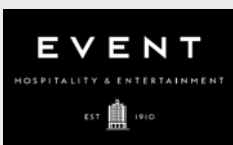


# STATEMENT OF ENVIRONMENTAL EFFECTS

## CONSTRUCTION OF A CAR PARK & ASSOCIATED WORKS CAR PARK CP3 FRIDAY FLAT THREDBO ALPINE RESORT



Prepared for:  
Event Hospitality & Entertainment Ltd



FEBRUARY 2019  
Project: 51-18

## STATEMENT OF VALIDITY

### Statement of Environmental Effects prepared by:

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**Applicant:** Event Hospitality & Entertainment Ltd

### Declaration

I certify that I have prepared the contents of the Statement of Environmental Effects in accordance with the requirements of the Environmental Planning and Assessment Act 1979 and Regulations and that, to the best of my knowledge, the information contained in this report is not false or misleading.

A handwritten signature in black ink, appearing to read 'I. Pasalich', is written over a horizontal line.

---

Ivan Pasalich  
**Principal**  
Dabyne Planning Pty Ltd

Nb: If the report is not signed above, it is a preliminary draft.

### Dabyne Planning Pty Ltd

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## EXECUTIVE SUMMARY

Dabyne Planning Pty Ltd has been engaged by Event Hospitality & Entertainment Ltd (Event) to prepare a Statement of Environmental Effects to accompany a Development Application (DA) to the NSW Department of Planning & Environment (DPE).

The DA is for the expansion of the existing Friday Flat car park, by constructing an additional car park below (to the south) of Friday Drive within the Thredbo Alpine Resort. The proposed car park expansion has been designed to meet existing parking demand.

The proposed expansion, referred to as CP3, will be achieved by constructing an on-grade car park (requiring some cut and fill plus batters and retaining) below Friday Drive, between Thredbo River and the road.

This site was selected as it is located adjacent to Friday Drive and other visitor parking and is largely a heavily modified site and/or comprises of planted vegetation.

As the proposed car park will require the loss of some existing parking spaces along the eastern edge of the existing visitor parking, the net total number of additional parking spaces achieved will be 171.

The proposed car park will be accessed via a two-way ramp from the south-east corner of the visitor car park. All vehicles will enter and exit the car park via this ramp. An additional emergency access entry and exit will be provided directly onto Friday Drive at the eastern end of the proposed car park.

Provision for pedestrian movement has been incorporated into the design by way of providing pedestrian paths and stairs up onto the visitor car park. Provision for a bus stop has also been incorporated along Friday Drive.

The site is constrained by its proximity to the Thredbo River, the drainage path from stormwater collected above and conveyed under Friday Drive (via a culvert) and the native vegetation and fauna habitat located along the northern edge of the river.

A preliminary constraints analysis was undertaken in September 2018 by Eco Logical Australia, which informed the design of the car park.

In response to these constraints, the car park has been subject to an extensive site and design analysis process. This has included ensuring a sufficient setback to the river can be achieved, providing connectivity between known habitat up and downstream and protecting most of the higher valued vegetation on the site.

The design of the carpark has also been informed by the topography of the site, its heavily modified state and the native vegetation located along the river bank and planted vegetation located along the top of its embankment, adjacent to the road.

The design has also been driven to achieve sufficient landscaping and setback buffers to the river to accommodate additional tree and shrub planting.

Due to engineering constraints, the level of the car park has been raised to be less susceptible to flooding and provide the required geotechnical foundations.

In accordance with clause 27 of State Environmental Planning Policy (Kosciuszko National Park – Alpine Resorts) 2007, the proposed development was considered to be a building over 1000m<sup>2</sup> in size and was determined to be ‘advertised development’, even though a car park is not a ‘building’ as defined.

Pursuant to clause 13, Schedule 6 of the Environmental Planning and Assessment Regulations 2000, a statement of environmental effects required by Schedule 1 to accompany a development application relating to a ski resort area must be prepared in accordance with guidelines issued under this clause if the proposed development is advertised development.

This SEE has been prepared in accordance with the Secretary Guidelines issued by the DPE on the 4 September 2018.

The SEE has concluded that following an extensive site and design analysis, the proposed car park achieves the desired vehicle access, traffic, parking and pedestrian movement and circulation outcomes whilst minimising impacts on the natural and built environment.

# 1. INTRODUCTION

## 1.1 Purpose of the Report

This report presents a Statement of Environmental Effects (SEE) for a proposal by Event Hospitality & Entertainment Ltd, for the expansion of the Friday Flat car park with a car park (CP3) at Friday Flat, Thredbo Alpine Resort.

The purpose of this SEE is to

- describe the land to which the DA relates;
- describe the form of the proposed works;
- define the statutory planning framework within which the DA is to be assessed and determined; and
- assess the proposed development against the matters for consideration listed under Section 4.15 of the Environmental Planning and Assessment Act, 1979 (EP&A Act, 1979).

In accordance with Schedule 1 of the Environmental Planning and Assessment Regulations 2000, a statement of environmental effects must indicate the following matters:

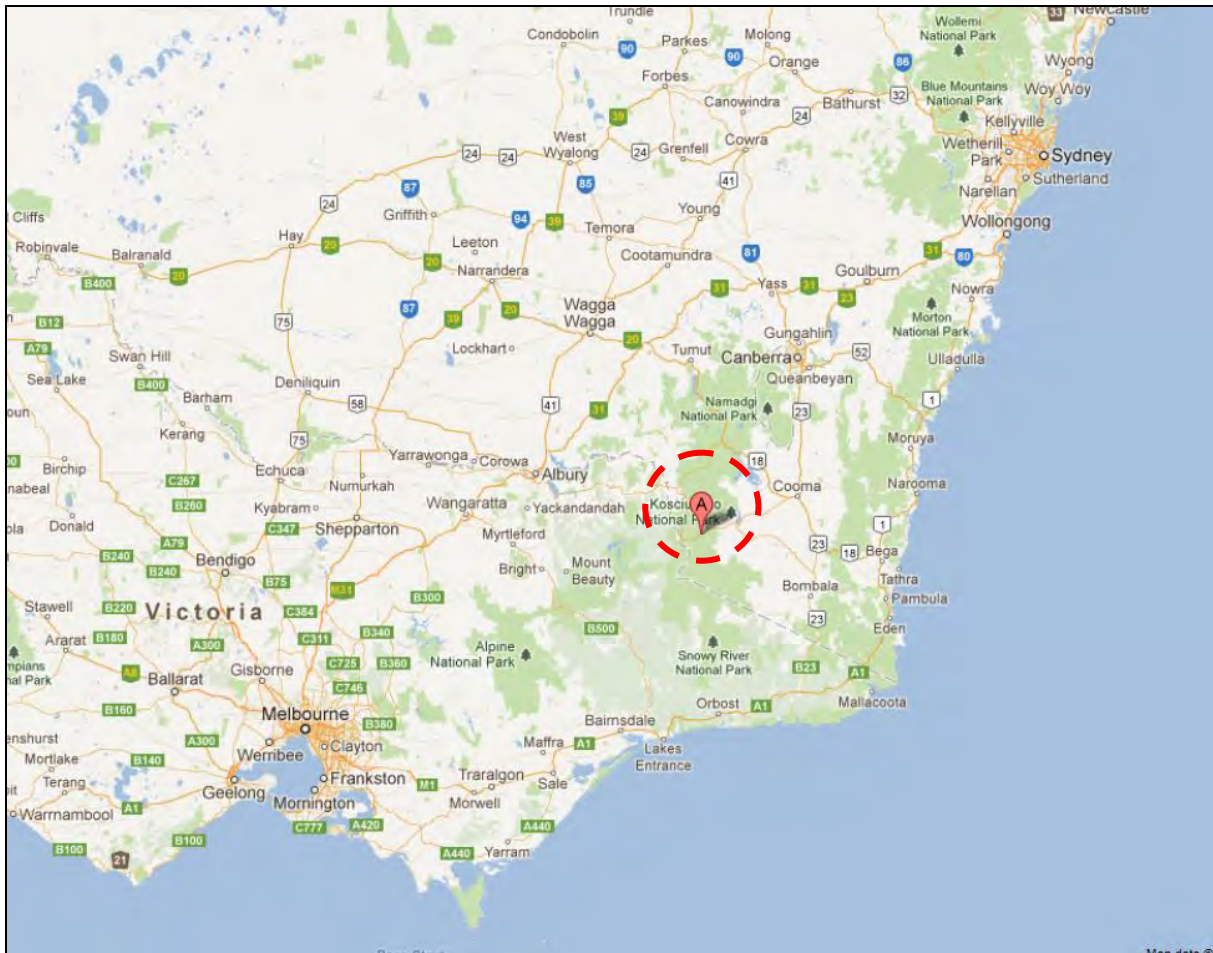
- the environmental impacts of the development,
- how the environmental impacts of the development have been identified,
- the steps to be taken to protect the environment or to lessen the expected harm to the environment,
- any matters required to be indicated by any guidelines issued by the Director-General (Secretary) for the purposes of this clause.

The report has been prepared in accordance with the requirements of Schedule 1 and Clause 13 of Schedule 6 of the Environmental Planning and Assessment Regulations 2000.

## 2. THE SITE AND LOCALITY

### 2.1 The Locality

The subject site is located within the Thredbo Alpine Resort, which is located in South-Eastern NSW as illustrated in figure 1 below:



**Figure 1: Location of the Thredbo Alpine Resort in context with South-Eastern NSW  
(source: Google Maps)**

Thredbo Alpine Resort is located within the southern part of the Kosciuszko National Park.

A map of Kosciuszko National Park is provided in figure 2 below.



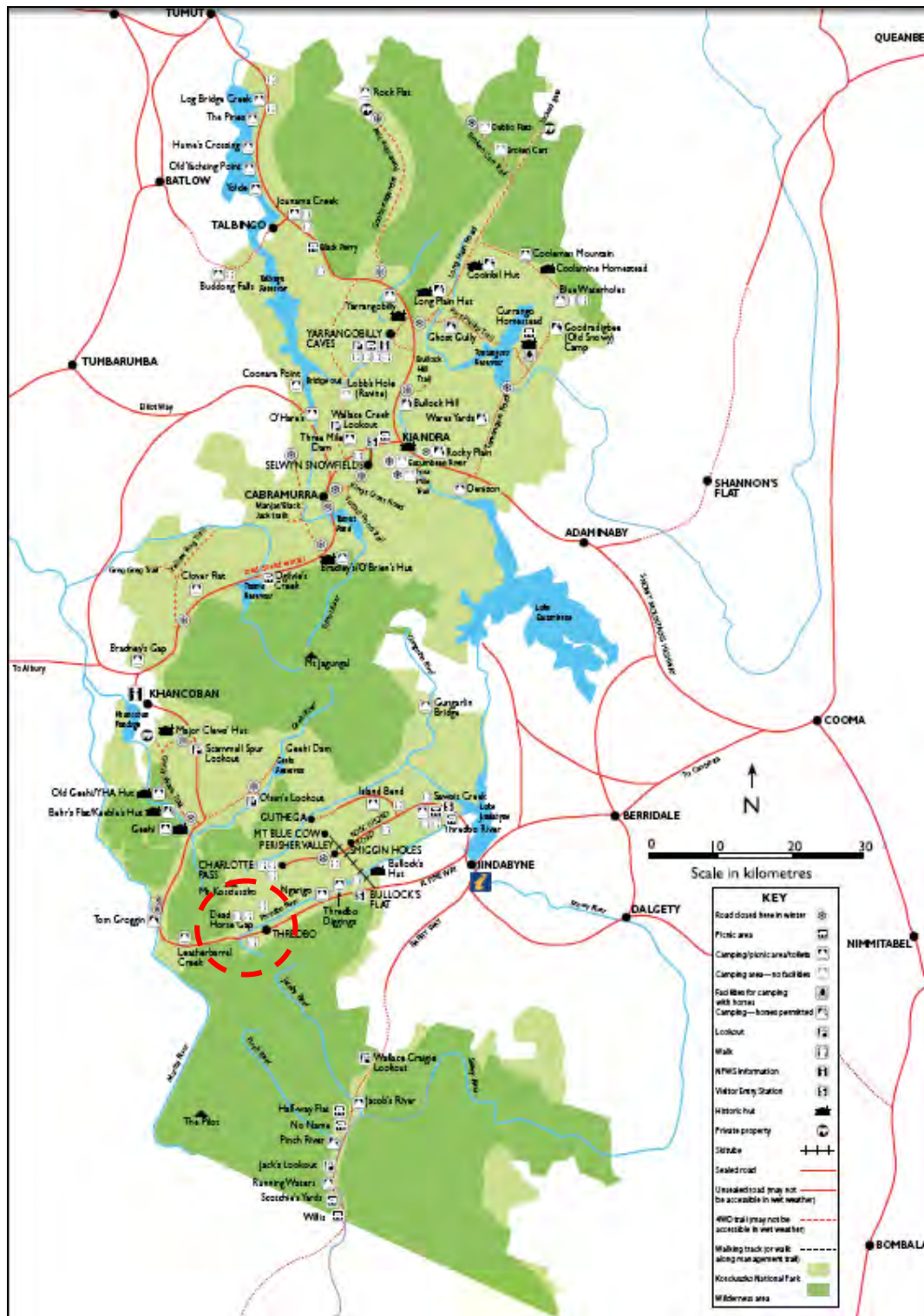
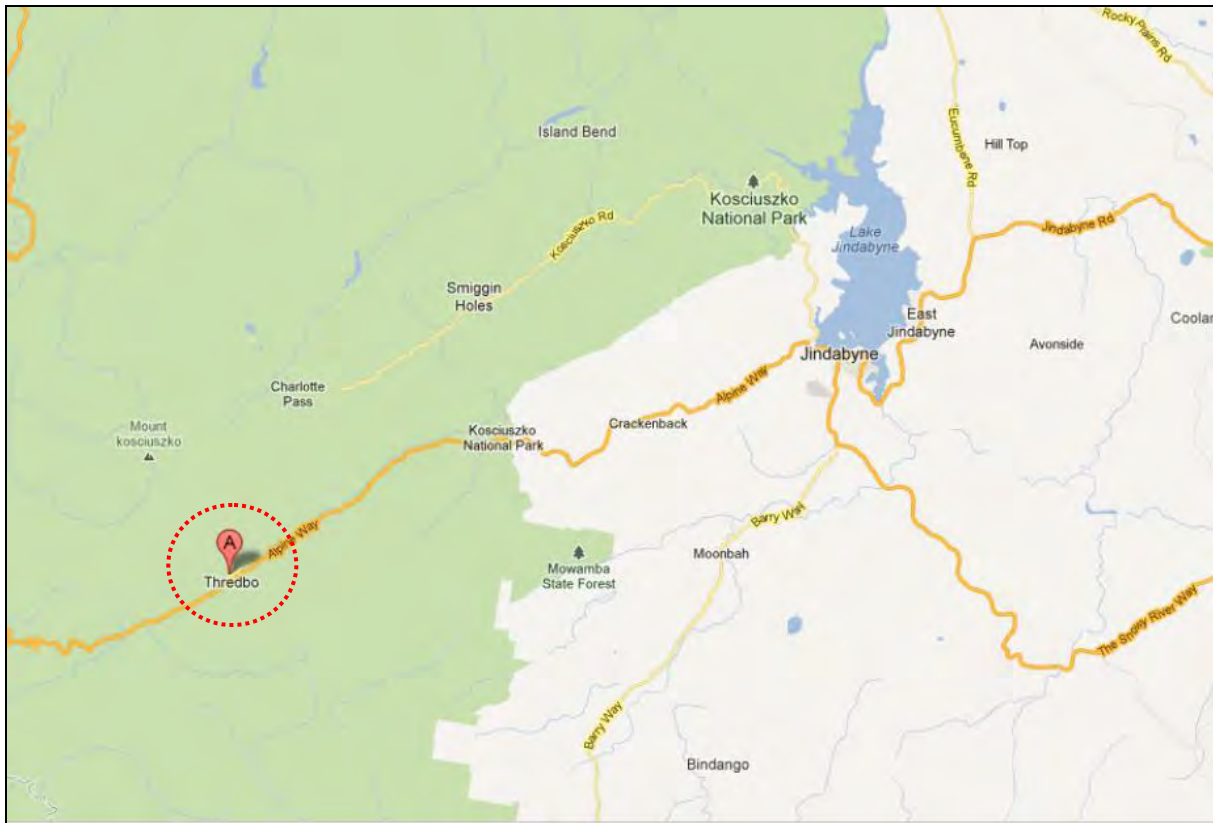


Figure 2: Location of Thredbo Alpine Resort in context with Kosciuszko National Park  
 (source: NPWS KNP 2011 Guide)

Thredbo Alpine Resort is located approximately 35kms from Jindabyne. Access to the resort is achieved via the Alpine Way.

The location of Thredbo is illustrated in context with the regional locality below in figure 3.



*Figure 3: Context of Thredbo Alpine Resort within the region (source: Google Maps)*

## 2.2 The Site

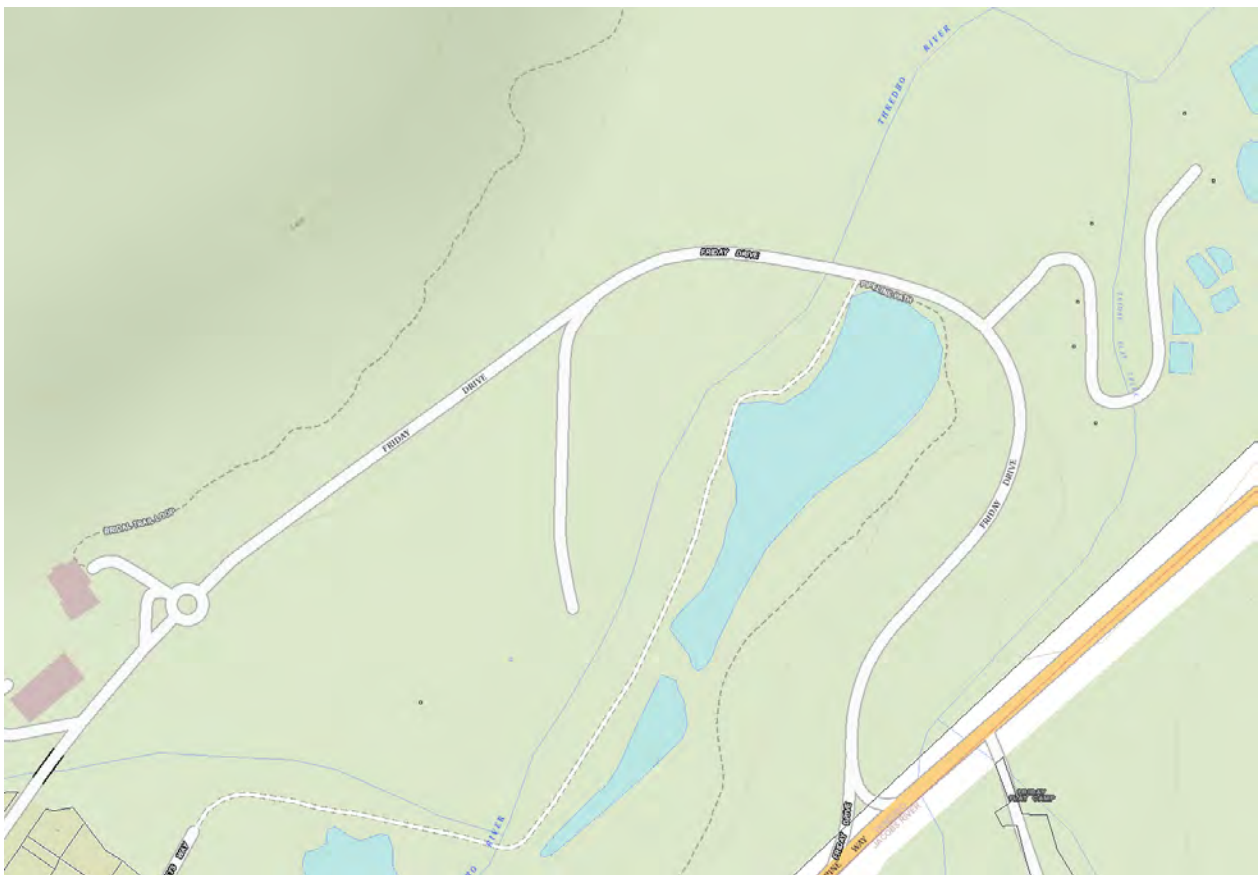
The subject site is bound by Friday Drive to the north, the Thredbo River to the east and south and the visitor car park to the west.

The site comprises a drainage line which conveys stormwater from Friday Drive and above through the site and into Thredbo River.

The site is identified in figure's 4 & 5 below:



*Figure 4: Aerial view of the subject site*



*Figure 5: Topographic map of the subject site*

The site forms a natural bowl with Friday Drive and the visitor car park at the top, sloping down to the Thredbo River.

The vegetation associated with the site is mostly heavily degraded as a result of historic development including the realignment of Thredbo River and is characterised by very weedy vegetation and plantings. Planted vegetation comprising mostly of Eucalypts are located along the top embankment adjacent to the road and existing car park, whilst the vegetation along Thredbo River is attributed to Alpine and subalpine peatlands, damp herbfields and fens (PCT 637) in a degraded state, as shown in figure 6 below.



*Figure 6: Aerial of the subject site*

Photos of the site and proposed location of the development are provided in Appendix A.

## **3. DESCRIPTION OF THE DEVELOPMENT**

### **3.1 Overview of the Proposal**

The proposal is to expand the existing Friday Flat car park by constructing an on grade car park below Friday Drive and above (to the north) of the Thredbo River. This is referred to as CP3.

As the proposed car park will result in the loss of some existing parking spaces along the edge of the visitor car park, the net total number of additional parking spaces achieved by the development will be 171.

This is achieved by providing a 174 new spaces within the CP3 car park, whilst only removing 3 existing spaces along the eastern edge of the existing visitor car park.

### **3.2 Vehicle Access & Parking**

Vehicle access into the car park will be achieved via a two-way ramp from the south-east corner of the visitor car park. All vehicles will enter and exit the car park via this ramp. An additional emergency access entry and exit will be provided directly onto Friday Drive at the eastern end of the proposed car park.

A one way vehicle circulation pattern is proposed for pedestrian safety and to avoid congestion during peak loading and unloading times, as is the current practice elsewhere.

This will include 90 degree angled parking.

The proposed parking spaces have been designed to achieve compliance with AS 2890.

### **3.3 Pedestrian Access and Circulation**

The proposed car park has been designed facilitate pedestrian access and circulation.

The car park includes two staircases that connect with the visitor car park to the west. This allows for connectivity to and through the CP1 car park to Friday Flat.

### **3.4 Snow Clearing & Management**

The proposed car park has been designed without kerb and guttering to allow for easier snow management with a more natural treatment with the use of rock boulders and planted vegetation to delineate edge of car park. Snow can be managed by being pushed into the bio swales and detention basin.

### **3.5 Stormwater Management**

Stormwater management for the new car park will include a catch drain along the top of the car park which will connect into a bio swale along the bottom edge of the car park and this will

discharge into a detention basin then erosion and control and energy dissipater before discharging into the Thredbo River.

The existing stormwater that is collected from Friday Drive and above and is currently managed by a rudimentary gabion basket system below the culvert and overland flow, which has resulted in the hydrology on this area being altered, making it extremely wet and dominated by rushes and exotic grasses.

This stormwater is proposed to be piped under the car park and managed before discharging into the Thredbo River.

The stormwater management system has largely been designed to be outside of the 15.24m riverbank setback (under the Head Lease) and riparian protection buffer, which is 22.5m from the centreline of the river.

A Stormwater Report has been prepared by Taylor Thomson Whitting (TTW) Civil Engineers has been provided in Appendix B.

The report outlines how the proposed development will not increase stormwater discharge for the 5 year or 100 year ARI storm. Water quality will achieve NSW Statewide targets, with bio swales treating water.

With regards to flooding, although the car park level has been raised, it remains a risk of flooding during the 20 year and 100 year flood. However, the car park will only be used under staff direction when other parking areas are full. The car park will not used during flood events and safe access routes are provided from the car park above the 100 year ARI flood level.

### **3.6 Landscaping & Rehabilitation**

The proposed car park development provides an opportunity to improve landscaping and rehabilitation of the site, being a mostly heavily modified and degraded site.

To offset the loss of native vegetation, including planted vegetation as a result of the development, the landscape concept plan identifies the planting of over fifty (50) native trees along with extensive native shrubs and ground cover species.

This will assist in partly screening the car park and reduce its visual impact, whilst contributing to its overall rehabilitation and provision for fauna habitat.

The landscape outcome for the car park is to replicate previous car parks and developments in Thredbo with a more natural finish, including use of boulders and vegetation rather than engineered structures such as kerb and guttering.

The landscaping and rehabilitation of the site following construction is to be undertaken as outlined in the SEMP provided in Appendix C and the Site Analysis & Rehabilitation and Landscape Concept Plan prepared by DJRD Architects.

### **3.7 Construction Hours & Timing**

Due to the limited construction season and the ski resort operations commencing the June long weekend of each year and finishing at the October long weekend, construction hours for the project are sought to be 7am – 6pm, 7 days a week. This is considered appropriate given the location of the development in context with the resort and distance to closest tourist accommodation.

The proposed construction timing of the project has been scheduled to start in October 2019 and be completed by June 2020.

## 4. KEY MATTERS FOR CONSIDERATION

### 4.1 Traffic, Access and Parking

A Traffic Impact Assessment has been undertaken by TTW. This assessment, provided in full in Appendix D, includes an assessment of traffic, transport and car parking implications undertaken by an appropriately qualified traffic engineer.

The assessment concludes that the design of parking spaces meets the requirements of AS 2890.1 and that the provision of a net 171 parking spaces to the capacity of Friday Drive car park is considered acceptable, with traffic management and local traffic conditions expected to improve.

### 4.2 Design

To inform the design and siting of the car park, a preliminary ecological constraints analysis was undertaken in September 2018 by Eco Logical Australia.

This analysis identified the site was subject to 'Protected Riparian Land' under the Biodiversity Conservation Regulations 2017 (BC Regs, 2017) and is included on the Biodiversity Values Map, as shown below in the extract of the preliminary constraints analysis.

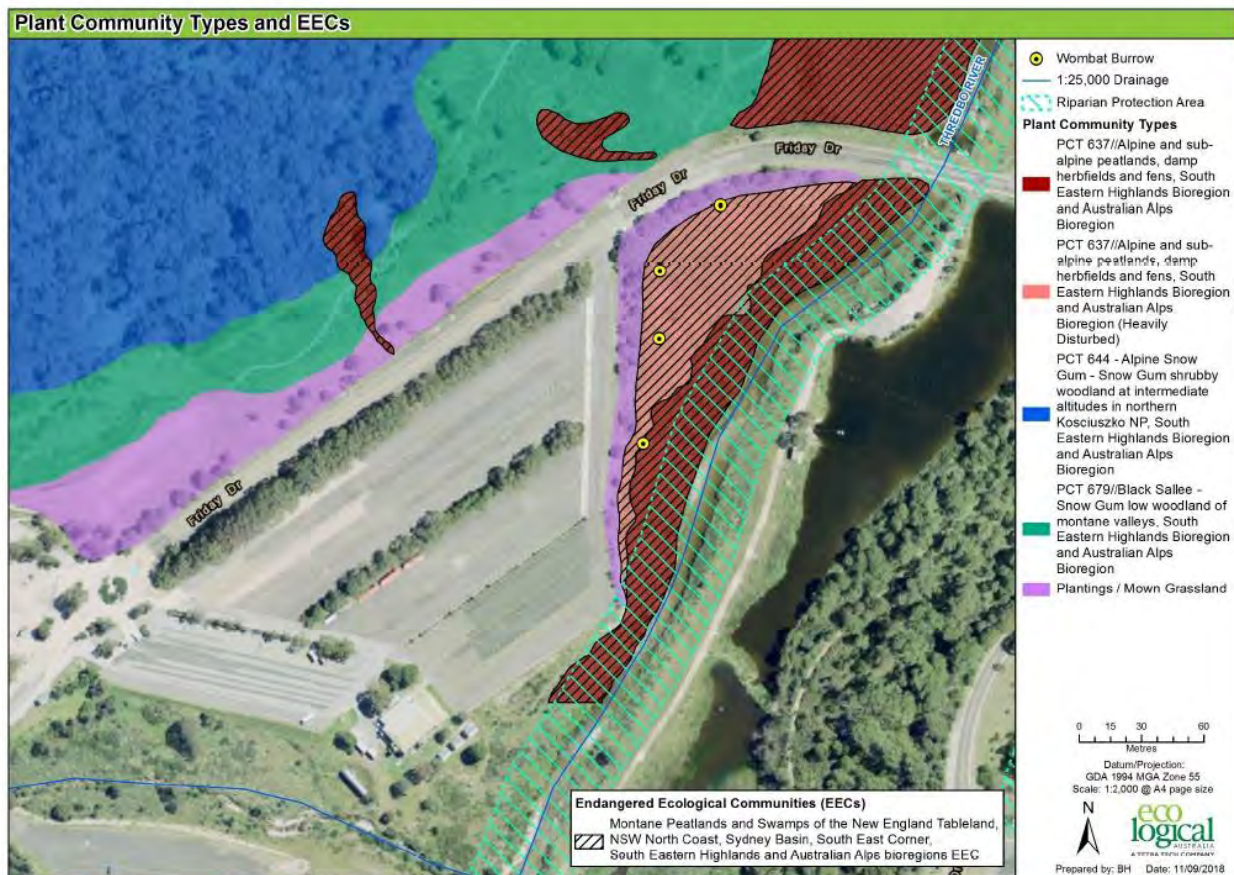


Figure 7: Preliminary constraints mapping (ELA, 2018)



Therefore a riparian protection area, measured to be 45m wide (22.5m from the centreline of the river) was overlaid on the subject site as a preferred buffer.

Secondly, the Thredbo Head Lease includes a minimum setback distance of 15.24m (50 feet) from the river bank.

The head lease setback was also overlaid on the subject site to inform the design process.

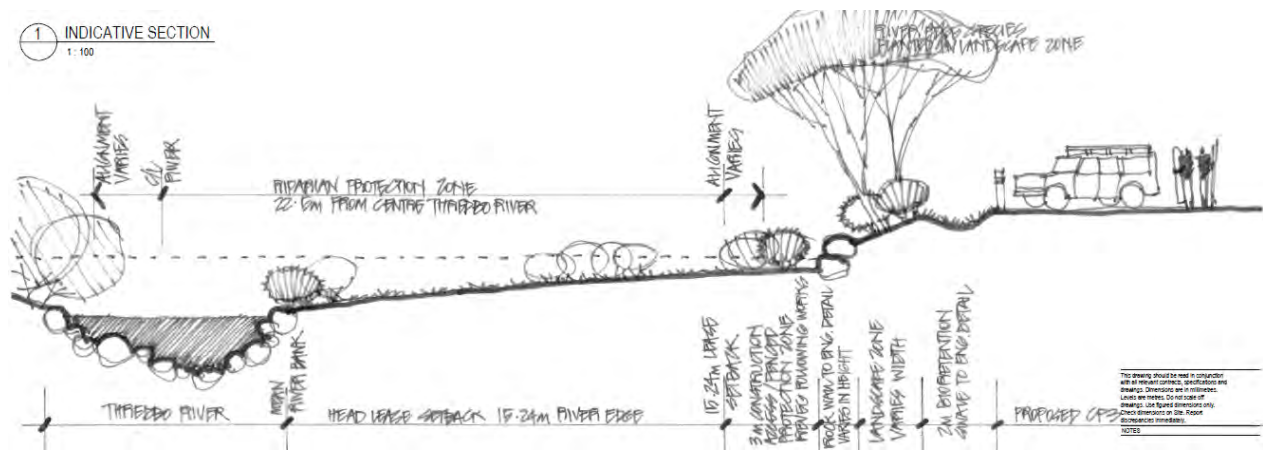
With these setback buffers identified, the car park was subject to further extensive engineering, architectural and landscape design analysis.

The design of the carpark was further informed by the topography of the site, its heavily modified state and the native vegetation located along the river bank and planted vegetation located along the top of its embankment, adjacent to the road.

The retainment of the majority of the planted trees along the top of the site, adjacent to the road was considered important for screening of the site and minimising visual impacts.

The design has also been driven to achieve sufficient landscaping and setback buffers to the river to accommodate additional tree and shrub planting.

An indicative long-section has been provided with the DA plans and an extract below:



**Figure 8: Typical cross-section of the car park and setback to the Thredbo River**

The use of rock walls and landscaping along the edge of the car park will assist in screening the view of large expanse of hard surfaces and to a lesser extent, the vehicles.

An aerial perspective photomontage of the car park is provided in figure 9 below. Although the public is not able to gain this perspective, it illustrates how the car park will sit within the landscape, relative to other road and parking infrastructure.



*Figure 9: Aerial photomontage of the CP3 car park*

### **4.3 Flora and Fauna**

As outlined above, the car park has been designed to provide a sufficient setback to the river and to largely protect the native vegetation along the edge of the river.

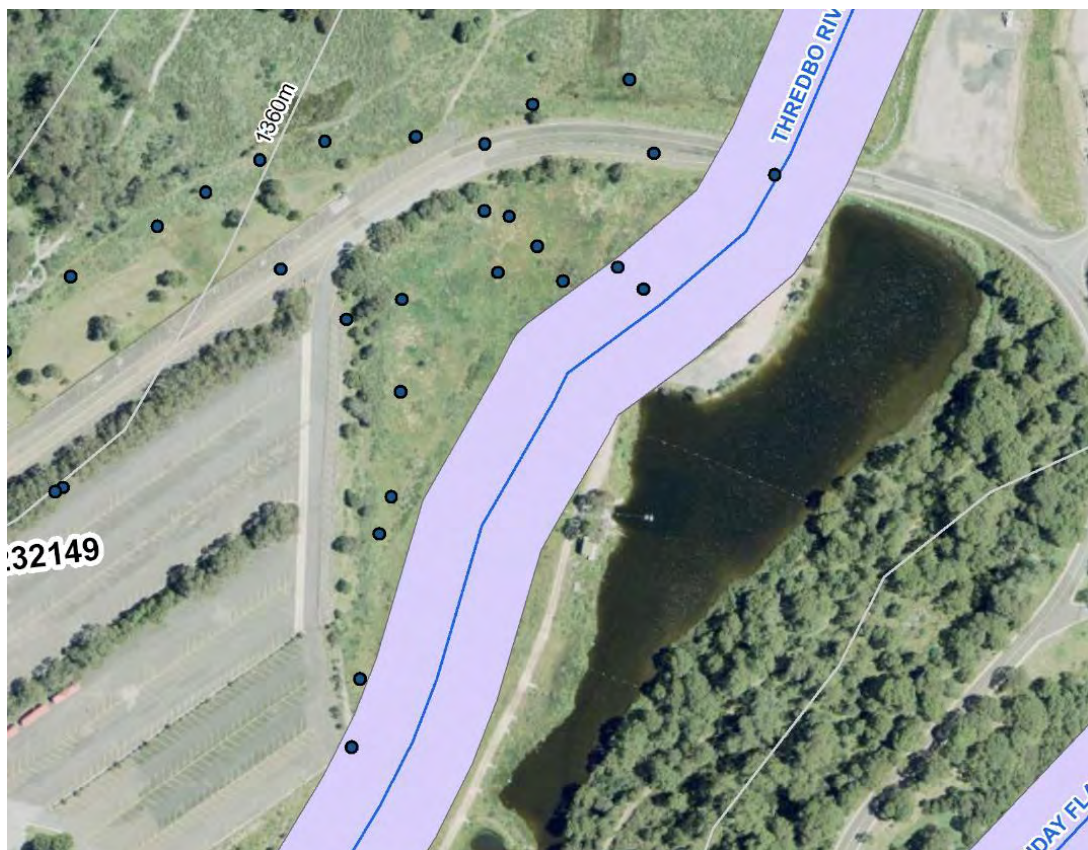
This has been undertaken to achieve an adequate buffer to the river to avoid where possible, undertaking work within the area mapped as high biodiversity area as part of the Biodiversity Values Map under the BC Act, 2016.

An extract of the Biodiversity Values Map for the locality is provided in figure 10 below.



*Figure 10: Biodiversity Values Map associated with the subject site (Source: OEH)*

A more detailed Biodiversity Values Map was sourced from OEH that related specifically to the site and this data was overlaid as part of the car park design and assessment of the site.



*Figure 11: Site specific Biodiversity Values Map (Source: OEH)*

Although the entire car park and its supporting infrastructure is located outside of the mapped high biodiversity area, the BOS is likely triggered by way of installing stormwater pipes to convey stormwater to the river.

Consequently a BDAR has been prepared by Ryan Smithers, Senior Ecologist with Eco Logical Australia and an Accredited Person.

The BDAR outlines the measures taken to avoid, minimise and mitigate impacts to the vegetation and habitats present within the development site during the design, construction and operation of the development. The residual unavoidable impacts of the proposed development were calculated in accordance with the BAM by utilising the BAMC. The BAMC calculated that a total of three (3) ecosystem credits and four (4) species credits are required to offset the unavoidable impacts to the vegetation and habitat present within the development site.

As a result of payment to the BCF for these offset credits, the physical implementation of offsets within the resort is not required. Furthermore, payment of these offset credits is an alternative to the retirement of biodiversity credits in accordance with Division 6 of the BC Act, 2016.

Serious and irreversible impacts values were also considered as part of the assessment under the BDAR and the report concluded that the proposal will not result in any serious and irreversible impacts.

A copy of the BDAR is provided in Appendix E.

#### **4.4 Aboriginal Cultural Heritage**

An 'Aboriginal Cultural Heritage Due Diligence Assessment' has been undertaken by Past Traces Heritage Consultants, which is provided in full in Appendix F.

The assessment was undertaken following the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* produced by the NSW Office of Environment and Heritage (OEH). The Due Diligence process was followed to ensure compliance with the code.

This process included a search of the AHIMS database covering 1km surrounding area centred on the project area, a review of previous studies, a landscape assessment and a site visit.

Based on the assessment the impacts from the project were identified as follows:

- No known Aboriginal objects or places will be impacted by the proposed works.
- No known Aboriginal objects or places are present in the project area.
- No areas of high potential to contain Aboriginal objects or places are present in the project area.

In conclusion, the report determined that the proposal can proceed with no additional archeological investigations and that no area of potential archeological deposits or heritage sites have been identified within the development area and the potential for Aboriginal objects within the development area has been assessed as low.

## 4.5 Visual Impacts

The subject site is visible from Friday Drive, when entering the resort from the east, as shown in figure 12 below.



*Figure 12: View from Friday Drive*

To mitigate the visual impacts associated with constructing a car park on a heavily modified and degraded site, the car park has been setback from the river to protect existing native vegetation and provide additional landscaping opportunities.

The existing line of planted Eucalypts along the top edge of the carpark, adjacent to the road have been designed to be mostly retained. This is considered important to provide a screen whilst passing the site on foot, bike or in a vehicle.



*Figure 13: View from Friday Drive partly screened by existing vegetation*

The landscaping of the site has focused its attention to the embankment above the car park and the riparian edge, below the car park. The inclusion of landscaping with the use of natural features and finishes rather than engineered structures (i.e. use of rocks and vegetation with no kerb and guttering) is also proposed.

With regards to views from the Alpine Way, the car park is mostly screened by the topography and vegetation.



*Figure 14: View from Alpine Way*

The proposed on-grade car park has been subject to an extensive engineering and architectural design process with input from a Landscape Architect. This is to ensure that the level of the car park achieves the desired operational and design outcomes.

The concept landscape plan identifies over fifty (50) trees to be planted, with additional shrubs and ground covers.

Overall visual impacts associated with the proposal are considered acceptable in context with its location adjacent to a road, other carparks and adjacent ski resort infrastructure and the extent of landscaping proposed in context with its location within a developed alpine resort.

## **4.6 Water Resources**

The Thredbo River has been re-aligned for the construction of the snow making reservoir. The river used to flow along the eastern side of what is now the footprint of the snowmaking reservoir.

Furthermore the site and its surrounds have been heavily modified by historic development. A large culvert currently discharges to the development site. These, and other historic disturbances, such as the construction of Friday Drive and the surrounding car parks, have already substantially modified the hydrology of the development site and immediate surrounds.

Notwithstanding that the river has been extensively altered and the site is heavily modified, the proposed car park (CP3) is located within 40m of Thredbo River, a third order stream and therefore the development will impact upon 'waterfront land'.

The BDAR prepared and provided by Eco Logical Australia in Appendix E includes a comprehensive assessment with regard to hydrological impacts.

This assessment identified that the proposal has predominately been located in the most heavily modified areas where the vegetation is of negligible conservation value and where the habitats for threatened species are poor, relative to the habitats in adjoining areas.

With regards to potential impacts on water dependant plant communities, the report identified that the proposal has been limited primarily to very highly modified and degraded areas of the Montane Peatlands and Swamps EEC.

Furthermore, the report concludes that *'the proposal will not result in any fracturing of geological features of significance or water dependent plant communities and their supporting aquifers. The proposal includes a range of design features, including water quality treatment ponds, catch-drains and erosion and energy dissipators, which are designed to avoid adverse water quality and hydrology impacts beyond the development footprint, and which should improve the quality of the water discharged to the Thredbo River.'*

With the setback buffers afforded by the car park design, stormwater management measures and landscaping to be undertaken, the development will be able to be undertaken with minimal harm to waterfront land.

## **4.7 Ecologically Sustainable Development**

The principles which would assist in the achievement of Ecologically Sustainable Development have been clearly set out in Schedule 2 of the EP&A Regulation 2000. These principles are:

*a) The precautionary principle - namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.*

*b) Inter-generational equity - namely, that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.*

*c) Conservation of biological diversity and ecological integrity - namely, that a full and diverse range of plant and animal species should be maintained.*

*d) Improved valuation, pricing and incentive mechanisms - these mechanisms would enable environmental factors to be included in the valuation of assets and services.*

The four principles are interrelated. For instance, inter-generational equity can only be achieved in many instances if biodiversity is conserved for the use and enrichment of future generations. The linkage of the four principles means that they must be considered both individually and collectively when assessing whether a proposed project would contribute to ESD in Australia.



The EPBC Act 1999 adopted the definition of ESD above, adding a fifth principle namely: *“decision making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations.”*

Sustainability now has a broader meaning with a strong focus on the integration of environmental, social and economic goals through society and economic development activity. The fifth principle set out in the EPBC Act together with those defined by the EP&A Regulation 2000, form the basis of sustainability against which the proposal is assessed.

As set out in this SEE report and its conclusions, the proposed development will generate positive social and economic impacts for the resort whilst minimising impacts on the natural and built environment. These impacts have been offset by:

- Undertaking a comprehensive ecological, design and engineering analysis.
- Locating the car park within the most heavily modified areas with low biodiversity values.
- Incorporating an adequate setback (buffer) to the river.
- Undertaking a comprehensive landscape strategy and rehabilitation of the site, when completed.
- Applying construction and environmental management practices as set out in the SEMP.

Overall, this assessment has concluded that the development can achieve compliance with the accepted principles of ecologically sustainable development and therefore it is considered that the proposal is clearly not contrary to the public interest in relation the principles of ecologically sustainable development.

## **4.8 Cumulative Impacts**

With regard to having consideration of cumulative impacts, it is noted that this is not a matter for consideration under 4.15 of the EP&A Act, 1979 (Part IV) or the Biodiversity Conservation Act, 2016. Each DA is to be assessed on its own merits.

Cumulative impacts have historically only been considered in context with developments that have a significant impact, particularly developments that require an Environmental Impact Statement (EIS) that commonly generate impacts beyond a specific locality or developments that require a Species Impact Statement.

Cumulative impacts are generally associated with these significant impact developments in relation to dust, air quality, water and noise and do not commonly apply to impacts on biodiversity (fauna and flora), unless a Species Impact Statement is required.

The proposed development does not generate significant impacts and does not require a Species Impact Assessment.

Cumulative impact assessments should be undertaken only where there is a likelihood of significant impacts on identified environmental values from more than one activity.

The proposal is for only one activity.

Notwithstanding this, the proposed development has been designed and will be undertaken incorporating a range of mitigation measures to reduce impacts with regards to biodiversity, stormwater, visual and traffic.

This has been achieved by constructing the car park within the most heavily modified areas with low biodiversity values, adjacent to an existing road and incorporating an improved stormwater management system using Water Sensitive Urban Design (WSUD) features as well as incorporating a landscape design.

Impacts on the wider resort will be overwhelmingly positive. The additional parking spaces provided will meet existing demand, thus reducing the need for guests to park further away within the overflow parking area, along the grass verge associated with Friday Drive and even the Alpine Way.

## 5. ENVIRONMENTAL AND PLANNING LEGISLATION

### 5.1 ENVIRONMENTAL PLANNING AND ASSESSMENT ACT, 1979

#### 5.1.1 SECTION 4.15(1)(a)(i) – ENVIRONMENTAL PLANNING INSTRUMENTS

##### *State Environmental Planning Policy (Infrastructure) 2007*

With regard to clause 104 – Traffic-generating development under State Environmental Planning Policy (Infrastructure) 2007, the proposed car park will comprise of a total of 171 additional parking spaces over both stages.

With the site located more than 90m from a classified road (Alpine Way), the proposed development is not captured by Schedule 3.

The proposed development therefore is not considered to be ‘Traffic-generating development’ and therefore does not require referral to the NSW Roads and Maritime Services (RMS).

##### *State Environmental Planning Policy (Kosciuszko National Park – Alpine Resorts) 2007*

The only other applicable Environmental Planning Instrument to the proposed development and site is State Environmental Planning Policy (Kosciuszko National Park – Alpine Resorts) 2007 (SEPP Alpine Resorts). The relevant clauses contained within SEPP Alpine Resorts are addressed below:

##### **Clause 11 - Land Use Table:**

The land use table for Thredbo Alpine Resort specifies that ‘Car parking’, is permissible with consent.

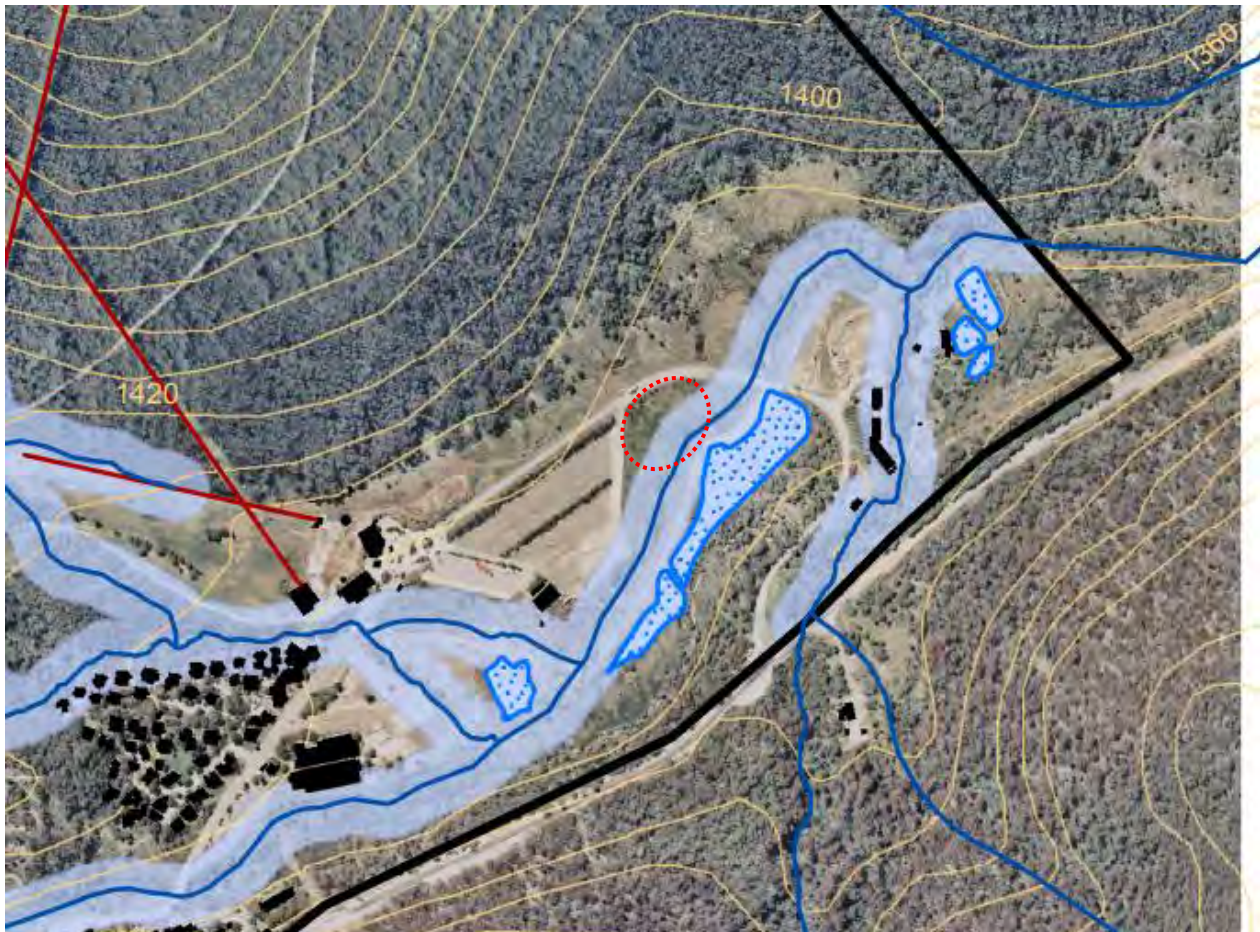
##### **Clause 14 - Matters for consideration:**

Matter for Consideration	Response
Cl.14 (1) In determining a development application that relates to land to which this Policy applies, the consent authority must take into consideration any of the following matters that are of relevance to the proposed development:	
(a) the aim and objectives of this Policy, as set out in clause 2,	<p><i>The proposed development is considered to be consistent with the aims and objectives of the Policy as the development will be providing an on grade car park over mostly heavily modified land.</i></p> <p><i>These impacts will be further mitigated through the implementation of the Site Environmental Management Plan provided in Appendix C.</i></p> <p><i>The proposed development is expected to generate significant positive social and economic impacts.</i></p>

<p>(b) the extent to which the development will achieve an appropriate balance between the conservation of the natural environment and any measures to mitigate environmental hazards (including geotechnical hazards, bush fires and flooding),</p>	<p><i>The proposed development does not require any measures to mitigate environmental hazards that would impact on the conservation of the natural environment.</i></p>
<p>c) having regard to the nature and scale of the development proposed, the impacts of the development (including the cumulative impacts of development) on the following:</p> <ul style="list-style-type: none"> <li>(i) the capacity of existing transport to cater for peak days and the suitability of access to the alpine resorts to accommodate the development,</li> <li>(ii) the capacity of the reticulated effluent management system of the land to which this Policy applies to cater for peak loads generated by the development,</li> <li>(iii) the capacity of existing waste disposal facilities or transfer facilities to cater for peak loads generated by the development,</li> <li>(iv) the capacity of any existing water supply to cater for peak loads generated by the development,</li> </ul>	<p><i>The proposed additional parking is to meet existing parking demand, providing improved vehicle access, parking and pedestrian outcomes for the resort.</i></p> <p><i>On this basis, the proposed development will not impact on the capacity of the existing transport to the resort, reticulated effluent management, waste disposal or water supply in relation to peak loads generated.</i></p> <p><i>By parking guests closer to the resort facilities and reducing the need for overflow parking and parking along Friday Drive up to the Alpine Way, as well as improving pedestrian circulation and safety, the existing transport within the resort, will be improved.</i></p>
<p>(d) any statement of environmental effects required to accompany the development application for the development,</p>	<p><i>This Statement of Environmental Effects satisfies this sub-clause.</i></p>
<p>(e) if the consent authority is of the opinion that the development would significantly alter the character of the alpine resort—an analysis of the existing character of the site and immediate surroundings to assist in understanding how the development will relate to the alpine resort,</p>	<p><i>The proposed car park will be located adjacent to Friday Drive and existing parking within a heavily modified area.</i></p> <p><i>The proposed development will therefore not significantly alter the character of the alpine resort.</i></p> <p><i>With regard to the potential visual impacts of the development, this has been addressed in Section 4.5 of the report.</i></p>

<p>(f) the Geotechnical Policy—Kosciuszko Alpine Resorts (2003, Department of Infrastructure, Planning and Natural Resources) and any measures proposed to address any geotechnical issues arising in relation to the development</p>	<p><i>The subject site is not located within the ‘G’ line and therefore not located within an area with potential geotechnical risk.</i></p> <p><i>The proposed car park will therefore require a Form 1A, which will be provided separately with the DA.</i></p>
<p>(g) if earthworks or excavation works are proposed—any sedimentation and erosion control measures proposed to mitigate any adverse impacts associated with those works,</p>	<p><i>Earthworks and excavation works are required for the proposed car park.</i></p> <p><i>Sedimentation and erosion control measures as outlined in the SEMP provided in Appendix C will mitigate any adverse impacts associated with such works.</i></p>
<p>(h) if stormwater drainage works are proposed—any measures proposed to mitigate any adverse impacts associated with those works,</p>	<p><i>Stormwater drainage works are proposed as covered in Appendix B and the plans provided.</i></p>
<p>(i) any visual impact of the proposed development, particularly when viewed from the Main Range,</p>	<p><i>The proposed development is located adjacent to Friday Drive and is not visible from the Main Range, with visual impacts assessed in Section 4.5 above.</i></p>
<p>(j) the extent to which the development may be connected with a significant increase in activities, outside of the ski season, in the alpine resort in which the development is proposed to be carried out,</p>	<p><i>The proposed development is not expected to result in an increase in activities outside of the ski season.</i></p>
<p>(k) if the development involves the installation of ski lifting facilities and a development control plan does not apply to the alpine resort:</p> <p style="padding-left: 40px;">(i) the capacity of existing infrastructure facilities, and</p> <p style="padding-left: 40px;">(ii) any adverse impact of the development on access to, from or in the alpine resort,</p>	<p><i>The development does not involve the installation of a ski lift.</i></p>

<p>(l) if the development is proposed to be carried out in Perisher Range Alpine Resort:</p> <p>(i) the document entitled Perisher Range Resorts Master Plan, as current at the commencement of this Policy, that is deposited in the head office of the Department, and</p> <p>(ii) the document entitled Perisher Blue Ski Resort Ski Slope Master Plan, as current at the commencement of this Policy, that is deposited in the head office of the Department,</p>	<p><i>Not applicable.</i></p>
<p>(m) if the development is proposed to be carried out on land in a riparian corridor:</p> <p>(i) the long term management goals for riparian land, and</p> <p>(ii) whether measures should be adopted in the carrying out of the development to assist in meeting those goals.</p>	<p><i>The proposed development is located within 40m of Thredbo River, as shown in figure 15 below.</i></p> <p><i>Refer to Section 4.6 of the SEE and Appendix E with regards to impacts on the riparian corridor.</i></p>
<p>(2) The long term management goals for riparian land are as follows:</p>	
<p>(a) to maximise the protection of terrestrial and aquatic habitats of native flora and native fauna and ensure the provision of linkages, where possible, between such habitats on that land.</p>	<p><i>Refer to Section 4.6 of the SEE and Appendix E with regards to impacts on the riparian corridor.</i></p>
<p>(b) to ensure that the integrity of areas of conservation value and terrestrial and aquatic habitats of native flora and native fauna is maintained,</p>	
<p>(c) to minimise soil erosion and enhance the stability of the banks of watercourses where the banks have been degraded, the watercourses have been channelised, pipes have been laid and the like has occurred.</p>	
<p>(3) A reference in this clause to land in a riparian corridor is a reference to land identified as being in such a corridor on a map referred to in clause 5.</p>	



*Figure 15: Proposed works located within 40m from Thredbo River*

### **5.1.2 SECTION 4.15(1)(a)(ii) – DRAFT ENVIRONMENTAL PLANNING INSTRUMENTS**

There are no draft Environmental Planning Instruments that are applicable to the site or proposed development.

### **5.1.3 SECTION 4.15(1)(a)(iii) – DEVELOPMENT CONTROL PLANS**

There are no Development Control Plans applicable to the Kosciuszko Alpine Resorts under State Environmental Planning Policy (Kosciuszko National Park – Alpine Resorts) 2007.

### **5.1.4 SECTION 4.15(1)(a)(iiia) – PLANNING AGREEMENTS**

There are no Planning Agreements applicable to the Kosciuszko Alpine Resorts under State Environmental Planning Policy (Kosciuszko National Park – Alpine Resorts) 2007.

### **5.1.5 SECTION 4.15(1)(a)(iv) – REGULATIONS**

The development application has been made in accordance with the requirements contained in Clause 50(1A) and clause 13 of Schedule 6 of the Environmental Planning and Assessment Regulations 2000.

In accordance with Clause 54(4) of the same regulations, the information that is required for a Construction Certificate, is not required to be provided for a DA in relation to either building or subdivision work. This is to ensure that the consent authority does not oblige the applicant to provide construction details up-front where the applicant may prefer to test the waters first and delay applying for a construction certificate until, or if, development consent is granted.

#### **5.1.6 SECTION 4.15(1)(b) – LIKELY IMPACTS**

##### **Natural Environment:**

Impacts on the natural environment and in particular biodiversity have been assessed as part of the BDAR provided in Appendix E.

This assessment determined that the proposal will not result in severe and irreversible impacts and includes mitigation measures as well as payment of credits to offset the unavoidable impacts to the vegetation and habitat present within the development site.

Along with the payment of offset credits and the mitigation measures outlined in the BDAR and SEMP, the likely impacts on the natural environment have been mitigated. This is attributed to the comprehensive site and design analysis that has ensured the car park is sufficiently setback from the river.

##### **Built Environment:**

Impacts on the built environment have been managed and mitigated with the design and level of the car park and use of natural features including proposed landscaping.

##### **Social and Economic impacts in the locality:**

The social and economic impacts from the proposed development overall is expected to be overwhelming positive by providing guests with additional parking.

Positive economic impacts will be derived by providing improved parking closer to resort facilities, capital improvement to the resort and the construction jobs generated.

#### **5.1.7 SECTION 4.15(1)(c) – SUITABILITY OF THE SITE**

The subject site is a heavily modified site that has been subject to hydrological changes and comprises mostly of low value biodiversity. With the higher valued biodiversity retained along the river's edge and existing planted trees along the road, the balance of the site is considered suitable to be used for additional car parking.

#### **5.1.8 SECTION 4.15(1)(d) – SUBMISSIONS**

The subject Development Application will be required to be advertised and any submissions received will be considered as part of the development assessment process.



### 5.1.9 SECTION 4.15(1)(e) – THE PUBLIC INTEREST

The above assessment has demonstrated that the proposal satisfies the objectives and relevant clauses prescribed under State Environmental Planning Policy (Kosciuszko National Park – Alpine Resorts) 2007.

The development is therefore considered to be within the public interest.

### 5.2 National Parks and Wildlife Act, 1974

The NSW National Parks and Wildlife Act, 1974 (NPW Act, 1974) governs the establishment, preservation and management of national parks, historic sites and certain other areas. The NPW Act also provides the basis for the legal protection of Aboriginal sites within NSW.

As detailed in Section 4 of the report, the proposed development will result in acceptable impacts, which will ensure the development is consistent with the provisions of the NPW Act, 1974.

### 5.3 Kosciuszko National Park Plan of Management 2006

The Kosciuszko National Park Plan of Management 2006 (PoM) sets out objectives and management strategies for specific areas of the Park. The plan identifies that the Thredbo Alpine Resort is a Management Unit within an Area of Exceptional Recreational Significance (Chapter 10).

The management objective under Section 10.4.1 states ..... *'The Thredbo Management Unit is managed so as to provide opportunities for visitors to enjoy, understand and appreciate the values of the park in ways that minimise adverse impacts'*.

The policies and actions for the Management Unit are prescribed below:

#### ***Policies and Actions***

1. *Any activity associated with the provision of visitor facilities and services by lessees and licensees will not be permitted except in accordance with the provisions of this plan and the following conditions:*
  - *An environmental management system is developed and implemented in accordance with Section 12.1;*
  - *A maximum of 4810 beds is provided;*
  - *A minimum of ten beds is provided for the volunteer ski patrol. These beds will not be available for commercial utilisation and will not attract a premium or rental;*
  - *The lessee contributes to the operation or maintenance of any facility or service being promoted by the lessee that is managed by the Service; and*
  - *The lessee coordinates recreational opportunities with strategies for the management of the Main Range Management Unit (Section 9.2) and other zones adjacent to or near the resort.*

2. *Ensure all activities associated with the running and preparation of race events, which use that part of the International Ski Run located in the Main Range Management Unit, are in accordance with Section 8.20.*
3. *Ensure any licence to use the International Ski Run:*
  - *Prohibits the construction of lifts or buildings or manipulation or disturbance of the ground or vegetation within the proposed licence area;*
  - *Requires the organising body of the event to provide and distribute information on the special values of the proposed licence area; and*
  - *Contains specific provisions for the management of spectators and the media to minimise the impact on the values of the area.*
4. *Require the lessee to maintain walking tracks on that part of the walking route to Mount Kosciuszko and Dead Horse Gap that is within the Thredbo lease area. Walking tracks will be managed in accordance with walking track classifications presented in Schedules 5 and 6.*

The proposed development is considered consistent with the management objective and policies and actions as prescribed in the PoM above.

#### **5.4 BIODIVERSITY CONSERVATION ACT, 2016**

Although the entire car park and its supporting infrastructure is located outside of the mapped high biodiversity area, the BOS is likely triggered by way of installing stormwater pipes to convey stormwater to the river.

Accordingly, a BDAR has been prepared by Ryan Smithers, Senior Ecologist with Eco Logical Australia and an Accredited Person.

The BDAR outlines the measures taken to avoid, minimise and mitigate impacts to the vegetation and habitats present within the development site during the design, construction and operation of the development. The residual unavoidable impacts of the proposed development were calculated in accordance with the BAM by utilising the BAMC. The BAMC calculated that a total of three (3) ecosystem credits and four (4) species are required to offset the unavoidable impacts to the vegetation and habitat present within the development site.

The payment for these credits to the BCF is the only offset obligation available to the Applicant, given that the retiring of credits is not available with no ability to create offset sites under a Biodiversity Stewardship Agreement within a National Park.

As a result of payment to the BCF for these offset credits, the physical implementation of offsets within the resort is not required. Furthermore, payment of these offset credits is an alternative to the retirement of biodiversity credits in accordance with Division 6 of the BC Act, 2016.

The BDAR fulfils the obligations under the BC Act, 2016 and is provided in Appendix E.

## 6. CONCLUSION

To meet existing parking demand, Event are proposing to expand the existing Friday Flat car park.

The proposed expansion, referred to as CP3, will be achieved by constructing an on-grade car park below Friday Drive.

The additional car park will result in a net 171 additional parking spaces.

The proposed car park has been subject to an extensive ecological, engineering and design analysis process which has resulted in the car park design and siting being located where the site is most heavily modified and comprises of low biodiversity value.

This has ensured a sufficient setback to the river can be achieved, providing connectivity between known habitat up and downstream and protecting most of the higher valued vegetation on the site.

Impacts on the river and its riparian corridor have further been mitigated by the stormwater management measures to be implemented, incorporating Water Sensitive Urban Design (WSUD) measures as well as the extensive landscaping proposed for the site.

To ensure that all the environmental and associated legislation is complied with and fulfilled, the proposed development has been considered with regard Section 4.15 of the Environmental Planning and Assessment Act, 1979, Biodiversity Conservation Act, 2016 and State Environmental Planning Policy (Kosciuszko National Park – Alpine Resorts) 2007.

The proposal has been found to be consistent with the above legislation and relevant Environmental Planning Instrument, as detailed in this SEE.

On balance, the proposed development will generate significant positive social and economic impacts for the resort and wider region, achieving the desired vehicle access, traffic, parking and pedestrian movement and circulation outcomes whilst minimising impacts on the natural and built environment.

## APPENDIX A

### PHOTOS



*Figure 1: View of the subject site from Friday Drive*



*Figure 2: View of the subject site from Friday Drive and bridge over Thredbo River*



*Figure 3: View of the subject site from Friday Drive*



*Figure 4: View of the subject site towards the west*



*Figure 5: View of the subject site towards the south-west*



*Figure 6: View of the subject site towards the south*



*Figure 7: View of the upper embankment and existing planted Eucalypts*



*Figure 8: Photo of the gabion basket stormwater management from Friday Drive*



*Figure 9: Photo of the gabion basket stormwater management and overflow from Friday Drive*



*Figure 10: View of the subject site from opposite side of the river (towards the north)*



*Figure 11: View of the subject site from opposite side of the river (towards the north-east)*



*Figure 12: View of the subject site from opposite side of the river (towards the north)*





*Figure 13: View of the subject site from opposite side of the river (towards the west)*

## **APPENDIX B**

### **STORMWATER REPORT**

# STORMWATER REPORT

## Friday Flat Car Park 3

Prepared for **EVENT HOSPITALITY & ENTERTAINMENT** / 26 / 02 / 2019

181487 CAAE

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## 1.0 Introduction

Taylor Thomson Whitting (TTW) has been appointed by Event Hospitality and Entertainment to prepare a concept Civil plan and report to support the Development Application for the proposed works at the Friday Flat car park at Thredbo Resort.

### 1.1 The Site

The site is located within Kosciuszko National Park. The site's locality is shown in Figure 1, bounded by Friday Drive to the north, existing carpark to the west and Thredbo River to the south-east. The existing site is undeveloped.



Figure 1: Aerial Image (Nearmap)

### 1.2 Relevant Documents

- DRJD Architect Plans (14/12/18)
- NSW MUSIC Modelling Guidelines 2015

## 2.0 Proposed Development

The proposed development is a new car park with entry and exit from the existing car park to the west, with an emergency exit to Friday Drive to the East. Figure 2 shows the plan of proposed works. The site area is 8000m<sup>2</sup> with 64% of this impervious (5100m<sup>2</sup>).



Figure 2: Proposed works

## 3.0 Stormwater Quantity & Quality

The proposed development will be increasing the impervious area of the site. An increase in impervious area will result in greater stormwater runoff and pollutants. The proposed development includes a treatment train that will reduce stormwater discharge and stormwater pollutants to levels compliant with state and national criteria. The car park generally drains from north-west to south-east towards a bioswale. This bioswale provide primary treatment and conveys stormwater to a detention basin where it is discharged to Thredbo River.

### 3.1 On-Site Detention

On-site stormwater detention will be used to meet the stormwater discharge requirement of that the peak post-development runoff rate is no greater than peak pre-development runoff rate. Bioswales and a detention basin will be constructed to facilitate on site detention and their positions are shown in Figure 3.

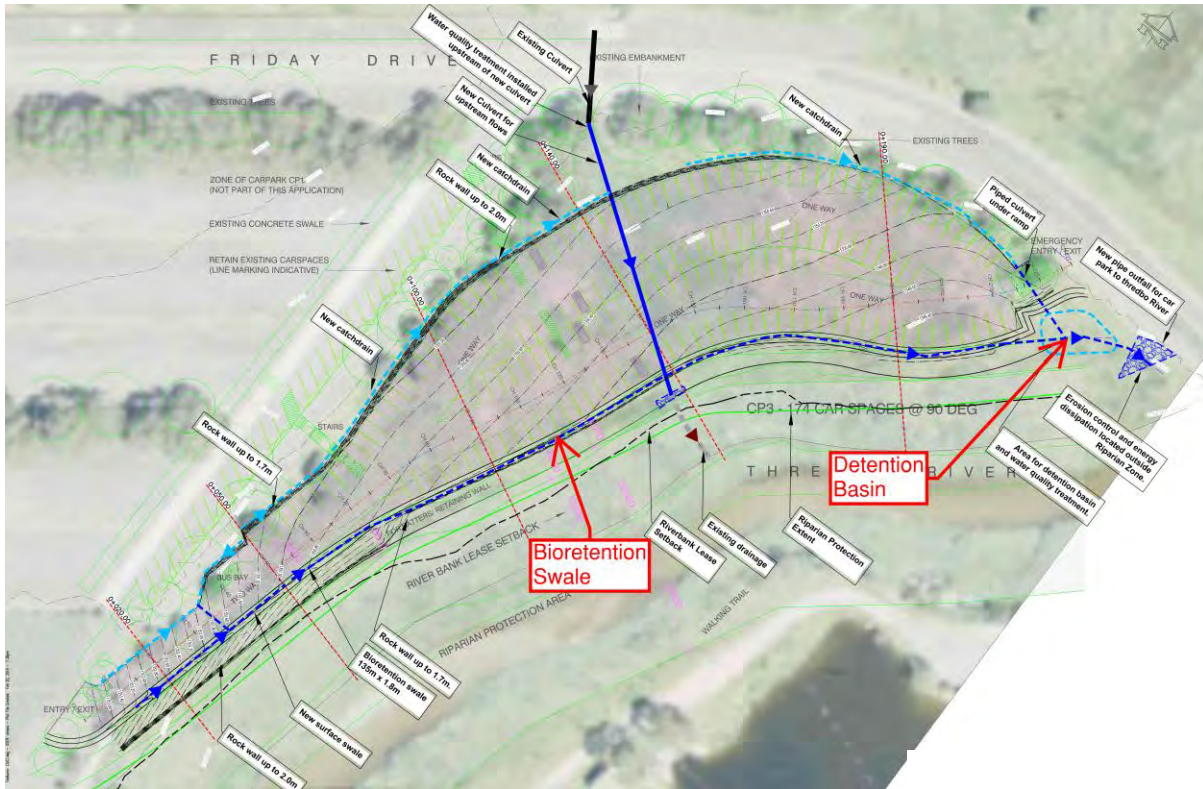


Figure 3: Location of detention basin and bioswale

DRAINS water quantity modelling software was used to determine the stormwater detention requirements. The model was set up to compare the proposed site with pre-development conditions. The new carpark surface (5,100m<sup>2</sup>) drains to the detention basin via bioswales, whilst the undisturbed slope to the north of the carpark will drain to the new culvert through new catch drains installed at the base of the slope.

The DRAINS model confirms that the detention basin requires a volume of 90m<sup>3</sup> (around 90m<sup>2</sup> and 1m deep) with an orifice plate 150mm in diameter and an outgoing pipe 225mm in diameter. The detention basin meets the stormwater target of ensuring that pre-development flow rates for storms between the 5-year and 100-year ARI storms are not increased following development.

Figure 4 shows a typical cross-sectional of bioswale.

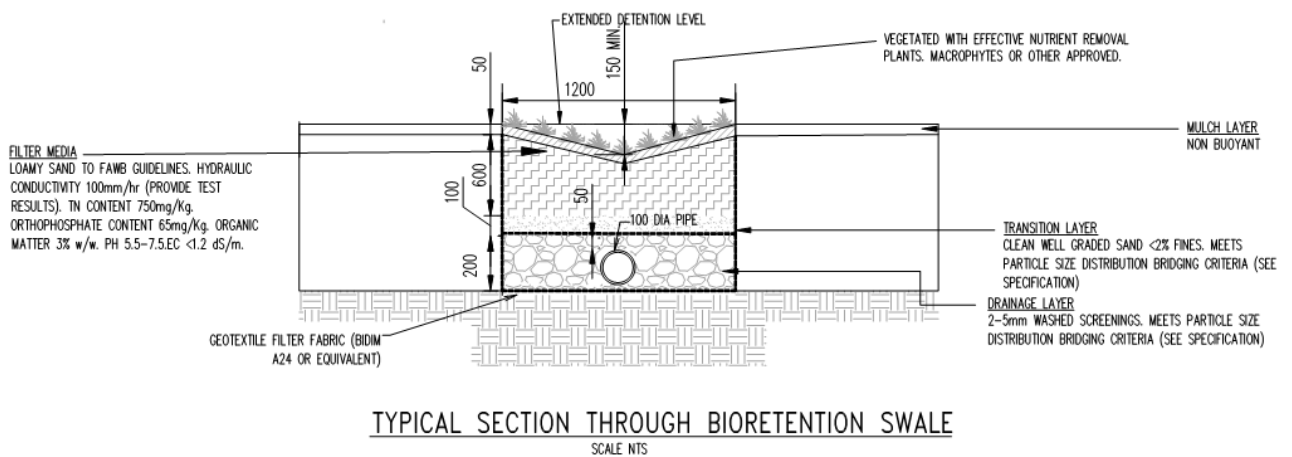


Figure 4: Bioswale cross-section

Table 1 compares the pre-development discharge rates to post development discharges

	Pre-development (l/s)	Post development (l/s)
5-year ARI	45	39
100-year ARI	105 (43l/s in pipe, 62l/s overflow)	111

Table 1: Site discharge rates

DRAINS modelling confirms that the detention basin will not overflow during the 20-year ARI storm. The basin will overflow during the 100-year ARI storm, with a high level weir allowing flows up to 62 l/s towards the Thredbo river. This overflow rate has been included in the post development discharge rate.

### 3.2 Stormwater Quality

MUSIC was used to model the stormwater quality of the proposed site and determine compliance with the stormwater objectives. Stormwater on site is treated through a bioswale and 2 litter basket pit inserts (e.g. Stormwater350 enviropod). The bioswale is required to have a media filter area of 0.6m<sup>2</sup>/m and the length of bioswale must be at least that shown in TTW’s civil engineering drawings.

The proposed site was split into sub-catchments and modelled according to land-use type. The impervious areas were modelled as “sealed road” and the batters were modelled as pervious “Landscape” areas. The default pollutant concentration values were adjusted to reflect the NSW MUSIC Modelling Guidelines 2010. Table 2 shows the pollutant concentrations used in the model and the layout of the MUSIC model is shown in Figure 5.

Table 2: Pollutant concentrations

Table 5-6 Base Flow Concentration Parameters (mg/L-log10) for NSW (adapted from Fletcher et al, 2004)

	TSS		TP		TN	
	Mean	Std. dev	Mean	Std. dev	Mean	Std. dev
<b>Small Areas of Interest</b>						
Roofs	n/a	n/a	n/a	n/a	n/a	n/a
Sealed road pavement	1.20	0.17	-0.85	0.19	0.11	0.12
Unsealed road pavement	1.20	0.17	-0.85	0.19	0.11	0.12
Landscaped areas	1.20	0.17	-0.85	0.19	0.11	0.12

Table 5-7 Storm Flow Concentration Parameters for NSW (mg/L-log10) for NSW (adapted from Fletcher et al, 2004)

	TSS		TP		TN	
	Mean	Std. dev	Mean	Std. dev	Mean	Std. dev
<b>Small Areas of Interest</b>						
Roofs	1.30	0.32	-0.89	0.25	0.30	0.19
Sealed road pavement	2.43	0.32	-0.30	0.25	0.34	0.19
Unsealed road pavement	3.00	0.32	-0.30	0.25	0.34	0.19
Landscaped areas	2.15	0.32	-0.60	0.25	0.30	0.19



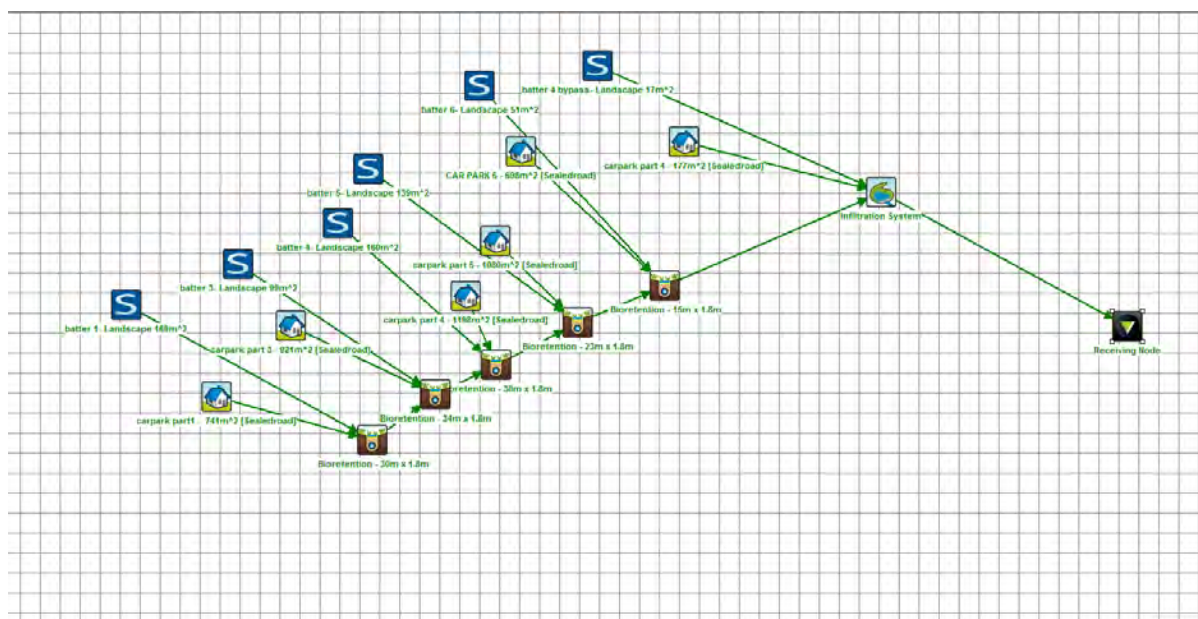


Figure 5: MUSIC model

The proposed treatment train of bioretention swales combined with a detention basin meets the stormwater quality targets as shown in Table 3.

Table 3: Stormwater Quality

	Proposed site (% reduction)	Targets (% reduction)
Total Suspended Solids	88	85
Total Nitrogen	53	45
Total Phosphorous	76	65
Gross Pollutants	100	99

## 4.0 Flood Management

There proposed site is located adjacent to Thredbo River, with a large upstream catchment draining toward the existing culvert beneath Friday Drive. Overland flow from the upstream catchment would flow east down Friday Drive and towards the crossing over Thredbo River. This overland flow would bypass the new carpark.

A flood study for Thredbo River was completed by SMEC in 1998. This report shows that at the site location, the 100 year and 20 year ARI flood levels is similar, around 1351m AHD. This flood level is above the proposed car park surface, however safe access above the 100 year flood level will be provided by the new ramp and pedestrian steps to the existing car park (minimum RL 1354m AHD). The new carpark will only become operational when all other car parks are full, and this car park will always be managed/directed by Thredbo staff. During flood warning periods, the entrance to the car park will be closed off with a barrier to prevent vehicles entering and the Thredbo staff will ensure that all cars are directed away from the car park.

## 5.0 Construction Phase Stormwater Management

During the construction phase of the project, an erosion and sediment control plan will be implemented to prevent sediment laden stormwater from entering the council drainage network. Stormwater controls for the site will be in accordance with the "Blue Book" - Managing Urban Stormwater: Soils and Construction (Landcom NSW).

In general the erosion and sediment control plan includes:

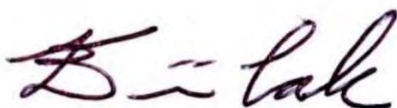
- Siltation fence around the perimeter of the site
- Vehicle wash down area
- Sedimentation trap

## 6.0 Conclusion

The proposed development consists of a new car park with entry and exit from the existing Friday Drive carpark.

- The proposed development will not increase stormwater discharge for the 5-year to the 100-year ARI storms. Stormwater will be detained in bioswales and a detention basin. The detention basin will have a volume of 90m<sup>3</sup> with an orifice plate of 150mm diameter.
- NSW industry standard best practice for stormwater quality is to remove 85% of total suspended solids, 65% of total Phosphorous, 45% of total Nitrogen and 99% of gross pollutants. The proposed treatment train of bioswales and litter baskets achieve these targets. The bioswales need to have a media filter area of 0.6m<sup>2</sup> per meter. The bioswale is to be planted with macrophytes or equivalent.
- Overland flow from the upstream catchment will bypass the proposed car park toward Thredbo River.
- The existing culvert and flow route will be maintained with a new culvert beneath the new carpark and directed to the existing outfall on Thredbo River.
- The proposed car park is at risk of flooding during the 20 year and 100 year flood. However, the car park will only ever be used under staff direction when all other parking is full. The car park will not be used during flood events. Safe access routes are provided from the car park above the 100 year ARI flood level.

Prepared by  
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Associate Director (Civil)

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## **APPENDIX C**

### **SITE ENVIRONMENTAL MANAGEMENT PLAN**



# **Site Environmental Management Plan**

**Friday Flat Car Park CP3**

**22.2.19**

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# **1 INTRODUCTION**

## **1.1 Background**

This Site Environmental Management Plan (SEMP) has been prepared for the proposed construction of a car park (CP3), below Friday Drive at Friday Flat, Thredbo Alpine Resort.

### **1.1.1 Project Description**

A detailed description of the development proposal is included within section 3 of the *Statement of Environment Effects*.

## **1.2 Objective**

The objectives of this SEM are to provide a platform:

- (a) That identifies environmental objectives;
- (b) That details environmental management guidelines and procedures, and ensures that Event Hospitality and Entertainment (Event) and the construction contractor are aware of these procedures, who is responsible for implementing and maintaining the required safeguards; and
- (c) That provides guidelines for incidents and emergencies.

## **1.3 Legislative/statutory requirements**

The activity must comply with the following legislation/standards:

- Biodiversity Conservation Act, 2016
- Environmental Planning and Assessment Act 1979,
- National Parks and Wildlife Act 1974,
- Building Code of Australia,
- Environment Protection and Biodiversity Conservation Act 1999 (Cwlth)
- Protection of the Environmental Operation Act 1997,
- Water Management Act 2000,
- Environmentally Hazardous Chemical Act 1985,
- Soil Conservation Act 1938.

# **2 SITE ENVIRONMENTAL MANAGEMENT PLAN**

## **2.1 Environmental Objectives**

The Environmental Management Objectives of this SEM are as follows:

### **2.1.1 Soils, geology and geomorphology**

- Minimise the potential for soil erosion of the proposed works so as not to impact on the surrounding landscape and hydrological features.

### **2.1.2 Hydrology and water quality**

- Minimise the risk of potential pollution during and following excavation of Creeks.

- Minimise the potential for sediment transport from the site.

### **2.1.3 Flora**

- Minimise potential impacts to native vegetation.
- Rehabilitate with appropriate indigenous and exotic species.

### **2.1.4 Fauna**

- Minimise direct impacts to native fauna and habitat.
- Restore habitat values as quickly as possible following the works.

### **2.1.5 Social and economic impacts**

- Ensure that works conform with the Environment Protection Authority's construction noise criteria.
- Obtain community and visitor understanding of the project to maximise tolerance associated with disruption.

### **2.1.6 Archaeology**

- To minimise impacts on places and artefacts of archaeological and aboriginal cultural significance, consistent with obligations under section 90 of the NPW Act.

### **2.1.7 Resource impacts**

- Minimise waste from the construction site and recycle waste where possible.
- Minimise risk of chemical spills.
- Ensure prompt and effective clean up of any accidental spills.

### **2.1.8 Visual and scenic**

- Minimise visual impact of works during and following construction.

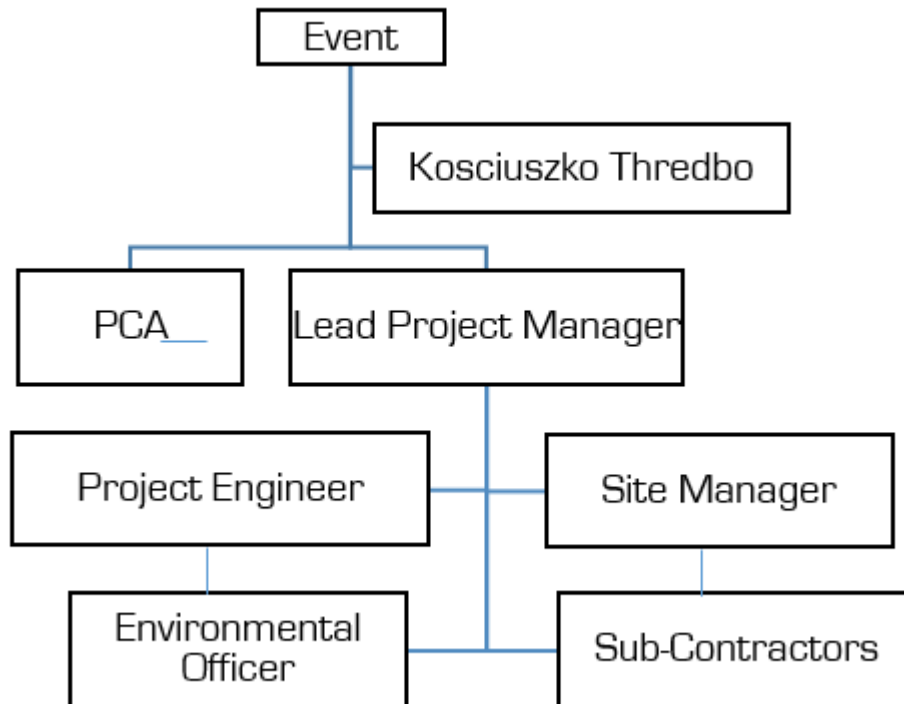


### **3 MANAGEMENT**

#### **3.1 Project Organisational Arrangement**

The proposal is funded by Event, who will manage its construction.

##### **3.1.1 Project Team Structure**



#### **3.2 Roles and Responsibilities**

##### **3.2.1 Lead Project Manager**

- Defines environmental responsibilities within the project,
- Develops, implements and maintains this SEMP,
- Supervises implementation of training/induction,
- Ensures records are kept,
- Ensures environmental requirements are incorporated into the contract document,
- Ensures the requirements of the SEMP are implemented, and
- Arranges audits/reviews of the SEMP at appropriate stages.

##### **3.2.2 Site Manager/Project Engineer**

- Is familiar with contents of this SEMP,
- Ensuring that all personnel including contractors/sub-contractors comply with the SEMP requirements relevant to their scope of work.

##### **3.2.3 Sub-Contractors**

- Implement and maintain SEMP relevant to work being undertaken, and

- Report on compliance as required (Environmental safeguards Action Chart).

### **3.2.4 Environmental Officer**

- Is familiar with the contents of this SEMP
- Is familiar with contractors Environmental Management Plan
- Observes and monitors contractors compliance on a daily basis,
- Reports on compliance with this SEMP and Contractors SEMP, and
- May participate in construction audits.
- Will undertake a weekly inspection and undertake a report as per Attachment 4.

### **3.3 Training**

All staff involved with works, and the contractor would be made aware of the relevant requirements of this SEMP. Training would be initiated by site induction. The Lead Project Manager/Site Manager is responsible for the site training of all of their employees, and nominated representatives of the contractor. The contractor is responsible for site induction and training of their staff.

Site induction of would include:

- i) Environmental awareness, including relevant Kosciuszko Thredbo (KT) policy, the concept of due diligence, and other relevant codes of practice;
- ii) Environmental issues including:
  - The SEMP,
  - Relevant legislation/licence/approvals,
  - Emergency preparedness/procedures,
  - Incident reporting,
  - Community consultation, and
  - Site environmental procedures

### **3.4 Communication**

The communication strategy would mirror the contractual responsibilities illustrated in section 3.2

#### **3.4.1 Stakeholder Consultation**

Key stakeholder consultation would occur with DPE, the NPWS and sub-lessees with interests in the development.

### **3.5 Environmental Control Plans**

A Soil and Water Management plan has been prepared and provided in Attachment 2 in addition to the Rehabilitation and Landscape Concept Plan prepared by DJRD Architects

## **3.6 Construction Program & Procedures**

### **3.6.1 Site Construction Fencing**

The diagrammatic plans provided in Attachment 1, identifies a suitable location for the site construction fencing around the work site.

### **3.6.2 Material/Stockpile Storage Areas**

The primary material/stockpile storage area is proposed to be located along the eastern edge of the visitor parking area within the angled parking area.

### **3.6.3 Site Compound**

The diagrammatic plans provided in Attachment 1, identifies the location for the site compound to be located along the eastern edge of the visitor parking area within the angled parking area. This is to be used for temporary site offices and other equipment.

### **3.6.4 Demolition Works**

All demolition work shall comply with *AS 2601 The demolition of structures*.

### **3.6.5 Noise, Vibration and Dust**

All vehicles carrying spoil, rubble or vegetation debris to or from the site shall at all times be covered to prevent the escape of dust or other material, with covers to be adequately secured and roadways and footpaths to be kept clean.

### **3.6.6 Waste Management**

All builders' waste and rubbish is to be contained within covered receptacles to prevent litter being blown about the site. All waste will be dealt with according to the Thredbo Village waste management strategy.

### **3.6.7 Emergency/Incident Procedures/Fuel and Chemical Spills**

Any emergency/incident procedure will follow the document, Construction Site Incident and Emergency Procedures Thredbo Village, October 2017, that includes reference to spill procedures and emergency and incident responses, including "call the mountain/general manager and 000 for Fire Brigade response".

The Thredbo brigade has HAZMAT response capabilities, and the village department has spill kits at every village facility (ie pump stations, golf course sheds etc) and a 240-litre bin spill kit available for response.

It would also be a requirement that the contractor has an emergency/incident procedure plan that includes an oil spill response plan. The contractors are responsible for responding to any environmental emergency, including contacting appropriate authorities (KT, NPWS etc). These procedures are detailed in the "Kosciuszko Thredbo Pty Ltd Safety Procedure" document.

### **3.6.8 Amenities**

Toilet facilities are provided within the Friday Flat base building, adjacent to the site.

### **3.6.9 Tree Cutting Protocol**

Where the identified trees are to be pruned or removed, the following measures are to be undertaken to reduce the potential impacts to tree dwelling fauna species:

- Pre-clearing check for tree-dwelling fauna, nests and hollows;
- Trees should be felled by contractor using chainsaw;
- Trees should be felled in such a way as to avoid impacts on intact native vegetation;
- Trees with hollows should be felled so that the hollow is uppermost when the tree is lying on the ground;
- Vegetation to be chipped and mulch to be re-used for rehabilitation of the subject site and/or other sites as required.

### **3.7 Construction Access**

Direct vehicle access can be achieved from the visitor parking area. A temporary construction entry/exit is to be established.

#### **3.7.1 Construction Parking**

Active construction vehicles can be parked along the edge of the eastern edge of the visitor car park within the angled parking area.

#### **3.7.2 Pedestrian and bike rider management**

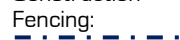
Mountain bike operations, bike riders and pedestrians using the Pipeline Trail and surrounding paths and trails that will be impacted by construction works will be managed by use of signage, partial closure of trails and exclusion from construction works.

# **Attachment 1**


## Diagrammatic Plan




**Legend:**

Site  
Construction  
Fencing: 

Active  
Construction  
Vehicle Parking: 

Temporary  
Construction  
Entry/Exit: 

Primary  
Material  
/Stockpile  
Storage Area: 

Erosion and  
sediment  
controls: 

Site Office: 

Nb: To be read in  
conjunction with  
Landscape and  
Rehabilitation Plan  
by DJRD  
Architects

**DIAGRAMMATIC PLAN - SEMP - FRIDAY FLAT CAR PARK CP3, THREDBO ALPINE RESORT**

# **Attachment 2**

## Soil and Water Management Plan

## **Soil and Water Management Plan**

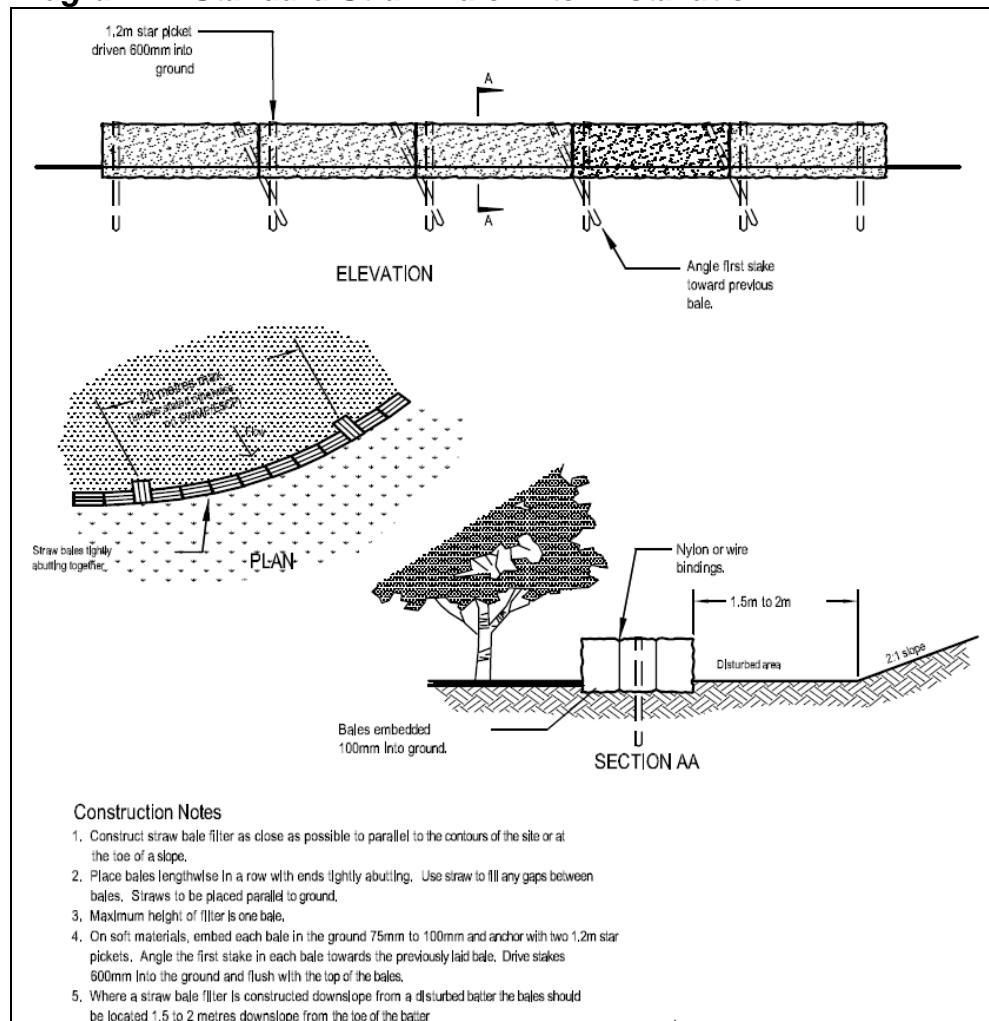
### ***Erosion and Sedimentation Control***

Appropriate environmental management controls will be required to manage soil and surface water during the construction of the development.

This will be undertaken in accordance with the Rehabilitation and Landscape Concept Plan prepared by DJRD Architects and Attachment 1 and as follows:

Temporary controls along the entire lower site fence will include a straw bale filter, installed as illustrated Diagram A

***Diagram A: Standard Straw Bale Filter Installation***



### **Monitoring:**

The nominated project Environmental Officer will be responsible for ensuring that all the erosion and sedimentation controls are installed in accordance with the above criteria and are regularly maintained and monitored.



# **Attachment 3**

## Record of Complaint

## Record of Complaint, Kosciuszko Thredbo Pty Ltd

For the recording of a complaint or incident (both verbal and written complaints).

Time and Date complaint received:

Reference number:

Name of representative who witnessed complaint:

Name and contact details of complainant:

Nature of complaint:.....  
.....  
.....  
.....  
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.....  
.....  
.....  
.....  
.....  
.....

Action taken in response to complaint:.....  
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.....  
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.....

# **Attachment 4**

## Weekly Inspection Report



# ENVIRONMENTAL SERVICES WEEKLY INSPECTION REPORT

Sheet \_\_\_\_ of \_\_\_\_

Project: \_\_\_\_\_  
**SITE ENVIRONMENT MANAGEMENT PLAN**

Inspection Date: \_\_\_\_\_

Inspected by: \_\_\_\_\_

Weather:	Morning		Afternoon	
	Clear/Overcast	Fine/Rain/Snow	Clear/Overcast	Fine/Rain/Snow
Operation	Condition	Plant/Labour	Comments	
Silt Fence				
Hay Bale retention ponds				
Hay Bale sediment protection				
Stormwater Pit protection				
Cyclone Fence (including gates)				
Paraweb Fence				
Site Signage				
Toilet Block				
Paint Washout facility				
Vehicle Washdown				
Waste Skips				
Tree Protection				
Verbal Discussion with Contractor:		Verbal discussion with others:		
Materials Received / Required:		Site Instructions Issued:		
Inspectors Report / Summary:		Action required:		
Signature: _____ Date: _____				

## APPENDIX D

### TRAFFIC IMPACT ASSESSMENT

# Traffic Impact Assessment

## Friday Flat Car Park 3

**Prepared for Event Hospitality & Entertainment**

26 February 2019

181487 TAAE

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## Revision Register

Rev	Date	Prepared by	Approved by	Remarks
0	14/12/18	MB	-	Draft for comment
0.1	07/01/19	MB, KA	PY	Revised Draft
1	25/02/19	MB, KA	PY	For issue

## Document Control

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File path	P:\2018\1814\181487\Reports\TTW\Traffic\CP3\190226 Friday Flat CP3 Traffic Report Rev 1.docx

## 1 Introduction

It is proposed to provide additional capacity at the Friday Flat car park at Thredbo Resort.

This report seeks to respond to the Secretary's Guidelines for the proposed development, which stated for traffic, access, and parking:

*The SEE shall:*

- *Include and assessment of traffic, transport and car parking implications undertaken by an appropriately qualified traffic engineer;*
- *Demonstrate that the proposed works will not impede the existing traffic and pedestrian flow on Friday Drive;*
- *Detail the anticipated number of spaces and impacts upon circulation within the existing car parking areas and off Friday Drive;*
- *Provide detailed plans of the proposed parking layout and access / egress points demonstrating the development complies with relevant Roads and Maritime Services (RMS) guidelines and Australian Standards AS 2890; and*
- *Outline any discussions held with the RMS.*

## 2 Existing Conditions

The Friday Flat car parking area is accessed from Friday Drive, which is a publicly accessible road within the Thredbo Resort site. The existing main car parking area provides a capacity of approximately 770 spaces.



Figure 1: Existing car park (via SIX Maps)



### 3 Proposed Works

It is proposed to increase the capacity of the parking area by introducing new at-grade parking. This carpark proposal is identified as CP3.

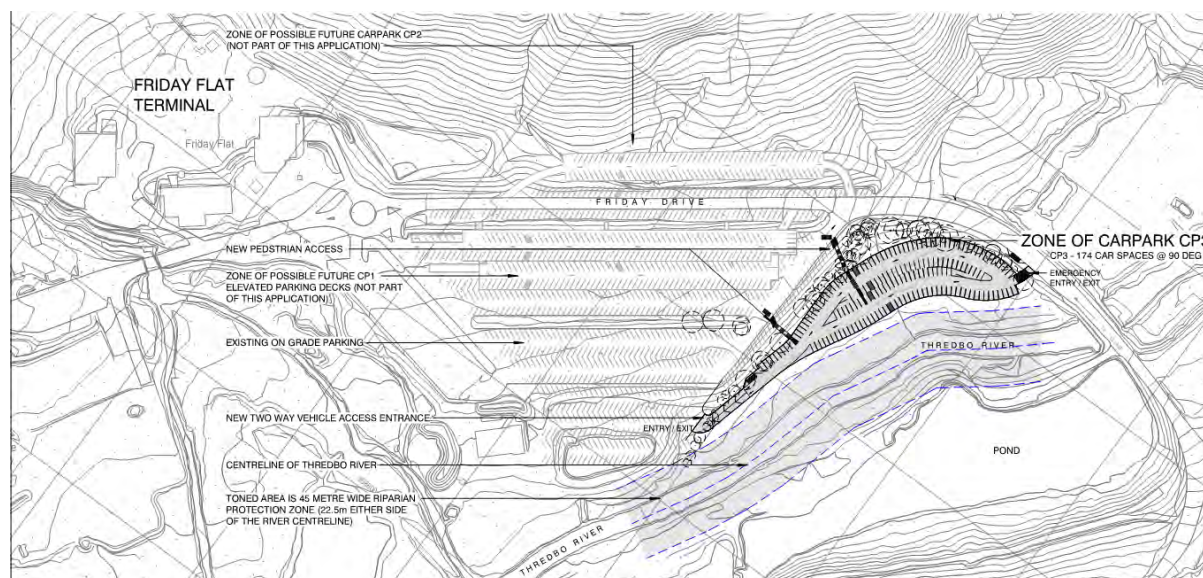


Figure 2: Proposed CP3 car park (dwg. A0.100, Rev. E, 20/02/19, DJRD Architects)

The set of architectural drawings on which this Traffic Impact Assessment is based is attached in **Appendix A** of this document.

#### 3.1 Parking Layout and Design

CP3 is located east of the existing carpark. Entry and exit from the car park are proposed to be via ramps located off the existing eastern boundary aisle of CP1 and an emergency entry and exit ramp located on the northern end of CP3 which connects to Friday Drive. The car park provides 90-degree spaces beginning in a single two-way aisle which connects into a one-way aisle loop running from south to northeast. The design of parking spaces meets that of a Class 3 parking area in accordance with Australian Standard AS2890.1 as follows:

- Parking space width: 2.7 metres
- Parking aisle width: 6.5 metres

Total proposed capacity for CP3 is 174 spaces. This increase in parking is not accompanied by any particular increase in resort capacity and is intended to provide an improved guest experience and better cater to existing demands. It is anticipated that the existing requirements for overflow parking (e.g. near the tip or along Friday Drive) will be reduced, improving road safety and user experience.

Changes to the parking within the site due to this proposal are detailed in Table 1.

**Table 1: Parking capacity changes**

Location	Existing	Proposed	Change (+/-)
CP1 (existing)	770	767	-3
Friday Drive	88	88	0
CP3	-	174	+ 174
<b>Total (subject site)</b>	<b>858</b>	<b>1,032</b>	<b>+ 171</b>

Outside of the scope of this application, other concurrent works are also proposed for this site including the proposal of one additional at-grade carpark (CP2) and upgrades to the existing carpark (CP1).

### 3.2 Accessible Parking

Accessible car parking spaces are provided in the existing main car park, close to the Friday Flat area. Additional accessible spaces are not required in the CP3 car park.

### 3.3 Pedestrian Access

Pedestrian movements from the new car park will connect to the Friday Flat terminal via two new pedestrian access paths from CP3 up the existing bank to CP1.

The driveway from the CP3 car park is currently proposed at a maximum grade of approximately 8% (1:12.5). This is suitable as a non-accessible walkway but will not be considered an accessible route, which is acceptable as all accessible parking spaces are located within the main CP1 car park.

Under a separate application, additional pedestrian infrastructure will also be provided on Friday Drive as part of the CP1 works (subject to approval). Independent of those works, the proposed CP3 car park is expected to provide sufficient pedestrian amenity and safety.

### 3.4 Traffic Assessment

No additional traffic generation is forecast for the proposed car park development.

As noted above, the provision of additional parking is intended to provide for existing demands and improve user experience. The development does not increase the capacity of the resort or create any additional trip attractors in the area.

During peak periods the site currently accepts up to 400 vehicles per hour with high densities of movements during the morning arrival period (8am – 10am). The provision of an additional driveway and parking capacity will assist in distributing vehicles to parking more quickly and improving traffic flow on Friday Drive.

Furthermore, existing parking capacity constraints require vehicles to be turned around from the site during peak periods, resulting in an increase in vehicle movements along Alpine Way (due to return movements). Additional parking will allow these vehicles to access the site and reduce excess movements on surrounding roadways. The proposed development should therefore to a small extent improve traffic conditions in the area.

In relation to exit periods, the provision of additional parking is considered acceptable. Departure movements for the ski resort occur over a much longer period (approx. 11am to 6pm) than arrivals, with limited impacts from the additional capacity. As discussed, these parking spaces will effectively be existing capacity relocated from overflow parking areas and will not change traffic conditions along the broader road network.

### 3.5 Parking and Traffic Management

It is recommended that the new car park areas continue to operate under marshalled traffic control as per the existing parking zones. This will ensure the vehicle and pedestrian safety is maintained.

Traffic marshalling and signage should ensure that entering vehicles are directed to the appropriate driveway thereby reducing unnecessary / repeat manoeuvres.

### 3.6 Construction Management

For the construction of the carpark, it is anticipated that the aisle along the east side of the existing at-grade parking would be required for scaffolding, access, construction compounds etc. This will result in a reduction in parking of up to approximately 29 spaces during construction of CP3.

As there shall be a loss of parking during construction (extent to be determined), construction is expected to occur during the off-peak period between approximately October and May.

Subject to approval of separate applications, construction of additional car parking capacity may assist in further offsetting reduced capacity during construction.


## 4 Conclusion

The provision of an additional 171 parking spaces to the capacity of the Friday Drive car park is considered to be acceptable and provide improved user experience for existing demands.

Traffic management and local traffic conditions including rejection of vehicles during peak periods (when the site reaches parking capacity) are expected to be improved, without increasing overall volumes as there is no additional attraction of trips to the site.

The proposed works are considered acceptable and supportable with regards to traffic and parking.

Prepared by  
**TAYLOR THOMSON WHITTING (NSW) PTY LTD**



**MICHAEL BABBAGE**  
Senior Traffic Engineer

## Appendix A

# Friday Flat CP3 Architectural Drawing Set

## **APPENDIX E**

### **BIODIVERSITY DEVELOPMENT ASSESSMENT REPORT**



Friday Flat Car Park 3  
Biodiversity Development Assessment Report

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**Event Hospitality and Entertainment Pty Ltd**

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## DOCUMENT TRACKING

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<b>Project Manager</b>	Ryan Smithers
<b>Prepared by</b>	Ryan Smithers
<b>Reviewed by</b>	Meredith Henderson
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<b>Version Number</b>	<b>2</b>
<b>Last saved on</b>	<b>7 February 2019</b>

This report should be cited as 'Eco Logical Australia. 2019 Friday Flat Car Park 3. Prepared for Event Hospitality and Entertainment Pty Ltd.'

## ACKNOWLEDGEMENTS

This document has been prepared by Eco Logical Australia Pty Ltd with support from Dabyne Planning.

### *Disclaimer*

*This document may only be used for the purpose for which it was commissioned and in accordance with the contract between Eco Logical Australia Pty Ltd and Event Hospitality and Entertainment Pty Ltd. The scope of services was defined in consultation with Event Hospitality and Entertainment Pty Ltd, by time and budgetary constraints imposed by the client, and the availability of reports and other data on the subject area. Changes to available information, legislation and schedules are made on an ongoing basis and readers should obtain up to date information. Eco Logical Australia Pty Ltd accepts no liability or responsibility whatsoever for or in respect of any use of or reliance upon this report and its supporting material by any third party. Information provided is not intended to be a substitute for site specific assessment or legal advice in relation to any matter. Unauthorised use of this report in any form is prohibited.*

Template 2.8.1

## Executive Summary

Eco Logical Australia Pty Ltd (ELA) was engaged by Event Hospitality and Entertainment Pty Limited to prepare a Biodiversity Development Assessment Report (BDAR) for a proposed 174 car space car park, within the Friday Flat area, at Thredbo Ski Resort.

This report has been prepared to meet the requirements of the Biodiversity Assessment Method 2016 (BAM) established under Section 6.7 of the NSW *Biodiversity Conservation Act 2016* (BC Act).

The proposed development has been located to take advantage of existing disturbed areas, and as such, the vast majority of the development site comprises heavily modified or planted vegetation.

The development site supports two Plant Community Types (PCT):

- PCT 637 -Alpine and sub-alpine peatlands, damp herbfields and fens, South Eastern Highlands Bioregion and Australian Alps Bioregion; and
- PCT 679 Black Sallee - Snow Gum low woodland of montane valleys, South Eastern Highlands Bioregion and Australian Alps Bioregion.

PCT 637 conforms to the Endangered Ecological Communities (EEC) *Montane Peatland and Swamps of the New England Tableland, NSW North Coast, Sydney Basin, South East Corner, South Eastern Highlands and Australian Alps bioregions*, and the *Alpine Sphagnum Bogs and Associated Fens*, which are listed under the NSW BC Act and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) respectively.

Targeted surveys within the development site and immediate surrounds identified one threatened fauna species, the *Mastacomys fuscus* (Broad-toothed Rat). One individual of the listed migratory species *Gallinago hardwickii* (Latham's Snipe) was also flushed from the site during the survey period.

This BDAR outlines the measures taken to avoid, minimise and mitigate impacts to the vegetation and habitats present within the development site during the design, construction and operation of the development. The residual unavoidable impacts of the proposed development were calculated consistent with BAM by utilising the Biodiversity Assessment Method Credit Calculator (BAMC). The BAMC calculated that a total of three ecosystem credits and four species credits are required to offset the unavoidable impacts to the vegetation and threatened species habitats present within the development site.

Serious and Irreversible Impact (SAII) values have been considered as part of this assessment. The proposal will not result in any SAII.

Following consideration of the administrative guidelines for determining significance under the EPBC Act, it is concluded that the proposal is unlikely to have a significant impact on matters of National Environmental Significance (MNES) or Commonwealth land, and a referral to the Commonwealth Environment Minister is therefore not required.



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## Abbreviations

Abbreviation	Description
BAM	Biodiversity Assessment Method
BAMC	Biodiversity Assessment Method Credit Calculator
BC Act	NSW <i>Biodiversity Conservation Act 2016</i>
BDAR	Biodiversity Development Assessment Report
BSSAR	Biodiversity Stewardship Site Assessment Report
CEEC	Critically Endangered Ecological Community
DNG	Derived Native Grassland
DoEE	Commonwealth Department of Environment and Energy
DPE	NSW Department of Planning and Environment
EEC	Endangered Ecological Community
ELA	Eco Logical Australia Pty Ltd
EP&A Act	NSW <i>Environmental Planning and Assessment Act 1979</i>
EPBC Act	Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i>
FM Act	NSW <i>Fisheries Management Act 1994</i>
GIS	Geographic Information System
GPS	Global Positioning System
IBRA	Interim Biogeographic Regionalisation for Australia
LGA	Local Government Area
LLS	Local Land Service
NSW	New South Wales
NOW	NSW Office of Water
OEH	NSW Office of Environment and Heritage
PCT	Plant Community Type
SEPP	State Environmental Planning Policy
SSD	State Significant Development
SSI	State Significant Infrastructure
TEC	Threatened Ecological Community
VIS	Vegetation Information System
WM Act	NSW <i>Water Management Act 2000</i>

# 1. Stage 1: Biodiversity assessment

## 1.1 Introduction

This Biodiversity Development Assessment Report (BDAR) has been prepared by Ryan Smithers, who is an Accredited Person under the NSW *Biodiversity Conservation Act 2016* (BC Act).

### 1.1.1 General description of the development site

Eco Logical Australia Pty Ltd (ELA) was engaged by Event Hospitality and Entertainment Pty Ltd (Event) to prepare a BDAR to accompany a proposal to construct a new car park, known as Car Park 3, in the Friday Flat area of Thredbo Alpine Resort.

This report includes two base maps, the Site Map (Figure 1) and the Location Map (Figure 2).

### 1.1.2 Development site footprint

The proposal comprises a new car park, below Friday Drive, with 174 car spaces, entry and exits, drainage, water quality treatment measures, retaining walls and landscaping, as shown in Figure 3. The car park will be accessed from the existing car park to the south of Friday Drive, with an emergency entry/exit to Friday Drive, adjacent to the existing bridge over the Thredbo River. The bulk of the footprint of the proposed car park is heavily degraded as a result of historic development and is characterised by very weedy vegetation and plantings, as shown in Photos 1-6.

### 1.1.3 Sources of information used

The following data sources were reviewed as part of this report:

- BioNet Vegetation Classification
- Bionet Atlas
- Threatened Biodiversity Data Collection
- Ecology Australia (2002)
- McDougall and Walsh (2007)
- Additional GIS datasets including cadastre, contours, imagery and drainage.

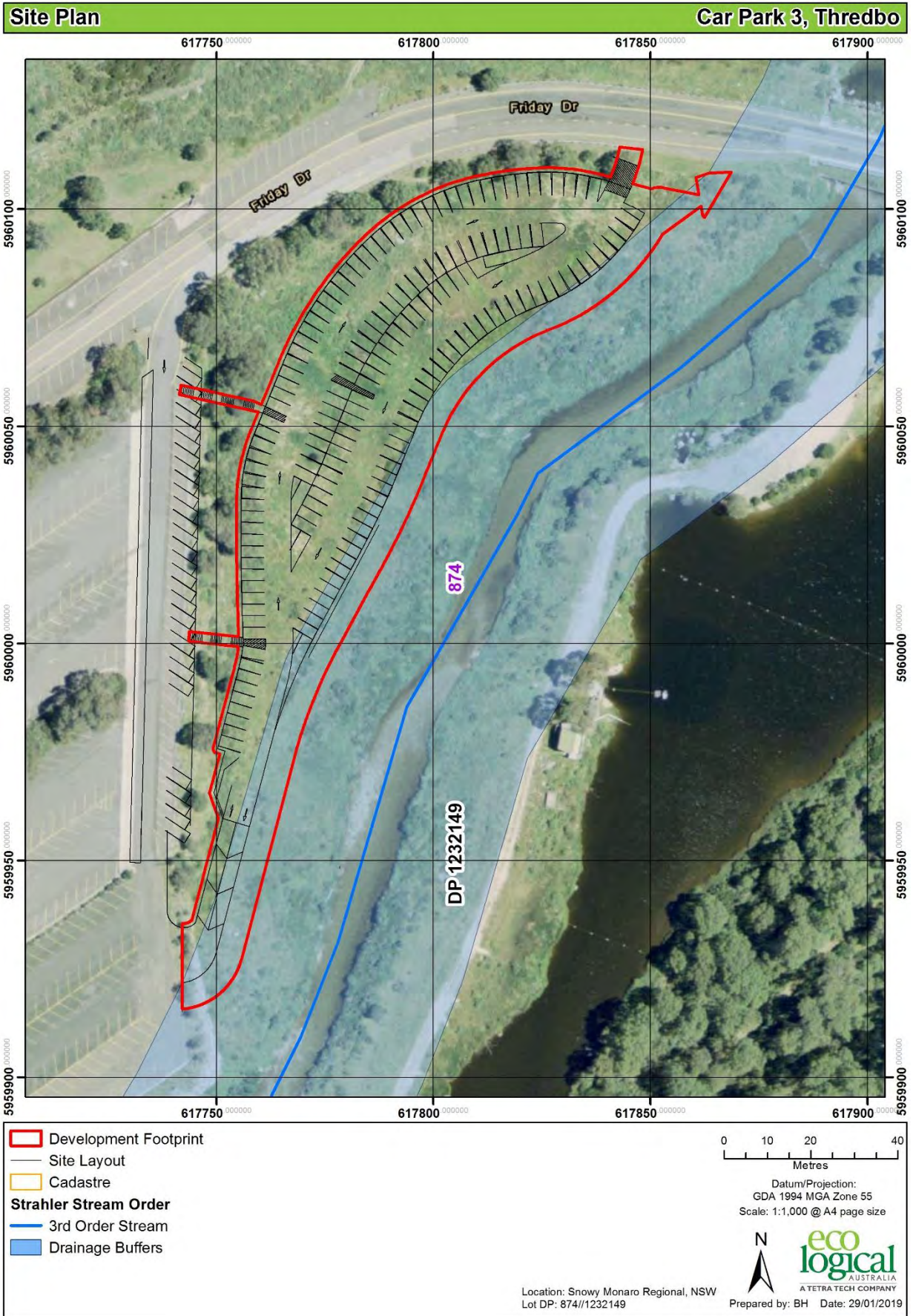


Figure 1: Site Plan

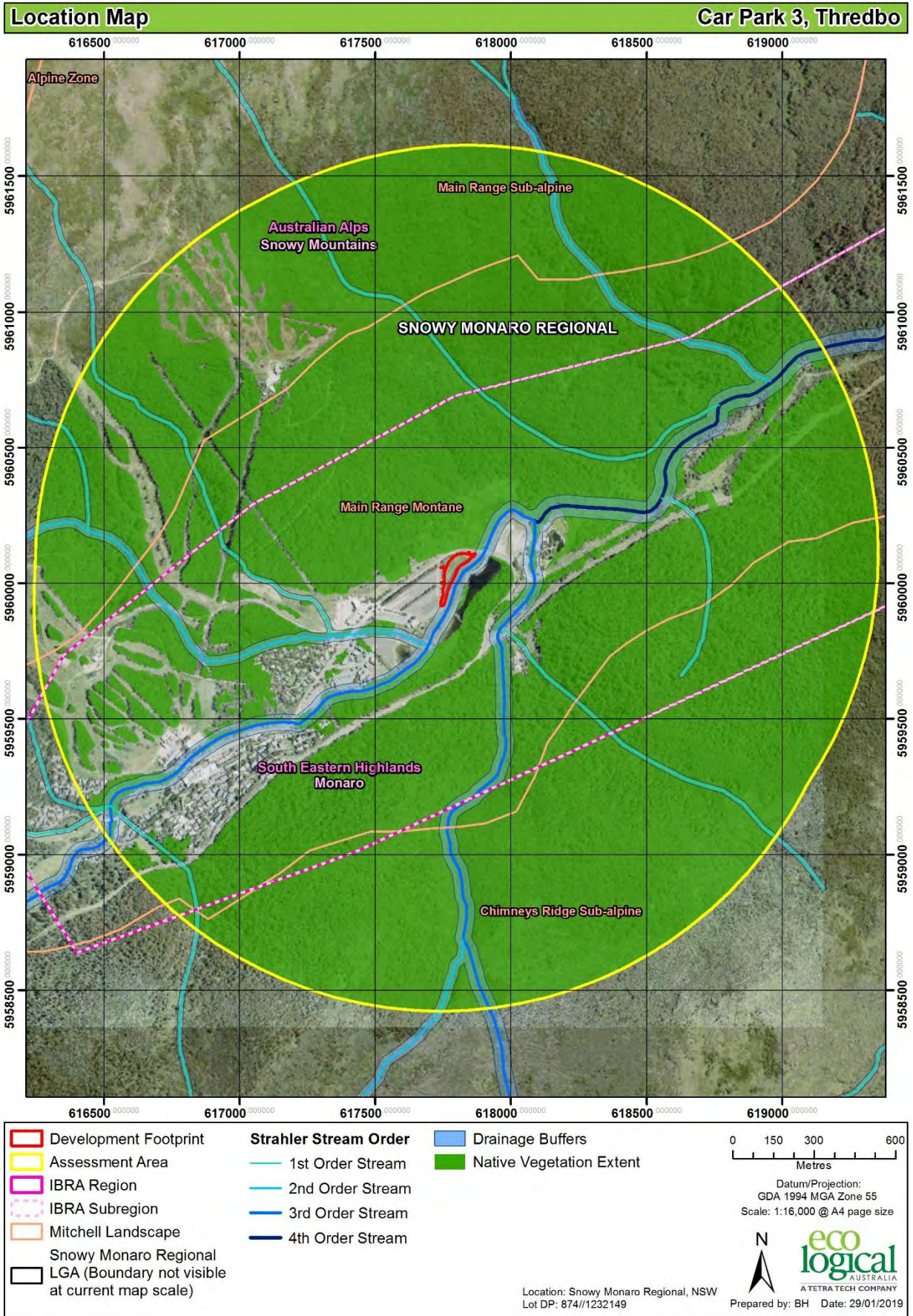


Figure 2: Location Map

The Proposal



Figure 3: The proposal





**Photo 1: Looking north towards Friday Drive showing the degraded vegetation in the northern parts of the development site which is dominated by exotic grasses.**



**Photo 2: Looking south showing the degraded vegetation in the southern parts of the development site which is dominated by exotic grasses.**



**Photo 3: The southern parts of the proposed car park where the entry / exit will join the existing car park.**



**Photo 4: A large culvert discharges water draining off Friday Drive to the central parts of the development site. This has altered the hydrology of this area making it extremely wet and dominated by rushes and exotic grasses.**



Photo 5: Native tree plantings line the batter to Friday Drive and the existing carpark above where the culvert is located.



Photo 6: Looking north across the development site showing the patchy remnant native vegetation closer to the river.

## 1.2 Legislative context

Table 1: Legislative context

Name	Relevance to the project	Report Section
<b>Commonwealth</b>		
<i>Environment Protection and Biodiversity Conservation Act 1999</i>	Matters of national Environmental Significance have been identified on or near the development site. This report assesses impacts to MNES and concludes that the development is not likely to have a significant impact on MNES.	App C
<b>State</b>		
<i>Environmental Planning and Assessment Act 1979</i>	The proposed development requires consent and is to be assessed under Part 4 of the EP&A Act. The EPA Act places a duty on the determining authority to adequately address a range of environmental matters including the maintenance of biodiversity and the likely impact to threatened species, populations and communities.	1 and 2
<i>Biodiversity Conservation Act 2016</i>	The proposed development involves clearing of vegetation identified as high conservation value on the Biodiversity Values Land Map and thus requires submission of a Biodiversity Development Assessment Report.	1 and 2
<i>Fisheries Management Act 1994</i>	The development does not involve impacts to Key Fish Habitat, does not involve harm to marine vegetation, dredging, reclamation or obstruction of fish passage. A permit or consultation under the FM Act is not required.	-
<i>Water Management Act 2000</i>	The project involves works on waterfront land and therefore requires a Controlled Activity Approval under s91 of the WM Act.	-
<b>Planning Instruments</b>		
SEPP Alpine Resorts - Kosciuszko National Park—Alpine Resorts	State Environmental Planning Policy (Kosciuszko National Park—Alpine Resorts) 2007 identified the Minister for Planning as the determining authority for development within the NSW Alpine Resorts. SEPP 73 requires the Minister for Planning to refer for comment any development application in the Alpine Resorts to the Director General of the NSW Office of Environment and Heritage (OEH).	1 and 2
Snowy River Shire Local Environment Plan 2013	The subject site is zoned E1 National Parks and Nature Reserves under the Snowy River Shire Local Environment Plan 2013.	-

## 1.3 Landscape features

### 1.3.1 IBRA regions and subregions

The development site falls within the IBRA region and subregions as outlined in Table 2 and Table 3.

Table 2: IBRA regions

IBRA region	Area within development site (ha)
Australian Alps	0.67

Table 3: IBRA subregions

IBRA subregion	Area within development site (ha)
Snowy Mountains	0.67

### 1.3.2 Native vegetation extent

The extent of native vegetation within the development site and buffer is outlined in Table 4.

**Table 4: Native vegetation extent**

Area within the development site (ha)	Area within the 1,500 m buffer area (ha)
0.67	660.35

There are no differences between the mapped vegetation extent and the aerial imagery.

### 1.3.3 Rivers and streams

The development site contains rivers and streams as outlined in Table 5.

**Table 5: Rivers and streams**

River/stream	Order	Riparian buffer
Thredbo River	3rd	30 m

### 1.3.4 Wetlands

The development site includes areas of montane peatland adjoining the Thredbo River which are considered local wetlands as defined by the BAM. The development site does not contain any Important Wetlands.

### 1.3.5 Connectivity features

The development site contains the connectivity features outlined in Table 6.

**Table 6: Connectivity features**

Connectivity feature name	Feature type
Thredbo River	River

The development site is part of an extensive area of habitat in the locality for a range of native animals and plants. The development site is part of the habitat providing connectivity along the Thredbo River between habitats for the *Mastacomys fuscus* (Broad-toothed Rat) population that is known to occur along the River.

### 1.3.6 Areas of geological significance and soil hazard features

The development site does not contain areas of geological significance and soil hazard features.

### 1.3.7 Site context

#### 1.3.7.1 Method applied

The site based method has been applied to this development.

#### 1.3.7.2 Percent native vegetation cover in the landscape

The current percent native vegetation cover in the landscape was assessed in a Geographic Information System (GIS) using aerial imagery sourced from SIX Maps and the mapping of Ecology Australia (2002). The results of this analysis are shown in Table 7.

**Table 7: Percent native vegetation cover in the landscape**

Area within the development site (ha)	Cover within the 1,500 m buffer area (%)
0.67	85

### 1.3.7.3 Patch size

Patch size was calculated using available vegetation mapping for all patches of intact native vegetation on and adjoining the development site (Table 8).

**Table 8: Patch size**

Patch	Patch size area (ha)
1	>101

## 1.4 Native vegetation

### 1.4.1 Survey effort

A vegetation survey was undertaken within the development site by Ryan Smithers on 5 December 2018.

A total of three full-floristic vegetation plots were surveyed to identify PCTs and TECs on the development site (Table 9) (Figure 5). Two of the full-floristic plots were 10 m by 40 m given the narrowness of the respective vegetation zones. A total of three vegetation integrity plots were undertaken on the development site in accordance with the BAM (Table 10).

All field data collected at full-floristic and vegetation integrity plots is included in Appendix B.

**Table 9: Full-floristic PCT identification plots**

PCT ID	PCT Name	Number of plots surveyed
637	Alpine and sub-alpine peatlands, damp herbfields and fens, South Eastern Highlands Bioregion and Australian Alps Bioregion	2
679	Black Sallee - Snow Gum low woodland of montane valleys, South Eastern Highlands Bioregion and Australian Alps Bioregion	1

**Table 10: Vegetation integrity plots**

Veg Zone	PCT ID	PCT Name	Condition	Area (ha)	Plots required	Plots surveyed
1	637	Alpine and sub-alpine peatlands, damp herbfields and fens, South Eastern Highlands Bioregion and Australian Alps Bioregion	Low	0.46	1	1
2	637	Alpine and sub-alpine peatlands, damp herbfields and fens, South Eastern Highlands Bioregion and Australian Alps Bioregion	Degraded	0.16	1	1
3	679	Black Sallee - Snow Gum low woodland of montane valleys, South Eastern Highlands Bioregion and Australian Alps Bioregion	Degraded	0.05	1	1

### 1.4.2 Plant Community Types present

A total of two PCTs were identified on the development site (Table 11, Figure 4). Of these, one is listed as a TEC under the BC and/or EPBC Acts (Table 12, Figure 6). Justification for the selection of PCTs occurring on the development site is based on a quantitative analysis of full-floristic plot data and is provided in Table 13.

**Table 11: Plant Community Types**

PCT ID	PCT Name	Vegetation Class	Vegetation Formation	Area	Percent cleared
637	Alpine and sub-alpine peatlands, damp herbfields and fens, South Eastern Highlands Bioregion and Australian Alps Bioregion	Alpine Complex	Alpine Bogs and Fens	0.62	5
679	Black Sallee - Snow Gum low woodland of montane valleys, South Eastern Highlands Bioregion and Australian Alps Bioregion	Subalpine Woodlands	Grassy Woodlands	0.05	35

**Table 12: Threatened Ecological Communities**

PCT ID	BC Act			EPBC Act		
	Listing status	Name	Area (ha)	Listing status	Name	Area (ha)
637	Endangered	Montane Peatlands and Swamps of the New England Tableland, NSW North Coast, Sydney Basin, South East Corner, South Eastern Highlands and Australian Alps bioregions	0.62	Endangered	Alpine Sphagnum Bogs and Associated Fens	0.16
679	Not listed	-	-	Not listed	-	-

**Table 13: PCT selection justification**

PCT ID	PCT Name	Selection criteria	Species relied upon for identification of vegetation type and relative abundance
637	Alpine and sub-alpine peatlands, damp herbfields and fens, South Eastern Highlands Bioregion and Australian Alps Bioregion	IBRA region, landform, soils vegetation formation, vegetation class and quantitative analysis	<i>Baeckea gunniana</i> , <i>Epacris paludosa</i> , <i>Richea continentis</i> , <i>Empodisma minus</i> , <i>Poa costiniana</i> , <i>Sphagnum cristatum</i> .
679	Black Sallee - Snow Gum low woodland of montane valleys, South Eastern Highlands Bioregion and Australian Alps Bioregion	IBRA region, landform, soils vegetation formation, vegetation class and quantitative analysis	<i>Eucalyptus stellulata</i> , <i>Eucalyptus pauciflora</i> , <i>Hakea microcarpa</i> , <i>Hovea montana</i>

In determining the PCTs for the development site, various attributes were considered in combination to assign vegetation to the best fit PCT. Attributes included dominant species in each stratum, community composition, soils and landscape position. Plot data was analysed in a quantitative analysis tool developed by ELA using the characteristic species present in each structural layer for all PCTs in the region sourced from the Bionet Vegetation Information System (VIS). This quantitative analysis was used to assist in determining PCTs that may be present. The tool uses positive characteristic species of PCTs

and matches them to the flora species collected in plots. The tool then provides a total number of characteristic species present in the canopy, mid-storey and ground-layer and matches those communities that fit most strongly with the PCTs available. The higher the number of characteristic species the greater the fit for that community. It can be the case that a community matches strongly floristically with a PCT, however does not match well with other characteristics such as structure, landscape position or region. Therefore, this tool assists in the decision-making process, but is not the sole determining factor. Rather the tool assists expert judgement.

ELA considered the vegetation within the bulk of the development site to comprise the PCT 637 Alpine and sub-alpine peatlands, damp herbfields and fens, South Eastern Highlands Bioregion and Australian Alps Bioregion (Photo 7 and Photo 8). Much of the site has been heavily modified as a result of historic disturbances, which include the re-alignment of the Thredbo River for the construction of a snow making reservoir. The River used to flow along the eastern side of what is now the footprint of the snowmaking reservoir. The vegetation within the bulk of the development site is dominated by exotic grasses, particularly, *Holcus lanatus* (Yorkshire Fog), *Anthoxanthum odoratum* (Sweet Vernal Grass), *Festuca arundinacea* (Tal Fescue) and Phalaris (*Phalaris aquatica*)

A quantitative analysis of the plot data obtained from the development site identified a best fit (the highest match of characteristic species) for PCT 637 (six characteristic species). These results were consistent with the best fit determination resulting from expert consideration of the vegetation structure, landforms, soils, vegetation formation, vegetation class, and consideration of the alternative PCTs. However, it is acknowledged that the vegetation within the development site is ecotonal with other PCTs such as PCT 938 Montane wet heath and bog of the eastern tablelands, South Eastern Highlands Bioregion.

The plantings on the batter to Friday Drive and the existing car park, which are dominated by *Eucalyptus stellulata* and *Eucalyptus pauciflora* (Photo 9), are considered to best fit with the PCT 679 Black Sallee - Snow Gum low woodland of montane valleys, South Eastern Highlands Bioregion and Australian Alps Bioregion. PCT 679 dominates the lower slopes to the Thredbo River up and down stream of the development site, and the plantings were likely an attempt to mimic the PCT that occurs adjacent to the site (Photo 10).

### 1.4.3 Vegetation integrity assessment

A vegetation integrity assessment using the Credit Calculator (BAMC) was undertaken and the results are outlined in Table 14.

**Table 14: Vegetation integrity**

Veg Zone	PCT ID	Condition	Area (ha)	Composition Condition Score	Structure Condition Score	Function Condition Score	Current vegetation integrity score
1	637	Low	0.46	30.3	0.5	-	3.8
2	637	Degraded	0.16	49.6	13.7	-	26.1
3	679	Degraded	0.05	19.5	42.8	28.8	28.8

### 1.4.4 Use of local data

Use of local data instead of benchmark integrity scores is not proposed.





**Photo 7:** The vegetation within Zone 1 is highly modified with only scattered native shrubs, tree and groundcovers and is dominated by exotic grasses, particularly *Festuca rubra*, *Holcus lanatus* and *Poa pratensis*.



**Photo 8:** The vegetation in zone 2 is in much better condition and is dominated by a range of native shrubs that are characteristic of subalpine and montane wetlands.



**Photo 9: Zone 3 comprises plantings above a predominately exotic grass cover with scattered native shrubs.**



**Photo 10: PCT 637 and 679 continue downstream of the development site, on the lower slopes to the Thredbo River and are typically in excellent condition.**

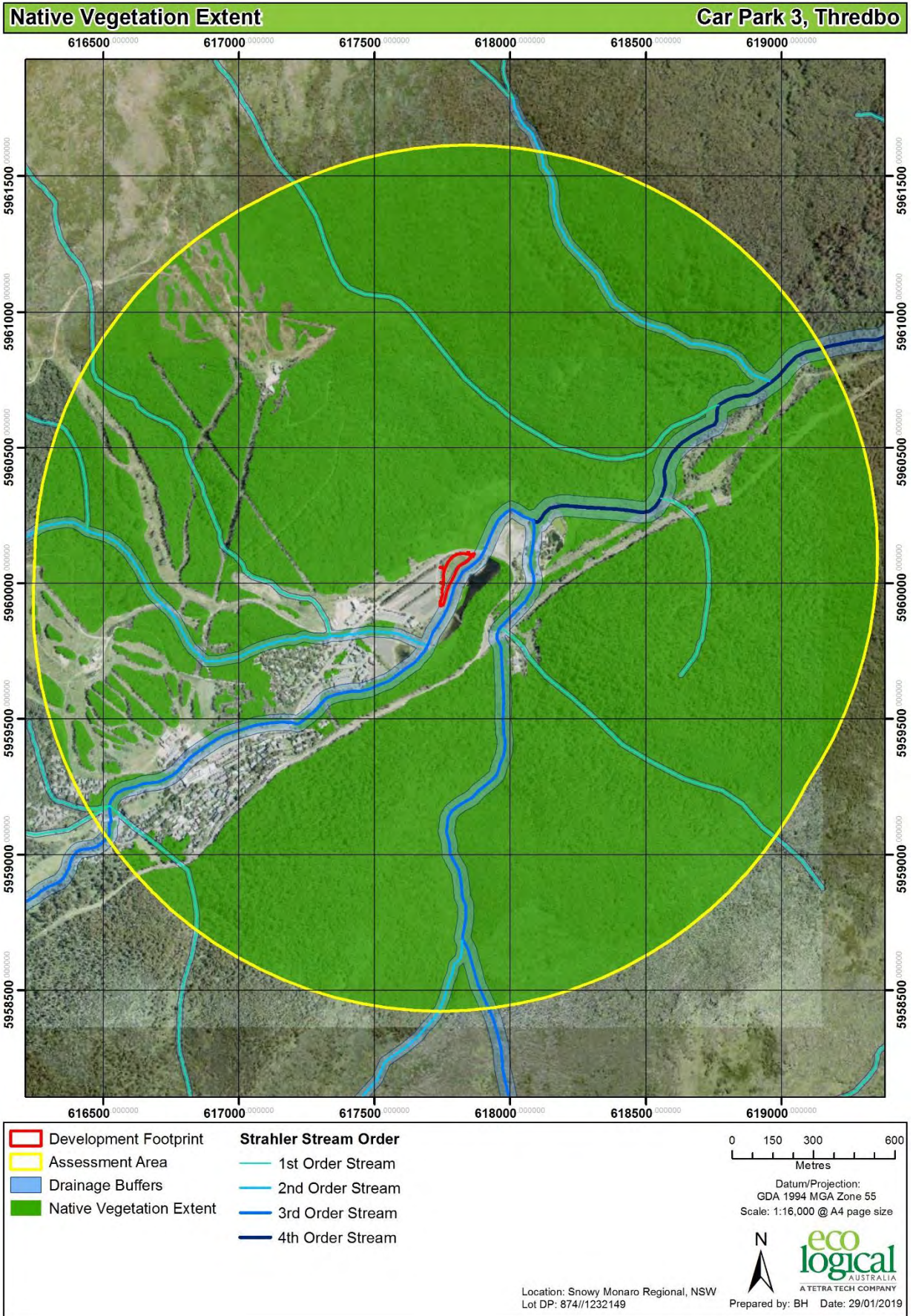


Figure 4: Native Vegetation Extent

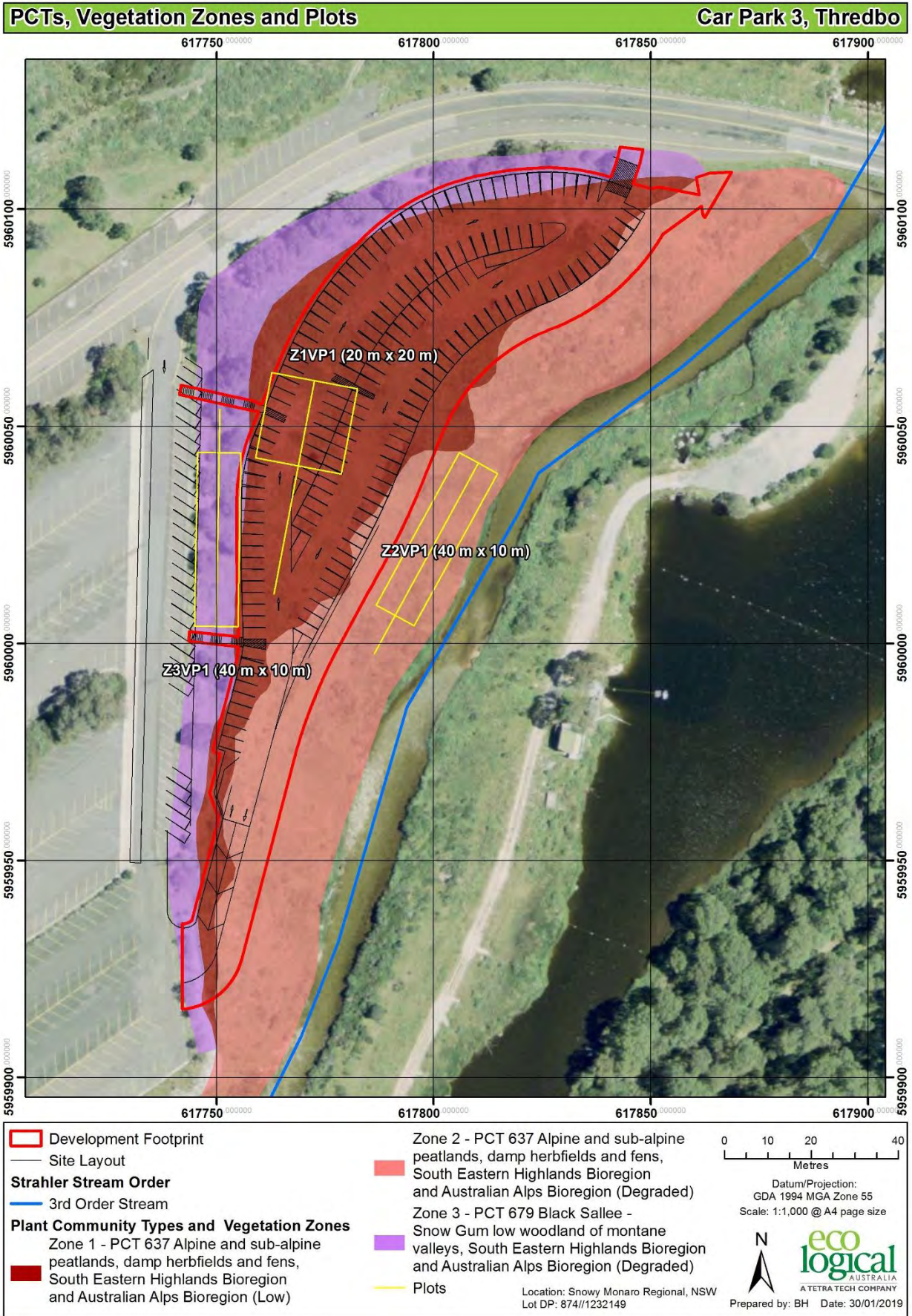


Figure 5: PCTs, Plot locations and Vegetation Zones

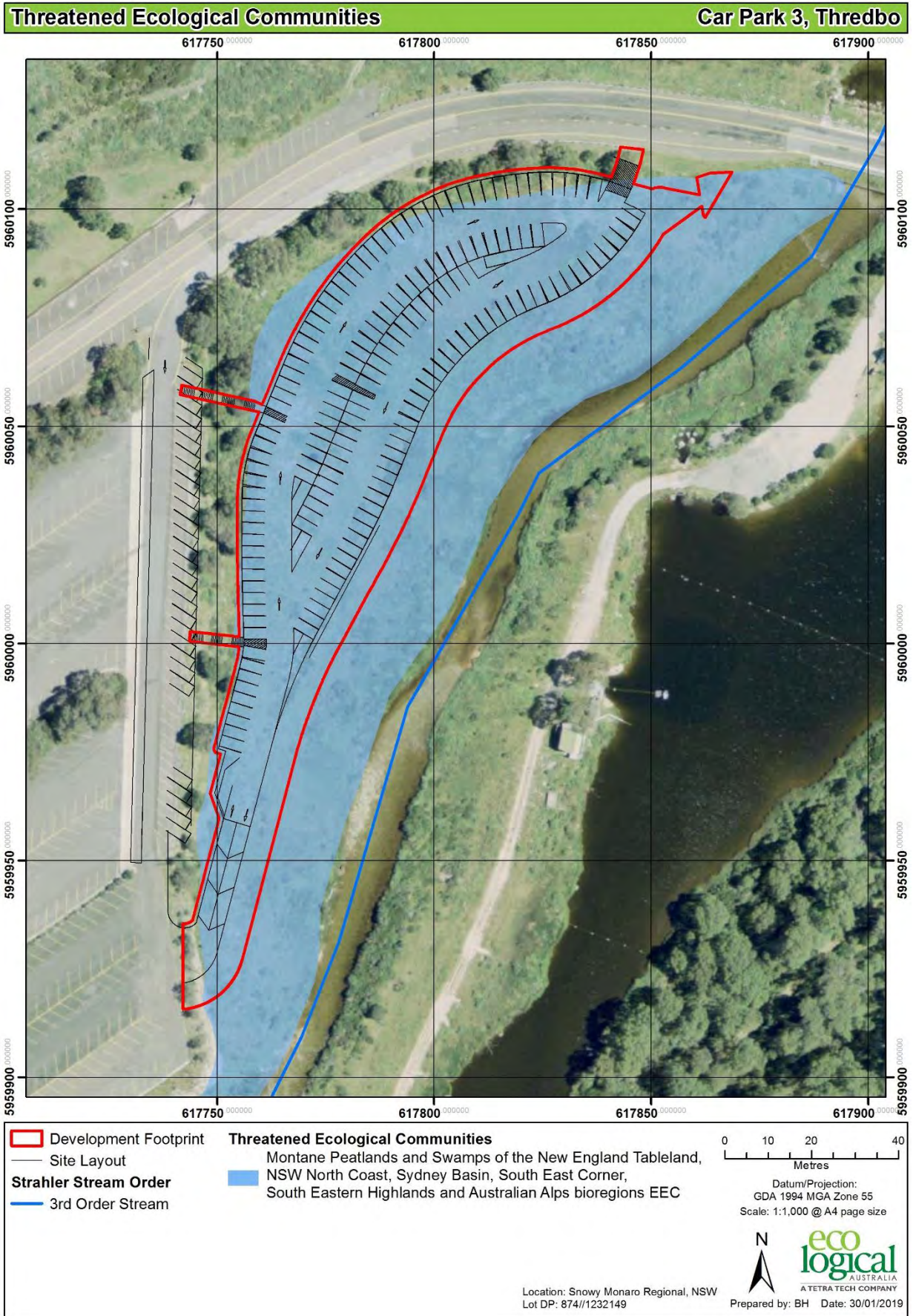


Figure 6: Threatened Ecological Communities

## 1.5 Threatened species

### 1.5.1 Ecosystem credit species

Ecosystem credit species predicted to occur at the development site, their associated habitat constraints, geographic limitations and sensitivity to gain class is included in Table 15.

**Table 15: Predicted ecosystem credit species**

Common Name	Species	Habitat Constraints	Geographic limitations	Sensitivity to gain class	NSW listing status	EPBC Listing status
Dusky Woodswallow	<i>Artamus cyanopterus</i>	-	-	Moderate	Vulnerable	Not Listed
Gang-gang Cockatoo (foraging)	<i>Callocephalon fimbriatum</i>	-	-	Moderate	Vulnerable	Not Listed
Varied Sittella	<i>Daphoenositta chrysoptera</i>	-	-	Moderate	Vulnerable	Not Listed
Spotted-tailed Quoll	<i>Dasyurus maculatus</i>	-	-	High	Vulnerable	Endangered
Eastern False Pipistrelle	<i>Falsistrellus tasmaniensis</i>	-	-	High	Vulnerable	Not Listed
White-bellied Sea-Eagle (Foraging)	<i>Haliaeetus leucogaster</i>	-	-	High	Vulnerable	Not Listed
Little Eagle (foraging)	<i>Hieraaetus morphnoides</i>	-	-	Moderate	Vulnerable	Not Listed
Eastern Bentwing-bat (Foraging)	<i>Miniopterus schreibersii oceanensis</i>	-	-	High	Vulnerable	Not Listed
Olive Whistler	<i>Pachycephala olivacea</i>	-	-	Moderate	Vulnerable	Not Listed
Scarlet Robin	<i>Petroica boodang</i>	-	-	Moderate	Vulnerable	Not Listed
Flame Robin	<i>Petroica phoenicea</i>	-	-	Moderate	Vulnerable	Not Listed

No Ecosystem credit species have been excluded from the assessment.

### 1.6 Species credit species

Species credit species predicted to occur at the development site (i.e. candidate species), their associated habitat constraints, geographic limitations and sensitivity to gain class is included in Table 16.

Table 16: Candidate species credit species

Species	Common Name	Habitat Constraints	Geographic limitations	Sensitivity to gain class	NSW listing status	EPBC Listing status
Mountain Pygmy-possum	<i>Burramys parvus</i>	-	sth - nth range between Dead Horse Gap and Mt Jagungle	High	Endangered	Endangered
Gang-gang Cockatoo (breeding)	<i>Callocephalon fimbriatum</i>	-	-	High	Vulnerable	Not Listed
Mauve Burr-daisy	<i>Calotis glandulosa</i>	-	north of Eucumbene	High	Vulnerable	Vulnerable
Raleigh Sedge	<i>Carex raleighii</i>	Treeless vegetation above 1000 m in altitude	Above 1100 m	High	Endangered	Not Listed
Alpine She-oak Skink	<i>Cyclodomorphus praealtus</i>	-	-	High	Endangered	Endangered
Leafy Anchor Plant	<i>Discaria nitida</i>	Riparian areas above 1000 m in altitude	Upstream from Jindabyne	High	Vulnerable	Not Listed
Rough Eyebright	<i>Euphrasia scabra</i>	-	-	High	Endangered	Not Listed
White-bellied Sea-Eagle (Breeding)	<i>Haliaeetus leucogaster</i>	-	-	High	Vulnerable	Not Listed
Little Eagle (Breeding)	<i>Hieraaetus morphnoides</i>	-	-	Moderate	Vulnerable	Not Listed
Guthega Skink	<i>Liopholis guthega</i>	Granite substrate and decomposing granite soils Rocky areas including sub-surface boulders	-	High	Endangered	Endangered
Alpine Tree Frog	<i>Litoria verreauxii alpina</i>	-	above 1000 m asl	High	Endangered	Vulnerable
Broad-toothed Rat	<i>Mastacomys fuscus</i>	-	-	High	Vulnerable	Vulnerable
Eastern Bentwing-bat (Breeding)	<i>Miniopterus schreibersii oceanensis</i>	-	-	High	Vulnerable	Not Listed
Pink Robin	<i>Petroica rodinogaster</i>	-	-	High	Vulnerable	Not Listed

Species	Common Name	Habitat Constraints	Geographic limitations	Sensitivity to gain class	NSW listing status	EPBC Listing status
Southern Corroboree Frog	<i>Pseudophryne corroboree</i>	Swamps Within 200m of high montane and sub-alpine bog or ephemeral pool environments	above 1000 m in altitude	Very High	Critically Endangered	Critically Endangered
Northern Corroboree Frog	<i>Pseudophryne pengilleyi</i>	-	above 700 m asl	Very High	Critically Endangered	Critically Endangered
Blue-tongued Greenhood	<i>Pterostylis oreophila</i>	-	-	High	Critically Endangered	Critically Endangered
Anemone Buttercup	<i>Ranunculus anemoneus</i>	Treeless vegetation above 1000 m in altitude	Above 1400 m	High	Vulnerable	Vulnerable
Perisher Wallaby-grass	<i>Rytidosperma vickeryae</i>	-	-	High	Endangered	Not Listed
Austral Toadflax	<i>Thesium australe</i>	-	-	Moderate	Vulnerable	Vulnerable

### 1.6.1 Targeted surveys

Targeted surveys for species credit species were undertaken at the development site on 5 December 2018 and 5 February 2019, as outlined in Table 17. The location of targeted surveys are shown on Figure 7, with the results of the surveys shown as individual species polygons on Figure 8.

**Table 17: Targeted surveys**

Date	Surveyors	Target species
16 November 2018	Ryan Smithers	Broad-toothed Rat, Gang-gang Cockatoo, White-bellied Sea-Eagle, Little Eagle, Raleigh Sedge, Leafy Anchor Plant, Austral Toadflax, Anemone Buttercup, Blue-tongued Greenhood.
5 February 2019	Ryan Smithers	Rough Eyebright, Perisher Wallaby Grass.

Weather conditions during the targeted surveys are outlined in Table 18.

**Table 18: Weather conditions**

Date	Rainfall (mm)	Minimum temperature 0C	Maximum temperature 0C
16 November 2018	0	16	16.5
5 February 2019	0	25	26

Survey effort undertaken at the development is outlined in Table 19.



Table 19: Survey effort

Method	Habitat (ha)	Stratification units	Total effort	Target species
Search for scats and signs (nests)	0.7	Suitable habitats within and immediately surrounding the site	2 person hours	Broad-toothed Rat, White-bellied Sea-Eagle and Little Eagle
Targeted flora surveys	0.7	Suitable habitats within and immediately surrounding the site	3 person hours	Perisher Wallaby-grass, Anemone Buttercup, Rough Eyebright, Leafy Anchor Plant, Raleigh Sedge, Austral Toadflax, Blue-tongued Greenhood.

Following completion of targeted surveys, the species credit species included in the assessment are outlined in Table 20. Minor quantities of the characteristic scats of the Broad-toothed Rat were detected within the development site, particularly in association with the better drained, less disturbed and shrubbier areas closer to the Thredbo River. The species is known to occur upstream along the Thredbo River where relatively large quantities of scats have been observed (ELA 2013). It is likely that the species occurs downstream of the development site along the Thredbo River.

Table 20: Species credit species included in the assessment

Common Name	Species	Species presence	Geographic limitations	Number of individuals / Habitat (ha)	Biodiversity Risk Weighting
Broad-toothed Rat	<i>Mastacomys fuscus</i>	Yes	-	0.67	2

### 1.6.2 Expert reports

Expert reports have not been used for this assessment.

Table 21: Justification for exclusion of candidate species credit species

Common Name	Species	NSW listing status	EPBC Listing status	Justification for exclusion of species
Mountain Pygmy-possum	<i>Burramys parvus</i>	Endangered	Endangered	The nearest core habitats for the species are at Charlotte Pass. Given the absence of preferred sheltering or foraging habitat within the development site or immediate surrounds it is considered highly unlikely that the species would occur there.
Gang-gang Cockatoo (breeding)	<i>Callocephalon fimbriatum</i>	Vulnerable	Not Listed	No hollow-bearing trees suitable for breeding were detected within the development site or immediate surrounds despite targeted surveys.
Mauve Burr-daisy	<i>Calotis glandulosa</i>	Vulnerable	Vulnerable	The study area does not satisfy the geographic constraint north of Eucumbene.
Raleigh Sedge	<i>Carex raleighii</i>	Endangered	Not Listed	There is only a very small amount of marginal potential habitat for the species in the development site. The potential habitat was searched for the species, which was not detected. It is considered highly unlikely that it occurs there.
Alpine Skink	She-oak <i>Cyclodomorphus praealtus</i>	Endangered	Endangered	The species is restricted to subalpine and alpine habitats above 1500 m. There is not suitable habitat within the development site.
Leafy Plant	Anchor <i>Discaria nitida</i>	Vulnerable	Not Listed	The species, which is quite conspicuous, was not detected within the development site or immediate surrounds despite targeted surveys.
Rough Eyebright	<i>Euphrasia scabra</i>	Endangered	Not Listed	The species, nor any other <i>Euphrasia</i> sp., was not detected within the development site despite targeted surveys.
White-bellied Sea-Eagle (Breeding)	<i>Haliaeetus leucogaster</i>	Vulnerable	Not Listed	No raptor nests were detected within the development site or immediate surrounds despite targeted surveys.
Little Eagle (Breeding)	Eagle <i>Hieraaetus morphnoides</i>	Vulnerable	Not Listed	No raptor nests were detected within the development site or immediate surrounds despite targeted surveys.
Guthega Skink	<i>Liopholis guthega</i>	Endangered	Endangered	The species is restricted to subalpine and alpine habitats above 1600 m. The nearest records of the Guthega Skink records are more than 3 km to the west of the development site and at much higher altitudes. It is considered unlikely that the species would occur within development site, given the absence of suitable habitats there.
Alpine Tree Frog	<i>Litoria verreauxii alpina</i>	Endangered	Vulnerable	The species has disappeared from much of its former range in the last 20 years and is restricted to a few breeding sites in murky ponds. There is no suitable breeding habitat for the species within the development site and it is highly unlikely that it would occur there.

Common Name	Species	NSW listing status	EPBC Listing status	Justification for exclusion of species
Eastern Bentwing-bat (Breeding)	<i>Miniopterus schreibersii oceanensis</i>	Vulnerable	Not Listed	There are no suitable caves that could be used as breeding roosts within the development site.
Pink Robin	<i>Petroica rodinogaster</i>	Vulnerable	Not Listed	Within the Thredbo Valley, this species is associated with deep gullies in Mountain Ash forests, where it breeds during summer. It would not occur in the open habitats within the development site.
Southern Corroboree Frog	<i>Pseudophryne corroboreei</i>	Critically Endangered	Critically Endangered	The Southern Corroboree Frog is limited to sphagnum bogs of the northern Snowy Mountains, in a strip from the Maragle Range in the northwest, through Mt Jagungal to Smiggin Holes in the south. Its range is entirely within Kosciuszko National Park. This species is all but extinct in the wild. It is no longer present at its former southern limit at Smiggin Holes.
Northern Corroboree Frog	<i>Pseudophryne pengilleyi</i>	Critically Endangered	Critically Endangered	The Northern Corroboree Frog does not occur within the locality, being limited to the northern parts of the Snowy Mountains and Brindabella Range.
Blue-tongued Greenhood	<i>Pterostylis oreophila</i>	Critically Endangered	Critically Endangered	In NSW the Blue-tongued Greenhood is known from a few small populations within Kosciuszko National Park and a population of about 40 plants in Bago State Forest and adjoining Crown Leases south of Tumut. It is considered highly unlikely that it would occur in the marginal potential habitat within the development site and was not observed there despite targeted survey.
Anemone Buttercup	<i>Ranunculus anemoneus</i>	Vulnerable	Vulnerable	This conspicuous species is typically associated with higher altitudes than the development site and was not detected there despite targeted survey.
Perisher Wallaby-grass	<i>Rytidosperma vickeryae</i>	Endangered	Not Listed	There is only very marginal potential habitat for the species in the development site. The potential habitat was searched for the species, which was not detected. It is considered highly unlikely that it occurs there.
Austral Toadflax	<i>Austral Toadflax</i>	Vulnerable	Vulnerable	This species was not detected within the development site despite targeted survey.

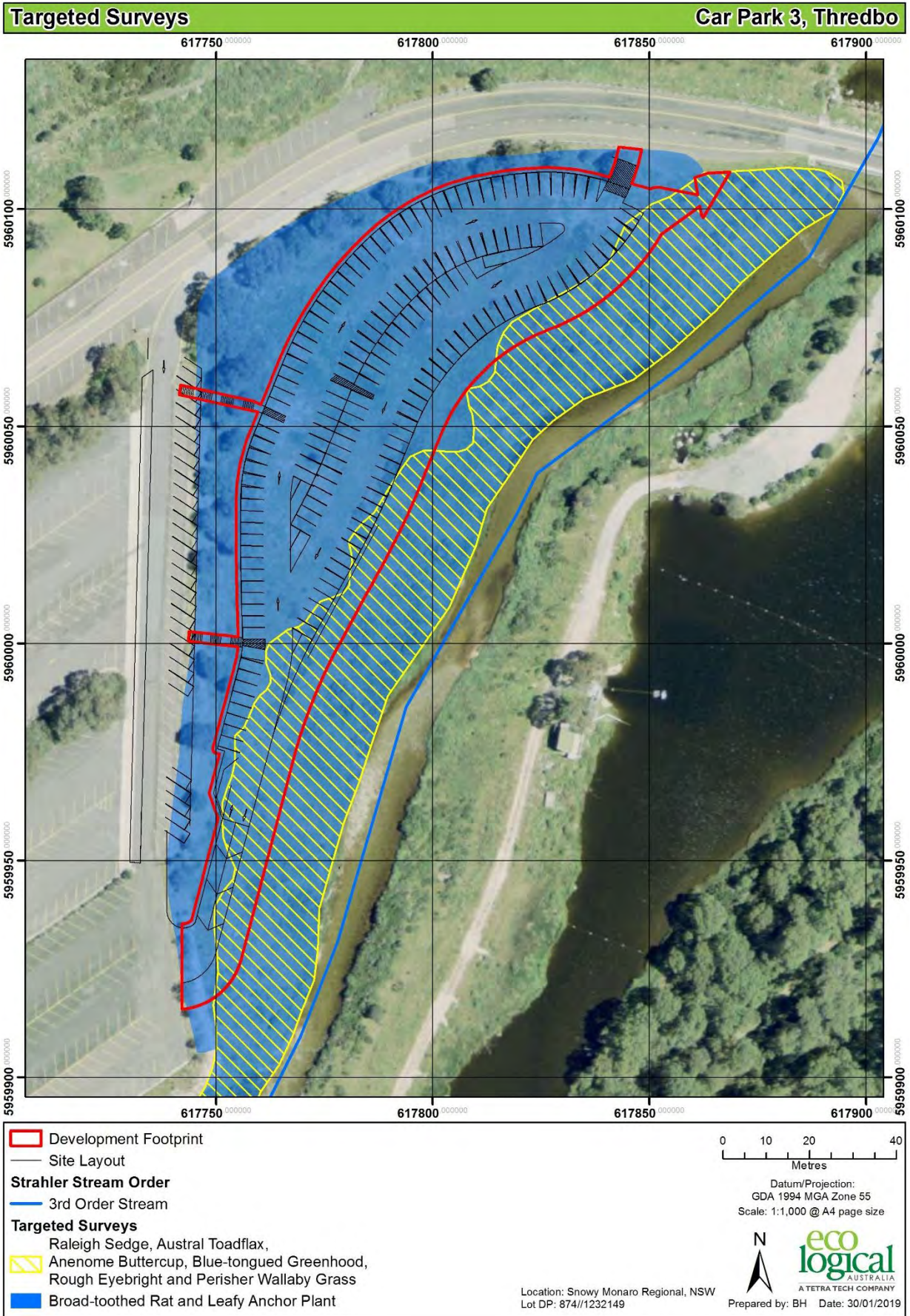


Figure 7: Targeted surveys

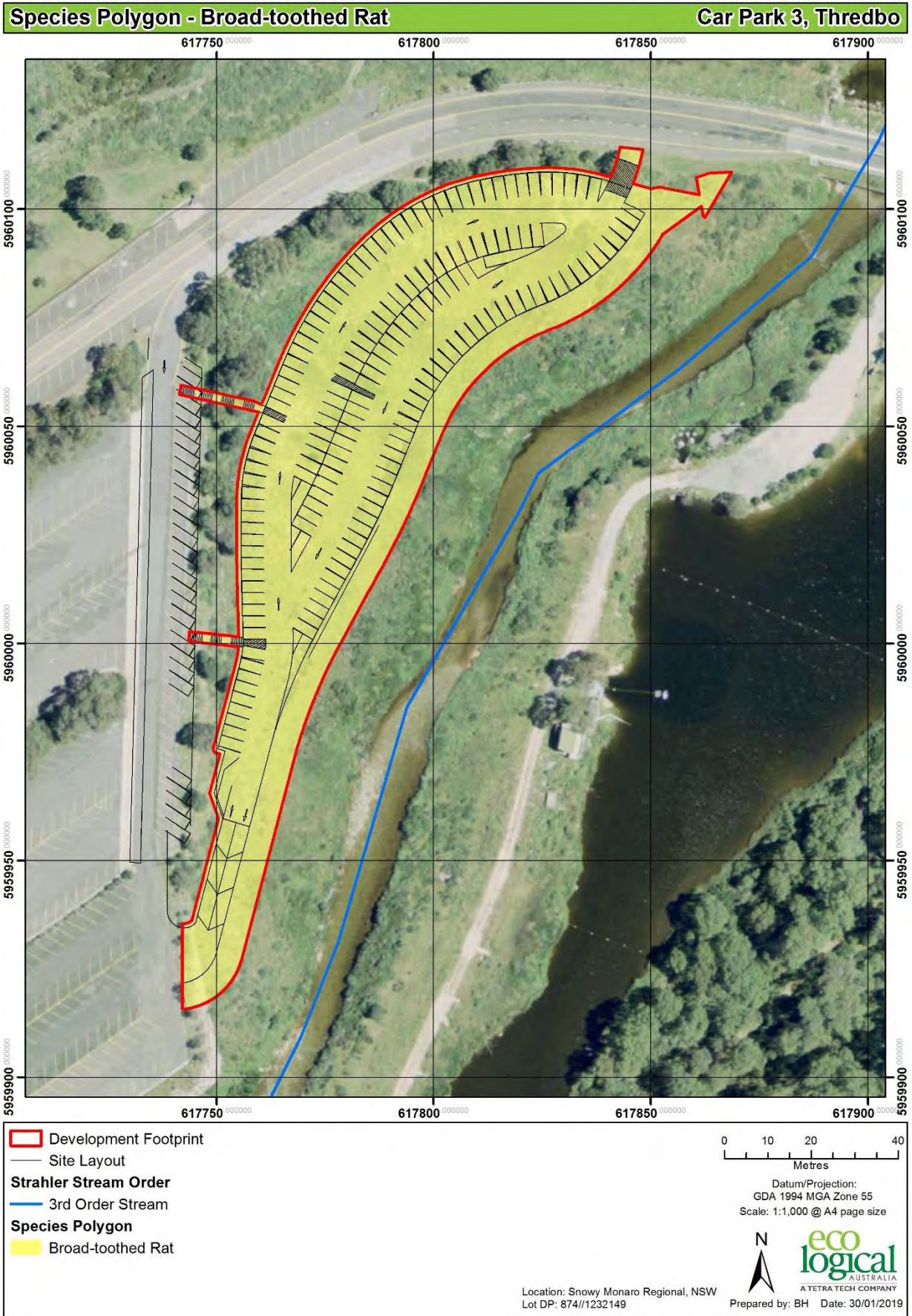


Figure 8: Species polygons

## 2. Stage 2: Impact assessment (biodiversity values)

### 2.1 Avoiding impacts

#### 2.1.1 Locating a project to avoid and minimise impacts on vegetation and habitat

The development has been located in a way which avoids and minimises impacts as outlined in Table 22.

**Table 22: Locating a project to avoid and minimise impacts on vegetation and habitat**

Approach	How addressed	Justification
<b>locating the project in areas where there are no biodiversity values</b>	The proposal has predominately been located in the most heavily modified areas with low biodiversity values. Encroachment into the less disturbed vegetation closer to the Thredbo River has been minimised.	The relative biodiversity value of the vegetation and habitats within the development site and immediate surrounds was identified through a preliminary constraints analysis, which informed the design of the proposed carpark. It is not possible to locate the proposal in an area where there are no biodiversity values, however the proposal has been designed to avoid and minimise impacts on biodiversity values.
<b>locating the project in areas where the native vegetation or threatened species habitat is in the poorest condition</b>	The proposal has predominately been located in the most heavily modified areas where the vegetation is of negligible conservation value and where the habitats for threatened species are poor, relative to the habitats in adjoining areas.	The minor encroachment on the better quality habitats in Zone 2 for threatened species such as the Broad-toothed Rat are justified given that the vast majority of the better quality habitat has been avoided by the project.
<b>locating the project in areas that avoid habitat for species and vegetation in high threat categories (e.g. an EEC or CEEC), indicated by the biodiversity risk weighting for a species</b>	The proposal has been limited primarily to very highly modified and degraded areas of the Montane Peatlands and Swamps EEC.	The minor encroachment on the better quality Montane Peatlands and Swamps EEC are justified given that the vast majority of the better quality EEC has been avoided by the project.
<b>locating the project such that connectivity enabling movement of species and genetic material between areas of adjacent or nearby habitat is maintained</b>	The proposal has been designed to avoid and minimise impacts on the better quality vegetation and habitats closer to the Thredbo River. This design principle minimises impacts on the Montane Peatlands and Swamps EEC and the better quality Broad-toothed Rat habitats, and also retained connectivity between habitats up and downstream of the development site.	The proposal is overwhelmingly concentrated on the most heavily modified and lower conservation value areas. It has been designed to retain the better quality vegetation and habitats closer to the Thredbo River and the connectivity that they provide.

#### 2.1.2 Designing a project to avoid and minimise impacts on vegetation and habitat

The development has been designed in a way which avoids and minimises impacts as outlined in Table 23.

**Table 23: Designing a project to avoid and minimise impacts on vegetation and habitat**

Approach	How addressed	Justification
<b>reducing the clearing footprint of the project</b>	The footprint of the proposed car park has been minimised by smart design, that maximises the number of car parking spaces and also through designing the batters so that they are the minimum possible.	The proposal is overwhelmingly concentrated on the most heavily modified and lower conservation value areas. It has been designed to retain the better quality vegetation and habitats in proximity to the development site and the connectivity that they provide.
<b>locating ancillary facilities in areas where there are no biodiversity values</b>	Construction equipment will be located in already disturbed areas. The proposal has been overwhelmingly located in areas that have low biodiversity values.	This approach minimises the construction and operational disturbance footprint.
<b>locating ancillary facilities in areas where the native vegetation or threatened species habitat is in the poorest condition (i.e. areas that have a lower vegetation integrity score)</b>	The bulk of the proposed car park is located in an area with a very low vegetation integrity score of 3.8.	The proposal is overwhelmingly concentrated on the most heavily modified and lower conservation value areas. It has been designed to retain the better quality vegetation and habitats in proximity to the development site and the connectivity that they provide.
<b>locating ancillary facilities in areas that avoid habitat for species and vegetation in high threat status categories (e.g. an EEC or CEEC)</b>	The proposal has been limited primarily to very highly modified and degraded areas of the Montane Peatlands and Swamps EEC.	The minor encroachment on the better quality Montane Peatlands and Swamps EEC are justified given that the vast majority of the better quality EEC has been avoided by the project.
<b>providing structures to enable species and genetic material to move across barriers or hostile gaps</b>	Minimising the width of the disturbance footprint and post construction rehabilitation.	The proposal has been designed such that the disturbance footprint will be limited primarily to the existing heavily disturbed areas, with only very minor incursions into less disturbed vegetation.
<b>making provision for the demarcation, ecological restoration, rehabilitation and/or ongoing maintenance of retained native vegetation habitat on the development site.</b>	The proposal will utilise construction techniques such that the disturbance footprint will be limited to the development site. Post construction rehabilitation and landscaping will promote recovery post disturbance.	The CEMP will outline where no-go areas would be located to minimise unanticipated incursions in the EEC.
<b>Efforts to avoid and minimise impacts through design must be documented and justified</b>	The efforts to avoid and minimise impacts have been documented in Section 1.1.2 and 2.1 of this report.	

### 2.1.3 Prescribed biodiversity impacts

The development site has the prescribed biodiversity impacts as outlined in Table 24.

Table 24: Prescribed biodiversity impacts

Prescribed biodiversity impact	Description in relation to the development site	Threatened species or ecological communities effected
<p>impacts of development on the habitat of threatened species or ecological communities associated with:</p> <ul style="list-style-type: none"> <li>karst, caves, crevices, cliffs and other geological features of significance, or</li> <li>rocks, or</li> <li>human made structures, or</li> <li>non-native vegetation</li> </ul>	The proposal will not affect any of these features.	NA
impacts of development on the connectivity of different areas of habitat of threatened species that facilitates the movement of those species across their range	The proposal has been designed to avoid and minimise impacts on the better quality vegetation and habitats closer to the Thredbo River. This design principle minimises impacts on the Montane Peatlands and Swamps EEC and the better quality Broad-toothed Rat habitats, and also retains connectivity between habitats up and downstream of the development site.	Montane Peatlands and Swamps EEC and Broad-toothed Rat.
impacts of development on movement of threatened species that maintains their lifecycle	The proposal has been designed to retain the connectivity associated with the better quality habitats closer to the Thredbo River. This design retains connectivity for the Broad-toothed Rat and other fauna between the habitats up and downstream of the development site.	Broad-toothed Rat
impacts of development on water quality, water bodies and hydrological processes that sustain threatened species and threatened ecological communities (including from subsidence or upsidence resulting from underground mining)	The development site and surrounds have been heavily modified by historic development, which included the re-alignment of the Thredbo River. A large culvert currently discharges to the development site. These, and other historic disturbances, such as the construction of Friday Drive and the surrounding car parks, have already substantially modified the hydrology of the development site and immediate surrounds. Despite these developments, the condition of the vegetation and habitats beyond the footprint of the affected areas is generally good. The proposal includes a range of design features, including water quality treatment ponds, catch-drains and erosion and energy dissipators, which are designed to avoid adverse water quality and hydrology impacts beyond the development footprint, and which should improve the quality of the water discharged to the Thredbo River.	Montane Peatlands and Swamps EEC and Broad-toothed Rat.
impacts of wind turbine strikes on protected animals	NA	NA
impacts of vehicle strikes on threatened species or on animals that are part of a TEC.	The proposal is not likely to result in any vehicle strikes on fauna species. It is likely that any animals sheltering within the development footprint will move to adjoining habitats as a result of the noise and vibration associated with the proposed works. Broad toothed Rats continue to occur along the Thredbo River despite the other much large car park developments which have occurred there, including the large car park constructed after the Thredbo landslide disaster.	The proposal will potentially have minor impacts on the Broad-toothed Rat.



2.1.3.1 Locating a project to avoid and minimise prescribed biodiversity impacts

The development has been located in a way which avoids and minimises prescribed biodiversity impacts as outlined in Table 25.

**Table 25: Locating a project to avoid and minimise prescribed biodiversity impacts**

Approach	How addressed	Justification
<b>locating the envelope of surface works to avoid direct impacts on the habitat features</b>	The proposal has predominately been located in the most heavily modified areas with low biodiversity values. Encroachment into the less disturbed vegetation closer to the Thredbo River has been minimised.	The relative biodiversity value of the vegetation and habitats within the development site and immediate surrounds was identified through a preliminary constraints analysis, which informed the design of the proposed carpark. It is not possible to locate the proposal in an area where there is no biodiversity values, however the proposal has been designed to avoid and minimise impacts on biodiversity values.
<b>locating the envelope of sub-surface works, both in the horizontal and vertical plane, to avoid and minimise operations beneath the habitat features, e.g. locating long wall panels away from geological features of significance or water dependent plant communities and their supporting aquifers</b>	The proposal will predominately comprise fill with only minor excavation in the western margins of the development site.	The proposal does not include significant excavation so should not affect the areas beneath habitats.
<b>locating the project to avoid severing or interfering with corridors connecting different areas of habitat, migratory flight paths to important habitat or preferred local movement pathways</b>	The proposal has been designed to avoid and minimise impacts on the better quality vegetation and habitats closer to the Thredbo River. This design principle minimises impacts on the Montane Peatlands and Swamps EEC and the better quality Broad-toothed Rat habitats, and also retained connectivity between habitats up and downstream of the development site.	The proposal is overwhelmingly concentrated on the most heavily modified and lower conservation value areas. It has been designed to retain the better quality vegetation and habitats in proximity to the development site and the connectivity that they provide.
<b>optimising project layout to minimise interactions with threatened and protected species and ecological communities, e.g. designing turbine layout to allow buffers around features that attract and support aerial species, such as forest edges, riparian corridors and wetlands, ridgetops and gullies</b>	The proposal has predominately been located in the most heavily modified areas with low biodiversity values. Encroachment into the less disturbed vegetation closer to the Thredbo River has been minimised.	The relative biodiversity value of the vegetation and habitats within the development site and immediate surrounds was identified through a preliminary constraints analysis, which informed the design of the proposed carpark. It is not possible to locate the proposal in an area where there is no biodiversity values, however the proposal has been designed to avoid and minimise impacts on biodiversity values.

Approach	How addressed	Justification
locating the project to avoid direct impacts on water bodies	The proposal will not involve any direct impacts on the Thredbo River and will largely be located beyond the Riparian Protection Area.	

2.1.3.2 *Designing a project to avoid and minimise prescribed biodiversity impacts*

The development has been designed in a way which avoids and minimises prescribed biodiversity impacts as outlined in Table 26.

**Table 26: Designing a project to avoid and minimise prescribed biodiversity impacts**

Approach	How addressed	Justification
engineering solutions, e.g. proven techniques to minimise fracturing of bedrock underlying features of geological significance, water dependent communities and their supporting aquifers; proven engineering solutions to restore connectivity and favoured movement pathways	The proposal will not result in any fracturing of geological features of significance or water dependent plant communities and their supporting aquifers. The proposal includes a range of design features, including water quality treatment ponds, catch-drains and erosion and energy dissipators, which are designed to avoid adverse water quality and hydrology impacts beyond the development footprint, and which should improve the quality of the water discharged to the Thredbo River.	The proposal is overwhelmingly concentrated on the most heavily modified and lower conservation value areas. It has been designed to retain the better quality vegetation and habitats in proximity to the development site and the connectivity that they provide.
design of project elements to minimise interactions with threatened and protected species and ecological communities, e.g. designing turbines to dissuade perching and minimise the diameter of the rotor swept area, designing fencing to prevent animal entry to transport corridors	The proposal has been designed as far as is possible to avoid and minimise impacts on threatened species. The proposal has been designed to avoid and minimise impacts on the better quality vegetation and habitats closer to the Thredbo River. This design principle minimises impacts on the Montane Peatlands and Swamps EEC and the better quality Broad-toothed Rat habitats, and also retained connectivity between habitats up and downstream of the development site.	There are extensive areas of similar vegetation surrounding the development site that will not be affected by the proposed development. The proposal has been designed to have minimal adverse impacts on the environment, whilst significantly enhancing car parking capacity.
design of the project to maintain environmental processes critical to the formation and persistence of habitat features not associated with native vegetation	The project has been designed to avoid any adverse impacts on the Thredbo River and associated habitats.	
design of the project to maintain hydrological processes that sustain threatened species and TECs	The development site and surrounds have been heavily modified by historic development, which included the re-alignment of the Thredbo River. A large culvert currently discharges to the development site. These, and other	

Approach	How addressed	Justification
	historic disturbances, such as the construction of Friday Drive and the surrounding car parks, have already substantially modified the hydrology of the development site and immediate surrounds. Despite these developments, the condition of the vegetation and habitats beyond the footprint of the affected areas is generally good. The proposal includes a range of design features, including water quality treatment ponds, catch-drains and erosion and energy dissipators, which are designed to avoid adverse water quality and hydrology impacts beyond the development footprint, and which should improve the quality of the water discharged to the Thredbo River.	
<b>design of the project to avoid and minimise downstream impacts on rivers, wetlands and estuaries by control of the quality of water released from the site.</b>	The proposal includes a range of design features, including water quality treatment ponds, catch-drains and erosion and energy dissipators, which are designed to avoid adverse water quality and hydrology impacts beyond the development footprint, and which should improve the quality of the water discharged to the Thredbo River.	

## 2.2 Assessment of Impacts

### 2.2.1 Direct impacts

The direct impacts of the development on:

- native vegetation are outlined in Table 27
- threatened ecological communities are outlined in Table 28
- threatened species and threatened species habitat is outlined in Table 29
- prescribed biodiversity impacts is outlined in Section 2.2.2

Direct impacts including the final project footprint (construction and operation) are shown on Figure 9.

**Table 27: Direct impacts to native vegetation**

PCT ID	PCT Name	Vegetation Class	Vegetation Formation	Direct impact (ha)
637	Alpine and sub-alpine peatlands, damp herbfields and fens, South Eastern Highlands Bioregion and Australian Alps Bioregion	Alpine Complex	Alpine Bogs and Fens	0.62
679	Black Sallee - Snow Gum low woodland of montane valleys, South Eastern Highlands Bioregion and Australian Alps Bioregion	Subalpine Woodlands	Grassy Woodlands	0.05

**Table 28: Direct impacts on threatened ecological communities**

PCT ID	BC Act			EPBC Act		
	Listing status	Name	Direct impact (ha)	Listing status	Name	Direct impact (ha)
637	Endangered	Montane Peatlands and Swamps of the New England Tableland, NSW North Coast, Sydney Basin, South East Corner, South Eastern Highlands and Australian Alps bioregions	0.62	Endangered	Alpine Sphagnum Bogs and Associated Fens	0.16

**Table 29: Direct impacts on threatened species and threatened species habitat**

Species	Common Name	Direct impact number of individuals / habitat (ha)	NSW listing status	EPBC Listing status
Broad-toothed Rat	<i>Mastacomys fuscus</i>	0.67	Vulnerable	Vulnerable

### 2.2.2 Change in vegetation integrity

The change in vegetation integrity as a result of the development is outlined in Table 30.

**Table 30: Change in vegetation integrity**

Veg Zone	PCT ID	Condition	Area (ha)	Current vegetation integrity score	Future vegetation integrity score	Change in vegetation integrity
1	637	Low	0.46	3.8	0	-3.8
2	637	Degraded	0.16	26.1	0	-26.1
3	679	Degraded	0.05	28.8	0	-28.8

### 2.2.3 Indirect impacts

The indirect impacts of the development are outlined in Table 31. Indirect impact zones are shown on Figure 10.

Table 31: Indirect impacts

Indirect impact	Project phase	Nature	Extent	Frequency	Duration	Timing
<b>sedimentation and contaminated and/or nutrient rich run-off</b>	Construction	Increased sedimentation risk during construction. Contamination and runoff risk will be addressed by CEMP and proposed detention basins.	minor	minor	During and after any heavy rainfall	During and post construction
<b>noise, dust or light spill</b>	Construction /operation	Minor increases in light and noise spill during operation	minor	minor	Intermittently during construction phase	During and post construction
<b>inadvertent impacts on adjacent habitat or vegetation</b>	Construction	Encroachment on vegetation beyond development site	minor	minor	Not expected but possible	8 month maximum
<b>transport of weeds and pathogens from the site to adjacent vegetation</b>	Construction /operation	On construction equipment and guest vehicles	minor	minor	Not expected but possible	During and post construction
<b>vehicle strike</b>	Construction /operation	Construction equipment and guest vehicles	minor	minor	Not expected but possible	During and post construction
<b>trampling of threatened flora species</b>	Construction /operation	Construction equipment and workers. Will be addressed by CEMP	Not expected	Not expected	Not expected	8 month maximum
<b>rubbish dumping</b>	Construction /operation	Guests	Not expected	Not expected	Not expected	Not expected
<b>wood collection</b>	Construction /operation	Construction	Not expected	Not expected	Not expected	Not expected
<b>bush rock removal and disturbance</b>	Construction /operation	Construction	Not expected	Not expected	Not expected	Not expected
<b>increase in predatory species populations</b>	Construction /operation	-	Not expected	Not expected	Not expected	Not expected

Indirect impact	Project phase	Nature	Extent	Frequency	Duration	Timing
increase in pest animal populations	Construction /operation	-	Not expected	Not expected	Not expected	Not expected
increased risk of fire	Construction /operation	Minor increased risk during construction	Not expected	Not expected	Not expected	Not expected
disturbance to specialist breeding and foraging habitat, e.g. beach nesting for shorebirds.	Construction /operation	Disturbance to Broad-toothed Rat and Latham's Snipe foraging habitat adjoining the development site.	minor	one off	during construction	8 month maximum

### 2.2.4 Prescribed biodiversity impacts

The development site has the prescribed biodiversity impacts as outlined in Table 32.

**Table 32: Direct impacts on prescribed biodiversity impacts**

Prescribed biodiversity impact	Nature	Extent	Frequency	Duration	Timing
impacts of development on the connectivity of different areas of habitat of threatened species that facilitates the movement of those species across their range	Minor impacts on connectivity	0.67	One off	Permanent	During construction and operation
impacts of development on movement of threatened species that maintains their lifecycle	Minor impacts on connectivity for the Broad-toothed Rat	0.67	One off	During construction	During construction
impacts of vehicle strikes on threatened species or on animals that are part of a TEC.	Minor increased risk of vehicle strike	0.67	During construction and operation	Permanent	During construction and operation

### 2.2.5 Mitigating and managing impacts

Measures proposed to mitigate and manage impacts at the development site before, during and after construction are outlined in Table 33.

### 2.2.6 Serious and Irreversible Impacts (SAIL)

The development does not have any Serious and Irreversible Impacts (SAIL).

Table 33: Measures proposed to mitigate and manage impacts

Measure	Risk before mitigation	Risk after mitigation	Action	Outcome	Timing	Responsibility
<b>Displacement of resident fauna</b>	Low	Low	Ensure the limit of the development site is appropriately marked with fencing or flagging so that fauna beyond the development site are not impacted.  If any of the wombat burrows within or in close proximity to the development site are found to be active, then the wombats should be relocated in consultation with NPWS.	Fauna within the disturbance footprint should move and thus any injury to fauna species during construction should be avoided.	During construction  Prior to construction	Event
<b>timing works to avoid critical life cycle events such as breeding or nursing</b>	Low	Low	None proposed	NA	NA	NA
<b>instigating clearing protocols including pre-clearing surveys, daily surveys and staged clearing, the presence of a trained ecological or licensed wildlife handler during clearing events</b>	Low	Low	None proposed	Injury to fauna species during construction should be avoided.	During construction	Event
<b>installing artificial habitats for fauna in adjacent retained vegetation and habitat or human made structures to replace the habitat resources lost and encourage animals to move from the impacted site, e.g. nest boxes</b>	Low	Low	None proposed	NA	NA	NA
<b>clearing protocols that identify vegetation to be retained, prevent inadvertent damage and reduce soil disturbance; for example, removal of native vegetation by chain-saw, rather than heavy machinery, is preferable in situations where partial clearing is proposed</b>	Medium	Low	Identify with flagging tape or fencing the limit of the proposed disturbance, where it encroaches upon relatively undisturbed native vegetation, prior to construction.	Risk of disturbance beyond proposed disturbance corridor is reduced	Prior to construction	Event



Measure	Risk before mitigation	Risk after mitigation	Action	Outcome	Timing	Responsibility
sediment barriers or sedimentation ponds to control the quality of water released from the site into the receiving environment	Low	Low	Sediment control measures as necessary such as fencing and hay bales	Risk of sedimentation of water quality impacts substantially reduced	During and post-construction	Event
noise barriers or daily/seasonal timing of construction and operational activities to reduce impacts of noise	Low	Low	Restrict work to daylight hours	Noise impacts mitigated	During construction	Event
light shields or daily/seasonal timing of construction and operational activities to reduce impacts of light spill	Low	Low	Restrict work to daylight hours	Light impacts mitigated	During construction	Event
adaptive dust monitoring programs to control air quality	Low	Low	None proposed	NA	NA	NA
programming construction activities to avoid impacts; for example, timing construction activities for when migratory species are absent from the site, or when particular species known to or likely to use the habitat on the site are not breeding or nesting	Low	Low	None proposed	NA	NA	NA
temporary fencing to protect significant environmental features such as riparian zones	Low	Low	The limits of the proposed disturbance footprint will be delineated with flagging tape or fencing where it encroaches upon relatively undisturbed native vegetation.	Protection of vegetation and habitats beyond the disturbance footprint	Prior to and during construction	Event
hygiene protocols to prevent the spread of weeds or pathogens between infected areas and uninfected areas	Medium	Low	Any machinery or vehicles involved with the proposed works that are not owned by Thredbo will be washed down to remove all soil and vegetative matter before entering the site to limit spread of weeds and disease such as <i>Phytophthora cinnamomi</i>	Risk of weed or pathogen spread substantially reduced	Prior to and during construction	Event
staff training and site briefing to communicate environmental features to	Medium	Low	Brief all workers as to limit of disturbance footprint and other environmental safeguards	Risk of disturbance beyond proposed	Prior to and during	Event

Measure	Risk before mitigation	Risk after mitigation	Action	Outcome	Timing	Responsibility
be protected and measures to be implemented				disturbance corridor is reduced	construction as necessary	
development control measures to regulate activity in vegetation and habitat adjacent to residential development including controls on pet ownership, rubbish disposal, wood collection, fire management and disturbance to nests and other niche habitats	NA	NA	NA	NA	NA	NA
making provision for the ecological restoration, rehabilitation and/or ongoing maintenance of retained native vegetation habitat on or adjacent to the development site	Medium	Low	Post construction rehabilitation consistent with standard Thredbo rehabilitation strategies	Post construction vegetation within the development footprint with high medium-term recovery potential.	Immediately post construction	Event

## 2.3 Risk assessment

A risk assessment has been undertaken for any residual impacts likely to remain after the mitigation measures (Section) have been applied. Likelihood criteria, consequence criteria and the risk matrix are provided in Table 34, Table 35 and Table 36 respectively.

**Table 34: Likelihood criteria**

Likelihood criteria	Description
<b>Almost certain (Common)</b>	Will occur, or is of a continuous nature, or the likelihood is unknown. There is likely to be an event at least once a year or greater (up to ten times per year). It often occurs in similar environments. The event is expected to occur in most circumstances.
<b>Likely (Has occurred in recent history)</b>	There is likely to be an event on average every one to five years. Likely to have been a similar incident occurring in similar environments. The event will probably occur in most circumstances.
<b>Possible (Could happen, has occurred in the past, but not common)</b>	The event could occur. There is likely to be an event on average every five to twenty years.
<b>Unlikely (Not likely or uncommon)</b>	The event could occur but is not expected. A rare occurrence (once per one hundred years).
<b>Remote (Rare or practically impossible)</b>	The event may occur only in exceptional circumstances. Very rare occurrence (once per one thousand years). Unlikely that it has occurred elsewhere; and, if it has occurred, it is regarded as unique.

**Table 35: Consequence criteria**

Consequence category	Description
<b>Critical (Severe, widespread long-term effect)</b>	Destruction of sensitive environmental features. Severe impact on ecosystem. Impacts are irreversible and/or widespread. Regulatory and high-level government intervention/action. Community outrage expected. Prosecution likely.
<b>Major (Wider spread, moderate to long term effect)</b>	Long-term impact of regional significance on sensitive environmental features (e.g. wetlands). Likely to result in regulatory intervention/action. Environmental harm either temporary or permanent, requiring immediate attention. Community outrage possible. Prosecution possible.
<b>Moderate (Localised, short-term to moderate effect)</b>	Short term impact on sensitive environmental features. Triggers regulatory investigation. Significant changes that may be rehabilitated with difficulty. Repeated public concern.
<b>Minor (Localised short-term effect)</b>	Impact on fauna, flora and/or habitat but no negative effects on ecosystem. Easily rehabilitated. Requires immediate regulator notification.
<b>Negligible (Minimal impact or no lasting effect)</b>	Negligible impact on fauna/flora, habitat, aquatic ecosystem or water resources. Impacts are local, temporary and reversible. Incident reporting according to routine protocols.

**Table 36: Risk matrix**

Consequence	Likelihood				
	Almost certain	Likely	Possible	Unlikely	Remote
<b>Critical</b>	Very High	Very High	High	High	Medium
<b>Major</b>	Very High	High	High	Medium	Medium
<b>Moderate</b>	High	Medium	Medium	Medium	Low
<b>Minor</b>	Medium	Medium	Low	Low	Very Low
<b>Negligible</b>	Medium	Low	Low	Very Low	Very Low

**Table 37: Risk assessment**

Potential impact	Project phase	Risk (pre-mitigation)	Risk (post mitigation)
<b>Vegetation clearing</b>	Construction/operation	Medium	Very Low
<b>sedimentation and contaminated and/or nutrient rich run-off</b>	Construction/operation	Medium	Very Low
<b>noise, dust or light spill</b>	Construction/operation	Low	Very Low
<b>inadvertent impacts on adjacent habitat or vegetation</b>	Construction	Medium	Very Low
<b>transport of weeds and pathogens from the site to adjacent vegetation</b>	Construction/operation	Medium	Very Low
<b>vehicle strike</b>	Construction/operation	Medium	Very Low
<b>trampling of threatened flora species</b>	Construction/operation	Low	Very Low
<b>rubbish dumping</b>	Construction/operation	Low	Very Low
<b>wood collection</b>	Construction/operation	Low	Very Low
<b>bush rock removal and disturbance</b>	Construction/operation	Low	Very Low
<b>increase in predatory species populations</b>	Construction/operation	Low	Very Low
<b>increase in pest animal populations</b>	Construction/operation	Low	Very Low
<b>increased risk of fire</b>	Construction	Low	Very Low
<b>disturbance to specialist breeding and foraging habitat, e.g. beach nesting for shorebirds.</b>	Construction/operation	Medium	Very Low
<b>sedimentation and contaminated and/or nutrient rich run-off</b>	Construction	Medium	Very Low

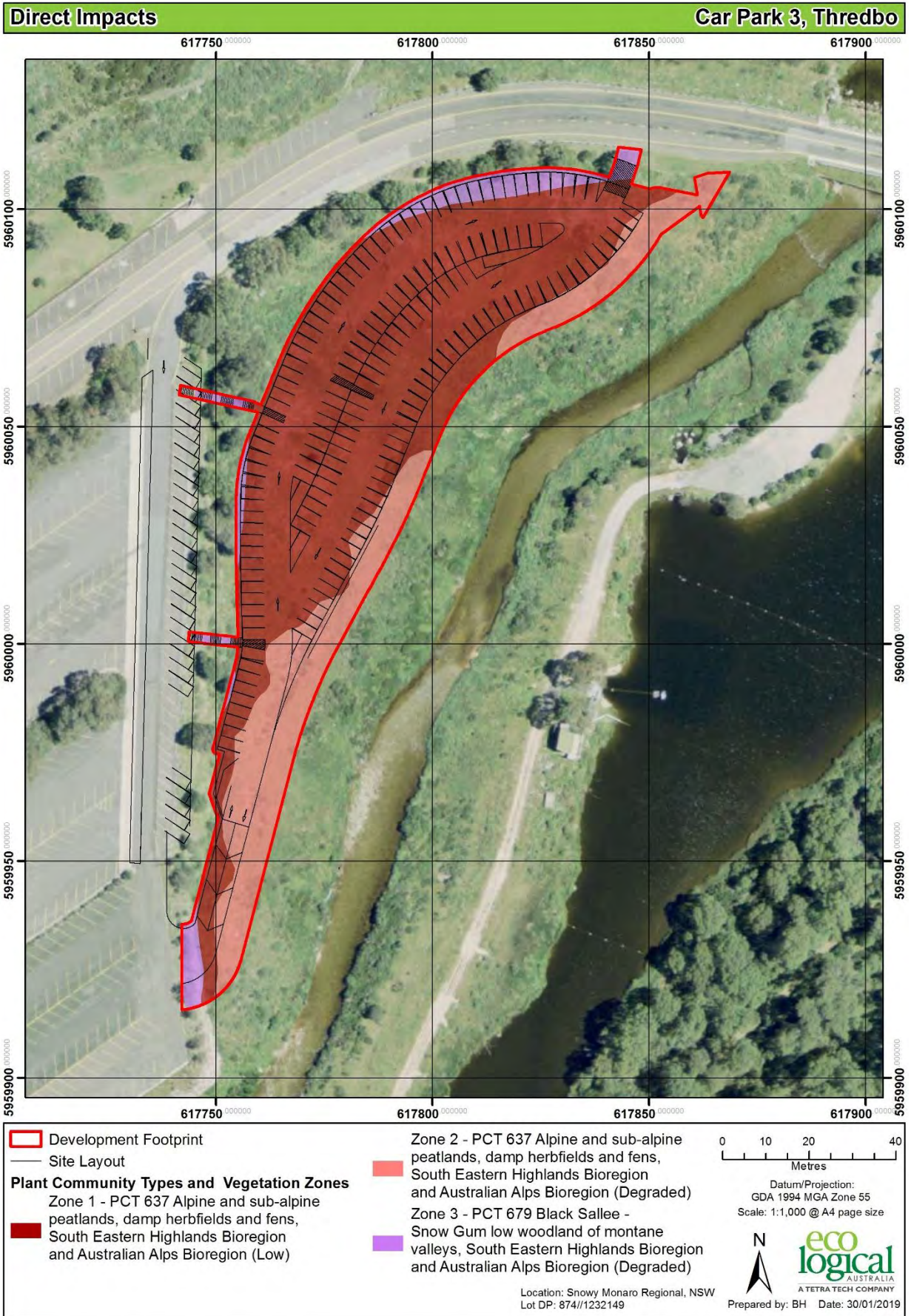


Figure 9: Final project footprint including construction and operation

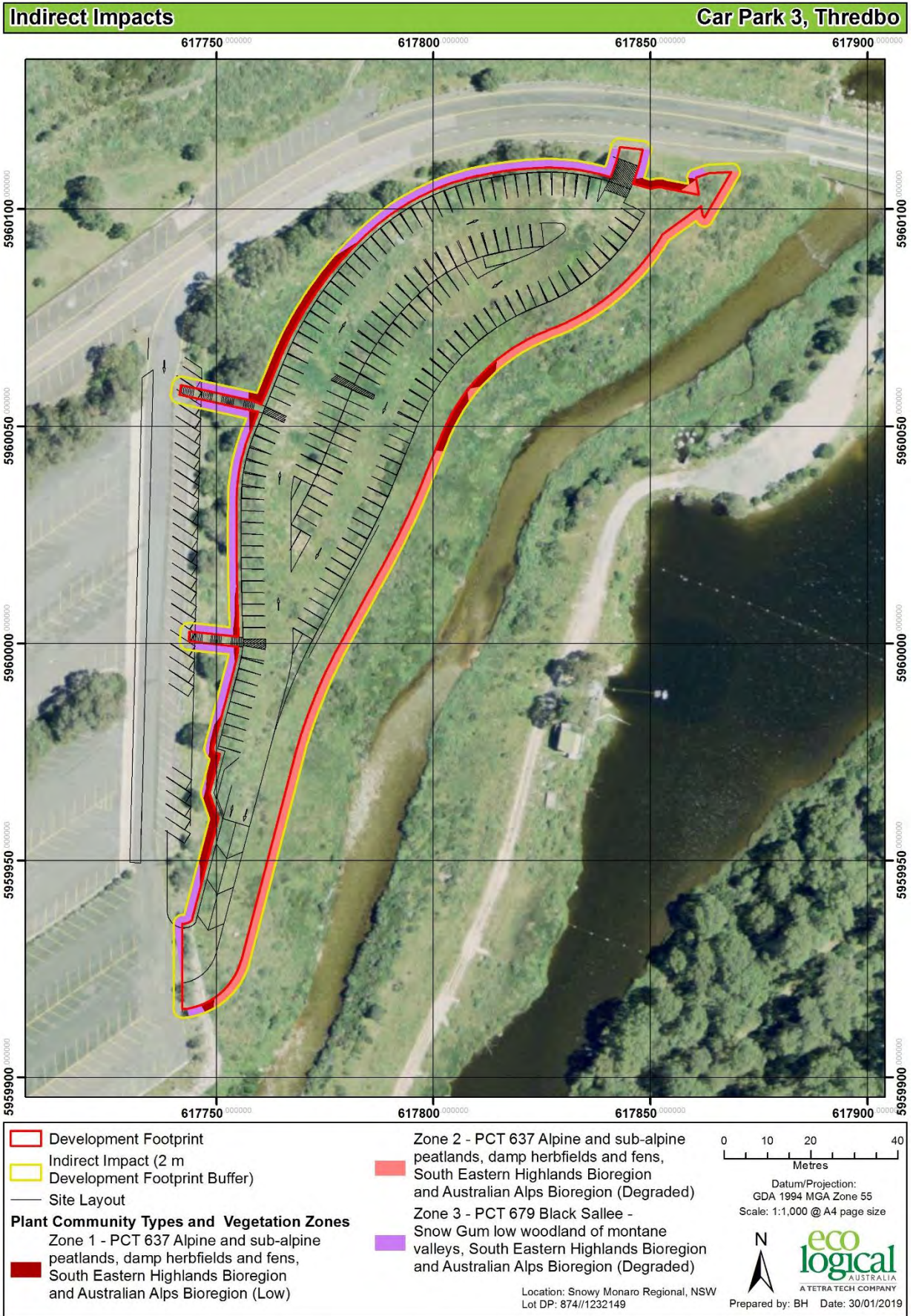


Figure 10: Indirect impact zones

## 2.4 Adaptive management strategy

This section is required for those impacts that are infrequent, cumulative or difficult to predict. Impacts associated with the proposed development have been considered extensively and addressed in Section 2.2.5 and further consideration of infrequent, cumulative or difficult to predict impacts is not considered to be necessary.

## 2.5 Impact summary

Following implementation of the BAM and the BAMC, the following impacts have been determined.

### 2.5.1 Serious and Irreversible Impacts (SAIL)

The development does not have any Serious and Irreversible Impacts (SAIL).

### 2.5.2 Impacts requiring offsets

The impacts of the development requiring offset for native vegetation are outlined in Table 38 and shown on Figure 11. The impacts of the development requiring offset for threatened species and threatened species habitat are outlined in Table 39 and on Figure 11.

**Table 38: Impacts to native vegetation that require offsets**

PCT ID	PCT Name	Vegetation Class	Vegetation Formation	Direct impact (ha)
637	Alpine and sub-alpine peatlands, damp herbfields and fens, South Eastern Highlands Bioregion and Australian Alps Bioregion	Alpine Complex	Alpine Bogs and Fens	0.12
679	Black Sallee - Snow Gum low woodland of montane valleys, South Eastern Highlands Bioregion and Australian Alps Bioregion	Subalpine Woodlands	Grassy Woodlands	0.05

**Table 39: Impacts on threatened species and threatened species habitat that require offsets**

Common Name	Species	Direct impact number of individuals / habitat (ha)	NSW listing status	EPBC Listing status
Broad-toothed Rat	<i>Mastacomys fuscus</i>	0.62	Vulnerable	Vulnerable

### 2.5.3 Impacts not requiring offsets

The impacts of the development not requiring offset for native vegetation are outlined in Table 40 and shown on Figure 12.

**Table 40: Impacts to native vegetation that do not require offsets**

PCT ID	PCT Name	Vegetation Class	Vegetation Formation	Direct impact (ha)	Rationale
637	Alpine and sub-alpine peatlands, damp herbfields and fens, South Eastern Highlands Bioregion and Australian Alps Bioregion	Alpine Complex	Alpine Bogs and Fens	0.46	Vegetation integrity score below 15 (3.8)

#### 2.5.4 Areas not requiring assessment

There are no areas that do not require assessment.

#### 2.5.5 Credit summary

The number of ecosystem credits required for the development are outlined in Table 41. The number of species credits required for the development are outlined in Table 42. A biodiversity credit report is included in Appendix D:.

**Table 41: Ecosystem credits required**

PCT ID	PCT Name	Vegetation Formation	Direct impact (ha)	Credits required
637	Alpine and sub-alpine peatlands, damp herbfields and fens, South Eastern Highlands Bioregion and Australian Alps Bioregion	Alpine Bogs and Fens	0.2	2
679	Black Sallee - Snow Gum low woodland of montane valleys, South Eastern Highlands Bioregion and Australian Alps Bioregion	Grassy Woodlands	0.1	1

**Table 42: Species credit summary**

Species	Common Name	Direct impact number of individuals / habitat (ha)	Credits required
Broad-toothed Rat	<i>Mastacomys fuscus</i>	0.62	4



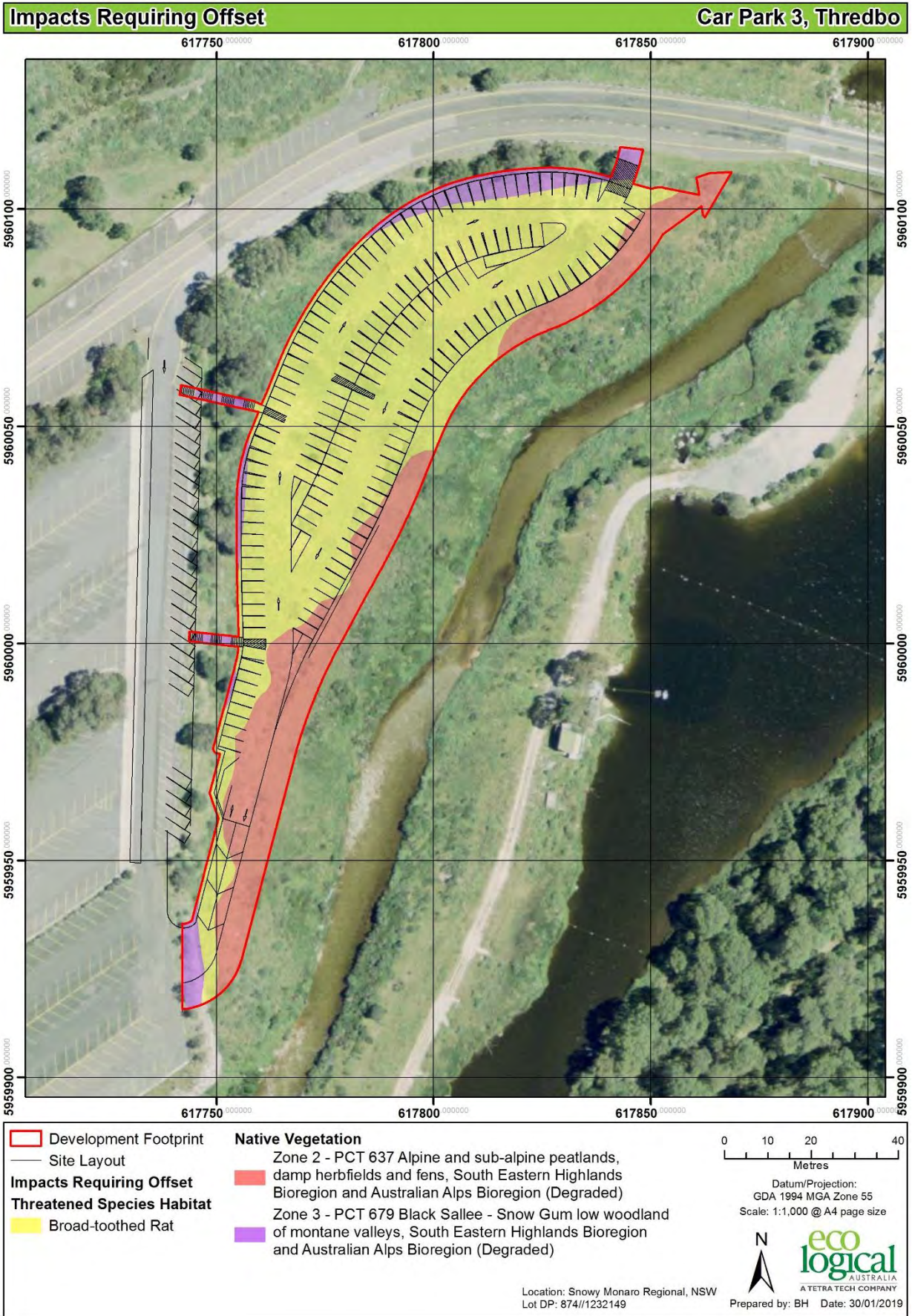


Figure 11: Impacts requiring offset



Figure 12: Impacts not requiring offset

## 2.6 Consistency with legislation and policy

An impact assessment under the EPBC Act was undertaken on MNES known to occur within the development site or immediate surrounds or with potential to occur there. These MNES were:

- Alpine Sphagnum Bogs and Associated Fens.
- Broad-toothed Rat.
- Latham's Snipe.

The outcome of this assessment was that it is highly unlikely that the development would significantly impact on those MNES assessed (Appendix C).

A referral to the Commonwealth under the EPBC Act is not considered necessary.

## 3. Recommendations

To further ameliorate the potential impacts of the proposed development and to improve environmental outcomes, the mitigation measures identified in Table 33 should be incorporated into the proposal.

## 4. Conclusion

Eco Logical Australia Pty Ltd (ELA) was engaged by Event Hospitality and Entertainment Pty Limited to prepare a Biodiversity Development Assessment Report (BDAR) for a proposed 174 car space car park, within the Friday Flat area, at Thredbo Ski Resort.

This report has been prepared to meet the requirements of the Biodiversity Assessment Method 2016 established under Section 6.7 of the NSW *Biodiversity Conservation Act 2016*. This BDAR outlines the measures taken to avoid, minimise and mitigate impacts to the vegetation and habitats present within the development site during the design, construction and operation of the development.

This BDAR outlines the measures taken to avoid, minimise and mitigate impacts to the vegetation and habitats present within the development site during the design, construction and operation of the development. The residual unavoidable impacts of the proposed development were calculated consistent with BAM by utilising the Biodiversity Assessment Method Credit Calculator (BAMC). The BAMC calculated that a total of three ecosystem credits and four species credits are required to offset the unavoidable impacts to the vegetation and threatened species habitats present within the development site.

Serious and Irreversible Impact (SAIL) values have been considered as part of this assessment. The proposal will not result in any SAIL.

Following consideration of the administrative guidelines for determining significance under the EPBC Act, it is concluded that the proposal is unlikely to have a significant impact on matters of National Environmental Significance (MNES) or Commonwealth land, and a referral to the Commonwealth Environment Minister is therefore not required.

## 5. Bibliography

Cogger, H.G. 1996. Reptiles and Amphibians of Australia, Reed Books, Sydney

Costermans, L. 1994. Native Trees and Shrubs of South-Eastern Australia, Lansdowne Publishing, Sydney.

Costins, C., Gray, M., Totterdell, C., and Wimbush, D. 2000. Kosciuszko Alpine Flora. CSIO Publishing, Victoria.

Eco Logical Australia 2013. *Ecological Assessment – Thredbo Village - Buildings Works and Future Precinct – Thredbo Alpine Resort*. Prepared for Amalgamated Holdings Limited (AHL).

Eco Logical Australia 2014. Flora and Fauna Assessment - Proposed Mountain Bike Trails – Stage 1B - Thredbo Alpine Resort. Prepared for Kosciuszko Thredbo Pty Ltd.

Ecology Australia. 2002. Kosciuszko Resorts Vegetation Assessment. A report for Planning NSW.

Gellie, N.J.H. 2006. Native vegetation of the southern forests: South-east Highlands, Australian Alps, South-west Slopes and South-east Corner bioregions. *Cunninghamia* 9, 219-254.

Green, K. 2002. Selective predation on the broad-toothed rat, *Mastacomys fuscus* (Rodentia: Muridae), by the introduced red fox, *Vulpes vulpes* (Carnivora: Canidae), in the Snowy Mountains, Australia. *Austral Ecology* 27, 353–359.

NGH Environmental 2007. Rehabilitation Guidelines for the Resort Areas of Kosciuszko National Park. A report for Parks and Wildlife Division. Department of Environment and Climate Change NSW.

Menkorst, P. Heinze, D. Broome, L. and Hynes, E. 2010. Draft National Recovery Plan for the Mountain Pygmy-possum *Burramys parvus*.

McDougall, K.L. & Walsh, N.G. 2007. Treeless vegetation of the Australian Alps, *Cunninghamia*, vol. 10, pp. 1-57.

NSW Department of Environment and Conservation (DEC). 2006. Kosciuszko National Park Plan of Management.

NSW National Parks and Wildlife Service 2001a Approved Recovery Plan for the Threatened Alpine Flora Anemone Buttercup (*Ranunculus anemoneus*), Feldmark Grass (*Erythranthera pumila*), Raleigh Sedge (*Carex raleighii*) & Shining Cudweed (*Euchiton nitidulus*). NSW NPWS, Hurstville NSW.

NSW National Parks and Wildlife Service. 2001b. Approved Recovery Plan for the Southern Corroboree Frog *Pseudophryne corroboree*. NSW National Parks and Wildlife Service Hurstville.

NSW National Parks and Wildlife Service. 2002. Approved Recovery Plan for the Mountain Pygmy Possum *Burramys parvus*. NSW National Parks and Wildlife Service Hurstville.

NSW Scientific Committee. 2005. Final Determination to list Montane Peatlands and Swamps of the New England Tableland, NSW North Coast, Sydney Basin, South East Corner, South Eastern Highlands and Australia Alps area as an endangered ecological community.

Sato, C.F., Wood, J.T., Schroder, M., Green, K., Michael, D.R. and Lindenmayer, D. B. 2013. The impacts of ski resorts on reptiles: a natural experiment. *Animal Conservation*. Doi: 10.1111/acv.12095.

Sato C. F., Wood J.T., Schroder M., Green, K., Michael, D.R., Osborne, W.S. and Lindenmayer, D. B. 2014. An experiment to test key hypotheses of the drivers of reptiles distribution in subalpine ski resorts. *Journal of Applied Ecology* 51, 13-22.

Sato, C.F., Schroder, M., Green, K., Michael, D.R., Osborne, W.S. and Lindenmayer, D. B. 2014. Managing ski resorts to improve biodiversity conservation: Australian reptiles as a case study. *Ecological Management and Restoration* 15(2).

Strahan, R. 1995. *The Australian Museum Complete Book of Australian Mammals*, Cornstalk Publishing, Sydney.

Threatened Species Scientific Committee. 2009. Listing Advice for the Alpine Sphagnum Bogs and Associated Fens Endangered Ecological Community.

## Appendix A: Definitions

Terminology	Definition
<b>Biodiversity credit report</b>	The report produced by the Credit Calculator that sets out the number and class of biodiversity credits required to offset the remaining adverse impacts on biodiversity values at a development site, or on land to be biodiversity certified, or that sets out the number and class of biodiversity credits that are created at a biodiversity stewardship site.
<b>BioNet Atlas</b>	The BioNet Atlas (formerly known as the NSW Wildlife Atlas) is the OEH database of flora and fauna records. The Atlas contains records of plants, mammals, birds, reptiles, amphibians, some fungi, some invertebrates (such as insects and snails) and some fish
<b>Broad condition state:</b>	Areas of the same PCT that are in relatively homogenous condition. Broad condition is used for stratifying areas of the same PCT into a vegetation zone for the purpose of determining the vegetation integrity score.
<b>Connectivity</b>	The measure of the degree to which an area(s) of native vegetation is linked with other areas of vegetation.
<b>Credit Calculator</b>	The computer program that provides decision support to assessors and proponents by applying the BAM, and which calculates the number and class of biodiversity credits required to offset the impacts of a development or created at a biodiversity stewardship site.
<b>Development</b>	Has the same meaning as development at section 4 of the EP&A Act, or an activity in Part 5 of the EP&A Act. It also includes development as defined in section 115T of the EP&A Act.
<b>Development footprint</b>	The area of land that is directly impacted on by a proposed development, including access roads, and areas used to store construction materials.
<b>Development site</b>	An area of land that is subject to a proposed development that is under the EP&A Act.
<b>Ecosystem credits</b>	A measurement of the value of EECs, CEECs and threatened species habitat for species that can be reliably predicted to occur with a PCT. Ecosystem credits measure the loss in biodiversity values at a development site and the gain in biodiversity values at a biodiversity stewardship site.
<b>High threat exotic plant cover</b>	Plant cover composed of vascular plants not native to Australia that if not controlled will invade and outcompete native plant species.
<b>Hollow bearing tree</b>	A living or dead tree that has at least one hollow. A tree is considered to contain a hollow if: (a) the entrance can be seen; (b) the minimum entrance width is at least 5 cm; (c) the hollow appears to have depth (i.e. you cannot see solid wood beyond the entrance); (d) the hollow is at least 1 m above the ground. Trees must be examined from all angles.
<b>Important wetland</b>	A wetland that is listed in the Directory of Important Wetlands of Australia (DIWA) and SEPP 14 Coastal Wetlands
<b>Linear shaped development</b>	Development that is generally narrow in width and extends across the landscape for a distance greater than 3.5 kilometres in length
<b>Local population</b>	The population that occurs in the study area. In cases where multiple populations occur in the study area or a population occupies part of the study area, impacts on each subpopulation must be assessed separately.
<b>Local wetland</b>	Any wetland that is not identified as an important wetland (refer to definition of Important wetland).
<b>Mitchell landscape</b>	Landscapes with relatively homogeneous geomorphology, soils and broad vegetation types, mapped at a scale of 1:250,000.

Terminology	Definition
<b>Multiple fragmentation impact development</b>	Developments such as wind farms and coal seam gas extraction that require multiple extraction points (wells) or turbines and a network of associated development including roads, tracks, gathering systems/flow lines, transmission lines
<b>Operational Manual</b>	The Operational Manual published from time to time by OEH, which is a guide to assist assessors when using the BAM
<b>Patch size</b>	An area of intact native vegetation that: a) occurs on the development site or biodiversity stewardship site, and b) includes native vegetation that has a gap of less than 100 m from the next area of native vegetation (or $\leq 30$ m for non-woody ecosystems). Patch size may extend onto adjoining land that is not part of the development site or stewardship site..
<b>Proponent</b>	A person who intends to apply for consent to carry out development or for approval for an activity.
<b>Reference sites</b>	The relatively unmodified sites that are assessed to obtain local benchmark information when benchmarks in the Vegetation Benchmarks Database are too broad or otherwise incorrect for the PCT and/or local situation. Benchmarks can also be obtained from published sources.
<b>Regeneration</b>	The proportion of over-storey species characteristic of the PCT that are naturally regenerating and have a diameter at breast height $< 5$ cm within a vegetation zone.
<b>Remaining impact</b>	An impact on biodiversity values after all reasonable measures have been taken to avoid and minimise the impacts of development. Under the BAM, an offset requirement is calculated for the remaining impacts on biodiversity values.
<b>Retirement of credits</b>	The purchase and retirement of biodiversity credits from an already-established biobank site or a biodiversity stewardship site secured by a biodiversity stewardship agreement.
<b>Riparian buffer</b>	Riparian buffers applied to water bodies in accordance with the BAM
<b>Sensitive biodiversity values land map</b>	Development within an area identified on the map requires assessment using the BAM.
<b>Site attributes</b>	The matters assessed to determine vegetation integrity. They include: native plant species richness, native over-storey cover, native mid-storey cover, native ground cover (grasses), native ground cover (shrubs), native ground cover (other), exotic plant cover (as a percentage of total ground and mid-storey cover), number of trees with hollows, proportion of over-storey species occurring as regeneration, and total length of fallen logs.
<b>Site-based development</b>	a development other than a linear shaped development, or a multiple fragmentation impact development
<b>Species credits</b>	The class of biodiversity credits created or required for the impact on threatened species that cannot be reliably predicted to use an area of land based on habitat surrogates. Species that require species credits are listed in the Threatened Biodiversity Data Collection.
<b>Subject land</b>	Is land to which the BAM is applied in Stage 1 to assess the biodiversity values of the land. It includes land that may be a development site, clearing site, proposed for biodiversity certification or land that is proposed for a biodiversity stewardship agreement.
<b>Threatened Biodiversity Data Collection</b>	Part of the BioNet database, published by OEH and accessible from the BioNet website.
<b>Threatened species</b>	Critically Endangered, Endangered or Vulnerable threatened species as defined by Schedule 1 of the BC Act, or any additional threatened species listed under Part 13 of the EPBC Act as Critically Endangered, Endangered or Vulnerable.

Terminology	Definition
<b>Vegetation Benchmarks Database</b>	A database of benchmarks for vegetation classes and some PCTs. The Vegetation Benchmarks Database is published by OEH and is part of the BioNet Vegetation Classification.
<b>Vegetation zone</b>	A relatively homogenous area of native vegetation on a development site, land to be biodiversity certified or a biodiversity stewardship site that is the same PCT and broad condition state.
<b>Wetland</b>	An area of land that is wet by surface water or ground water, or both, for long enough periods that the plants and animals in it are adapted to, and depend on, moist conditions for at least part of their life cycle. Wetlands may exhibit wet and dry phases and may be wet permanently, cyclically or intermittently with fresh, brackish or saline water
<b>Woody native vegetation</b>	Native vegetation that contains an over-storey and/or mid-storey that predominantly consists of trees and/or shrubs



## Appendix B: Vegetation plot data

Table 43: Species matrix (species recorded by plot)

Family	Species	Common name	Exotic	High Threat Weed	PCT 679		PCT 637			
					Plot 3	Plot 1	Plot 2			
					Cover	Abundance	Cover	Abundance	Cover	Abundance
<b>Rosaceae</b>	<i>Acaena novae-zelandiae</i>	Bidgee-widgee	FALSE	-					0.1	5
<b>Polygonaceae</b>	<i>Acetosella vulgaris</i>	Sheep Sorrel	TRUE	Yes	10	10000	0.1	50	0.1	50
<b>Asteraceae</b>	<i>Achillea millefolium</i>	Yarrow	TRUE	Yes	5	5000	1	500		
<b>Poaceae</b>	<i>Anthoxanthum odoratum</i>	Sweet Vernal Grass	TRUE	-	10	1000	5	300		
<b>Myrtaceae</b>	<i>Baeckea gunniana</i>	Alpine Baeckea	FALSE	-					20	50
<b>Myrtaceae</b>	<i>Baeckea utilis</i>	Mountain Baeckea	FALSE	Yes					1	1
<b>Fabaceae (Faboideae)</b>	<i>Bossiaea foliosa</i>	Leafy Bossiaea	FALSE	-	0.1	1				
<b>Myrtaceae</b>	<i>Callistemon pityoides</i>	Alpine Bottlebrush	FALSE	-					0.1	2
<b>Cyperaceae</b>	<i>Carex appressa</i>	Tall Sedge	FALSE	-	0.1	2	1	50	25	200
<b>Cyperaceae</b>	<i>Carex canescens</i>		FALSE	-						
<b>Cyperaceae</b>	<i>Carex echinata</i>	Star Sedge	FALSE	-						
<b>Cyperaceae</b>	<i>Carex gaudichaudiana</i>		FALSE	-			2	300		

Family	Species	Common name	Exotic	High Threat Weed	PCT 679		PCT 637			
<b>Caryophyllaceae</b>	<i>Cerastium glomeratum</i>	Mouse-ear Chickweed	TRUE	-						
<b>Asteraceae</b>	<i>Cirsium vulgare</i>	Spear Thistle	TRUE	-	0.1	1	0.1	5		
<b>Apiaceae</b>	<i>Conium maculatum</i>	Hemlock	TRUE	-					0.2	10
<b>Restionaceae</b>	<i>Empodisma minus</i>		FALSE						5	100
<b>Ericaceae</b>	<i>Epacris paludosa</i>	Swamp Heath	FALSE	-					25	50
<b>Ericaceae</b>	<i>Epacris petrophila</i>	Snow Heath	FALSE	-					2	50
<b>Onagraceae</b>	<i>Epilobium billardierianum</i>		FALSE	-					0.1	10
<b>Onagraceae</b>	<i>Epilobium ciliatum</i>		TRUE	-			1	100	1	50
<b>Myrtaceae</b>	<i>Eucalyptus pauciflora</i>	White Sally	FALSE	-	20	10				
<b>Myrtaceae</b>	<i>Eucalyptus stellulata</i>	Black Sally	FALSE	-	40	20	1	1		
<b>Poaceae</b>	<i>Festuca arundinacea</i>		TRUE	-			50	1000	10	500
<b>Poaceae</b>	<i>Festuca rubra</i>		TRUE	-	60	60000				
<b>Geraniaceae</b>	<i>Geranium spp.</i>		TRUE	-			0.1	2		
<b>Geraniaceae</b>	<i>Geranium retrorsum</i>	Cranesbill Geranium	FALSE	-	0.1	3				
<b>Apiaceae</b>	<i>Gingidia harveyana</i>	Slender Gingidia	FALSE	-			0.1	1		
<b>Proteaceae</b>	<i>Grevillea australis</i>	Alpine Grevillea	FALSE	-			0.1	1	0.2	5
<b>Proteaceae</b>	<i>Hakea microcarpa</i>	Small-fruited Hakea	FALSE	-	2	10	0.4	3	10	30

Family	Species	Common name	Exotic	High Threat Weed	PCT 679		PCT 637			
Poaceae	<i>Holcus lanatus</i>	Yorkshire Fog	TRUE	-	0.5	100	30	500	0.1	1
<b>Fabaceae (Faboideae)</b>	<i>Hovea montana</i>		FALSE	-	1	20				
Asteraceae	<i>Hypochaeris radicata</i>	Catsear	TRUE	-	0.1	10				
Juncaceae	<i>Juncus effusus</i>		TRUE	-			0.5	50	0.1	1
Myrtaceae	<i>Leptospermum grandifolium</i>	Woolly Teatree	FALSE	-					0.3	3
<b>Fabaceae (Faboideae)</b>	<i>Lotus uliginosus</i>	Birds-foot Trefoil	TRUE	-	0.2	100	0.1	10	1	300
Juncaceae	<i>Luzula novae-cambriae</i>		FALSE	-			0.1	20		
Asteraceae	<i>Olearia phlogopappa</i>	Dusty Daisy-bush	FALSE	-			0.1	3		
Apiaceae	<i>Oreomyrrhis ciliata</i>	Bog Carraway	FALSE	-			0.1	1		
Asteraceae	<i>Ozothamnus hookeri</i>	Kerosene Bush	FALSE	-			0.1	2		
Asteraceae	<i>Ozothamnus thyrsoideus</i>		FALSE	-	20	100				
Poaceae	<i>Phalaris aquatica</i>	Phalaris	TRUE	-			1	100		
Plantaginaceae	<i>Plantago lanceolata</i>	Lamb's Tongues	TRUE	-	0.1	1				
Poaceae	<i>Poa fawcettiae</i>	Smooth Blue Snowgrass	FALSE	-					0.1	5
Poaceae	<i>Poa helmsii</i>	Broad-leaved Snowgrass	FALSE	-					2	50
Poaceae	<i>Poa pratensis</i>	Kentucky Bluegrass	TRUE	-	1	200	1	100	1	500

Family	Species	Common name	Exotic	High Threat Weed	PCT 679		PCT 637			
Poaceae	<i>Poa costiniana</i>	Bog Snowgrass	FALSE	-					0.1	1
Amygdalaceae	<i>Prunus spp.</i>		TRUE	-	0.1	1	0.1	1		
Ranunculaceae	<i>Ranunculus spp.</i>		FALSE	-	0.1	5	0.1	5	1	100
Ericaceae	<i>Richea continentis</i>	Candle Heath	FALSE	-					10	50
Polygonaceae	<i>Rumex brownii</i>	Swamp Dock	FALSE	-	0.1	1	0.1	1	0.1	2
Sphagnaceae	<i>Sphagnum cristatum</i>		FALSE	-					0.1	1
Asteraceae	<i>Taraxacum officinale</i>	Dandelion	TRUE	-			0.1	5		
Fabaceae (Faboideae)	<i>Trifolium repens</i>	White Clover	TRUE	-	0.3	50				

Tree (TG), Shrub (SG), Grass & Grasslike (GG), Forb (FG), Fern (EG), Other (OG).

**Table 44: Vegetation integrity data (Composition, Structure and function)**

Plot location data					
Plot no.	PCT	Condition	Easting	Northing	Bearing
1	637	Low	617811	5960082	180
2	637	Degraded	617803	5960027	180
3	679	Degraded	617765	5960010	340

**Composition (number of species)**

Plot	Tree	Shrub	Grass	Forb	Fern	Other
1	1	4	3	4	0	0
2	0	9	5	4	0	0
3	2	4	1	3	0	0

**Structure (Total cover)**

Plot	Tree	Shrub	Grass	Forb	Fern	Other
1	1.0	0.7	3.1	0.4	0.0	0.0
2	0.0	68.6	32.2	1.3	0.0	0.0
3	60.0	23.1	0.1	0.3	0.0	0.0

**Function**

Plot	Large Trees	Hollow trees	Litter Cover	Length Fallen Logs	Tree Stem 5-9	Tree Stem 10-19	Tree Stem 20-29	Tree Stem 30-49	Tree Stem 50-79	Tree Regen	High Threat Weed Cover
1	0	0	32	1	0	1	0	0	0	0	1.1
2	0	0	48	0	0	0	0	0	0	0	0.1
3	0	0	55	0	1	1	1	0	0	0	15.0

## Appendix C: EPBC Act Significant Impact Criteria

The EPBC Act Administrative Guidelines on Significance set out ‘Significant Impact Criteria’ that are to be used to assist in determining whether a proposed action is likely to have a significant impact on matters of national environmental significance. Matters listed under the EPBC Act as being of national environmental significance include:

- Listed threatened species and ecological communities;
- Listed migratory species;
- Wetlands of International Importance;
- The Commonwealth marine environment;
- World Heritage properties;
- National Heritage places;
- Nuclear actions; and
- Great Barrier Reef.

Specific ‘Significant Impact Criteria’ are provided for each matter of national environmental significance except for threatened species and ecological communities in which case separate criteria are provided for species listed as endangered and vulnerable under the EPBC Act.

The Commonwealth listed entities which are known or considered to have the potential to occur within the study area are the Broad-toothed Rat, Latham’s Snipe and Alpine Sphagnum Bogs and Associated Fens EEC.

The relevant Significant Impact Criteria have been applied to determine the significance of impacts associated with the proposal.

Matters to be considered	Impact
Any environmental impact on a World Heritage Property or National Heritage Places	No. The proposed action does not impact on a World Heritage Property or a National Heritage Place as addressed in the SEE. (listed natural: Australian Alpine National Parks and Reserves; nominated historic: Snowy Mountains Scheme NSW).
any environmental impact on Wetlands of International Importance	No. The proposal will not affect any part of Ramsar wetland.
any impact on Commonwealth Listed Critically Endangered or Endangered Species;	No. The study area does not provide potential habitat for any Commonwealth listed endangered species.

any impact on Commonwealth Listed vulnerable Species;	<p>Yes. The study area provides known habitat for one Commonwealth listed vulnerable species: the Broad-toothed Rat.</p> <p>The significant impact criteria in terms of the vulnerable species are discussed below:</p> <p>a. lead to a long-term decrease in the size of an important population of a species.</p> <p>Whilst the proposed action will affect some known Broad-toothed Rat habitat, it will affect only a small amount of the potential habitat for the species in the immediate area. Furthermore, the bulk of the habitat to be affected is highly modified and considered to comprise only marginal habitat for the species based on the paucity of the species characteristic scats observed within the development site. As such, the proposed works are unlikely to adversely affect a significant proportion of the local population of the Broad-toothed Rat and will not result in habitat fragmentation which could isolate individuals or a population of the Broad-toothed Rat. The noise and vibration associated with the proposed works is likely to temporarily deter any Broad-toothed Rat individuals that may be near the affected areas during construction. As such, it is unlikely that any individuals would be killed during the implementation of the proposed action.</p> <p>Under these circumstances the proposed action will not lead to a long-term decrease in the size of an important population of the Broad-toothed Rat.</p> <p>b. reduce the area of occupancy of an important population</p> <p>The proposed action will lead to a relative minor reduction in the area of occupancy of the local population of the Broad-toothed Rat. The species continues to be locally common in the Thredbo Resort Area where there have been many similar and larger developments over many decades. As such, the proposed action is unlikely to significantly reduce the area of occupancy of the Broad-toothed Rat.</p> <p>c. fragment an existing important population into two or more populations</p> <p>The proposed action will not fragment an existing important population of the Broad-toothed Rat into two or more populations. The species population extends beyond the development site and the Thredbo Resort Area. The proposal has been designed to retain connectivity between habitats for the species along the Thredbo River.</p> <p>d. adversely affect habitat critical to the survival of a species</p> <p>No habitat within the development site is considered to be critical to the survival of the Broad-toothed Rat.</p> <p>e. disrupt the breeding cycle of an important population</p> <p>The proposed action and affected area is too small to disrupt the breeding cycle of a population of the Broad-toothed Rat.</p> <p>f. modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline</p> <p>The proposed action will not modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the Broad-toothed Rat is likely to decline.</p> <p>g. result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat</p> <p>The proposed action will not result in invasive species that are harmful becoming established in habitat for the Broad-toothed Rat.</p> <p>h. interferes substantially with the recovery of the species.</p> <p>Whilst there have been documented declines in some Broad-toothed Rat populations within the Snowy Mountains, these declines have been attributed to factors such as major bushfire events and early snow thaws, and not impacts of the nature of those proposed. In any case, the local population of the Broad-toothed Rat appears to continue to be relatively large on the basis of the abundance of the species scat throughout the Thredbo Resort Area, including within the village, and in areas that have been subject to the sorts of development proposed. As such, it is considered highly unlikely that proposed action will substantially interfere with the recovery of the Broad-toothed Rat.</p>
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Any impact on a Commonwealth Endangered Ecological Community	<p>Yes: The Alpine Sphagnum Bogs and Associated Fens endangered ecological community occurs within the development site.</p> <p>The significant impact criteria in terms of endangered ecological communities are discussed below:</p> <p>a. reduce the extent of an ecological community</p> <p>The proposal is expected to result in the loss of approximately 0.16 ha of the Alpine Sphagnum Bogs and Associated Fens EEC, the bulk of which is already heavily modified and of low conservation significance.</p> <p>b. fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines;</p> <p>The proposal will not fragment the Alpine Sphagnum Bogs and Associated Fens EEC as connectivity will be retained, along the Thredbo River, between occurrences of the community up and downstream of the development site.</p> <p>c. adversely affect habitat critical to the survival of an ecological community</p> <p>The local occurrence of the Alpine Sphagnum Bogs and Associated Fens EEC is considerably larger than the development site. In this context, the habitat for the community within the development site is not considered to be critical to its survival.</p> <p>d. modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns</p> <p>The proposal has been designed so as to not modify or destroy the abiotic factors necessary for the survival of the Alpine Sphagnum Bogs and Associated Fens EEC. On the contrary, the proposal has been designed to mitigate against any potential impacts on surface or subsurface hydrology.</p> <p>e. cause a substantial change in the species composition of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting.</p> <p>The development site does not support a unique assemblage of characteristic flora species of the Alpine Sphagnum Bogs and Associated Fens EEC that does not occur elsewhere within the local occurrence. Similarly, the fauna assemblage inhabiting the development site is likely to be distributed throughout the local occurrence and contiguous vegetation. Fauna species such as invertebrates, amphibians, reptiles, birds, and mammals utilising foraging substrates within the development site would not be restricted to the areas affected by the action proposed and would be highly likely to continue to utilise habitats in the remainder of the local occurrence.</p> <p>f. cause a substantial reduction in the quality or integrity of an ecological community, including, but not limited to:</p> <ul style="list-style-type: none"> <li>-assisting invasive species, that area harmful to the listed ecological community, to become established, or</li> <li>-causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants in the ecological community which kill or inhibit the growth of species in the ecological community</li> </ul> <p>The proposed action includes appropriate safeguards to limit the potential for invasive plants or pathogens to encroach upon the Alpine Sphagnum Bogs and Associated Fens EEC. It will also include safeguards which limit the potential for any chemicals or pollutants to enter the Alpine Sphagnum Bogs and Associated Fens EEC in association with the action proposed.</p> <p>g. interfere with the recovery of an ecological community</p> <p>The Alpine Sphagnum Bogs and Associated Fens EEC has recovered well since the cessation of grazing in the NSW alps and is one of the most common vegetation communities in alpine and subalpine habitats. It has also recovered well since the 2003 wildfires.</p> <p>The proposed action will not reduce the extent of the Alpine Sphagnum Bogs and Associated Fens EEC, will not interfere with any wider recovery of the community, which is only potentially threatened by impacts associated with climate change, the re-introduction of grazing, or adverse fire regimes.</p>
--	--



Matters to be considered	Impact
any environmental impact on Commonwealth Listed Migratory Species;	<p>Yes. The development site provides habitat for one listed migratory species, Latham’s Snipe.</p> <p>The significant impact criteria in terms of endangered ecological communities are discussed below:</p> <p>a. substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species</p> <p>A single individual of Latham’s Snipe was flushed from the development site during the surveys in December 2018. The proposal will destroy a small area of already heavily disturbed habitat for the species. However, the better quality habitat for the species within the Riparian Protected Area will be retained. The habitat to be destroyed or modified by the action proposed is not considered to be important habitat for Latham’s Snipe given its small size relative to the extent of similar and better quality habitat for the species associated with the Thredbo River immediately up and downstream, and with the extensive areas of bog and wet tussock grasslands in the locality.</p> <p>b. result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species, or</p> <p>The action proposed will not result in an invasive species that is harmful to the Latham’s Snipe becoming established in an area of important habitat for the species.</p> <p>c. seriously disrupt the lifecycle (breeding, feeding, migration or resting behavior) of an ecologically significant proportion of the population of a migratory species.</p> <p>Latham’s Snipe does not breed in Australia. The proposal is too small to disrupt the lifecycle of an ecologically significant proportion of the population of Latham’s Snipe.</p>
does any part of the Proposed action involve a Nuclear Action;	<p>No. The project does not include a Nuclear Action.</p>
any environmental impact on a Commonwealth Marine Area;	<p>No. There are no Commonwealth Marine Areas within the study area.</p>
In addition, any direct or indirect impact on Commonwealth lands	<p>No. The project does not directly or indirectly affect Commonwealth land.</p>

## Appendix D: Biodiversity credit report



# BAM Credit Summary Report

## Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00013978/BAAS17061/19/00013980	Friday Flat Carpark 3	04/01/2019
Assessor Name	Report Created	BAM Data version *
Ryan Smithers	31/01/2019	6
Assessor Number	* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.	
BAAS17061		

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

Zone	Vegetation zone name	Vegetation integrity loss / gain	Area (ha)	Constant	Species sensitivity to gain class (for BRW)	Biodiversity risk weighting	Candidate SAI	Ecosystem credits
<b>Alpine and sub-alpine peatlands, damp herbfields and fens, South Eastern Highlands Bioregion and Australian Alps Bioregion</b>								
1	637_Low	3.8	0.5	0.25	Moderate Sensitivity to Potential Gain	1.75		0
2	637_Degraded	26.1	0.2	0.25	Moderate Sensitivity to Potential Gain	1.75		2
							<b>Subtotal</b>	<b>2</b>



## BAM Credit Summary Report

Black Sallee - Snow Gum low woodland of montane valleys, South Eastern Highlands Bioregion and Australian Alps Bioregion							
3	679_Degraded	23.2	0.1	0.25	High Sensitivity to Potential Gain	1.50	1
						<b>Subtotal</b>	<b>1</b>
						<b>Total</b>	<b>3</b>

### Species credits for threatened species

Vegetation zone name	Habitat condition (HC)	Area (ha) / individual (HL)	Constant	Biodiversity risk weighting	Candidate SAll	Species credits	
<b><i>Mastacomys fuscus / Broad-toothed Rat ( Fauna )</i></b>							
637_Low	3.8	0.46	0.25	2	False	1	
637_Degraded	26.1	0.16	0.25	2	False	2	
679_Degraded	23.2	0.05	0.25	2	False	1	
						<b>Subtotal</b>	<b>4</b>



## **APPENDIX F**

### **ABORIGINAL DUE DILLIGENCE ASSESSMENT**

# Aboriginal Cultural Heritage Due Diligence Assessment

## FRIDAY FLAT CARPARK PROPOSED EXTENSIONS



Report Prepared for Event Hospitality Pty Ltd

20<sup>th</sup> December 2018

---

Project Number:		6643	
Project File Name:		Due Diligence Friday Flat Carpark Extension	
Revision	Date	Prepared by (name)	Reviewed by (name)
Draft	5/10/2018	Lyn O'Brien	Ivan Pasalich
Final	20/12/2018	Lyn O'Brien	

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## **Important Information Concerning the Distribution of this Document**

This report contains information restricted under NPW Act 1974 and cannot be publicly available. Restricted information includes (but is not limited to):

- Tabled GPS co-ordinates for Aboriginal places or objects, including lithic artefacts, stone arrangements, middens, burials, scarred trees, rock art and Potential Archaeological Deposits.
- Maps or images depicting the location of Aboriginal places or objects, including lithic artefacts, stone arrangements, middens, burials, scarred trees, rock art and Potential Archaeological Deposits.
- Location or overly descriptive information pertaining to places of Aboriginal cultural significance, as expressed or directed by Representative Aboriginal Organisations, Aboriginal elders, or members of the wider Aboriginal community.
- Heritage places or objects vulnerable to vandalism, theft, or damage.

These items must be removed from the report before being made available to the general public and should only be made available to those persons with a just and reasonable need for access to the knowledge.



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## EXECUTIVE SUMMARY

Event Hospitality & Entertainment Limited, operators and managers of Thredbo Alpine Resort, are seeking to upgrade and augment the facilities of the Resort. A number of building projects have been identified as part of this process including the proposed extension of visitor car park facilities at Friday Flat at Thredbo.

This report provides Aboriginal heritage due diligence advice for the proposed extension to the Friday Flat Carpark. The current car parking facilities are in need of expansion to meet the requirements for the increased visitor numbers to the area. The proposed extension will involve the construction of three additional carparks and consists of:

- Carpark 1 – construction of suspended deck and on grade parking to accommodate 115 vehicles within Stage 1 (CP1-A) and 104 vehicles within Stage 2 (CP1-B), located on the south side and adjacent to Friday Flat Drive. This car park is within the current day parking location and will not impact any additional areas.
- Carpark 2 – Construction of on grade parking located on the north side and adjacent to Friday Flat Drive. This area of construction will involve vegetation removal, cut and fill earthworks, storage of materials and temporary lay down areas.
- Carpark 3 – Construction of on grade parking located on the south side of Friday Flat Drive on flats adjacent to Thredbo River. This area of construction will involve vegetation removal, cut and fill earthworks, compaction, plant movement and site construction areas.

The study area is shown in a regional context on Figure 1 and the proposed carpark extension footprint in Figure 2.

No Aboriginal heritage sites were identified within the project area based on a review of heritage registers and previous reports. No areas of Potential Archaeological Deposit (PAD) were located within the project area during the field survey or background review.

As a result of the desktop background research and site visit completed for the project, the following recommendations have been developed:

- No recorded Aboriginal objects or places are present in the project area.
- No areas of high or moderate potential to contain unrecorded Aboriginal objects of places are present in the project area within the locations of carpark 1, 2 or 3.
- The development proposal should be able to proceed with no additional archaeological investigations as no areas of potential archaeological deposits or heritage sites have been identified within these development areas and the potential for Aboriginal heritage objects within the development areas has been assessed as low.
- All Aboriginal objects are protected under the *NSW National Parks and Wildlife Act 1974*. It is an offence to disturb an Aboriginal site without a consent permit issued by the Office of Environment and Heritage. Should any Aboriginal objects be encountered during works then works must cease and the find should not be moved until assessed by a qualified archaeologist.
- In the unlikely event that human remains are discovered during the construction, all work must cease. OEH, the local police and the appropriate LALC should be notified. Further assessment would be required to determine if the remains are Aboriginal or non-Aboriginal.

- Further archaeological assessment would be required if the proposal activity extends beyond the area of the current investigation.

# 1 INTRODUCTION

Event Hospitality & Entertainment Limited, operators and managers of Thredbo Alpine Resort, are seeking to upgrade and augment the facilities of the Resort. A number of building projects have been identified as part of this process including the proposed extension of visitor car park facilities at Friday Flat at Thredbo.

This report provides Aboriginal heritage due diligence advice for the proposed extension to the Friday Flat Carpark. The current car parking facilities are in need of expansion to meet the requirements for the increased visitor numbers to the area. The proposed extension will involve the construction of three additional carparks and consists of:

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- Carpark 3 – Construction of on grade parking located on the south side of Friday Flat Drive on flats adjacent to Thredbo River. This area of construction will involve vegetation removal, cut and fill earthworks, compaction, plant movement and site construction areas.

The study area is shown in a regional context on Figure 1 and the proposed carpark extension footprint in Figure 2.

These works are high impact and would have a negative impact on any Aboriginal heritage located within the project boundary. Aboriginal heritage sites may be located on the surface or subsurface in areas of high potential for the preservation of archaeological remains of past usage by Aboriginal groups.

To assess the potential impacts of the proposed works on Aboriginal heritage this Due Diligence Heritage Assessment has been undertaken.

This report and associated research has been conducted in accordance to the requirements of the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (OEH 2010).

## 1.1 PROJECT OBJECTIVES

The following is a summary of the major objectives of the due diligence assessment:

- Identify Aboriginal objects and places known to exist within the Project Area through a search of the Aboriginal Heritage Information Management System (AHIMS) maintained by the Office of Environment and Heritage (OEH).
- Assessment of Landscape for landforms that may contain potential for unrecorded sites and to determine level of disturbance of landscape features.
- Complete due diligence report containing recommendations to minimise potential impacts to heritage values within the project area.


## **1.2 ABORIGINAL CONSULTATION**

Consultation with the Aboriginal community is not a requirement of the Due Diligence Code and this Due Diligence assessment has been undertaken without further consultation with the LALC. If impacts to Aboriginal heritage are found to occur as a result of the development then consultation will be undertaken with the LALC and the wider Aboriginal community as required by NSW Office of Environment and Heritage (2010).



**Figure 1: Study Area  
in the Thredbo Context**

**Legend**

 Study Area



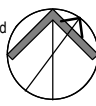
1:10,000

0 62.5 125 250 375 500

Meters

Coordinate System:  
GDA 1994 MGA Zone 55  
Imagery: © Dept. of Finance,  
Services & Innovation 2017

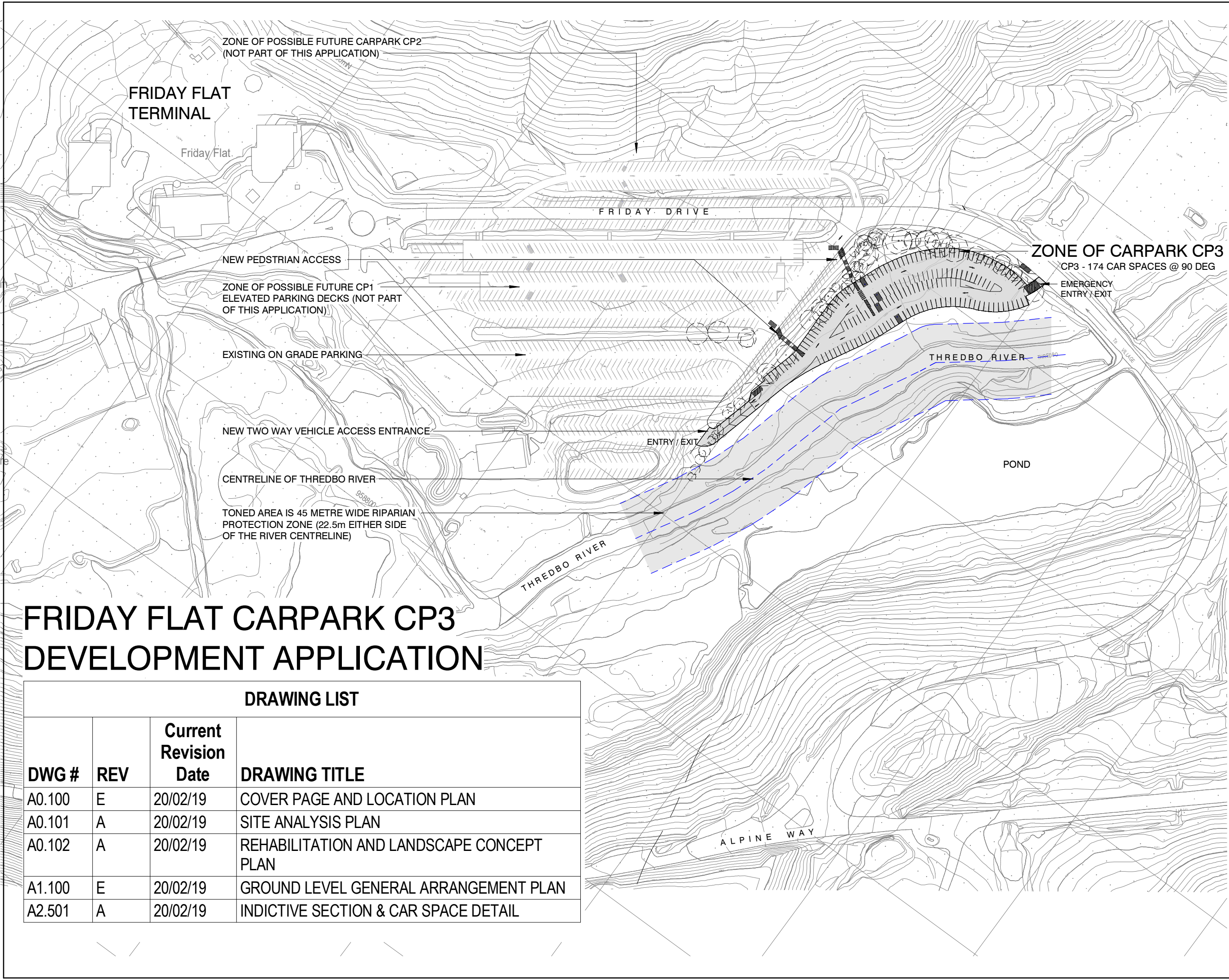
This drawing should be read in conjunction with all relevant contracts, specifications and drawings. Dimensions are in millimetres. Levels are metres. Do not scale off drawings. Use figured dimensions only. Check dimensions on Site. Report discrepancies immediately.



NOTES

AUTHORISED FOR ISSUE

E	20/02/19	UPDATED SET - DRAFT DA	ST
D	14/12/18	UPDATED LAYOUT	ST
C	07/12/18	UPDATED LAYOUT	ST
B	29/11/18	UPDATED LAYOUT	ST
A	23/11/18	INITIAL ISSUE	ST



# FRIDAY FLAT CARPARK CP3 DEVELOPMENT APPLICATION

## DRAWING LIST

DWG #	REV	Current Revision Date	DRAWING TITLE
A0.100	E	20/02/19	COVER PAGE AND LOCATION PLAN
A0.101	A	20/02/19	SITE ANALYSIS PLAN
A0.102	A	20/02/19	REHABILITATION AND LANDSCAPE CONCEPT PLAN
A1.100	E	20/02/19	GROUND LEVEL GENERAL ARRANGEMENT PLAN
A2.501	A	20/02/19	INDICTIVE SECTION & CAR SPACE DETAIL

ISSUE	DATE	SUBJECT	VALIDN.
CLIENT			

EVENT Hospitality and Entertainment

### DEVELOPMENT APPLICATION

PROJECT  
NEW FRIDAY FLAT CARPARK CP3

FRIDAY DRIVE  
THREDBO VILLAGE

ARCHITECT

T +612 9319 2955  
 ABN: 48 942 921 969  
 Nominated Architects:  
 Andrew Hipwell 6562  
 Daniel Beekwilder 6192  
 64 Ross Street  
 Chippendale NSW 2008  
 Sydney Australia  
 djrd.com.au

DRAWN	SCALE AT A3
ST	1 : 2000

DESCRIPTION  
COVER PAGE AND LOCATION PLAN

PROJECT No	DRAWING No	REVISION
18_421	A0.100	E

## 2 ASSESSMENT RESULTS

### 2.1 AHIMS SEARCH

A search of the OEH AHIMS database was undertaken on the 03/09/2018 (AHIMS Search No 367807) covering the 1km surrounding area centred on the project area. The extensive search revealed no previously recorded heritage sites within the project area with 22 sites within the wider search area. Four of the sites are located on ridge lines, two of these sites are located on level spur crests amongst the mid slopes with the remaining on the valley flats near creek lines.

The sites located in this area are provided in table 1 and consist of isolated finds or low density scatters of stone artefacts and conform to the wider site predictive model for the Thredbo Valley/Kosciusko area (NOHC 2000, Grinsbergs 2008, Ironbark 2013). This model predicts a site location model of small sites located on level ground in proximity to water sources, or on level areas of spur lines and ridge crests amongst mountainous areas. These areas would be well drained and provided sheltered locations. This predictive model is discussed in more detail in Section 2.2.

The majority of all sites located in the region consists of low density artefact scatters or isolated finds. The location of previously recorded sites is shown in Figure 3.

Table 1. AHIMS Sites in vicinity of Project Area

<u>Site ID</u>	<u>Site name</u>	<u>Easting</u>	<u>Northing</u>	<u>Site features</u>	<u>Recorders</u>
61-6-0120	Rams Head	614180	5959030	Artefact : 6	Mr.Edward Clarke
61-3-0021	Bogong Creek;No.1;Thredbo;	614500	5958800	Artefact : -	Miss.Marjorie Sullivan
61-3-0024	Bogong Creek;	614714	5959332	Artefact : -	S.L Hodges
61-3-0049	Crackenback Chairlift 1;	615170	5960500	Artefact : -	Kerry Navin,Mr.Kelvin Officer
61-6-0081	Golf Course Extension Site 1;	615900	5958520	Artefact : -	Ms.N Fuller
61-6-0099	Ramshead Creek 1;	616100	5958960	Artefact : -	Mr.Kelvin Officer
61-6-0100	Ramshead Creek 2;	616290	5959060	Artefact : -	Mr.Kelvin Officer
61-6-0103	EDI 1	616820	5959600	Artefact : -	Charles Dearling Archaeological and Cultural Heritage Consultants
61-6-0121	Merritts Creek 1	616850	5959500	Artefact : -	Mr. Alistair Grinbergs
61-6-0082	Merritts Park Nature Trail;Site 1;	616930	5959330	Artefact : -	Ms.N Fuller
61-6-0083	Merritts Park, Site 1;	617150	5959550	Artefact : -	Ms.N Fuller



<u>Site ID</u>	<u>Site name</u>	<u>Easting</u>	<u>Northing</u>	<u>Site features</u>	<u>Recorders</u>
61-3-0065	Friday Flat IF-1;?;	617550	5959500	Artefact : 1	P Saunders
61-6-0104	Friday Flat 2	617800	5959710	Artefact : 1	Kerry Navin,Mr.Kelvin Officer
61-3-0062	Alpine Way 7	617909	5959497	Artefact : -	Kerry Navin
61-3-0063	Alpine Way 8	618350	5960050	Artefact : -	Kerry Navin
61-3-0137	Thredbo Walking Track 20	618380	5960092	Artefact : 4	Mr.Alistair Grinbergs
61-3-0138	Thredbo Walking Track 21	618380	5960092	Artefact : 1	Mr.Alistair Grinbergs
61-3-0039	Bullocks Flat to Thredbo 11	618500	5960150	Artefact : -	M Walkington
61-3-0038	Bullocks Flat to Thredbo 10	618700	5960300	Artefact : -	M Walkington
61-3-0037	Bullocks Flat to Thredbo 09	619050	5960700	Artefact : -	M Walkington
61-3-0036	Bullocks Flat to Thredbo 08	619200	5960650	Artefact : -	M Walkington
61-3-0044	Bullocks Flat to Thredbo 12	619650	5960890	Artefact : -	Mr.Doug Williams,Doctor.Sue Feary

## 2.2 PREVIOUS HERITAGE STUDIES

A number of heritage studies have been undertaken in the immediate area of the Thredbo Valley. These have been mainly small scale and development focused. Studies covering a larger area and generating models of occupation have been undertaken in the Perisher Valley (NOHC 2000) and Thredbo (Ironbark 2013). A review of this large body of work has been undertaken to provide context and site location modelling for the project area. The most relevant reports for the current project are summarised below.

Geering (1983) undertook field survey and assessment of the Bullocks Flat area for the Skitube development. The assessment recorded twelve isolated artefacts and three artefact scatters. Paton (1984) completed a further assessment including excavation of test pits in areas of high potential and in areas based on modelling considered to hold low potential, such as steeper slopes. None of the test pits revealed any artefacts and Paton concluded that the modelling based on areas of level ground near creek lines (Flood 1980) was correct in this location.

Paton (1985) completed a survey along the Thredbo River valley between the Ranger Station and Dead Horse Gap for the Alpine Way upgrade. This survey covered a range of differing landforms located on site on area of level ground amongst spur line.

Walkington (1988) completed a survey for a proposed 33kV powerline from Bullocks Flat to Thredbo identifying 11 artefact scatters and two isolated finds. Almost all of the sites found were situated on gently sloping ground such as spurs elevated above the river.

Paton (1988) surveyed the Thredbo Valley for a fibre optic cable route again crossing differing topographies in the area. Paton located a further two site during this assessment which supported his earlier location model.

Fuller (1988) completed a survey of the proposed development areas in Thredbo Village recording seven archaeological sites all consisting of isolated finds or small artefact scatters. The sites were located in level areas on basal and midslopes. Fuller concludes that all of the sites are typical of high altitude sites in being low-density artefact scatters (1988:7).

Navin and Officer completed two surveys of the Thredbo valley, one for the Alpine Way in 1992 and the other for the Thredbo Alpine Village in 1994. A number of small sites were located, conforming to the site models being isolated finds or small artefact scatters located on level areas or gradual slopes within basal contexts and within 400m of the river frontage.

Kamminga (1993) interprets the archaeology of the Thredbo valley as a continuous archaeological site, comprising many activity areas. He postulates that flaking of quartz pebbles at locations along the valley floor and lower slopes over millennia has produced a high background count of flaking debitage. Kamminga considers that every test excavation conducted at regular intervals along the Thredbo valley will reveal stone artefacts (Kamminga 1993).

Navin Officer completed a further survey in 1996 for the proposed electricity cable along Thredbo River. This surveyed identified site 62-1-0104 located on the southern bank of the Thredbo River, opposite the current study area. This site consisted of a scatter of 5 artefacts and an area of moderate potential on the lower slopes, located approximately 50m back from the alluvial flats.

NOHC in 2000 completed a large scale and extensive field surveys and subsurface testing of landforms for the Perisher Blue Ski Resort. This study resulted in the development of a site location model which is equally applicable to the Thredbo region as similar topography and landscape features are present.

Navin Officer Heritage Consultants concluded that the strongest site determinants were:

- Relatively level, well drained ground
- Shelter from prevailing weather patterns (mainly from the west and northwest)
- Avoidance of cold air drainage contexts
- Preference for terrain which facilitates pedestrian access and through travel
- Proximity to exploitable resources such as open woodland, grassland and herb fields and Bogong moth aestivation sites (2000:41).
- Majority of sites would be small artefact scatters of less than 15 artefacts, found throughout landscape
- Larger sites (minority) would be located on crests of ridges and major spur lines or more commonly on basal valley slopes. The larger sites decreased in artefact density the higher the location from the basal slopes (NOHC 2000:41).

Dibden (2003) completed a survey of proposed upgrade works for Antons and Sponnars T-bars at Thredbo. No sites were found, due to previous disturbance from clearing, land modification for grooming of ski slopes and the fact that the study corridor was located on steep, mid to upper slopes with low archaeological potential (2003:1).

Aecom (Formerly HLA) throughout 2004 and 2005 completed a series of survey and excavations for a proposed works depot at Friday Flat, located on level basal slopes and within a recorded site location (NOHC 1992) on the southern side of Alpine Way. This site is approximately 413m south of the current study area and 300m south of the Thredbo River. The excavations were placed in six differing locations and recovered 99 artefacts.

Grinsbergs (2008) completed a survey for the proposed multi-use trail from Bullocks Flat to Thredbo which identified 21 sites, comprising 11 artefact scatters, nine isolated artefacts and a grinding groove as well as two areas of potential archaeological deposit. All of these sites were spread along the basal slopes of the Thredbo River or river flat areas. Based on the site locations Grinbergs concludes that general model of site location for the valley was applicable and reflective of the archaeological situation.

Ironbark Heritage (2013) completed a due diligence assessment for the Thredbo Mountain Bike Trails which included the development of a GIS Slope analysis model. This assessment showed slopes of more than 10 degrees as not being conducive to Aboriginal usage and holding low potential for sites and subsurface deposits. Comparison of the current project area to the slope analysis model shows the majority of the alignments within the low potential areas.

AMBS (2013) completed an overview study of the Thredbo Village Area for development planning. Two areas adjacent to the current study area were investigated, the workshop area on the western side (carpark area) and an area for additional staff residents on the southern side of Thredbo River. The workshop area was considered to hold low potential based on previous disturbance levels whilst the area on the southern side of the Thredbo River was considered to hold moderate potential on the lower slopes above the river flats. This area was also the location of artefact scatter 62-1-0104. In addition to the previously recorded sites within the large area of assessment, AMBS identified a number of small artefact scatters and areas of potential based on site patterning. They concluded that sites would most likely be located (AMBS 2013:21):

- On lower slopes and in places where the valley floor widens
- Sites are likely to be greater in size (area) and higher in density with decreasing altitude below tree line
- Sites are likely to occur along topographic features such as major ridgelines, saddles and valleys which were used as Aboriginal people as access routes through the mountains
- Well drained elevated flats, at least 20m above marshy alluvial flats adjacent to creek lines, were favoured locations
- Sites may also be located on well drained moderately inclined slopes; however this occurs less frequently

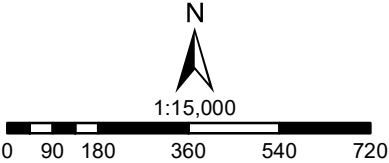
NGH (2017) completed an Aboriginal heritage due diligence assessment for the Thredbo Mountain Bike Trails covering three new trail locations. The terrain features within the project area were mostly steep slopes, with few potential areas of sensitive landforms. No sites or areas of potential were identified and the study concluded that the potential for the presence of Aboriginal sites is low due to the level of disturbance associated with previous ski slope work and the general steepness of the terrain.

Figure 3: AHIMS



Legend

- ★ AHIMS
- StudyArea



Coordinate System:  
GDA 1994 MGA Zone 55  
Imagery: © Dept. of Finance,  
Services & Innovation 2017

## 2.3 PREDICTIVE MODEL

The findings of these previous assessments have been used for the development of a predictive model for the project area (Table 2). The project area is limited in size and confined to lower slopes and river flats.

This site prediction model is based on:

- Site distribution in relation to landscape features within the project area
- Consideration of site type and densities likely to be present within the project area
- Potential Aboriginal use of natural resources present or once present within the project area
- Opportunities for movement through the landscape
- Soil properties.

**Table 2 Site Prediction Model**

Site Type	Definition	Potential to occur
<b>Isolated finds and surface scatters of stone artefacts</b>	Artefact sites can range from high density concentrations to sparse, low density 'background' scatters and single finds	Moderate – small scatters and isolated finds have been previously recorded near creek lines and spur crests. Areas of level lower slopes may be present within the project area. No sites recorded in river flats.
<b>Rock Engravings</b>	Motifs scratched or painted onto rock surfaces, usually within a rock shelter or overhang.	Nil: No such rock features are present within the project area.
<b>Stone arrangements</b>	Stone arrangements can include circles, lines and other patterns and usually mark ceremonial areas.	Nil: this is a rare site type and no previous studies have identified this site type as present.
<b>Stone quarries/Ochre sources</b>	Raw materials for lithic artefacts and ochre are gathered from these sites. They are highly valued by the community.	Nil: There are no known ochre or stone quarries identified by previous studies. The nearest known quarry is silcrete located on western shore of Lake George
<b>Potential Archaeological Deposits (PADS)</b>	Sub surface deposit of cultural material	Low – aerial photos show high degree of disturbance
<b>Scarred Trees</b>	Trees with cultural modifications over 150 year old.	Nil: no remnant mature trees remain within project area.
<b>Axe grinding grooves</b>	Grooves in stone platforms created through grinding of stone implements such as axe heads	Nil: no stone platforms occur within the project area

Site Type	Definition	Potential to occur
<b>Burials</b>	Burials of Aboriginal persons	Nil: no deep sand deposits or soil types are present within the project area to indicate the potential for burials to occur.
<b>Aboriginal places</b>	Aboriginal places may not have any archaeological remains present, but are important to Aboriginal people due to their cultural, spiritual or historical associations.	Nil: There are no recorded associations for the project area.

## 3 SITE VISIT

A site visit and field survey of the study area was undertaken on the 21st September 2018 to verify the findings of the desktop review of landforms and disturbance. The aim of the investigation was to identify heritage objects or places of Potential Archaeological Deposit (PAD). Based upon the background research, known Aboriginal site patterning, current aerial photography, existing ground disturbances and consultation with the land owner, a pedestrian survey methodology was developed focused on the areas of proposed impact. All of these proposed impact areas were visually inspected and degree of disturbance noted.

Special attention was given to areas along drainage lines and on the surrounding landforms considered to hold potential based on landform modelling. All surveyed areas and items of interest were recorded on a topographic map of the study area (using a GPS and GDA 94 coordinates), along with levels of visibility, erosion, soil conditions, and evidence of land disturbance.

### 3.1 LANDFORM ASSESSMENT

The project area consists of a level to gently gradient area on the lower slopes above the Thredbo River to the north of Friday Flat Drive and a second area on the river flats to the south of Friday Flat Drive and to the north of the Thredbo River. Based on aerial photography the river flat area currently consists of grasslands and river flat vegetation communities and appears to hold a low level of disturbance. The area on the lower slopes to the north of Friday Flat Drive appears to have been impacted by the construction of the access road and to consist of moulded slopes and revegetation of grasses and tree plantings.

The Thredbo valley was a major thoroughfare for Aboriginal people moving into the higher mountain peaks from ceremonial grounds at Kalkite and the Wollondibby valley and the base of Mount Crackenback (Kamminga 1993). Open areas such as Friday Flats would have been a focus for camping and ceremonial activity.

Due to the importance of the area for the annual Bogong migration it is highly likely that the Thredbo Valley was used frequently by non-Ngarigo speaking people from the coast and elsewhere, for the purposes of meeting with other groups for ceremonial activities.

Review of previous sites located in the vicinity indicates a site location model based on level areas of lower slopes and creek flats in proximity to water resources such as small creek lines or level areas along spur lines and ridge crests (NOHC 2000, Ironbark 2013). The location of the proposed car park extension (Carpark 2) is positioned on a level area of lower slopes above the Thredbo River and holds moderate potential for Aboriginal heritage, however this area appears to have been subject to modification and impacts due to roadworks. The degree of disturbance is discussed in section 3.1.2.

The area of Carpark 3 is located on alluvial flats considered to hold low potential for Aboriginal heritage to be present based on marshy, poorly drained ground cover.

The potential of these landforms to retain unrecorded heritage sites or deposits will depend on their degree of disturbance and surface conditions. These factors will be investigated in the following sections.

### 3.2 GROUND SURFACE VISIBILITY

Ground surface visibility (GSV) is the percentage of ground surface that is visible during the field inspection. GSV increases in areas of exposures such as stock impact trails, roads, gates and along areas of erosion such as creek banks and dam walls. As a result surveys undertaken in areas with high exposure rates result in a more effective survey coverage.

GSV over most of the study area was very low due to the high levels of vegetation and grass coverage. Exposures were present at low frequency across the project areas consisting of levelled areas, pedestrian walking trails and mountain bike trails. The conditions at the time of the site visit are shown in plate 1.



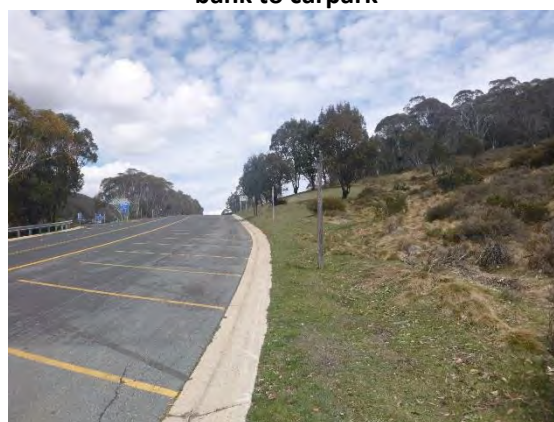
**Plate 1: view north across Carpark 3 - low GSV with planted trees along road verge**



**Plate 2: view north east along Thredbo River flats to carpark 3 location showing constructed bank to carpark**



**Plate 3: view east along Carpark 2 area**



**Plate 4: view west along carpark 2 area**

### 3.3 DISTURBANCE

The project area has been subject to a high level of overall disturbance. Historically the Thredbo valley was used as a major stock route for pastoral grazing in the high country. Lower slope areas at Thredbo would have been impacted by the hard hooves, removal of trees and damage to river frontage. This practice was halted in 1958 (AMBS 2013:21).

The development of Thredbo for recreation commenced in the 1950s and a number of previous developments have occurred in the vicinity of the project area. The area along the valley floor has been levelled for buildings, facilities and car parking. These actions involved the cut and fill of landforms and slopes and the deposition of large amounts of fill to provide level areas above flood inundation. The construction of Friday Flat Drive also involved earthworks, material stockpile and work site areas. These



works have been undertaken adjacent to the current project area and these areas would have been affected to various degrees by these works.

The degree of disturbance varied across the two car park areas (Carpark 2 and Carpark 3). Disturbance appeared to be high across the area of Carpark 2, located adjacent to the north of Friday Flat Drive. Disturbances were present in the form of prior vegetation and tree removal, construction of mountain bike and pedestrian trails and Friday Flat Drive. The landform appeared to have been shaped to provide level to gentle gradient access to walking trails and has been planted with grass and rows of trees along the verge of Friday Flat Drive. The excavation for the road access and the land shaping along the verges would have removed or deposited soils in this area removing archaeological potential for site retention. Blue metal and gravels are visible in several locations along the road verge on the slopes.

Disturbance appeared to be low across the river flats proposed for Carpark 3. The flats were wet and marshy on the day of field survey with clear water channels through the vegetation. Being low lying and just above the river line this area would be currently subject to flood events. The marshy conditions would not have been conducive to Aboriginal camping or gathering as sites are generally located in well drained, elevated contexts above water lines. This area is considered to hold low potential for any unrecorded heritage sites to be present in a subsurface context.



**Plate 5: area of river flats showing standing water through grasses.**

### **3.4 RESULTS - ABORIGINAL HERITAGE SITES**

No areas of Aboriginal heritage were identified during the field survey. No known heritage sites will be affected by the proposed development.

### **3.5 RESULTS - AREAS OF POTENTIAL ARCHAEOLOGICAL DEPOSIT (PAD)**

Areas of PAD are defined as landforms that hold higher potential than their surrounds to contain subsurface deposits of past Aboriginal occupation. Based on a review of previous studies completed for the region, areas of PAD would be located in association with waterways (1<sup>st</sup> or 2<sup>nd</sup> order streams) on well drained level ground or within level areas of mid slopes and spurlines.

Areas matching this description are present along the northern verge of Friday Flat Drive within the area of Carpark 2, but due to the high level of disturbance the potential for sites to be present has been removed. The area of Carpark 3 is located within low lying marshy river flats considered to hold low potential for unrecorded heritage sites.

As a result of the site visit no areas of PAD were identified as present within the two areas of proposed impact.

## 4 IMPACT ASSESSMENT

As a result of the desktop assessment and site visit, it is considered that the project has low potential to impact on unrecorded Aboriginal heritage sites or areas of PAD. No Aboriginal heritage sites and no areas of PAD were recorded as a result of the assessment.

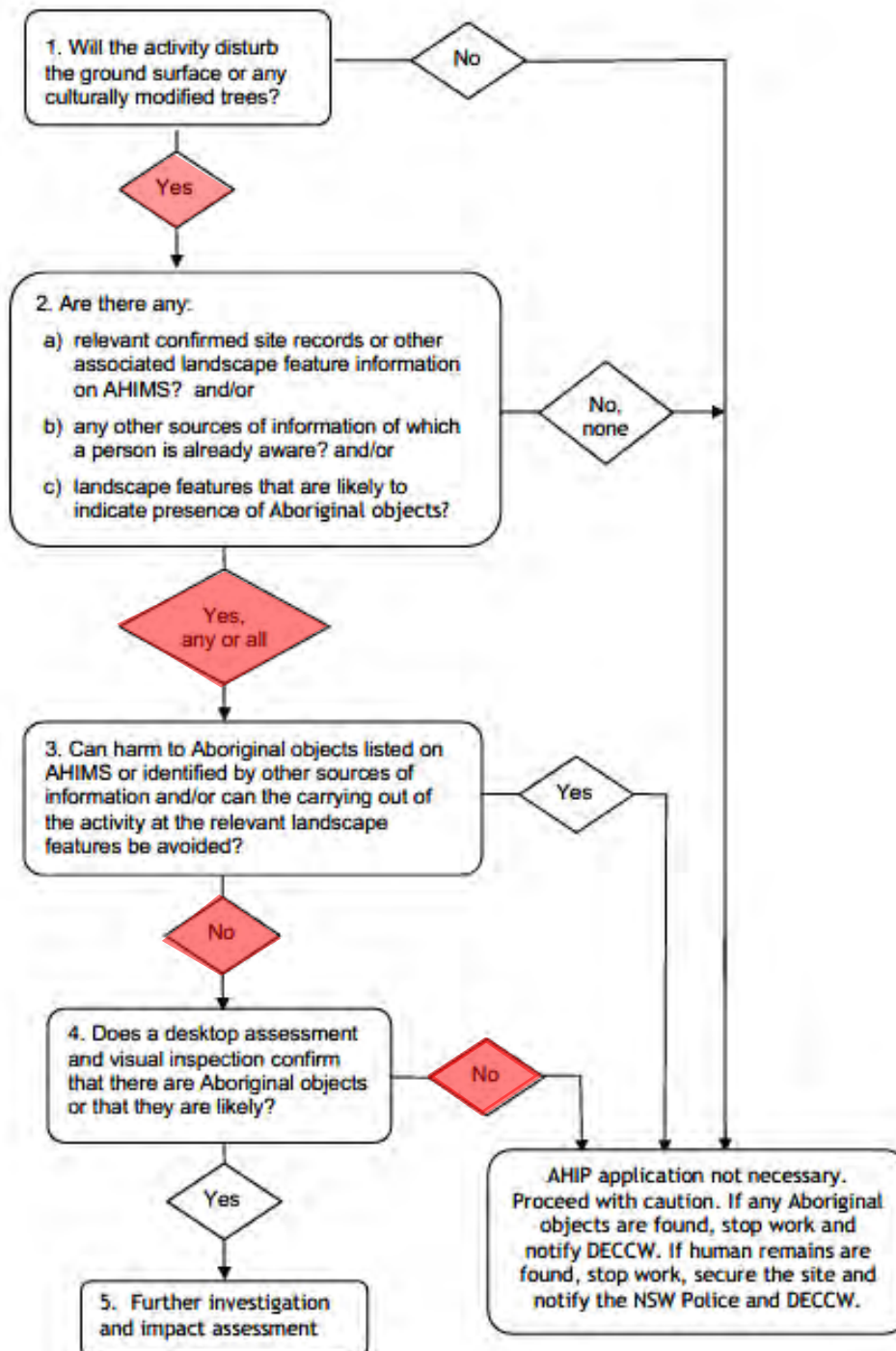
The area of Carpark 1 is within the boundary of the current constructed carpark and will have no heritage impacts. Areas within the project area for Carpark 2 where slopes are gentler have been impacted by previous land shaping and construction of car parking facilities and access roads, whilst the area of Carpark 3 is located in low lying marshy river flats.

Based on the assessment the impacts from the project are as follows:

- No known Aboriginal objects or places will be impacted by the proposed works.
- No known Aboriginal objects or places are present in the project area.
- No areas of high or moderate potential to contain unrecorded Aboriginal objects of places are present in the project area within the locations of carpark 1, 2 or 3.

The Code provides a flowchart of six questions to identify the presence of and potential harm to Aboriginal heritage. These questions and their applicability to the project are shown in Figure 4. The responses to these questions determine if further heritage investigations are required.

Figure 4. Flowchart of Due Diligence process



## 4.1 RECOMMENDATIONS

Based on this due diligence assessment the following actions are recommended for the project.

### **Recommendation 1: Works to proceed without further heritage assessment with caution in areas of Carpark 1, 2 and 3.**

The proposed works can proceed without further assessment as no Aboriginal heritage sites (objects or places) are present within the project area. The potential of impacting unrecorded sites within these areas during the proposed works is assessed as extremely low, based on landform analysis and prior levels of disturbance.

### **Recommendation 2: Discovery of Unanticipated Aboriginal cultural material.**

All Aboriginal places and objects are protected under the NPW Act 1977. This protection extends to Aboriginal material that has not been previously identified, but might be unearthed during construction activities. In the event that Aboriginal material is discovered during construction the following steps should be undertaken:

- **Cease Work:** Works must cease in the vicinity of the find and a fenced buffer zone of 10m around the find be erected.
- **Notification:** OEH must be notified of the find.
- **Management:** A qualified heritage consultant should be engaged to assess and record the find in accordance with the legislative requirements and OEH guidelines. If the find is Aboriginal in nature, consult with OEH in regards to appropriate steps and management. This would usually involve consultation with the Aboriginal community and may require application for an Aboriginal Heritage Impact Permit.

Adherence to these recommendations will result in the low potential for the proposal to negatively impact on Aboriginal heritage values.

### **Recommendation 3: Discovery of Human Remains**

In the unlikely event that human remains are discovered during the construction, all work must cease. OEH, the local police and the appropriate LALC should be notified. Further assessment would be required to determine if the remains are Aboriginal or non-Aboriginal.

### **Recommendation 4: Alteration of impact footprint**

Further archaeological assessment would be required if the proposal activity extends beyond the area of the current investigation.

## 5 REFERENCES

- Australian Museum Business Services. (2013). *Thredbo Project: Preliminary Aboriginal Cultural Heritage Assessment*. Report to Amalgamated Holdings Limited.
- Dearling, C. (1997). *Cultural Heritage Survey Proposed 'Easy Does It' Ski Run Improvement Works Thredbo*. Report to Kosciusko Thredbo Pty Ltd.
- Fuller, N. (1988). *An Archaeological Assessment of Potential Development Areas in Thredbo Village*. Report to Margule and Partners.
- Geering, K. (1983). *Archaeological Survey Appendix J in Hogg 1983. Perisher Skitube Skifields Access System EIS*.
- Grinbergs, A. (2008). *Preliminary Aboriginal Cultural Heritage Assessment Proposed Thredbo to Bullocks Multi-Use track*. Report to Dept of Environment and Climate Change.
- HLA- Environsciences. (2004). *Indigenous Heritage Assessment: Snow Clearing Depot Friday Flat, Thredbo*. Report to NSW Road and Traffic Authority.
- HLA Environsciences. (2005). *Preliminary Research Permits #2071 and 2072: Excavations and Findings at Friday Flat Snow Clearing Depot Thredbo NSW*. Report to National Parks and Wildlife Service .
- Ironbark Heritage. (2013). *A Cultural Heritage Due Diligence Assessment for Thredbo Bike Trails Stage 1 Kosciusko National Park*. Report to Dabyne Planning Pty Ltd.
- Navin Officer Heritage Consultants . (1996). *Archaeological Survey: proposed underground electricity easement Thredbo KNP*. Report to Margule and Partners.
- Navin Officer Heritage Consultants. (1992). *Archaeological Survey: Alpine Way, Kosciusko National Park NSW*. Report to NSW National Park and Wildlife Service.
- Navin Officer Heritage Consultants. (2000). *Perisher Range Resorts Area Aboriginal Cultural Heritage Study*. Report to Connell Wagner Pty Ltd.
- NSW Archaeology. (2003). *Electric Driver Conversion of Antons and Spooners T-Bar lifts Thredbo NSW*. Report to NGH Environmental.
- NSW Archaeology. (2004). *Tower 10 Ski run proposed works, Thredbo NSW Aboriginal Archaeological Assessment*. Report to URS Australia Pty Ltd.
- Paton, R. (1984). *An Archaeological Survey of the Bullocks Flat Skitube Development*. Report to Phil McMaster Pty Ltd.
- Paton, R. (1985). *An Archaeological Survey of the Proposed Alpine Way Re-alignment near Thredbo, NSW*. Report to National Parks and Wildlife Service.
- Paton, R. (1988). *An Archaeological Investigation of the Thredbo Telecom Valley Optical Fibre Cable Route*. Report to David Hogg Pty Ltd.
- Walkington, M. (1987). *An Archaeological survey of a 33kV transmission Line (no 2) from Bullocks Flat to Thredbo*. Report to Monaro City Council.