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**Royal Commission into National Natural Disaster Arrangements
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Re: Submission to the Royal Commission into National Natural Disaster Arrangements

This submission has been drafted on behalf of the NSW Branch of the Australian Plants Society. Our society consists of members with enthusiasm, expertise and utmost concern for Australia's flora, bushland areas and other natural ecosystems. We promote the cultivation, study and conservation of Australian native plants. We also promote the protection of our unique and biodiverse bushland ecosystems. Our society consists of members with in-depth knowledge of Australian flora identification, botany, propagation, native plant distributions and conservation.

Our society is deeply concerned with the bushfire event in NSW of 2019-2020 and asks that the Royal Commission consider our points in its investigations and deliberations. We advocate:

1. That bushfire management regimes be designed to best protect and enhance biodiversity, whilst achieving hazard reduction targets, based on a scientific assessment tool.

The natural vegetation communities and assemblages in Australia are very complex and diverse ranging from rainforest to dry sclerophyll woodlands to heathlands and alpine herb fields (to name a few). Of these, it is the dry sclerophyll forests and woodlands that create the largest flammable fuel loads which lead to intense wildfires. There are intrinsic issues with the management of such areas in terms of successful hazard reduction whilst maintaining biodiversity conservation ^[1,2]. Hence, it is very difficult for hazard reduction to achieve biodiversity outcomes.

However, bushland fire management practices are often carried out ad-hoc with mixed results without proper consideration of the scientifically prescribed intervals for the vegetation being managed. This can lead to biodiversity loss and both enhance the chances of survival for some species, to the detriment of others.

For this submission, this author has found documents such as: *National Guidelines for Prescribed Burning Operations* ^[3]. This document states:

2 Planning considerations and general approach

The NPWS has a standard inter-agency Prescribed Burn Plan template used for all burns including interface burns. Planning of prescribed burns must use the standard template and is only undertaken by personnel with appropriate competencies (pre-requisite Crew Leader and Prescribed Burn Planner qualifications).

This submission advocates that a new national vegetation assessment methodology be implemented for the assessing of fuel loads for hazard reduction. Such a methodology would require the assessment of quantitative variables on sites such as depth of leaf litter, the interval since the last burn, the state of vegetation regeneration, the nature of the previous fire damage, and number of species in random plots. Qualitative variables would include the vegetation community, geology and soil landscape etc.

Such data should be entered into an assessment tool, similar to that of the NSW Biodiversity Assessment Methodology tool, which could provide a set of recommended criteria for the carrying out of hazard reduction burns. Practitioners who undertake this methodology should be certified under a certification and training system (outlined below).

2. That a set of National Standards be produced for bushfire management and controlled burning operations

This submission advocates that a set of national standards are likely required for hazard reduction operations. Again, this author refers to the *National Guidelines for Prescribed Burning Operations* ^[3]

This document contains some very good information and methodologies for hazard control operations. However, the document does state:

2.5 Determining the burn prescription

There are no standard burn prescriptions developed specifically for the Blue Mountains – burn prescriptions are developed on a case-by-case basis. For each burn limiting conditions are prescribed for relative humidity, temperature, wind speed (and in some cases direction) and timeframe. An overarching prescription applied is for a FDR in the Low to Moderate Range (FDI <12).

The above would imply that a matrix of standards and /or guidelines are currently been prescribed to bushfire management across NSW, as well as wider Australia.

It is advocated that the above currently used *guidelines*, and other such guidelines, be made into a set of applicable national standards which combine all approaches taken across Australia for hazard reduction burns and vegetation management. Such standards would be used in conjunction with the suggested methodology above and be arbitrary. These standards would also have a requirement for post-fire monitoring and reporting of outcomes.

3. The establishment of a national body to advise, coordinate and approve controlled burning programs using a rigorous assessment process.

With the above points, it is likely that a national government body is required to oversee, assess and approve hazard reduction operations. Such a body would serve as a point of contact for all practitioners undertaking hazard reduction operations and assessments and also deliver training and certification for practitioners (or at least prescribe such training). Given the somewhat similar nature of specific Australian vegetation types in combination with climate, across large parts of Australia (e.g. coastal dry sclerophyll forests in Victoria, NSW and WA), it seems sensible that a national body be set up to coordinate vegetation and bushfire data and assessment, provide advice and education, and undertake approval for bushfire hazard assessment activities.

It is advocated that such a body would run the certification scheme for bushfire management practitioners as stated above. Training could, of course, be delivered to both the public and private sector. It is highly likely that the private sector is needed, in terms of commercial operations, to aid in the assistance of bushfire hazard reduction and biodiversity conservation. Such operators would have to be suitably trained and certified in bushfire management techniques whilst also having suitable training in ecology with an understanding of species dynamics and responses to bushfires.

4. Provisions for more training and education for bushfire management practitioners and increase in numbers of practitioners

This submission advocates that more training and education be provided in terms of bushfire management, aimed towards sustainable biodiversity outcomes, as part of a national approach. It is likely that a more effective amalgamation and integration of industry, government, and indigenous knowledge is needed to equip land managers with the necessary skills and knowledge to achieve better outcomes.

Land agencies such as the National Parks and Wildlife Service, are frequently under-staffed and are unable to cover the amount of ground required to achieve sufficient bushfire management outcomes [4,5]. Therefore, a more cohesive approach involving multiple agencies and practitioners is likely required.

Formal training and education are required for practitioners by way of the afore-mentioned certification scheme coinciding with either statements of attainment or ASQA qualifications in bushfire management. Currently, there are no courses, that this author could find, set up by the Australian Government (i.e. Training.gov) in bushfire management. This is of paramount importance.

5. The establishment of a coordinated National Indigenous Burning Management Program.

This author feels strongly that, especially in southern Australia, opportunities are being missed for the practice of indigenous burning techniques and management. Whilst there is published literature available documenting historic indigenous burning practices [6,7], it is a cultural practice that is declining in modern Australia.

This submission advocates that a national indigenous burning program, or at least an organization, be setup to encourage and train primarily Australians of indigenous descent, and well as non-indigenous peoples in bushfire management and hazard reduction programs. Such a program could be integrated into the above suggestion in points 1 to 5, with established indigenous knowledge adding a crucial dynamic to the assessment process and implementation. Such programs are already in place, but we hear mostly about them in northern Australia [8,9,10]. These programs engage indigenous youth, create jobs for indigenous peoples and maintain a cultural trend that has shaped the Australia flora of tens of thousands of years. The knowledge held by Indigenous Australians for bushfire management is unique and cannot be dismissed in an integrated process.

6. Provisions for more ecological monitoring post-fire events.

This submission advocates that constant funding is provided to ecological monitoring efforts in bushfire-affected areas. Such monitoring should also be done in accordance with a national standard or methodology where a set of variables are recorded to provided data on species regeneration and the nature of recovery of vegetation assemblages.

Such data could be used to inform best-practice standards for the implementation of fire regimes in different vegetation assemblages. There is very little amalgamated data on the regeneration response time for particular species after fire and most data is purely observational. It is very difficult to prescribe burning periods for specific vegetation types without a standard data collection process to quantify species response times and better set intervals for hazard reduction operations. It is known that species of banksia, for example, require several years between fire events to adequately set seed. But such data is not available for many species.

No standardized method of post-fire monitoring and data collection has been implemented. This requires a national approach.

7. That the Commonwealth and State Governments take more positive action towards Climate change

It is crucial that the above points are implemented in conjunction with a genuine attempt by Government at all levels to offset the impacts of climate change. The Australian Government, in this author's view, is dragging the chain substantially on the move to renewable clean energy; a move that we can see as inevitable given our technological progress over the last 200 years. Already we are seeing countries such as India producing the world's cheapest solar power [11].

Climate change in Australia will result in a positive feedback loop of heat, drought and fire in Australian bushland. The likelihood of this is that more wildfires similar to that of 2019-2020 will be experienced in a shorter time period.

Government must act to reduce CO₂ and other greenhouse gas emissions for the effective management of bushfire and biodiversity conservation.

We strongly support the Commission in its important work.

Yours Sincerely

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