

Submission Number: NND.001.01210

Submission Of: Nicki de Preu

Your Details

Email address:

Phone:

Preferred means of contact: Email

What is your submission based on? I am making this submission based on my professional knowledge, qualifications or experience or on behalf of a group or organisation

What is your area of professional expertise?

If you are lodging your submission on behalf of a group or organisation, what is the name of the group or organisation? Nature Conservation Society of South Australia

Your Submission

In your experience, what areas of the bushfire emergency response worked well?

Investment in early warning phone messaging and apps and educating the public to 'leave early' has contributed to less fatalities associated with the 2019/20 Bushfire Season compared with previous major bushfire incidents such as the 2005 Wangary fire despite a significantly greater area being burnt this year. The early response and co-ordination of aerial and ground-based fire-fighting units combined with the use of farm fire-fighting units to support CFS crews were all critical in controlling these fires. The deployment of large aircraft and fire-retardant lines to slow the rate of spread of these fires was also beneficial.

In your experience, what areas of the bushfire emergency response didn't work well?

Hazard reduction burns were ineffective in preventing the risk of bushfires spreading under the extreme conditions. Burning more vegetation more often will not prevent bushfires from occurring on catastrophic risk days when most losses and damage occur. Management of remnants of unburnt vegetation through back burning under the extreme conditions caused more damage in some cases and was done despite advice from local crews. Lack of skilled crews to extinguish fires in hollow-bearing trees that provide important wildlife habitat and can be the cause of reignitions was a notable deficiency.

In your experience, what needs to change to improve arrangements for preparation, mitigation, response and recovery coordination for national natural disaster arrangements in Australia?

There is an urgent need for an expanded aerial firefighting fleet and an increase of secure Federal and state funding to support the operational costs of fighting fires at their ignition point, in both remote and populated areas, before they become uncontrollable.

We strongly believe there is an urgent need for strengthened national environmental protection laws particularly in regards to triggers for matters of national conservation significance or critical habitat determinations after a wildfire or other natural disaster.

There is an urgent need for better adaptive management frameworks to support pre and post-fire monitoring of flora and fauna and to incorporate favourable ecological outcomes into wildfire risk management.

It is critical that good post-fire recovery action is put in place, including invasive predator and herbivore control to reduce the pressure on recovering vegetation communities. The Australian Government should, at least, match state government funding for these initiatives.

Immediate cessation of approvals for unsafe land divisions and developments within, and adjoining, significant areas of native vegetation such as National Parks and reserves.

Fire suppression activities be conducted with a view to limiting damage to natural assets wherever possible.

Is there anything else you would like to tell the Royal Commission?

Please refer to our submission for further comments

Do you agree to your submission being published? Yes I agree to my submission being published in my name

Supporting material provided:

NCSSA Submission to the Bushfire Royal Commission April 2020 Final.pdf



5 Milner Street,
Hindmarsh SA 5007

Phone: (08) 7127 4630

Email: ncssa@ncssa.asn.au

Website: www.ncssa.asn.au

Air Chief Marshal Mark Binskin AC,
Honourable Dr Annabelle Bennett AC SC and Professor Andrew Macintosh

28th April 2020

Submission to the Bushfires Royal Commission

The Nature Conservation Society of South Australia (NCSSA) welcomes the opportunity to provide input to the Bushfires Royal Commission that will examine coordination, preparedness for, response to and recovery from disasters as well as improving resilience and adapting to changing climatic conditions and mitigating the impact of natural disasters. As South Australia's primary nature conservation advocacy organisation, NCSSA has an active interest in the protection and conservation of South Australia's environmental assets with particular attention being paid to nationally and state listed threatened plants, animals and ecological communities, management of remnant native vegetation and protected areas.

NCSSA considers the impact of unmanaged fire on native vegetation and the habitat it provides for native fauna poses one of the greatest threats to biodiversity conservation in South Australia, and that it is likely to be exacerbated by the effects of climate change. NCSSA believes informed fire management is essential for effective biodiversity conservation because fire regimes (including their frequency, extent and intensity) interact with plant and animal survival techniques and play a significant and positive role in sustaining and promoting plant and animal diversity. NCSSA therefore advocates strongly for active fire management that protects environmental assets as well as life and property. Currently, NCSSA provides input to a wide range of plans and policy documents that direct the management of fire in South Australia and has staff representing the Conservation Council of South Australia on two of the state's Bushfire Management Committees.

Whilst the efforts of emergency services, volunteer firefighters and other support services during the 2019/20 Bushfire Season in South Australia were commendable, we believe there are some areas that require considerable improvement. Our submission primarily addresses policy and planning matters and issues related to hazard reduction burns to protect life, property and the environment.

We look forward to ongoing involvement with the management of bushfire risk in South Australia and would be available to clarify or discuss any of the points raised in this submission via email to [REDACTED] or phone [REDACTED].

Yours sincerely,

[REDACTED]

Nicki de Preu

Nature Conservation Society of South Australia

The Nature Conservation Society of South Australia Submission to the 2020 Bushfire Royal Commission.

The Nature Conservation Society of South Australia provides the following information as the basis of our submission to the Bushfire Royal Commission with particular attention to the Terms of Reference (ToR) identified in the Terms of Reference.

ToR (a) The responsibilities of, and co-ordination between, the Commonwealth and State, Territory and local Governments relating to preparedness for, response to, resilience to, and recovery from, natural disasters, and what should be done to improve these arrangements, including with respect to resource sharing

NCSSA believe the role for the Commonwealth is one of facilitating co-ordination, and delivering supporting funding, especially in relation to:

- Effective funding to significantly increase the capacity for the deployment of aerial point of ignition control, especially in remote areas. Expenditure on ignition control can be a very cost-effective strategy, benefitting the public, the economy and the environment
- Facilitation of evacuation strategies.

However, while Federal co-ordination and funding are important, we believe it should primarily be the states and territories which plan for, establish and perform fire mitigation strategies, and develop evacuation strategies.

ToR (b) The findings and recommendations (including any assessment of the adequacy and extent of their implementation) of other reports and inquiries that you consider relevant, including any available State or Territory inquiries relating to the 2019-2020 bushfire season, to avoid duplication wherever possible.

NCSSA recommend the Commissioners refer to Report from the 2009 Senate Select Committee on Agricultural and Related Industries into the incidence and severity of bushfires across Australia following the “Black Saturday” Bushfires in Victoria. This report notes that most of the themes and issues identified from previous bushfire inquiries were again raised during that Inquiry with the Senate Select Committee recognising the frustration many people feel about raising well established concerns over bushfire management to yet another inquiry, when previous inquiry processes have not resolved the issues that have been so consistently brought to the attention of governments. Chapter 2 of the 2009 Senate inquiry explores these issues with an apparent cycle of disaster followed by inquiry followed by inaction that appears to characterise this area of public policy. The following comments from Professor Peter Kanowski (Panellist on the 2004 Council of Australian Governments National Inquiry into Bushfire Mitigation and Management¹) are of particular relevance to the 2020 Bushfire Royal Commission:

“The COAG Inquiry... found a repeated cycle of response by governments and the community to major fire events: first, suppression and recovery processes are always accompanied by assertions, accusations and allocations of blame, even while the fires are still burning; second, inquiries are established and report; third, recommendations are acted upon, to varying degrees; fourth, the passage of time sees growing complacency and reduced levels of preparedness... and the cycle begins again with the next major bushfire event”.

The COAG Inquiry concluded that breaking of this cycle, collectively and individually, was perhaps the greatest challenge we face in learning from the impacts of each bushfire on life and property, and applying our learning in time for the next bushfire event².

¹ 2004 (national): Council of Australian Governments National Inquiry into Bushfire Mitigation and Management. S. Ellis *et al.*

² Professor Peter Kanowski, *Committee Hansard*, Canberra, 12 March 2010, p. 31

It is in this context that NCCSA urges the 2020 Royal Commission to ensure that it does not perpetuate this cycle and afford confidence to the community that the Australian Government will provide the necessary leadership and resources to act on key areas to improve Australia's resilience and adaptation to changing climatic conditions and future bushfire events and natural disasters.

NCCSA also refer the Commissioners to the Independent Review of the 2019/20 Bushfire Season in South Australian that, when completed, will provide relevant material on the Prevention, Preparation, Response and Recovery to the devastating bushfires that occurred in parts of South Australia.

ToR (c) Australia's arrangements for improving resilience and adapting to changing climatic conditions, what actions should be taken to mitigate the impacts of natural disasters, and whether accountability for natural disaster risk management, preparedness, resilience and recovery should be enhanced, including through a nationally consistent accountability and reporting framework and national standards.

AND

Ways in which Australia could achieve greater national coordination and accountability – through common national standards, rule-making, reporting and data sharing – with respect to key preparedness and resilience responsibilities, including for the following:

- i) land management, including hazard reduction measures;***
- ii) wildlife management and species conservation, including biodiversity, habitat protection and restoration;***
- iii) land-use planning, zoning and development approval (including building standards), urban safety, construction of public infrastructure, and the incorporation of natural disaster considerations;***

AND

Any ways in which the traditional land and fire management practices of Indigenous Australians could improve Australia's resilience to natural disasters.

ToR (c) National standards for accountability and reporting

NCCSA supports the current reporting framework processes that the Commonwealth and South Australian Governments have in place through their 5-yearly State of the Environment Reports however recommend that further commitment and resources are required to address the ongoing environmental pressures and challenges identified in these reports if we are to reverse the ongoing decline in biodiversity across Australia.

Particularly, the lack of effective biodiversity monitoring and reporting has been raised in every jurisdictional State of the Environment report, and multiple other reports and papers, as a major impediment to understanding the state and trends of Australian biodiversity, including in response to fire. In relation to a nationally consistent accountability and reporting framework and the setting of national standards, NCCSA recently made a submission to the review of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* arguing for stronger national environmental laws, including calling for the establishment of an independent National Environment Protection Agency. Part of the remit of the National Environmental Protection Authority would be to support widespread biodiversity monitoring, including strategically selected, long-term biodiversity monitoring as well as the curation of existing long-term data sets. This could include a much-needed reporting framework and the setting of national standards in relation to monitoring the impact of fire on biodiversity, including on sensitive environmental assets such as threatened species.

At a national level, the recently established Wildlife and threatened species bushfire recovery Expert Panel³, could provide insight into information that would be useful in triaging future fire events. Similarly, the Wildlife Recovery and Habitat Taskforce recently established in South Australia could provide state-based input⁴.

³ <https://www.environment.gov.au/biodiversity/bushfire-recovery/expert-panel>

⁴ <https://www.premier.sa.gov.au/news/media-releases/news/new-wildlife-and-habitat-recovery-taskforce-formed>

The 2016 State of the Environment Report (Jackson *et al.*, 2017) was the fifth national assessment of the state of Australia's environment and found that "The main pressures facing the Australian environment today are the same as in 2011: climate change, land-use change, habitat fragmentation and degradation, and invasive species. In addition, the interactions between these and other pressures are resulting in cumulative impacts, amplifying the threats faced by the Australian environment".

This report found that, during the past 5 years, policies and management practices have achieved some improvements in the state and trends of parts of the Australian environment however, a number of key challenges to the effective management of the Australian environment remain:

- An overarching national policy that establishes a clear vision for the protection and sustainable management of Australia's environment to the year 2050 is lacking. Such a program needs to be supported by
 - specific action programs and policy to preserve and, where necessary, restore natural capital and our unique environments, taking into account the need to adapt to climate change
 - complementary policy and strengthened legislative frameworks at the national, state and territory levels
 - efficient, collaborative and complementary planning and decision-making processes across all levels of government, with clear lines of accountability.
- Poor collaboration and coordination of policies, decisions and management arrangements exists across sectors and between different managers (public and private).
- Follow-through from policy to action is lacking.
- Data and long-term monitoring are inadequate.
- Resources for environmental management and restoration are insufficient.
- The understanding of, and capacity to identify and measure, cumulative impacts is inadequate, which reduces the potential for coordinated approaches to their management.

Meeting these challenges requires:

- integrated policies and adaptive management actions that address drivers of environmental change and the associated pressures
- national leadership
- improved support for decision-making
- a more strategic focus on planning for a sustainable future
- new, reliable sources of financing.

NCSSA contend that, although there has been incremental progress in tackling some of these challenges over the past 10 years, further commitment and resources are required to address these issues and reverse the ongoing decline in the state of our environment. The 2019/2020 Bushfire Season saw some of the largest bushfires ever experienced in many areas with devastating impacts on communities, the environment and economy. Due to the extent of these bushfires, recovery of the natural environment is likely to take decades and in the case of some plants and animals possibly longer, if ever, that will mean ongoing declines in the state of the environment. Although the Commonwealth and South Australian State Government have committed significant financial resources towards bushfire recovery there has been ongoing delays in preliminary actions to assist with bushfire recovery that are now being hampered by concerns about the spread of COVID 19.

ToR (c)i) Land management, including hazard reduction measures

NCSSA acknowledges that the South Australian landscape has evolved under a natural and cultural regime of fire in the landscape and that many of our vegetation communities and native plant species are adapted to periodic fires to maintain their ecological functioning. Human activity (Indigenous and European) has influenced the known history of fire in Australia and impacted greatly on its biological systems (Kershaw *et al.*, 2002). Since European settlement, human assets have been built in bush fire prone landscapes, not only placing those assets at risk from bush fire but progressively fragmenting the landscape. This is particularly important from the South Australian perspective where, in large parts of the state, protected areas and

remnant native vegetation on private land provide the only remaining habitat for long term conservation of biodiversity.

Prescribed burning is a widely used tool used in South Australia and other jurisdictions to reduce fuel loads in high risk areas such as around built assets and infrastructure. It is also used for ecological purposes to allow for regeneration of plant communities and threatened plant species such as programs conducted on Kangaroo Island and the Fleurieu Peninsula to protect nationally endangered ecological communities and threatened plant species. There is, however, increasing evidence that such programs do little to prevent the risk of bushfires spreading under extreme conditions such as that experienced during the 2019/20 Bushfire Season. We understand that all the prescribed burns conducted on Kangaroo Island in 2019 burnt again in the bush fires that devastated the western end of the island. The Royal Commission should acknowledge that, despite the best intentions, no amount of hazard reduction burning will prevent major bushfires from occurring under extreme and catastrophic conditions such as that experienced during the 2019/2020 Bushfire Season. There is also a need to transition away from using a lack of hazard reduction burning as the underlying cause of major bushfires. There is no evidence to support that this is the case. A primary cause of failure to achieve hazard reduction targets has been the brief and shrinking fire-weather window in which agencies can safely conduct hazard reduction burning, without causing damage to the very assets they are attempting to protect. Several studies (e.g. Jolly *et al.* 2015; Quinn-Davidson and Varner 2012) have demonstrated, and senior fire managers from multiple states (<https://www.abc.net.au/news/2020-01-10/hazard-reduction-burns-bushfire-prevention-explainer/11853366>) have reiterated, that failure to achieve hazard reduction hectare targets is due to being constrained by an ever decreasing window of opportunity in which to safely conduct burning. Over the past 2 decades, lengthening Fire Danger Seasons are reducing opportunities for hazard reduction burning (Matthews *et al.* 2012; Ximenes *et al.* 2017) and increasing the resource needs of firefighting services. The lengthening fire season means that opportunities for fuel reduction burning are decreasing and this is predicted to increase in response to climate change.

There is also increasing recognition that inappropriate fire regimes such as too frequent or intense fires can lead to:

- loss of critical habitat, as well as animal and plant species (Lunt, 1998; Bunk, 2004; Parsons & Gosper, 2011; Armstrong & Phillips, 2012);
- alter the composition and dominance of vegetation communities and ecosystems (Hobbs, 2002; Crowley *et al.*, 2009; Russell-Smith *et al.*, 2010);
- promote weed and exotic animal invasion (Thompson & Leishman, 2005; Fisher *et al.*, 2009; Pickup *et al.*, 2013); and
- regular burning of vegetation increases the regeneration of fire prone plant species that can result in more intense fires than occurs in mature vegetation communities (Pastro *et al.* 2011).

NCSSA has conducted a review of the Annual Reports for the South Australian Environment Department from 2018/2019 to 2009/2010 and found that during this time the Department has conducted 719 prescribed burns covering a total area of approximately 79,800 hectares across the State primarily with a focus on high-risk areas within the Mount Lofty Ranges and protected areas elsewhere across the state. Following the 2009 Royal Commission into the Victorian Black Saturday Fires, South Australia adopted a state-wide hectare target (% area) that created a perverse incentive for land management and fire agencies to treat large areas in remote locations (that represented a low risk to life and property), rather than smaller, more costly and difficult burns in places where they would provide better protection of human assets (Handmer and Keating 2015). Over the past two years, the CFS and Department of Environment and Water have adopted a risk based approach to prescribed burning with approximately 26% of burns (32 of 120 completed) conducted on private landholdings however the vast majority still occur on protected areas and in areas that represent a low risk to life and property in the event of a bushfire.

Examples of some of the fire related projects that are being/have been conducted in South Australia to increase knowledge and improve the way fire management activities are carried out is available on the DEW website: <https://www.environment.sa.gov.au/topics/fire-management/fire-science/fire-research>

It is critical that the outcomes from these research investigations are used to inform future hazard reduction burns and that we continue to increase and improve our knowledge of the ecological fire requirements for plants, animals and ecological communities across South Australia.

NCSSA strongly supports the development of four key areas of scientifically based fire management.

- a. The preparation of fire management guidelines for managing the habitats of plants and animal species and ecological communities of conservation significance.
- b. On-ground implementation of scientific knowledge in fire ecology and conservation biology. This includes the employment of skilled technicians in the field of fire management to ensure that scientific guidelines are appropriately applied.
- c. Monitoring and evaluation of the impacts of fire and fire management on fire patterns and biodiversity which is ongoing and adequately resourced. Such monitoring is particularly important given the uncertainties about future environmental change due to climate change.
- d. An adaptive-management approach that ensures that the results of monitoring the effectiveness of fire management in asset protection and achieving ecological objectives are constantly fed into planning of future burns.

The effects and interactions of climate change with hazard reduction burning also need to be acknowledged as they may further reduce the adaptive capacity of our natural ecosystems and threaten their ability to provide services essential for human life, livelihood and wellbeing such as water, climate moderation (including carbon capture), biodiversity and tourism and recreation opportunity. Research undertaken by Luke and McArthur (1978) indicates that South Australia can expect serious fires somewhere in the State in six or seven years out of every ten. This finding needs to be factored into any hazard reduction burning program conducted on public and private land and also the time interval between burns in a particular area to ensure that the vegetation communities in those areas have time to regenerate sufficiently before being burnt again.

ToR (c)ii) Wildlife management and species conservation, including biodiversity, habitat protection and restoration

NCSSA acknowledges that the Australian landscape has evolved under a natural and cultural regime of fire in the landscape. Human activity (Indigenous and European) has influenced the known history of fire in Australia and impacted greatly on its biological systems (Kershaw *et al.*, 2002). Since European settlement, human assets have been built in bush fire prone landscapes, not only placing those assets at risk from bush fire but progressively fragmenting the landscape.

As noted under ToR (c)i) there is increasing evidence that inappropriate fire regimes can lead to a loss of habitat, as well as animal and plant species (Lunt, 1998; Bunk, 2004; Parsons & Gosper, 2011; Armstrong & Phillips, 2012), alter the composition and dominance of vegetation communities and ecosystems (Hobbs, 2002; Crowley *et al.*, 2009; Russell-Smith *et al.*, 2010), promote weed and exotic animal invasion (Thompson & Leishman, 2005; Fisher *et al.*, 2009; Pickup *et al.* 2013) and may increase fire frequency and intensity due to the regeneration of fire prone plant species that can result in more intense fires than occurs in mature vegetation communities.

The South Australian Department for the Environment and Water (DEW) has developed ecological guidelines for the management of all fire-prone vegetation types which occur in the agricultural areas of SA that describe how frequently specific vegetation communities should be burnt. The guidelines take into account the dominant floral species that comprise these vegetation classes and recommend an interval consistent with seed set, seed viability and reproductive age of the species. These Guidelines aim to ensure that a fire will not occur too regularly or too often, as too frequent fire may destroy immature plants established since the previous fire, before they are able to produce viable seeds to ensure the propagation of the next generation. These guidelines are a recommended approach to developing ecological fire regimes (that is, fire regimes to maintain and enhance biodiversity). Specifically, the Guidelines identify five aspects of fire regimes (interval, frequency, spatial, intensity and season) for each major vegetation sub-group in a planning area. DEW has also developed a series of ecological fire management strategies have

also been developed for several significant threatened or pest species for which fire is a critical threat or management tool.

Further information about these guidelines and strategies is available at the DEW website: <https://www.environment.sa.gov.au/topics/fire-management/fire-science/ecological-strategies-and-guideline>

There have been a considerable number of research investigations, both in South Australia and interstate that demonstrate inappropriate fire regimes (achieved through either too frequent bushfires or prescribed burning programs) can result in a decline in biodiversity values (Gill *et al.* 1999, Pastro *et al.* 2011).

Fire frequency and intensity are two key elements in hazard reduction burning that need to be carefully managed to ensure that ecosystems are not damaged irreversibly. Importantly, where fire regimes occur outside of the sequence to which the plants and animals in a particular area have adapted to, extinction of species can occur. Informed fire management is essential for effective biodiversity conservation because fire regimes interact with plant and animal survival techniques and play a significant and positive role in sustaining and promoting plant and animal diversity. Knowledge of the interactions between the elements of biodiversity and fire regimes is an evolving area that requires ongoing commitment and resources to ensure more effective fire management across the state including within South Australia's protected areas.

NCSSA acknowledge the importance of and need for a rapid damage assessment of property and infrastructure following a bushfire in order to commence the process of recovery for communities and landholders affected by fire. We advocate that there is a critical need for damage to environmental assets to be included as part of this assessment of fireground damage if we are to better understand the impacts of bushfires on native plants, animals and ecosystems. The timing of these assessments may be some weeks after the fires have been declared safe however it is critical that they do occur so that recovery of the environment is also addressed as part of the broader recovery efforts. There has been a significant effort dedicated towards recovery of the natural environment with the Kangaroo Island and Cudlee Creek bushfires in 2019/20 that has united people from a wide range of sectors and helped to rebuild communities following the fires. Unfortunately, the environmental devastation caused by the fires during the 2019/20 Bushfire Season could take many decades to recover, and possibly longer, and will require ongoing monitoring and resources to assess the response of native plants, animals and threatened ecological communities. The Bushfire Royal Commission needs to address such issues as a matter of high priority in conjunction with the recovery of built and social infrastructure.

There are also problems such as the indirect impacts of increased predation by feral cats and foxes following bushfires when habitat and food resources are limited, and invasion of introduced plants into areas of burnt native vegetation that need to be considered as part of the long-term recovery efforts for areas impacted by major fires as have occurred in the 2019/20 Bushfire Season.

From an operational perspective, NCSSA is advised that there are many situations where excessive resources are deployed and effort wasted to control fires burning inside large standing tree hollows including significant and regulated trees and trees that provide habitat for rare and threatened species. At times, tank loads of water are wasted on attempting to extinguish burning trees if there is no adequate technique to direct the water onto the internal fire. Additional resources such as bulldozers and chain saw crews are then needed to fell trees whilst other crews waste considerable hours looking on, and waiting, to extinguish fires once trees are on the ground. In many cases, this approach is not necessary and results in avoidable environmental damage when experienced tree crews can extinguish such trees efficiently and reduce the risk of rekindles from tree trunks smouldering on the fire ground.

We are also aware that on Kangaroo Island where there were important marked and unmarked nesting trees for the nationally endangered Glossy Black Cockatoo, offers to extinguish trees during the 2019/2020 bushfires were refused on safety grounds, despite coming from a brigade where dozens of trees had been extinguished at the Cudlee Creek fire during the same bushfire season. We strongly recommend that CFS units in South Australia and elsewhere include tree ready units and teams experienced with such techniques to be routinely deployed to assist with fires in hollow bearing trees that provide important habitat for wildlife including species of conservation significance.

NCSSA contend that the secondary risks to the environment associated with risk mitigation activities (e.g. the environmental impacts caused by fire retardants on wetlands and native vegetation) needs to be considered in terms of logistic arrangements for all bushfires – particularly in and around wetlands of national and international significance. We also contend that the use of salt water must be a last resort option as it kills the vegetation and soil, taking decades to recover. We understand that salt water is regularly used for aerial fire control operations on Kangaroo Island and recommend that pre-season planning needs to establish multiple sources of water for firefighting and aerial firefighting to prevent the need to source salt water that is so harmful to the environment.

NCSSA advocates strongly for the following ecosystem and wildlife protection and recovery after bushfires:

- Ensure the on-ground implementation of current scientific knowledge in fire ecology and conservation biology post-bushfire
- Implement pest animal and pest herbivore control programs as soon as it is practical, and safe, to do so after a major bushfire to assist wildlife and habitat recovery to address priorities identified in Threat Abatement and Recovery Plans
- Undertake ecological monitoring and evaluation of the impacts of bushfire which is ongoing and adequately resourced - particularly for areas where species/ecological communities of conservation significance were known to occur prior to the fire
- Repeat surveys of monitoring sites located within a fire scar area as soon as it is practical, and safe, to do so after a major bushfire

ToR (c)iii) Land-use planning, zoning and development approval (including building standards), urban safety, construction of public infrastructure, and the incorporation of natural disaster considerations

From a land-use planning perspective, it is widely acknowledged that in spatial terms, anthropogenic and natural assets converge at the urban – bushland interface. Although one perspective holds that bushland, in itself, poses a fire threat to property, this framework fails to recognise that homeowners can do a lot in terms of preparing and protecting their own properties from destruction by fire. Indeed, management solutions need to be found on both sides of the bushfire interface, and across all tenures.

Over recent years South Australia has developed Bushfire Management Area Plans for the nine Bushfire Management Areas across the state that adopt a tenure blind approach to management of the risk of bushfires. In metropolitan and rural urban areas, fuel is often relatively continuous between property boundaries thus requiring a coordination of strategies across tenures. Fires can also originate on both sides of the interface and may be caused by natural events such as lightning strikes or by human activities such as prescribed burning or arson.

Management of fuel in close proximity to the asset, as opposed to fuel management on the bushland side of the interface, is often a far more effective strategy to achieve fire protection to a particular asset. Short of cementing over or clearing vast tracts of bushland, fuel reduction at the interface must be combined with strategies to increase the ability of a house, structure, product or other economic asset to withstand a bush fire event.

Given the continuous expansion of urban development into bushland areas and predicted climate change impacts there is an urgent need for (i) government agencies to review and adapt their bush fire management strategies and (ii) for at risk private property owners to adequately prepare their properties their homes against increased or more unpredictable bush fire events. In this context within South Australia the “government agencies” should be deemed to include the SA Department of Planning, Transport and Infrastructure, the Country Fire Service and all relevant Local Government Areas.

NCSSA considers the bushfire zoning framework that applies to building and infrastructure developments in South Australia to be inadequate and inherently flawed. The categories currently used include areas with General, Medium and High bushfire risk to identify areas where a proposed development requires referral to the SA CFS for review and recommendation regarding application of bushfire protection standards that often require the removal of native vegetation. However, under extreme and catastrophic conditions, there would be no difference in fire behaviour between these categories as seen in the devastating fires at

Pinery, Wangary and Yorketown where difficult and fast-moving grass and crop fires were all or largely within general bushfire risk zones.

The Planning Framework in South Australia has continued to approve unsafe land divisions and developments including tourism facilities within, and adjoining, significant areas of native vegetation including sites within National Parks, conservation reserves and Wilderness Areas. The destruction of the Southern Ocean Lodge Wilderness retreat in the Flinders Chase National Park on Kangaroo Island provides one example for the 2019/2020 Bushfire Season yet, unfortunately, there are many other poor planning decisions that have allowed development to be approved with inadequate regard to the full impact assessment of what is required to protect buildings and infrastructure other than the removal of native vegetation. It is of serious concern to NCSSA that such land divisions and developments are still being approved for example the recent proposal by the Australian Walking Company for “eco-accommodation” in Flinders Chase National Park. These matters need to be urgently addressed along with the building standards for construction of dwellings in bushfire prone areas.

(d) Any relevant matter reasonably incidental to a matter referred to in paragraphs (a) to (c).

NCSSA also refer the following matters for consideration by the Royal Commission:

- *The role of the state bushfire committee in South Australia;*

The Fire & Emergency Services Act (FES Act) is the primary legislative document for Bushfire Management Area Planning in South Australia. Under the FES Act there is a two-tiered bushfire management framework, consisting of a State Bushfire Coordination Committee (SBCC) and nine Bushfire Management Committees (BMCs). The FES Act provides details on the composition and functions of the SBCC whose primary role is to prepare and maintain a SBMP that establishes a strategic risk-based framework for bushfire management in South Australia. As discussed below the SBMP has never been finalised and, with the aim of improving future bushfire management in South Australia and links to the state Emergency Plan, we believe this should be actioned as a matter of high priority.

The SBCC is also responsible for determining the composition and term of appointment of BMC members after consultation with the Minister. The Conservation Council of SA is entitled to have a representative on each BMC with NCSSA staff members currently fulfilling this role on the Adelaide Mount Lofty and Flinders, Mid North & Yorke BMCs. Each BMC is required by the FES Act to develop, implement and review a Bushfire Management Area Plan (BMAP) based on assessment of bushfire risk to assets, incorporating a broader perspective on bushfire management values and local knowledge. Each of the BMAPs are required to be monitored for amendments annually and formally reviewed every four years.

There are other roles and responsibilities that the SBCC and BMCs are required to undertake in order to develop, maintain and review the BMAPs. The SBCC and BMC have specific functions including governance over bushfire management in South Australia, quarterly meetings, reporting on bushfire management activities, consideration of amendments to BMAPs, public consultation, election of sub-committees and working groups to achieve BMAP outcomes such as the recent risk assessment for environmental assets.

From our perspective there appears to be considerable competition between the role of the SBCC and other Government groups such as the State Emergency Management Council, State Mitigation Advisory Group (SMAG) and the Heads of Agencies that is unhelpful. We are advised that decisions made by these groups have, at times, undermined the role of the SBCC in terms of agreements made and progress in accordance with the FES Act. Critically, the Heads of Agencies should be supporting the effective implementation of the Act yet, we are advised when it comes to key codes of practice and the State Bushfire Management Plan this has not been the case.

- *Developing a new state bushfire plan for South Australia;*

NCSSA strongly support the proposal for a new State Bushfire Management Plan (SBMP) given the current draft plan was written in 2010 and was never finalised despite suggestions that the CFS Rural Fire Hazard Plan be adopted as the State Plan. Sections 73 of the *Fire and Emergency Services Act 2005* and the *Fire and Emergency Services (Review) Amendment Act 2009 (FES Act)* require the State Bushfire Coordination Committee to prepare a State Bushfire Management Plan and, given that it is now ten years since the interim plan was written, we believe that this should be actioned as a matter of high priority. Section 73(5) of the *FES Act* also requires the SBMP to be reviewed at least once in every four years, another outstanding

matter that has not occurred since the draft Interim SBMP was written. Although significant progress has been made during this time in developing Bushfire Management Area Plans across the state these plans do not negate the need for an overarching State Bushfire Plan, or its periodic review, given the increasing research and knowledge regarding fire behaviour and technological advances in this field.

- *Developing policies and standards to reduce bushfire risk.*

NCSSA supports the need to develop and review policies and standards to reduce bushfire risk and understand there is currently a considerable backlog of policy and planning work that needs to be addressed including the State Bushfire Management Plan, Bushfire Management Plan Handbook and various Codes of Practice including those for Fire Management on Public Land in South Australia, Fire Prevention and Preparedness on Private Land and Fire Prevention and Preparedness on Council Land. We are advised that the CFS Bushfire Management Planning Unit requires additional resources and expertise to undertake the development and review of the existing backlog of plans and policies and to support the SBCC. Of critical importance, as identified in the Interim SBMP, there is an urgent need for formal coordination of, and integration between, bushfire prevention plans at all levels, and between these plans and land management agency plans.

- *Reducing risk of bushfire ignitions from machinery and power tools;*

Although there are Codes of Practice for the use of machinery and power tools in South Australia to reduce the risk of this source of ignition, they continue to be a significant factor in bushfire ignitions – particularly in the agricultural areas. An analysis of the causes of bushfire ignitions in South Australia between 2000 and 2004 found that fires relating to machinery and vehicles, including harvesting and slashing were the second greatest cause of ignitions after burn-offs (Bryant, 2008). The Interim State Bushfire Management Plan (State Bushfire Coordination Committee, 2010) states that 10% of all bushfire ignitions between 2000 and 2005 were the result of ignitions caused by machinery. These statistics are of serious concern and we advocate that further education and communication through media and internet is required to make landholders more aware of the risk of using such equipment during the Fire Danger Season and particularly days of Extreme or Catastrophic Fire Danger.

- *Lightning strikes and detection;*

Lightning strikes continue to be a natural source of bushfire ignition responsible for around 7% of bushfires in South Australia between 2000 and 2005 (State Bushfire Coordination Committee, 2010). Current climate models predict that fires ignited by lightning have, and will likely, continue to increase across temperate regions in the Southern Hemisphere under a warmer climate (Mariani *et al.*, 2018). Lightning also results in the production of nitrous oxide that further contributes to atmospheric greenhouse gases. We strongly support the need for ongoing improvements in technology to track and detect lightning strikes to enable earlier response to bushfire ignitions from this cause particularly in remote and inaccessible landscapes such as western Kangaroo Island, Ngarkat and the Flinders and Outback areas. There needs to be continued efforts to monitor and respond to lightning strikes and extinguish small lightning strike fires before they become large bushfires that are more difficult to control and can cause devastating impacts to human life, property and the environment. Bushfires that are ignited by lightning and burn significant areas of habitat for rare and threatened plants and animals is of particular concern to NCSSA, such as the devastation of habitat for the Kangaroo Island Dunnart, Glossy Black Cockatoo and Southern Brown Bandicoot that occurred during the 2019/20 bushfires.

References

- Armstrong, G. and Phillips, B. (2012). Fire history from life-history: determining the fire regime that a plant community is adapted using life-histories. *PLoS ONE*, 7, e31544.
- Bunk, S. (2004). World on Fire. *PLoS Biology*, 2, 0154-0159.
- Bryant, C. (2008). Understanding bushfire: trends in deliberate vegetation fires in Australia. Technical and background paper no. 27. Canberra: Australian Institute of Criminology.
- Crowley, G., Garnett, S. and Shephard, S. (2009). Impact of storm-burning on *Melaleuca viridiflora* invasion of grasslands and grassy woodlands on Cape York Peninsula, Australia. *Austral Ecology*, 34, 196-209.
- Fisher, J.L., Loneragan, W.A., Dixon, K., Delaney, J. and Veneklaas, E.J. (2009). Altered vegetation structure and composition linked to fire frequency and plant invasion in a biodiverse woodland. *Biological Conservation*, 142, 2270-2281.
- Gill, A.M, Woinarski, J.C.Z. & York, A. (1999) Australia's Biodiversity – Responses to Fire Plants, Birds and Invertebrates. Biodiversity Technical Paper, No. 1. Environment Australia. Biodiversity Convention and Strategy Section, Department of the Environment and Heritage, Canberra ACT.
- Handmer J. and Keating A. (2015) Bushfire fuel management targets: Options analysis. In: Review of performance target for bushfire fuel management on public land. Inspector-General for Emergency Management, Victorian Government, Melbourne.
- Hobbs, R. (2002). *Fire regimes and their effects in Australian temperate woodlands. Flammable Australia: The Fire Regimes and Biodiversity of a Continent*. Cambridge University Press; United Kingdom.
- Jackson W.J., Argent R.M., Bax N.J., Clark G.F., Coleman S., Cresswell I.D., Emmerson K.M., Evans K., Hibberd M.F., Johnston E.L., Keywood M.D., Klekociuk A., Mackay R., Metcalfe D., Murphy H., Rankin A., Smith D.C & Wienecke B. (2017). Australia state of the environment 2016: overview, independent report to the Australian Government Minister for the Environment and Energy, Australian Government Department of the Environment and Energy, Canberra.
- Jolly W.M., Cochrane M.A., Freeborn P.H., Holden Z.A., Brown T.J., Williamson G.J. & Bowman D.M.J.S. (2015) Climate-induced variations in global wildfire danger from 1979 to 2013. *Nature Communications* 6, 7537.
- Kershaw, A.P., Clark, J.S. and Gill, A.M. (2002). *A history of fire in Australia. Flammable Australia: The Fire Regimes and Biodiversity of a Continent*. Cambridge University Press; United Kingdom.
- Luke, R. H. and McArthur, A. G. (1978) *Bushfires in Australia*. Published by Australian Govt. Publishing Service, Canberra.
- Lunt, I.D. (1998). *Allocasuarina* (Casuarinaceae) invasion of an unburnt coastal woodland at Ocean Grove, Victoria: Structural Changes 1971-1996. *Australian Journal of Botany*, 46, 649-656.
- Mariani, M., Holz, A., Veblen, T.T., Williamson, G., Fletcher, M-S. and Bowman, D. M. J. S. (2018) Climate Change Amplifications of Climate-Fire Teleconnections in the Southern Hemisphere. *Geophysical Research Letters*,
- Matthews, S., Sullivan, A.L., Watson, P. and Williams, R.J. (2012) Climate change, fuel and fire behaviour in a eucalypt forest. *Global Change Biology*, Volume 18, Issue 10: Pages 3212-3223.
- Pastro, L. A., Dickman, C. R. & Letnic, M. (2011) Burning for biodiversity or burning biodiversity? Prescribed burn vs. wildfire impacts on plants, lizards, and mammals. *Ecological Applications*, 21(8), pp. 3238–3253.
- Parsons, B.C. and Gosper, C.R. (2011). Contemporary fire regimes in a fragmented and an unfragmented landscape: implications for vegetation structure and persistence of the fire-sensitive malleefowl. *International Journal of Wildland Fire*, 20, 184-194.

- Pickup, M., Wilson, S., Freudenberger, D., Nicholls, N., Gould, L. Hnatiuk, S. and Delandre, J. (2013). Post-fire recovery of revegetated woodland communities in south-eastern Australia. *Austral Ecology*, 38, 300-312.
- Quinn-Davidson L.N. and Varner J.M. (2012) Impediments to prescribed fire across agency, landscape and manager: an example from northern California. *International Journal of Wildland Fire* 21, 210–218.
- Russell-Smith, J., Yates, C.P., Brock, C. and Westcott, V.C. (2010). Fire regimes and interval sensitive vegetation in semiarid Gregory National Park, northern Australia. *Australian Journal of Botany*, 58, 300-317.
- State Bushfire Coordination Committee (2010) Interim South Australian State Bushfire Management Plan Part One: Information to Support a State Bushfire Risk Assessment.
- Thompson, V.P. and Leishman, M.R. (2005). Post-fire vegetation dynamics in nutrient-enriched and non-enriched sclerophyll woodland. *Austral Ecology*, 30, 250-260
- Ximenes, F., Stephens, M., Brown, M., Law, B., Mylek, M., Schirmer, J., Sullivan, A. and McGuffog, T. (2017). Mechanical fuel load reduction in Australia: a potential tool for bushfire mitigation. *Australian Forestry*. 1-11.