Biodiversity and Aboriginal Heritage Assessment

Project: Visitor Centre, Quarry Enlargement & Other Infrastructure
213A Kings Cross Road, Kiandra NSW
Lot 36 DP 46316

DATE: NOVEMBER 2020
REVISION: 02
PREPARED FOR: SELWYN SNOW RESORT PTY LTD
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1.0 Project Details

The project for which this Statement applies is for a new guest facility building for Selwyn Snow Resort, lifting and snow play areas as well as essential infrastructure. The proposal aims to seek approval for a new staged guest facility building, relocated snow play area, enlargement of quarry for increased water storage, two above ground portable lifts and essential infrastructure to provide much needed amenities for visitors to Selwyn Snow Resort during the winter ski season.

Selwyn Snow Resort is located at 213A Kings Cross Road, Kiandra within the Kosciusko National Park, NSW. The site is legally described as Lot 36 DP46316.

Facility buildings which serviced Selwyn Snow Resort experienced extensive damage during the 2019/2020 bushfire season and have since been removed from site. As a result, the site is currently clear of structures and this application is part of the re-development of the alpine resort.

The proposed development is deemed to be of positive influence on both the Selwyn Snow Resort and Kosciuszko National Park by offering guest facilities and essential infrastructure to enhance the safety and guest experience of visitors to Selwyn Snow Resort after the previous building being lost in the 2019/2020 bushfires. The relocation of the toboggan slope and installation of above ground portable lifts in a new learning area will create fun outdoor recreation activities for families visiting the resort. As a result, the proposed development provides a safe recreation environment to visitors enhancing their experience of Kosciuszko National Park.

FIGURE 1 SITE LOCALITY WITHIN KOSCIUSZKO NATIONAL PARK

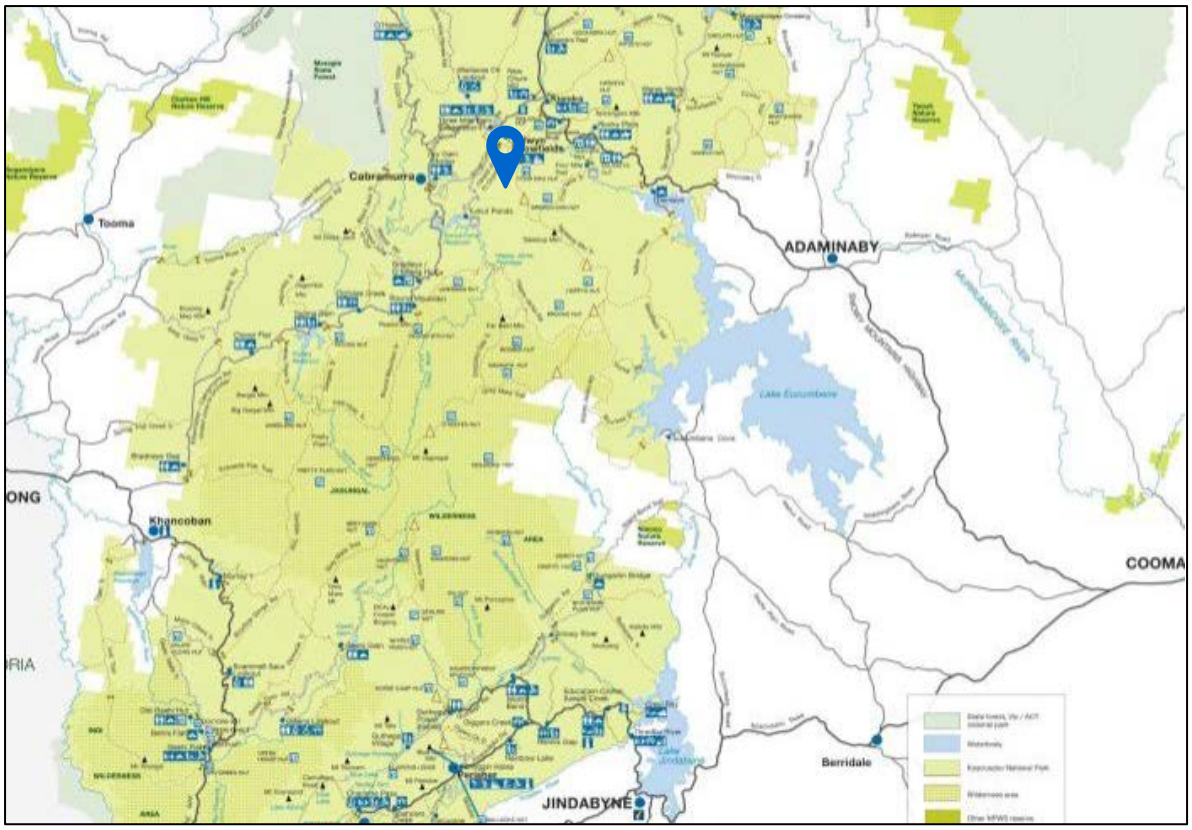


Image source: National Parks and Wildlife Services (2014)

FIGURE 2 PROPOSED LOCATION OF GUEST FACILITIES WITHIN CONTEXT OF SELWYN SNOW RESORT

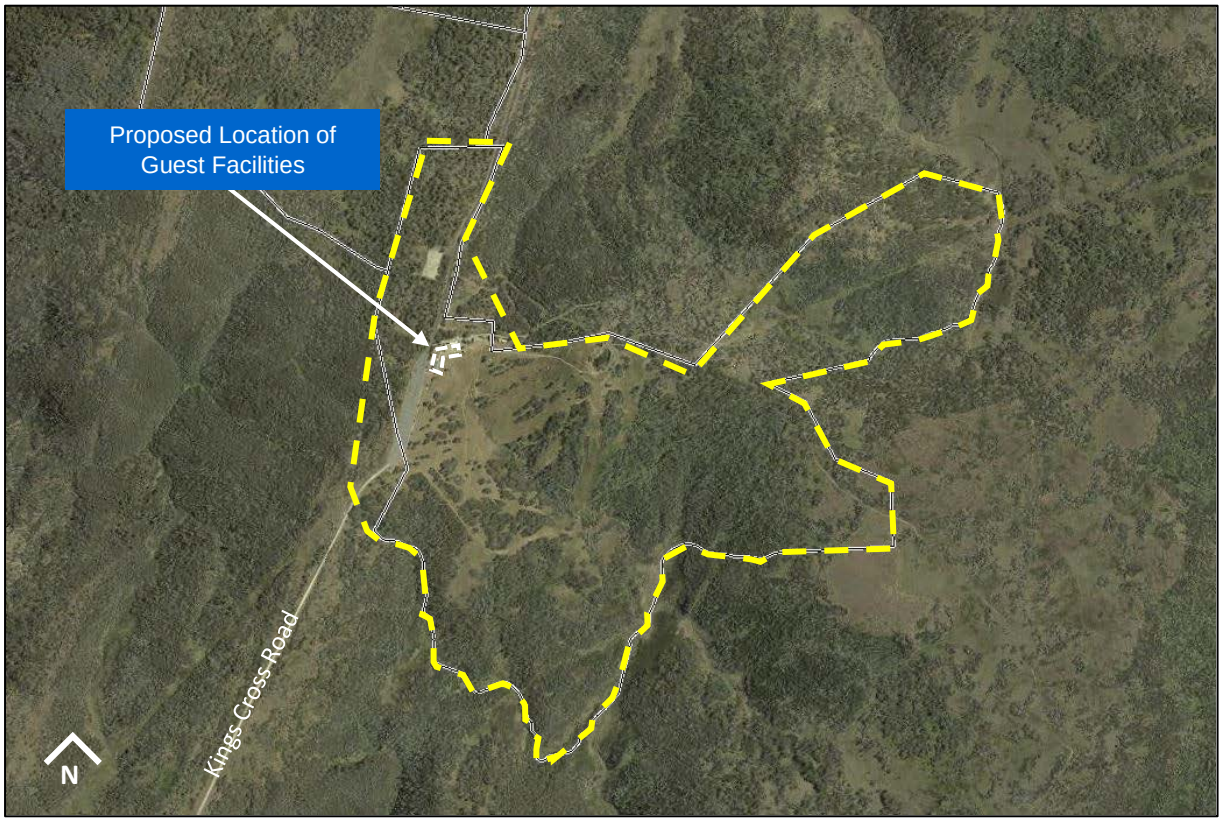


Image source: Six Maps

FIGURE 3 PROPOSED VISITOR CENTRE LOCATION

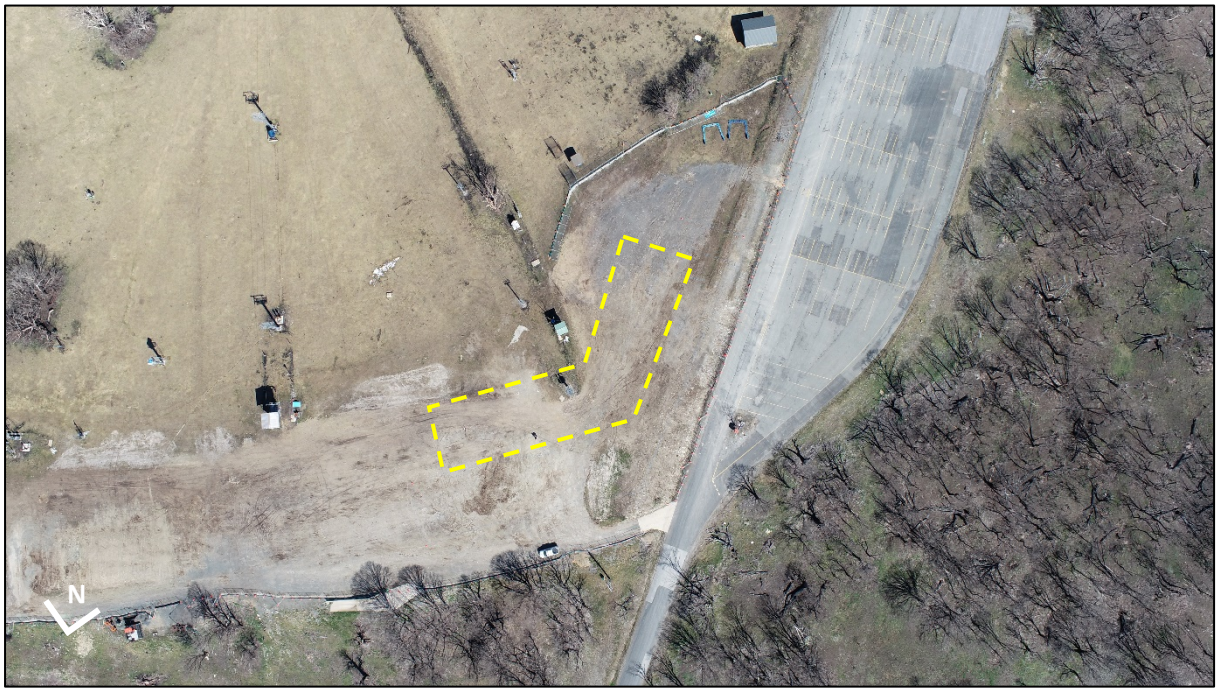


FIGURE 4 PROPOSED SITE PLAN OVER AERIAL PHOTO

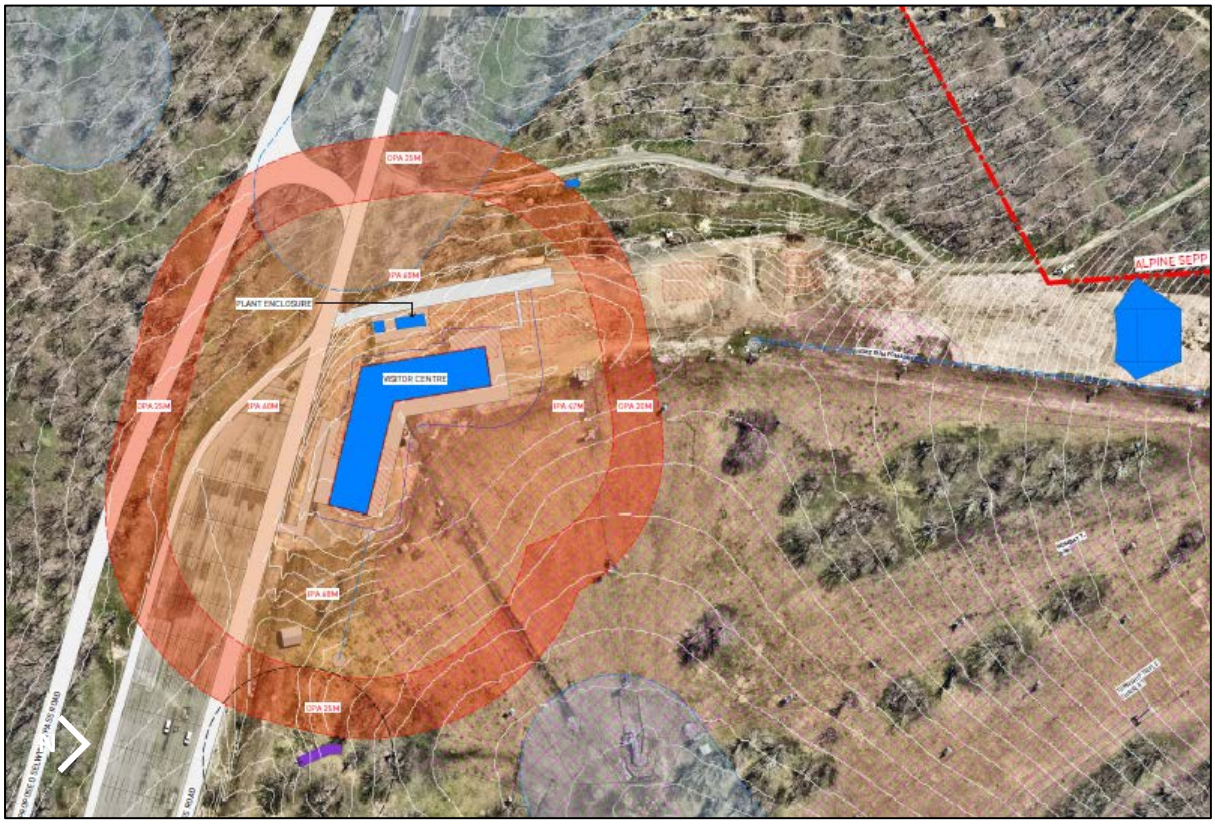


Image source: Sissons

FIGURE 5 PROPOSED SITE PLAN

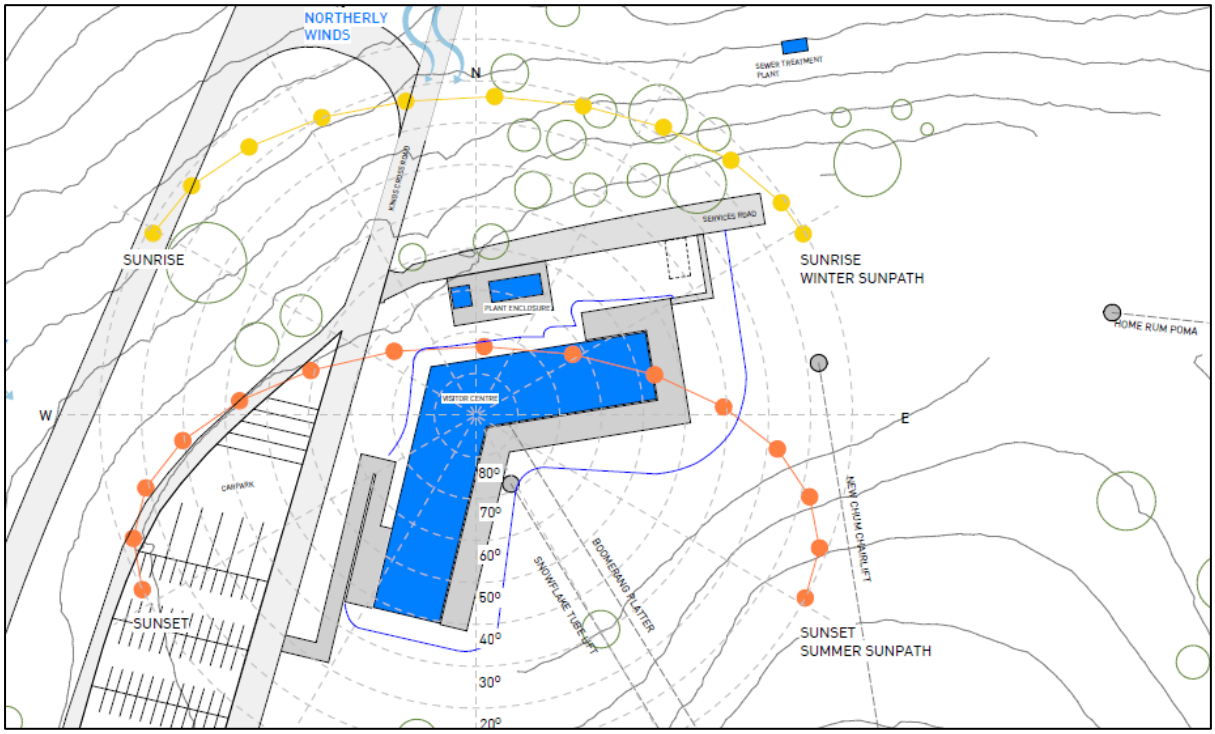


Image source: Sissons

2.0 Biodiversity Offsets Scheme Assessment

It is vital that all development and clearing follows the Biodiversity Offsets Scheme which has been created to avoid, minimise and offset impacts on biodiversity.

There are two key elements to the Biodiversity Offsets Scheme, as follows:

A. Developers and landholders who undertake development or clearing, generating a credit obligation which must be retired to offset their activity
B. Landholders who establish a biodiversity stewardship site on their land, generating credits to sell to developers or landholders who require those credits, to securely offset activities at other sites.

This report will address and assess the proposed works and requirements under element A. To complete this assessment, we will evaluate the four triggers and demonstrate that the proposed guest facilities, wastewater treatment facility, toboggan slope, above ground portable lifts and associated infrastructure will not trigger the Biodiversity Offsets Scheme and therefore the owner will not be required to offset their proposed activities.

The proposed site for the guest facilities is within the extensively disturbed area of previous facility buildings including the Selwyn Centre and separate ski hire building, there is no vegetation removal within the site area. Likewise, the toboggan slope, sewerage treatment facility, above ground portable lifts and infrastructure will not require vegetation removal required, especially when using David Wood's recommended methodology for services trenches. In addition to this, vegetation within the proposed APZ area of the guest facilities building is the fire impacted Eucalyptus trees, some which are reshooting, some which are not. The reshooting is mainly from the base. There are no heath or shrubs on the site.

Ecologist, David Woods, has completed a flora and fauna assessment (Appendix I) for the proposed development site and APZ areas.

FIGURE 6 BIODIVERSITY VALUES MAP

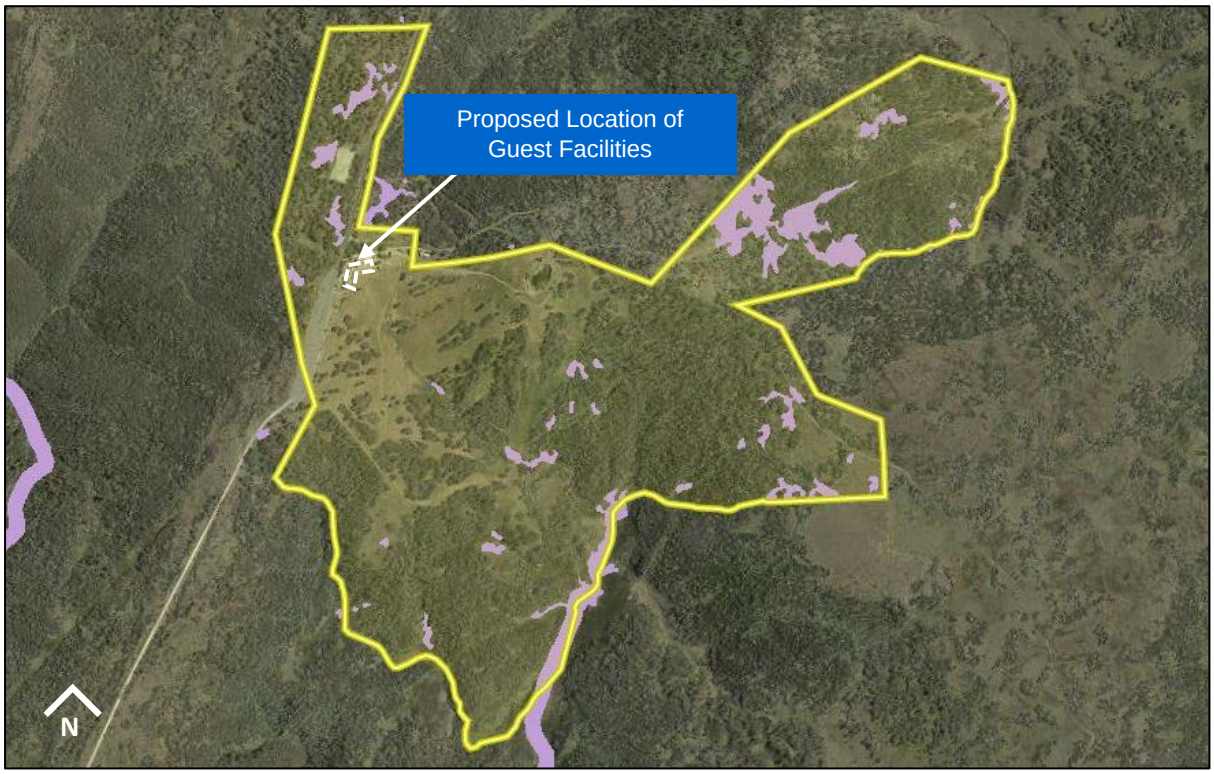


Image source: NSW Biodiversity Values Map and Threshold Tool

2.1 Clearing Threshold

The subject site, 213A Kings Cross Road, Kiandra has a site area of approximately 204 ha which lies between 40ha and 1000ha which allows for a clearing threshold of less than 1 ha before offsets will apply for the development.

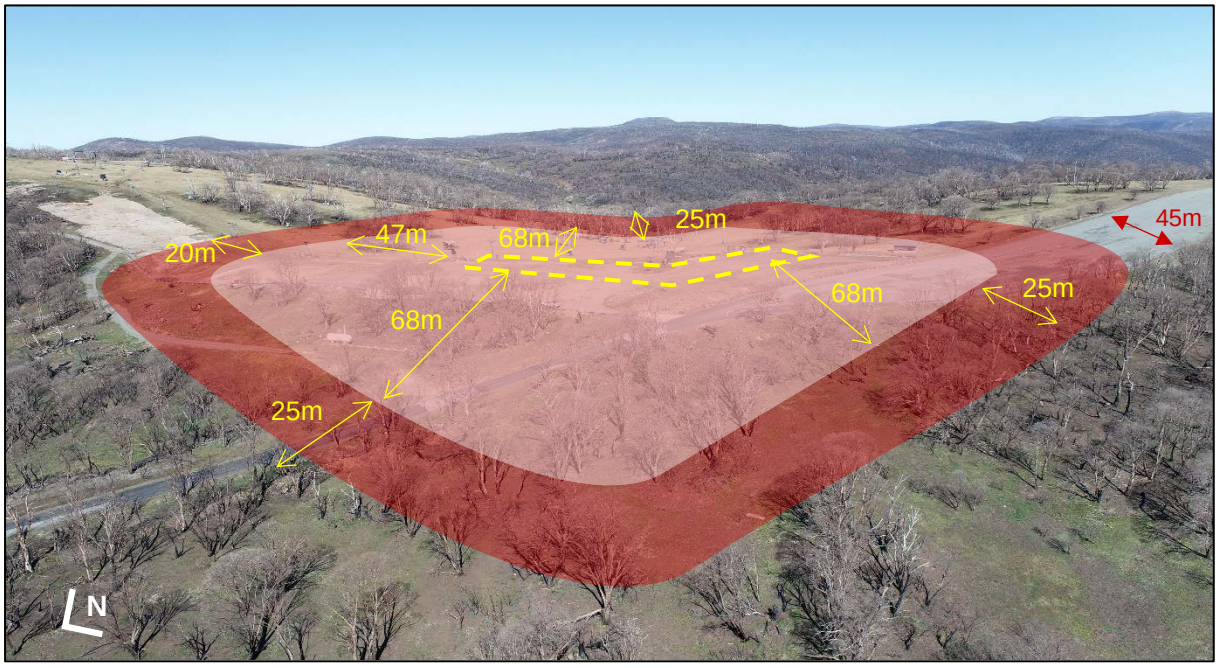
FIGURE 7 CLEARING THRESHOLD

Minimum lot size associated with the property	Threshold for clearing, above which the BAM and offsets scheme apply
Less than 1 ha	0.25 ha or more
1 ha to less than 40 ha	0.5 ha or more
40 ha to less than 1000 ha	1 ha or more
1000 ha or more	2 ha or more

Minimal clearing is proposed as part of this application, as there is no vegetation within the proposed site locations and an area of 0.25ha is proposed to be thinned to establish IPA directly North of the proposed guest facilities building and hence will not trigger the Biodiversity Offsets Scheme and no offsets will apply to the proposed works due to this trigger.

As per the recommendations from ecologist David Words, future clearing to maintain an APZ in perpetuity to be undertaken within consultation with NPWS as *"future vegetation clearing could require specialised fauna survey methods to be employed and respective significant impact criteria to be tested against possible candidate species and communities.*"

FIGURE 8 PROPOSED VEGETATION TO BE MAINTAINED FOR APZ



2.2. Biodiversity Values Map

In order to assess if the development is located within an area identified with Biodiversity Values, we have completed a search using the Biodiversity Values Map. The Biodiversity Values Map identifies areas of high biodiversity values and those that are particularly sensitive to impacts from clearing or any development.

As seen in Figure 6, the proposed location of the guest facilities and wastewater treatment plant are not within areas of high biodiversity values. The proposed relocation of the snow play area with new toboggan slope, installation of above ground portable lifts, quarry dam enlargement and all associated infrastructure are also not within any areas presenting high biodiversity values. Areas presenting on the Biodiversity Values Map with high biodiversity values are outside of proposed development areas including paths of services trenches as well as the quarry dam upgrades. This thoughtful positioning of the guest facilities, wastewater treatment plant, relocated snow play area, installation of above ground lifts and infrastructure away from these areas promotes an ecological sustainable development.

Although the APZ will enter areas of high biodiversity values, no development will occur in these areas and hence will not trigger the biodiversity offsets scheme by the proposed works. No vegetation is required to be removed within these areas to establish the APZ. As per the recommendations from ecologist David Words, future clearing to maintain an APZ in perpetuity to be undertaken within consultation with NPWS as *"future vegetation clearing could require specialised fauna survey methods to be employed and respective significant impact criteria to be tested against possible candidate species and communities.*"

As the subject development is not within a high biodiversity values, the proposed development will not have a significant impact on biodiversity of the site and no biodiversity offset will apply under the Biodiversity Offsets Scheme due to this trigger.

2.3 Threatened Species Test of Significance

To assess the impact of the proposed developments on threatened species, ecologist David Woods completed a test of significance to determine if the proposed works are likely to significantly affect threatened species, ecological communities or their habitats. We have considered the level of impact to the biodiversity of the area and to do this we have assessed the significance of any of the proposed activities at the site and surrounding alpine ecosystem.

David Woods found:

> *"No threatened flora was detected and habitat potential for most threatened species was absent or greatly diminished. The proposed redevelopment and associated activities pose no risk to threatened species or threatened ecological communities given the information provided and, in the context prescribed, discussed in this report. Therefore, no 'Test of Significance' under the BC Act or the Commonwealth's 'Significant Impact Criteria' under the EPBC Act was applied. However, future vegetation clearing could require specialised fauna survey methods to be employed and respective significant impact criteria to be tested against possible candidate species and communities."*

Our assessment of the impact on threatened species and habitats finds:

- The site does not contain any known Threatened Species or their habitat and thus no predicted impacts to Threatened Species habitat.
- As there are no impacts to Threatened Species habitat then the full Test of Significance is not required to be completed.
- No endangered ecological communities or critically endangered ecological communities in the development site resulting in no impacts.

- No predicted impacts to threatened species habitat at all. Significant species: *Podocarupus* has been found within the Selwyn Snow Resort area but not within the locality of the proposed development. The species has been found in denser pockets of forest vegetation and riparian areas. Mature trees suitable for breeding sites of Gang Gang Cockatoo within APZ area have suffered significant damage from the 2019/2020 bushfire with new shoots emerging from base of the tree trunks only.
- Not identified within alpine bog community and no predicted impact to bog communities within Selwyn Snow Resort.
- Visual inspection of trees within APZ area showed no evidence of being used as active habitat.
- Minimal removal of vegetation is proposed/required to establish clear site and an APZ and is unlikely to result in removal of breeding habitats or fragmentation of habitats so will unlikely impact the long-term survival of any species or community.
- No areas of outstanding biodiversity values within Kosciuszko National Park.
- Vegetation removal is a key threatening process. Minimal vegetation is proposed to be removed so is not considered to have a significantly impact any threatened species.

After assessing the potential impact of the proposed developments within Selwyn Snow Resort using the test of significance, the above results indicate that there will be no impact on threatened species and therefore the Biodiversity Offset Scheme will not be triggered by the proposed works.

2.4 Areas of Outstanding Biodiversity Values

Protecting the habitats of endangered species is vital to the conservation and recovery of these species. Areas of declared critical habitat under the Threatened Species Conservation Act 1995, have become the first Areas of Outstanding Biodiversity Value (AOBV) in NSW with the commencement of the Biodiversity Conservation Act 2016.

The Biodiversity Conservation Regulation 2017 establishes the criteria for declaring AOBVs. The criteria have been designed to identify the most valuable sites for biodiversity conservation in NSW.

Kosciuszko National Park is not listed as an Area of Outstanding Biodiversity under the Biodiversity Conservation Act 2016. Therefore, due to the location of Selwyn Snow Resort within the National Park the proposed works are not within an area of outstanding biodiversity values and hence not trigger the BOS.

2.5 BOS Conclusion

The above assessment of the four triggers shows that the proposed works are not likely to have a significant impact on threatened species or their habitat.

Minimal vegetation clearing under clearing thresholds is proposed as part of this application to accommodate a clear site and establish an APZ. Any future clearing to maintain the APZ will be minimal. Proposed clearing is below the clearing threshold and the site is not located within an area identified with high biodiversity values on the Biodiversity Values Map. The proposal will not have a significant effect on threatened species or ecological communities, or their habitats. Likewise, Selwyn Snow Resort is not declared as an area of outstanding biodiversity value within Kosciuszko National Park. As a result, biodiversity offsets do not apply as part of this application.

As a result, the applicant will not be required to apply the Biodiversity Offsets Scheme or prepare a species impact statement (SIS).

3.0 Aboriginal Cultural Heritage

All Aboriginal objects are protected under the National Parks and Wildlife Act 1974. The aim of this assessment is to ensure any proposed works will not impact Aboriginal Cultural Heritage and ensure that we preserve, protect and renew culture and heritage for Indigenous Australians.

In order to achieve this, we performed three assessments:

1. NSW Planning Portal – Aboriginal Land Application
2. AHIMS Search
3. Generic Due Diligence Assessment

3.1 NSW Planning Portal

Mt Selwyn Snow Resort is not identified as being within an Aboriginal Land Application area. The resort is located within the Wagonga Local Aboriginal Land Council.

FIGURE 9 ABORIGINAL LAND APPLICATION AREA

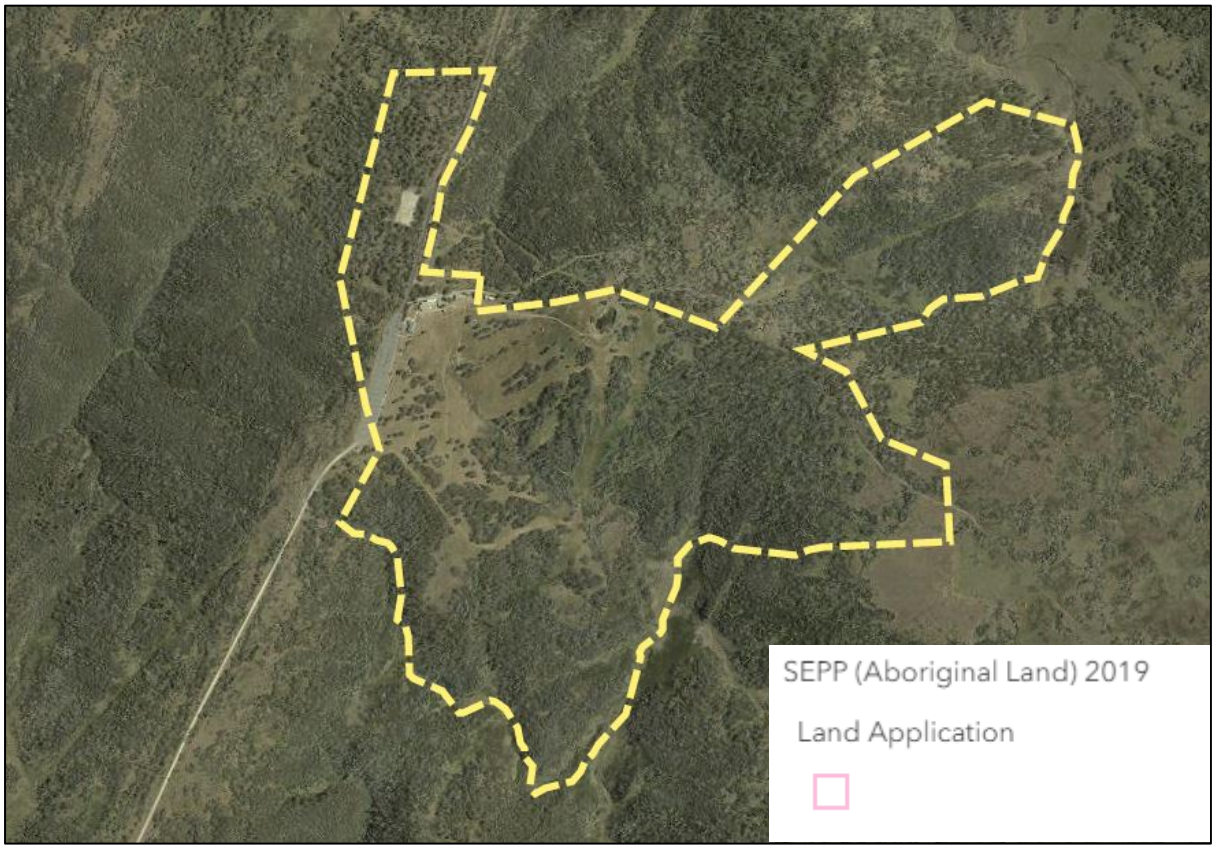


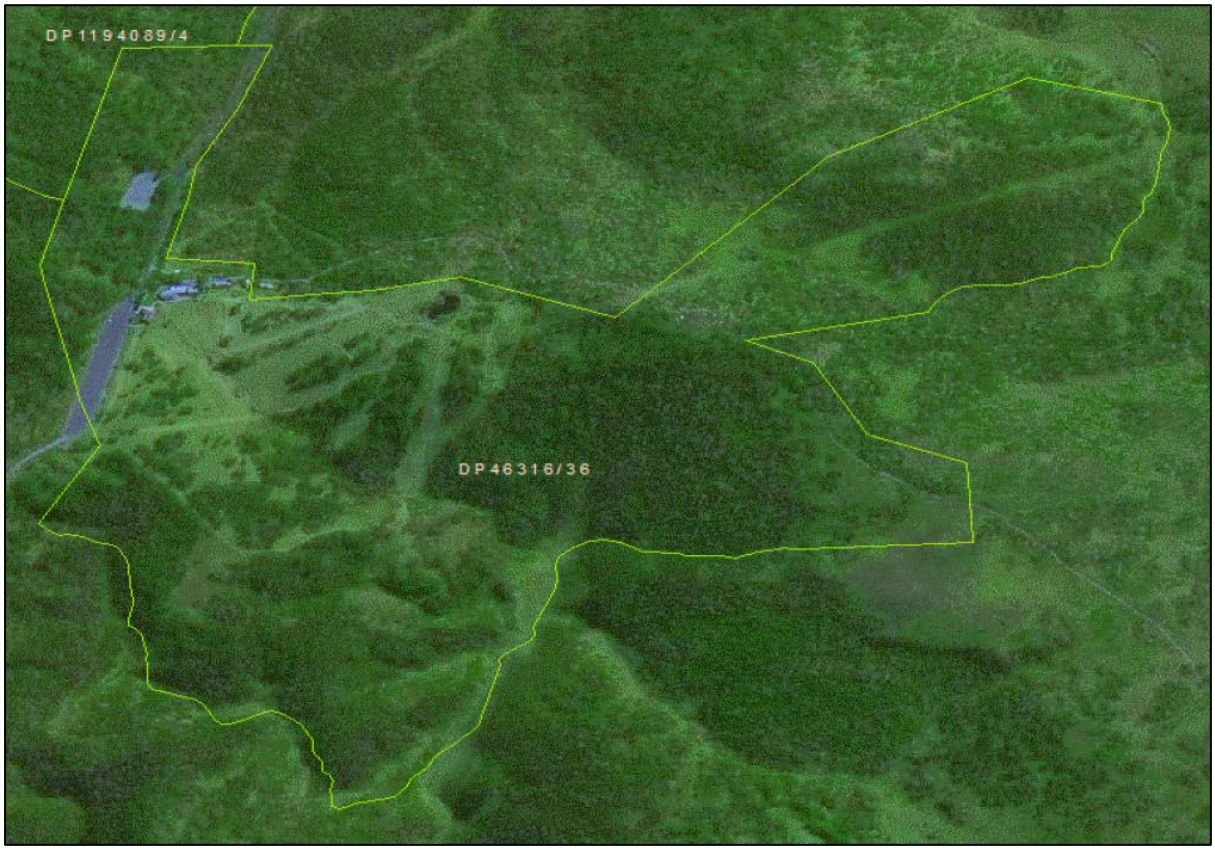
Image source: NSW Planning Portal

3.2 AHIMS Results

An AHIMS search with a 50-metre buffer around the site has been completed and has resulted in zero Aboriginal sites being recorded or declared near the property.

As some parts of New South Wales have not been investigated in detail, there may be fewer records of Aboriginal sites in those areas. These areas may contain Aboriginal sites which are not recorded on AHIMS and are still protected by the National Parks and Wildlife Act 1974. Therefore, proposed works must proceed with caution and if any objects are to be found works will be stopped and appropriate authorities are to be notified.

FIGURE 10 AHIMS SEARCH RESULT



0	Aboriginal sites are recorded in or near the above location.
0	Aboriginal places have been declared in or near the above location. *

Image source: AHIMS database search result conducted 04 September 2020

3.3 Generic Due Diligence Assessment

In this section of the report we will assess and complete an Aboriginal Cultural Heritage Due Diligence assessment for the proposed new guest facility building, relocation of snow play area, enlargement of quarry for increased water storage, two above ground portable lifts and essential infrastructure for Selwyn Snow Resort. The aim of this assessment is to ensure any proposed works will not impact Aboriginal Cultural Heritage and ensure that we preserve, protect and renew culture and heritage for Indigenous Australians.

Mt Selwyn traditionally lay within the country of a large indigenous linguistic group known as the Wolgal people. The Wolgal land generally lay across the Upper Murray region, which was covered in snow in the winter (Wesson, 2000). Today the land is part of the Wagonga Local Aboriginal Land Council Area and many Aboriginal people living on the tablelands and on the coast consider themselves to be descendants of the Wolgal people (Feary, 2010).

3.3.1 Ground Disturbance

The proposed guest facilities and wastewater treatment plant will disturb the ground surface. The proposed site for the guest facilities have been subject to extensive ground disturbance since the development of the area as a ski field in the 1980's, including; the previous amenity buildings, former service road, snow grooming, vehicle use and a range of impacts from more than 40 years operation as an alpine resort as well as history of grazing and mining in the area. Likewise, the wastewater treatment plant is proposed to be installed to the East of the existing Elgas enclosure and accessible from the existing service road North of the proposed guest facilities complex. This area has experience moderate ground disturbance from the establishment of the service road, use of road and installation and use of the Elgas tank enclosure.

The proposed construction footprints for the potable water connection from the new water tank installed as part of Staff Accommodation (separate DA) to the guest facilities will run parallel to Kings Cross Road. A second water supply for the purpose of bushfire fighting purposes, will also traverse disturbed ground from the quarry dam. The proposed battered wall to increase the water holding capacity of the quarry dam is in an area of extensive disturbance as the site was previously mined for road base. Locations for the proposed new location of the snow play area with toboggan slope and installation of above ground portable lifts will be within the existing ski fields which have been extensively disturbed during operations.

FIGURE 11 SITE PHOTO

3.3.2 AHIMS and Other Sources

Within the Australian Alps National Parks and Reserves there have been various surface artefact scatters and physical evidence of Aboriginal heritage (Goulding et al. 2002).

Aboriginal groups have identified places with heritage significance within the Australian Alps National Parks and Reserves. These sites have included a wide array of uses from dreaming trails and spiritual places to food and medicine collection localities and men's and women's places. Several specific locations of importance to individuals have also been named (Goulding et al. 2002; Waters 2004). In addition to this, there are historical records of large gatherings within the Australian Alps National Parks and Reserves associated with the collection of bogong moths from the mountain peaks. These gatherings were important for maintaining trading, ceremonial and social connections among the different groupings with the Australian Alps National Parks and Reserves (Flood 1980).

Previous consultation with the members of the Wagonga LALC, including the conduction of a heritage survey of the lease area, resulted in the LALC considering Selwyn Snow Resort to present a low potential for containing sites due to the lack of potable water and the LALC interpret the area as a place where Aboriginal people would pass through and not reside (Feary, 2010).

Likewise, there are no confirmed site records or any other associated landscape feature information from an AHIMS search. There is no oral, historical or archaeological evidence to suggest that burials or places of spiritual, ceremonial or social significance occurred with the resort area.

Archaeologist Alistair Grinbergs (ENFAC, 2009) performed an extensive survey of Selwyn Snow Resort including survey transects of the proposed development location. A single flake made from tuff was found from outside of the proposed development area. This is consistent with the history of the Australian Alps with the most likely artefacts to be found being small stone artefacts. This is as a result of stone artefacts being known to survive extensive ground disturbance, including the level of ground disturbance which has occurred within Selwyn Snow Resort. It is important to note that stone artefacts are rarely found *in situ*, limiting their scientific significance (Feary, 2010)

FIGURE 12 GRINBERGS SURVEY TRANSECTS

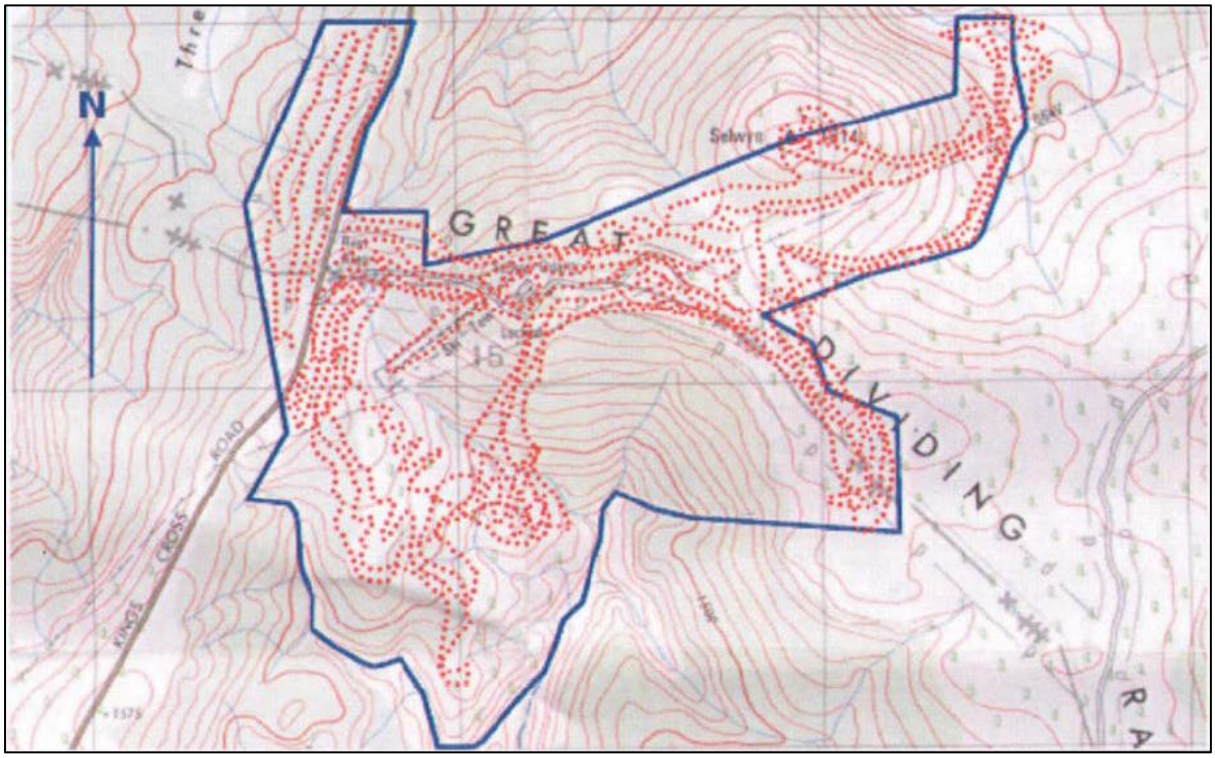


Image source: ENFAC 2009 *Natural and Cultural Inventory of Selwyn Snowfields Lease Area*

In 2010, Feary conducted a visual inspection of the ridgeline and found two stone artefacts in an erosion scar below a natural spring. This discovery is consistent with previous studies that potential sites may be found near natural springs (ENFAC 2009). The proposed services trench to connect potable water to the guest facilities building runs parallel to Kings Cross Road in an area of disturbed ground. However, the proposed trench lies within 40m of the site where the two stone artefacts were found and every effort has been made to keep the trench as far as possible away from the location with stone artefacts are rarely found in situ it is expected to present low risk of further artefacts (Feary, 2010). Past Traces Heritage Consultants were engaged to assess potential impacts to this area for the proposed services trench and determined that:

> *"The trenching works can proceed in these areas, without further assessment as no Aboriginal objects or places have been identified as occurring within the project area. The potential of impacting unrecorded sites during the proposed works is assessed as low.*
>
> *If any alteration of works is undertaken, which will reduce the intervening distance from the identified heritage site, then protective barrier fencing may be required. In any alteration of footprint, re-assessment of impacts will be required."*

The proposed guest facilities building, wastewater treatment facility, relocation of snow play area with toboggan slope, installation of above ground portable lifts and water pipe from the quarry dam have been confined to disturbed areas of the resort and do not contain natural springs and hence it is very unlikely to present with any Aboriginal objects.

FIGURE 13 STONE ARTEFACT LOCATION

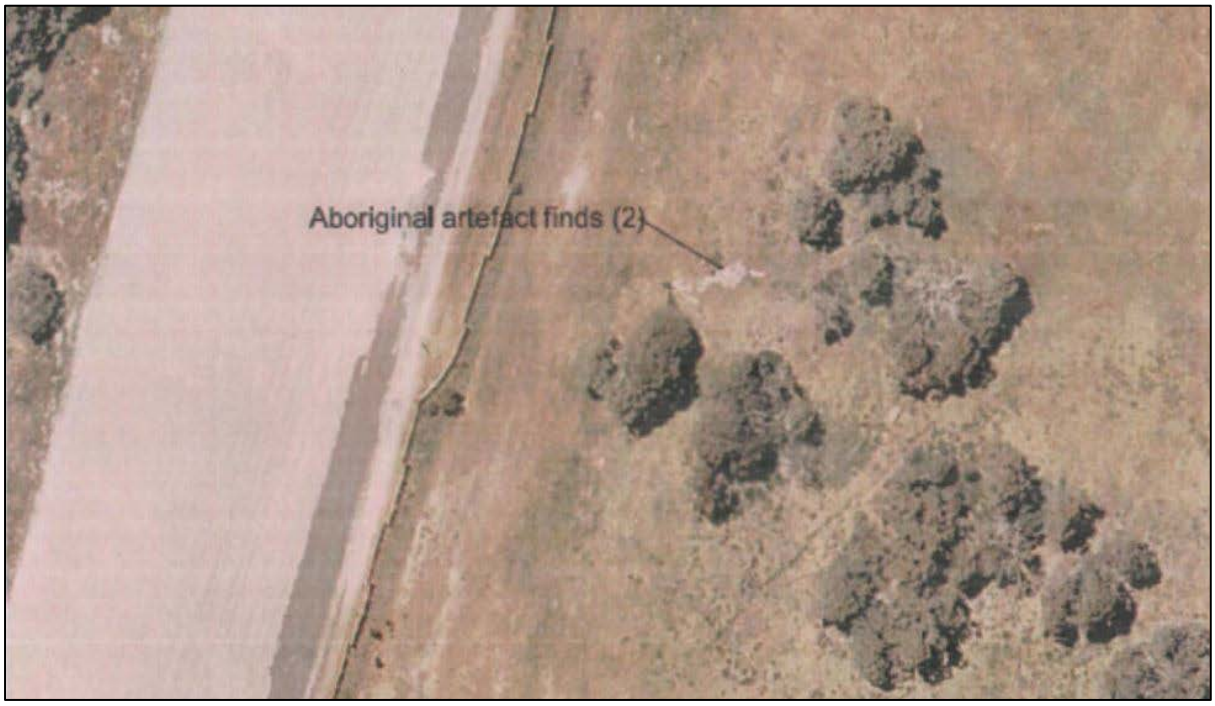


Image source: Feary 2009 Aboriginal Archaeological Assessment

Previous Aboriginal heritage assessments within Selwyn Snow Resort have been conducted including:

Report	Findings
Perisher Range Resort Area: Aboriginal Cultural Heritage Study (Navin Officer 2000)	Broad range study of Aboriginal Heritage with Kosciuszko National Park and found "The surviving archaeological resource within the park is a historically and scientifically

	significant component of the alpine and subalpine heritage landscape" (Navin, 2000).
Aboriginal Archaeological Assessment: Mount Selwyn Telecommunications Facility.	No sites were found but an area of low-moderate potential for subsurface artefacts was identified (Dibden 2003).
Selwyn Snowfields Ski Resort - Three Mile Dam Pipeline.	No sites were found along the 2.5 kms water pipe alignment. Dibden (2006) noted that the impact area had very low archaeological potential, due to the nature of the landforms and the disturbance history.
Natural and Cultural Inventory of Selwyn Snowfields Lease Area.	Grinbergs (ENFAC, 2009) found a single artefact comprised of a flake made from tuff. Grinbergs also noted that areas of high archaeological potential were also those most extensively disturbed.
Aboriginal Archaeological Assessment: Proposed Day Use Facility Aboriginal Archaeological Assessment	Feary (2010) found two stone artefacts in an erosion scar. It is important to note that stone artefacts are rarely found *in situ*, limiting their scientific significance (Feary, 2010)
Aboriginal Objects Due Diligence Assessment: Optus Telecommunications Facility	No sites were found but an area of low-moderate potential for subsurface artefacts was identified (Niche, 2019).

In addition to the previous archaeological surveys, a cultural values map provided by NPWS shows an Aboriginal site located just outside of the North-Western boundary of the allotment which is approximately 1.5km from the proposed guest facilities.

FIGURE 14 NPWS MT SELWYN – CULTURAL VALUES MAP

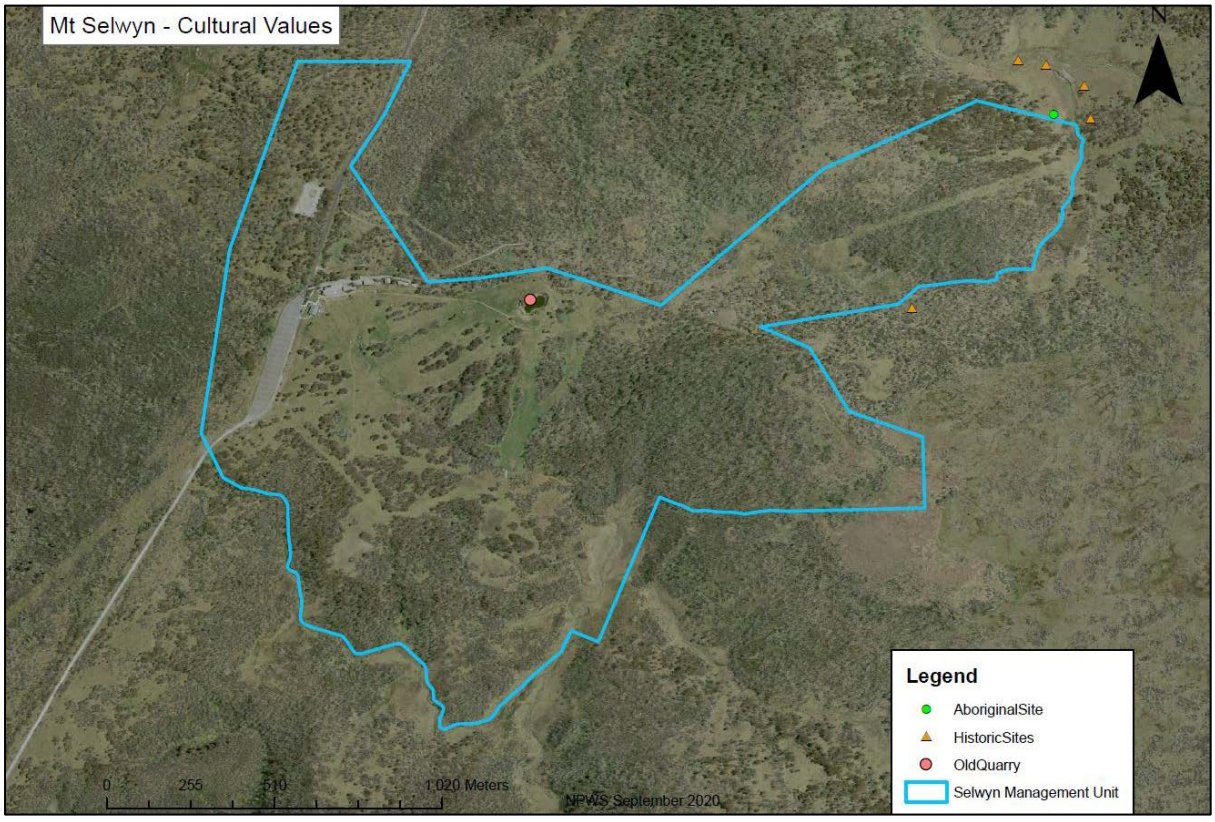


Image source: NPWS September 2020

3.3.3 Landscape Features and Visual Inspection

Selwyn Snow Resort does not contain long-term open water source which indicates the resort area was not used as a camp for Aboriginal communities. Aboriginal movement through the resort area would have been in a hunter-gatherer scenario and the likelihood for large Aboriginal objects is very-low which has been confirmed by previous Archaeological assessments of the resort area.

A site inspection confirmed that the proposed location of the development shows no evidence or landscape features to suggest the presence of Aboriginal objects. The proposed site of the guest facilities, wastewater treatment facility, new location of snow play area with toboggan slope and locations for above ground portable lifts lie within disturbed ground and vegetation. Survey transects were conducted at 2m intervals across the site including a 40m buffer area and no Aboriginal objects were observed. As it is unlikely to have been a site for an indigenous settlement there is low – very-low probability of sub-surface artefacts to be present.

As our due diligence assessment found that two Aboriginal artefacts had been recorded by Feary in 2010, Past Traces Heritage Consultants were engaged to conduct a further detailed investigation of this location and the proposed services trench to establish if the risk of further Aboriginal artefacts being identified and found:

> "*The impression gained through field visitation is that the artefact-bearing exposure is a relatively concise feature that indicates the presence of a very low to low density artefact scatter associated with lightly impacted to considerably disturbed deposits directly abutting the substantially altered landscape of the road corridor*." And,
>
> "*The placement of the trench adjacent to or within the disturbed areas associated with the road and bund and the containment of construction plant within the levelled ancillary track corridor will ensure that all works are remote to any identified archaeologically sensitive areas*."

3.3.4 Table of Results

Due Diligence	Comments
1. Will there be ground disturbance?	Yes, move to 2
2. Are there any:	
a. Confirmed site record or any other associated landscape feature information on AHIMS?	Nil recorded or declared sites in or near the above location.
b. Any other sources of information that a person is already aware?	Yes, see section 3.3.2.
c. Landscape features that are likely to indicated presence of Aboriginal objects?	No, see section 3.3.3.
Result	AHIP application not necessary. Proceed with caution. If any Aboriginal objects are found, stop work and notify DECCW. If human remains are found, stop work, secure the site and notify the NSW Police and DECCW.

3.3.5 Due Diligence Conclusion

The proposed site does not contain any visible Aboriginal objects. The potential for subsurface cultural material for the project have been previously disturbed and presents a low – very-low risk of Aboriginal objects.

The proposed trench to connect potable water to the guest facilities building runs parallel to Kings Cross Road in an area of disturbed ground. However, the proposed trench lies within 40m of the site where the two stone artefacts were found. Past Traces Heritage consultants confirmed that the potential impacts to this area from the proposed services trench is low with every effort made to keep the trench as far as possible away from the location of the previous finds.

As a result, the General Due Diligence Assessment showed that AHIP application is not necessary. The proposed works should be able proceed with caution. All workers on the development should be made aware of the potential of subsurface Aboriginal artefacts and if Aboriginal objects are found, all activities must stop and an appropriately qualified archaeologist engaged to assess the findings, and notification is provided to the Office of Environment and Heritage. In the unlikely event that human remains are found, stop work, secure the site and notify the NSW Police and the Office of Environment and Heritage.

Any future clearing of trees within the APZ area to maintain the APZ in perpetuity should retain the tree stumps to minimise ground disturbance.

4.0 Heritage Conservation

4.1 Heritage Areas

The site is not identified as being within a heritage conservation area.

FIGURE 15 HERITAGE AREAS

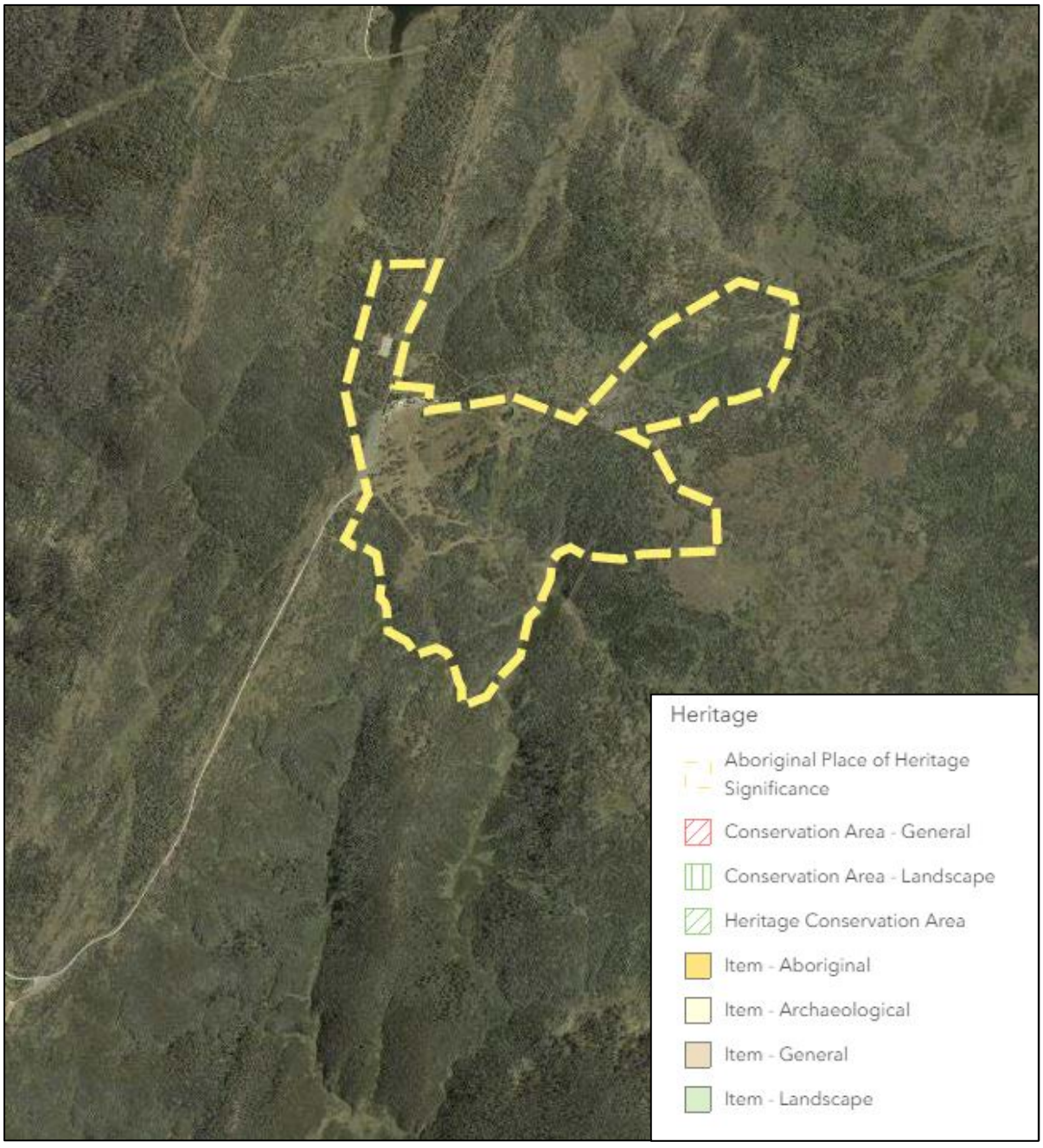


Image source: NSW Planning Portal

4.2 Heritage Buildings and Landscapes

Selwyn Snow Resort is not identified as a heritage item on the State Environmental Planning Policy (Kosciuszko National Park – Alpine Resorts) 2007.

4.3 Mining Heritage

Gold was discovered in Kiandra in 1859, marking the start of a goldrush in the Australian Alps. At its peak, the Kiandra Goldfield supported approximately 10,000 people and demonstrates National cultural heritage significance values in relation to the conditions under which mining was undertaken up until its end in 1861. In general, mining efforts were concentrated within Kiandra and along waterways such as Four Mile Creek, Nine Mile Creek and the Eucumbene River.

There is no documentation of any historic gold mining sites within Mt Selwyn Snow Resort and no evidence has been found by locals or staff of the alpine resort since commencement of operations in 1966 with the installation of a tow-rope in the quarry. This is consistent with a visual inspection of the site not uncovering any old mine sites, water races or sluicing scars.

During the goldrush, northern European miners introduced skiing into the surrounding mountains. Australia's first T-bar and Ski Club, *Kiandra Pioneer Ski Club* was established in Kiandra. Skiing facilities were closed in Kiandra in 1978 and the existing lifts were moved to Selwyn Snow Resort where they continued to operate for 31 years prior to upgrades being installed. And hence, the ski resort is steeped in history and has strong cultural significance within the alpine resorts of the Kosciuszko National Park. The proposed development will promote the use of the resort and continue the history of use as a ski field.

The below map provided by National Parks and Wildlife Service shows the known Aboriginal and historic sites as well as the old quarry located with the resort. The old quarry was mined for granite road base and was used as the first ski run when there was no snow left in Kiandra. The old quarry was mined for granite road base and was used as the first ski run when there was no snow left in Kiandra. The proposed works are approximately 400m East of the old quarry.

FIGURE 16 CULTURAL VALUES MAP

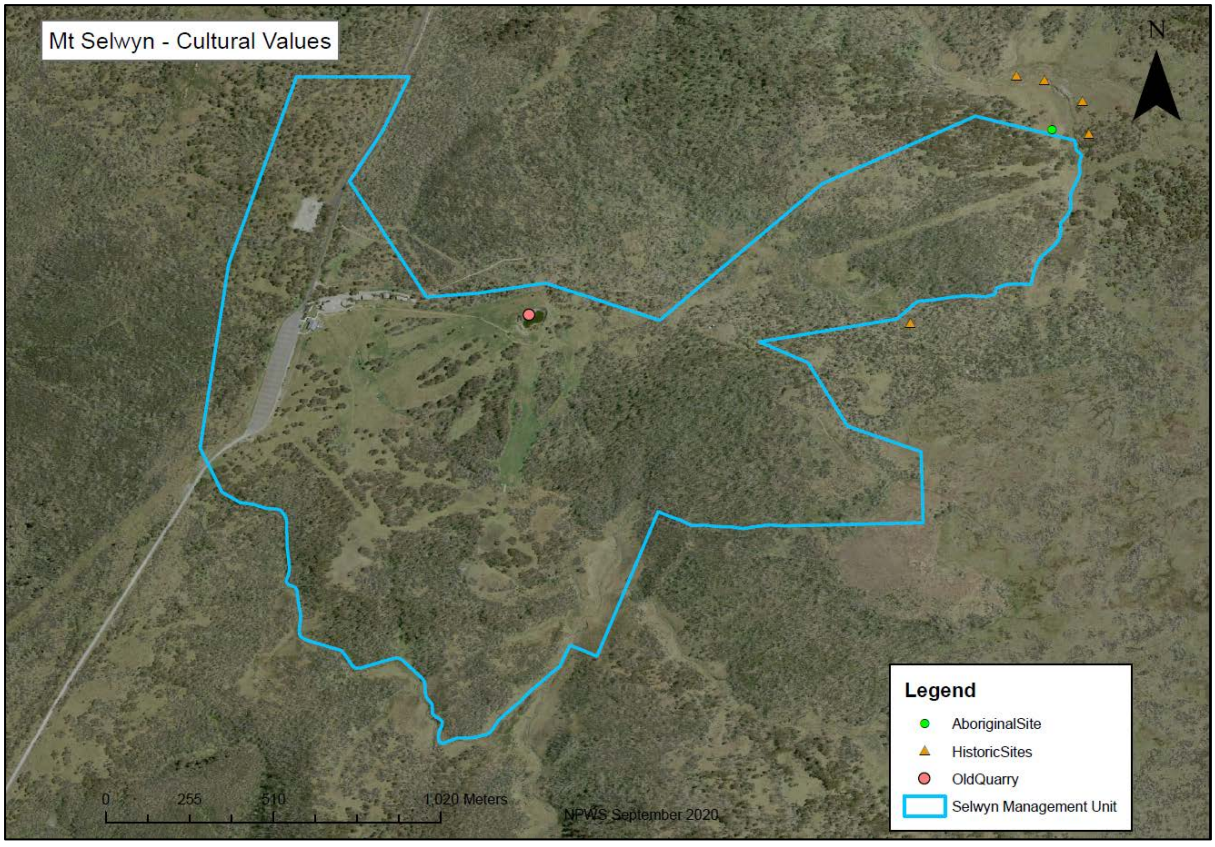


Image source: National Parks and Wildlife Services

5.0 Conclusion

Suitability of the Site for the Development

The Biodiversity and Aboriginal Heritage Assessment confirms that the site is suitable and capable of sustaining the proposed development with minimal adverse impacts.

After assessing the four triggers of Biodiversity Offset Scheme, the proposed works do not trigger the Scheme and therefore no offsets will need to be applied for these works. A major factor in this result is minimal clearing of vegetation is proposed as part of this application to establish an APZ. Proponents are to work with NPWS to establish a rehabilitation plan for the vegetation removed as part of this development. Vegetation of the site is previously disturbed from use as ski resort since the 1980s.

Likewise, this report has found there are no confirmed site records or any other associated landscape feature information from an AHIMS search. There is no oral, historical or archaeological evidence to suggest that burials or places of spiritual, ceremonial or social significance occurred with the resort area. Likewise, previous consultation with the members of the Wagonga LALC, including the conduction of a heritage survey of the lease area, resulted in the LALC considering Mt Selwyn Snow Resort to present a low potential for containing sites.

In correlation with supplementary due diligence provided by Past Traces Heritage Consultants, the project site locations do not contain any visible Aboriginal objects and the potential for subsurface cultural material is low – very-low.

General Due Diligence Assessment showed that AHIP application is not necessary. The proposed works should be able proceed with caution. All workers on the development should be made aware of the potential of subsurface Aboriginal artefacts and if Aboriginal objects are found, all activities must stop and an appropriately qualified archaeologist engaged to assess the findings, and notification is provided to the Office of Environment and Heritage. In the unlikely event that human remains are found, stop work, secure the site and notify the NSW Police and the Office of Environment and Heritage.

Given the proposals minimal impact to biodiversity conservation and Indigenous Heritage, it is unlikely to raise significant objection.

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APPENDIX I FLORA AND FAUNA ASSESSMENT (DAVID WOODS, 2020)

FLORA AND FAUNA ASSESSMENT

Proposed Redevelopment

for

Selwyn Snow Resort

213A Kings Cross Road, Kiandra, NSW, 2630

Prepared by David Woods

for

TSA Management (on behalf of Selwyn Snow Resort P/L)

October 2020

Traditional Owner Acknowledgement

The author would like to pay his respects to the traditional owners, Wolgal, the original custodians of the land upon which this assessment and field work was carried out.

Documentation

Project Name	Flora and Fauna Assessment – Proposed Redevelopment for Selwyn Snowy Resort Inclusive of Guest Facilities, Resort Operation Centre, Quarry Dam Augmentation & Asset Protection Zone Selwyn Snow Resort, 213A Kings Cross Road, Kiandra, NSW, 2630	
Prepared for:	TSM Management (Marko Osti)	
Author	David Woods	
Draft Reviews	24/10/2020 (internal)	25/10/2020 (external)
Final Document	25/10/2020	

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Definitions and Acronyms used in this Report

APZ	Asset Protection Zone
BC Act	NSW *Biodiversity Conservation Act, 2016*
BC Regulation	NSW *Biodiversity Conservation Regulation, 2017*
BAM	Biodiversity Assessment Method
BOS	Biodiversity Offset Scheme
CEEC	Critically Endangered Ecological Community
DP	NSW Department of Planning
DPIE	NSW Department of Planning, Infrastructure and Environment
EEC	Endangered Ecological Community
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act, 2009*
FM Act	NSW *Fisheries Management Act, 1994*
NPWS	NSW National Parks and Wildlife Service
PCT	Plant Community Type
PMR	Protected Matters Report
ROC	Resort Operation Centre
TEC	Threatened Ecological Community

SUMMARY

A flora and fauna assessment was undertaken at Selwyn Snow Resort, 213A Kings Cross Road, Kiandra, NSW. The proponent wishes to build new Guest Facilities and a Resort Operation Centre (ROC) following the loss of most buildings during the January 2020 bushfire. These buildings will mostly site on the previous building envelope of the former resort. The proponent also wishes to increase the volume of water for snow making purposes that is currently retained in a former quarry. The proposal is to increase the current embankment at the front of the quarry by approximately 1.5 metres to increase the current full-dam level by approximately 1 m. Associated with each of the proposed Guest Facilities and ROC is an Asset Protect Zone (APZ). Part of the APZ includes roads and carpark. However, the APZ also includes part of the ski slope where vegetation is maintained short for ski slope use and management, and a more natural area of trees and shrubs to the north and west of the proposed buildings. Collectively the Guest Facilities, ROC, quarry dam augmentation and APZ areas form part of the survey area and have been referred to in this report as the 'Proposed Redevelopment'. A separate development application has been prepared for proposed staff accommodation and an associated water pipe and water tank. Some of the survey effort for that application was undertaken at the same time for this assessment.

A field survey was undertaken on 15th October 2020 following a database and literature review of candidate threatened species either known in the area or possibly occurring based on landscape vegetation. Threatened flora from the filtered species list was targeted while fauna was appraised based on habitat opportunity, both before the bushfire and in the context of the status of recovering vegetation approximately 10 months after the bushfire. The results of the field survey included 117 vascular plants of which 67 species were native, 40 were exotic and a further 10 species were unable to be identified to genus level (four grasses and six forbs) due to the time of year and regrowth status since the fire. Incidental fauna was also recorded and included 19 birds, five mammals (two native and three introduced), one amphibian and two reptiles.

No threatened flora was identified in the building footprint of the proposed buildings, dam embankment or in the associated APZ areas. Fresh Broad-toothed Rat scats were identified approximately 70 m south along Clear Creek from the existing pump house, but more than 330 m distant from the boundary of the closest APZ identified in this report. Some elements of Montane Peatland were also identified outside of the proposed APZ although these communities were showing little signs of regrowth at the time of the field assessment. For most parts, habitat opportunity has been lost or degraded within the survey area as a result of the bushfire. Most trees have lost their canopy and there is very little shrub understorey in or adjacent to the resort. In some areas, regrowth vegetation has completely covered the ground (southern APZ areas) while in other areas ground cover is patchy. Areas of trees and shrubs are showing signs of regeneration from basal coppice regrowth but at this stage there is very little ground debris of logs and branches – most having been consumed in the fire. However, overtime many of the habitat attributes present before the bushfire will be re-established (assuming no further high intensity wildfire in the near future).

At the time the field survey was undertaken, habitat complexity and opportunity were considered low, particularly around the northern and western APZ. However, as the vegetation starts to recover and tree debris is added to the ground, so too will the habitat opportunity for threatened species be improved. How the vegetation will be managed and to what extent will need to be subject to future discussions that will also need to be made in the context of the recovery status of the vegetation to be targeted and whether any threatened species are present at that time. The presence of several noxious weed species before the fire and those recorded in this assessment, should be managed to reduce competition with native species during this period of sensitive post-fire recovery.

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1 INTRODUCTION

1.1 Background

This flora and fauna report is to support a Development Application to the NSW Department of Planning for Selwyn Snow Resort P/L to construct new Guest Facilities and a Resort Operation Centre following the loss of most buildings and infrastructure to a bushfire in January 2020. The assessment is to account for the proposed building footprint and proposed asset protection zone for these developments. Important to the resurrection of Selwyn Snow Resort as a winter tourist destination, but not fire affected as a result of the January 2020 bushfire, is the augmentation of the current quarry that is used as a snow making dam. It is proposed to increase the volume of the dam by raising the height of the existing embankment by 1.5 m. For the purpose of this assessment, the Guest Facilities, Resort Operation Centre (ROC), APZ and quarry dam augmentation is collectively referred to as the 'Proposed Redevelopment for Selwyn Snow Resort' (see Figures 1, 3 and 4).

A separate Development Application has been prepared by Complete Town Planning for six staff dwellings further to south of the proposed Guest Facilities and ROC. A flora and fauna assessment was also undertaken as part of that submission to account for a new pipe to provide potable water to a water tank that will serve those dwellings as well as increase fire-fighting capabilities in the resort (see Figure 2). That flora and fauna assessment was provided as an addendum to the Staff Accommodation submission, but the field work was undertaken at the same time as the data collected for this assessment. This report includes reference to the data for the proposed water pipe where it is relevant to account for information on the southern areas of the resort.

For the proposed Guest Facilities and ROC, the building footprint will be located over much of the previous footprint associated with buildings prior to the bushfire. The configuration of the building sites will be different to the previous building arrangements, but they will still be located along the northern perimeter of the resort adjacent to Kings Cross Road and carpark, and the previous management road. Furthermore, and more importantly as it pertains to environmental impact, the Guest Facilities and ROC will occupy mostly disturbed ground. At the time this survey was undertaken, all remnants of the burnt buildings and structures had been removed. A portable barrier fence had been erected around proposed building areas and the colonising vegetation was mostly an exotic flora, consistent with those species present in heavily, and subsequently maintained, disturbed sites.

Image 1: Facing east, much of this cleared area is proposed to site the Guest Facilities. Projected further up the centre of the image will be the proposed ROC. A yet to be confirmed Sewerage Plant is tentatively proposed left of centre of the image.

Figure 1: Location of the Guest Facilities, Resort Operation Centre and Quarry Dam. The Guest Facilities and ROC overlap with the footprint of the previous resort buildings that can be seen from the superimposed image taken before the January 2020 bushfire. Management and staff accommodation have been relocated to a proposed site further to the south adjacent to Kings Cross Road. Coloured polygons relate to significant environmental attributes (source: map provided by TSA Management).

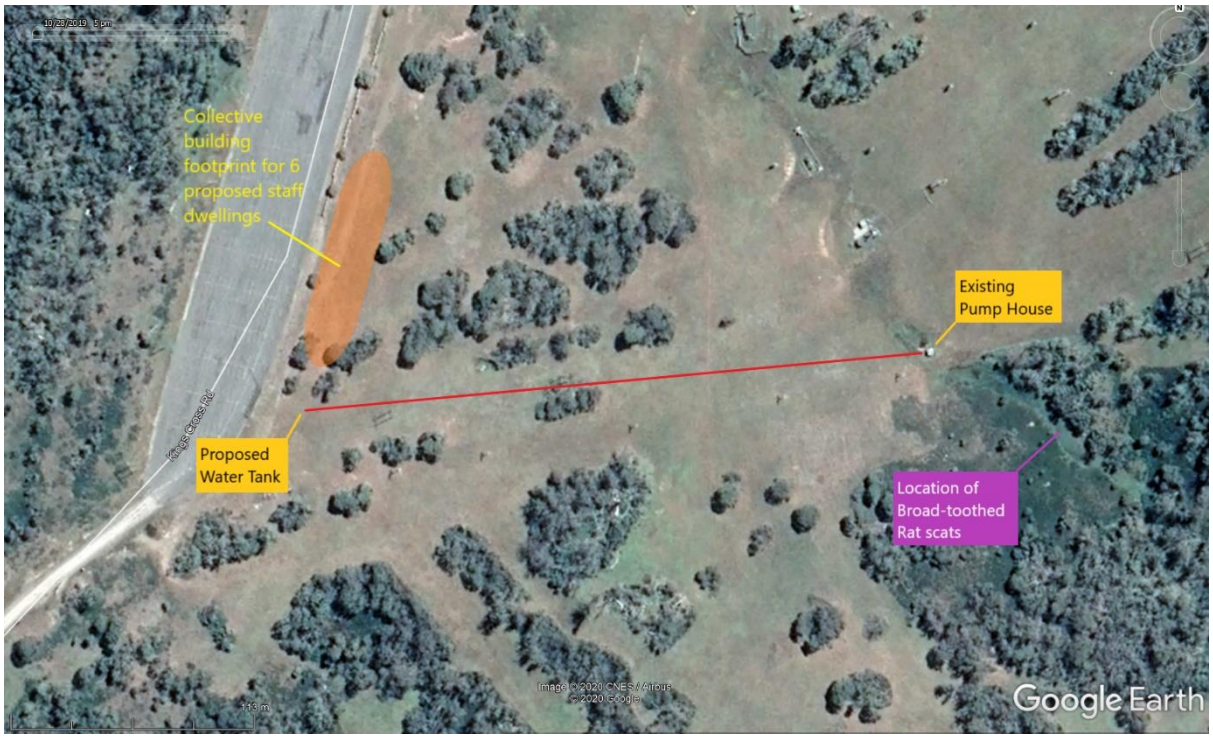

Figure 2: Location of the proposed Water Pipe, Water Tank and Staff Accommodation at Selwyn Snow Resort between the proposed water tank and existing pump house. These proposed assets are part of a separate development application, but some of the fauna habitat assessment was undertaken in this area and discussed in this report. The location of fresh Broad-toothed Rat scats is shown. The aerial image precedes the January 2020 bushfire. No tree canopy remains due to a bushfire in January 2020 (source: base map Google Earth, 2020).

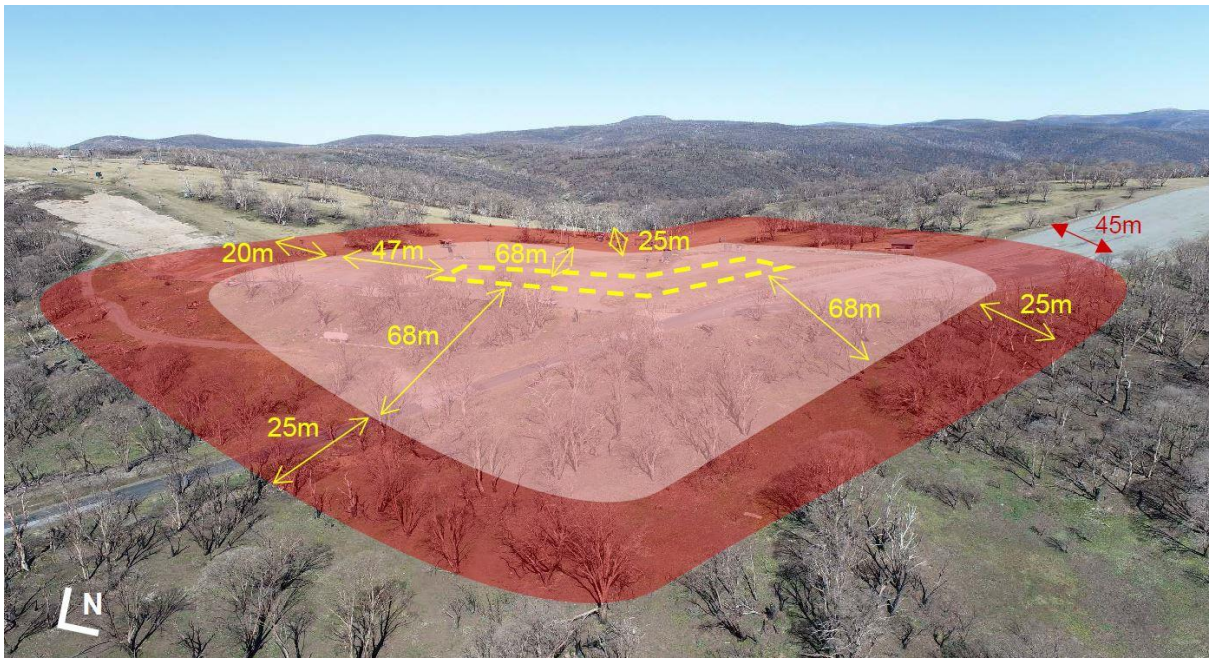

Figure 3: An oblique aerial view from the north-east with the proposed APZ superimposed from table calculations pertaining to the proposed Guest Facilities. The pink shading relates to the Inner APZ and the red shading relates to the Outer APZ (source: Complete Town Planning).

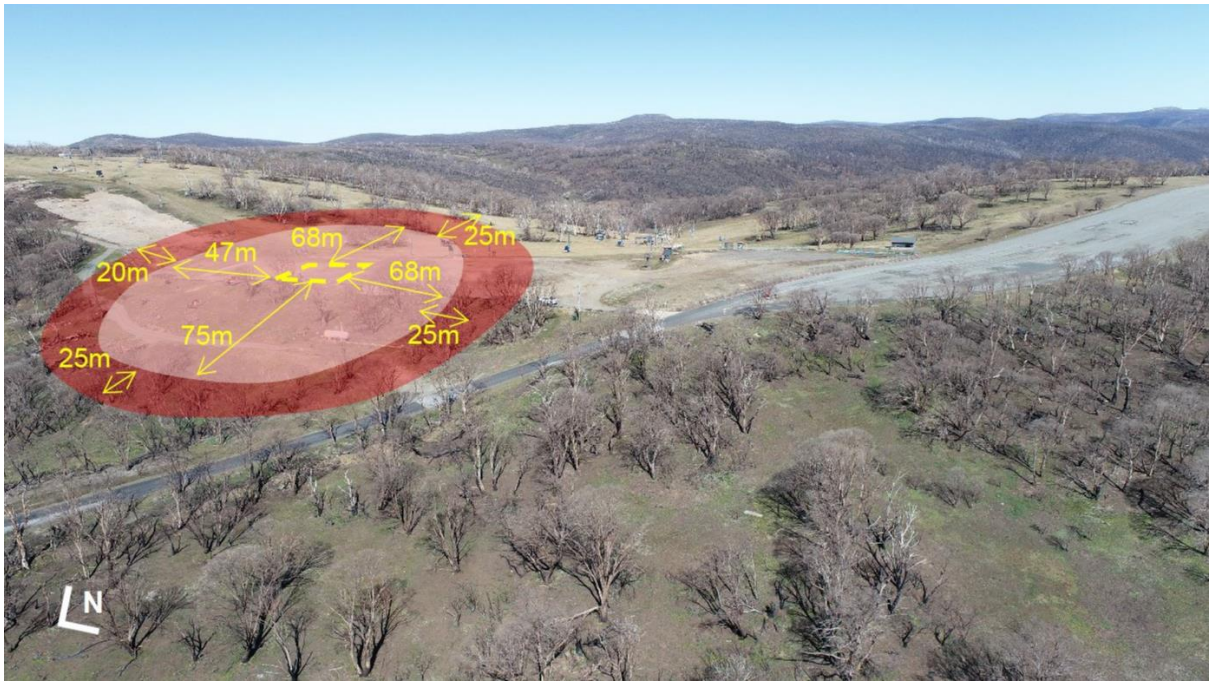

Figure 4: An oblique aerial view from the north-east with the proposed APZ superimposed from table calculations pertaining to the proposed Resort Operation Centre. The pink shading relates to the Inner APZ and the red shading relates to the Outer APZ (source: Complete Town Planning).

1.2 Aim of Flora and Fauna Assessment

This flora and fauna assessment is site-specific to qualify the condition of the existing environment and the potential impacts upon native vegetation, threatened species and threatened ecological communities as it pertains to the construction of proposed Guest Facilities, Resort Operation Centre and augmentation of the existing quarry dam. Associated with the Guest Facilities and ROC is the APZ. The assessment extends to the existing environment as indicated in Figures 3 and 4 with reference to ecological impacts from the January 2020 bushfire. However, at the time this flora and fauna assessment was prepared, there was uncertainty as to what vegetation clearing would be required to meet inner and outer APZ conditions, and how the APZ would be managed as vegetation started to regenerate. Therefore, this assessment focuses on the environment as observed and recorded in mid-October 2020, approximately 10 months after the wildfire event.

The key elements of this assessment include:

- Review BioNet data, Protected Matters Report and other localised literature for threatened species records

- Flora survey to identify vascular plants and vegetation community types inclusive of the building footprint of the proposed Guest Facilities, ROC and quarry embankment, as well as within the APZ as calculated by Complete Town Planning

- Threatened vascular plant survey for species known within the area and/or aligned to the vegetation type and landscape position of the proposed redevelopment structures and associated APZ

- Habitat assessment for the opportunity of threatened fauna species to occur surrounding the proposed redevelopment structures and APZ, targeting vertebrate species known or possibly occurring within the area, and

- Incidental recording of all vertebrate fauna detected during the site inspection as an indicator of animal activity during the day and in response to vegetation recovery approximately 10 months after the bushfire.

1.3 Survey Area

The proposed survey area of approximately 14 ha ranges from approximately 1540 m asl at the lower parts of the APZ, to approximately 1590 m asl at the quarry dam. At approximately 1550 m asl, an east-west aligned spur includes a relatively flat portion of land that is the historical site of the former resort buildings and the proposed site for the redevelopment. This same ridge forms the northern part of the upper catchment to Clear Creek that is centre to the ski slope to the south, an incline averaging 5 – 10°. On the northern side of the ridge commensurate with the slope for the northern APZ area, the average incline is 10 – 15° although the slope decreases to 5 – 10° around to the west.

Although the southern aspect is a highly modified ski slope where most of the open areas included a reduced shrub cover (before the bushfire), the area is still commensurate with a sub-alpine woodland as indicated by the landscape position of surrounding vegetation. The author also has previous site experience around Mt. Selwyn to account for the vegetation structure in the general area that included isolated and continuous shrub stands away from the ski slope. Some shrub species were also observed to be resprouting across the slope, some from seed and others from root stock burnt during the fire. However, most resprouting vegetation, or plants growing from seed, were less than 10 cm tall, and there was no large scale burnt shrub branches or root boles compared to burnt areas surrounding the resort.

There was little shrub stratum within or adjacent to the ski resort due to the intensity of the bushfire. All tree canopy (*Eucalyptus pauciflora* ssp. *niphophila* [*E.p.* ssp. *niphophila* assumed versus *E.p.* ssp. *debeuzevillei*]) has either been scorched or consumed by fire, and very little ground vegetation was left unburnt. However, since the January 2020 fire and with good rainfall since winter, ground vegetation (grasses, graminoids and forbs) had regenerated in many areas, particularly across the ski slope. Ground cover away from the ski slope, particularly in treed areas, was patchy and in some areas there was no ground vegetation present.

Image 2: A southerly view down Clear Creek from near the middle of the ski slope below the proposed new buildings. The recovery of ground vegetation on the ski slope since the bushfire was good, but patchy in tree covered areas. Little shrub understorey and stratum was present during the survey, both within and adjacent to the resort.

2 METHODOLOGY

2.1 Desktop and Literature Review

A desktop review was undertaken prior to the field survey so that an appreciation was gained on the diverse range of flora and fauna previously recorded in the area and, more specifically, to filter those threatened species and threatened ecological communities either known or predicted to occur within the area. Threatened species, threatened ecological communities and their associated habitats would in turn form the primary target of the field survey. The databases included records derived from OEH BioNet (DPIE 2020a), access to Sensitive BioNet data (Category 2), OEH BioNet Vegetation Classification (DPIE 2020b) and the Commonwealth's Protected Matters Report (PMR) for elements relevant under the *Environment Protection and Biodiversity Conservation Act,* 1999 (*EPBC Act*)(DoEE 2020)(see Appendix 1). A 10 km search radius was used to filter BioNet data and PMR records, although a wider radius was used when interrogating additional location information for some threatened species. Several other species were also considered based on the author's familiarity with the area and following a review of threatened species associated with the relevant Plant Community Type (see Table 1).

Literature review included several past environmental assessments but most relevant to this appraisal was the 'Natural and Cultural Inventory of Selwyn Snowfields Lease Area by ENFAC (2009) and the 'Kosciuszko Resorts Vegetation Assessment by Ecology Australia (2003).

2.2 Field Survey

A site inspection was carried out on 15th October 2020. A meandering traverse was employed to survey across the entire building footprint of the Guest Facilities and ROC, the quarry dam including the inner quarry wall and areas of the proposed embankment, and the APZ zones associated with the two proposed buildings. Within the survey area special attention was given to macro and micro habitat features, an appraisal of standing vegetation and surviving structure and stratum layers, inspection of hollows, logs and boulders, regrowth proliferation by different species following the fire, and any predominance of weeds species, particularly high threat exotics.

All vascular plants including exotic species were recorded according to nomenclature prescribed in the NSW Royal Botanical Database (PlantNET). A qualitative relative abundance score was also applied against each species and notes taken pertaining to any interesting or concerning high threat exotics that could proliferate as a result of the proposed activity, particularly in the context of a fire-affected landscape. The threatened flora identified from database records and literature review became the main target of the search.

No threatened fauna was targeted *per se*, but rather habit as a surrogate indicator of those threatened species known in the area became the focus of the fauna assessment. However, all fauna detected on the day including southern areas of the resort associated with a proposed new water pipe were recorded. Detection included observations, calls and scats.

2.3 Limitations

Surveying vegetation in mid-October above 1500 m in elevation is generally early. Many plants are only beginning to emerge after a winter dormancy, and therefore key attributes including flowers and fruits used to identify plants to species level are often absent. Occasionally plants may retain fruiting material from the previous season, however, this can be reduced in upland areas that succumb to

strong winds, severe frosts and seasonal snow loading. This may be further compounded by pest and native herbivore grazing (e.g. rabbits and macropods) and ski slope maintenance. However, Selwyn Snow Resort did not operate during the 2020 snow season due to major infrastructure loss from the bushfire. This same bushfire event also affected nearly all vegetation within the study area. Consequently, all ground species were regenerating and most shrub species appeared to be either suckering or responding by seedling regrowth.

At the time of the survey, very few vascular plants were in bud and even less were in flower. No grasses were observed to be in flower except for one exotic **Dactylis glomerata*. In contrast, several graminoids (e.g. Cyperaceae and Juncaceae) were in flower, allowing confident identification of plants to species level. The same issue of lacking flowering/fruiting material also pertained to forbs and shrubs, although several abundant exotic species were in flower.

Therefore, it is possible that some of the targeted threatened species may have been missed or not fully developed to be detected. A slow and concentrated meander search was employed to account for that possibility. Where doubt existed as to part or full species identification, botanical conventions were used to communicate any uncertainty. It is likely that several plant species have gone undetected, but for targeted threatened vascular plants that are also known in the area, these species can generally be identified without the presence of reproductive material (perhaps excluding orchid species). Furthermore, many species identified in this report also reflect the author's relative experience for identifying vascular plants in this type of landscape, although many species were still left identified to the genera level.

For threatened vertebrate fauna, mid-October is a reasonable time for detecting returning seasonal migratory species, particularly woodland birds and microbats, although these vertebrates were not directly surveyed in this assessment. For local species that overwinter including reptiles and amphibians, animal activity at the time of the inspection will depend upon temperatures and other weather conditions, and the circumstances as to when respective species exited brumation and hibernation. However, limitations for detecting species presence is reconciled by focusing on habitat opportunity as a surrogate indicator, and the rationale that each of the development footprints for Guest Facilities, ROC and quarry embankment are highly disturbed sites with little native vegetation. In contrast, the APZ to the north and west of the proposed buildings, while temporarily modified due to the bushfire, retains a better habitat complexity. It is uncertain what structural elements have been lost that were used by species present before the fire without pre-fire site surveys. However, this does not negate the importance of recognising habitat opportunity as a surrogate for animal populations present now and into the future. Furthermore, the level of assessment presented here is also commensurate with the level of impact associated with building on disturbed sites. What is not discussed in any detail, as mentioned above, is the circumstances surrounding any vegetation clearing requirements to meet APZ thresholds. The state of the vegetation, and hence fuel loads, will change over time. How this is to be managed was still subject to discussions between Selwyn Snow Resort P/L, NSW Department of Planning and NSW NPWS. That said, the information contained in this flora and fauna assessment will help with the APZ appraisal, at least as it pertains to conservation elements.

Notwithstanding the challenges and limitations discussed in this section, the author is satisfied that the survey methods and survey effort undertaken in mid-Spring has provided a reasonable understanding as to whether the proposed redevelopment poses any significant risk to threatened species and threatened ecological communities in the area.

3 RESULTS

3.1 Database and Literature Review

The review of data filtered from the BioNet database, the Commonwealth's Protected Matters Report and in particular the ENFAC report (2009), has culminated in a suite of threatened species and threatened ecological communities as target candidates for the field survey. The list of candidate species is not a total representation of species extracted from databases and literature without some justification for inclusion. As the BioNet data was filtered within a 10 km radius, this two-dimensional filter will invariably include records that occur at lower elevations and species with narrow and unique habitat requirements. Therefore, not every species has been listed for subsequent assessment, but rather a list of candidates based on a possible likelihood of occurrence, even if that occurrence is deemed to be low. The species that were filtered and justified for preliminary assessment are presented in Table 1

Table 1: List of threatened species filtered from database records for their known or potential occurrence in or adjacent to the proposed redevelopment project at Selwyn Snow Resort. The table also includes the conservation status and justification for selection as a candidate species for field assessment. Where data has been extracted from NSW BioNet an indication of the number of site records has been provided within 10 km of the survey area.

Codes:

V – Vulnerable, E – Endangered, CE – Critically Endangered, EEC – Endangered Ecological Community, CEEC – Critically Endangered Ecological Community

Scientific Name	Common Name	NSW Conservation Status	C'lth Conservation Status	Number of Site Records	Likely Occurrence	Justification
FLORA						
Prasophyllum retroflexum	Kiandra Leek Orchid	V	V	1	Moderate	Although only one record within 10 km of Selwyn Snow Resort (a record near Kiandra), the species occurs in sub-alpine grasslands and woodlands, consistent with some of the environment in the survey area (DPIE 2020c). Most plants have been recorded in the Long Plain, Kiandra and Tantangara area. Although the ground vegetation within ski slopes is modified, areas to the north of the proposed buildings in in the APZ still retain a reasonable native composition and structure - although some of the ground layer weed vegetation is more intense in this area than on the modified ski slope.
Pterostylis foliata	Slender Greenhood	V	-	1	Low	Although found in several other states, in NSW this species occurs mainly in the Southern Tablelands south from Batlow (DPIE 2020d). The species grows in eucalypt forest amongst an understorey of shrubs, ferns and grasses. It grows on loam or clay loam soils on sheltered slopes and occasionally seepage areas. The one record from 1992 has been denatured, but it is unlikely to occur within Selwyn Snow Resort and probably the montane valleys to the west within

						10 km of the study area (DPIE 2020a). It is unlikely to be a sub-alpine species.
Discaria nitida	Leafy Anchor Plant	V	-	4	Moderate	Records of this species tend to be scattered either on or close to rocky stream banks or on rocky areas (DPIE 2020e). The species occurs in both woodland and heathy riparian vegetation and on treeless grassy sub-alpine plains (DPIE 2020e). In the local area most records are along the Kiandra Plains. Some of these habitat elements are present in or adjacent to Selwyn Snow Resort. However, most populations survive in sites that appear to be rarely burnt 'fire refugia' as the species is known to be highly fire sensitive and recruitment infrequent. An easy plant to identify if present.
Thesium australe	Austral Toadflax	V	V	10	Moderate	Several records exist for this small straggling parasitic herb. Away from the coast the species occurs in grassland and grassy woodland, often in association with *Themeda triandra* (Kangaroo Grass) (DPIE 2020f). This species is a moderate candidate for occurring in the survey area as local records exist not far near Cabramurra to the west and in the Kiandra Plain area to the east. A good candidate if Kangaroo Grass is present.
Pimelea bracteata	Rice Flower	CE	-	8	Moderate	Although only 8 site records exist in BioNet, one record is within 1 km to the north of the proposed buildings (DPIE 2020a). However, due to the critically endangered status of this species, the location is likely to be denatured as the record is not commensurate with its known habitat. The species is a localised shrub occurring in wetlands and along waterways and stream edges in high altitude treeless subalpine valleys. The study area is essentially a snow gum woodland and the survey area not aligned to wetland or creek lines (Clear Creek does not truly form until well south of the APZ and the bog/gully vegetation to the north of the proposed APZ is outside of the survey area (DPIE 2020g). However, the species is retained as records include the Kiandra area and the species has declined dramatically from a range of threats including pathogen or invertebrate-induced foliage dieback. An estimated 50% of the range of this species was burnt during the January 2020 bushfire (DPIE 2020g).
Calotis glandulosa	Mauve Burr-daisy	V	V	0	Moderate	No local records in BioNet but this species is found in sub-alpine grassland dominated by Poa spp. and in snow gum woodland (DPIE 2020h). The species also often occurs in disturbed environments where ground disturbance can act as a precursor for seed germination (DPIE 2020h). Habitat elements for this species can be expected around the Selwyn area.
Diuris ochroma	Pale Gold Moths	E	V	0	Low	This terrestrial orchid is better known for its occurrence in the Kybeyan area on the Monaro Tableland (DPIE 2020i), but a

						population also exists on the sub-alpine plains near Tantangara in Kosciuszko National Park (pers. obs). Habitat at Selwyn not typical of locations known for this species, but kept as a candidate as a precaution.
Leucochrysum albicans var. *tricolor*	Hoary Sunray		V	0	Low	Frequent populations occur along roadsides along the western fringe and central areas of the Monaro Tablelands. Often occurs in disturbed environments including bare areas. In less disturbed areas it is also known to colonise grassland, woodland and forests (DPIE 2020j). An easy plant to identify when in flower. Although no records in BioNet, the species occurs along the Snowy Mountains Hwy at lower altitudes. Due to its predisposition to disturbed areas, it is kept as a candidate species, albeit low likelihood of occurrence.
Pterostylis oreophila	Blue-tongued Greenhood	CE	CE	0	Low	In Kosciuszko National Park this species is only known from a few small populations. It grows along sub-alpine watercourses under more open thickets of Mountain Tea-tree in muddy ground very close to water, but less commonly in peaty soils and sphagnum mounds (DPIE 2020k). Highly unlikely to occur at Selwyn, but kept as a precaution.
Rutidosis leiolepis	Monaro Golden Daisy	V	V	0	Moderate	In Kosciuszko National Park this species occurs in sub-alpine grasslands, but generally at lower elevations compared to the Selwyn area (DPIE 2020l). Kept as a candidate as a precaution.
Calotis pubescens	Max Mueller's Burr-daisy	E	-	0	Moderate	No local records but grows in sub-alpine treeless plains in herb-rich grassland that is not subject to periodic inundation (DPIE 2020m). The few populations that occur in Kosciuszko National Park include elevation ranges similar to Selwyn, but often in frost hollow or open valleys (pers. obs). Kept as a candidate as a precaution.
FAUNA						
Litoria verreauxii alpina	Alpine Tree Frog	E	V	12	Moderate	In NSW the alpine tree frog usually occur above 1100 m in a wide variety of habitats including woodland, heath, grassland and herbfields (DPIE 2020n) It breeds in natural and artificial wetlands including ponds, bogs, fens, streamside pools, stock dams and drainage channels that are still or slow flowing (DPIE 2020n). Non-breeding habitat and overwintering refuges are poorly known but are likely to include flat rocks, fallen logs, leaf litter and other ground debris (DPIE 2020n). While most vegetation associated with this proposed development is a dry form, the quarry dam is proposed to increase in volume by increasing the height of the embankment by 1.5 m. As the closest BioNet records are within 2 km to the north of the proposed development (DPIE 2020a), this species has been included for further consideration.
Cyclodomorphus praealtus	Alpine She-oak Skink	E	E	1	Moderate	Only 1 BioNet record was retrieved within 10 km of the proposed

						development which was a 1969 entry (DPIE 2020a). Until recently the species' northern distributional limit was thought to be in the Kiandra area, but surveys associated with Snowy Hydro 2 and a PhD study have identified Alpine She-oak Skink further north in the Long Plain area (Schroder pers. comm.). The species has specific habitat requirements preferring treeless or very lightly treed areas that contain tussock grasses, low heath or combination of both (DPIE 2020o). Within this habitat the species shelters beneath litter, rocks, logs and other ground debris, and has been observed basking in tussocks (pers. obs – Rennix Gap). Broad habitat type includes alpine to sub-alpine grasslands in flat to gently sloping areas (DPIE 2020o).
Callocephalon fimbriatum	Gang-gang Cockatoo	V	-	34	High	This species is frequently observed in the area including snow gum woodland with numerous records over time showing persistence in the Snowy Mountains area. Nesting requirements are generally 10 cm diameter or larger hollows at least 9 m above the ground (DPIE 2020p). In autumn and winter the species is likely to move to lower altitudes.
Pachycephala olivaceae	Olive Whistler	V	-	4	Moderate	Olive Whistler prefer moist forests with a thick understorey such as along creek lines or contiguous vegetation in wet sclerophyll forests (DPIE 2020q). The impact of fire upon this species is likely to be great given the extent of the event, consuming wet gully vegetation. The vegetation in the upper Selwyn Snow Resort area was probably not optimum habitat for this species, but further south along Clear Creek habitat was likely to be more favourable. Retained for habitat assessment during the field survey.
Petroica phoenicea	Flame Robin	V	-	60	High	Extending up to the alpine area, this species occupies a range of communities including wet sclerophyll forest, dry sclerophyll forests, woodlands, open woodlands and heathland. As a seasonal and altitudinal migrant, Flame Robin tend to be more prevalent in the area during non-winter months. Flame Robin often forage from low perches (including fence posts and taller vegetation e.g. thistles) from which they sally or launch into the air, on the ground or on other features to pursue insects (DPIE 2020r). Nests are often near the ground and are built in sheltered sites such as shallow cavities in trees, stumps or banks (DPIE 2020r). The species occurs in recently burnt areas but habitat is usually unsuitable following regeneration that results in closed vegetation (DPIE 2020r).
Cercartetus nanus	Eastern Pygmy-possum	V	-	11	Low	A suite of recent records to the west at lower elevations in montane dry and wet sclerophyll forest and woodland, are the result of recent surveys pertaining to the Snowy Hydro 2 project. The species has a low chance of occurrence in

						Selwyn pending a habitat assessment, particularly since the fires. Selwyn Snow Resort is at the upper altitudinal limit for this species which have been recorded in Thredbo Village, above which Mountain Pygmy-possum tend to occur, but in specific habitats. It is found in a broad range of habitats from rainforest through sclerophyll forest and woodland to heath, but in most areas woodland and heath appear to be preferred (DPIE 2020s). It feeds largely on nectar and pollen collected from banksias, eucalypts and bottlebrushes. Also feeds on insects throughout the year which may be very important in habitats where flowers are less abundant, particularly after bushfire. Retained pending habitat assessment and the impact of the bushfire.
Matacomys fuscus	Broad-toothed Rat	V	V	19	Moderate	There are several records near Selwyn Snow Resort and fresh scats were identified approximately 70 m south of the pump house on Clear Creek that was assessed as an independent activity to this proposal. The Broad-toothed Rat lives in a complex of runways through the dense vegetation of wet grass, sedge, or heath, and under the snow in winter (DPIE 2020t). Sheltering nests of grass are built in the understorey or under logs, where two or three are born in summer. Food is mostly gathered at night in summer and autumn and during the early evening in winter. The diet consists almost solely of grasses and sedges, supplemented by seeds and moss spore cases (DPIE 2020t). The species has been recorded in and adjacent to the resort. The species has been retained pending assessment of habitat opportunity in the proposed development area and following the impact of the January 2020 bushfire.
Pseudomys fumeus	Smoky Mouse	CE	E	12	Low	Surveys associated with the Snowy Hydro 2 project have detected more Smoky Mouse populations. Most of these records are to the west at lower elevations. Up until the extra survey work, few sites existed. However, Selwyn Snowy Resort is within the elevation range for this species known across south-eastern Australia, albeit in disjunct populations. The Smoky Mouse appears to prefer heath habitat on ridge tops and slopes in sclerophyll forest, heathland, and open forest, up to 1800 m asl (DPIE 2020u). Seeds and fruits from leguminous shrubs form the main summer and autumn diet with some invertebrates (DPIIE 2020u). In winter and spring, hypogeal fungi with some flowers, seeds and soil invertebrates form the main diet (DPIE 2020u). The species may occur singly or in pairs based around patches of heath. Nesting burrows have been found in rocky localities among tree roots (and Grass Trees where present)(DPIE 2020u). The species has been retained pending habitat appraisal.

Microbats • *Falsistrellus tasmaniensis* • *Miniopterus orianae oceanensis*	• Eastern False Pipistrelle • Large Bent-winged Bat	V V	-	10 1	High	Two species that have been recorded within 10 km of the proposed buildings have been listed. However, where Eastern False Pipistrelle usually roost in eucalypt hollows, loose bark and buildings (DPIE 2020v), Large Bent-winged Bat tend to favour caves, old mines, stormwater tunnels, buildings and other man-made structures (DPIE 2020w). That said, both species are listed in the same appraisal based on existing records, but also under the auspices of 'microbats' as a vertebrate group to account for other bats not recorded but possibly present in the area. Microbats are cryptic and unless special detection methods are employed (e.g. ultrasonic detection and harp traps), then the group will continue to go unrecorded in many areas. Habitat appraisal will be used to account for roosting, breeding and overwintering opportunities in the survey area. Potential impacts will be assessed against the habitat opportunities for microbats in and adjacent to the survey area.
Threatened Ecological Community						
Montane Peatlands and Swamps of the New England Tableland, NSW North Coast, Sydney Basin, South East Corner, South Eastern Highlands and Australian Alps bioregions		EEC	E	-	High	The Montane Peatlands community is associated with accumulated peaty or organic-mineral sediments on poorly drained flats in the headwaters of streams. It occurs on undulating tablelands and plateaux, above 400-500 m elevation, generally in catchments with basic volcanic or fine-grained sedimentary substrates or, occasionally, granite (DPIE 2020x). Several communities have been mapped in and adjacent to Selywn Snow Resort (see Figure 1). No construction footprint associated with the Guest Facilities, ROC or quarry dam augmentation will affect this community. However, there are elements of montane peatland to the north and north east of the proposed buildings within or bounded by the APZ. Retained for further assessment.

3.2 Field Surveys

3.2.1 Flora

A total of 117 vascular plants were identified within the survey area of approximately 14 ha (see Appendix 2). This included 67 native species, 40 exotic species, four unidentified grasses and six unidentified forbs (unidentified to genus level). Very few species were in flower with the average ground cover height 5 cm, occasionally to 10 cm for some plants. Only one grass species was in flower (*Dactylis glomerata*) making grass identification difficult. In contrast, other graminoids including *Carex breviculmis*, *Carex appressa*, *Isolepis* sp. and *Luzula novae-cambriae* were in advanced stages of inflorescence development (though the author found it difficult to identify the *Isolepis* to species level).

Because of the lack of flowering material, it was difficult to identify many plants to species level, particularly grasses. The author's familiarity with some species allowed some confident determinations, but for many others it was left at the genera level or the species epithet questioned. Due to the predominance of grass cover within the southern survey area including the ski slope, it was also difficult to provide an accurate, although only a relative, cover abundance rating. In contrast to the open grassy vegetation in the south, much of the vegetation in the north of the survey area was part of a structural snow gum woodland, albeit burnt. Ground cover was less contiguous with grasses and forbs but presented as patches of open unvegetated areas interspersed with vigorous regrowth of sprawling native forbs (e.g. *Stellaria pungens*) and introduced weeds (e.g. **Viola arvensis*). There were also extensive patches of weeds surrounding the down slope areas immediately adjacent to the former management road where most resort activities and infrastructure was placed. Some shrub species showed signs of post-fire recovery as did many snow gums with lignotuber shoots emanating from the base of most l trees. But most noticeable within the contiguous tree stands in the north and west of the survey area was the lack of tree canopy and the almost total removal of the shrub understorey.

Given the circumstances of the intense and extensive bushfire, the extent and recovery of ground vegetation was relatively good, covering most of the open areas that were burnt. Areas beneath trees showed less recovery which could be a combination of less seed material in those areas due to less plants from tree debris prior to the fire, and the fire intensity around trees being greater due to the prevalence of higher fuel loads.

In the coming weeks when the flora matures and other species germinate, plant identification would be more accurate and the abundance of species across the site better understood, though this dynamic will change over time as some slower growing species become more dominant.

Notwithstanding the challenges to identify plants to species level, and the incursion of introduced species, the proposed site is still a predominately native flora with a high composition of native species. The relative abundance rating used in Appendix 2 pertains to the whole survey area of the APZ inclusive of the proposed building footprints and the less structurally diverse ski slope area. It does not attempt to discriminate between areas in the north and south even though there are species and structural differences between these two areas. In essence the recorded species and relative abundance rating is an assessment of the entire survey area while searching for threatened species and assessing habitat complexity. However, as the Quarry Dam embankment is a separate project not bound to the APZ, those species recorded in an adjacent to the quarry have been listed separately. That said, only one species was recorded associated with the quarry that was not recorded in the broader proposed building and APZ areas, ?*Elatine gratioloides*, a partially submerged forb (there was still some uncertainty as to the correct identification of the species). There were 27 vascular plants

recorded that were associated with the quarry entrance including 12 native species, 13 exotic species and two unknown forbs.

Across the survey area the most dominant family was Poaceae with six natives, 11 exotics and four unidentified grasses. The dominant native grass was *Poa sieberiana* var *sieberiana* though it was difficult to determine the relative cover abundance of other native species. Several exotic species were also present though many such as **Holcus lanatus* and **Dactylis glomerata* only occurred in isolated patches. An exception was **Agrostis capillaris* that appeared to have a wide distribution.

Asteraceae species was also well represented with a dominance of native plants (19 native and eight exotic). Many species recorded are common constituent species of sub-alpine woodlands and grasslands in Kosciuszko National Park. Interestingly, Fabaceae was also well represented (four native and seven exotic) with most of the germinating shrub species belonging to this family. Besides *Poa sieberiania* and a mix of other native grasses, inter-tussock forbs were well represented by *Stellaria pungens*, *Asperula* spp., *Ranunculus* spp., *Acaena* spp., *Geranium* spp., *Pimelea* spp., *Scleranthus* spp. and a diverse array of Asteraceae including *Craspedia* spp., *Brachycome* spp., *Celmissia* sp., *Coronidium scorpioides*, *Leptorhynchos squamatus* and *Senecio gunnii*. The suite of native forbs was also matched by the distribution of the introduced **Hypochaeris radicata*, **Trifolium* spp. and the co-dominant **Acetosella vulgaris*. While some exotic species were distributed across the survey area, some species were more prevalent in isolated stands including **Viola arvensis* and **Leucanthemum x superbum*.

Several shrubs were resprouting and/or growing from seedlings including *Daviesia ulicifolia*, *Bossiaea foliosa*, *Hovea* sp. ?*Oxylobium ellipticum* (*possibly Podolobium alpestre*) and *Tasmmania xerophila*. All shrub species were in the early stages of regrowth. Within the northern APZ area, both seedlings and lignotuber regrowth from *Eucalyptus pauciflora* were recorded – but very little epicormic response.

In summary, no threatened flora was detected in the survey area nor were the suite of constituent species that form a bog and fen community. There were elements of a bog complex to the north of the APZ area that was severely impacted by the bushfire, but this was beyond the survey area. Similarly, the lower reaches of Clear Creek (as part of the proposed water pipe assessment) contained species associated with damp sites and water ways (e.g. *Carex appressa* and *Geum urbanum*), but not bog. The quarry dam is artificial and there was no remnant species suggesting the site was a former bog or fen. Except for a few localised damp areas, the vegetation across the survey area was mostly a dry form commensurate with a snow gum woodland. This is in part related to the landscape position of the proposed activities being centred on a ridge line and past resort practices of maintaining the ski slope with a low ground cover.

Image 3: Part of the northern APZ associated with the proposed Resort Operation Centre. Many trees in this area were not large to provide good fauna habitat opportunity (e.g. hollows), but tree crowns would have still provided foraging opportunities for a range of bird species. While the above ground tree trunks are dead, technically the tree is still alive as evident by the coppicing base of most trees in the APZ across the survey area. However, ground cover was patchy in some areas of the APZ as depicted in this image (compared to Image 2 [p.10] for southern areas of the ski slope in the same APZ).

Image 4: A close-up of the patch-like recovery in some northern parts of the APZ. The image shows a native Geranium sp. *(largest leafy ground plant) surrounded by the introduced *Taraxacum officionale (yellow flower), *Viola arvensis (pale-coloured flower) and *Acetosella vulgaris (in flower but not easily seen in the image).*

3.2.2 Fauna

Fauna data was collected while conducting other activities including the flora survey and habitat assessment. The time of year was relatively early to maximise detection of vertebrate species. This was compounded by the dramatic habitat change with an almost 100% loss of tree canopy and shrub understorey due to the January 2020 bushfire, which has no doubt reduced fauna species presence and abundance in the area. That said, 19 birds, five mammals, one amphibian and two reptiles were detected (see Appendix 3). A site inspection in late-Spring/early -Summer may detect a greater number of species, but the diversity of fauna on the day of the inspection was surprisingly high given the magnitude of habitat change. During the inspection cloud was approximately 2/8, there was a slight breeze from the north-west and temperatures ranged from 10 to 15^{o} C.

Some birds were heard well distant of the ski resort, but most of those recorded in Appendix 3 were recorded either in burnt canopy, on tree trunks or flying low above the canopy. Many of the species recorded were heard throughout the day. All mammals were detected by scats. Of particular interest were a few fresh scats of Broad-toothed Rat approximately 70 m downstream of the pump house within the riparian corridor (well outside the survey area for the proposed redevelopment). This corridor appeared to have a partially contiguous shrub layer before being burnt by the bushfire. Ground vegetation was regenerating including grass tussocks. This was an encouraging sign that Broad-toothed Rat had survived the fire. No sign of Broad-toothed Rat was recorded within any part of the survey area for this assessment. Of the introduced animals, very few scats were observed suggesting that at least both rabbit and hare populations have been greatly reduced since the fire.

Common Eastern Toadlet were heard at two locations – along the creek line near the pump house, and in the quarry that supplies water for snowmaking. Tadpoles were also recorded in the quarry dam. Two reptiles were recorded: two Eastern Three-lined Skinks (one near the quarry and the other on the ski slope taking refuge under a rock) and one Highland Copperhead located to the north of the resort in the proposed APZ. The Highland Copperhead looked relatively thin, which may be due to the lack of available prey, including ground fauna such as lizards, small mammals (e.g. antechinus) and large insects.

Habitat complexity has been greatly reduced since the bushfire, both within and outside of the survey area. Very few rocks and no boulder outcrops were present in the survey area. There was no canopy remaining on the snow gum overstorey and most of the shrub understorey had been destroyed by fire. Some shrub regeneration was encouraging but height of shrub regrowth averaged 10 cm with a few species attaining a height of 15 cm. As described above in the plant results, ground cover was patchy in the northern and western areas within the APZ. Furthermore, there were few logs and other large ground debris that could provide refuge for ground dwelling fauna. The lack of logs indicates a high intensity wildfire when large ground fuels had very little moisture content, and the fire behaviour included a relatively long-residency time in the area that consumed large fuel types that would otherwise persist in fires of lower intensity. The same fire behaviour has also changed the habitat opportunity that existed amongst the larger trees before the fire, either by destroying the existing hollows, or in some cases, increasing hollow size and creating hollows that didn't exist prior to the fire.

For each of the threatened species identified in Table 1, if they have survived the January 2020 bushfire, then habitat following the fire up until the date of this survey has been greatly diminished or removed entirely. That said, habitat opportunity will improve over time as the vegetation regenerates. Many of the existing habitats lost during the January 2020 bushfire will be reinstated over time, subject to no further large conflagrated events, at least for the next 20 years. Twenty years should see a recovery of a shrub layer and ground material increased from falling trunks and branches of some of the surrounding snow gums. However, the trees will take longer to recover as most of the above

ground parts of *Eucalyptus pauciflora* are easily destroyed by fire and contain relatively little regenerative epicormic tissue under the thin bark. Most trees, however, still appeared to be alive as observed by the coppice regrowth emanating from most tree bases. Furthermore, in some sites, seedlings were germinating – this included on the ski slope in areas adjacent to tree stands (island vegetation) and in the northern and western areas of the APZ within the snow gum woodland.

There are encouraging signs of different fauna vertebrate groups occupying areas in and around Selwyn Snow Resort. No threatened fauna was detected in the area although no specialised target fauna surveys were employed for this assessment. However, habitat opportunity on the site for the proposed Guest Facilities, ROC and quarry embankment wall is poor (non-existent). That said, the inner quarry area with its rocky alignment could provide habitat for other reptile species (above the full dam level) and possibly refuge areas for frog species other than *Crinia signifera*. The full spectrum of other habitat requirements to support the critical life-cycle of threatened frog species in the region or *Cyclodomorphus praeltus* were not present, but the quarry by virtue of containing water, rocks and boulders and unburnt shrubs still retains a relatively good habitat complexity compared to many other areas around the resort (e.g. the eastern three-lined skink and common eastern toadlet were record at the quarry site).

In contrast to the development footprints, the APZ area to the south across parts of the upper ski slope area is recovering well with a complete ground cover of vegetation, although rarely exceeding 5 cm height. Habitat complexity for this environment before the bushfire would be considered low, and not provide for too many threatened species known in the area with the exception of Alpine She-oak Skink (assuming it was present). Key habitat features for Alpine She-oak Skink also appears low without appropriate rocky refuge areas or a greater cover of woodland debris. This does not negate the ability of the site to improve in habitat complexity in the future and allow occupancy of Alpine She-oak Skinks from adjacent areas. The prevalence of Alpine She-oak Skink assumes they were present in surrounding areas and a viable population has survived the bushfire to be able to colonise new sites.

Most habitat opportunity associated with the proposed redevelopment pertains to the northern and western areas of the APZ. In these areas most woodland trees still remain, although habitat potential for the immediate future is low until canopied stratum returns (trees and shrubs). Until there is a substantial return of leafy canopy, most threatened birds identified in Table 1 will not be able to nest. Some bat species may find suitable hollows to roost and breed in this area, but other requirements such as food availability will take some time to respond until the total ecosystem starts to recover – most of which is based on plant regeneration.

Image 5: The image was taken within a tree stand at the southern end of the ski slope adjacent to the proposed water pipe. However, it is presented here as a relatively better representation of habitat opportunity compared to many areas in the northern APZ. As tree material starts to fall to the ground and accumulate, then habitat complexity and subsequent fauna opportunity will increase – both for common and threatened species.

Image 6: The quarry dam showing little habitat complexity associated with the embankment that is proposed to increase in height by 1.5 m. However, the inner environment, some of which will be flooded when the dam increases to its new full potential, is more complex than surrounding areas. A separate species list for the area on and adjacent to the current embankment is presented in Appendix 2.

Image 6: Some tree material was cut down during the bushfire event in an attempt to protect some of the resort assets. Other material that had fallen since the fire and was obstructing access was pushed into a pile. As shown in the right of the image, large habitat trees were burnt. Habitat complexity in the northern areas of the APZ will take many years to return to the state that existed prior to the bushfire.

Image 7: Part of the APZ area to the north-west of the proposed Guest Facilities. Patchy regeneration of native and exotic grasses and forbs, no shrub understorey and basal coppicing of Eucalyptus pauciflora was the typical environment present in most sub-alpine woodland when the flora and fauna assessment was undertaken approximately 10 months after the January 2020 bushfire.

4 IMPACT ASSESSMENT

The results of this flora and fauna assessment did not identify any threatened flora species within the survey area, or suitable habitat that could support any threatened species identified in Table 1 ***at the time of the survey***. That said, only flora and threatened ecological communities were targeted during the field survey, with threatened species assessed through habitat opportunity. Furthermore, some species are mobile or may not use one location to fulfill all habitat or niche requirements. However, as the vegetation regenerates in and around Selwyn Snow Resort as a result of the January 2020 bushfire, habitat will also recover and so will the opportunity for many species to reoccupy sites. The presence of habitat, however, does not necessarily guarantee occupancy by common or threatened species. A suite of circumstances needs to occur including the survival and persistence of more localised species (e.g. reptiles and some ground mammals) having survived the bushfire and the challenges posed thereafter including habitat availability, prey and foraging opportunities, increased predation and competition with other surviving species and populations. For more mobile species including birds, micro-bats and larger mammals, the same circumstances are also relevant, except the species has a greater opportunity to search for unburnt or less burnt environments. That said, some of these species could also become prey for larger animals in the short term after fire if refuge and roosting areas are no longer available. Furthermore, if key habitat requirements aren't available or fully sustainable in the area, the species may succumb to hunger, fall prey or unable to breed.

To state the obvious, the proposed building footprint and operational area pertaining to the Guest Facilities and ROC will have no impact upon threatened flora and fauna. The sites are effectively devoid of most native vegetation and for most parts, commensurate with the previous building precinct of the former resort. Similarly, the raising of the earthen embankment by 1.5 m will not have a detrimental impact on any threatened species at the site *per se*, as the site is highly disturbed and retains little habitat complexity. However, other parts of the quarry that serve to retain water for snowmaking does include some habitat variability that could provide opportunity for several species. By raising the wall and subsequent height of the water by an extra 1 m above the current full-dam level, some of the existing habitat will be submerged. That said, it is unlikely that the quarry and dam support threatened species known in the wider area as there are other habitat components missing that would need to be present for any of the threatened species to complete their respective life-cycles.

Threatened species habitat opportunity was of a better relative complexity to support a range of vertebrate fauna and vascular plants in the APZ, particularly in the northern areas. Southern APZ areas are also diverse in terms of vascular plant richness, but as a ski slope it lacks vegetation structure and stratum. In addition, most rocks have been removed over the years to make the slope safe for guests and slope grooming operations. In the southern APZ area, most habitat complexity is found in remnant tree stands. These sites are not of the highest condition, but tree structure, canopy, occasional shrubs and rocks can be found, particularly in the larger stands. In contrast to southern APZ areas on the ski slope, the northern and western APZ area has a higher habitat complexity, but much of this has been diminished since the January 2020 bushfire. Therefore, habitat opportunity needs to be considered in the short and long term – how it exists at the time of this assessment, and the projected habitat quality that may return and provide opportunity to the same (and other) species that it did prior to the fire.

If any of the trees and shrubs are to be removed in the future, or not permitted to regenerate to maintain inner and outer APZ thresholds, then obviously habitat opportunity will be reduced. The state of the environment when this assessment was undertaken was also in a critical phase of recovery, with several introduced species starting to proliferate including those with a relatively early

flowering period. This means that these species will have an advantage over native species to colonise new areas, or at least contribute more seed to the seed bank and germinate when other opportunities become available. The survey data also provides the recovery status of the environment approximately 10 months after the bushfire. This challenged the ability to detect as many plant species as possible and confidently identify flora to species level at a time when most grasses, forbs and emerging shrubs were not budding or in flower. Unfortunately, this challenge also extends to threatened flora. There remains the possibility that some of the flora in Table 1 may have been present but overlooked due to concealment amongst other plants or at an inconspicuous stag of growth. As a simple comparison between the flora identified by Ecology Australia in 2003 and presented in the ENFAC report (2009), 174 vascular plants were recorded of which 12 were introduced. That inventory was taken across the entire resort area and included more diverse community variation than that assessed for this assessment, notwithstanding the impact of the bushfire. However, there are some presentation and interpretation issues amongst the data in the report as ENFAC also identified 35 weed species. This contrasts with the 40 exotic species identified in this report, many of which were not identified by Ecology Australia nor reported by ENFAC. Accepting that there will be some identification differences and errors amongst all botanists and ecologists, and some nomenclature changes over time between surveys, concerning is the diversity of the weed species present in the area. Using the list of exotic and noxious weeds recorded by ENFAC in 2009 before the fire (p. 37 ENFAC 2009), and those identified in this report (Appendix 2), the potential incursion and abundance of weeds over the warmer months is great. All introduced species compete with the integrity of native species. However, some species, often those described and formally listed as noxious, tend to be more concerning. Table 3 lists those species that may pose a risk of increasing their current distributional limit in the resort area and take advantage of bare areas yet to be colonised by native species. The list is taken from noxious weeds listed by ENFAC in 2009 and those identified in this report as identified on the 15th October 2009. These species should be the subject of priority weed control although a broader discussion should be made with NPWS to account for any other potential noxious weeds in the area including appropriate control methods.

Table 2: Noxious weeds identified in the Selwyn Snow Resort area.

Scientific Name	Common Name
Perennial grasses	*(although some may not be practical control)*
Dactylis glomerata	Cock's Foot
Holcus lanatus	York-shire Fog
Phleum pratense	Timoth Grass
Achillea millefolium	Milfoil
Cirsium vulgare	Scotch Thistle
Collomia grandiflora	Great Collomia
Echium vulgare	Viper's Bugloss
Echium plantagineum	Paterson's Curse
Hypericum perforatum	St. John's Wort
Leucanthemum x superbum	Shasta Daisy
Onopordum acanthium	Scotch Thistle
Rubus sp.	Blackberry
Salix cinerea	Black Willow

To appraise the impacts of the proposed redevelopment on the species listed in Table 1, and the field work that attempted to search for those species and assess habitat potential, each species has been

assessed in the context of the existing environment with consideration for how habitat will change overtime as vegetation regrowth progresses.

Table 3 below provides an assessment of those threatened species and threatened ecological communities either known or possibly occurring in and adjacent to the proposed redevelopment buildings, structures and APZ, ***and*** whether the proposed redevelopment and its use has the ***potential to adversely affect*** those species and threatened ecological communities. Those species identified as 'occurring' ***or*** having a 'high likelihood of occurrence', ***and*** where the potential to adversely affect is considered 'high', would be subjected to a 'Test of Significance' under the *BC Act* and/or 'Significant Impact Criteria' under the *EPBC Act* respectively. Consideration of the 'potential to adversely affect' species and threatened ecological communities is commensurate with the extent and type of disturbance activities prescribed and anticipated with the redevelopment. However, it does not attempt to explicitly interpret any vegetation clearing associated with northern and western areas of the APZ as the degree of impact would depend upon the amount and type of vegetation to be cleared. In the most simple of responses, the greater the vegetation removal of trees and/or shrubs, the lesser the habitat complexity and in turn, the less habitat available to common and threatened species, whether that be for foraging, roosting, refuge or nesting sites. However, a cursory comment has been provided to indicate a general impact description upon each species in the northern and western APZ based on the species' general occupancy within the structure of their preferred habitat.

Table 3: Evaluation of threatened species and threatened ecological communities as potential candidates for assessment of the 'Test of Significance' under the BC Act and 'Significance Assessment Criteria' under the EPBC Act.

Codes:
V – Vulnerable, E – Endangered, CE – Critically Endangered, EEC – Endangered Ecological Community.

Scientific Name/Common Name/Conservation Status	Previously recorded in survey area	Recorded during field surveys	Potential to be impacted by the proposed redevelopment	Justification
FLORA				
Prasophyllum retroflexum *Kiandra Leek Orchid* V – BC Act V – EPBC Act	No	No	Low	Habitat elements present in the area, but not fully commensurate with environments where the species occurs in other areas in KNP. Not detected but possibly missed during the survey. However, unlikely to occur on sites proposed for the buildings and embankment. If it were present in the southern APZ, then it has survived ongoing slope maintenance before the fire. If it is present in the northern APZ, then it is unlikely to be impacted whatever the future of the shrub and tree retainment as it is not part of the targeted fuel load.
Pterostylis foliata *Slender Greenhouse* V – BC Act	No	No	Low	Arguably a forest species and at lower elevations. Not detected but possibly missed during the survey. However, unlikely to occur on sites proposed for the buildings and embankment. If it were present in the southern APZ, then it has survived ongoing slope maintenance before the fire. If it is present in the northern APZ, then it is unlikely to be impacted whatever the future of the shrub and tree retainment as it is not part of the targeted fuel load.
Discaria nitida *Leafy Anchor Plant* V – BC Act	No	No	Low	A strong fidelity to rocky creek lines or rocky areas not too distant from natural water bodies. Habitat not consistent within the northern parts of Selwyn Snowy Resort. An easy plant to identify, although slow growing. The species was not present on sites proposed for the buildings and embankment, nor present in the southern APZ. If it were present in the northern APZ, then it could be impacted by clearing to

				meet APZ thresholds. However, very unlikely to be present.
Thesium autrale) Austral Toadflax V – BC Act V – EPBC Act	No	No	Low	A greater appreciation of this species' distribution as a result of more surveys associated with the Snowy Hydro 2 project. A strong association with Kangaroo Grass – *Themeda australis*. Not detected and unlikely to be present. However, unlikely to occur on sites proposed for the buildings and embankment. If it were present in the southern APZ, then it has survived ongoing slope maintenance before the fire. If it is present in the northern APZ, then it is unlikely to be impacted whatever the future of the shrub and tree retainment as it is not part of the targeted fuel load.
Pimelea bracteata Rice Flower CE – BC Act	No	No	Low	A species that grows on the fringe of wetlands and waterways, but habitat not present within the survey area except for the artificial quarry dam. The closest possible habitat is further to the north of the APZ along a mapped bog area. This site was severely impacted by the wildfire and inspected, but no plants noted. In summary the species is unlikely to occur on sites proposed for the buildings and embankment. If it were present in the southern APZ, then it has survived ongoing slope maintenance before the fire. If it is present in the northern APZ, then it is likely to be impacted by any shrub clearing as it is of height that could be targeted to meet APZ thresholds. But given the APZ occurs in dry vegetation types, the species is very unlikely to be present.
Calotis glandulosa Mauve Burr-daisy V - BC Act V - EPBC Act	No	No	Low	A possible occurring species even though no plants were detected during this survey or surveys undertaken by Ecology Australia (2003) and ENFAC (2009). However, unlikely to occur on sites proposed for the buildings and embankment. If it were present in the southern APZ, then it has survived ongoing slope maintenance before the fire. If it is present in the northern APZ, then it is unlikely to be impacted whatever the future of the shrub and tree retainment as it is not part of the targeted fuel load.
Diurus ochroma Pale Gold Moths E – BC Act V – EPBC Act	No	No	Low	Some habitat elements present in the area, but not fully commensurate with environments where the species occurs in other areas in KNP. Not detected but possibly missed during the survey. However, unlikely to occur on sites proposed for the buildings and embankment. If it were present in the southern APZ, then it has survived ongoing slope maintenance before the fire. If it is present in the northern APZ, then it is unlikely to be impacted whatever the future of the shrub and tree retainment as it is not part of the targeted fuel load.
Leucochrysum albicans var. *tricolor* Hoary Sunray V – EPBC Act	No	No	Low	Generally occurs at lower elevations than Selwyn, but tends to occur in unexpected disturbed sites. Not detected but possibly missed during the survey. However, unlikely to occur on sites proposed for the buildings and embankment. If it were present in the southern APZ, then it has survived ongoing slope maintenance before the fire. If it is present in the northern APZ, then it is unlikely to be impacted whatever the future of the shrub and tree retainment as it is not part of the targeted fuel load.
Pterostylis oreophila Blue-tongued Greenhood CE – BC Act CE – EPBC Act	No	No	Low	A species with a fidelity to sub-alpine watercourses under thickets of Mountain Tea-tree. An unlikely candidate in the survey area, but possibly occurring in other areas of the resort, particularly further to the south along Clear Creek. Not detected but possibly missed during the survey. However, unlikely to occur on sites proposed for the buildings and embankment. If it were present in the southern APZ, then it has survived ongoing slope maintenance before the fire. If it is present in the northern APZ, then it is unlikely to be impacted whatever the future of the shrub and tree retainment as it is not part of the targeted fuel load.
Rutidosis leiolepis Monaro Golden Daisy V – BC Act V – EPBC Act	No	No	Low	A lower elevation growing species compared to environments around Selwyn. Not detected but possibly missed during the survey. However, unlikely to occur on sites proposed for the buildings and embankment. If it were present in the southern APZ, then it has survived ongoing slope maintenance

				before the fire. If it is present in the northern APZ, then it is unlikely to be impacted whatever the future of the shrub and tree retainment as it is not part of the targeted fuel load.
Calotis pubescens Max Mueller's Burr-daisy E – BC Act	No	No	Low	Tends to occur in natural treeless sub-alpine treeless plains compared to the environment that has been created around Selwyn. Not detected but possibly missed during the survey. However, unlikely to occur on sites proposed for the buildings and embankment. If it were present in the southern APZ, then it has survived ongoing slope maintenance before the fire. If it is present in the northern APZ, then it is unlikely to be impacted whatever the future of the shrub and tree retainment as it is not part of the targeted fuel load.
FAUNA				
Litoria verreauxii alpina Alpine Tree Frog E – BC Act V – EPBC Act	No	No	Moderate	Although not subject to any direct surveys, and arguably any attempts to survey for this species may be considered too early in the season to maximise detection. However, the quarry dam was the only site in the survey area where there was a water body to support tadpoles. However, there was a lack of other supporting vegetation around the perimeter. That said, if animals were present and found enough niche requirements within the confines of the dam, then some impacts could be considered if the current full-dam level were to increase by another vertical 1 m. If that were to occur, the quarry basin would still provide the same attributes of grasses, forbs and rock refuge that currently exists, except the amount of area currently available would be reduced.
Cyclodomorphus praeltus Alpine She-oak Skink E – BC Act E – EPBC Act	No	No	Moderate	The species has specific habitat requirements preferring treeless or very lightly treed areas that contain tussock grasses, low heath or combination of both (DPIE 2020o). Within this habitat the species shelters beneath litter, rocks, logs and other ground debris, and has been observed basking in tussocks (pers. obs – Rennix Gap). Broad habitat type includes alpine to sub-alpine grasslands in flat to gently sloping areas (DPIE 2020o). Little optimum habitat currently exists since the 2020 bushfire, although other components such as rocks are not prolific in the survey area. There is no habitat available for this species at any of the proposed buildings and the quarry dam embankment. If habitat were present in the southern areas of the APZ, then the species survived winter recreation and slope grooming activities before the fire. If the species were present on the northern areas of the APZ, then they are unlikely to be affected by the removal of any trees or the thinning of shrubs, particularly if grass tussocks continue to grow and more tree and shrub debris is left on the ground as refuge sites. The current environment in the northern APZ area lacks rocks and ground debris. Future regrowth of shrub species may actually detract from this area being candidate habitat for Alpine She-oak Skink. The probability for this species being present in and adjacent to the redevelopment is low and therefore impacts are also low. However, without absolute knowledge of species being present or absent, a more conservative Moderate impact is declared based on the types of activities associated with the redevelopment.
Callocephalon fimbriatum Gang-gang Cockatoo BC – V	No	No	Low	The chances of this species being present either flying over the canopy or feeding on seed on unburnt trees is high, at least before the bushfire. Feeding opportunities have been diminished although Gang-gang Cockatoo are known to feed on grasses, graminoids and forbs on the ground. Perhaps more critical within the Selwyn area is the availability of tree hollows, an attribute that is limiting the conservation status for this species. Due to the fire many of the tree hollows have been lost, although some others have been created but in smaller trees and with less hollow sites that may not meet the bird's requirements of 10 cm diameter or larger and at least 9 m above the ground. The vegetation type and exposed area on a ridge top and adjacent spur is not optimum for this species. The lack of records in the resort area for such

				an easily identified bird may reflect the lack of critical breeding opportunities in the area. In summary, some nesting opportunities still exist, feeding opportunities in the canopy have been lost, and there is no immediate impact upon this species by the proposed activities associated with the redevelopment. If some of the larger trees in the northern and western areas of the APZ were to be felled, then there could be a minor impact of breeding opportunities for this species, but it would not be deemed significant for this area.
Pachycephala olivaceae Olive Whistler V – BC Act	No	No	Low	Although a sub-alpine resident or seasonal/altitudinal migrant, the species does prefer a thick and contiguous understorey along creek lines or in wet sclerophyll forests. Much of this habitat has been lost due to the intensity of the bushfire. However, optimum habitat is not present and unlikely to have been present before the wildfire. No impact associated with the proposed buildings and embankment upgrade, and a low impact should any shrubs be removed from the northern APZ.
Petroica phoenicea Flame Robin V – BC Act	Yes	No	Moderate	Only one record exists for this species in the survey area, but it would be expected that historically more species would have been present across the ski slope as the resort and surrounding area provides optimum summer habitat. However, since the 2020 bushfire, foraging and nesting habitat has been either diminished or entirely lost. The critical components of tree and shrub canopy will regenerate in woodland areas in the future to a level that will provide breeding and nesting opportunities for this species. However, at the time of this survey, critical habitat components were absent and will take some time to return. Birds may still be present in the resort and perch from trees to sally for insects, or from other structures. However, whether there are enough insects in the area during the non-winter months is unknown. However, the suite of bird species in Appendix 2 would suggest omnivores, insectivores and granivores are finding enough food 10 months after the fire, though the relative abundance and relative densities for each of these species is unknown. The species is unlikely to be impacted by any of the activities associated with the proposed development, with only local impacts should trees and shrubs in the northern APZ area be removed in the future.
Cercartetus nanus Eastern Pygmy-possum V – BC Act	No	No	Low	No Eastern Pygmy-possum have been identified in the Selwyn area, although new records have been established within 5 km to the north-east as part of Snowy Hydro survey assessments. However, these sites are at lower altitudes to Selwyn. Eastern Pygmy-possum was listed by the author in Table 1 as the species has been recorded above 1400 m in a few other areas in KNP, and most records until recently were incidental. Areas above 1500 m elevation appear to be too high for the species to survive, though the environment in the northern APZ area before the bushfire did contain elements consistent for this species including tree hollows at various heights, ground debris including logs, and a contiguous shrub cover. If Eastern Pygmy-possum were in these environments before the bushfire, there is little habitat available that could support this species in the near future. Vegetation in sub-alpine areas is slow to recover, particularly given the extent and intensity of the January 2020 fire.
Mastacomys fuscus Broad-toothed Rat V – BC Act V – EPBC Act	Yes (the species was recorded outside of the western edge of the APZ area, but considered close enough as the vegetation was the same type)	No (but fresh scats were identified about 70 m south of the existing pump house along Clear Creek)	Moderate	There is no effective habitat on any of the proposed development sites and the current and projected height of ground vegetation in the southern areas of the APZ would not be adequate. However, vegetation around the northern and western areas of the APZ could have provided sub-optimum habitat for this species that prefers wet grassland, wet heath and bog communities or a complex of these types. Dry shrub understorey is not optimum but could be used to bridge areas. Perhaps more important are thick Poa tussocks from which the animal makes runways and tunnels from where it feeds on grasses and sedges. The northern and western APZ area has been severely fire affected, and currently there is no effective

				contiguous grass cover, shrubs are absent, and the degree of burnt trunks and absence of a tree canopy indicates a high intensity fire. It is highly unlikely that Broad-toothed Rat are currently present in this area and it will take some time for any species to recolonise. For this to happen, optimum habitat will have to regenerate and there needs to be animals in the area that survived the fire. Relatively fresh scats were identified along Clear Creek. This is encouraging as the grass growth in this area was good although not thick or contiguous enough to provide cover for transitory animals away from the creek line. At this point in time it is unlikely that Broad-toothed Rat are present in the survey area and nor would they be impacted by the proposed redevelopment. A reassessment would be required in the future if regenerated shrubs or seedling regrowth needed to be removed to meet APZ thresholds. It is possible that no significant impact could occur if a contiguous tussock ground cover was present and left intact. Detection of this species is relatively easy using the presence of scats.
Pseudomys fumeus Smoky Mouse CE – BC Act E – EPBC Act	No	No	Low	Unlike Broad-toothed Rat, Smoky Mouse require a greater habitat complexity than thick contiguous Poa tussocks. Records for this species have included high sub-alpine areas in KNP, although most records are from lower elevations including a new suite of records about 5 km to the north-west. Given the loss of ground and shrub vegetation including most ground debris and logs, it is highly unlikely that Smoky Mouse would be present in the northern and western APZ area. Whether habitat opportunity changes in the future will depend upon post-fire regeneration, the accumulation of ground debris including logs and the survival or recolonisation of a local population. At this point in time there is a low risk of impacting this species by the proposed activities associated with the redevelopment. However, if there is a requirement in the future to remove vegetation to meet APZ thresholds, then this species will need to be re-evaluated with the likely requirement to undertake trapping to determine whether this species is present.
Microbats (V – BC Act) • *Falsistrellus tasmaniensis* Eastern False Pipistrelle • *Miniopterus orianae oceanensis* Large Bent-winged Bat	No	No	Moderate	Although no records in the survey area, the chances of species of microbat being present in the Selwyn area is high, even for short periods of time during the non-winter months. The chances of roosting in some of the larger trees with small hollows, fissures and larger slabs of decorticating bark is also high – at least before the January 2020 bushfire changed the habitat. Suitable hollows are still present but the loss of foliage and other vegetation that supported various insect species including moths has been lost – the degree of impact can only be postulated. By the development of the Guest Facilities, ROC and increased size of the embankment there will be no impact upon any microbat species. There is no habitat value within the southern APZ except tree stands scattered across the slope. The trees in the northern and western APZ are still likely to provide some roosting opportunities, but persistence in the immediate area will also depend upon prey (e.g. insects and other invertebrates). Habitat opportunities will improve over time as the vegetation regenerates, although tree canopy to match the pre-fire status will take a long time as this will only take place by the maturing coppice shoots currently sprouting at the base of most trees. If trees are to be removed to meet APZ thresholds, then a greater level of assessment would be required to determine which species are present and which trees would be providing roosting or nesting sites at that point in time. Furthermore, specialised detection methods would be required to identify microbats including harp traps and ultrasonic equipment.
Threatened Ecological Community				
Montane Peatlands and Swamps of the New England Tableland, NSW North Coast, Sydney Basin, South East	No	No	Low	No Montane Peatland is present within the survey area. The closest recorded community is to the north of the northern APZ area. The current outer APZ calculations identify the zone to be within the snow

Corner, South Eastern Highlands and Australian Alps bioregions EEC – BC Act E – EPBC Act				gum woodland. There are other patches of Montane Peatland within the resort, but these are mostly scattered to the south and to the north-east. Where adjacent Montane Peatland community to the APZ is present, it would only be impacted if the adjacent APZ were to include future clearing. Surface and sub-surface drainage is an integral process to the maintenance of Montane Peatland communities. Any changes to water flow by removing upslope vegetation that could increase flow rates away from the site or increase evaporation rates by the loss of canopy species, would be detrimental. The challenges faced by fire-affected Montane Peatlands is significant. Many of the peatlands observed by the author as part of a Peatland Monitoring project in KNP that includes many sites along the Snowy Mountains Hwy and Cabramurra Rd., shows a dramatic loss of peatland species including the constituent Sphagnum component. Recovery of these ecosystems will take yeas to see the return of previous species, but in some cases, where the peat has been destroyed by fire, the main process driver of this ecosystem has been lost. If upslope vegetation from the adjacent Montane Peatlands is to be removed as part of any future APZ commitments, then a reappraisal of these communities may need made in the context of how much vegetation and the location of that vegetation in relation to the peatland. However, the sites for the proposed Guest Facilities, ROC and enlarged quarry embankment will not have any impact upon Montane Peatlands adjacent to the survey area.

In summary, no adverse impacts are anticipated upon threatened flora and fauna as a result of the proposal to build Guest Facilities and Resort Operation Centre on the previously disturbed sites that contained the former resort buildings prior to the January 2020 bushfire. The proposal to increase the embankment height at the quarry dam and subsequent water volume will also not have any adverse impacts as the quarry is essentially a disturbed area, and habitat will remain within the enclosure, although the amount of area will be reduced when the full-dam level is periodically reached. APZ areas to the south of the Guest Facilities and ROC are mostly a managed ski slope where the height of the vegetation is maintained to a low profile for skier safety and snow grooming operations. The plant diversity in this area is high with a strong representation of native species, although habitat opportunity is low due to that lack of vegetation structure and stratum and other features such as rocks and boulder outcrops. Vegetation has recovered relatively well since the bushfire.

APZ areas to the north and west of the Guest Facilities and ROC had a greater habitat complexity before the bushfire as provided by trees and shrub layer. The bushfire has removed most tree canopy and nearly all shrubs. Ground cover is patchy with some areas recovering well like southern APZ areas, while other areas are still devoid of any vegetation. The presence of numerous noxious weeds in this area as identified by ENFAC (2009) before the fire, and those identified here approximately 10 months after, pose an ongoing risk to the recover of native vegetation. Habitat potential within the northern and western APZ areas has been diminished due to the bushfire, although this will be reinstated overtime as the vegetation regenerates and more ground debris accumulates. The severity of the fire has removed most logs and branches that are important habitat components for ground fauna, but this will also be reinstated when some of the standing tree material including trunks and branches collapse.

While burnt vegetation is considered aesthetically unpleasing, the opportunity that fire can have by creating or enhancing hollows needs to be recognised. There will be different opportunities to different species in the short and long term of tree and community regeneration. Unless unsafe to staff and guests, or where slope operations are impeded, burnt trees and felled material should be left as part of fauna habitat, including habitat opportunities for non-threatened species.

6 CONCLUSIONS

The building of new Guest Facilities and Resort Operation Centre will not have any adverse impact upon threatened species or threatened ecological communities as it is sited over the same building envelope and precinct as existed before the January 2020 bushfire. The quarry dam augmentation will not have any impact upon threatened species or threatened ecological communities at the embankment wall, and the subsequent increased dam potential is not anticipated to have any adverse impacts upon threatened species as area with the dam will still be available (should threatened species be present). The APZ area to the south will continue to be managed as a ski slope as it existed before the bushfire, and therefore will pose no risk to threatened species and threatened ecological communities. The post-fire recovery of the APZ area to the north and west will take many years to attain the same habitat opportunities to that which existed prior to the bushfire. However, prevention or subsequent removal of any tree and shrub regrowth will have an impact upon habitat potential, the degree to which is uncertain without specific vegetation targets. Future targets or work may have to be assessed in the context of the vegetation to be removed at that point in time and the species present or likely to be present at that point in time reappraised.

At the time this assessment was undertaken approximately 10 months after the bushfire, no threatened flora was detected and habitat potential for most threatened species was absent or greatly diminished. The proposed redevelopment and associated activities pose no risk to threatened species or threatened ecological communities given the information provided and, in the context prescribed, discussed in this report. Therefore, no 'Test of Significance' under the BC Act or the Commonwealth's 'Significant Impact Criteria' under the *EPBC Act* was applied. However, future vegetation clearing could require specialised fauna survey methods to be employed and respective significant impact criteria to be tested against possible candidate species and communities.

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APPENDIX 1:

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

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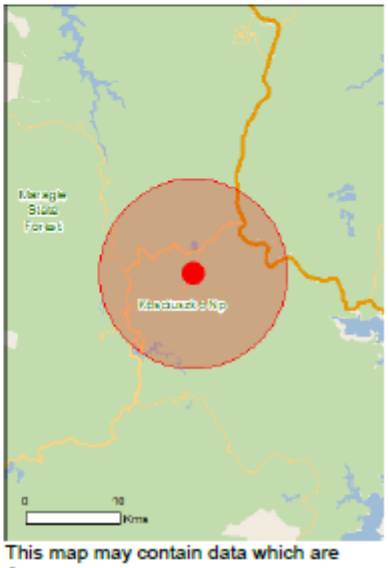

This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2015

Coordinates
Buffer: 10.0Km

Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	2
Wetlands of International Importance:	4
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	3
Listed Threatened Species:	34
Listed Migratory Species:	11

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at http://www.environment.gov.au/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Land:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	16
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

State and Territory Reserves:	1
Regional Forest Agreements:	1
Invasive Species:	30
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

National Heritage Properties		[Resource Information]
Name	State	Status
Natural		
Australian Alps National Parks and Reserves	NSW	Listed place
Historic		
Snowy Mountains Scheme	NSW	Listed place

Wetlands of International Importance (Ramsar)	[Resource Information]
Name	Proximity
Banrock station wetland complex	700 - 800km upstream
Hattah-kulkyne lakes	500 - 600km upstream
Riverland	700 - 800km upstream
The coorong, and lakes alexandrina and albert wetland	700 - 800km upstream

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Name	Status	Type of Presence
Alpine Sphagnum Bogs and Associated Fens	Endangered	Community known to occur within area
Natural Temperate Grassland of the South Eastern Highlands	Critically Endangered	Community may occur within area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community may occur within area

Listed Threatened Species [Resource Information]

Name	Status	Type of Presence
Birds		
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Foraging, feeding or related behaviour may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area
Fish		
Maccullochella macquariensis Trout Cod [26171]	Endangered	Species or species habitat may occur within

Name	Status	Type of Presence
		area
Maccullochella peelii		
Murray Cod [66633]	Vulnerable	Species or species habitat may occur within area
Macquaria australasica		
Macquarie Perch [66632]	Endangered	Species or species habitat may occur within area
Frogs		
Litoria booroolongensis		
Booroolong Frog [1844]	Endangered	Species or species habitat likely to occur within area
Litoria raniformis		
Growling Grass Frog, Southern Bell Frog, Green and Golden Frog, Warty Swamp Frog, Golden Bell Frog [1828]	Vulnerable	Species or species habitat may occur within area
Litoria spenceri		
Spotted Tree Frog [25959]	Endangered	Species or species habitat likely to occur within area
Litoria verreauxii alpina		
Alpine Tree Frog, Verreaux's Alpine Tree Frog [66669]	Vulnerable	Species or species habitat known to occur within area
Pseudophryne corroboree		
Southern Corroboree Frog [1915]	Critically Endangered	Species or species habitat may occur within area
Mammals		
Burramys parvus		
Mountain Pygmy-possum [267]	Endangered	Species or species habitat known to occur within area
Dasyurus maculatus maculatus (SE mainland population)		
Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat likely to occur within area
Mastacomys fuscus mordicus		
Broad-toothed Rat (mainland), Tooarrana [87617]	Vulnerable	Species or species habitat known to occur within area
Petauroides volans		
Greater Glider [254]	Vulnerable	Species or species habitat likely to occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)		
Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat may occur within area
Pseudomys fumeus		
Smoky Mouse, Konoom [88]	Endangered	Species or species habitat known to occur within area
Pteropus poliocephalus		
Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour may occur within area
Plants		
Calotis glandulosa		
Mauve Burr-daisy [7842]	Vulnerable	Species or species habitat may occur within area
Colobanthus curtisiae		
Curtis' Colobanth [23961]	Vulnerable	Species or species habitat likely to occur within area
Diuris ochroma		
Pale Golden Moths [64565]	Vulnerable	Species or species habitat may occur within area

Name	Status	Type of Presence
Glycine latrobeana Clover Glycine, Purple Clover [13910]	Vulnerable	Species or species habitat may occur within area
Leucochrysum albicans subsp. tricolor Hoary Sunray, Grassland Paper-daisy [89104]	Endangered	Species or species habitat may occur within area
Prasophyllum bagoense Bago Leek-orchid [84276]	Critically Endangered	Species or species habitat may occur within area
Pterostylis oreophila Blue-tongued Orchid, Kiandra Greenhood [22903]	Critically Endangered	Species or species habitat likely to occur within area
Rutidosis leiolepis Monaro Golden Daisy [21490]	Vulnerable	Species or species habitat likely to occur within area
Swainsona recta Small Purple-pea, Mountain Swainson-pea, Small Purple Pea [7580]	Endangered	Species or species habitat may occur within area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat known to occur within area
Xerochrysum palustre Swamp Everlasting, Swamp Paper Daisy [76215]	Vulnerable	Species or species habitat known to occur within area
Reptiles		
Cyclodomorphus praealtus Alpine She-oak Skink [64721]	Endangered	Species or species habitat may occur within area
Liopholis guthega Guthega Skink [83079]	Endangered	Species or species habitat may occur within area

Listed Migratory Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat likely to occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat likely to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area

Name	Threatened	Type of Presence
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat likely to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat may occur within area

Extra Information

State and Territory Reserves	[Resource Information]
Name	State
Kosciuszko	NSW

Regional Forest Agreements	[Resource Information]

Note that all areas with completed RFAs have been included.

Name	State
Southern RFA	New South Wales

Invasive Species	[Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

Name	Status	Type of Presence
Birds		
Acridotheres tristis Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
Alauda arvensis Skylark [656]		Species or species habitat likely to occur within area
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Carduelis carduelis European Goldfinch [403]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species

Name	Status	Type of Presence
		habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Passer montanus Eurasian Tree Sparrow [406]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Turdus merula Common Blackbird, Eurasian Blackbird [596]		Species or species habitat likely to occur within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Capra hircus Goat [2]		Species or species habitat likely to occur within area
Equus caballus Horse [5]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Feral deer Feral deer species in Australia [85733]		Species or species habitat likely to occur within area
Lepus capensis Brown Hare [127]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		

Name	Status	Type of Presence
Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
Cytisus scoparius Broom, English Broom, Scotch Broom, Common Broom, Scottish Broom, Spanish Broom [5934]		Species or species habitat likely to occur within area
Nassella neesiana Chilean Needle grass [67699]		Species or species habitat likely to occur within area
Nassella trichotoma Serrated Tussock, Yass River Tussock, Yass Tussock, Nassella Tussock (NZ) [18884]		Species or species habitat likely to occur within area
Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within area
Rubus fruticosus aggregate Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Ulex europaeus Gorse, Furze [7693]		Species or species habitat likely to occur within area

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Coordinates

-35.90748 148.44945

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact Us page.

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APPENDIX 2:

Flora Survey – Species List and Relative Abundance Weighting

Vascular plants recorded as part of the broader APZ for the proposed new Guest Facilities and Resort Operation Centre, as well as a stand-alone species list for the proposed height increase of the embankment in front of the quarry to raise the capacity of the dam. No flora species list is presented specifically for the building footprint of the Guest Facilities and Resort Operation Centre as the proposed sites are mostly devoid of vegetation or only contain exotic ground flora commensurate with the exotic grasses and forbs present surrounding the original buildings.

Data was collected on 15th October 2020. Scientific nomenclature follows that prescribed in the NSW PlantNet Database managed by the Royal Botanical Gardens.

Relative Abundance – code and description:

1 – rarely observed within the survey area. May be numerous but only in a very small area or isolated clump.

2 – occasionally observed in the survey area. May include scattered clumps.

3 – frequently observed in the survey area. May be scattered as isolated plants or clumps but expect to observe in different areas along the alignment.

4 – abundant. Frequently observed in the survey area without traversing too far. A dominant plant in terms of frequency or vertical projection and characterises the relevant community composition and structure.

Scientific Name	Common Name	Cover Abundance APZ	Cover Abundance Quarry Dam
(FERNS)			
DRYOPTERIDACEAE			
Polystichum proliferum	Broad Shield Fern	1	1
(MONOCOTYLEDONS)			
CYPERACEAE			
Carex appressa	Saw Sedge	2	
Carex breviculmis.	A Sedge	3	1
?*Isolepis* sp.	A Club Sedge	2	
JUNCACEAE			
Luzula novae-cambriae	Luzula	3	1
**Juncus effusus*	Soft Rush	1	
AMARYLLIDACEAE			
?**Narcissus* sp.	Daffodil	1	
PHORMIACEAE			
Dianella tasmanica	Tasman Flax-lily	2	
LOMANDRACEAE			
Lomandra longifolia	Spiny Headed Mat-rush	2	
POACEAE			
Agrostis sp.	A Native Bent Grass	2	
?*Deyeuxia* sp.	A Native Bent Grass	2	
Poa constiniana	Bog Snow Grass	1	
Poa phillipsiana	Purple Snow Tussock	1	

Poa sieberiana var. *sieberiana*	Snow Grass	4	2
?*Rytidosperma* sp.	A Wallaby Grass	2	
**Agrostis capillaris*	Brown-top Bent	3	2
**Aira* sp.	A Hair Grass	2	
**Anthoxanthum odoratum*	Sweet Vernal Grass	1	
**Dactylis glomerata*	Cock's Foot	2	2
**Festuca arundinaceae*	Tall Fescue	2	
**Festuca nigrescens*	Chewing's Fescue	1	
**Festuca rubra*	Red Fescue	2	2
**Holcus lanatus*	Yorkshire Fog	1	2
**Phleum pratense*	Timothy Grass	1	1
**Poa annua*	Winter Grass	2	
**Poa pratensis*	Kentucky Blue Grass	2	
Unidentified grass 1 (no inflorescence)		2	
Unidentified grass 2 (no inflorescence)		1	
Unidentified grass 3 (annual)		1	
Unidentified grass 4 (annual)		1	
(DICOTYLEDONS)			
APIACEAE			
Aciphylla simplicifolia	Mountain Aciphylla	1	
Oreomyrrhis argentea	Silvery Carraway	2	
ASTERACEAE			
Brachyscome decipiens	Field Daisy	2	
Brachyscome spathulata	Spoon Daisy	1	
Brachyscome sp.	A Daisy	1	
Cassinia ?*monticola*	Mountain Cassinia	1	
Celmisia sp.	Silver Snow Daisy	2	
Coronidium scorpioides	Button Everlasting	3	
Craspedia ?*coolaminica* (linear basal leaves)	A Billy Button	1	
Craspedia ?*jamesii*	A Billy Button	2	
Craspedia sp. (large hairy leaved	A Billy Button	2	
?*Erigeron bellidioides*	A Native Feabane	1	
Euchiton sp.	A Cudweed	2	
Leptorhynchos squamatus ssp. *alpinus*	Scaly Buttons	2	
Olearia erubescens	Pink-tip Daisy Bush	2	
Olearia phlogopappa ssp. ?*serrata*	Dusty Daisy Bush	1	
Cassinia monticola	Mountain Cassinia	1	
Picris angustifolia ssp. *merxmuelleri*	Native Picris	1	
Podolepis laciniata	Mountain Lettuce	1	
Rhodanthe anthemoides	Chamomile Sunray	1	
Senecio gunnii	A Montain Grounsel	2	1
**Achillea millefolium*	Milfoil	1	
**Cirsium vulgare*	Spear Thistle	2	
**Crepis* ?*foetida*	Stinking Crepis	1	2
**Hypochaeris glabra*	Smooth Cat's Ear	1	
**Hypochaeris radicata*	Cat's Ear	3	3
**Leucanthemum x superbum*	Shasta Daisy	2	
**Taraxacum officionale*	Dandelion	2	2
**Tragopogon dubius*	Goatsbeard	1	

BORAGINACEAE			
**Myosotis discolor*	Forget-me-not	1	
BRASSICACEAE			
Cardamine sp.	A Bitter-cress	1	
**Erophila verna*	Whitlow Grass	1	
CAMPANULACEAE			
Lobelia pedunculata	Trailing Pratia	2	
Wahlenbergia sp.	A Bluebell	1	
CARYOPHYLLACEAE			
Scleranthus biflorus	Two-flowered Knawel	2	
Scleranthus?fasciculatus	Knawel	1	
Stellaria pungens	Prickly Starwort	3	2
**Cerastium* sp.	A Chickweed	1	2
**Spergularia rubra*	Sandspurry	1	
ELATINACEAE			
?*Elatine gratioloides*	Water Wort		2
EUPHORBIACEAE			
Poranthera microphylla	Small Poranthera	1	
FABACEAE			
Bossiaea foliosa	Leafy Bossiaea	1	
Daviesia ulicifolia	Gorse Bitter Pea	2	
Hovea montana or H asperifolia (just emerging)	Hovea	2	
?*Oxylobium ellipticum* (possibly *Podolobium alpestre* – material just emerging)	Bush Pea	2	2
**Trifolium arvense*	Haresfoot Clover	1	
**Trifolium* ?*campestre*	Hop Clover	2	
**Trifolium* ?*dubium*	Yellow Suckling Clover	2	
**Trifolium fragiferum*	Strawberry Clover	1	
**Trifolium pratense*	Red Clover	1	1
**Trifolium repens*	White Clover	3	2
**Trifolium* ?*subterraneum*	Subterranean Clover	2	
GERANIACEAE			
Geranium ?*antrorsum*	Common Crane's Bill	2	
Geranium ?*solanderi* var. *solanderi*	Cut-leaf Crane's Bill	2	2
**Erodium cicutarium*	Common Stork's Bill	1	
GOODENICACEAE			
Goodenia hederaceae ssp. *alpestris*	Mountain Ivy Goodenia	2	
Scaevola hookeri	Mountain Mat-flower	1	
HALORAGACEAE			
Gonocarpus ?*tetragynus* (Possibly *G. montanus)*	A Raspwort	2	
HYPERICACEAE			
**Hypericum peforatum*	St. John's Wort	2	2
MYRTACEAE			
Baeckea gunniana	Alpine Baeckea	1	
Eucalyptus pauciflora ssp. *niphophila* (assumed to be *E. p. niphopila* and not *E. p. debeuzevillei*)	Snow Gum	3	1
ONAGRACEAE			
Epilobium billardierianum ssp. *hygrophilum*	Hairy Willow Herb	1	2
OXALIDACEAE			
Oxalis ?*perennans*	Oxalis	1	

**Oxalis corniculata*	Oxalis	1	
PLANTAGINACEAE			
**Plantago lanceolata*	Lamb's Tongues	2	
**Veronica anagallis-aquatica*	Blue Water Speedwell	1	
POLYGONACEAE			
**Acetosella vulgaris*	Sheep Sorrell	4	4
**Polygonum aviculare*	Wireweed	1	
RANUNCULACEAE			
Ranunculus graniticola	Granite Buttercup	2	
Ranunculus sp.	Buttercup	1	
ROSACEAE			
Acaena novae-zelandiae	Bidgeee-widgee	2	2
Aceana sp.	A Sheep's Burr	2	
Geum urbanum	Herb Bennett	1	
RUBIACEAE			
Asperula gunnii	Mountain Woodruff	2	
Asperula scoparia	Prickly Woodruff	2	
STYLIDIACEAE			
Stylidium ?montanum	Alpine Triggerplant	2	
THYMELEAECEAE			
Pimelea biflora	*Matted Rice Flower*	1	
Pimelea linifolia	Poison Rice Flower	3	
Pimelea ?curviflora	Poison Rice Flower	1	
VIOLACEAE			
Viola betonicifolia	Showy Violet	1	
**Viola arvensis*	Field Pansy	3	
WINTERACEAE			
Tasmannia xerophila ssp. *xerophila*	Pepper Bush	2	
Unidentified forb 1		2	
Unidentified forb 2 (possibly an Asteraceae)		2	1
Unidentified forb 3 (possibly exotic – close to road)		1	
Unidentified forb 4		1	
Unidentified forb 5 (possibly exotic – highly disturbed area)		2	1
Unidentified herb (lily-like).		1	

**denotes exotic species*

Site Summary	Total Native	67	12
	Total Exotic	40	13
	Unknown	10 (4 grasses & 6 forbs)	2 (forbs)
	Total Species	117	25

APPENDIX 3:

Fauna Records – Incidental Species List

Vertebrate fauna detected across Selwyn Snow Resort while conducting vegetation surveys and habitat assessments on 15th October 2020. Scientific nomenclature follows that used by the NSW Department of Planning, Infrastructure and Environment.

Detection Codes: O – Observed, H – Heard, S – Scats

Birds

Common Name	Scientific Name	Detection
Nankeen Kestral	*Falco berigora*	O/H
Yellow-tailed Black Cockatoo	*Calyptorhynchus funereus*	H
Crimson Rosella	*Platycercus elegans*	H
Yellow-rumped Thornbill	*Acanthiza chrysorrhoa*	O/H
Brown Thornbill	*Acanthiza pusilla*	O/H
Striated Pardalote	*Pardalotus striatus*	H
Yellow-faced Honeyeater	*Caligavis chrysops*	H/O
Red Wattlebird	*Anthochaera carunculata*	O/H
Fan-tailed Cuckoo	*Cacomantis flabelliformis*	O/H
Black-faced Cuckooshrike	*Coracina novaehollandiae*	O/H
Australian Magpie	*Cracticus tibicen*	O
Pied Currawong	*Strepera graculina*	O/H
Willie Wagtail	*Rhipidura leucophrys*	O/H
Australian Raven	*Corvus coronoides*	H
Fairy Martin	*Petrochelidon ariel*	O
Australasian Pipit	*Anthus novaeseelandiae*	O/H
Common Starling	**Sturnus vulgaris*	O/H
Unknown Bird 1	*Possibly a whistler*	H
Unknown Bird 2	*Possibly another cuckoo species*	H

Mammals

Common Wombat	*Vombatus ursinus*	S
^Broad-toothed Rat	*Mastacomys fuscus*	S
Horse	**Equus caballus*	S
European Hare	**Lepus europaeus*	S
Rabbit	**Oryctolagus cuniculus*	S

^ fresh scats were found about 70 metres down stream of the Pump House within the creek line. Very little vegetation above the creek line of suitable height and density to provide refuge, safe passage and food for this species. Poa and other species of native tussock yet to attain full height since the bushfire.

Amphibians

+Common Eastern Toadlet	*Crinia signifera*	H/O

+ heard along the creek near the Pump House and in the Quarry Dam at the top of the resort.

Reptiles

Eastern three-lined Skink	*Acritoscincus duppereyi*	O
#Highland Copperhead	*Astrelaps ramsayi*	O

 # the animal looked thin and malnourished, suggesting limited feeding opportunities since exiting the winter brumation period.

**denotes introduced species*

APPENDIX II TOBOGGAN SLOPE ADDENDUM (DAVID WOODS, 2020)

Starwood Agroforestry & Ecosystem Management

PO BOX 891
JINDABYNE NSW 2627
M: 0417 229 015
ABN: 36 394 669 376

RE: PROPOSED TOBOGGAN RAMP – THREATENED SPECIES ADDENDUM LETTER TO THE PROPOSED REDEVELOPMENT FOR SELWYN SNOW RESORT P/L

This letter is an addendum and further advice for the Proposed Redevelopment Project for Selwyn Snow Resort. A threatened flora and threatened fauna habitat assessment was prepared in October 2020 to account for the environment targeted by the proposed Guest Facilities, Resort Operation Centre, the Asset Protection Zone surrounding those two structures, and the augmentation of the existing Quarry Dam for the proposed height increase of the front embankment. The same field inspection and data collection also provided information for a separate water pipe and associated trenching between the existing pump house along Clear Creek to a proposed water tank at the top of the ridge adjacent to planned staff dwellings.

Due to the multiple assessment items and the extent of the Asset Protection Zone around the proposed Guest Facilities and Resort Operation Centre, a broad survey area was captured in the flora and fauna assessment. This included the proposed site for the 'Toboggan Ramp' which was not identified at the time of the site inspection nor specifically targeted, but which was inadvertently surveyed as part of the wider study area. The proposed site, the subject of this addendum, was at the time of the survey (15 October 2020) heavily mulched and devoid of any native stratum. Several native (e.g. *Geranium* sp. and *Stellaria pungens*) and introduced (e.g. **Acetosella vulgaris* and **Taraxacum officionale*) plants were germinating through the straw and woodchips, though no threatened species that were targeted for all other proposed sites was observed or expected in this area. The threatened species targeted during the field survey are listed in Table 3 in the Flora and Fauna Assessment Report for the Proposed Redevelopment of Selwyn Snow Resort. This table summarised the existing information of each plant species, the absence of threatened plant recordings following the field work and an assessment of each plant in relation to the proposed impact. The assessment was also based on the existing environment. Notwithstanding the scattered mix of native and introduced species growing through the mulch, the site is now affectively heavily disturbed and the existing mulch assumed to be the fallen trees in the area that were severely burnt by the January 2020 wildfire.

On the basis of the survey undertaken for threatened species identified in Table 3 and the flora survey results listed in Appendix 2 of the same report, there is confidence that no threatened plant species is likely to occur on the proposed Toboggan Ramp site. In regards to threatened fauna, it is also highly unlikely that any threatened fauna species would be adversely affected by the proposed Toboggan Ramp at this site, given the loss of habitat values including habitat complexity (i.e. no vegetation structure or stratum, and no other features such as logs and boulders).

That said, this addendum cannot account for the environmental conditions that existed before the wildfire nor the post-wildfire environmental attributes before the site was mulched. On the basis that the site is highly disturbed at the time this addendum letter was prepared, the site has low environmental condition and a low possibility that any threatened species occur on the site.

David Woods

Ecologist

17/11/2020

APPENDIX III SUPPLEMENTARY ABORIGINAL DD (PAST TRACES, 2020)

16/11/2020

Mr Marko Osti

TSA

GPO Box 609

Canberra ACT 2601

Dear Marko,

Re: Supplemental Aboriginal Due Diligence Heritage Advice – Mt Selwyn Snow Resort

This letter report provides Aboriginal heritage advice for the proposed redevelopment of the Mt Selwyn Snow Resort site located at Lot 36 DP46316, 213A Kings Cross Road Kiandra within the Kosciusko National Park. The resort was destroyed by bushfires in 2020 and the proposed redevelopment includes a new resort operations centre providing staff facilities, ski patrol office, groomer and ski-doo storage and vehicle repair station.

This report has been prepared under the requirements of the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (DECCW 2010).

Project Background

As a result of the 2020 bushfire damage, the Mt Selwyn Snow Resort requires redevelopment. A due diligence report was commissioned from Complete Town Planning which in accordance with the Due Diligence Code of Practice completed a review of heritage registers and an assessment of heritage impacts from the proposed works.

The Due Diligence assessment identified that an identified Aboriginal heritage site (not listed on the NSW Heritage Aboriginal Heritage Information Management System (AHIMS) database) was present in the vicinity of the proposed infrastructure trench to be placed adjacent to the current Kings Cross Road verge. This Aboriginal Heritage site was recorded in 2010 by Feary and consists of three surface artefacts within an area of erosional exposure.

Meetings were held by TSA with NSW Heritage who requested a field survey by a qualified archaeologist to assess impacts if the development was within 40m of the site location.

As a result, this report has been commissioned to provide certainty in regards to Aboriginal heritage constraints and impacts resulting from the project. This letter advice on the results of the field survey is supplemental to the Due Diligence Report completed by Complete Town Planning and the documents should be read in conjunction.

The area of trenching works and the relationship to the identified site are shown on figure 1.

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Figure 1. Site location

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Project Objectives

The following is a summary of the major objectives of the supplemental assessment:

- Review of previous heritage reports undertaken in the Mt Selwyn immediate area and known heritage site details.
- Assessment of Landscape for landforms that may contain potential for unrecorded sites and to determine level of disturbance of landscape features.
- Undertake site visit to visually inspect the recorded site location, areas identified as holding potential and to verify levels of disturbance.
- Complete heritage advice letter containing assessment of impacts and if applicable, recommendations to minimise potential impacts to heritage values within the project area.

Aboriginal Consultation

Consultation with the Aboriginal community is not a requirement of the Due Diligence Code. As a result for this preliminary assessment no consultation has been undertaken. If heritage values are found to be present within the project area as a result of this assessment, or further investigation is required, then consultation in accordance with the NSW Heritage guidelines will be required.

Assessment Results

AHIMS Search

A search of the OEH AHIMS database was undertaken on the 4th September 2020 by Complete Town Planning which revealed no registered sites within the project area or in the close vicinity.

Previous Heritage Assessments.

The project area has been subject to heritage survey in 2009 (ENFAC 2009) and 2010 (Feary) during which one site was identified by Feary in 2010. The site consisted of three artefacts within an erosion scar, located to the east of any of the proposed 2010 works. No other heritage sites were identified and the area across the remainder of the resort classified as holding low potential for unrecorded sites.

To determine the degree of impact of the proposed works on the identified site is the primary aim of the field survey.

Site Visit

A field inspection of the previously recorded artefact scatter site location and the adjacent proposed trenching works area was carried out on the 13th of November 2020.

The alignment for the proposed trenching follows the eastern side of Kings Cross Road, a zone known to have been substantially altered by successive phases of landscape management. Field assessment confirms this observation, with the following specific forms of impact being apparent:

- Construction of the main sealed road feature;
- A gravel and earth bund approximately 10 metres wide directly adjacent to the eastern margin of the sealed road;

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- A graded and levelled ancillary vehicle track or service corridor approximately 20 metres wide paralleling the eastern side of the road; and
- A mechanical push of mixed local soil and imported gravels several metres wide running along the eastern edge of the ancillary track.

The disturbed road corridor context is shown in Plates 1 and 2.

Plate 1. Looking north along road corridor

Plate 2.Looking south showing landform disturbance, reshaping

The location of the artefact scatter site recorded by Feary in 2010 was revisited at GPS refs 630749. 6025330, at the eastern edge of the disturbed road corridor. The location of the recorded site at the time of the field survey is shown in Plate 3.

Plate 3. Site location looking south along road alignment.

As noted by Feary in 2010, the location comprises an eroded surface in the upslope vicinity of a natural spring or soak. Landscape position is a low gradient upper slope or ridge side/crest interface. Following the recent bushfire events the surface exposure may be expected to have expanded in extent and during the current inspection was measured at 20m x 5m in area with very high levels of surface visibility. The deposit within the exposure area is a medium to dark brown alpine loam soil of indeterminate depth with a surface lag of locally sourced gravels. Bedrock (likely of metamorphic rock) is apparent in occasional adjacent low outcrops.

The stone artefacts noted by Feary in 2010 were not relocated and no additional archaeological items or features were found during the inspection of the exposure or surrounding landscape surfaces. Given the intervening period between the original artefact recording and the current assessment, it is not surprising that the three stone artefacts apparent at the location in 2010 are no longer visible, particularly considering surficial processes associated with ongoing solifluction, bushfire and bioturbation.

The areas of exposure at the time of field survey are shown in Plates 4 and 5.

Plate 4. Looking East

Plate 5. Looking west

The impression gained through field visitation is that the artefact-bearing exposure is a relatively concise feature that indicates the presence of a very low to low density artefact scatter associated with lightly impacted to considerably disturbed deposits directly abutting the substantially altered landscape of the road corridor.

The location of the artefacts and any comparatively undisturbed associated deposits lies approximately 40 metres from the edge of the sealed road surface or 30 metres from the edge of the road bund and is separated from this zone by approximately 20 metres of levelled surface and mixed, redeposited sediments and rock. This intervening area of disturbed soils in shown in Plate 6.

Plate 6. Looking east – Ranging pole marks site exposure – intervening surface heavily disturbed

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SUMMARY

As posited by Feary, the original landscape and ecological setting apparent at the site location may be expected to have been a focus for at least transitory prehistoric Aboriginal activity. Although no stone artefacts were apparent at the time of the inspection, it is expected that local deposits will contain a very low to low density of dispersed artefacts in and around the recorded site exposure. The surface exposure in which the originally recorded artefacts were noted is most likely the terminal upslope expression of the extent of any remnant local archaeological deposits, now truncated by the broad road corridor following the local ridge top. This archaeological occurrence is separated from the setting for the proposed trenching activity by 30 to 40 metres of highly disturbed landscape.

As a result of the localised nature of the artefact scatter, and the wide intervening area of disturbed landform between the proposed works and the identified site location, no heritage impacts are anticipated from the proposed works.

The placement of the trench adjacent to or within the disturbed areas associated with the road and bund and the containment of construction plant within the levelled ancillary track corridor will ensure that all works are remote to any identified archaeologically sensitive areas.

Recommendations

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

Recommendation 1: Works to proceed without further heritage assessment.

The trenching works can proceed in these areas, without further assessment as no Aboriginal objects or places have been identified as occurring within the project area. The potential of impacting unrecorded sites during the proposed works is assessed as low.

Recommendation 2. Alteration of development footprint.

If any alteration of works is undertaken, which will reduce the intervening distance from the identified heritage site, then protective barrier fencing may be required. In any alteration of footprint, re-assessment of impacts will be required.

Recommendation 3. Discovery of Unanticipated Aboriginal cultural material.

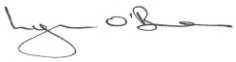
All Aboriginal places and objects are protected under the NPW Act. This protection extends to Aboriginal material that has not been previously identified, but might be unearthed during construction activities. In the event that Aboriginal material is discovered during construction the following steps 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: NSW Heritage 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. If the find is Aboriginal in nature, consult with NSW Heritage 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.

If you have any further questions in regards to the due diligence report, please contact me to resolve them. My contact details are provided below.

Regards



Lyn O'Brien

Director
Ph: 0403 021296
pasttraces@ozemail.com.au

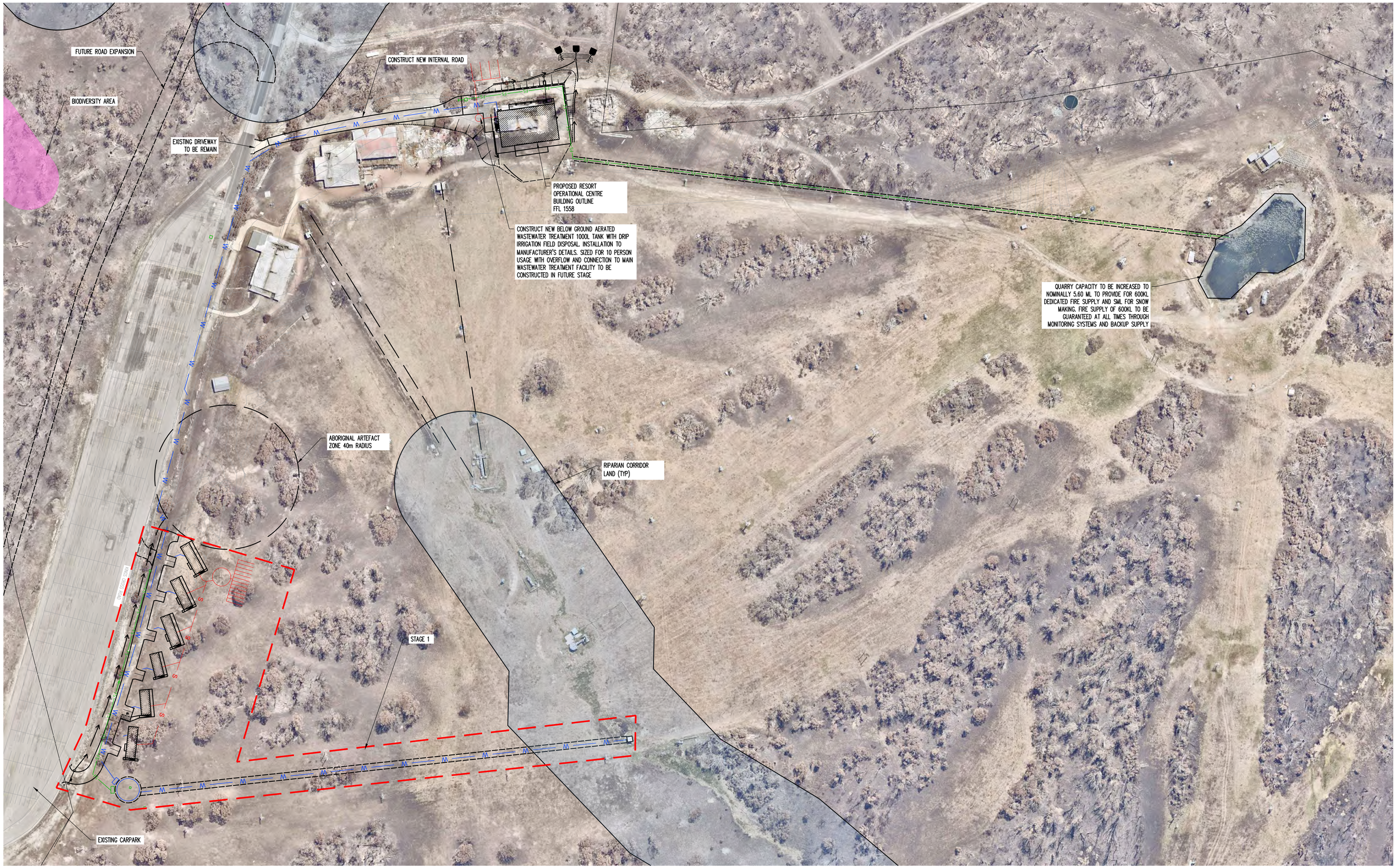
References

Complete Town Planning 2020. Resort Operations Centre 213A Kings Cross Road Kiandra NSW Lot 36 DP46316. Biodiversity and Aboriginal Heritage Assessment. Report for Selwyn Snow Resort Pty Ltd.

ENFAC 2009. Natural and Cultural Assessment at Selwyn Snowfields Lease Area. Report prepared for DECC.

Feary. S. 2010. Proposed Day Use Facility, Mt Selwyn Ski Resort, Kosciusko National Park. Aboriginal Archaeological Assessment. Report for Selwyn Snowfields.

THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT NOTES ON DRAWING C101



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GENERAL ARRANGEMENT PLAN

SCALE 1:1000

Figure 1. Proposed Works

LEGEND

- W — PROPOSED WATER RETICULATION
- S — PROPOSED WASTEWATER RETICULATION
- FS — PROPOSED FIRE SERVICES
- → — STORMWATER OVERLAND FLOW PATH

Rev	Description	Eng	Draft	Date
C	FOR DEVELOPMENT APPLICATION	CP	EM	22.10.20
B	FOR DEVELOPMENT APPLICATION	CP	EM	20.10.20
A	FOR DA REVIEW	CP	EM	02.10.20

Project: Selwyn Snow Resort

Civil Engineer: Taylor Thomson Whitting
612 6285 1766 | 103 Tennant Street Fyshwick ACT 2069

Project: SELWYN SNOW RESORT - ROC

Sheet Subject: GENERAL ARRANGEMENT PLAN

Scale : A1	Drawn	Authorised
1:1000	EM	RMD

Job No	Drawing No	Revision
209064	C120	C

Plot File Created: Oct 22, 2020 - 12:08pm