

This fact sheet outlines the mapping methodology and criteria used to determine Bushfire Prone Areas and where the Bushfire Management Overlay will apply.

### Bushfire Prone Areas

Bushfire Prone Areas (BPA) are areas that are subject to or likely to be subject to bushfires. Since November 2011 the Minister for Planning has formally designated BPAs under the *Building Act*. Specific construction and planning requirements apply to development in a BPA. Bushfire Prone Areas include grasslands and other vegetation types, and therefore include most of the State of Victoria except for some urban areas. To view the location of a BPA, refer to [Vicplan](#) the State government's online mapping system.

### Bushfire Management Overlay

The Bushfire Management Overlay (BMO) is a planning scheme provision used to guide the development of land in areas of very high to extreme bushfire hazard. The location, design and construction of development and the implementation of bushfire protection measures must be considered under a BMO.

The BMO applies to areas where there is potential for extreme bushfire behaviour, such as a crown fire and extreme ember attack and radiant heat. All areas where the BMO applies are also BPA. To view the location of the BMO, refer to [Vicplan](#) the State government's online mapping system.

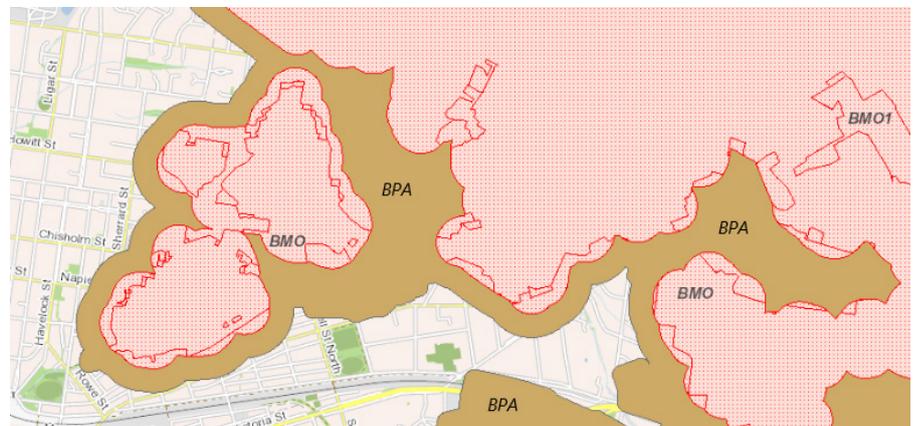


Figure 1 - Example of map showing BMO and BPA



## The difference between bushfire hazard and bushfire risk

A hazard is a specific source of potential damage or harm. The bushfire hazard consists of two key elements:

1. Vegetation (fuel) – Plants are the primary source of fuel for a bushfire. The amount, type and arrangement of vegetation affects how quickly a bushfire will spread and its intensity.
2. Topography (slope) - Fire burns faster uphill. As the slope increases so does the spread of fire and its intensity.

Bushfire risk is the likelihood and consequence of a fire starting, spreading and impacting on people, property and the environment.

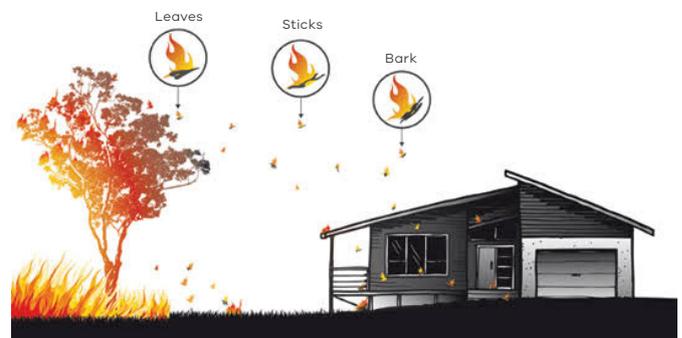
## How do the BPA and the BMO address bushfire hazard and risk?

1. The methodology and criteria outlined in this fact sheet are used to map and rate bushfire hazard. A Bushfire Hazard Level (BHL) is attributed to different areas.
2. This information is used to identify Bushfire Prone Areas. Areas likely to be exposed to high or extreme bushfire hazard are identified as areas where a Bushfire Management Overlay should apply.
3. In Bushfire Prone Areas and the Bushfire Management Overlay:
  - Construction needs to meet specific requirements under Australian Standard 3959:2018 Construction of Buildings in Bushfire Prone Areas. When a building permit application is required, a Bushfire Attack Level (BAL) assessment needs to be undertaken and a minimum BAL12.5 standard needs to be met.
  - When a planning permit application is required, certain types of development need to consider bushfire risk and apply bushfire protection measures for siting, access, water supply and construction.
4. In the Bushfire Management Overlay, a planning permit application will also involve a hazard and risk assessment. This involves considering a proposal against the objectives, standards and decision guidelines of the BMO and clause 53.02 of the planning scheme.

## The impact of bushfire on structures beyond the vegetation

The three main ways a bushfire can impact a structure are ember attack, radiant heat and direct flame contact. Each of these elements can impact a structure at different distances beyond vegetation itself. Bushfire mapping takes this variable distance into account.

Ember attack is the most common way houses catch fire during a bushfire. Ember attack occurs when small burning twigs, leaves and bark are carried by the wind, landing in and around houses and their gardens. If they land on or near flammable materials, such as leaf litter and dead plant matter, they can develop into spot fires. Embers can also ignite a house if they land on or near vulnerable parts of the building (such as decks).



**Figure 2** – Ember attack on a structure.

Source: <https://www.cfa.vic.gov.au/plan-prepare/how-fire-behaves>

Embers can travel several kilometres ahead of the fire front. However, the most intense ember attack occurs within 150 metres of the fire. Ember attack will have the most significant impact on the extent of the BMO map because radiant heat and direct flame contact impact at a much shorter distance.

Radiant heat can:

- ignite surfaces without direct flame contact or ember attack
- crack and break windows, allowing embers to enter a building
- distort and melt materials such as plastic.

Radiant heat can also dry out vegetation ahead of the bushfire so that it burns more readily and the bushfire spreads more quickly and with greater intensity.

Direct flame contact occurs when flames touch a structure. Burning vegetation can ignite a structure if it is close enough.



## Mapping methodology and criteria

There are three steps in the mapping methodology:

1. Hazard data is developed by the Department of Environment, Land, Water and Planning (DELWP).
2. Bushfire Hazard Levels (BHL) are determined for different areas.
3. A verification process is undertaken by DELWP, in collaboration with relevant fire authorities and local government.

These steps are explained in more detail below.

### Step 1 – Bushfire hazard data

The 2009 Victorian Bushfires Royal Commission recommended that a central point of responsibility for, and with expertise in, mapping bushfire be established to review mapping criteria used in the planning system based on the best available science. DELWP is the responsible agency for creating and updating hazard data to inform mapping for the BPA and the BMO.

Hazard data is developed from fire behaviour factors, including topography, fire fuel type and load and weather. This informs fire modelling. An example of this is head fire intensity which is a measure of the rate of energy release per unit length of fire front, expressed as kW/m.

### Step 2- Bushfire Hazard Levels

To enable the hazard data to be used in the planning and building systems, three different BHLs have been created. It is important to note that BHLs *do not represent bushfire risk but provide an understanding of potential hazard*. Also, BHLs do not consider property and township boundaries, previous bushfire history or planned fuel reduction works.

Bushfire Hazard Level Low (BHL Low)	Bushfire Hazard Level One (BHL1)	Bushfire Hazard Level Two (BHL2)
<p>Areas where the extent, configuration and/or management of vegetation results in low potential for bushfire spread.</p> <p>These areas may or may not be identified as Bushfire Prone Areas. The Bushfire Management Overlay is not applied.</p>	<p>Moderate bushfire hazard can be expected in these areas with head fire intensity modelled to be between 4,000kW/m and 30,000kW/m.</p> <p>This level of hazard informs areas declared as Bushfire Prone Areas. Where appropriate and advised by the relevant fire authority, areas at the upper end of the bushfire intensity range will be included in the BMO.</p>	<p>The most significant bushfire hazard where head fire intensity is modelled to be 30,000kW/m or more.</p> <p>This level of hazard informs areas declared as Bushfire Prone Areas where the BMO should apply.</p>



The inputs used to determine BHL areas include:

- landscape conditions such as vegetation type (based on Ecological Vegetation Classes) and size, topography, hydrology and roads
- modelled fuels (at maximum fuel hazard/fuel load) for different vegetation types and sizes
- calculations used in AS3959:2018 but adjusted where necessary to reflect Victoria’s unique bushfire conditions (a Fire Forest Danger Index (FFDI) of 120 and a flame temperature of 1200kelvin).

	BHL Low	BHL1	BHL2
Vegetation type (fuel)	<ul style="list-style-type: none"> <li>• Managed grasslands</li> <li>• Urban areas</li> <li>• Sports ovals and recreational areas,</li> <li>• Botanical gardens</li> <li>• Irrigated agricultural land</li> <li>• Managed golf courses</li> <li>• Parks and reserves less than 2 ha in size</li> </ul>	<ul style="list-style-type: none"> <li>• Forests and rainforests</li> <li>• Woodlands</li> <li>• Scrub</li> <li>• Shrublands</li> <li>• Mallee</li> <li>• Unmanaged grasslands</li> </ul>	<ul style="list-style-type: none"> <li>• Forests and rainforests</li> <li>• Woodlands</li> <li>• Scrub</li> <li>• Shrublands</li> <li>• Mallee</li> </ul>
Vegetation Size	<p>Generally smaller than 2ha for parks and reserves</p> <p>Note: Grasslands less than 2ha in size may be considered for inclusion in BHL1 based on their connectivity to other forms of vegetation, shape of the vegetation patch and other factors.</p>	Between 2 and 4 ha	<ul style="list-style-type: none"> <li>• ≥4 ha</li> <li>• contiguous and non-contiguous vegetation areas</li> </ul>
Ember protection buffer		<p>For any vegetation other than grassland, a 150m buffer is applied</p> <p>For grassland larger than 2 ha in size, a 60m buffer is applied</p>	<ul style="list-style-type: none"> <li>• 150m from the edge of the vegetation (note: based on research on house loss which indicates that 92% of house loss occurs within 150m of the bushfire hazard)</li> <li>• If models indicate extreme head fire intensity, for example in forested areas, an additional 150m buffer is applied (total 300m buffer from the edge of the vegetation)</li> </ul>
System Response (BPA, BMO)	<p>No BPA</p> <p>Note: BMO and BPA buffers may extend into a BHL Low area</p>	<p>BPA</p> <p>BMO for the upper end of the bushfire intensity range</p> <p>Note: BMO buffers may extend into BHL1 areas</p>	BMO



### Step 3 – Verification process

The BHL data verification process is undertaken by DELWP in partnership with fire authorities and municipal councils. The purpose of the verification is to:

- refine the accuracy of the map
- ensure the map reflects the purposes of the BPA, and the BMO planning provisions where applicable
- ensure that the map can be readily used as a statutory tool in planning schemes.

The verification process may also involve:

- additional information sources to refine the accuracy of the map such as aerial photos, topographical and land use information such as water bodies and irrigated agricultural land. This information assists in identifying the extent of vegetation, and where consistent with bushfire protection, enables areas of lower hazard to be removed.
- qualitative assessment, which may include consideration of bushfire history data, landscape-scale bushfire hazards, site visits and other relevant activities and resources. This information assists in determining which areas in BHL1 should be included in the BMO.
- GIS processing so that the final map is suitable for statutory purposes and applies buffers consistently.

### More information

More bushfire related information is available at:  
<http://www.planning.vic.gov.au>

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