

Living with Fire in NSW National Parks

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Abstract

The Minister for the Environment recently launched ‘Living with Fire in NSW National Parks’, a ten year strategy for managing bushfires in national parks and reserves. The strategy identifies and responds to the drivers of change in fire management and addresses some of the long standing myths about fire management practices in protected areas. The strategy contains a vision, strategies, actions and a set of key performance indicators covering the NSW National Parks and Wildlife Service land and fire management responsibilities. A strategic research statement and our key research priorities over the next ten years are also outlined within the strategy, as part of the NPWS adaptive approach to fire management.

INTRODUCTION

In April 2013, Minister Robyn Parker, the Minister for the Environment and Heritage, launched the ‘Living with Fire in NSW National Parks – A strategy for managing fire in national parks and reserves’. This is a ten-year strategy for managing fire within protected areas. The strategy was developed following a long period of consultation with a range of stakeholders including: the Nature Conservation Council (NCC) of NSW, National Parks Association (NPA), the NSW Rural Fire Services Association (RFSA), Bush Fire Coordinating Committee, the National Parks and Wildlife Advisory Council and Regional Advisory Committees, together with officers within the National Parks and Wildlife Service (NPWS) and from within the science division of the Office of Environment and Heritage (OEH).

To provide some context, the NPWS is a group of about 1 700 staff within the OEH. It is the lead government agency for the conservation of flora and fauna and for Aboriginal cultural heritage in NSW. The NPWS is responsible for managing 865 parks and reserves, covering an area of

about 9% of the state. There are approximately 56 000 km of boundary surrounding those parks and reserves. A range of values are managed with assets including approximately 37 000 km of trails, 2 000 km of walking trails, 450 camping areas and 780 picnic areas, 625 lookouts. NPWS caters for around 35 million visits per year.

There are 7 categories of reserves covered under the *National Parks and Wildlife Act 1974*, each with its own set of management principles. Plans of management which are statutory instruments have been developed for about 70% of those reserves and cover about 80% of the total area of the parks. All NPWS parks and reserves are covered by Bush Fire Risk Management Plans and more than 90% have specific Reserve Fire Management Strategies developed by the NPWS.

There are four World Heritage areas and 51 wilderness areas that are protected within the reserve system. There are 25 joint management agreements with Aboriginal people, covering about 1.6 million hectares, including six parks that

have Aboriginal Boards of Management, while 20 000 of the state's 70 000 recorded Aboriginal sites are also protected in the reserve system.

There are therefore many different values protected within the reserve system and the management of fire, as a potential threat to these values, is a very important land management issue that requires a strategic, coordinated and landscape level response.

NPWS's role in fire and incident management is drawn from the following policy instruments; the *State Emergency and Rescue Management Act 1989*, *Rural Fires Act 1997*, *The National Parks and Wildlife Act 1974*, *The Environmental Planning and Assessment Act 1979* and the *Threatened Species Conservation Act 1995*. There is a planning framework for managing fire within NSW.

The RFS is the lead combat agency and NPWS is a supporting agency. At a local

level, District Bush Fire Risk Management Plans (DBFMP's) are jointly prepared as strategic and landscape level fire management documents. They are 5-year statutory based plans based on local government areas which identify the risk of fire to assets and values within those areas.

The NPWS strategic and fire management plans for its parks and reserves feed into these DBFMP's. For example, the 'Living with Fire' strategy is NPWS's state wide framework for managing fire in parks and reserves. There are also statutory plans of management with a term of about 5 – 10 years and contain a section dealing with fire management policies and actions for those reserves. At the reserve level, there are specific Reserve Fire Management Strategies which are in three different formats, depending on the type of risks that fire presents. Those strategies identify the values and operational guidelines that NPWS adopts to protect the assets within the parks (Fig. 1).

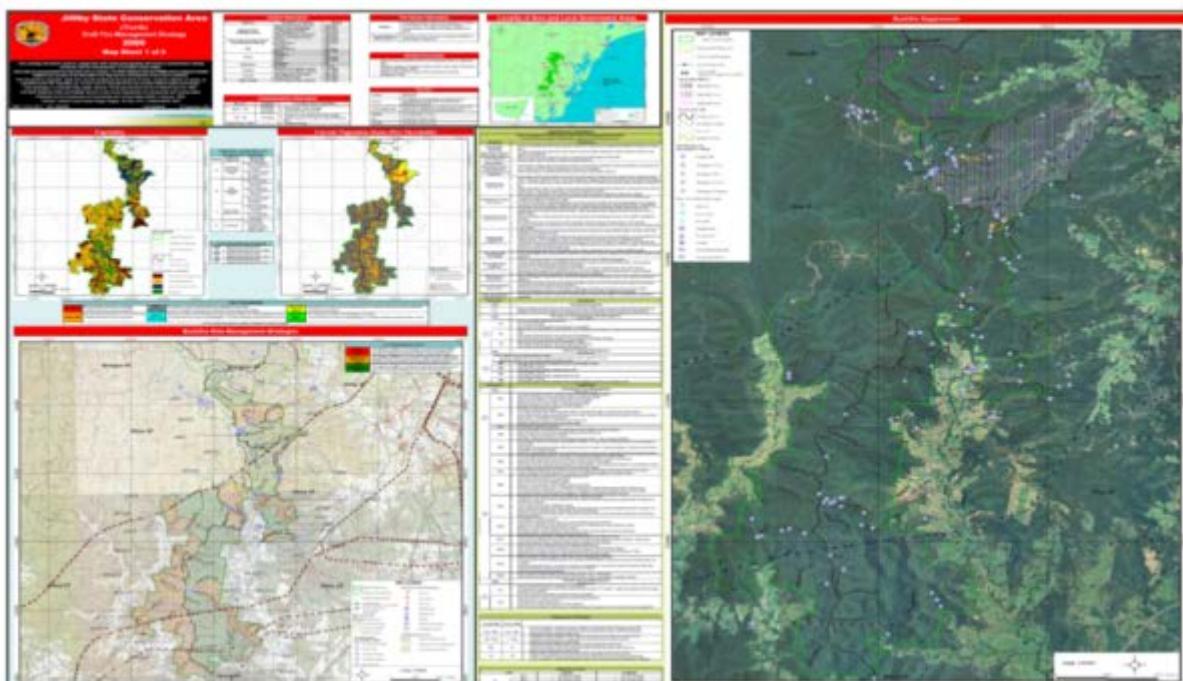


Fig. 1: an example of a type-2 Reserve Fire Management strategy for the Jilliby State Conservation Area in the Central Coast. It contains a vegetation map, a fire threshold map and operational guidelines.

The NPWS Fire Management Manual is a compendium of fire management policies and procedures covering the prevention, preparedness, response and recovery framework that is commonly used for fire management practices in Australia. It is reviewed annually and guides fire management in parks and reserves.

The ‘NSW 2021’ is the government’s plan for NSW that establishes very clear targets and priority actions to be achieved by 2016, which are intended to address the risks associated with bushfires.

The ‘Living with Fire’ strategy will guide the fire management operations for NPWS over the next ten years. It looks at the drivers behind fire management that will occur in the foreseeable future including climate change and its impacts.

Hennessy et al. (2005) report that since 1950 rainfall has decreased in south east Australia, droughts have become more severe and the number of extremely hot days has risen. The effects of these changes has increased Fire Danger Ratings and consequently increased the average frequency and intensity of wildfires.

The Bureau of Meteorology has found that all of Australia has experienced warming over the past 50 years and some areas have experienced warming since 1960 of up to a 0.4°C increase per decade, resulting in a total warming over the five decades of $1.5 - 2^{\circ}\text{C}$. The increase in trend of changing climate is evident when comparing the last 100 years of change with changes over the last 40 years, considering both mean annual temperature and rainfall. Temperature is higher and rainfall has strongly decreased in the last 40 years, compared to the last 100 years. The areas that have had a significant reduction in rainfall are of interest to the NPWS. One such example

is the far south coast of NSW, which is a heavily forested area.

The importance of climate change on fire behaviour and damage to assets is clear. There is a relationship between climate and weather indicators such as the Southern Oscillation Index (SOI) and the occurrence of major fires with negative Southern Oscillation Index values (Fig. 2).

Drier and warmer weather conditions as indicated by negative values of the Southern Oscillation Index in NSW over approximately the last 100 years indicate a strong relationship with devastating fire events, the frequency of which appear to have increased over the last 50 years.

In Australia, the McArthur Mark 5 Forest Fire Danger Index (FFDI) is used operationally by weather forecasters and fire services to determine the risk of a fire starting and spreading. The FFDI has been closely related to the probability of asset destruction in Sydney region (Bradstock and Gill, 2001). As the FFDI increases (Fig. 3), the probability of wildfires being destructive events becomes more certain.

There is a strong positive relationship between proportion of total house loss and the Forest Fire Danger Index (Fig. 3)

A number of other factors have been taken into account when planning the fire management that occurs on NPWS estate including:

i) demographic changes:

- increased population;
- ageing population;
- growing peri-urban & rural residential development; and
- tree changers unfamiliar with natural hazards

ii) socio-economic changes and environmental changes:

- Greater expectations for responsive Government;
- growth in social media use;
- increasing cost of wildfires;
- growth in protected areas;
- impacts on air quality;
- tourism, vineyards etc.;
- concern with biodiversity impacts, water yield, carbon sequestration;
- use of new technology; and
- risk of litigation & prosecution (e.g. Work Health Safety Act)

iii) recent inquiries, reports and policy changes:

- COAG Inquiry on Bushfire Mitigation and Management 2004;
- Canberra 2003 Firestorm Report 2006;

- impact of Fire on Public Lands in Victoria Report 2008;
- incidence & Severity of Bushfires in Aust. Report 2010;
- Victorian 2009 Bushfire RC Final Report 2010; and
- National Bushfire Management Policy 2011.

Past fire history in the reserve system is also used in strategic fire management planning. This includes reviewing the areas that have been affected by the prescribed burning program, the areas that have been affected by wildfires, as well as the total percentage of area burnt in the parks and reserves and the values affected.

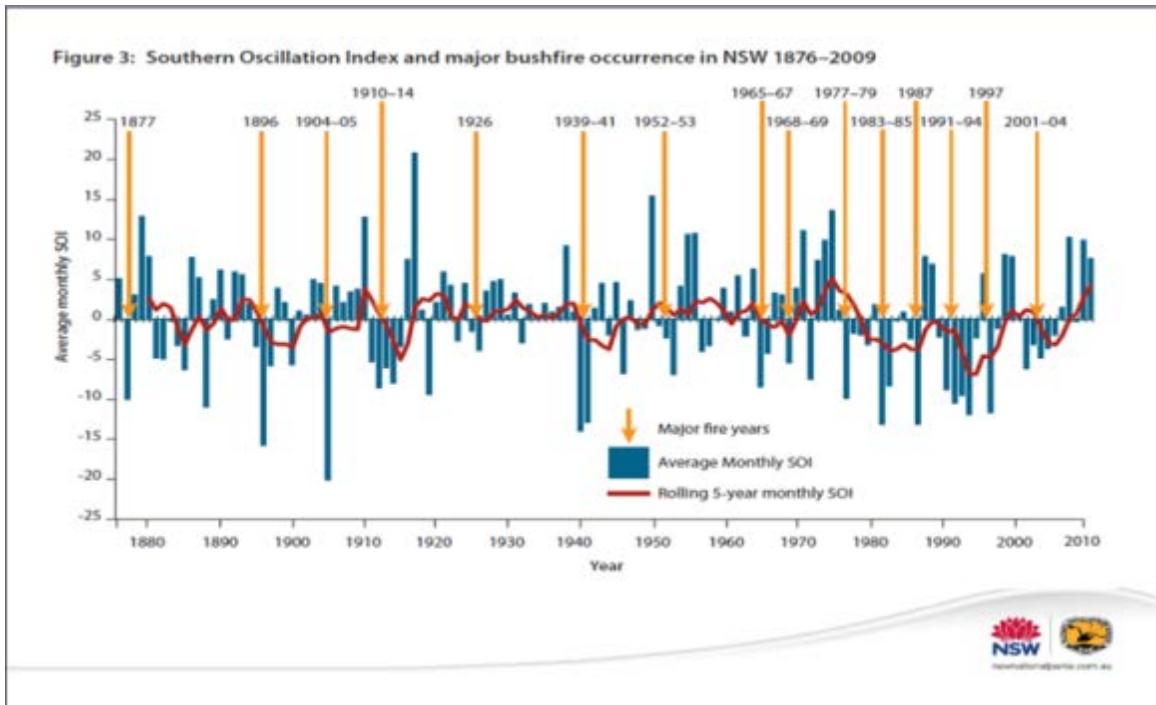


Fig. 2: the association between the negative Southern Oscillation Index values (presented as a 5-year monthly SOI) and the clumping of major fire events since 1960.

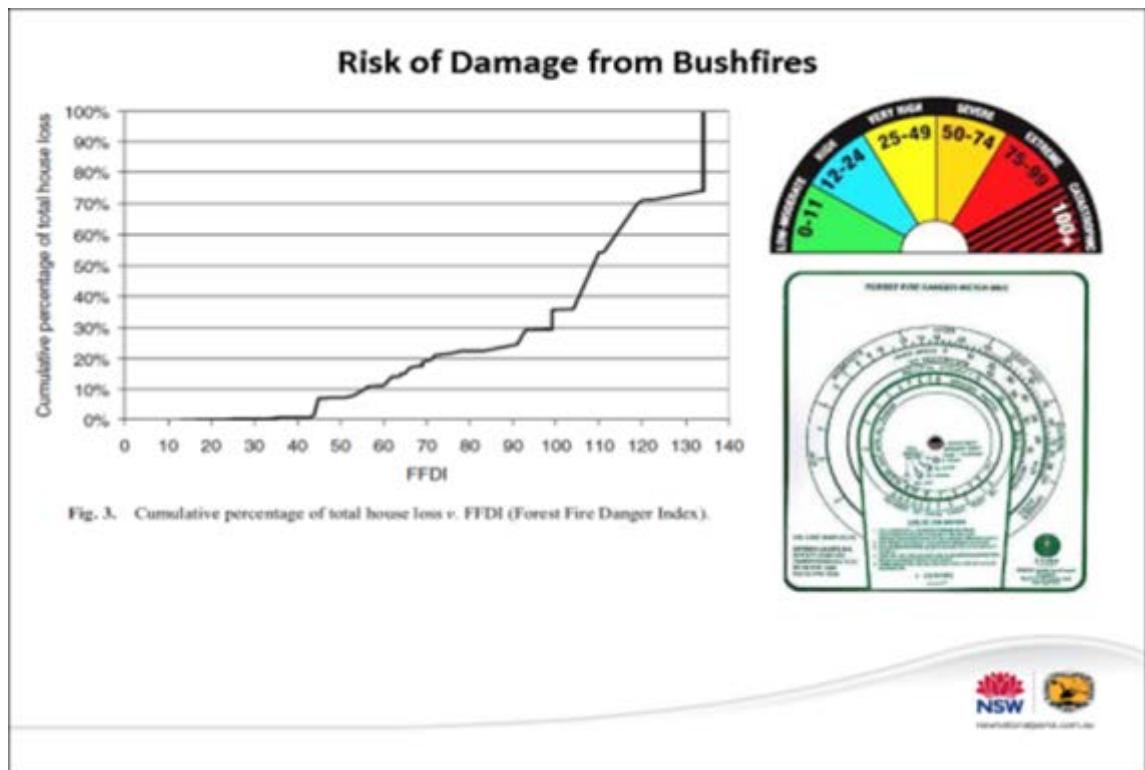


Fig. 3: the relationship between total house loss (as a percentage) and the Forest Fire Danger Index (FFDI).

For example, using 40 years of fire history collected for our parks and reserves, some key trends have been observed:

1. There is large variation in the area burnt from one year to the next. This means, when looking at performance indicators for managing wildfires and prescribed burns, rolling averages are required;
2. Wildfires are a high contributor to the total area burned, resulting in a 5:1 ratio between wildfires and prescribed burns respectively; and
3. A high percentage of parks have been burnt in the last 5 years.

CONCLUSION

The ‘Living with Fire’ strategy establishes a clear vision, objectives, a set of management principles and priorities for fire management in parks and reserves over the next ten years. Performance will be measured against the key performance

indicators which are reported monthly. The indicators will cover performance on hazard reduction treatments as well as compliance with fire threshold values for different vegetation types on parks and reserves. There will also be an assessment of the causes and origins of fire across the state and success in reducing the undesirable impacts of wildfires.

Fire authorities and land managers will confront increasingly complex and difficult conflicts in the allocation of resources to address changes in fire regimes and assets to be protected.

Adaptive fire management practices can mitigate future changes in fire regimes.

Increased understanding of the hazards, the threat and risks associated with bushfires, combined with increased levels and strategic positioning of hazard reduction treatments, more effective prevention, detection and rapid response to wildfire ignitions and greater attention

to the recovery phase of fire management will help mitigate future damage from wildfires.

REFERENCES

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- Hennessy, K. J., Lucas, C., Nicholls, N., Bathols, J. M., Suppiah, R., & Ricketts, J. R. (2005). *Climate change impacts on fire-weather in south-east Australia*. Consultancy report by CSIRO Marine and Atmospheric Research, Bureau of Meteorology and Bushfire CRC.

BIOGRAPHY

Mr Bob Conroy was director of Conservation Programs Branch at the NSW NPWS. He worked with the NPWS for more than 30 years in a variety of positions and has a long standing interest and involvement in the development of fire management policies and practice for protected areas. He has been awarded the National Fire Medal and has been a long standing member of the NSW Bush Fire Coordinating Committee, the Australasian Fire and Emergency Service Authorities Council and the Bushfire CRC.