

**Department of
Sustainability and
Environment**

Investigation of Fuel and Bushfire
Risk Management in Victoria's High
Country Using Strategic Cattle
Grazing

Report identifying conceptual
models of Traditional Owners;
Mountain Cattlemen; and the
Department of Sustainability
and Environment

September 2011

Executive summary

The Victorian Government has committed to investigate fuel and fire management in Victoria's high country, including the Alpine National Park, using strategic cattle grazing. A long term research trial is planned to assess the effectiveness of fuel and bushfire risk management in Victoria's high country using strategic cattle grazing.

To inform the design process for the long term research trial, DSE engaged GHD to consult with the three main groups of people who have managed grazing and/or fire in the Victoria's high country to document past and present grazing and fire management approaches and practices. The three groups consulted were:

- ▶ Traditional owners with connections to Victoria's high country.
- ▶ The Mountain Cattlemens Association of Victoria.
- ▶ The Department of Sustainability and Environment and Parks Victoria

In consultation with DSE, GHD devised a stakeholder consultation program for the project. This involved a range of facilitated focus group sessions, semi-structured group interviews and field visits, and individual interviews by phone and in-person (see section 2 of this report for stakeholder consultation session details).

GHD transcribed, in key point form, information divulged by each stakeholder group, along with information from documents stakeholders directed GHD refer to. The information provided was developed into a summarised conceptual model for each group, with more detailed explanation of model components documented as sub-models. Draft models and sub-models were provided to the relevant informant stakeholder groups for review and comment, and subsequently finalised by GHD. The three models presented in this report, and the detailed sub-models in the appendices, are based only on the information provided by the relevant groups and individuals interviewed. It is the intent of the authors of this report to faithfully reproduce the information, views and knowledge of the interviewees.

Model summaries

All the models vary in their arrangement. This reflects that the models operated at different times, in various landscapes and different operating environment conditions. For example Traditional Owners used fire in a pre-European settlement landscape free of the institutional and legal frameworks that apply today. They also used fire for very different reasons to post-European settlement land managers. Mountain cattlemen developed their traditional grazing and burning practices during times before contemporary land tenure systems, and when Government and public interest in their activities was very different to present times. They were not as constrained in their management of grazing and fire as present day public land management agencies are. Therefore, by necessity, the model constructs developed for each of the groups have a number of differences in layout although they also have a number of similarities.

Traditional Owner model

Traditional owners used fire for a different range of reasons other than bushfire risk management. Therefore the Traditional Owner model identifies:

- The basic survival/subsistence needs that were related to their use of fire;
- How and/or Why they used fire to meet their basic needs; and
- What impact their fire use had on high country vegetation groups and the landscape generally

Mountain Cattlemen model

Mountain cattlemen used fire to reduce bushfire risk in the high country and to prevent a decline in the condition (feed abundance and quality) of their grazing leases. In particular they claim substantial bushfire risk reduction benefits arise from their management, and without grazing and/or burning substantial increases in bushfire risk arise. Therefore their model is essentially a cause and effect style model identifying:

- The grazing and burning practices traditionally applied;
- The effect of these practices on vegetation and fuel characteristics;
- How the fuel modification arising from grazing and burning affects fire behaviour;
- How the changes to fire behaviour alter the likelihood and consequence of fires and therefore bushfire risk at the high country landscape scale

DSE and PV high country fire management model

DSE and PV identified strongly that the circumstances and management objectives to which they manage fire are very different from those that applied in the past. With the range of risks being managed (some competing) and objectives being pursued, they generally identified a risk management approach. Therefore the DSE PV model identifies:

- The general risks and constraints under which contemporary public land management operates;
- Risk factors considered during risk assessment;
- The broad suite of risk treatments pursued to address the range of risks;
- How bushfire mitigation and other risk management measures are applied in different high country vegetation groups and the general effect on high country fire regimes

Model depictions

Each of the three models are summarised in the 'model-on-a-page' models in section 3 of this report. Models complete with their sub-model descriptions which explain more fully the model components are provided in Appendices A to C.

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Appendix A

Traditional Owner conceptual model of high country burning

Appendix B

Mountain Cattlemen conceptual model for the application of grazing and low intensity burning to manage fuel and bushfire risk in Victoria's high country

Appendix C

Department of Sustainability and Environment (DSE) and Parks Victoria (PV) conceptual model of bushfire management in Victoria's high country

1. Background to Project

The Victorian Government has committed to investigate fuel and fire management in Victoria's high country, including the Alpine National Park, using strategic cattle grazing. A long term research trial is planned to assess the effectiveness of fuel and bushfire risk management in Victoria's high country using strategic cattle grazing.

The Mountain Cattlemen's Association of Victoria (MCAV) believe that cattle grazing in conjunction with burning conducted as their ancestors did in the high country, is an effective tool for fuel reduction and thus bushfire risk management. There is a view that while this cannot be said to emulate past Aboriginal burning practices, it may provide a modern day method for managing fire risk in the high country.

Prior to setting up a long term research trial it is important to have an understanding of past and current burning practices in the high country, including:

- ▶ Past Aboriginal burning practices.
- ▶ Grazing and burning practices traditionally conducted by mountain cattlemen.
- ▶ The current fire management practices conducted by Parks Victoria and the Department of Sustainability and Environment.

This project has been set up to develop three separate models through discussions with the relevant stakeholders, the models are:

- ▶ Traditional Owner practice model
- ▶ High country grazing & burning model
- ▶ Conservation reserve management (without livestock grazing) model

2. Methodology

2.1 Focus Group Discussion

Two focus group discussions were held to gather information for the development of models. One focus group was held in Omeo with members of the MCAV on the 3rd June 2011. Attendees are listed in Table 1 below.

Table 1 Attendees at MCAV focus group 3rd June 2011

Name	Location
Graeme & Wendy Stoney	Mansfield
Mark Coleman	Heyfield
Simon Turner	Bindi (via Swifts Creek)
Richard Faithful	Benambra
John Cook	Benambra
David Hurley	Dargo
Chris Cooper	Black Mountain (Gelantipy)
Bruce McCormack	Mansfield
Joe Connley	Benambra
Phillip Commins	Ensay
Glenn Chalwell	Myrtleford
Ken Heywood	Myrtleford
Chris and Jeanette Commins	Ensay
Charlie & Glenda Lovick	Mansfield
Vince & Di Pendergast	Benambra
Scott Jennison	Bairnsdale
Brian Higgins	Heyfield

Another focus group was held with members of the Gunai/Kurnai and southern Monero Traditional Owner groups in Orbost on the 29th June 2011 (for notes from the discussion Appendix A). The Taurunung declined an invitation to be involved. Attendees are listed in Table 2 below.

Table 2 Attendees at Traditional Owner focus group discussion 29 June 2011

Name	Location
Aileen Blackburn	Cann River
Alex Mongta	Cann River
Rachel Mullett	Bruthen
Albert Mullett	Bruthen
Susan Martin	Orbost
Dawn Mongta	Cann River
David Hewat	Newmerella
Kevin Murray	Orbost

Focus groups were held in a semi-structured interview format whereby a number of questions were asked to gather information on burning and grazing practices (specifically looking at where, when, why, what and how) and the impacts these practices had on the landscape and subsequent bushfire risk.

2.2 Semi-structured interviews and site visits

A number of semi-structured interviews and site visits were also held with informants from the MCAV including:

- ▶ Chris Commins
- ▶ Simon Turner
- ▶ John Cook
- ▶ Buff (John) Rogers
- ▶ Kevin Higgins
- ▶ Mark Coleman

No other interviews have been transcribed as they were conducted during site visits; however information from these site visits has been used to inform the model. Site visits included the Nunniong run out from Ensay and Kevin Higgins freehold land at 1300m, out from Licola.

2.3 DSE and PV model consultation

Input for the DSE / PV model was obtained through a series of phone and face-to-face consultations. Table 3 on the following page lists consultations that were undertaken:

Table 3 Participants in DSE/PV model consultations (July/August 2011)

Name	Location
Liam Fogarty (DSE)	Melbourne
David Nugent (PV)	Melbourne
Peter Jacobs (PV)	Bright
Dan Jamieson (PV)	Bright
Ben Rankin (DSE)	Swifts Creek
Evan Lewis (DSE)	Bairnsdale

2.4 Development of Models

Models were developed based on focus group discussions, interviews and site visits. As outlined in the brief for this project no literature reviews were undertaken as part of this project, appropriate references were used when they were supplied by informants or where they were found to support assertions made by informants. The MCAV also provided a number of photos for inclusion in the models. Diagrams were also developed as part of the high country grazing and burning model in order to better explain aspects of this model.

2.5 Review of notes and models

Notes from focus group discussions and draft models were provided to informants in order to allow them the opportunity to provide feedback. Appropriate changes were made to focus group notes and models based on this feedback. The Traditional Owner practice model is provided in Appendix A; the mountain cattlemen high country grazing and burning model is provided in Appendix B; and the conservation reserve management (without livestock grazing) model is provided in Appendix C.

2.6 Acknowledgements

GHD acknowledges the willing assistance given by the stakeholder groups for this project.

Members of MCAV drove considerable distances, at their own expense and in their own time to attend stakeholder consultation meetings in Omeo, and Heyfield on two occasions. In particular, MCAV president Mark Coleman, and members Chris Commins, Simon Turner and Kevin Higgins are gratefully acknowledged for their assistance and generosity in arranging and hosting field visits to Nunniong/Diggers Holes and Bennison Plain to view and discuss high country fire management issues.

Attendees of the traditional owner stakeholder group are acknowledged for their attendance at the stakeholder group in Orbost, and for reviewing notes recorded, and draft models developed.

Peter Jacobs and Dan Jamieson of Parks Victoria are acknowledged for organising and hosting discussions in Bright regarding the DSE/PV's historical and current approach to fire management in the Alpine National Park.

3. Model summaries

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3.2 Mountain Cattlemen

Mountain cattlemen used fire to reduce bushfire risk in the high country and to prevent a decline in the condition (feed abundance and quality) of their grazing leases. In particular they claim substantial bushfire risk reduction benefits arise from their management, and without grazing and/or burning substantial increases in bushfire risk arise. Therefore their model is essentially a cause and effect style model identifying:

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3.3 DSE and PV high country fire management model

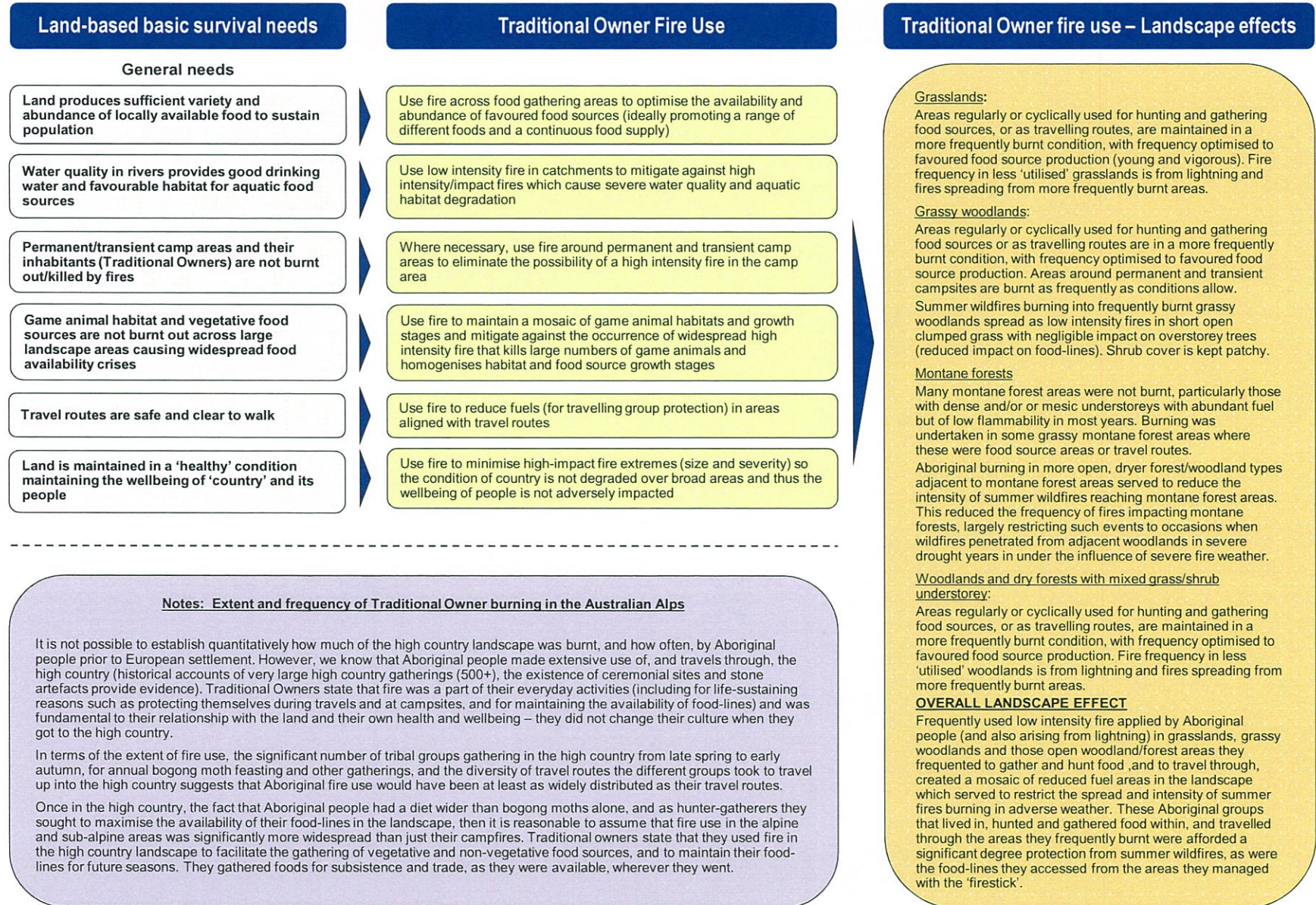
DSE and PV identified strongly that the circumstances and management objectives to which they manage fire are very different from those that applied in the past. With the range of risks being managed (some competing) and objectives being pursued, they generally identified a risk management approach. Therefore the DSE PV model identifies:

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- Risk factors considered during risk assessment;
- The broad suite of risk treatments pursued to address the range of risks;
- How bushfire mitigation and other risk management measures are applied in different high country vegetation groups and the general effect on high country fire regimes

3.4 Model depictions

Each of the three models are summarised in the 'model-on-a-page' models on the following pages. Models complete with their sub-model descriptions which explain more fully the model components are provided in Appendices A to C.

Conceptual model of high country Traditional Owner fire use



Conceptual model of traditional high country grazing and burning: effect on bushfire risk reduction

Inputs

High country vegetation state*

* Upon arrival of pioneer cattlemen

Open grassland areas: Healthy open-clumped grassland, easy to walk/ride through, highly palatable to stock, kept open and short by low intensity lightning fires and Aboriginal burning.

Grassy sub-alpine woodlands: (mostly snow gum and black sally) Open cover of mature trees (easy to ride through) with vigorous open-clumped snow grass, favourable for grazing. Low intensity lightning fires and Aboriginal burning kept grassy understorey open and easy to walk through.

Woodlands with mixed grass/shrub understorey: Taller mixed species stands at lower elevations with grassy understorey with scattered shrubs – easy to ride and move cattle through. Unrestrained lightning fires and Aboriginal burning maintained grass dominance; easy to move stock through; adequate feed for stock.

Other vegetation not grazed by stock:

Scrub dominated rocky patches, forests with little grass cover.

Grazing¹ (and burning²) practice

Extent: Grazing in grassland, grassy woodlands and grassy forest extensively across high country to above tree line.

Grazing cycles: At lower elevations – all year round while ever there was sufficient grass to maintain stock condition. At higher elevations (above ~800m) stock taken up late spring and brought down as first big autumn frosts arrived.

Stocking levels: According to seasonal conditions, stocked to level at which herd maintains/improves condition. Historical stocking levels (when burning was allowed) were significantly higher than current levels.

Burning: Grazing conducted in conjunction with ongoing patch-burning. Burning conducted in grasslands, grassy woodlands and 'bush runs' wherever rank grass or shrubs had accumulated to levels sufficient to carry low intensity fire. There was no fixed cycle for grazer burning – selection of patches/areas for burning was based on condition assessment. Intervals between burns in grassland/grassy woodland, were typically around 6-7 years in lightly or ungrazed areas, and around 4 years in more routinely grazed areas.

Immediate effects

Effect of grazing and grazer burning on vegetation and fuel characteristics³

Open grasslands: Grass kept short, open-clumped and mostly green even through summer. Grass response to grazing and burning was strong growth of fresh green grass during the growing season. Inter-tussock spaces were kept open, favouring a variety of herbaceous ground cover plants. Grazing and burning inhibited proliferation of woody shrubs, maintaining dominance of grass and diverse herbage.

Grassy woodlands (snow gum/black sally): Grass kept short, open clumped and mostly green. Sparse/patchy shrub presence in understorey maintained. Grazing and low intensity burning prevented woodland 'thickening' maintaining an open cover of mature trees (regeneration of young trees was mostly associated with occasional disturbance events such as higher intensity summer fires or after rabbit plagues).

Negligible ladder fuel between short grass understorey and overstorey tree canopy.

Woodlands with mixed grass/shrub understorey: New-season grass grazed short, rank grass remains, some shrubs browsed but not removed. Low-intensity burning maintains a grassy understorey dominated by young grass, and prevents increasing shrub domination. Juvenile shrubs may be killed in burnt patches, but larger, adult (low-intensity fire tolerant) shrubs remain in burnt and unburnt patches. Burning chars bark on fibrous barked trees, and reduces leaf litter and suspended bark (reducing ladder fuels).

Areas where grazing and burning are excluded: Snow grass clumps grow accumulating dead thatch with each growing season, crowding out inter-tussock spaces and creating a dense accumulation of fine fuel (flammable under a wide range of conditions). Shrubs increase in extent, cover and height with ongoing absence of fire. A low frequency, high intensity fire regime promotes shrubby understorey thickening. Fibrous barked Eucalypts accumulate flammable bark and add leaf/twig litter to understorey grass and shrub fuels.

Intermediate effects

Vegetation/fuel effects on fire behaviour⁴

Grazed grasslands: Short, open-clumped and mostly green grass will not carry fire even through summer. In recent severe fire events (2003 & 2006), many recently grazed open high country grassland areas did not burn, providing survivable refuge for stock, firefighters, and equipment. Fire may cross short grazed areas as embers from forests and woodlands.

Grassy woodlands (snow gum/black sally): In mature snow gum/black sally stands with short grazed grass, fires burning in extreme weather will not burn or reduce in behaviour to a low intensity surface grass fire. Rate of spread and fire intensity are reduced by the low grass fuel availability and short structure, and by the wind speed reduction effect of the tree canopy. The extent of full crown scorch is significantly reduced.

In recent extreme fire events, fire behaviour in short recently grazed snow gum stands has been reduced so as to prevent significant tree mortality.

Woodlands with mixed grass/shrub understorey: In grazed and low-intensity burnt woodlands with mixed grass/shrub understorey, summer bushfire behaviour is typically reduced to a surface fire (significantly reducing crown fire except on steep uphill runs and high fuel patches). Where grazing only is carried out (no low intensity grazer burning) fire behaviour is not significantly altered due principally to near-surface and elevated shrub fuels and extreme bark hazard.

Areas where grazing and fire are excluded: Long-ungrazed and unburnt snow grass will burn vigorously in a wide range of conditions when fire gets in to dead thatch accumulations (abundant very fine fuel which is easily ignited). Snow gum woodlands with long-unburnt and ungrazed grass or shrubby understorey can support crown fires and will support a vigorous surface fire likely to result in complete and widespread scorch and tree mortality. Long-unburnt grassy/ shrubby woodlands may support intense surface fires and crown fires.

Long-term effects

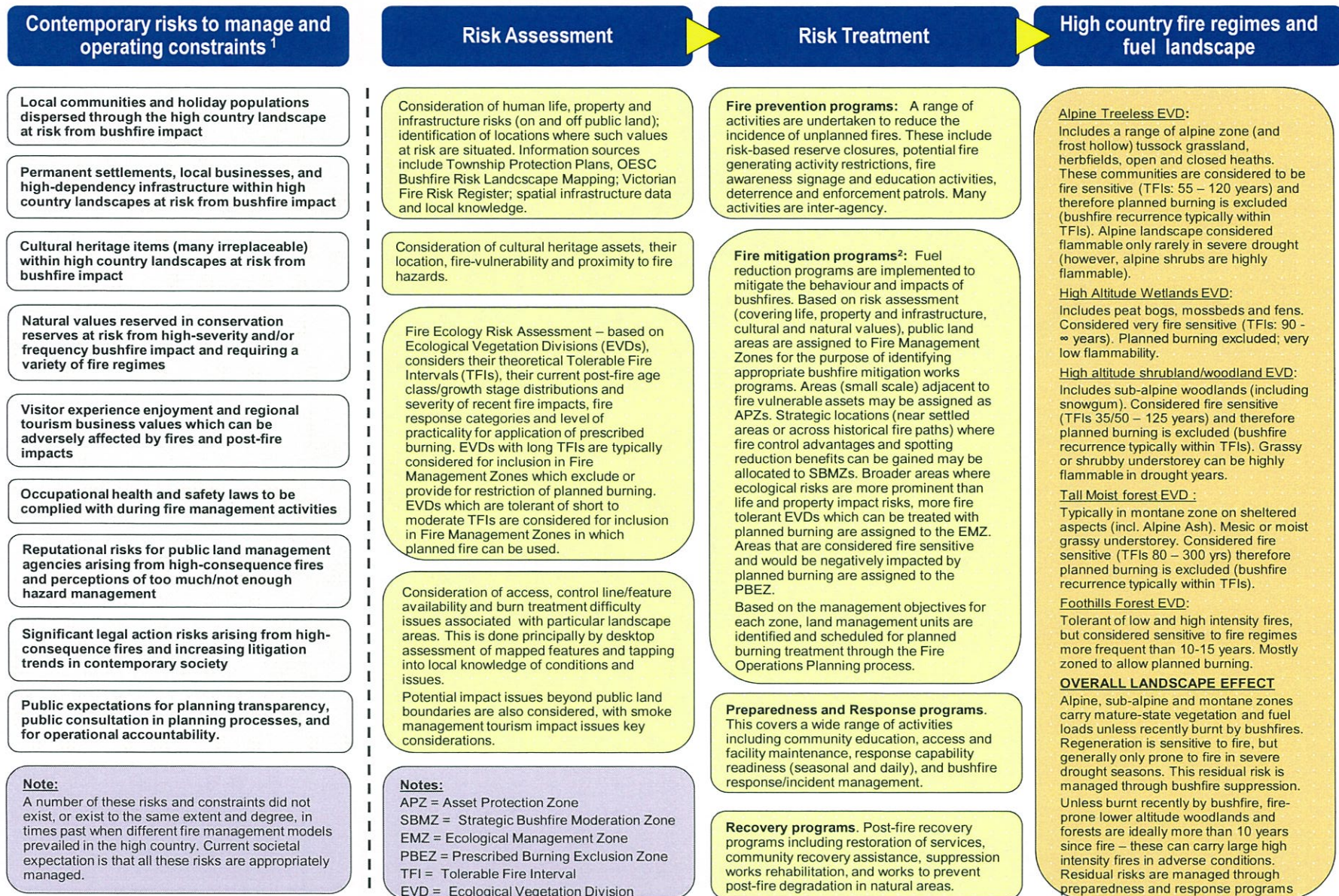
Landscape fire impact and risk reduction⁵

The effect of high country grazing and traditional burning practices is to:

- ✓ reduce the extent to which summer bushfires spread in high country landscapes (due to lowering rates of fire spread), particularly reducing the likelihood of fires crossing high alpine plateaus
- ✓ lengthening the interval between high intensity/impact fire events
- ✓ significantly reducing the impact of bushfires on thin-barked woodland tree species such as snow gum which are killed if they suffer full crown scorch
- ✓ significantly reducing the extreme soil erosion impacts that arise when large scale high intensity fires remove tree cover and burn long-accumulated snow grass thatch at high intensity
- ✓ Increase the resilience of high country ecosystems to summer bushfires by avoiding large scale fuel accumulations, (summer fire impacts are patchier with greater variety in fire intensity)
- ✓ Increasing the opportunities for control of unplanned summer bushfires by increasing the extent and connectedness of low fuel areas where fire behaviour will moderate allowing suppression
- ✓ Reducing the potential for catastrophic fire impacts in sensitive systems (eg. moss beds and peat bogs) by reducing fuel around these such that summer fires do not burn into these features

Note: For landscape scale risk reduction benefits to be realised, alignment and distribution of grazing runs along a large extent of ridge/plateau systems is required. Small scale piecemeal grazing can only achieve small scale localised risk reduction and cannot achieve broader landscape scale benefits. Grazing without burning will significantly limit effectiveness.

Conceptual model of high country fire management by DSE / PV



Appendix A [Click to open Appendix A](#)

Traditional Owner conceptual model of high country burning

Appendix B [Click to open Appendix B](#)

Mountain Cattlemen conceptual model for the application of grazing and low intensity burning to manage fuel and bushfire risk in Victoria's high country

Appendix C [Click to open Appendix C](#)

Department of Sustainability and Environment (DSE) and
Parks Victoria (PV) conceptual model of bushfire management
in Victoria's high country

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Document Status

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