Strategic Fuel Breaks

A Pictorial Guideline

FOREST FIRE MANAGEMENT VICTORIA

Acknowledgements

We acknowledge and respect Victorian Traditional Owners as the original custodians of Victoria's land and waters, their unique ability to care for Country and deep spiritual connection to it. We honour Elders past and present whose knowledge and wisdom has ensured the continuation of culture and traditional practices.

We are committed to genuinely partner, and meaningfully engage, with Victoria's Traditional Owners and Aboriginal communities to support the protection of Country, the maintenance of spiritual and cultural practices and their broader aspirations in the 21st century and beyond.

The Forest Fire Management Victoria (FFMVic) Strategic Fuel Break Pictorial Guide (SFBPG) are managed by the Strategic Fuel Break Task-Force Unit in the Forest and Fire Operations Division.

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Version Control

The Strategic Fuel Break Pictorial Guide is a version-controlled document. It is the reader's responsibility to ensure they have the most current version of this document.

Version one

Interpretation of the Pictorial Guide

This is a guide that reflects standards and is intended to instruct FFMVic staff only.

When reading and applying this Guide, please note that Strategic Fuel Break activities are divided between *mandatory practices*, referred to with the word '*must*', and *expected practices*, referred to with words such as '*should*' and '*may*'. *Mandatory practice* covers key policies and legal obligations that FFMVic personnel must adhere to.

These include prescribed obligations including those created under the *Occupational Health and Safety Act 2004*, the *Forest Act 1958*, and requirements under the Code of Practice for Bushfire Management on Public Land (2012). They also incorporate operational standards established by the Emergency Management Commissioner under the *Emergency Management Act 2013*, as published in the Joint Standard Operating Procedures.

Expected practice outline expected ways in which FFMVic personnel conduct Strategic Fuel Break management activities whilst noting that procedures may not account for all possible situations. As such, personnel are empowered to make operational decisions based on the situational factors that they face, but they should ensure they work in accordance with the intent of the procedure and be able to justify any variation to documented procedures.

Reference to "the Department"

This Guide is a compilation of procedures, work instructions and other documents produced by the Department of Environment, Land, Water and Planning (DELWP) and its predecessors. The "Department" is used when referring to DELWP, but there may be instances and documents that reference or contain graphics produced by the former Department of Environment and Primary Industries (DEPI) or the former Department of Sustainability and Environment (DSE). Where this is the case the information from former iterations of the Department is still considered current and valid.

Photo credit

Cover: Fairhaven Strategic Fuel Break Barwon South West Source: DELWP

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Introduction

This Pictorial Guide aims to illustrate and accompany the expected standards of asset and landscape protection Strategic Fuel Breaks (SFBs) found in Guideline 3.3.4.1 - Strategic Fuel Break Construction and Maintenance (GUI 3.3.4.1).

The development of GUI 3.3.4.1 was initiated to support Strategic Fuel Break development – please review this document for detailed guidance.

Both the SFB Construction and Maintenance Guideline, as well as this Pictorial Guide, are aimed to inform operators on what SFBs are, and how they help to reduce the risk and impacts of more frequent, intense and damaging bushfires under a changing climate.

A range of methods have been reviewed to assess the value and efficacy of potential Strategic Fuel Breaks, that include experiences from past fires and findings from current research. Our strategic approach focuses on four key pillars:

1. **Advanced fuel management:** Targeted burning and all year mechanical fuel treatments close to communities, combined with strategic fuel breaks and large-scale mosaic burns to break up the landscape,

2. **Enhanced capacity and capability to control and prevent fires:** local, experienced forest fire fighters on the ground to safely and rapidly respond to fires,

3. **Improved risk modelling and fire ecology capability:** ensuring we're using the most relevant and scientific approach to modelling to identify priorities,

4. **Traditional Owner-led cultural land and fire practices:** re-embracing the knowledge and practices of Victoria's first peoples in living with fire.

Strategic Fuel Breaks

Strategic Fuel Breaks are defined as:
'A strip of land where vegetation has been permanently modified to reduce rate of spread and intensity of fire for the direct protection of assets and/or to assist fire control.'

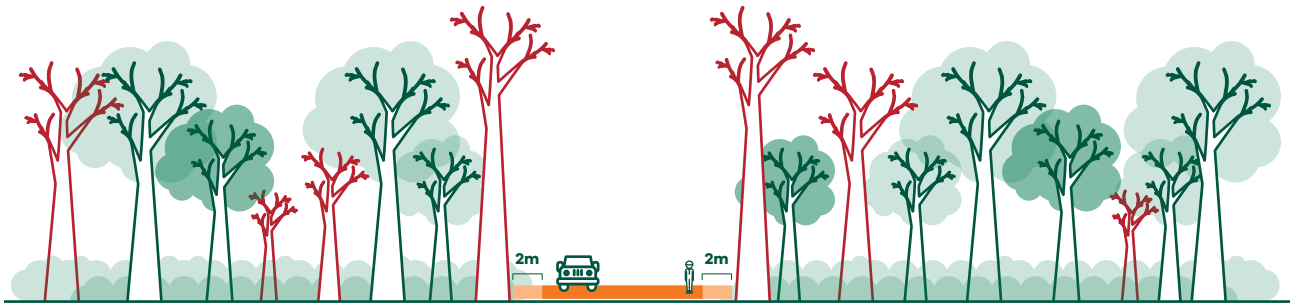
Categories of Strategic Fuel Breaks are:

1. **Asset Protection Breaks**
   'designed to provide direct protection of communities and assets'

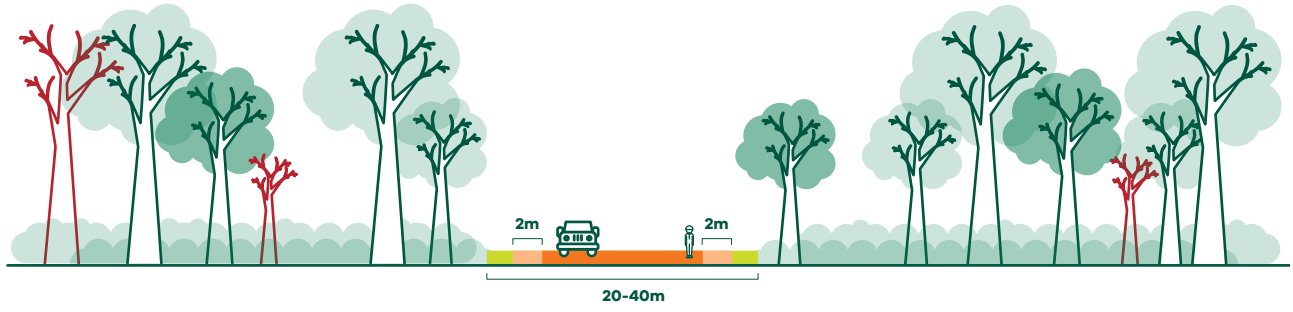
2. **Landscape Protection Breaks**
   'designed to divide the landscape into units established to assist in the containment of large fires before they impact on communities, environmental values and assets'

STRATEGIC FUEL BREAKS

Before Strategic Fuel Break



After Strategic Fuel Break



Track - Road Verge Maintained ground veg Untreated ground veg Hazardous tree

*Diagram not to scale

Hazardous trees often also have habitat values and where these trees do not present a risk to people working off the break they should be retained. In certain situations, high value habitat will be retained, mapped and marked as part of the break design, construction and maintenance as a mitigation measure to minimise the environmental impact of the break.

Asset Protection Breaks

"The last line of defence for the direct protection of communities and assets"

Asset Protection is:

1. Actions taken to eliminate or reduce the risk of built assets and other high value assets being damaged by bushfire.
2. A firefighting strategy employing tactics aimed at preventing bushfire damage to high value assets within the fire area or area under threat but which is not aimed at containing the spread of the fire.

Asset Protection Zone is:

An area managed to provide the highest level of strategic protection to human life, property and highly-valued assets.

Protection and preservation of life and relief of suffering is paramount.

See also other Fire Management Zones:

- *Ecological Management Zone*
- *Prescribed Burning Exclusion Zone*
- *Strategic Wildfire Moderation Zone.*

Assets and values include:

Recognised features of the built, natural and cultural environments. Built assets may include buildings, roads and bridges or structures managed by utility and service providers as well as recognised features of private land such as houses, property, stock and crops and associated buildings and equipment.

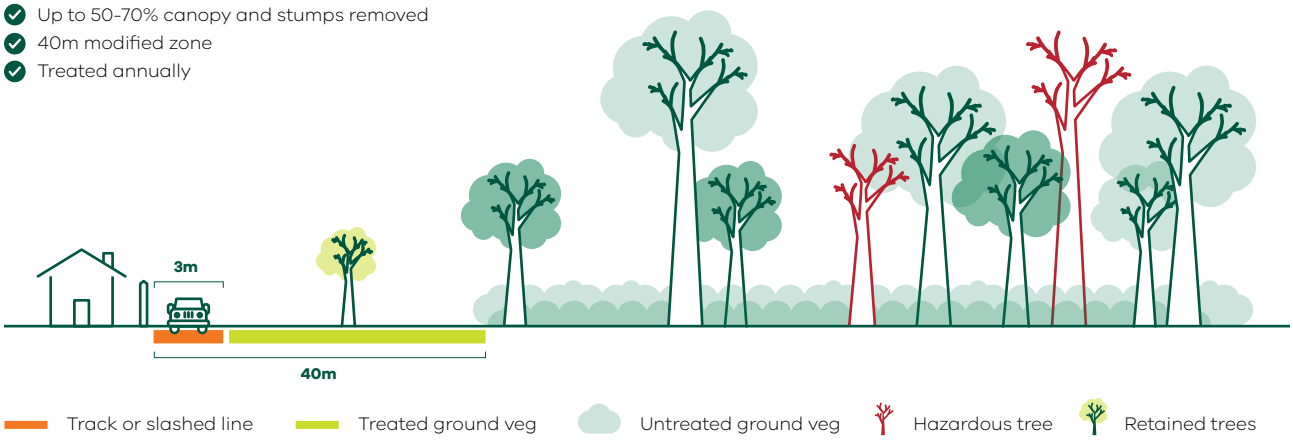
Natural assets may include forest produce, forest regeneration, conservation values including vegetation types, fauna, air and water catchments. Cultural values may include recreational, indigenous, historical, archaeological and landscape values.

Refer to the Fire Management Document (Glossary of Terminology, 2021, page 34) for further guidance.

UNMANAGED EDGE

ASSET PROTECTION BREAK

- Simple (constructed track)
- Hazardous trees removed
- Up to 50-70% canopy and stumps removed
- 40m modified zone
- Treated annually



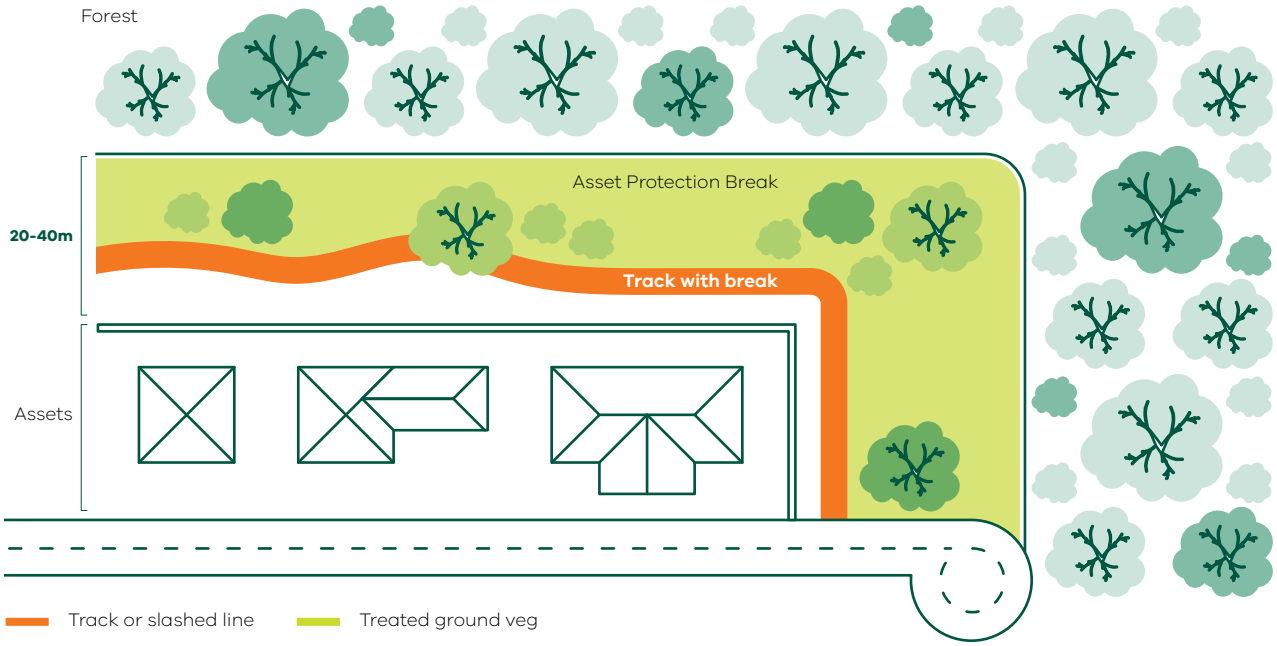
Asset Protection Breaks need to be located as close as feasible to the assets being protected.

To improve the effectiveness of the fuel break the adjoining fuel can be managed by mechanical treatment or prescribed fire to reduce the potential for ember attack.

Asset Protection Break specifications

Specification	Asset Break
Objective	Defendable space next to assets
Location	Next to assets
Width	Usual preferred width 40m
Retained Trees	Minimum 5m gap between tree crowns over break
Debris	Remove off-site, chip and spread, or heap and completely burn. No windrowing, partial burning, or push back.
Stumps	Preferably excavated, can be ground, never left as is.
Access	Linked to local road and track network.

Plan of a typical Asset Protection Break



Examples of Asset Protection Breaks

Coastal Shrub and Woodland

Barwon South West, During Construction

- Hazardous trees ground down, stumps retained, elevated fuel mulched.
- 30 to 40m wide linked to local road and track network.

Coastal Woodland

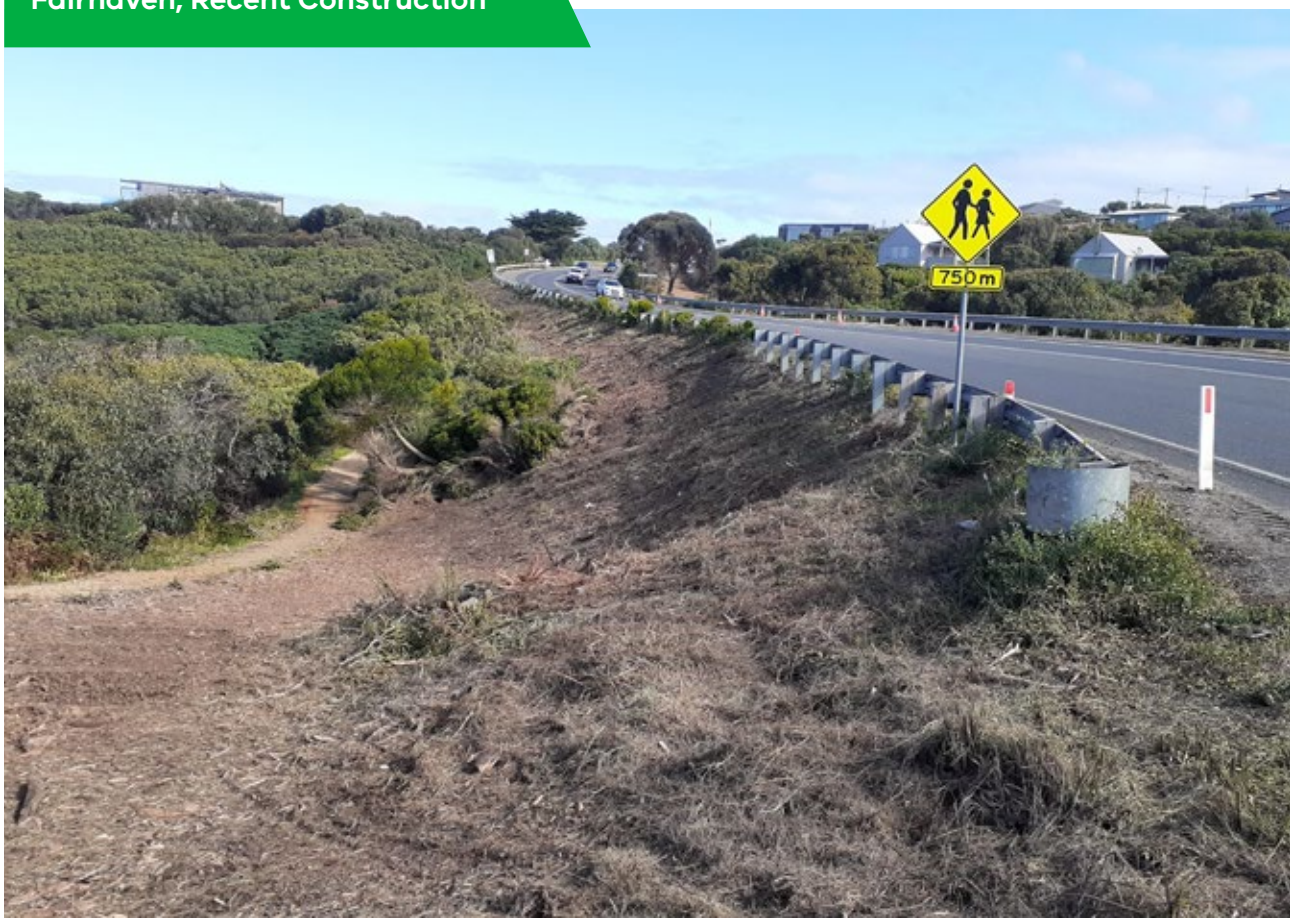
Barwon South West, Post Construction

- Shrubs and small trees chipped and mulched, scattered healthy trees retained and maintained as a grassy under-story.
- 40m wide break to provide asset protection of homes and property.

Construction of the strategic fuel break also allows fuel reduction where it was not previously feasible due to the lack of a practical and safe control line.

Coastal Shrub, Healthy Community Composition

Fairhaven, Recent Construction



- 15m vegetation removal on both sides of local arterial road.
- Shrubs and small trees chipped and mulched, scattered healthy young trees retained.
- Integrated asset management provides an overall 30m protection break for adjoining houses and access for emergency response.
- Routine maintenance will be required.

Stringybark, Healthy Dry Forest, Foothill Forest Types

Fairhaven, Bimbadeen

- 40m wide break, maintained as a grassy understory, annually slashed to 100mm, to alter heavy fuels that generate radiant heat against homes and properties.
- Minimum 5m gap between tree crowns over break, allowing tree separation for reduced bark hazard, reduced fuel loads and ease of maintenance.

These Strategic Fuel Breaks facilitate the delivery of complex and important Asset Protection Planned burns, that further provide community protections outcomes through reduced fuels around the community interface with bushland.

Landscape Protection Breaks

"Designed to divide the landscape into units established to assist in the containment of large fires"

A landscape protection break should be located at strategically chosen locations well suited for backburn ignition and the containment of large fires. This includes supporting ongoing planned burn operations. Fuel reduction of the adjoining forest where possible is important to reduce long distance spotting over the break.

For Landscape Protection Breaks a 20m clearing width supported by adjoining hazardous tree removal is generally adequate to provide a well-established platform for backburning.

Landscape Protection Break specifications

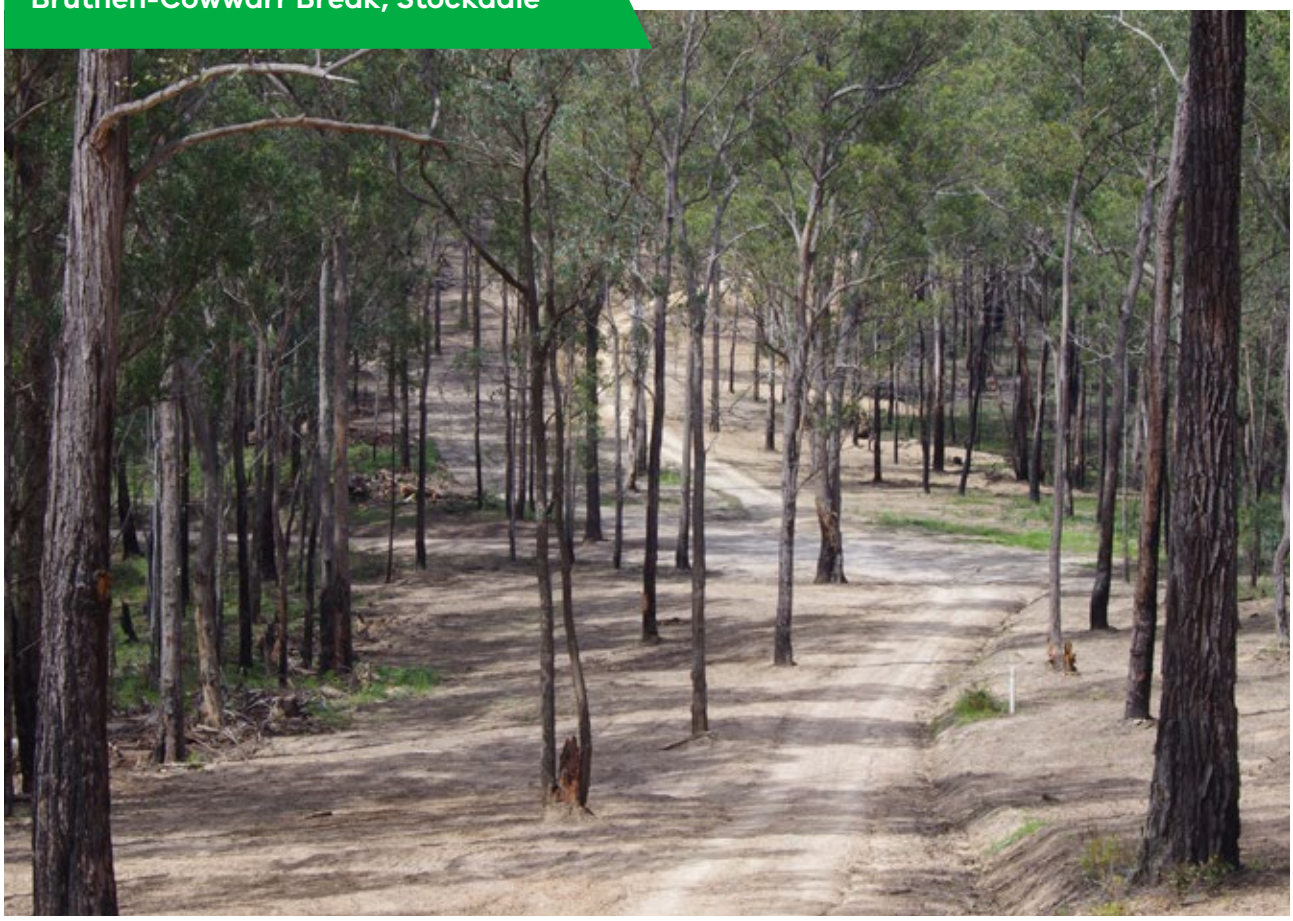
Specification	Landscape Protection Break
Objective	Prepared backburn platform for containment of larger fires in the landscape.
Location	Best backburn locations.
Width	Effective width depending on terrain and fuel, usual preferred width 20m – but can be up to 40m.
Retained Trees	Minimum 5m gap between tree crowns over break.
Debris	Remove off-site, chip and spread, or heap and completely burn. No windrowing, partial burning, or push back.
Stumps	Preferably excavated, can be ground, never left as is.
Access	Linked to heavy strategic fire access roads.

Wider breaks up to 40m may be required in some locations e.g. adjacent to critical infrastructure, along parts of arterial roads or in areas where planned burning is difficult to conduct to create a safe working area.

Examples of landscape tree retention in various habitat types

Foothill Mixed Species Forest

Bruthen-Cowwarr Break, Stockdale



- 20-40m wide, recently constructed.
- Lightly scalped ground fuels.

Note that some retained trees close to the track could be required as the mitigation measures to reduce impact on connectivity for species.

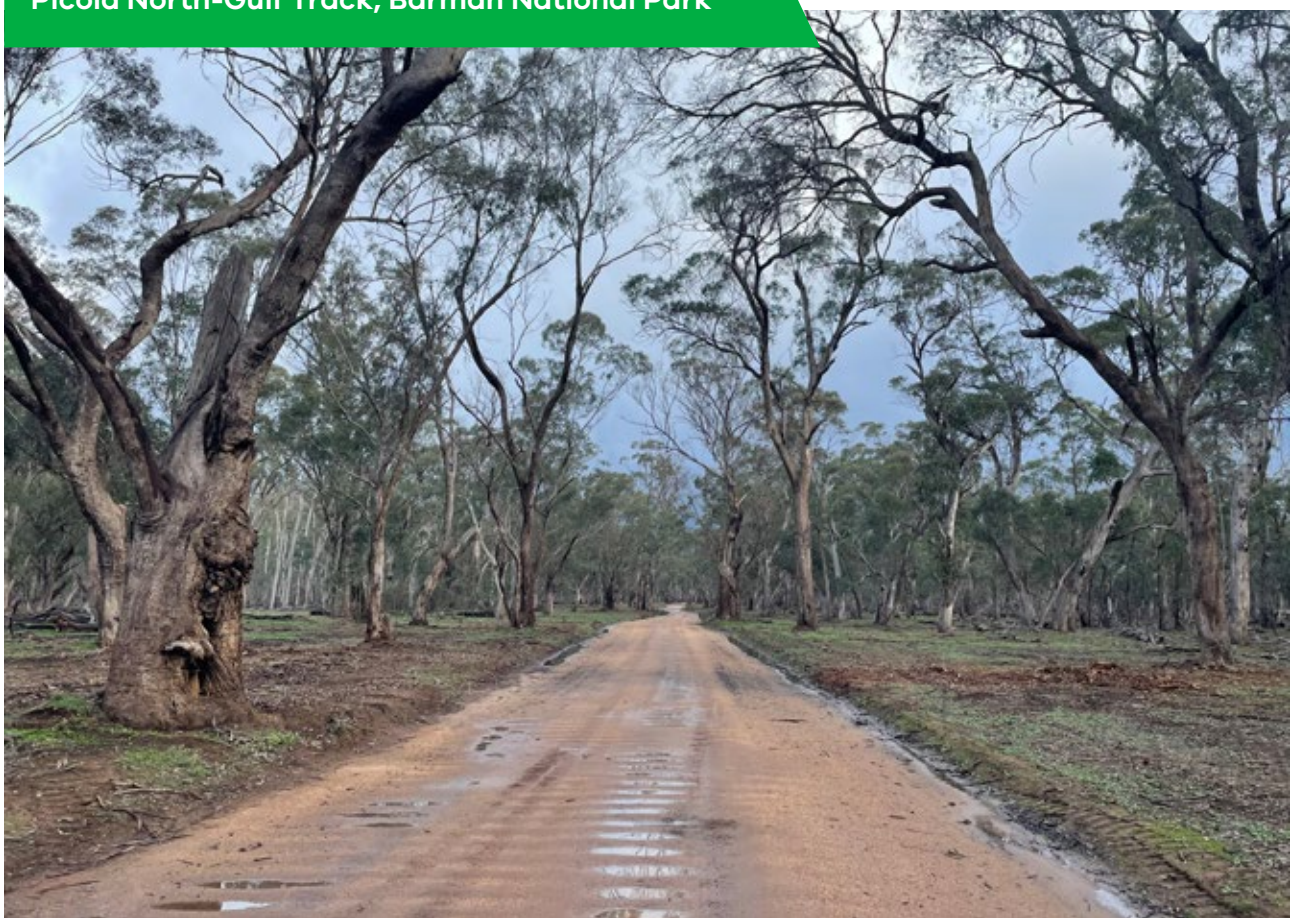
Where possible breaks should be constructed to allow regular maintenance by wheeled tractors with slashers/mulchers due to the efficiency, speed, and cost advantages (GUI 3.3.4.1).

The Cowwarr to Bruthen Strategic Break was initially constructed under emergency conditions during the Black Summer fires 2019-2020. The break has created a safe boundary for firefighters to use and has been aligned as close to the public-private interface as possible.

The new Cowwarr to Bruthen Strategic Fuel Break helps us suppress fires before they impact on communities (Gippsland Bushfire Management Strategies 2020).

Red Gum Forest

Picola North-Gulf Track, Barmah National Park



- 30m total width.
- 15m from the centreline on east and west side of track, with heavy timber being pushed back 25m from the centreline.

Area burnt in 2015, mulched into a SFB in June 2021.

Retained trees should be at a level that ensures there is limited to no crown connectivity.

Generally retaining a final minimum 5 metre gap between tree crowns over the extent of the break.

However, planning for the protection of environmental and cultural values may require site specific design modifications including tree retention (GUI 3.3.4.1).

Examples of Landscape Protection Breaks

Silvertop Coastal Forest

Betka Track, Mallacoota

✔ 20-40m wide, approximately 30% of trees retained.

Note that post 2019/20 bushfire nearly all the retained trees are now hazardous and fuel break renewal will be required.

Vegetation is often disturbed by fire or removed during the construction of fire control lines. Once a part of the fire has been brought under initial control it is important that considered and timely decisions are made regarding the future of control lines to avoid any redundant rehabilitation and unnecessary disturbance.

When works align with future fire, land and values management intent it may be efficient and desirable to consider additional works as part of an integrated fire response to improve or construct permanent fuel breaks (SOP 4.5.10).

Under the Code of Practice for Bushfire Management on Public Land (2012), strategic objectives are as follows:

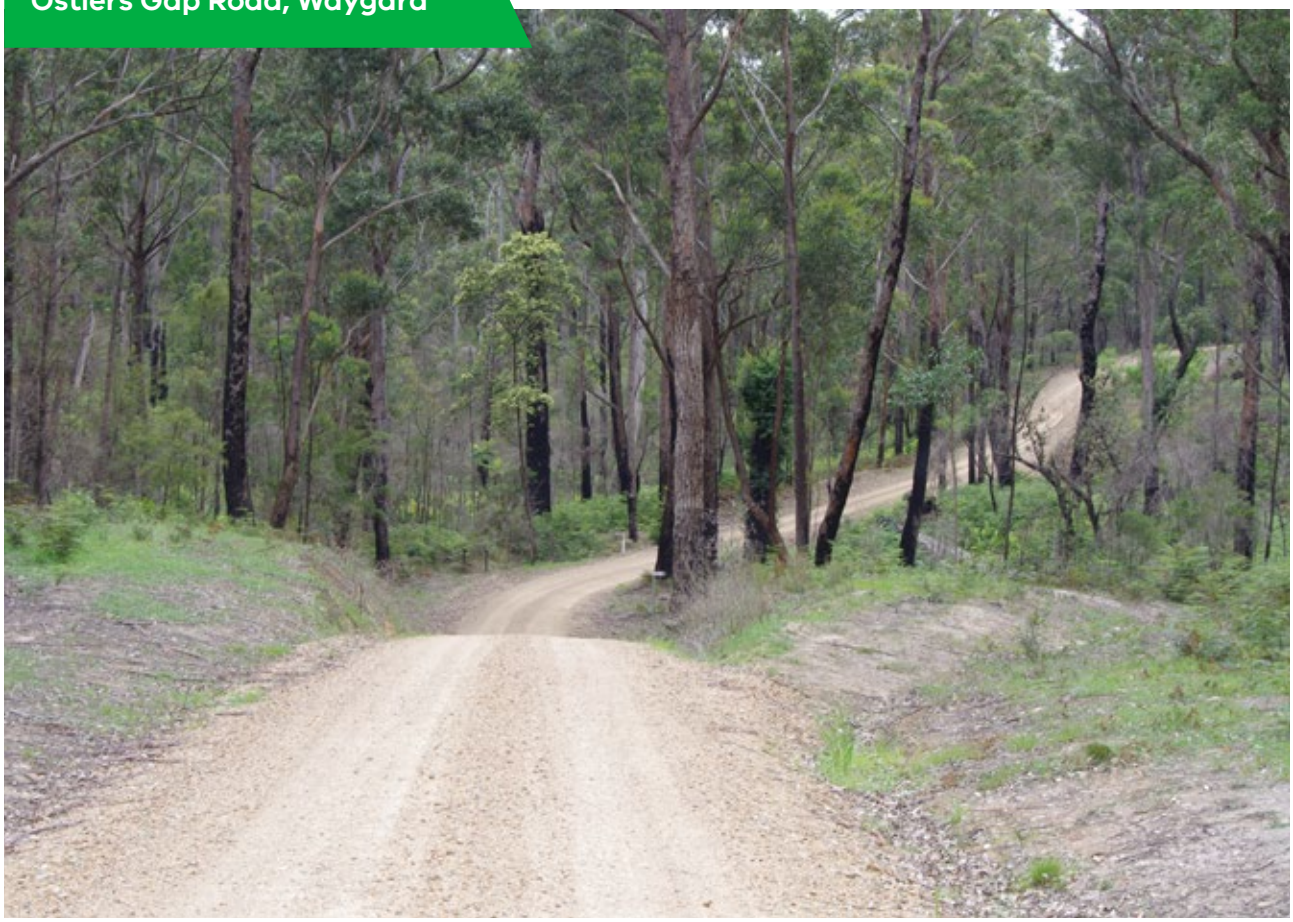
To minimise the impact of major bushfires on human life, communities, essential and community infrastructure, industries, the economy and the environment.

Human Life will be afforded priority over all other considerations.

To maintain or improve the resilience of natural ecosystems and their ability to deliver services such as biodiversity, water, carbon storage and forest products.

Coastal Mixed Species Forest

Ostlers Gap Road, Waygara



- 30m wide break.

Note tree retention in creek line to maintain habitat values and native species connectivity.

Best practice is a requirement for compliance with the *Aboriginal Heritage Act 2006* and is mandatory for all DELWP staff involved in the planning and delivery of land-management activities.

All staff should actively seek to avoid harm to Aboriginal Heritage through engagement, planning and ongoing partnerships with Traditional Owners (SOP 0.4.1)

Mullundung Forest

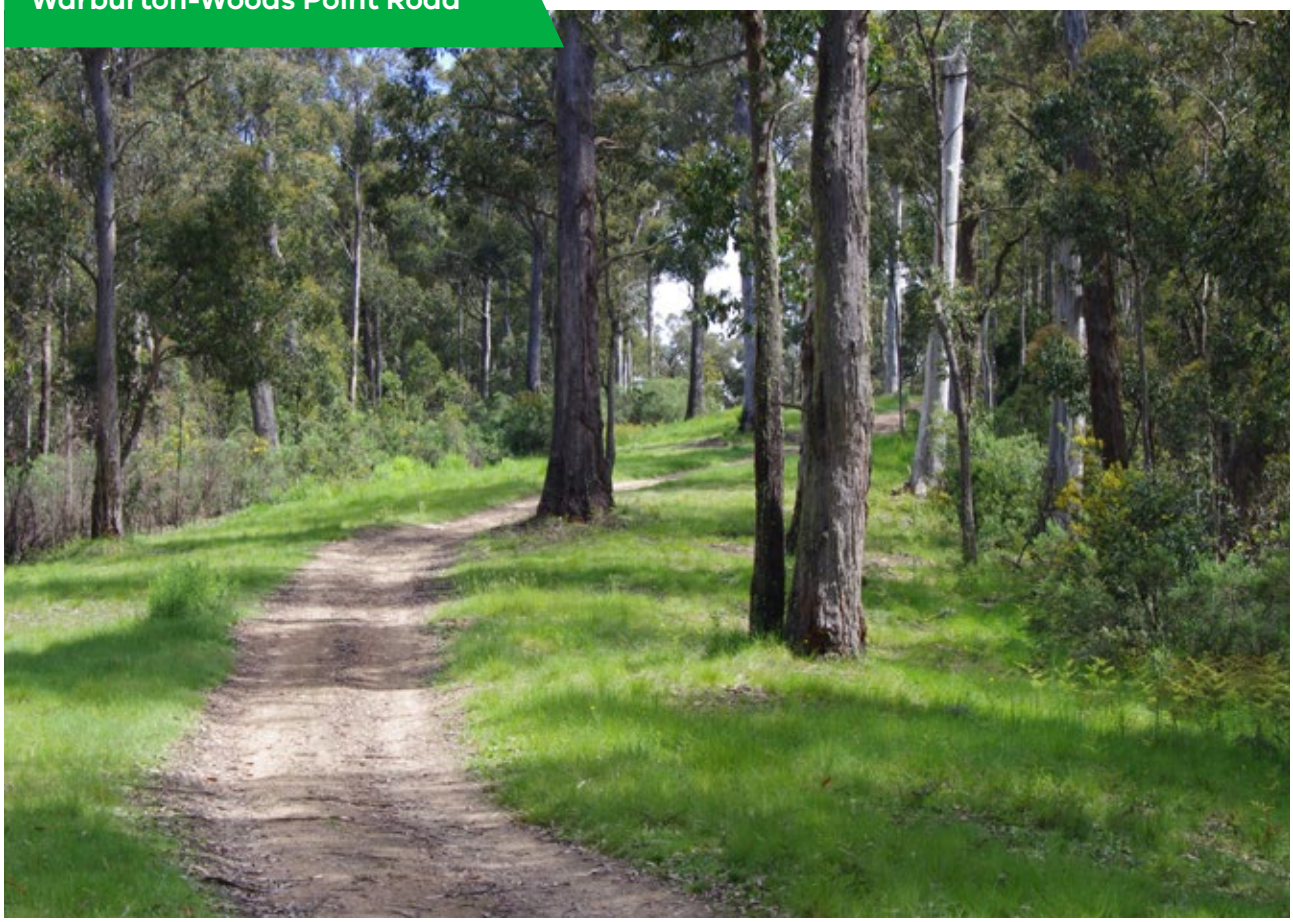
Old Rosedale Road

- 25m wide break, with occasional retained trees.
- Fuel reduction of the adjoining forest where possible is important to reduce long distance spotting, over the break.

Follow up maintenance will be required to ensure the effectiveness of the break.

Wet Forest

Warburton-Woods Point Road



- 20m wide break with occasional retained trees.
- An established landscape protection fuel break in damp forest with scattered retained trees and a grassy ground cover.

Note no debris or windrows.

Dune Fields

Pella Track, Booligal, Wyperfeld National Park

- Rolled break maintenance, 20m wide, every 5 years based on slow regrowth rates has proven to be effective in supporting fire control operations.

This type of break construction is rare outside of Mallee vegetation.

Practices to avoid if possible

Uncontrolled tree hazard

Often arising when hazard trees are not treated soon enough after a fire and the area regenerates.

- Ensure tree hazard is assessed and treated for at least one tree length from the edge of the fuel break.

Unacceptable debris management

- Don't leave windrows, trees pushed back into bush, or left on the break. The retention of heavy fuels close to the break reduces its effectiveness in the control of fires and protection of assets.

This can also result in weed problems, unmaintainable ground, fire access problems and an eyesore. It can seriously compromise social license for the works.

Trees retained too close to the track

- Interfere with drainage and batter maintenance, and present an added level of hazard.
- All trees and stumps within 1.5 slasher widths of the road or track should be removed.

Unmaintained Fuel Breaks

- Ineffective for their purpose, and require costly and slow heavy disturbance to reestablish.
- Choose fuel breaks carefully for their strategic value and ensure maintenance is programmed annually.

Special breaks

Greater than 40m wide are subject to planning permit requirements for native vegetation removal (unless constructed as a control line during a fire and then retained as a fuel break). New construction may be justifiable in exceptional cases with high-value assets.

Special breaks should only be considered where combinations of planned burning, mechanical treatment, asset hardening etc are not possible.

Newmerella – Natural gas pumping station

- 40-60m treeless cleared break.

Strategically Important Asset for the Supply of Gas to Sydney

Examples other Fuel Break width classes

Nominated high bush-fire risk town

Bemm River township

✔ 40-70m treeless break after planning permit process for native vegetation removal.

Large areas of forest can allow fires to become large and intense before they impact on communities. Other, smaller settlements near forest may be equally likely to be impacted by bushfire but have fewer houses and people at risk.

As such, protection breaks are often evident and is informed by sophisticated bushfire modelling (Gippsland Bushfire Management Strategy 2020).

FOREST FIRE MANAGEMENT VICTORIA