

# Bushfire Hazard Assessment Report



Project: Addition and Alterations to Existing Ski Lodge  
93 Charlotte Way, Charlotte Pass  
Kosciuszko National Park  
Lot 103 DP 1242013

DATE: OCTOBER 2023  
REPORT NO: 23141  
REVISION: 01  
PREPARED FOR: ARLBERG SKI LODGE  
PREPARED BY: ACCENT TOWN PLANNING

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- Preparation of Bushfire Reports for Development in Bushfire Prone Areas
  - Bushfire Attack Level (BAL) Certificates
  - Bushfire Evacuation Plans
  - Construction Solutions & Advice for Bushfire Prone Areas

# BUSHFIRE HAZARD ASSESSMENT

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### **DISCLAIMER**

The recommendations provided in the summary of this report are a result of the analysis of the proposal in relation to the requirements of Planning for Bushfire Protection 2019. Utmost care has been taken in the preparation of this report however there is no guarantee of human error. The intention of this report is to address the submission requirements for Development Applications on bushfire prone land. There is no implied assurance or guarantee the summary conditions will be accepted in the final consent and there is no way Accent Town Planning Pty Ltd is liable for any financial losses incurred should the recommendations in this report not be accepted in the final conditions of consent.

This bushfire assessment provides a risk assessment of the bushfire hazard as outlined in the PBP 2019 and AS3959 2018. It does not provide protection against any damages or losses resulting from a bushfire event.

## EXECUTIVE SUMMARY

This bushfire assessment is for external alterations and additions to an existing ski lodge, known as Arlberg Ski Lodge. The existing ski lodge is located at Lot 103 DP1242013, 93 Charlotte Way, Charlotte Pass NSW 2624.

The land is zoned tourist accommodation and has been identified as being in bushfire prone land, and hence as outlined in *Planning for Bushfire Protection – PBP 2019* (NSW RFS 2019) is considered Special Fire Protection Purpose (SFPP) and is required to obtain a BFSA from the RFS under section 100B of the RF Act.

It is recommended that:

- ***The proposed external addition to the existing lodge meets BAL 19 construction requirements on all elevations as per AS 3959.***
- ***The entire allotment is to be managed as an Inner Protection Area.***
- ***It is recommended that the existing building be upgraded for ember protection in accordance with Appendix II***

Pending compliance with the recommendations outlined in this report. The performance criteria and deemed to satisfy provisions of infill development within the Alpine Resorts outlined in Section 6.4 and 6.6 of PBP 2019 are found to be satisfied.

The assessment confirms the lot is located on Bushfire Prone Land and identifies the following:

- The predominant bushfire threat is *Sub-Alpine Shrub-Grass Woodland* vegetation to the South of the existing lodge.
- The entire allotment is to be maintained as an Inner Protection Area (IPA).
- Clearing will not exceed the clearing threshold permissible above which the Biodiversity Assessment Method (BAM) and offsets scheme to apply.
- The proposed APZ is not within the identified terrestrial biodiversity areas.
- No changes to existing road access are proposed as part of this application.
- Charlotte Pass is serviced by reticulated water and a hydrant system. The location and distance to the hydrants will be consistent with the requirements of the PBP 2019.





## ASSET PROTECTION ZONES

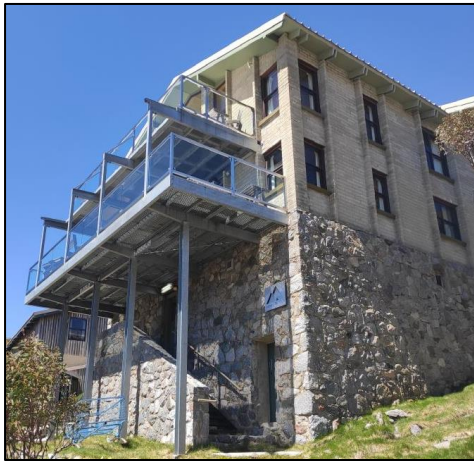
Asset protection zones are the most strategically valuable defence against radiant heat and flame, and to lesser extent embers. To allow for emergency service personnel and residents to undertake property protection activities, a defensible space that permits unobstructed pedestrian access is to be provided around the building.

An APZ should be maintained from the commencement of building works and maintained for perpetuity for the following distances:

- **ENTIRE LOT TO BE MANAGED AS AN INNER PROTECTION AREA (IPA).**

The APZ consists of an Inner Protection Area (IPA). The IPA is critical for providing a defensible space and managing heat intensities at the building surface.

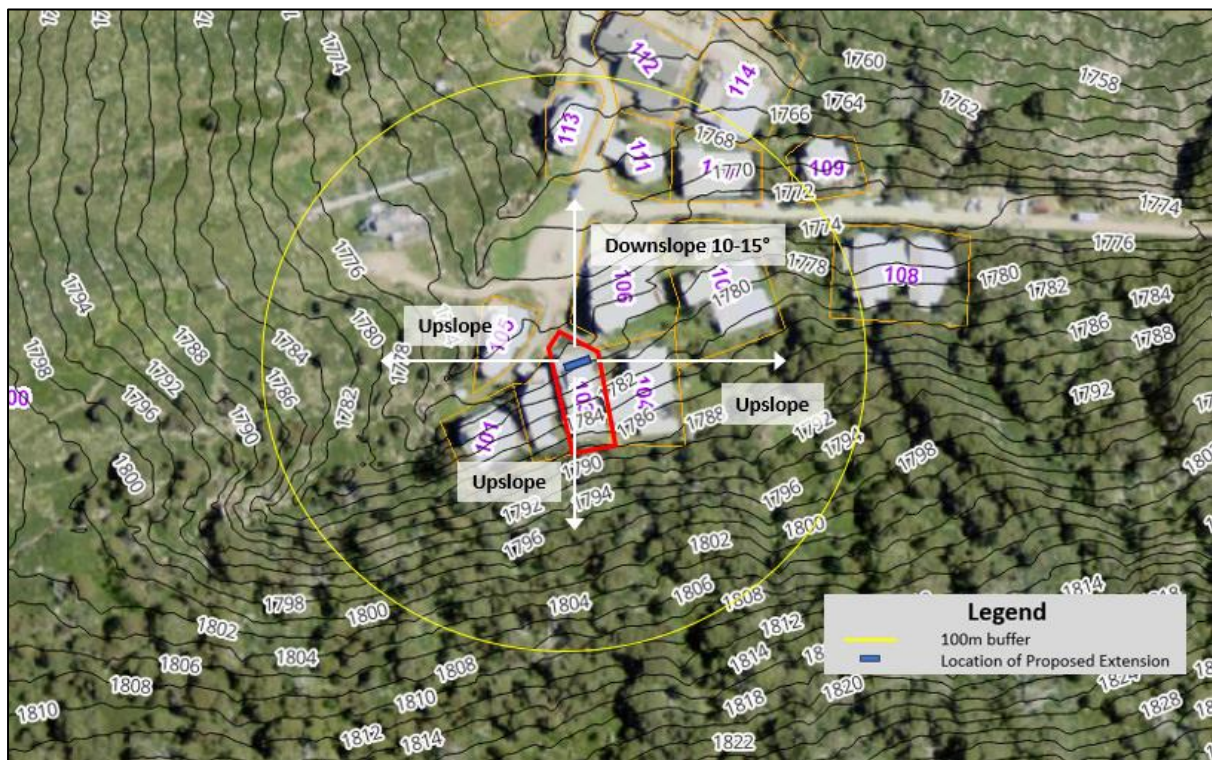
## CONSTRUCTION



Existing Building



Proposed Extension



The proposed external works include:

- Extension to existing lodge of 47.5sqm area x 3 storeys, to contain a new entry way, verandah, boot/ski storage room, wood store, waste materials room, staircase, and managers unit
- Extension of existing terrace on 1<sup>st</sup> floor with new glazed balustrade

All new external works are to be constructed to **BAL 19** on all elevations as per AS3959-2018, with the exception that the construction requirements shall be varied to comply with the requirements of Section 7.5 of the NSW Rural Fire Service *Planning for Bushfire Protection 2019*. It is recommended that the existing building be upgraded for ember protection.

## UTILITIES

The intent of measures is to minimise the risk of bush fire attack and provide protection for emergency services personnel, residents and others assisting firefighting activities. To achieve this, the following conditions shall apply:

## WATER

All above ground water pipes external to the building are to be metal.

## GAS

If gas is connected to the lodge on the subject land, must perform as per the following criteria:

- Bottled gas is installed and maintained in accordance with AS 1596 and the requirements of relevant authorities. Metal piping is to be used.
- All fixed gas cylinders are kept clear of all flammable materials to a distance of 10 metres and shielded on the hazard side of the installation.
- If gas cylinders need to be kept close to the building, the release valves are directed away from the building and at least 2 metres away from any combustible material, so that they do not act as a catalyst to combustion. Connections to and from gas cylinders are metal.
- Polymer sheathed flexible gas supply lines to gas meters adjacent to buildings are not to be used.

## EVACUATION AND EMERGENCY MANAGEMENT

The intent of measures is to provide suitable emergency and evacuation (and relocation) arrangements for occupants of special fire protection purpose developments.

To achieve this, the following conditions shall apply:

A building evacuation diagram, site layout diagram and Statement of Action are to be provided in each building in accordance with the NSW Rural Fire Service Guidelines for the Preparation of Emergency/Evacuation Plan and with Australian Standard AS 3745 2010 'Planning for Emergencies in Facilities'.

## 1. PROPOSAL

This Bush Fire Assessment Report has been compiled for submission to the Department of Planning for the purpose of assessment under Section 100B of the RF Act and is also considered “integrated development” under Section 4.46 of *Environmental Planning and Assessment Act 1979* (EP&A Act).

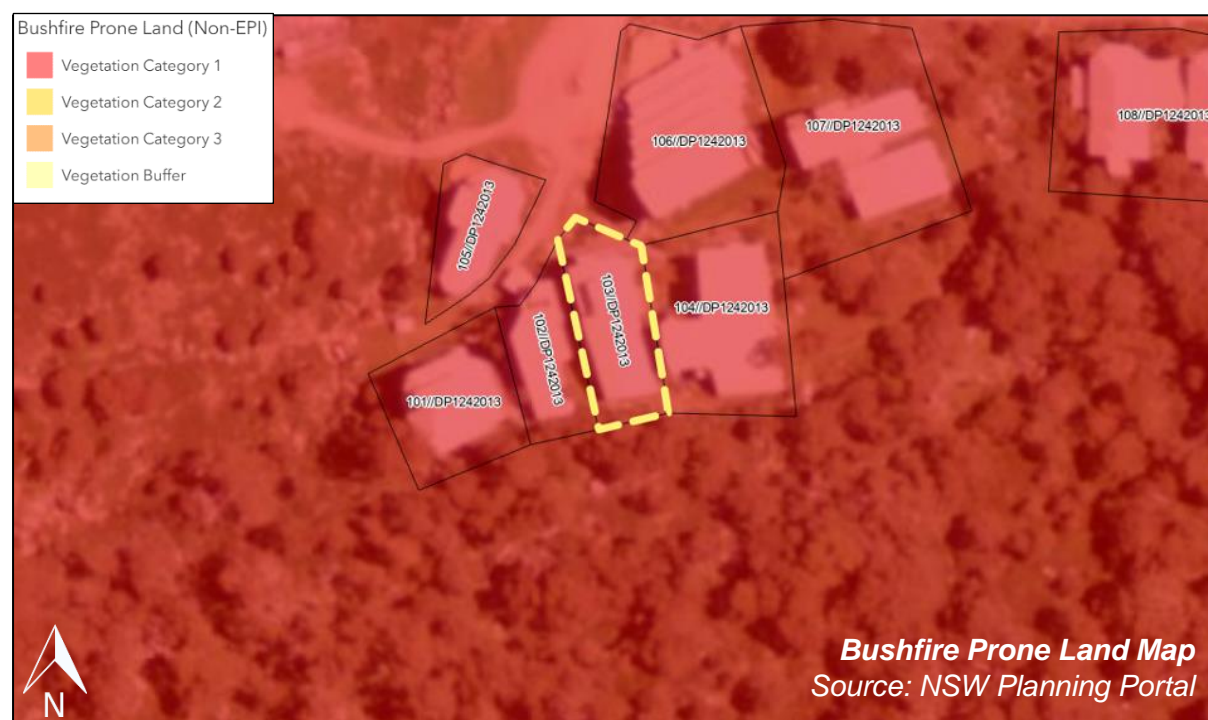
The report has been prepared in accordance with the submission requirements of Appendix 4 of *Planning for Bush Fire Protection* (NSW RFS 2019) and identifies the proposal can meet the appropriate objectives and performance criteria of Section 6.4, 6.5 and 6.6 *Planning for Bush Fire Protection* (NSW RFS 2019).

The assessment confirms the subject lot is mapped as bushfire prone.

Accent Town Planning was commissioned to provide this bushfire assessment. Accent Town Planning inspected the site on 23 October 2023.

- **Figure 1** – Shows the subject lot location.
- **Figure 2** – Provides a broad scale aerial view of the subject site.
- **Figure 3** – Shows the proposed plans.

**FIGURE 1 SITE LOCATION**





**FIGURE 2      BROAD SCALE AERIAL VIEW OF THE SUBJECT SITE**



**FIGURE 3      CLOSE UP AERIAL VIEW OF SUBJECT LOT**



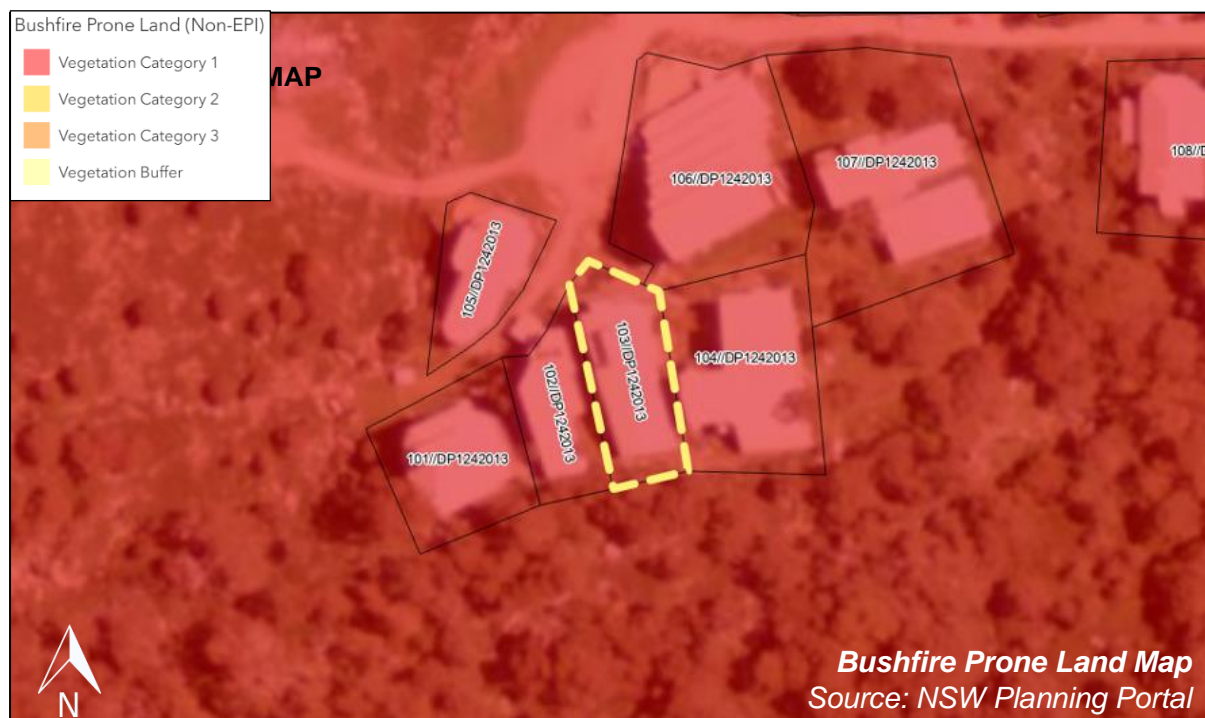
## 2. PLANNING LAYERS

The following planning layers are described in Table 1 and shown in the Figures below:

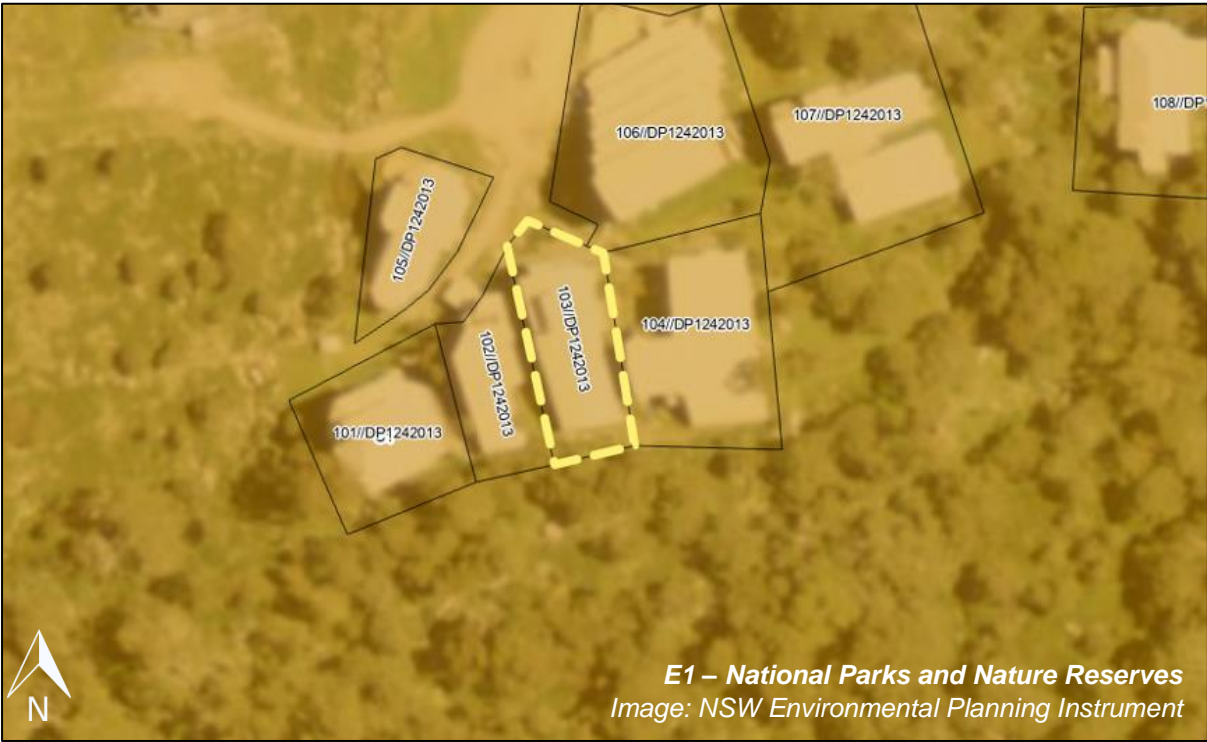
**TABLE 1 PLANNING LAYERS**

MAP	FIGURE	DESCRIPTION
<b>Bushfire Prone Land Map</b>	4	The subject lot is mapped as “Vegetation Category 1”.
<b>LEP Zone Map</b>	5	The subject lot is zoned as “E1 – National Parks and Nature Reserves”
<b>Vegetation Mapping</b>	6	<p>The vegetation surrounding the existing lodge has been mapped as:</p> <ul style="list-style-type: none"> <li>- Sub-alpine Shrub-Grass Woodland</li> <li>- Alpine Wet Herbfield</li> <li>- Managed Land</li> </ul> <p>According to Keith (2004) these formations are classified as both “Woodland” and “Forest” depending on the density of the vegetation.</p>
<b>Biodiversity Values Map</b>	7	Allotment has areas identified with high biodiversity values. See Biodiversity and Aboriginal Heritage Assessment provided.

**FIGURE 4 BUSHFIRE PRONE MAP**







**FIGURE 6**      **VEGETATION MAPPING**

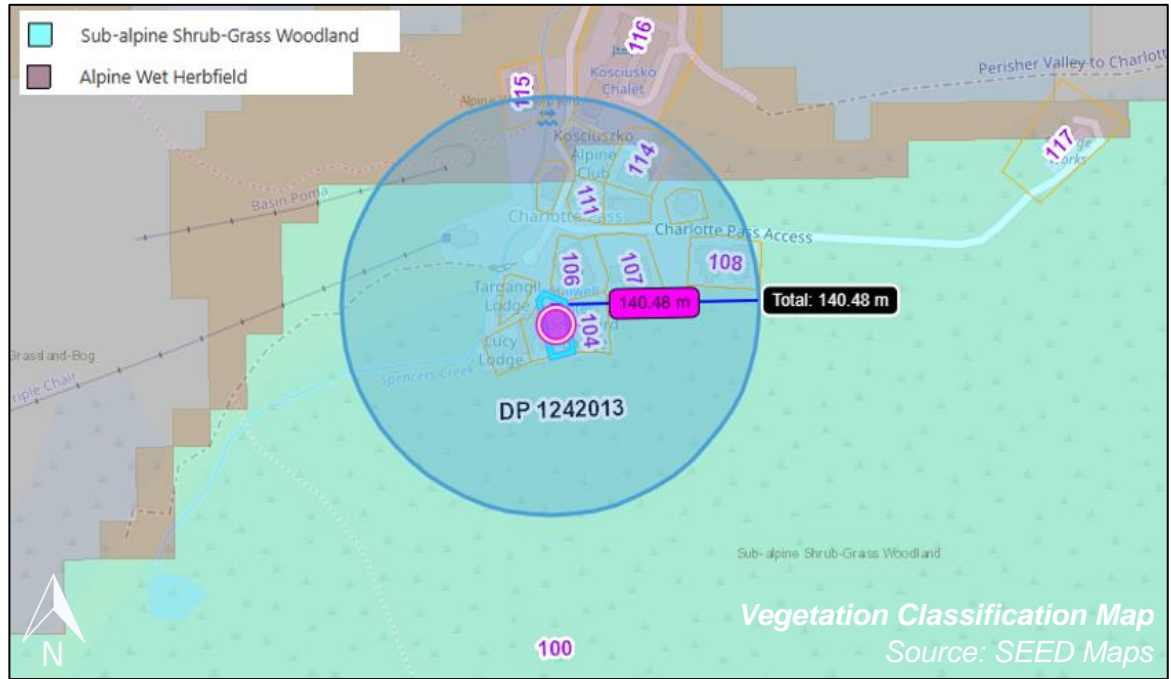
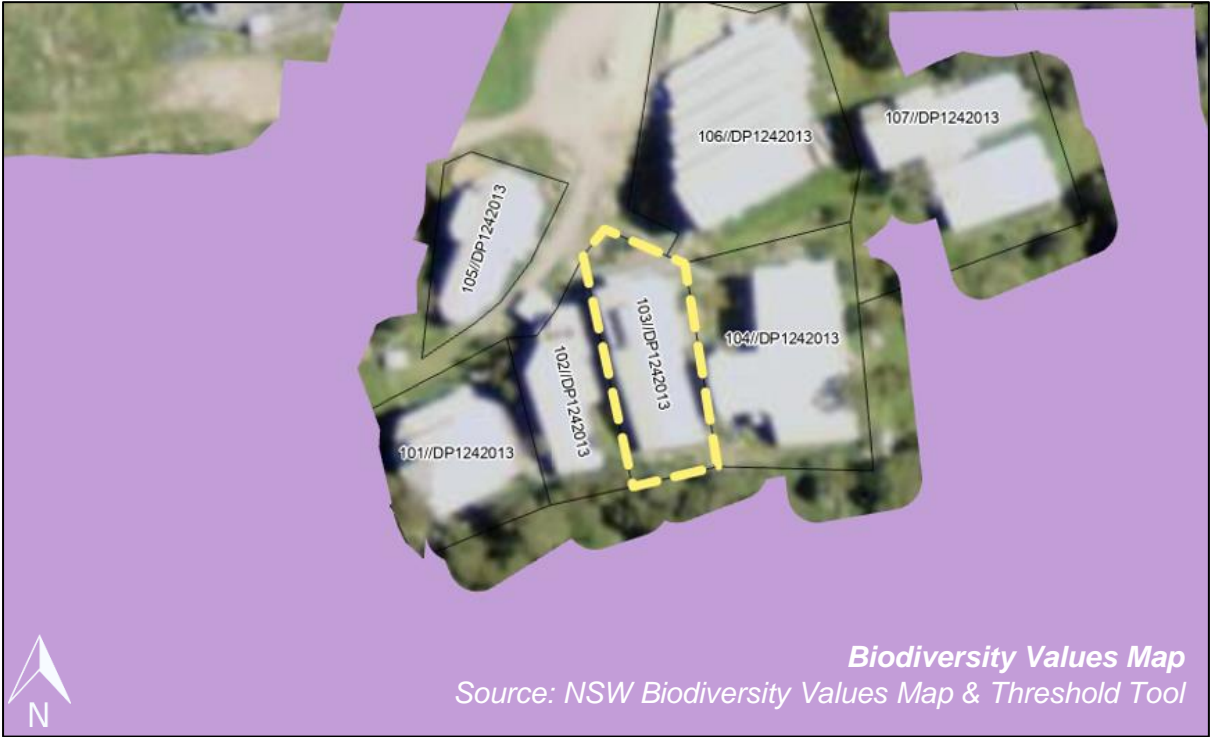


FIGURE 7      BIODIVERSITY VALUES MAP



### 3. SITE DESCRIPTION

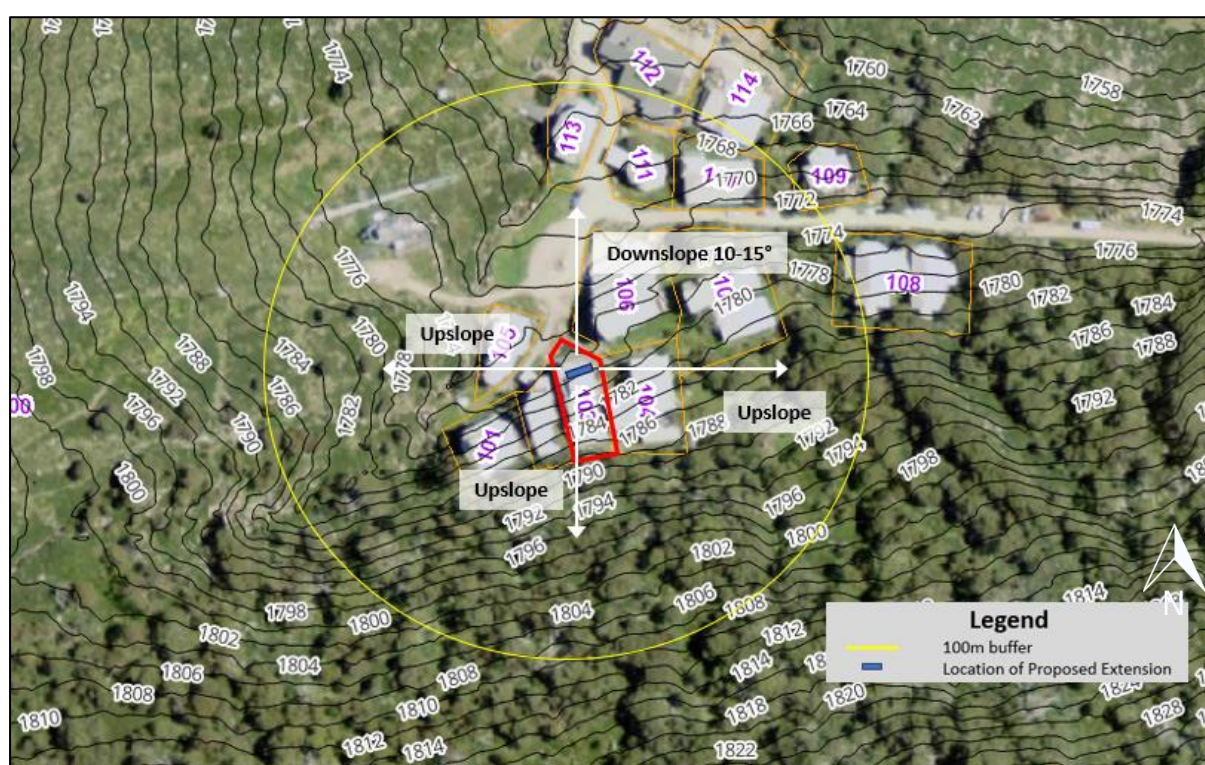
#### 3.1. Slope and aspect of the site within 100 m of the site

The slopes that would most significantly influence fire behaviour was determined to be to the East, South and West, which all present an Upslope from the existing lodge. There are existing lodges immediately to the East and West of Arlberg Ski Lodge, so the threat is lower on these elevations due to being managed land.

The Australian Standard AS3959-2018 identifies that the slope of the land under the classified vegetation is much more important than the slope between the site and the edge of the classified vegetation.

As can be seen in Figure 8 the land surrounding the existing lodge exhibits an Upslope to the South, East and West through *Managed Land* initially and then on to Sub-Alpine woodland vegetation in all directions, and a 10 – 15° Downslope to the North through *Managed Land*.

**FIGURE 8 SLOPE**



#### 3.2. Vegetation formation within 140 m of proposed dwelling

Charlotte Pass is comprised of *Woodland*, *Alpine Complex* and *Managed Land* at the base of the valley. Within 140m of the site, the area is a combination of *Woodland*, *Alpine Complex* and *Managed Land* vegetation.

As seen in Figure 6, within 140m of 93 Charlotte Way, Charlotte Pass there are three types of vegetations:

- Sub-alpine Shrub-Grass Woodland
- Alpine Wet Herbfield
- Managed Land

Areas of Sub-alpine Shrub-Grass Woodland and Alpine Wet Herbfield to the North dominated by Managed Land. To the East and West there are other existing lodges immediately surrounding Arlberg ski lodge, which can be classed as Managed Land. Beyond the Managed Land in the East



and West, the Sub-Alpine Shrub-Grass Woodland can be classified as Sub-Alpine Woodland. Managed land does not require an APZ, however, in order to enhance the bushfire protection of the lodge, the entire lot has been allocated as an IPA.

To the South, the areas of Sub-Alpine Shrub-Grass Woodland are dominated by denser vegetation comprised of eucalypt species approximately ranging from 10m to 30m in height, as well as a diverse ground cover of grasses and herbs with sparsely distributed shrubs. Being a type of sub-alpine woodland, and denser unmanaged land, this woodland vegetation is recognised as *Forest* vegetation by NSW Rural Fire Service under Table A1.12.7 of the *Planning for Bushfire Protection 2019* document.

	VEGETATION FORMATION	EFFECTIVE SLOPE	PHOTOS
<b>NORTH</b>	Managed Land	Downslope 10 – 15°	1
<b>EAST</b>	Managed Land	Upslope	2
<b>SOUTH</b>	Sub Alpine Woodland	Upslope	
<b>WEST</b>	Managed Land	Upslope	3

**TABLE 2      PREDOMINATE VEGETATION CLASSIFICATION**

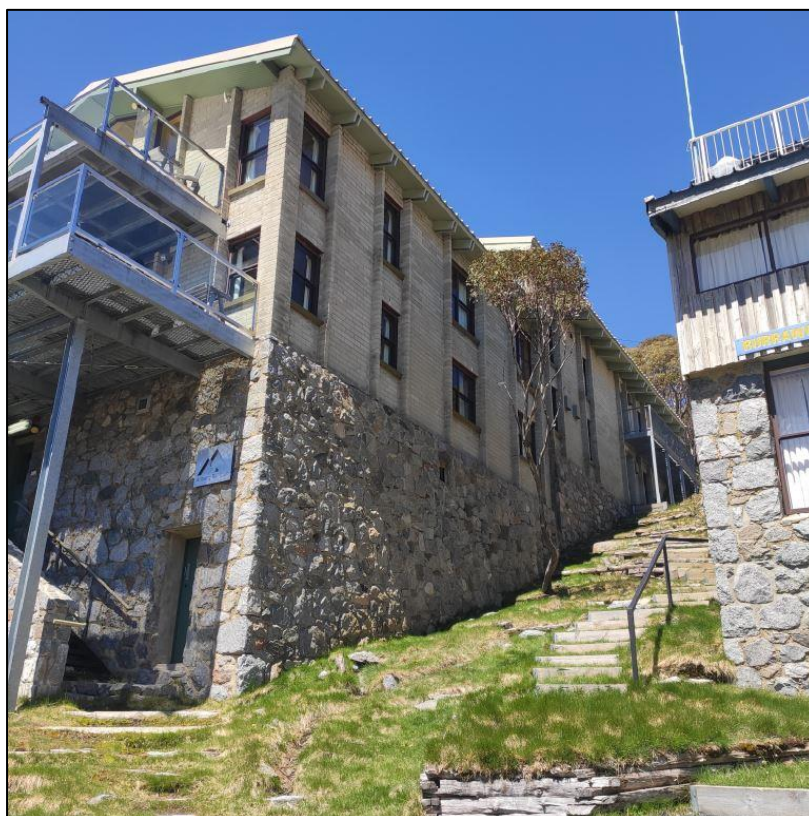
**Photo 1: Northern elevation**



**Photo 2: Eastern Elevation**



**Photo 3: Western Elevation**





## 4.0 BIODIVERSITY ASSESSMENT

### 4.1 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 development under element A. To complete this assessment, we will evaluate two of the four triggers and demonstrate that the proposed repair works should not trigger the Biodiversity Offsets Scheme and therefore the owner will not be required to offset their proposed activities.

#### 4.1.1 Clearing Threshold

**FIGURE 9 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

The proposed works do not require tree removal or land clearing above the 0.25ha threshold. Some trimming of tree limbs may be required for APZ management, however this, combined with the clearing required to construct the addition, will be significantly less than the permissible 0.25 ha of clearing. As a result, no offsets for the proposed works would be required due to this trigger.

#### 4.1.2 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. As shown in Figure 8, the subject allotment does not contain areas with high biodiversity values. Hence, the proposed works do not trigger the entry into the Biodiversity Offsets Scheme.

#### 4.1.3 Biodiversity Offset Scheme Conclusion

After our assessment of these triggers it is evident that the biodiversity offsets scheme will not be triggered by the alterations and additions. Upon assessment by the consent authority (ie Department of Planning) further assessment by a suitably qualified consultant may be required if they deem the other two triggers relevant.



## 4. BUSHFIRE THREAT ASSESSMENT

### 5.1 Asset Protection Zones (APZ)

PBP 2019 Table A1.12.7 has been used to determine the width of the required APZ for the proposed development using the vegetation and slope data identified. An FFDI of 50 was used for this location. An APZ should be maintained from the commencement of building works and maintained in perpetuity.

The vegetation classification for bushfire purposes for this site is *Managed Land* and *Sub-Alpine Woodland*. *Sub-Alpine Woodland* vegetation can be managed as an Inner Protection Area (IPA). The IPA is critical for providing a defendable space and managing heat intensities at the building surface.

The IPA should provide a tree canopy cover less than 15% and any tree canopies must be located greater than 2 metre from any part of the proposed lodge roofline. Garden beds of flammable shrubs should not be located under trees and should be no greater than 10m from an exposed window or door. Trees should have lower limbs removed up to a height of 2 metres above ground.

Table 3 below shows the APZ and BAL Determination for the new work at the existing lodge.

**TABLE 3 APZ AND BAL DETERMINATION**

	NORTH	EAST	SOUTH	WEST
Gradient	Downslope 10 – 15°	Upslope	Upslope	Upslope
Vegetation	Managed Land	Managed Land	Sub-Alpine Woodland	Managed Land
Proposed distance to be provided between edge of building and vegetation	>100 m  Entire Lot to be Managed as IPA	30 m  Entire Lot to be Managed as IPA	31 m  Entire Lot to be Managed as IPA	43 m  Entire Lot to be Managed as IPA
APZ required by PBP 2019 under Table A1.12.7	39-52 m	22-30 m	30-<100 m	30-<100 m
BAL Proposed	BAL 19	BAL 19	<b>BAL 19</b>	BAL 19

The land to the North, East and West of the subject allotment is comprised of Managed Land. The distance between the Northern side of the building to the edge of the managed land is greater than 100m; to the Eastern side of the building to the edge of the managed land is 30m and to the Western side of the building to the edge of the managed land is 43m.

From the Southern side of the proposed building addition, it is 31m to the vegetation, which is located beyond the existing lodge.

### Relevant Construction Standard

The Australian Standard AS 3939 – 2018 is the enabling standard that addresses the performance requirements of both parts 2.3.4 and Part GF5.1 of the Building Code of Australia for the construction of the Class 1, 2 and Class 3 buildings within a designated Bushfire Prone Area.

The following was determined for this site:

Relevant fire danger index..... FFDI 50

The applicant proposes any new works must meet the requirements of BAL 19.

### 5.2. Safe Operational Access

The Planning for Bushfire Protection requires the provision of safe operational access to structures and water supply for emergency services, while residents are seeking to evacuate from an area.

The PBP (2019) requires the provision of safe operational access to structures and water supply for emergency services, while residents are seeking to evacuate from an area.

- 93 Charlotte Way is a two-wheel drive, all weather road between October and June, and is only accessible via approved vehicles between June and October due to snow on the road in this period. The widths and design would allow safe access for firefighters while residents are evacuating an area. The capacity of road surfaces is sufficient to carry fully loaded firefighting vehicles.

### 5.3. Emergency Management

The intent of measures is to provide suitable emergency and evacuation (and relocation) arrangements for occupants of special fire protection purpose developments.

To achieve this, the following conditions shall apply:

*A building evacuation diagram, site layout diagram and Statement of Action are to be provided for the proposed development in accordance with Building Emergency Procedures and Bush Fire Evacuation Plan, the NSW Rural Fire Service Guidelines for the Preparation of Emergency/Evacuation Plan and with Australian Standard AS 3745 2010 'Planning for Emergencies in Facilities'.*

The owners are advised to obtain the NSW Rural Fire Service – “Guidelines for the Preparation of Bush Fire Evacuation Plans” & ‘Bush Fire Survival Plan’ In the event of emergency, the owners should ensure they are familiar with the RFS Bush Fire Alert Levels and use their Bush Fire Survival Plan.

### 5.4. Adequate Water and Utility Services

Charlotte Pass is serviced by reticulated water and a hydrant system. The location and distance to the hydrants will be consistent with the requirements of the PBP 2019.

Any bottled gas will be installed and maintained in accordance with AS1596 and the requirements of the relevant authority. If gas cylinders need to be kept close to the buildings, the release valves must be directed away from the building and away from any combustible material. Polymer sheathed flexible gas supply lines to gas meters adjacent to buildings are not to be used.

## 6. LANDSCAPING

An APZ is required to be established and should be maintained for perpetuity as specified.

When landscaping, vegetation should be located greater than 2 m from any part of the roofline of a building or the shed. Garden beds of flammable shrubs are not to be located under trees and should be no be within 10 m of an exposed window or door. Trees should have lower limbs removed up to a height of 2 m above the ground.

Appendix 4 (PBP 2019) provides guidelines for landscaping and Bushfire Provisions within the APZ. To incorporate bushfire protection measures into future development, the owner is advised to consider the following:

- Avoid planting trees species with rough fibrous bark, or which retain/shed bark in long strips or retain dead material in their canopy.
- Avoid planting deciduous species that may increase fuel at surface/ground level by the fall of leaves.
- Avoid climbing species to walls and pergolas.
- Locate combustible materials such as woodchips/mulch, flammable fuel stores (LPG gas bottles) away from the building.
- Locate combustible structures such as garden sheds, pergolas and materials such as timber furniture away from the building.
- Ensure any vegetation planted around the house is a suitable distance away so these plants do not come into physical contact with the house as they mature.

The property should be developed to incorporate suitable impervious area surrounding the house, including courtyards, paths and driveways.



## 7. HOW THIS PROPOSAL MEETS DEEMED TO SATISFY SOLUTION

### DEMONSTRATION COMPLIANCE UNDER SECTION 6.4 – SPECIFIC OBJECTIVES PLANNING FOR BUSHFIRE (2019)

Performance Criteria	Complies	Acceptable solutions
<b>The intent may be achieved where:</b>		
<ul style="list-style-type: none"> <li>provide an appropriate defensible space</li> </ul>	<input checked="" type="checkbox"/>	See Table 3 for APZ distances.
<ul style="list-style-type: none"> <li>site the building in a location which ensures appropriate separation from the hazard to minimise potential for material ignition</li> </ul>	<input checked="" type="checkbox"/>	No change to existing building location. See Table 3 for APZ distances for new work.
<ul style="list-style-type: none"> <li>provide a better bush fire protection outcome for existing buildings</li> </ul>	<input checked="" type="checkbox"/>	Proposed alterations and repair works will provide a better bushfire protection outcome for the building and its occupants.
<ul style="list-style-type: none"> <li>new buildings should be located as far from the hazard as possible and should not be extended towards or situated closer to the hazard than the existing buildings (unless they can comply with section 6.8);</li> </ul>	<input checked="" type="checkbox"/>	The new addition to the existing lodge is located on the front of the lodge, away from the vegetation
<ul style="list-style-type: none"> <li>ensure there is no increase in bush fire management and maintenance responsibility on adjoining landowners without their written confirmation</li> </ul>	<input checked="" type="checkbox"/>	Defensible space for APZ to be established and maintained in perpetuity.
<ul style="list-style-type: none"> <li>ensure building design and construction enhances the chances of occupant and building survival</li> </ul>	<input checked="" type="checkbox"/>	Proposed alterations and repair works will provide a better bushfire protection outcome for the building and its occupants.
<ul style="list-style-type: none"> <li>provide for safe emergency evacuation procedures including capacity of existing infrastructure (such as roads)</li> </ul>	<input checked="" type="checkbox"/>	<p>Access to the lodge is provided via Charlotte Way which is an all-weather two-wheel drive access road between October and June and accessible by approved vehicles only between June and October.</p> <p>Emergency Evacuation plan will be provided in accordance with Charlotte Pass Snow Resort evacuation management plan. An individual evacuation plan will be prepared as described in section 4.4. of this report.</p>

**DEMONSTRATION COMPLIANCE UNDER SECTION 6.6 – SPECIFIC OBJECTIVES  
PLANNING FOR BUSHFIRE (2019)**

Performance Criteria	Complies	Acceptable solutions
<b>The intent may be achieved where:</b>		
<ul style="list-style-type: none"> <li>provide an appropriate defensible space</li> </ul>	<input checked="" type="checkbox"/>	See Table 3 for APZ distances.
<ul style="list-style-type: none"> <li>provide a better bush fire protection outcome for existing structures (e.g. via ember protection measures)</li> </ul>	<input checked="" type="checkbox"/>	The proposed addition will be constructed to BAL19. It is recommended the existing building be upgraded for ember protection.
<ul style="list-style-type: none"> <li>ensure new building work complies with the construction standards set out in AS 3959;</li> </ul>		Proposed works to comply with the requirements of AS 3959.
<ul style="list-style-type: none"> <li>to ensure ongoing management and maintenance responsibilities are in place where APZs are proposed outside of the sub lease or leasehold area</li> </ul>		Entire allotment to be maintained as an Inner Protection Area.
<ul style="list-style-type: none"> <li>written consent from the land managers is provided for all proposed works outside of the sub lease or leasehold area</li> </ul>	<input checked="" type="checkbox"/>	Entire allotment to be maintained as an Inner Protection Area.
<ul style="list-style-type: none"> <li>proposed APZs outside of the sub lease or leasehold area are supported by a suitable legal mechanism to ensure APZs are managed under a binding legal agreement in perpetuity</li> </ul>	<input checked="" type="checkbox"/>	Entire allotment to be maintained as an Inner Protection Area.
<ul style="list-style-type: none"> <li>ensure building design and construction standards enhance the chances of occupant and building survival;</li> </ul>	<input checked="" type="checkbox"/>	No change to existing building location. The proposed alterations and repair works and ember protection upgrade will provide a better bushfire protection outcome for the building and its occupants.
<ul style="list-style-type: none"> <li>provide safe emergency evacuation procedures.</li> <li>Any additional construction requirements should be commensurate with the following: <ul style="list-style-type: none"> <li>the scope of the proposed works, including any increase in size and footprint of the building</li> <li>any additional capacity for the accommodation of guests and/or staff on site</li> <li>the cost associated with the proposed upgrade of any building.</li> </ul> </li> </ul>	<input checked="" type="checkbox"/>	<p>Access to the lodge is provided via Charlotte Way which is an all-weather two-wheel drive access road between October and June and accessible by approved vehicles only between June and October.</p> <p>Emergency Evacuation plan will be provided in accordance with Charlotte Pass Snow Resort evacuation management plan. An individual evacuation plan will be prepared as described in section 4.4. of this report.</p>

## 9. CONCLUSION

Pending the satisfaction of recommendations outlined in this report, the level of bushfire hazard risk identified in relation to the subject land and the proposed alterations and additions is not considered to be such that the proposal should be denied due to bushfire considerations.

- ***The proposed external addition to the existing lodge meets BAL 19 construction requirements on all elevations as per AS 3959***
- ***The entire allotment is to be managed as an Inner Protection Area.***
- ***It is recommended that the existing building be upgraded for ember protection in accordance with Appendix II***

This proposal meets a “deemed to satisfy” outcome for Bushfire Protection.

This report does not find that the proposal should be rejected due to bushfire considerations provided the recommendations are undertaken as proposed.

Sarah Wilmshurst

21 November 2023

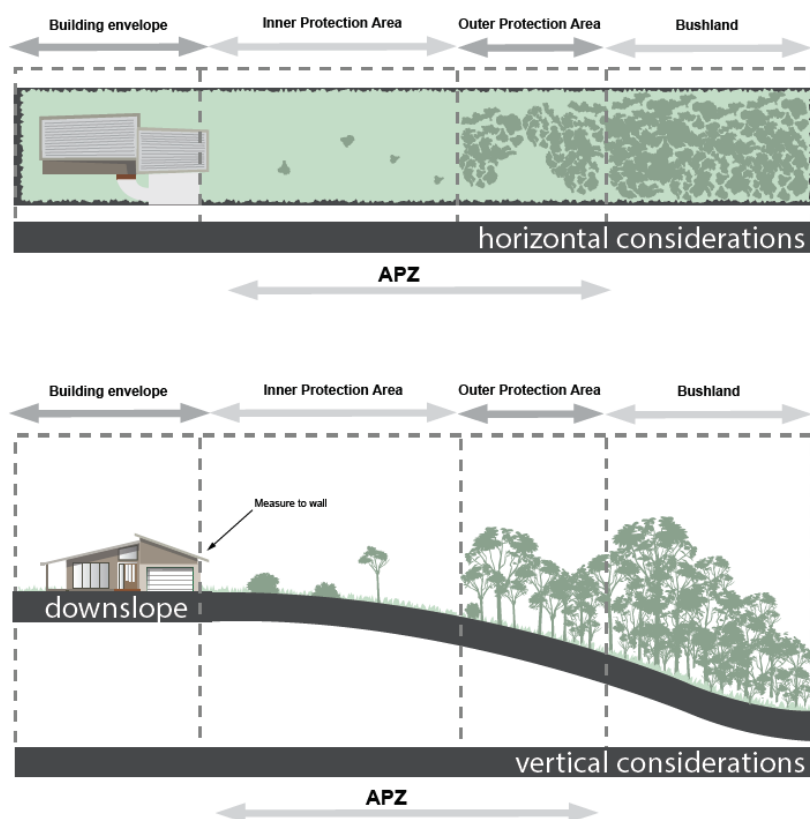


## APPENDIX I DEFINITION OF ASSET PROTECTION ZONES

Vegetation within the APZ should be managed in accordance with APZ specifications for the purposes of limiting the travel of a fire, reducing the likelihood of direct flame contact and removing additional hazards or ignition sources. The following outlines some general vegetation management principles for APZs:

1. Discontinuous shrub layer (clumps or islands of shrubs not rows)
2. Vertical separation between vegetation stratum
3. Tree canopies not overhanging structures
4. Management and trimming of trees and other vegetation in the vicinity of power lines and tower lines in accordance with the specifications in "Vegetation Safety Clearances" issued by Energy Australia (NS179, April 2002)
5. Maintain low ground covers by mowing / whipper snipper / slashing; and
6. Non-combustible mulch e.g. stones and removing stores of combustible materials
7. Vegetation to be planted should consist of fire retardant/ less flammable species strategically located to reduce attack from embers (i.e. as ember traps when in small clumps and short wind breaks).

Typical Inner and Outer Protection Areas.



**APPENDIX II EMBER PROTECTION UPGRADES**

<b>BUILDING ELEMENT</b>	<b>MINIMAL PROTECTION MEASURES</b>
<b>GENERAL</b>	<p>Seal all gaps (&gt;33mm) around the house (excluding subfloor) with:</p> <ul style="list-style-type: none"> <li>• Appropriate joining strips.</li> <li>• Flexible silicone based sealant; or</li> <li>• Mesh with a maximum aperture of 2mm, made from corrosion resistant steel, bronze, or aluminum.</li> </ul>
<b>WALLS</b>	Install sarking with a flammability index of not more than 5 behind weatherboards or other external cladding when they are being replaced for maintenance or other reasons.
<b>SUBFLOOR</b>	Removal of combustible materials and keeping areas clear and accessible.
<b>DOORS</b>	Install weather strips, draught excluders, or draught seals at the base of side-hung doors.
<b>VENTS &amp; WEEPHOLES</b>	Seal vents and weepholes in external walls with mesh (with an aperture size of 2mm) or corrosion resistant steel, bronze or aluminum.
<b>ROOFS</b>	<p>Seal around roofing and roof penetrations with a non-combustible material.</p> <p>Install sarking with a flammability index of not more than 5 beneath existing roofing when it is being replaced for maintenance or other reasons.</p> <p>If installed, gutter and valley leaf guards shall be non-combustible.</p>
<b>WINDOWS</b>	Install mesh with a maximum aperture of 2mm, made from corrosion resistant steel, bronze or aluminum to all external doors and openable windows.