

**Submission to the Council of Australian
Government (COAG) Inquiry into Bushfire
Mitigation and Management**

Nature Conservation Council of NSW
www.nccnsw.org.au

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Executive Summary:

The Nature Conservation Council of NSW (NCC) has been involved in bushfire management in NSW for almost 20 years. Bushfire management, like many other natural resource and risk management problems, presents a range of complex sociological, political and scientific issues which are difficult to resolve. Nevertheless, we believe that integrated approaches to bushfire management provide the best opportunities for reconciling the often competing objectives, divergent interpretations and diffuse activities of fire researchers, land users, managers and planners. Underpinning integrated approaches to land management is the ability to adapt management systems to the requirements of users and stakeholders.

1. Introduction

The challenges of modern fire management in Australia call for a major shift in thinking and approach. While fire and land management institutions have advanced considerably in recent decades, the biological, physical and social context in which they operate have also changed.

Settlement and development patterns, land use change and the pressures of population growth and internal migration have combined with a range of other factors including climate change to greatly increase our vulnerability to bushfires and other natural disasters.

In general, our response to this increased vulnerability has been to develop our fire response systems. However, in more recent times, governments have invested in risk management planning and fire research while other agencies, researchers and interest groups have grouped together to further shared management objectives.

As a result, fire fighting technology and risk management planning have markedly improved. A gradual formalisation and centralisation of semi autonomous rural fire brigades into authorities like the NSW Rural Fire Service has occurred, and in some cases formalised partnerships between interest groups have developed. Nevertheless, effective bushfire management still presents significant and major difficulties in terms of managing conflict and coordinating the diffuse activities of resource users,

managers, planners and researchers, as well as mobilising and harnessing community capacity for self reliance.

2. Barriers to Integrated bushfire management

The NCC believes that an integrated and process driven management approach to sustainable bushfire management could address many of the following challenges¹:

1. Entrenched political conflict between interest groups and agencies.
2. Competition and turf wars between brigades, districts, agencies and levels of government.
3. Lack of public interest (knowledge) and participation in bushfire management.
4. Over reliance on fire and land management authorities for community protection.
5. Alienation of the public and stakeholders from planning and implementation processes.
6. Lack of capacity within fire and land research and management agencies to effectively integrate research and management activities.
7. Lack of capacity within land and fire management agencies to support regulations with appropriate awareness, training, information and enforcement infrastructure.
8. Lack of capacity within fire and land research and management agencies to effectively engage with the Australian public.
9. Lack of vertical integration within rural fire services, and lack of coordination between the various spatial scales of management.
10. A tradition of relying on reactive technological solutions to management problems (to the detriment of social considerations).
11. Disjointed and fragmented communication, mapping, data collection and storage systems
12. Problem complexity².

¹ Explanatory notes and a review of integrated natural resource management literature are provided on page 10.

² Poch *et al* (2003) identify 'problem complexity' in the context of natural resource management as being twofold; 1. Uncertainty, or approximate knowledge, 2. Multiplicity of scales. Poch, M, Comas, J, Rodriguez-Roda, I Sanchez-Marre, M & Cortes, Ulises. (2003) 'Designing and building real environmental decision support systems', *Environmental Modelling & Software*, pp. 1-17

13. Lack of public and stakeholder access to information
14. Lack of political leadership.
15. Deficient performance indicators³.

This list is not exhaustive - many more challenges could be included. However, the NCC believes strongly that it is possible to develop systems and processes for anticipating and managing conflict, and for enabling more cooperative stakeholder interaction. In our view, adaptive and integrated approaches to bushfire and natural resource management provide many of these opportunities for maximising risk management and conservation outcomes.

3. Integrated bushfire management

The NCC considers that bushfire management systems should be reformed focusing on the development of methodologies for:

1. Public and Stakeholder Participation.
2. Enhanced Inter and Intra Agency Coordination.
3. Integrated Research (Cross-disciplinary research).
4. Adaptive Management (Integration of Research with Planning and Implementation Phases).
5. Consensus Decision Making within a Framework of Dynamic Stakeholder Interaction.
6. Adaptive Decision Making Tools and Data Sharing.

It is the NCC's experience that bushfire management projects able to develop processes for accommodating these standards can expect to meet the following objectives:

- Increased stakeholder collaboration
- Shared problem understanding
- More robust decision making
- Shared capital
- Greater support for management actions
- Increased transparency and accountability
- Increased information exchange
- Increased technology transfer
- Human resource capacity building

³ For e.g. see WAFA submission to the WA EPA review of CALM's fire management (appendix 5)

However, due to the inherent uncertainty in this approach, management should be supported by the development of 'ecological bushfire management planning guidelines'. These would be simple and easy to understand principles for fire management that would steer fire managers in their everyday activities. They should be developed by researchers, users and managers but the NCC's suggestions (for sustainable bushfire management) would include the following:

- Optimal fire regimes for fuel reduction will generally differ from optimal fire regimes for conserving biodiversity
- Different vegetation types are adapted to different fire regimes
- An important first step in fire management planning is to identify management goals for different areas in the landscape, for example areas where protection of life and property is the primary goal, and areas where biodiversity is the main objective.
- Variability in fire regime (frequency, size, season and intensity) is desirable for maintaining biodiversity

These would compliment existing hazard management and emergency response guidelines.

4. Examples of integrated bushfire management

Despite recognising the significant barriers to an integrated approach to bushfire management, the NCC believes that the current interest in bushfires provides a valuable opportunity for change and reform. In addition to this momentum, we also have several working models, operating at different scales, of integrated and strategic bushfire management from which to draw and build on.

These include, but are not limited to:

- Property level initiatives including the outcomes of the South East Queensland Fire and Biodiversity Consortium's (SEQFABC) Individual Property Planning Kit (IPPK) and community workshop program⁴.
- Neighborhood level initiatives like the Bundjalung National Park, Richmond Valley RFS and Riley's Hill community

⁴ <http://www.gu.edu.au/school/asc/fire2/kit.PDF>

partnership in North East NSW and 'Cool Off Australia Day' projects in the Lower Hunter Valley⁵

- Township level plans including the multi tenure Minnie Waters Bushfire Management Plan in the Clarence Valley (North East NSW).
- Integrated Landscape Conservation Reserve and Park Level Plans. Examples from NSW include the Pilliga Plan of Management, and the Central West Bushfire Management Project (Western NSW)
- Some District and Zone Bushfire Management Committees and their Bushfire Risk Management Plans (NSW)
- Regional clusters of managers, interest groups and researchers working in collaboration, for example the SEQFABC (South East Queensland).
- Multi-stakeholder State Level Coordinating bodies
- National and International Fire Councils (e.g. Australasian Fire Authorities Council) and Cooperative Research Centers.

The new Bushfire CRC also presents a major opportunity for advancing an integrated approach to bushfire research and management.

These projects generally meet the criteria (outlined above) for integrated bushfire management. From the NCC's perspective, they have also contributed to the realisation of key risk mitigation and natural resource management outcomes in their respective jurisdictions. As a result, we believe that these case studies provide us with a range of useful management models, which we can now evaluate and learn from.

5. The Commonwealth and integrated bushfire management

The NCC believes that the Commonwealth Government of Australia could play an important role in assisting the States to move towards an integrated approach to management. This assistance should not necessarily include the development of new regulations or requirements - rather it should embody a

⁵ The NCC has formal documentation for many of these all of these initiatives. See appendix 3 for information on the Riley's Hill project (NCC Richmond valley Bushfire Management Workshop, 23rd & 24th of August, 2003.) The NCC also has information on the 'Cool Off Australia' community initiative filed in our office. We would be pleased to provide you with additional info or put you in contact with key people if need be.

cooperative and complimentary approach and provide real services to managers operating at State and District levels.

This could include technical, legal and managerial support services, as well as information, education and capacity building products. For example, a Commonwealth Bushfire Management Support Center could identify and review various integrated bushfire management projects operating around the country. A support center could then provide advice to managers developing integrated approaches on an ongoing basis, or provide 'starter kits' for managers wanting to learn more about adaptive approaches.

This is essentially the NCCs overall assessment of the requirements of sustainable bushfire management in Australia. However, a more detailed and specific list of recommendations was produced in conjunction with the Australian Conservation Foundation (ACF) for the Commonwealth House Select Committee into Bushfires, chaired by Gary Nairn. These have been updated for this Submission and are included below.

Explanatory notes have also been compiled to assist with interpretation of the major points and arguments.

6. Adapted recommendations to the Nairn Inquiry into Bushfire Management adapted for COAG.

Environment Groups believe that increased funding and resources should be provided for property, street and village level fire management plans and projects. These plans should be integrated with district *Bush Fire Risk Management Plans* and in conjunction with all of the relevant authorities and stakeholders.

Within this framework Environment Groups believe that the following strategies should be employed to achieve sustainable bushfire management:

- *Strategic planning and decision making systems* that are designed to facilitate community and stakeholder involvement, interagency coordination and federal, state and local government collaboration.
- *Landscape and cross tenure management planning*, facilitated by interactive and participatory processes.

- *Community education and awareness campaigns* to achieve risk management objectives including self reliance, as well as coordinated preparedness and emergency strategies.
- Development and integration of *property, reserve, street, village and town level risk management plans*
- *Involvement* of Indigenous peoples and traditional owners in bushfire and land management and respect and recognition for their knowledge, interests, rights and cultural values
- *Assistance for volunteer and professional workers* to achieve effective delivery of appropriate management objectives through provision of adequate training and resources.
- *National building and development controls* that are effective in preventing the development of vulnerable infrastructure, particularly housing, in fire prone areas.
- *Strategic hazard reduction activities* that are effective in protecting natural, built and commercial assets in fire prone areas.
- *Monitoring of the effects of hazard reduction activities (including burning, slashing, clearing, etc)* on fuel loads and distribution, as well as plant and animal communities. This would involve mapping treated areas and developing fire histories.
- The review and development of general *ecological and risk management guidelines*, including maximum and minimum fire intervals for biodiversity conservation for a range of ecological communities.
- Appropriate *ecological burning* in conservation reserves, national parks and state forests.
- *Strategic fire fighting operations* that have *forward planned* strategic breaks, lines, access, asset priorities, attack strategies, etc, to maximise operational preparedness and minimise unnecessary environmental damage.

- Development and application of the best available *research and spatial information* to risk management planning and fire fighting operations.
- Provision of leading *information technology and mapping software* to land and fire management agencies, as well as non government stakeholders, the public and resource users, to enable the effective achievement of management objectives.
- the establishment and use of *integrated community web based mapping systems*, with centralisation of data of conservation and strategic values to guide hazard reduction works and fire fighting operations.
- Adequate *monitoring, auditing and review* processes to ensure that operations are linked to bush fire risk management plans.
- Review of *performance measures and indicators*, including those that funding levels are based on, to achieve more effective outcomes.
- Incorporation of the principles of *adaptive management* into all phases of the bush fire risk management process to ensure that management knowledge can be developed, and performance evaluated.

Specifically:

- Increased funding and resource assistance to Volunteer brigades and community safety officers, Fire Services, Land Management Agencies, as well as conservation, land-holder groups and Indigenous land management services for the purpose of enhanced planning, coordination and implementation of bushfire management strategies. These stakeholders should be consulted on how these funds should be used but NCC suggestions would be for increased support for:
 - micro planning (i.e. property, street, village planning)
 - integration of local knowledge into planning
 - enhanced stakeholder communication and coordination

- Increased funding, monitoring and research for hazard reduction, focusing on assessing the effects of various methods and management regimes on fuel loads and distribution as well as plants and animals.
- Increased funding, monitoring and research into post fire rehabilitation strategies.
- Access to leading edge mapping technology for all stakeholders in bushfire management.
- National standards for building and development controls in fire prone areas.
- Incentives, including vulnerability based insurance thresholds (including the use of rate rebates, insurance discounts, revolving funds and other innovative fiscal instruments), to encourage the upgrading of homes in fire prone areas.
- Research, development and dissemination of information on garden landscaping and maintenance for fire protection, including management of vegetation.
- Trans-disciplinary research, which aims to integrate the work of policy makers, scientists and sociologists, with the aim of developing holistic strategies that address the challenge of fire management across the Australian landscape.
- The development of Commonwealth capacity to support and assist State Government Agencies in technical, scientific, legal, logistical and other areas of bushfire management.
- Ratification of the Kyoto Protocol on global climate change and reduction of green house gas emissions.

7. Explanatory notes

Challenges in contemporary fire management include:

1. Entrenched political conflict between interest groups and agencies:

In a climate of tension and conflict over natural resource management and land use, as well as changing environmental

conditions and population pressures, bushfire management has become highly politicised. The politicisation of fire and fire management may be inevitable due to its broad implications for a range of human pursuits, economies, as well as for natural and biological systems, but it is possible to develop systems and processes for anticipating and managing conflict

2. Competition and turf wars between agencies and governments:

Government organisations and agencies often do not work well together. This can occur as a result of rivalries at district, state, and national levels, or as a result of competition for funding, operational control or management of land (territory). These types of antagonism can manifest in lack of cooperation through to obstruction or even confrontation. Hostilities can occur during the risk management phase however, they are most obvious during emergency fire fighting operations. The results can be disastrous.

Although cooperation between agencies in NSW has improved dramatically over the last couple of years, attention still needs to be given to petty rivalries at the district, zone and state levels. This mostly occurs between land management agencies, volunteer fire brigades, as well as metropolitan and rural fire services, national parks, state forests and private neighbours.

3. Lack of public interest (knowledge) and participation in bushfire management

Civilian capacity to manage bushfire risks and natural resources has not increased in the past 50 years. Many urban interface and semi urban settlements remain in precarious and unmanaged states, yet the inhabitants are unprepared and seemingly unaware of the potential threat they face. The public generally rely on fire control authorities to protect them from fire attack.

4. Over reliance on fire and land management authorities for community protection, and
5. Alienation of the public and stakeholders from planning and implementation processes.

It is fair to say that large sections of the Australian public who face bushfire risk feel alienated from the management process. Often this is a function of a lack of knowledge or initiative at the household level; however, government agencies continue to engage with the public (and often with each other) in disjointed and badly planned ways.

Community/public involvement in the planning process is essential to community appreciation of bushfire risk management strategies, and to cultivating an appreciation amongst the public of their role in bushfire risk management.

Management of hazards on private property should be an integral component of any bushfire risk management strategy. But while government agencies are usually well represented on bushfire management planning bodies, generally the public has only marginal participation.

The concept of self reliance implies internalised responsibility and capacity, so states and territories should move away from token public consultation on risk management plans and towards facilitating community participation in the planning and mitigation processes. Hi level risk areas could be prioritised in the first instance through the development and implementation of property, reserve, village and town level management plans.

Fire Services and land managers need to develop these and other mechanisms for collecting and utilising knowledge and information from locally acting stakeholders including farmers, volunteer fire fighters, conservationists and the Aboriginal community. The integration of these human resources would have the dual outcomes of developing a comprehensive understanding of fire and its interaction with the environment in particular localities, as well as broadening the scope of risk management and creating a sense of involvement on the part of stakeholders. This would have beneficial outcomes for risk management on both private and public land.

In addition to this, fire managers need to work with and support the efforts of land-holders to mitigate fire risk on their properties while conserving natural resources and agricultural productivity. This is necessary for effective risk management on private property, as

well as coordinated public-private bushfire management (cross tenure).

6. Lack of capacity within fire and land research and management agencies to effectively integrate research and management activities.

Adaptive management is increasingly a feature of land and fire management planning, but many efforts to more closely incorporate research with planning and policy have had only mixed success. Trans-disciplinary research, while occurring to some extent in federal research institutions and universities, has not extended in a meaningful way to district or state level planning processes. Moreover, competition and disagreement between agencies and stakeholders has largely precluded the development of cooperative and effective data and resource sharing relationships, despite significant efforts in this direction. The irony is that while we have more technology and hardware at our disposal than ever before, and bushfire risk remains acute, the managerial challenges associated with integrated management have been largely unresolved.

7. Lack of capacity within land and fire management agencies to support regulations with appropriate awareness, training, information and enforcement infrastructure:

Proactive landowners in NSW who identify the need to manage vegetation in a particular way, using fire, machines, or animals to manipulate or reduce fuels, are then faced with a complicated and badly administered regulatory framework through which they must pass. Although many land holders in NSW lack the information or knowledge base on which to make informed risk management or conservation decisions, it is the NCCs view that regulations in NSW relating to hazard reduction are inadequately supported by trained personnel, community awareness campaigns and enforcement capacity.

8. Lack of capacity within fire and land research and management agencies to effectively engage with the Australian public:

In most cases public servants and volunteers are ill equipped to deal with the complex sociological issues and management

challenges associated with community engagement, intergovernmental coordination and conflict resolution.

9. Lack of vertical integration within agencies, and lack of coordination between the various spatial scales of management

Historically the RFS has operated as a decentralized authority that relies heavily on semi autonomous volunteer brigades. More recently efforts to centralize the RFS have resulted in a shift from local to state government administration. However, many districts still operate in isolation from RFS HQ, and efforts to coordinate management between district, zone, region and state operations are needed.

10. A tradition of relying on reactive technological solutions to management problems (to the detriment of social considerations).

Successive inquiries have identified lack of community preparedness and participation as a major vulnerability in our bushfire management systems. However, aside from the recent Nairn Inquiry, which recommended that local knowledge be integrated into risk management and fire fighting systems⁶, most inquiries have simply prescribed reviews and increased spending on orthodox information dissemination campaigns⁷.

It is tempting to analysis this situation with reference to a critique of modern societies over reliance on technological solutions. This position argues that western societies unprecedented success in developing and applying sophisticated technologies to problems has resulted in an unhealthy dependence on these technologies, and a commensurate decrease in our capacity to address the social and cultural aspects of these challenges.

This analysis goes on to argue that problems need to be re-contextualised so as to enable a full exploration of the range of factors and forces active in realltion to a particualr issue.

⁶ A Nation Charred, Report on the inquiry into bushfires, House of Representatives, Select Committee into the Australian bushfires.

<http://www.aph.gov.au/house/committee/bushfires/inquiry/report/front.pdf>

⁷ E.g; Report on the Inquiry into the 2001/02 Bushfires, NSW Joint Select Committee on Bushfires.

<http://www.parliament.nsw.gov.au/Prod/Parlment/Committee.nsf/0/5cfbdcc517014a18ca256bab0013ce56?OpenDocument>

11. Disjointed communication, mapping, data collection and storage systems, and
12. Lack of public and stakeholder access to information and communication mediums

For stakeholders to be able to contribute effectively to bushfire management they should have ready and equal access to a range of natural resource and other spatial data and information.

13. Lack of political leadership

Public confusion and insecurity have been exploited by entrenched positions, vested interests, media and party politics.

8. Integrated Environmental Management

Improving integration across sectors, jurisdictions and research disciplines have been identified as priorities by a number of policy initiatives into natural resource management in Australia in recent years⁸. As sustainable development gains currency as a concept in international forums, civil society and with governments, the imperative of integrating economic, social and environmental consideration into natural resource management and land use planning have arisen. Meanwhile, researchers have helped us to identify and define the key components, principles and processes associated with the development of successful integrated management processes.

From this work we can now identify integrated environmental management as promoting a holistic and interconnected approach to managing environmental systems, and through a goal orientated, strategic process⁹.

However, the operational reality behind this framework poses significant challenges for resource managers, planners and researchers and are far from resolved¹⁰. The need to undertake management at multiple spatial and temporal scales, and to

⁸ For example; Australian Oceans Policy (AOP),

⁹ Margerum, R. D. (1999), 'Integrated Environmental Management: lessons from the Trinity Inlet management program', *Land Use Policy*, Elsevier Science Ltd. vol 16, pp. 179-190

¹⁰ Walker, D. H., Cowell, S. G. & Johnson, A. K. L. (2001), 'Integrating research results into decision making about natural resource management at a catchment scale', *Agricultural Systems*, Elsevier Science Ltd. Vol 60, pp. 85-98.

involve disparate and often opposing interest groups are two such methodological challenges¹¹.

The current efforts within bushfire management circles to facilitate integration of research with management, stakeholder collaboration and public participation at various levels can be seen as attempts at addressing these operational imperatives. However, these initiatives have often been undertaken in a reactive and haphazard way, and rarely articulate in an effective or strategic way with other natural resource management initiatives (e.g., catchments management plans, local government projects, Landcare programs or regional vegetation management plans). As a result, efforts to reform bushfire management systems into a more integrated and strategic framework, have largely failed, and now managers run the risk of reverting to simplistic non participatory strategies for mitigating bushfire threat.

Nevertheless, the opportunity to reform bushfire management systems into a more integrated approach is still open. Although on the decline, the inertia for reform, generated from the past two fire seasons, is still with us. We also have the benefit of being able to draw on the experiences of researchers and practitioners who have taken steps to develop integrated approaches to natural resource management in recent years.

Bushfire management is not the only natural resource sphere that has traditionally vested decision making in the hands of regulatory authorities but that is now taking into consideration the benefit of community involvement in planning and decision making¹². The benefit of a participatory approach is thought to be that solutions developed through an inclusive process are likely to be more robust and workable. Meanwhile, adaptive management has progressed from an expert based process relying primarily on extensive quantitative modeling, to a more inclusive and participatory paradigm¹³. Many case studies applying these principles are now available for review and evaluation.

¹¹ Poch, M, Comas, J, Rodriguez-Roda, I Sanchez-Marre, M & Cortes, Ulises. (2003) 'Designing and building real environmental decision support systems', Environmental Modelling & Software, pp. 1-17

¹² Walker, D. H., Cowell, S. G. & Johnson, A. K. L. (2001), 'Integrating research results into decision making about natural resource management at a catchment scale', Agricultural Systems, Elsevier Science Ltd. Vol 60, pp. 85-98.

¹³ Ibid

These case studies provide the information base with which we can identify the potential benefits, costs as well challenges associated with integrated and participatory approaches to fire management. For example, Margerum's review of the Trinity Inlet Management Program in tropical Queensland informs us that a properly executed integrated management approach will lead to better understanding of the problem, more robust solutions and greater political support for implementation. However, these outcomes will depend on the construction of a process that is able to accommodate a high level of interaction between stakeholders, as well as community participation, but that is also capable of facilitating this interaction in a strategic and goal orientated direction¹⁴.

Another study, this one from Southern Europe, argues that for integration and coordination to be maximized, stakeholder groups need to work together at both strategic/organizational levels as well as the level of implementation¹⁵. In other words, in order to achieve coordinated implementation of strategies, it is necessary to involve stakeholder in the planning of those strategies.

9. The NSW Rural Fires Act 1997 and Ecologically Sustainable Development (ESD).

In 1997, the NSW *Bush Fires Act 1949* was repealed and the *Rural Fires Act 1997* enacted. The new *Rural Fires Act 1997* gave effect to a multi-stakeholder planning process and provided for: '...the protection of the environment by requiring certain activities [referred to in paragraphs (a)-(c)] to be carried out having regard to the principles of ecologically sustainable development described in section 6(2) of the *Protection of the Environment Administration Act 1991*.'

The principles of Ecologically Sustainable Development as defined in the *NSW Protection of the Environment Administration Act 1979*, (amended 1991) are summarised as:

- the precautionary principle

¹⁴ Margerum, R. D. (1999), 'Integrated Environmental Management: lessons from the Trinity Inlet management program', *Land Use Policy*, Elsevier Science Ltd. vol 16, pp. 179-190

¹⁵ Oxley, T & Lemon, M, (2003), 'From social enquiry to decision support tools: towards an integrative method in the mediterranean rural environment', *Journal of the Arid Environment*, vol 54.

- inter-generational equity
- conservation of biodiversity and ecological integrity
- the improved valuation and pricing of environmental resources

10. Appendices

1. NCC/ACF Submission to the Nairn Inquiry
2. Australian Council - International Union of Conservation Nature (IUCN), resolution 1.24, February 2003. 'Impacts of Human-Induced Fire Events on Biodiversity Conservation'
3. 2003 Bushfire Community Education Program Reports
4. Wafa submission to the WA EPA review of CALM's fire management
5. Margerum, R. D. (1999), 'Integrated Environmental Management: lessons from the Trinity Inlet management program', Land Use Policy, vol 16.
6. Walker, D. H., Cowell, S. G. & Johnson, A. K. L. (2001), 'Integrating research results into decision making about natural resource management at a catchment scale', Agricultural Systems, vol 60.
7. Oxley, T & Lemon, M, (2003), 'From social enquiry to decision support tools: towards an integrative method in the mediterranean rural environment', Journal of the Arid Environment, vol 54.