bushfire&natural HAZARDSCRC

The Secretary
Environment and Planning Committee
Parliament House
Spring Street
EAST MELBOURNE VIC 3002

15th June 2016

Dear Sir,

The Bushfire and Natural Hazards Cooperative Research Centre (CRC) welcomes the opportunity to provide a brief submission into the **Inquiry into Fire Season Preparedness** as this is a critical aspect of risk reduction for the Victorian community.

An introduction to fire season preparedness

Fire seasons are becoming longer and extreme fire weather is becoming more common, but that is not the whole story in Australia. The management of natural hazards, including bushfire, is a highly complex issue involving all layers of government, the private sector, and the community.

Hazards, such as bushfire, exist because they are a natural part of the environment and the phenomenon harms something we value: our lives, houses, livelihood, or amenities. There has been a long historical transfer of responsibility for the protection against such hazards to the government and its agencies on the premise that it is better to have properly-trained and resourced organisations to respond and protect us. However, as pointed out by the Victorian 2009 Bushfires Royal Commission, that transfer of responsibility has probably gone too far. Individuals are no longer taking sufficient responsibility for their own risk management. It is analogous to the community not installing locks on houses because we have a police force to address the risk of burglary.

Governments over many years have allowed this risk transfer to continue through perverse incentives that favour people not taking responsibility. In fact, the World Bank noted in a recent World Development Report[1] that it is not just a local problem. One of the main reasons why 'DRR [*Disaster Risk Reduction*] savings are not always enacted is because political capital is rarely gained from cost-effective DRR measures': voters reward politicians for delivering disaster relief funding but not for investing in disaster preparedness. That presents a fundamental challenge to the implementation of the recent Productivity Commission's inquiry[2] into disaster funding arrangements, which in its report advocated a substantial shift of focus from funding relief and recovery to funding mitigation.

It is clear from Bushfire and Natural Hazards CRC research, conducted after major fire events, that while the population recognises it is living in a risky environment, many people do not perceive that as a risk to them personally. Information about household preparedness, and warnings about leaving early, are mostly unheeded. This presents a challenge for authorities responsible for fire season

[1] http://siteresources.worldbank.org/EXTNWDR2013/Resources/8258024-1352909193861/8936935-1356011448215/8986901-1380568255405/WDR14_bp_Disaster_Mitigation_is_Cost_Effective_Kelman.pdf

[2] http://www.pc.gov.au/inquiries/completed/disaster-funding

Bushfire and Natural Hazards CRC
ABN 21 163 137 979
Level 5, 340 Albert Street
East Melbourne VIC 3002
Australia
E office@bnhcrc.com.au
W bnhcrc.com.au
T 03 9412 9600
F 03 9416 3717

preparations, as it results in a large percentage of people waiting to see what will happen, and in many cases sees them leave at the last minute.

The Bushfire and Natural Hazards CRC believes that any discussion on fire season preparedness must engage all parties, public and private, across all land tenures, to work towards mitigation of the fire hazard utilising a range of tools and activities.

These include, but are not limited to:

- **Reducing the level of bushfire risk through planned burning for given levels of investment and resourcing.**
- **Educating communities to make better decisions about their behaviour before, during and after fires.**
- **Understanding the impact of climate change and weather variability on different Victorian ecosystems and fire's role in those landscapes.**
- **Planning for more appropriate land uses in high fire risk areas, including rebuilding in ways that mitigate future fire impacts.**
- **Recruiting and retaining volunteer and career firefighters in order cope with potentially longer fire seasons.**

The Bushfire and Natural Hazards CRC[3] and its predecessor the Bushfire CRC[4] have accumulated a decade of research into the bushfire hazards faced by Victorian communities. Much research was conducted on planned burning that includes a cost-benefit analysis of the risk, the economics of burning, the environmental impacts across varied types of landscapes, and the acceptance of prescribed burning by rural and interface communities.

Specific responses to the terms of reference are attached, as is an overview of the Bushfire and Natural Hazards CRC's research program.

If the Bushfire and Natural Hazards CRC can be of any further help in the Committee's Inquiry please do not hesitate to contact me.

Yours sincerely,

Dr Richard Thornton
CEO
Bushfire and Natural Hazards CRC

[3] www.bnhcrc.com.au
[4] www.bushfirecrc.com

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Terms of reference – Inquiry into Fire Season Preparedness

The Bushfire and Natural Hazards CRC wishes to comment on the following Terms of Reference:

The amount and nature of preventative burning undertaken

It is well understood that fuel reduction will decrease fire intensity, flame height and the forward rate of spread. One of the most efficient methods of reducing fuel over large areas is through the use of controlled fire under prescribed conditions – that is, through prescribed burning or planned/preventative burning.

However, there are other methods of fuel reduction other than just burning, including selected thinning and mechanical removal. Although these may be more labour intensive and therefore more expensive, they may be more appropriately applied in areas where the use of fire is not practicable, such as close to housing or other infrastructure.

Importantly, fire is applied to various ecosystems for other reasons than just as preventative burning for fuel reduction. This may include the preservation of ecosystem values such as biodiversity, water yield and quality, soil preservation and other objectives. As noted in the 2012 Code of Practice for Bushfire Management on Public Land:

> *There are two primary objectives for bushfire management on public land:*
>
> • *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.*

With the more recent focus on risk assessment and with the endorsement of the National Emergency Risk Assessment Guidelines (NERAG) by the Australian and NZ Emergency Management Committee, and then by the Ministerial Council of Law, Crime and Community Safety, it is sensible to link the level of planned burning to the level of risk reduction of individual communities rather than just an arbitrary area-burnt target that is not linked to prioritised objectives. Without such an objective-based measures there is no answer to the question about what is the right amount of land to treat.

It is important that whatever targets are put in place that these are based on the best available evidence and scientific research. They should be measurable, achievable and articulated in such a way that the community understand their residual risk.

Any target must recognise that no hazard reduction target will reduce the risk to zero, and that trade-offs are required. It is also important that the community understands that the effectiveness of hazard reduction is strongly dependent on the weather conditions that prevail on the day they are impacted by fire. On extreme days like Black Saturday, the effectiveness of most prescribed burning on stopping runs of large fires will be minimal because medium and long range spotting will see these large areas overrun.

However, the fuel levels around properties and communities can make a significant difference to the intensity of the fire as it impacts private and public assets.

The impact of land tenure on the ability to provide fire prevention activities

The 2009 Victorian Bushfires Royal Commission had a focus on the role that fuel levels on public land played on the events of Black Saturday. It was almost entirely silent on the role of fuels on private land, despite the fact that most deaths and damage to private assets resulted from the fires traveling over private land immediately before impact.

It is a falsehood to assume that by setting targets only for public land the risk to people and property can be solved. The idea that people should not consider the fuel levels on their own property and risk that it poses to themselves and others is inconsistent with the arguments and scientific evidence about the important role of fuels within 100 metres of properties. The idea that residents can ignore this because the government is treating the public land is dangerous and inconsistent with the arguments relating to shared responsibility outlined in the Royal Commission report and enshrined in the National Strategy for Disaster Resilience.

Bushfires do not respect tenure boundaries and nor should a risk based consideration of community protection. It is important that planned burning activities recognise the multiple players in land-management, and that the government alone should not be solely responsible for the risk treatments.

The impact of preventative burns on the climate

While the Bushfire and Natural Hazards CRC is not conducting research directly on modelling climate change there is much work in Australia and elsewhere that is noting the increased frequency of higher fire danger days. Across Australia fire seasons appear to be starting earlier and finishing later. This is creating ongoing issues for fire preparations and resource allocation across the country and internationally, as many resources are shared according to traditional timings of fire seasons.

An essential element in fire season resource preparation and allocation for all Australian states and territories is the annual Bushfire and Natural Hazards CRC's *Seasonal Bushfire Outlook.* The 2015/16 *Outlook* noted that much of the South East of Australia had seen a decade of below average rainfall. The CRC issued the *Outlook* in September 2015 (http://www.bnhcrc.com.au/hazardnotes/010) but subsequently had to reissue the report with an increased risk owing to the exceptionally dry October across much of south-east Australia (http://www.bnhcrc.com.au/hazardnotes/12). Significantly this increased risk area included large parts of Victoria. The assessment for Victoria stated in some detail the need for fire season resource allocation to be based on the ongoing research and monitoring of climate and weather variability:

> *A preliminary investigation of factors affecting the fire season outlook for 2015-16 point to an above normal season across most of Victoria.*
>
> *Key indicators of above normal fire potential are currently in place. They include an extended rainfall deficit, drying conditions in eastern central Australia that affect north westerly air patterns, and rain that dampens but doesn't soak soil profiles.*
>
> *The normal course of spring warming, increasing day length and drier conditions in key areas that affect Victoria's weather leads to a strong likelihood that the season will begin early.*
>
> *Areas with long-term rainfall deficits extend in a broad band from the South Australian border to the north east foothills, and includes some areas of Gippsland.*

There are local occurrences of lowest-on record rainfall in the west of the state. Short-term rainfall deficits exist across much of the state, with the exception of the south west coast and Far East Gippsland.
Crop and pasture growth has been highly variable across the state in response to autumn rainfall patterns. The exact pattern of factors affecting grass growth and curing is not yet clear, though an increased outlook for spring rain may indicate increased grass growth in some areas.

Agencies will monitor conditions and the emerging weather outlook closely in the lead up to summer. Historically, the August to October period is the wettest time of the year in Victoria, and it sets the scene for fuel growth and fuel conditions over the summer.

Current climatic signals indicate a slightly better than average chance of above average rainfall and below average daily maximum temperatures across most of the state, leading to an improved outlook for grass growth. However, given the long term rainfall deficits, significant rain would be required over the spring period to alter the outlook for an above normal fire potential for most of Victoria.

Drier conditions in key areas of the continent that affect Victoria's weather, when combined with the normal course of spring warming and increasing day length, leads to a strong likelihood that the season will begin early.

The effectiveness of preventative burns in achieving community safety

Victoria has been an early adopter of the fire spread simulator Phoenix, which was developed by the Bushfire CRC along with the University of Melbourne. This simulator is one of the best available in Australia and provides an indication of the future path of fires, both in wildfire situations and in planned burns, that help direct warnings and safety messages to communities at most risk of fire impact.

Phoenix is based upon science which is being updated through research at the Bushfire and Natural Hazards CRC, the University of Melbourne and also through work funded by the Victorian Department of Environment, Land, Water and Planning (DELWP) through the CRC. The model is only as accurate as the inputs though; the CRC is working with a range of partners to develop better landscape dryness measures, better weather forecasting and better use of remote sensing products to improve this accuracy.

Empirical fire spread models are also only as good as the observations and fire behaviour models that have been used. In the case of Phoenix the models used are the best currently available, however, there are many known limitations with those models. These limitations primarily occur at extreme fire danger levels, where there is substantial interaction between the fire and the atmosphere, which is why the Bushfire and Natural Hazards CRC has extensive research underway to produce better fire spread models for use in preventative burns and wildfires.

The Victorian government is a major player in the Australian and New Zealand Emergency Management Committee's working group on a new National Fire Danger Rating System (NFDRS) - a recommendation from the Victorian 2009 Bushfires Royal Commission. This investigation of the science and structure of a new NFDRS was funded through the National Emergency Management Program and run by the Bushfire and Natural Hazards CRC. The project has developed a framework

for updating the NFDRS to incorporate the best science to assist with fire season preparation and response.

The next step for this project has recently been considered by the Australian and New Zealand Emergency Management Committee.

The resources available to ensure that adequate protection is undertaken;

This is an operational issue for the Victorian Government, however the Bushfire and Natural Hazards CRC is conducting research around capability especially considering the way in which incident management teams co-ordinate with each other. The previous Bushfire CRC, of which the Bushfire and Natural Hazards CRC is now the custodian of the research, also conducted research on workforce issues including fitness and fatigue management on the fireground. This work is on the Bushfire CRC website www.bushfirecrc.com