100 per cent. Alternatively, if in this same BCA only half the general units were used (50 per cent) then there will be 0.5 general units and 1 specific units remaining, half the original values.
Biodiversity Class Area (BCA)	The BCA is the organisational unit of an offset site. BCAs are determined by the unique combination of general and specific biodiversity equivalence units calculated across the offset site.
Condition score	This is the site-assessed condition score for the native vegetation. Each habitat zone in the offset site is assigned a condition score according to the habitat hectare assessment method. This information has been provided by or on behalf of the applicant in the GIS file submitted for processing.
General biodiversity equivalence units (general units)	<p>The general biodiversity equivalence units (general units) quantify the relative overall contribution that the protection and management of native vegetation at the offset site makes to Victoria's biodiversity. The general biodiversity equivalence units is calculated as follows:</p> $\text{General biodiversity equivalence units} = \text{site gain in habitat hectares} \times \text{strategic biodiversity score}$
General offset attributes	The attributes of a general offset site must match those in an offset requirement that is a condition on a permit to remove native vegetation, in order for that offset site to be used to satisfy the permit condition. General offsets must be located in the same Catchment Management Authority boundary or Municipal District (local council) as the clearing site. They must also have a strategic biodiversity score that is at least 80 per cent of the clearing site. The strategic biodiversity score of a general offset is determined by the biodiversity class area the units are sold from.
Habitat importance score	The habitat importance score is a measure of the relative importance of the habitat located on a site for a particular rare or threatened species, compared to all other habitat for that species. The habitat importance score for a species is a weighted average value calculated from the habitat importance map for that species. The habitat importance score is calculated for each biodiversity class area where the habitat importance map indicates that species habitat occurs and where the protection of habitat across the offset agreement is greater than the threshold test.
Habitat zone	Habitat zone is a discrete contiguous area of native vegetation that: <ul style="list-style-type: none">• is of a single Ecological Vegetation Class• has the same measured condition.
Offset type	There are two types of offsets, general offset and specific offsets. All offset sites can be general offsets. Sites that are mapped as habitat for specific rare or threatened species can be specific offsets for those species habitat.

Offset site report

Site gain in habitat hectares Site gain in habitat hectares is a site-based measure that combines extent and site gain per hectare of native vegetation at an offset site. The site gain in habitat hectares measures both the current status of native vegetation at a site and the potential site gain from the protection and management of the native vegetation at that site. The condition of a site, or the gain in condition due to protection and management actions are multiplied by the extent (area in hectares) of native vegetation to calculate the site gain in habitat hectares value. For a biodiversity class area the site gain in habitat hectares is determined using the following formula:

$$\text{Site gain in habitat hectares} = \text{total extent (hectares)} \times \text{site gain per hectare}$$

Site gain per hectare This is the site-assessed gain per hectare for the native vegetation based on the agreed management and security commitments. Each habitat zone in the offset proposal is assigned a site gain per hectare according to the habitat hectare assessment and gain scoring methods. This is a number between 0 and 1. This information has been provided by or on behalf of the applicant in the GIS file. These values are aggregated to the level of the BCA in order to calculate offset amounts at the offset site.

Specific offset attributes The attributes of a specific offset site must match those in an offset requirement that is a condition on a permit to remove native vegetation, in order for that offset site to be used to satisfy the permit condition. Specific offsets must be located in the mapped habitat for the species that has triggered the specific offset requirement.

Specific biodiversity equivalence units (specific units) Specific biodiversity equivalence units (specific units) are associated with a particular rare or threatened species habitat. The specific biodiversity equivalence units quantifies the relative overall contribution that the protection and management of native vegetation at an offset site makes to the habitat of the relevant rare or threatened species. Specific units are calculated for each species in each biodiversity class area where the result of the threshold test is greater than 0.0025 per cent. Specific units are calculated as follows:

$$\begin{aligned} \text{Specific biodiversity equivalence units}_{\text{species } x} \\ = \text{site gain in habitat hectares} \times \text{habitat importance score}_{\text{species } x} \end{aligned}$$

Strategic biodiversity score This is the weighted average strategic biodiversity score of the marked native vegetation. The strategic biodiversity score has been calculated from the *Strategic biodiversity map* for each BCA. The strategic biodiversity score of native vegetation is a measure of the native vegetation's importance for Victoria's biodiversity, relative to other locations across the landscape. The *Strategic biodiversity map* is a modelled layer that prioritises locations on the basis of rarity and level of depletion of the types of vegetation, species habitats, and condition and connectivity of native vegetation.

Threshold test By default, a threshold test is applied to offset sites to limit the number of rare or threatened species for which specific biodiversity equivalence units are calculated. This is done to make organising and trading credits more manageable. The test determines if the offset site can generate specific habitat protection for any rare or threatened species above a threshold. The threshold is set at 0.0025 per cent of the total habitat for a species. When the proportion of habitat protected is above the threshold, specific biodiversity equivalence units are calculated for that species.

Offset site report

**Total extent
(hectares) for
calculating site
gain in habitat
hectares**

This is the total area of offset site native vegetation in hectares.

The total extent of native vegetation is an input to calculating the site gain in habitat hectares at a site and in calculating the total gain in general and specific biodiversity equivalence units.

Appendix 6: Offset outcomes with surveyed and modelled habitat data

Habitat Type	Area (ha)	Average Habitat Importance (/1)	Gain Score (/100)	Gain (Habitat Hectares)	SBEUs Available	SBEUs Required	SBEU Balance
Fog Club-sedge							
Modelled Habitat	10.13				2.785		
Surveyed Habitat	5.56				1.484		
HZ E (EVC 210 Sub-alpine Wet Heathland)	1.28	0.9	30.30	0.39	0.349		
HZ F (EVC 917 Sub-alpine Wet Sedgeland)	0.35	0.9	29.34	0.10	0.093		
Drainage Lines	3.93	0.9	29.45	1.16	1.043		
Overlap between Modelled and Surveyed	0.56				0.154		
TOTAL (Modelled + Surveyed - Overlap)	15.13				4.114	7.337	-3.223
Green Billy-buttons							
Modelled Habitat	20.25				5.518		
Surveyed Habitat	29.87				7.964		
HZ E (EVC 210 Sub-alpine Wet Heathland)	1.10	0.9	28.39	0.31	0.282		
HZ F (EVC 917 Sub-alpine Wet Sedgeland)	27.13	0.9	29.65	8.04	7.240		
HZ G (EVC 1001 Alpine Grassland)	1.28	0.9	30.30	0.39	0.349		
HZ H (EVC 1004 Alpine Grassy Heathland)	0.35	0.9	29.34	0.10	0.093		
Overlap between Modelled and Surveyed	11.46				3.114		
TOTAL (Modelled + Surveyed - Overlap)	38.66				10.359	7.172	3.187

Habitat Type	Area (ha)	Average Habitat Importance (/1)	Gain Score (/100)	Gain (Habitat Hectares)	SBEUs Available	SBEUs Required	SBEU Balance
Mossy Knawel							
Modelled Habitat	15.19				4.219		
Surveyed Habitat	28.24				7.522		
HZ G (EVC 1001 Alpine Grassland)	1.10	0.9	28.39	0.31	0.282		
HZ H (EVC 1004 Alpine Grassy Heathland)	27.13	0.9	29.65	8.04	7.240		
Overlap between Modelled and Surveyed	10.82				2.995		
TOTAL (Modelled + Surveyed - Overlap)	32.61				8.736	6.059	2.677
Planarian							
Modelled Habitat	0.56				0.164		
Surveyed Habitat	5.56				1.386		
HZ E (EVC 210 Sub-alpine Wet Heathland)	1.28	0.7	30.30	0.39	0.271		
HZ F (EVC 917 Sub-alpine Wet Sedgeland)	0.35	0.7	29.34	0.10	0.072		
Drainage Lines	3.93	0.9	29.45	1.16	1.043		
Overlap between Modelled and Surveyed	0.00				0.000		
TOTAL (Modelled + Surveyed - Overlap)	6.13				1.550	0.796	0.754
Sticky Fleabane							
Modelled Habitat	5.06				1.412		
Surveyed Habitat	28.24				7.522		
HZ G (EVC 1001 Alpine Grassland)	1.10	0.9	28.39	0.31	0.282		
HZ H (EVC 1004 Alpine Grassy Heathland)	27.13	0.9	29.65	8.04	7.240		
Overlap between Modelled and Surveyed	4.31				1.201		
TOTAL (Modelled + Surveyed - Overlap)	28.99				7.733	5.650	2.083

Appendix 7: Flora species list

The following status codes are used throughout Appendix 1:

Code	Meaning	Relevant Legislative Instrument
FFG Act		
P	Protected species	Victorian <i>Flora and Fauna Guarantee Act 1988</i> (FFG Act)
State Advisory List		
e	Endangered	State Advisory List of Rare or Threatened Plants in Victoria (DEPI 2014)
v	Vulnerable	
r	Rare	
k	Poorly known	
CaLP Act		
RC	Regionally controlled species	Victorian <i>Catchment and Land Protection Act 1994</i> (CaLP Act)
RR	Regionally restricted species	

Status	Scientific Name	Common Name
Indigenous species		
P	<i>Acacia obliquinervia</i>	Mountain Hickory Wattle
	<i>Acaena novae-zelandiae</i>	Bidgee-widgee
r	<i>Acrothamnus montanus</i>	Snow Beard-heath
	<i>Agrostis parviflora</i> s.s.	Hair Bent
P	<i>Argyrotegium fordianum</i>	Alpine Cudweed
	<i>Asperula conferta</i>	Common Woodruff
	<i>Asperula gunnii</i>	Mountain Woodruff
	<i>Astelia alpina</i> var. <i>novae-hollandiae</i>	Silver Astelia
	<i>Asterolasia trymalioides</i>	Alpine Star-bush
P	<i>Baeckea gunniana</i>	Alpine Baeckea
P	<i>Baeckea utilis</i> s.s.	Mountain Baeckea
P	<i>Blechnum nudum</i>	Fishbone Water-fern
P	<i>Blechnum penna-marina</i> subsp. <i>alpina</i>	Alpine Water-fern
P	<i>Brachyscome rigidula</i>	Leafy Daisy
P	<i>Brachyscome scapigera</i>	Tufted Daisy
P v	<i>Brachyscome</i> sp. 1	Peat Daisy
P	<i>Brachyscome spathulata</i> subsp. <i>spathulata</i>	Spoon Daisy
v	<i>Cardamine lilacina</i> s.s.	Lilac Bitter-cress
	<i>Carex appressa</i>	Tall Sedge
	<i>Carex breviculmis</i>	Common Grass-sedge
	<i>Carex hebes</i>	Mountain Sedge
r	<i>Carex jackiana</i>	Carpet Sedge
	<i>Carex</i> spp.	Sedge
P r	<i>Celmisia costiniana</i>	Carpet Snow-daisy

Status	Scientific Name	Common Name
P r	<i>Celmisia latifolia</i>	Victorian Snow-daisy
P	<i>Celmisia pugioniformis</i>	Slender Snow-daisy
	<i>Chaerophyllum australianum</i>	Fringed Caraway
	<i>Chaerophyllum eriopodum</i>	Australian Caraway
	<i>Coprosma hirtella</i>	Rough Coprosma
P	<i>Coronidium monticola</i>	Pale Everlasting
P r	<i>Craspedia adenophora</i>	Sticky Billy-buttons
P r	<i>Craspedia aurantia</i> subsp. <i>aurantia</i>	Orange Billy-buttons
P r	<i>Craspedia aurantia</i> subsp. <i>jamesii</i>	Green Billy-buttons
P	<i>Craspedia coolaminica</i>	Ashen Billy-buttons
P r	<i>Craspedia</i> sp. 1	Mountain Forest Billy-buttons
P	<i>Craspedia</i> spp.	Billy Buttons
	<i>Deyeuxia brachyathera</i>	Short Bent-grass
r	<i>Deyeuxia crassiuscula</i>	Thick Bent-grass
	<i>Dianella tasmanica</i>	Tasman Flax-lily
	<i>Dichondra repens</i>	Kidney-weed
P	<i>Dicksonia antarctica</i>	Soft Tree-fern
P	<i>Epacris paludosa</i>	Swamp Heath
	<i>Epilobium billardierianum</i> subsp. <i>hydrophilum</i>	Robust Willow-herb
	<i>Epilobium gunnianum</i>	Gunn's Willow-herb
P	<i>Erigeron</i> spp.	Fleabane
	<i>Eucalyptus pauciflora</i> subsp. <i>pauciflora</i>	White Sallee
k	<i>Gentianella cunninghamii</i> subsp. <i>major</i>	Tall Snow-gentian
r	<i>Gentianella muelleriana</i> subsp. <i>willisiana</i>	Mount Buller Snow-gentian
r	<i>Geranium potentilloides</i> var. <i>abditum</i>	Soft Crane's-bill
	<i>Geranium potentilloides</i> var. <i>potentilloides</i>	Soft Crane's-bill
v	<i>Geranium solanderi</i> var. <i>solanderi</i> s.s.	Austral Crane's-bill
	<i>Gonocarpus micranthus</i> subsp. <i>micranthus</i>	Creeping Raspwort
	<i>Gonocarpus montanus</i>	Mat Raspwort
	<i>Gonocarpus tetragynus</i>	Common Raspwort
	<i>Goodenia hederacea</i>	Ivy Goodenia
P	<i>Grevillea alpina</i>	Cat's Claw Grevillea
P	<i>Grevillea australis</i>	Alpine Grevillea
P r	<i>Grevillea victoriae</i> s.s.	Royal Grevillea
	<i>Hierochloa redolens</i>	Sweet Holy-grass
	<i>Hovea montana</i>	Alpine Rusty-pods
	<i>Hydrocotyle algida</i>	Mountain Pennywort
	<i>Hydrocotyle</i> spp.	Pennywort
P	<i>Hymenophyllum peltatum</i>	Alpine Filmy-fern
	<i>Hypericum gramineum</i> spp. agg.	Small St John's Wort
	<i>Hypericum japonicum</i>	Matted St John's Wort
	<i>Isolepis aucklandica</i>	New Zealand Club-sedge
r	<i>Isolepis montivaga</i>	Fog Club-sedge

Status	Scientific Name	Common Name
	<i>Isolepis subtilissima</i>	Mountain Club-sedge
P	<i>Lagenophora stipitata</i>	Common Bottle-daisy
	<i>Leionema phyllicifolium</i>	Alpine Leionema
P	<i>Leptinella filicula</i>	Mountain Cotula
	<i>Leptospermum</i> spp.	Tea Tree
	<i>Luzula modesta</i>	Southern Woodrush
P	<i>Lycopodium</i> spp.	Clubmoss
	<i>Melicytus</i> sp. aff. <i>dentatus</i> (Snowfields variant)	Alpine Shrub-violet
P	<i>Microseris lanceolata</i>	Alpine Yam-daisy
	<i>Nertera granadensis</i>	Matted Nertera
P	<i>Olearia algida</i>	Mountain Daisy-bush
P r	<i>Olearia phlogopappa</i> var. <i>flavescens</i>	Dusty Daisy-bush
P	<i>Olearia pimeleoides</i>	Pimelea Daisy-bush
	<i>Oreobolus distichus</i>	Fan Tuft-rush
	<i>Orites lancifolia</i>	Alpine Orites
	<i>Oxalis perennans</i>	Grassland Wood-sorrel
P	<i>Ozothamnus cupressoides</i>	Kerosene Bush
P r	<i>Pappochroma nitidum</i>	Sticky Fleabane
	<i>Pimelea alpina</i>	Alpine Rice-flower
	<i>Pimelea axiflora</i>	Bootlace Bush
r	<i>Pimelea axiflora</i> subsp. <i>alpina</i>	Alpine Bootlace Bush
	<i>Pimelea ligustrina</i>	Tall Rice-flower
	<i>Plantago antarctica</i>	Mountain Plantain
	<i>Plantago euryphylla</i>	Broad Plantain
	<i>Poa costiniana</i>	Bog Snow-grass
	<i>Poa fawcettiae</i>	Horny Snow-grass
	<i>Poa helmsii</i>	Tall Mountain Tussock-grass
	<i>Poa hothamensis</i>	Ledge Grass
	<i>Podocarpus lawrencei</i>	Mountain Plum-pine
P	<i>Podolepis robusta</i>	Alpine Podolepis
	<i>Podolobium alpestre</i>	Alpine Podolobium
	<i>Polyscias sambucifolia</i>	Elderberry Panax
P	<i>Polystichum proliferum</i>	Mother Shield-fern
P	<i>Prostanthera cuneata</i>	Alpine Mint-bush
r	<i>Psychrophila introloba</i>	Alpine Marsh-marigold
P	<i>Pterostylis</i> spp.	Greenhood
	<i>Ranunculus graniticola</i>	Granite Buttercup
	<i>Ranunculus lappaceus</i>	Australian Buttercup
	<i>Ranunculus</i> spp.	Buttercup
P	<i>Richea continentis</i>	Candle Heath
	<i>Rubus parvifolius</i>	Small-leaf Bramble
	<i>Rumex</i> spp.	Dock
	<i>Rytidosperma nudiflorum</i>	Alpine Wallaby-grass
r	<i>Rytidosperma oreophilum</i>	Mountain Wallaby-grass
	<i>Rytidosperma penicillatum</i>	Weeping Wallaby-grass

Status	Scientific Name	Common Name
	<i>Scaevola hookeri</i>	Creeping Fan-flower
	<i>Schoenus calytratus</i>	Alpine Bog-sedge
	<i>Scleranthus biflorus s.s.</i>	Twin-flower Knawel
P	<i>Senecio gunnii</i>	Mountain Fireweed
P r	<i>Senecio pinnatifolius var. alpinus</i>	Snowfield Groundsel
P	<i>Senecio pinnatifolius var. lanceolatus</i>	Lance-leaf Groundsel
P	<i>Senecio velleioides</i>	Forest Groundsel
P	<i>Sphagnum spp.</i>	Peat Moss
	<i>Stellaria pungens</i>	Prickly Starwort
P	<i>Stylidium armeria</i>	Common Triggerplant
P r	<i>Stylidium montanum</i>	Alpine Triggerplant
P r	<i>Taraxacum aristum</i>	Mountain Dandelion
	<i>Tasmania xerophila</i>	Alpine Pepper
r	<i>Trachymene humilis</i>	Alpine Trachymene
	<i>Uncinia flaccida</i>	Mountain Hook-sedge
	<i>Veronica derwentiana</i>	Derwent Speedwell
	<i>Viola betonicifolia</i> subsp. <i>betonicifolia</i>	Showy Violet
	<i>Wahlenbergia ceracea</i>	Waxy Bluebell
	<i>Wahlenbergia gloriosa</i>	Royal Bluebell
P	<i>Xerochrysum subundulatum</i>	Orange Everlasting
Introduced species		
	<i>Acetosella vulgaris</i>	Sheep Sorrel
	<i>Agrostis capillaris</i>	Brown-top Bent
	<i>Agrostis capillaris var. capillaris</i>	Brown-top Bent
	<i>Cerastium glomeratum</i>	Common Mouse-ear Chickweed
	<i>Cerastium spp.</i>	Mouse-ear Chickweed
	<i>Cerastium vulgare</i>	Common Mouse-ear Chickweed
RR	<i>Cirsium vulgare</i>	Spear Thistle
	<i>Festuca rubra</i>	Red Fescue
RC	<i>Hypericum perforatum</i> subsp. <i>veronense</i>	St John's Wort
	<i>Hypochaeris radicata</i>	Flatweed
	<i>Mimulus moschatus</i>	Musk Monkey-flower
RC	<i>Rubus fruticosus</i> spp. agg.	Blackberry
RR	<i>Salix cinerea</i>	Grey Sallow
	<i>Taraxacum officinale</i> spp. agg.	Garden Dandelion
	<i>Trifolium repens var. repens</i>	White Clover