BUSHFIRE POLICY
2014

Review of NCC Bushfire policy

A review of the NCC Bushfire policy has been undertaken to ensure it captures new understandings regarding bush fire management and is up-to-date in the information provided. The policy was last updated in 2009, and it has been the aim of the Bush Fire Advisory Committee (BFAC) to update it to be suitable for endorsement at the 2014 NCC Annual Conference. BFAC considers it meets that requirement.

The current review of the NCC Bushfire policy has revealed the need for a further revisit of it in within the next year to:

- reduce the length of the document; and

- deliver a policy that is more oriented towards defining NCC's position in regard to bush fire management issues.

Currently the policy contains information that is valuable and should not be discarded, but is more aligned to management prescriptions rather than policy statements. A primary objective of its next review should be to improve it by detailing strong and concise policy positions that are not diluted by unnecessary details.

A review during 2014-2015 would also be an opportunity to broadly align its format and its direction with other NCC policies. It would also be a valuable exercise to examine all NCC policies with the aim of modifying them to achieve a generally standardised format across all policies. It is recognised that this can only be achieved should time and resources allow.

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A. Introduction to the NCC Bushfire Management Program

1. Introduction to the NCC

The Nature Conservation Council of NSW (NCC) is a non-profit, non-government organisation representing approximately 120 community environment groups across NSW.

As NSW's peak environmental organisation operating since 1955, the Nature Conservation Council works closely with NCC member groups, local communities, government and business to ensure a positive future for NSW's diverse ecosystems. NCC facilitates large-scale environmental community awareness and education campaigns, as well as producing original research reports and publications.

2. Ecologically Sustainable Bushfire Management

Ecologically sustainable fire management involves the implementation of fire regimes that maintain as much diversity and integrity as possible in the natural ecosystems that occur in the landscape. Planned fires should be based on non-uniform regimes in which:

- the intervals between fires (both planned and unplanned) are based on an understanding of ecological processes and criteria such as specific ecological characteristics, fire frequency, intensity, and extent, topographical variations and seasonality,

- the fire intervals are not applied repeatedly at the maximum or minimum intervals but with a variation of intervals and over different parts of the landscape to create a mosaic pattern,

- the extent of fires is based on a mosaic design where areas of unburnt vegetation remain in the burnt landscape.

In relation to ecologically sustainable bushfire management NCC:

2.1 Promotes understanding in the community about bushfire management and ecological issues and bushfire policy;

2.2 Plays an important role in the development of ecologically sustainable bushfire management policies and legislation;

2.3 Engages with, and facilitates communications between, a diverse range of people within the community, including all the stakeholders in bushfire management;

2.4 Convenes stakeholder conferences, workshops and forums that provide an opportunity for sharing of ideas and information;

2.5 Provides its expertise and leadership to partnerships, producing a wide base of support, from various public, private and government sectors, for bushfire management campaigns focused on environmental conservation and ecological sustainability;

2.6 Is represented by NCC nominees on state and local bush fire committees that have a significant role in developing Bushfire Management Plans throughout NSW.

3. Advocacy Role

NCC advocates for ecologically sustainable bushfire management by:

3.1 Liaising with Commonwealth, State and Local Governments to implement the objectives and strategies, as outlined in this policy, in an ecologically sustainable and socially equitable manner;

3.2 Implementing NCC's statutory right and obligations under the Rural Fires Act (1997) in relation to NCC representation on the Rural Fire Service Advisory Council (RFSAC), Bushfire Coordinating Committee (BFCC) and Bushfire Management Committees (BFMC);

3.3 Maintaining the role of NCC on Bushfire Management Committees (BFMCs) at all levels, by actively supporting NCC representatives to:
   a. effectively represent community concerns about the environment on their committee;
   b. advocate for the protection of ecological values to be given appropriate attention in the decision-making processes of the BFMC;
   c. keep the NCC informed of relevant issues and the outcomes, including any media reporting;
   d. express and support positions and views consistent with NCC policy and consult with Bushfire Program staff before expressing views on matters outside the scope of NCC policy.

4. Statutory Representation Role

NCC will ensure that its representatives are adequately trained and able to advocate for the NCC Bushfire Policy by means of:

4.1 Providing information to representatives on relevant NCC policies, legislation and upholding their roles on local BFMCs;

4.2 Organising workshops and seminars, in order to provide information and opportunities for representatives to network;

4.3 Providing technical advice and support to representatives to enable them to better communicate the ecological values and constraints of bushfire management to their committees and the wider community;

4.4 Developing guidelines and manuals to assist representatives;

4.5 Supporting representatives in resolving specific issues;

4.6 Aiming to achieve adequate and reliable reporting of bushfire management issues by the print and electronic media;

4.7 Convening a biennial bushfire management conference for the purpose of disseminating research that highlights the potential for fire managers to improve the ecological sustainability of fire management throughout NSW.

5. Fire and NCC Practical Objectives

NCC aims to protect the integrity of the natural environment from inappropriate fire regimes and irreversibly damaging operational and mitigation practices while taking into account life and property protection imperatives. The Bushfire Policy and the Bushfire Management Program events provide strategies for the conservation of biodiversity and ecological processes without compromising the need to protect human life and property.

5.1 **Fire and the Australian Environment**
The NCC 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.

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. Inappropriate fire regimes have been listed as a key threatening process in the *Threatened Species Conservation Act 1995*.

5.2 **Fire and Climate Change**
In accordance with current scientific models NCC advocates the need for bushfire management to incorporate the implications of climate change. NCC strongly supports research into the potential risks posed by climate change to the environment and ecological systems, in order to mitigate the risks prior to irreversible ecological damage occurring. NCC will continue to hold forums to assist representatives and members of the wider community with planning for the challenges associated with climate change.

5.3 **Fire and the Precautionary Principle**
Whilst NCC advocates for the fundamentals of the precautionary principle, NCC also recognises the benefit and importance of adaptive management initiatives being undertaken at the local scale. It is important that rigorous evaluations of these approaches are completed in order to maintain improved results for ecological systems and attain effective risk management outcomes. However for adaptive management to be effective, resources are needed for the monitoring of fire and its impacts on the landscape at both local and regional scales.

5.4 **Fire, Threatened Species and Ecological Communities**
NCC believes that fire should be managed so as to result in the greatest benefits to ecological systems whilst minimising damage to ecological communities and threatened species. NCC advocates that appropriate research and advice is incorporated when using fire management to preserve Australia's endangered and threatened species.

5.5 **Fire and Legislation**
NCC recommends that at the urban-bushland interface, all strategies should be governed by the principles of ecological sustainability as required under the *Rural Fires Act 1997* and other relevant environmental legislation. NCC, through its public events, strongly advocates for a maintained balance between life, property and environmental protection. To achieve this balance, it needs to be recognised that future developments must incorporate resilience measures through effective land-use planning decisions and building standards.

5.6 **Fire and the Community**
NCC believes that continued and increased community participation in fire management planning and debriefing processes is essential to ensure that NSW's emergency services continue to progress in an environmentally responsible forward direction. Every effort should be made to seek community input during risk management planning and debriefing processes undertaken at the local level for the increased protection of life, environment and property.

6. Primary Objectives of the NCC Bushfire Policy

6.1 Achievement of ecologically responsible bushfire related legislation, policy and procedures at all levels of government and within all relevant institutions;

6.2 Innovation, development and implementation of ways of educating the community to be more aware and involved in both safety and ecological aspects of bushfire management;

6.3 Conservation of biodiversity and ecological integrity by advocacy of appropriate fire management regimes;

6.4 Promotion of a better understanding of the ecological requirements and integrate these into bushfire risk management research and policy, in order to achieve the protection of life, the environment and property in an ecologically sustainable manner;

6.5 Emphasis of risk mitigation planning on the implementation of works immediately adjacent to identified assets, and on engagement with the community to promote both community and environmental resilience;

6.6 Championship of mitigation and operational works that effectively mitigate risk to environment, life and property;

6.7 Support for a multi-stakeholder, cross-tenure bushfire risk management planning process facilitated through the development of Bush Fire Risk Management Plans;

6.8 Maintenance of a valuable network of NCC representatives on relevant bushfire committees around NSW; facilitate useful communication, cooperation and collaboration between all interested parties in bushfire management;

6.9 Engagement with individuals and organisations on the role of fire in biodiversity conservation and on cost effective, ecologically sound fire management;

6.10 Empowerment of land owners and managers to take responsibility for their own preparedness;

6.11 Promotion of the use of improved planning, building design and construction controls as well as ensuring ongoing enforcement as an effective fire mitigation measure;

6.12 Refitting of existing buildings to be incorporated as part of a suite of bush fire protection measures for land owners in bush fire prone areas (see C. 3 for more detail).

B. Pre-Fire Bushfire Management and Mitigation

1.   Risk Management Planning in NSW

Vision: Bushfire Risk Management Plans should be based on a collaborative effort to provide details of a variety of treatment options for addressing bushfire mitigation based upon sound ecological considerations across the landscape including:

1.1   Bushfire Risk Management Plans are to incorporate ecological assets (including those of regionally and local significant status) to a level that can provide agency, operational staff and volunteers the best possible information to minimise adverse environmental impacts when conducting bushfire operations. These plans should contain performance criteria for implementation, monitoring, reporting and auditing of environmental outcomes;

1.2   Best practice assessment of cultural and natural heritage, including vegetation communities, threatened species, populations or ecological communities, fire sensitive fauna and their habitat, soil, water quality and air pollution impacts (local and global implications); and cultural heritage places, locations and objects;

1.3   All treatment options should be considered, including 'no action' and 'no burn' in some areas and for fire sensitive environmental assets. The treatment options should not exclude adaptive management approaches designed to benefit ecological values. NCC advocates that any one management option should always be explored for the possibility of augmentation with another e.g. a strip burn of 10m near the urban/bushland interface should be augmented with community education in order to further mitigate the risk to life, property and the environment;

1.4   All fire prescribed as a treatment option should be based on existing regulations and reference the best research available. The *Guidelines for Ecologically Sustainable Fire Management* (Kenny et al. 2004) and *Bush Fire Environmental Assessment Code for NSW* (RFS 2006) should be the absolute minimum requirement for referencing;

1.5   Community engagement and pre existing community based volunteer fire units (e.g. Community Fire Units, Firewise fire units) should be identified as very effective treatment options in mitigating risk to life and property;

1.6   Bush Fire Risk Management Plans should incorporate independently constructed ecologically sustainable fire management plans for private properties, where it can be demonstrated that:
    a.   the landowner or land manager has taken action to meet the relevant legislative requirements under the *Rural Fires Act 1997*; and
    b.   the plan demonstrates an ecologically sound and suitable fire management strategy that coincides with the overall objectives of the relevant Bush Fire Risk Management Plan;

1.7   Bush Fire Risk Management Plans should be inclusive of and complementary to other local and regional management plans that include fire management and risk assessments within their scope;

1.8   Bush Fire Risk Management Plans should be reviewed at a maximum of a five yearly basis. NCC advocates that advancements in fire management and knowledge of fire ecology over a five year period can have significant benefits for biodiversity. NCC supports the early review, revision and or creation of new bushfire risk management plans as required;

1.9   Bush Fire Management Committees for each bushfire management area should encourage landholders and the community to be involved in the open planning and preparation of Bush Fire Risk Management Plans, as community participation will aid in

adherence to the plan objectives in the local area. Councils and other agencies may require additional financial support to establish and maintain competent liaison staff;

1.10 Adequate resources should be made available to BFMCs in order to facilitate community consultation and involvement in the mandatory public exhibition process required for Bushfire Risk Management Plans;

1.11 When preparing Bushfire Risk Management Plans, BFMCs should ensure compatibility with other significant environmental land management policies such as State Environmental Planning Policies (SEPPs) (e.g. SEPP 19 - Bushland in Urban Areas, SEPP 14 - Coastal Wetlands, SEPP 26 - Littoral Rainforest, SEPP 44 - Koala Habitat Protection), Local Environmental Plans (LEPs), and plans of management prepared by land managers including the Office of Environment and Heritage, Forestry Corporation of NSW, Crown Lands and local governments (under S.36 *Local Government. Act, 1993);*

1.12 NCC supports the urgent need to include weed management strategies into Bush Fire Risk Management Plans. Weed management strategies will facilitate regeneration of native species and control invasive weeds following vegetation disturbances during fire mitigation and suppression works.

2. Adequate Data Base for Fire Management Plans

Vision: To support ecologically sustainable fire management in NSW an adequately funded, interagency accessible database should be created with the capability to store information on: fire events, fire history and severity, fire trails, strategic fire advantages, (cultural, economic, environmental assets), ecologically sustainable fire management regimes, SEPP 14, 19, 26 and 44 requirements.

2.1 For use in future planning, records of all areas burned should be kept describing date, extent, scorch height, ignition point and source, patchiness and impact on threatened species and endangered ecological communities.

2.2 Conditions to all relevant applications should be applied so that non location specific information on threatened species and ecologically endangered communities (EECs) is freely available to members of the BFMC.

2.3 In acknowledgement of volunteer time constraints, information (including maps) available to the BFMC should be available to all BFMC members including NCC representatives, to enhance their capacity to contribute to the process.

3. Other Fire Management Plans

Vision: All levels of bushfire management plans prepared across all tenures take into account ecologically sustainable fire management factors and are consistently prepared for integration with other fire management plans.

3.1. Bushfire management plans that involve risk management and/or contingency emergency works on public lands should be openly available to all members of the BFMC including NCC representatives; they should also be publicly available on request.

3.2 Bushfire management plans (including risk plans) that are created for implementation on public lands (including council fire management planning initiatives), must seek the input of the BFMC. Any community groups participating in works in the area must also be notified prior to works being undertaken (e.g. bush regeneration, Landcare and traditional owners.)

3.3 NCC advocates the adoption of property fire management plans as designed by the Hotspots Fire Project or other ecologically sound fire management planning programs, and recommends that these plans should be incorporated into district Bushfire Risk Management Plans as described in B 1.6.

3.4 Fire management and mitigation measures should be an integral part of all property management planning and NCC advocates that the RFS strongly encourage landholders to attend fire management programs that incorporate ecological fire management as a primary component in addressing risk.

3.5 District Operational Plans should be consistent with the Bush Fire Risk Management Plans, and should incorporate all information necessary for fire practitioners to make ecologically sound decisions.

3.6 All public land managers should prepare fire management plans that as well as aiming to satisfy management objectives and prioritising risk management imperatives, include sustainable ecological management requirements.

4. Hazard Reduction and Fuel Management Strategies

Vision: That environmentally sound methods of hazard reduction will be adopted as common practice by land and fire managers.

4.1 The precautionary principle should be applied to all hazard management strategies. The priority of asset protection should be to manage the flammability of assets and their immediate surroundings, and although fire can be a useful tool in reducing hazard in some situations, there are other fire protection measures that should also be considered.

4.2 NCC encourages the appropriate use of fire for ecological benefit across the landscape. Fire is a useful, but not the only tool in hazard reduction management, and hazard reduction in bushland areas should always take into account ecological management considerations.

4.3 Hazard reduction in NSW should not be prioritised or determined by annual hazard reduction targets, nor by the number of properties or the dollar value protected.

4.4 Hazard reduction programs should be strategically designed as per the co-ordinated approach of risk management planning undertaken by Bush Fire Management Committees, and include adequate consideration and protection of the environment in their implementation.

4.5 All hazard reduction proposals must be subject to prior environmental assessment, be consistent with the relevant risk management plan(s), and assessment of their strategic value should be undertaken during the initial planning stage.

4.6 Large conservation reserves such as water catchments, national parks, and wilderness areas should not be subject to broad area burning solely for the purpose of hazard reduction. NCC supports a strategic risk based approach based on sound science which should be adopted by land management agencies.

4.7 Notices issued to landholders under Section 66 of the *Rural Fires Act 1997* should not be issued on public or private land where the complainant is an adjacent private landholder who cannot demonstrate they have taken steps to reduce the risk on their own property, or where the purpose of the complaint is to gain advantage for future development.

4.8 Due to the lack of complete scientific information on the responses of ecosystems to fire, the application of fire should aim to ensure appropriate fire regimes based on criteria such as specific ecological characteristics of key species, fire frequency, severity, spatial distribution, topographical variations and seasonality, are implemented.

4.9 Where fire is prescribed in management plans, to maintain as much diversity in bushland as possible planned fires should be based on *non-uniform regimes* that display:
   a. intervals between fires that are based on a sound understanding of the associated ecological process;(see B 1.3)
   b. spatial distribution of fires that is based on scientifically founded mosaic patterns (e.g. for the benefit of habitat retention/creation).

4.10 Equilibrium fuel loads (point at which litter fall equals decomposition) are not well researched but have the potential to impact on how we measure the 'time since fire' and fuel load relationship. They should be taken into consideration when assessing risk for high fuel priorities and hazard reduction.

5. Threatened Species and Endangered Ecological Communities

Vision: Fire regimes are designed and implemented that take into account the requirements of threatened species and endangered ecological communities, including at the urban/bushland interface, while providing adequate protection of life and property.

5.1 NCC will continue to engage with fire practitioners and the general community about the different responses of individual threatened species to fire, and provide direction for new research programs.

5.2 A key NCC objective is to protect, maintain and preserve threatened species, communities and their habitat. NCC advises of the need to avoid the extremes of fire thresholds and regimes within vegetation communities where threatened species are located. Promotion of a diverse range of fire treatments will assist in mitigating the overall risk of impact on threatened species.

5.3 NCC supports and promotes the availability for grant funding to assist private landholders implementing fire management for the purpose of biodiversity conservation of threatened species.

5.4 NCC supports analysis of the fire requirements for threatened species in order to implement a fire regime that will protect a majority of the ecological community as well as the protection of individual threatened species.

5.5 NCC acknowledges the effort required by the Office of Environment and Heritage (OEH) to maintain and update a threatened species database (Atlas of New South Wales Wildlife, RoTAPS[1]) and will support additional and adequate funding that enables OEH to carry out this duty in a more effective manner.

5.6 NCC urges the ongoing update by OEH of the Threatened Species Hazard Reduction List used as an assessment tool under the Bush Fire Environmental Assessment Code. It is an essential component necessary for determining relevant conditions when hazard reduction works are proposed where threatened species, populations or ecological communities occur.

6. Fire Trails

Vision: Essential fire trails are located so as not to intrude upon the natural values of an area, and are constructed and maintained in an ecologically sustainable manner that aids the safety of fire fighters and the containment of wildfires.

6.1 Construction should be determined by the strategic operational importance of the trail and its relationship to the operational and risk management plans for the area. Fire trail construction must be standardised by environmental protection guidelines to avoid the risk of increased soil erosion, weed proliferation, introduction of exotic animals, vandalism and arson.

6.2 NCC supports the *Bush Fire Coordinating Committee Policy No. 2/2007 on Fire Trails*; however NCC recommends that a detailed set of guidelines for ecologically sustainable development and management of fire trails be established. The Soil Conservation Service should be consulted when preparing the guidelines.

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[1] Rare or Threatened Australian Plants

6.3 Demonstrated and sustainable maintenance plans should be essential when new fire trails are proposed and constructed.

6.4 Where authorities are unwilling or unable to maintain the strategic trails to a safe and ecologically sound condition, or the fire trails do not play a substantial and strategic role in bushfire mitigation and suppression, they should be closed, drained and rehabilitated.

6.5 NCC recognises that funding for mitigation works and proper implementation of fire trails is insufficient in NSW, and in order to increase the standard of works performed NCC encourages more services such as the Soil Conservation Service to be publicly resourced to assist private land owners and smaller land mangers that are constructing fire trails in accordance with the risk management plans.

6.6 Fire trail and plant contractors should have to attain a minimum certification for trail construction based upon the guidelines mentioned in clause 6.2.

6.7 Fire trail registers should be updated annually.

6.8 Fire trails listed on fire trail registers should be closed to the public during periods of severe and above fire danger ratings to prevent vehicle access by arsonists and to limit the risks of accidental ignitions as well as traffic congestion and the risk of collisions. Monitoring for unauthorised access should occur and where possible be prevented, and responsible use promoted. Gates should be constructed and closed where and when appropriate.

6.9 State-wide accreditation for contractors and plant operators should be supported by the BFCC. The training should involve environmental awareness, legal and professional responsibility for acting to a duty of care, and a register of accredited contractors formed. For mechanical hazard reduction, only contractors that have accreditation should be permitted to undertake works as directed by land management agencies. In the interim, plant operators shall be supervised by competent staff

6.10 NCC supports the periodic auditing and mapping of fire trails to assist the decision making process for maintenance priorities.

C. Development, Planning & the Urban/Bushland Interface

Vision: New development is ecologically sensitive and harmonises with bushfire protection requirements to benefit the ecological values of the surrounding natural area. Systems are introduced that assist owners to implement upgrades of existing developments to reduce the risk from bush fire.

1. Asset Protection Zones

Preamble: The planning and development of built assets near the bushland interface should utilise bush fire protection measures that do not impact on the values of adjacent natural areas. NCC believes that the implementation of asset protection zones (APZs) is a useful strategy for mitigating the impact of an approaching wildfire. However, the construction and management of APZs can give rise to many environmental problems and result in ecological degradation, with over-clearing of native vegetation leading to weed infestation, soil erosion, loss of habitat, altered hydrological flows and/or loss of wildlife habitat (NPWS, 2001) and may exacerbate fire risk.

APZs should be implemented within the land to be protected and not rely on measures to be undertaken on adjoining lands, particularly those set aside for public conservation. NCC recognises that previous planning decisions have created a legacy where developments have been allowed without sufficient buffers included to provide sufficient protection, and that in these cases it may not always be possible to avoid adverse impacts on adjacent lands.

1.1   NCC is concerned that landowners and contractors currently do not receive enough guidance on construction and maintenance of APZs. NCC urges that further guidance on APZ construction and maintenance be made available to landowners and contractors through the Department of Planning and RFS, including access to regular distribution of information and district tutorial days.

1.2   NCC recommends that examples of ecologically sustainable APZ design, construction and maintenance for residential dwellings, such as that described in the Fact Sheet "Creating bird-friendly gardens in bush fire prone areas" (NCC & Birdlife Australia, 2014) and Special Fire Protection Purpose (SFPP) developments be included in *Planning for Bushfire Protection 2006* as an appendix. This will serve to demonstrate how APZs can be designed and managed for both ecological and property protection objectives.

1.3   APZs for new developments should never be located on public land unless there is a clear and demonstrated positive public interest benefit.

1.4   No area listed primarily as an Environmental Protection Zone (e.g. E1 National Parks and Nature Reserves, E2 Environmental Conservation) should be developed for any purpose other than a use authorised under the *National Parks and Wildlife Act 1974* or designated environmental protection works. In all circumstances, locating of APZs within E1 or E2 zones should be avoided. Any area containing EECs, threatened species habitat, wetlands or other environmentally sensitive areas should not be utilised for development (including provision of APZ) regardless of the zone designation.

1.5   All new development should seek to minimise the size of APZs through the use of construction standards and alternative methods of satisfying the objectives of PBP 2006 and should specifically consider the management of edge effects. Any APZ proposal should be sufficiently detailed with respect to existing and proposed vegetation (including a tree survey) to ensure that impacts on adjoining native vegetation (edge effects) can be minimised and habitat retained where possible. APZs do not require the removal of all vegetation, and in fact will function more effectively where significant trees are appropriately retained (*Planning for Bushfire Protection 2006* (Department of Planning & RFS,2006)).

1.6 NCC supports planning initiatives that can incorporate water, vegetation, wildlife, weed and pest management strategies into the implementation of APZs and their maintenance regimes to ensure they are ecologically sustainable.

1.7 NCC supports a system that enables APZs to be reviewed as further research is undertaken and scientific justification is provided which allows for the amendment of APZ widths accordingly.

1.8 Provisions that significantly increase the extent of allowable asset protection zones without demonstrating a clear benefit and/or cause significant ecological harm, should not be introduced.

2. Building and Construction Standards

Preamble: Bush fire risk must be a key component in the development of planning strategies in bush fire prone areas. Well researched and simple design, careful construction and sensible maintenance are key measures to improve the ability of buildings to withstand and protect occupants during bush fires. NCC advocates that:

2.1 The requirement for higher building and construction standards be supported as detailed in *Planning for Bushfire Protection 2006*, in order to reduce the impact of clearing native vegetation for APZ;

2.2 In order to reduce the risk to life and property and to enable APZ requirements to be minimised, the following should be required where relevant: high standards of building construction and design and the use of flame retardant materials, fire retardant gels and spray-ons (only if endorsed by the RFS), provision of safe vehicle access, the installation of sprinkler systems, and adequate water supplies and pumping systems.

2.3 Existing buildings should be retrofitted to appropriate increased building standards where they cannot demonstrate the ability to construct an APZ or defendable space on their own land;

2.4 More effective urban planning strategies should be identified to overcome the problems at the urban-bushland interface, which is where most property losses occur;

2.5 Mapping of vegetation types, threatened species, specific habitats and EECs should be available that enables easier identification by consent authorities when assessing new developments and development applications.

3. Retrofitting of Asset Protection

Preamble*:* Retrofitting relates to the upgrading of fire protection for a particular asset, usually in reference to the built environment. It may include construction of a new APZ on the land where the asset is located in order to reduce the risk of fire damage.

Where retro fitting of asset protection is required for houses and multiple occupancy properties, the Department of Planning, Rural Fire Service, local governments and Local Government NSW in collaboration with the insurance industry should:

3.1 Develop an effective incentive scheme for all existing owners in bush fire prone areas to have their properties assessed for bush fire vulnerability;

3.2 Advise such property owners where appropriate, about the specific structural changes to their built environment required to bring the structures up to an appropriate standard dependent upon their existing material construction and their assessed level of risk from bush fire attack;

3.3 Enable such property owners, where necessary, to gain access to funding incentives (including the use of rate rebates, insurance discounts, revolving funds and other innovative fiscal instruments).

4. Planning Instruments

Vision: Planning for new development integrates environmental considerations into its framework and incorporates bushfire protection requirements at minimal cost to the ecological values of the surrounding area.

4.1 Bushfire Prone Lands mapping should be incorporated into regional and local planning instruments to provide a strategic basis for the control of development.

4.2 Bushfire Prone Lands mapping should be subject to on-ground verification and frequently reviewed, particularly areas where clearing or substantial regrowth is known to have occurred.

4.3 All community land (see definition under *Local Government Act 1993*) is required to have a management plan and should include a statement that bushfire/ecological management must form part of any review of such plans.

D. Science and Research

Vision: NSW bushfire management is well supported by science and research that guides ecologically sustainable fire management.

1. Priority Research Areas

The following overarching priorities should apply to bushfire research:

1.1   Bushfire management regimes need to be informed by research into post-fire operations with a view to achieving ecological sustainability.

1.2   Appropriate steps to minimise impacts on fire sensitive flora and fauna communities using existing guidelines such as the *"Guidelines for Ecologically Sustainable Fire Management"* (*Kenny et al, 2004*), should be taken by government departments. Embedding of a funded program within OEH is needed to ensure that ongoing research updates and provides additional detail that enables existing guidelines to be improved such that they are more sensitive to local fire ecology needs.

1.3   Bushfire research needs to be coordinated to address agreed priorities and should be conducted on a co-operative and collaborative basis.

1.4   Funding to support further research into managing fire should be provided on a bipartisan basis by the NSW and Commonwealth governments.

1.5   Mentoring programs should be established for tertiary students studying relevant fields (e.g. environmental science, conservation land management) to encourage interest in working in key areas such as fire management.

1.6   Ongoing and effective support should be ongoing for undergraduate and post-graduate university courses that address bushfire related areas of study including fire ecology, community engagement and property protection.

2. Areas for New Bushfire Research

NCC recommends that research be undertaken in the following areas:

2.1   Leaf litter accumulation in relation to species reproduction, soil and litter invertebrates, and soil nutrients, recognising that litter is an important part of many ecosystems;

2.2   Effects of bush fire regimes on geomorphological and ecosystem processes, including:
  a. the effects of fire and fire operations on soils, soil biota, soil erosion, and Acid Sulphate Soils;
  b. the effects of fire on karst processes;
  c. the impact of fire management in water catchment areas;
  d. use of fire as a management tool to restore degraded lands or address ecological problems such as Bell Miner Associated Dieback;

2.3   Impacts of fire regimes and fire operations activities on biodiversity, including:
  a. aerial ignition and lighting patterns to ascertain the impact on fauna movement amongst areas subjected to large-scale use of fire;
  b. the response of threatened species to particular operational practices;
  c. the impact of fire on endangered and vulnerable ecological communities and the development of criteria for appropriate fire regimes (including the absence of fire);
  d. the relationship of fire to weed invasion, especially on the urban fringe;
  e. the use of fire as a tool for restoration of habitats for threatened species and the long-term maintenance of EECs.

2.4 Bush fire risk assessment and fire behaviour modelling including:
    a. state-wide post fire mapping and assessment;
    b. risk contours mapping and house loss analysis
2.5 Impact of fire regimes on Aboriginal heritage and historic heritage values;
2.6 Public attitudes and responses to bushfire, arson and community responsibility issues to enable a targeted basis for public education and awareness;
2.7 Effectiveness of bush fire suppression techniques;
2.8 Effectiveness of bush fire protection measures including land use planning, asset protection zones, construction standards, landscaping and house water spray systems.

3. Ongoing Research

NCC supports ongoing research and analysis in the following areas:

3.1 Impacts of fire regimes on biodiversity values, including:
    a. vegetation dynamics and fire history;
    b. fire ecology specific to landscapes and plant and animal communities;
    c. the effects and efficacy of fire management activities;
    d. impacts of increasing rates of hazard reduction on threatened species;
    e. the effects of fire season and intensity on seed germination;
3.2 Fuel characteristics and accumulation rates, specifically
    a. leaf litter accumulation in relation to fuel build-up;
    b. quantifying fuel characteristics and accumulation rates for different vegetation formations and age classes;
    c. quantifying the effects of hazard reduction burns on fuel loads and fuel arrangement;
3.3 Impacts of the various layers of vegetation and of the different canopy and substrata types on fire behaviour and risk assessment outcomes;
3.4 Effects of climate change including:
    a. the potential for greenhouse gas mitigation through appropriate fire management;
    b. optimisation of fuel reduction burning for carbon, water and vegetation outcomes;
    c. modelling of fire regimes under changing climate circumstances;
    d. the effects on bush fire fuel loads and on bush fire weather, and potential impacts on flammability of fire sensitive vegetation formations e.g. cool temperate rainforests.
3.5 Application of research findings including:
    a. investigation into improving the assimilation of knowledge into on-ground fire management policies and practice;
    b. improving dissemination of fire research to fire management agencies, Bush Fire Management Committees and the public.

E. Education and Community Involvement

Vision: Fire management will be considered a shared responsibility between fire authorities, land managers and local communities, with extensive community engagement acknowledged as a necessary component for the creation of resilient communities in bush fire prone areas.

1. NCC Community Engagement Program

NCC will through its ongoing program:

1.1 Deliver workshops and conferences for its representatives on Bush Fire Management Committees, government agencies and the public to disseminate and discuss the latest science and ideas on fire and the environment

1.2 Carry out other community engagement programs to provide an increased understanding of fire and the environment, and of fire preparedness.

1.3 Take a lead role in encouraging private property owners and managers in managing fire for positive environmental outcomes, and encouraging property owners to adopt measures that share responsibility for fire management across the community.

2. Community Awareness

Preamble: There is a widespread need for greater awareness of, and exposure and access to knowledge and information about the ecological impacts of bush fire. There is also a need for more sensitive and responsible bushfire management strategies, including acceptance that the community must take a shared responsibility for the safety of their families, properties and the environment in which people live.

2.1 Engagement and awareness programs should be strengthened and increased with particular emphasis on encouraging householders to be responsible for appropriate fire hazard reduction and preparedness around their homes.

2.2 NCC supports the Rural Fire Service Firewise Program and will promote the establishment of Community Firewise groups, providing the program is consistent with the principles of ecological sustainability and the Bush Fire Risk Management Plans.

2.3 Active fire management agencies should be required to review existing community engagement/education programs with the aim of coordinating and supporting their varied responsibilities in a more cohesive manner.

2.4 Both the Rural Fire Service and NSW Fire Brigades community education programs should be transparently reported upon in their Annual Reports with documentation of a trend analysis of budget allocations and the percentage of property owners reached in fire prone areas.

2.5 The general public, brigades and institutions should have ready access to information on all aspects of bush fire behaviour, suppression, mitigation, ecology, funding, planning and administration.

2.6 Workers in the areas of ecology or bushland management should have a duty of care responsibility to learn about fire suppression techniques, just as workers in the area of bushfire suppression have a responsibility to learn about ecology. The staff of land management authorities who are charged with the management of natural areas, regardless of their level of responsibility , should undertake ongoing training in:
   a. the ecological aspects of bush fire management;
   b. the preparation and provision of appropriate information and educational materials to the public on fire mitigation practices and planning;

      c. techniques for mediation between fire control authorities and the environmental movement;

      d. competence assessment of those applying for burning permits regarding their ability to manage fire appropriately.

2.7   Every volunteer brigade is to be encouraged to train members in the ecological impacts of fire.

2.8   State government and/or local government staff should be available to residents who:

      a. are qualified, trained and experienced in ecological aspects of fire and in fire prevention and control;

      b. have qualifications and/or proven skills in public education and information dissemination;

      c. can work co-operatively with both other fire control authorities and public land managers and with the environmental movement;

      d. will be available to residents and property owners on the urban/bushland interface for advice regarding fire management plans, and fire prevention and control on their properties;

      e. can assess the competence of applicants for hazard reduction certificates and fire permits regarding their experience and ability in handling the levels of fire intensity that will be safe and most environmentally suitable for the situation;

      f. can authorise and oversee hazard reduction by fire or manual methods on individual small properties on the urban/bushland interface in order to complement any fire control strategies that might exist.

F. Responsibility, Regulations and Enforcement

Vision: That NSW regulations and enforcement provide adequate protection of the environment from the impacts of inappropriate bushfire mitigation and suppression operations, use of fire for hazard reduction, and use of fire on private property.

1. Illegal Use of Fire

Vision: The community is adequately informed about the impacts of illegal use of fire, to the point where the incidences of illegal use and arson are minimised.

1.1 The prevalence of arson and the careless use of fire, as a cause of bushfires, requires an effective response from the NSW government which must develop effective strategies to manage this problem.

1.2 NSW Government agencies (including NSW Police, Office of Environment and Heritage, Rural Fire Service, Fire & Rescue NSW, Forestry Corporation of NSW, Roads & Maritime Services, Crown Lands Division of NSW Trade & Investment and other land managers) and local councils should take the following actions to redress the culture of tolerating the illegal use of fire by:

   a. mounting a public education campaign on the liabilities of people illegally lighting or using fire;

   b. increasing their efforts and willingness to adequately investigate the illegal lighting or use of fire including obtaining forensic evidence;

   c. allocating adequate human and financial resources in order to give greater priority to pursuing the prosecution of people who illegally light or use fire.

1.3 NCC supports concerted and consistent efforts to prevent illegal ignitions and to investigate and prosecute offenders, including the permanent establishment of well-resourced bush fire arson investigation teams.

2. Responsibilities of Land Owners and Land Managers

Vision: Owners and occupiers of land will take responsibility for the protection of their properties in an ecologically sustainable manner.

2.1 All public land management authorities should have regard for biodiversity and the principles of ecological sustainability when preparing bush fire risk management policies and plans.

2.2 Local government should prioritise risk management works in high bush fire risk zones, whilst encouraging private property owners to mitigate the risk through responsible building design and risk management (AS3959 and AS4360 respectively).

2.3 Public land managers should produce fire management plans or guidelines based on ESD principles, for fire management on their lands. These should be subject to regular review through an open and accountable process. The plans should be prepared in consultation with the community using an approach that maximises effective community involvement.

2.4 Notification of bushfire hazard reduction work under Section 66 of the *Rural Fires Act 1997* should only be issued by an appropriately trained RFS Officer and should clearly define the area affected by the notice, indicate the degree and nature of risk, specific strategies and actions to mitigate risk, and clearly state that mitigation actions performed should not create or transfer risk to other life, property or environmental assets.

2.5 Community-based land management groups (e.g. Trusts, Landcare, bush regenerators) must be consulted by the proponent prior to any fire mitigation works being performed on lands where they are performing works or are the land manager. This includes works proposed to be carried out on public lands upon which these groups are working.

2.6 All public land management agencies should develop bushfire management strategies and provide sufficient financial resources to accomplish this task. Such plans should be subject to public exhibition, comment and review as public documents.

2.7 Authorities that are defined as having responsibility for "managed lands," and any other managers of public lands, should recognise that roadside and rail reserves often contain valuable remnant flora and fauna habitats which must be protected under the principles of ecological sustainability when subject to bushfire hazard reduction (*Rural Fires Act 1997: definitions; Regulations: Clause 38)*

2.8 All government departments with representation on Bush Fire Management Committees should ensure that their representatives are diligent in attending meetings, and attendance records should be published in the Annual Reports of the Rural Fire Service and NSW Fire Brigades.

2.9 The authorities should be responsible for the protection of catchment values and ecological communities, especially wetlands and world heritage areas within tenure, from the adverse affects of prescribed or wild fire. Appropriate strategies should be included in the Bush Fire Risk Management Plan for these areas.

2.10 Taking into consideration the requirements of district Bush Fire Risk Management Plans, residents should be encouraged and assisted through information and education, to formulate for their own properties a bushfire management plan that does not include removal of significant amounts of native vegetation. Particular emphasis in any bushfire management plan should be on effects of fire on rare and endangered fauna, fire sensitive areas, vegetation communities and wildlife habitats.

G. During/Post Fire Bushfire Operations

Vision: That fire fighting authorities incorporate protocols across all fire fighter levels that embed a high level of duty towards ensuring all phases of operations effectively consider environmental impacts.

1. Use of Aircraft during Bushfire Operations

Preamble: NCC recognises that fire-fighting aircraft are integral to modern fire management. NCC supports and encourages the use of aircraft to aid initial attack and response to wildfire events, as initial attack can often minimise the overall fire fighting effort.

   1.1 NCC supports the use of aircraft for mapping and surveillance of wildfires throughout NSW, and encourages their increased use for the early detection of wildfires, particularly during bush fire danger periods and in remote areas, to enable rapid detection, assessment and response.
   1.2 On extreme fire danger days, a co-ordinated approach to surveillance should be used including the use of fire towers and aircraft.
   1.3 NCC recommends research in the use of aerial incendiaries. There are a number of unresolved issues such as:
      a. the potential for lighting patterns to impact on faunal movement/escape from fire fronts;
      b. the effects of unseasonably high intensity fire behaviour;
      c. the reduced capacity to operationally identify areas of fire sensitive vegetation, vulnerable soils and water catchments areas and how aerial incendiaries may affect them;
      d. incendiary drops for hazard reduction will result in interference in natural fire paths and hence have the potential to impact on fire sensitive vegetation.
   1.4 NCC recognises that there are other associated issues with the use of aircraft in fire suppression, including:
      a. the drop pattern (water bombing) technique may cause localised washouts;
      b. aircraft have the potential to disperse aquatic pollution when using large static water sources with retardant and/or contaminated equipment;
      c. the implications in the use of salt water for fire suppression.

2. Fire Retardants

Preamble: NCC recognises that aircraft play an important role in active suppression of fires in otherwise inaccessible areas. NCC recognises that a limited water supply and increased use of aerial support in fire suppression currently exists; furthermore acknowledge that fire retardants play a useful role in fire suppression.

Fire retardants (including foam and gel based) that are currently used by agencies contain surfactants and other chemicals that are known toxins to aquatic organisms and systems (Buscemi et al, 2007; Seymour and Collett, 2009; Chen et al., 2012; Dietrich et al, 2013). There is also the concern about adding nutrients to low nutrient natural systems, which have an unknown effect on terrestrial and aquatic organisms and systems (Hopmans et al, 2007; Couto-Vázquez et al, 2011). Surfactants used in many retardants may enhance the toxicity of other chemical components within many fire retardants through their impact on cellular membranes (Starkov & Wallace, 2001; Lehmler, 2005).

2.1 NCC suggests further research be undertaken to accurately assess the effects of retardants on terrestrial organisms and to measure the level of the additional nutrients in retardants on natural soil and water systems. NCC supports and encourages academic institutions to perform more research to assess the chemical composition, the active ingredients and more importantly the toxicity of retardants.

2.2 NCC recommends that:
   a. scientifically based operational guidelines be prepared for retardant use to minimise adverse environmental impact and ensure fire-fighter safety; and
   b. the RFS includes a component on the environmental risk of such use as a part of Advanced Fire-Fighting (AF) and aerial fire-fighting training programs.

3. Emergencies

Preamble: NCC acknowledges the difficult and potentially dangerous activities that both volunteer and paid fire-fighters undertake, and is aware of the increased pressure placed upon fire fighters and decision makers in relation to suppression during emergency incidents. NCC advocates for investigation of ways in which fire-fighting agencies and the community could improve the ecological sustainability of bushfire operations. In particular, back burning operations have the potential to trap wildlife escaping the main fire front or flanks and introduce large amounts of intense fire into the environment, often during high-extreme fire danger periods. Back burning operations sometimes result in serious ecological impacts on the fire regime for the local area and may fail to achieve their desired operational aims or even be counter-productive. Whilst many Incident Management Teams (IMTs) are aware of the optimal fire regimes and ecological parameters for use of fire in suppression, this knowledge needs to be passed on to the on-ground fire fighters.

3.1 Local operational plans should exist in all bushfire prone areas to inform Incident Management Teams of approved procedures during fire operations. The plans should have regard for ecological and cultural values in the local area.

3.2 While NCC recognises the effectiveness of strategic back burning during bushfire suppression, NCC advocates that a more proactive approach should be adopted. Where large scale back burns for the purpose of property protection are likely to be required, they should be performed on the basis of contingencies set out in a plan of operations endorsed by the local Bush Fire Management Committee.

3.3 NCC recommends that briefings for on-ground decision makers (at minimum sector leader/captains) should include any information available on the ecological values and potential impacts.

3.4 In planning back burn operations, ignition patterns should consider faunal movement and safe escape routes.

3.5 Many wildfires provide opportunities for land managers to utilise resources to complete planned hazard reduction works. These planned hazard reduction works should be only carried out where it can be demonstrated that there is adequate unburnt vegetation available for habitat for displaced fauna.

3.6 Media should use the correct terms and definitions used within fire fighting operations, in order to ensure consistent messaging to the general public, and accept its responsibility for reporting accurate and useful information.

3.7 NCC supports the classification of existing dormant fire trails as suitable priorities for reopening during emergency operations as required by the land manager, except where on-ground changes have occurred that make them no longer appropriate.

4. Professional Action and Responsibility

Vision: Fire fighting agencies and their operatives will adopt a practical duty of care to the environment and be able to minimise acts of negligence. The operational debrief models adopted will be robust enough to provide some practical lessons learnt and hence increase the future effectiveness of suppression and reduce the impact on the environment.

4.1 NCC supports an open and transparent debriefing process that involves all representatives on the BFMC in order to achieve better operational fire management and ultimately ecologically sustainable outcomes for the local area.

4.2 NCC would like to see operational debriefs for S.44 fires performed in a constructive and blame free environment, using a technical approach similar to that of air-crash investigations. The reports should allow for feedback from the community, agencies and the IMT.

4.3 NCC acknowledges that volunteer and professional fire-fighters ought not to be expected to risk personal safety over threat to property or environmental loss. NCC supports education initiatives by any agency aimed at increasing the environmental awareness for fire-fighters and ultimately the ecological sustainability of fire fighting agencies.

4.4 NCC supports the inclusion of information about local environmentally and culturally significant sites and constraints relating to them in fire ground briefings for fire-fighters or crew leaders.

4.5 NCC supports the process of a public debrief where there is a reasonable demand from the community. Ecological concerns should be open for discussion during public debriefs.

5. Operational Best Practice

Vision: That operations in bushfire mitigation and suppression be to the world's best practice with regard to effectiveness and ecological sustainability.

5.1 NCC will support and champion operational fire fighting that uses ecologically sound practice.

5.2 The removal of tree hollows has been listed as a key threatening process. NCC supports the retainment of tree hollows that are not deemed to be unsafe to the general public. The issuing of chainsaw accreditations within volunteer fire brigades should be accompanied with training on the habitat values associated with tree hollows. One example of a suitable technique is, where possible, to extend the burn 30 or 40m beyond tree fall areas to avoid chance of re-ignition.

5.3 NCC recognises that there is a need for operational procedures and awareness in Advanced Fire Fighter training to assist with best practice guidelines in order to avoid cross contamination of aquatic weeds (e.g. Caulerpa spp, Salvinia) when drafting from open water sources (eg. dams, creeks etc.). Training at the Advanced Fire Fighter level should also include the incorporation of practices that ensure fire fighting operations minimise the spread and contamination of terrestrial weed and invasive species.

5.4 NCC will support at all levels, any local operational initiatives that have been developed that could have state-wide benefit for ecological sustainability in fire suppression and fire management.

5.5 Aboriginal and European cultural heritage sites that are present within an area of bushfire operations should be clearly identified to fire-fighters in order to mitigate any risk of damage.

5.6 Opening and construction of new emergency fire trails should only be done by accredited contractors to ensure the best available construction standards are used,

consistent with minimising adverse environmental impact. Emergency fire trail construction should also involve close and direct supervision from either the IMT or a person responsible for upholding legislative requirements to protect the environment (i.e. NPWS staff, RFS FCOs or appropriate land managers).

5.7 All contractors and fire-fighters should have access to the fire-ground radio networks and means of direct communication with the IMT to avoid inappropriate clearing of areas that are not strategic to the overall mission.

5.8 Construction of helipads for access by Remote Area Fire Team (RAFT) should be strategically placed to avoid unnecessary clearing of vegetation in otherwise un-disrupted bushland.

5.9 Sensitive areas including environmental assets and heritage areas should be given special consideration to ensure that suppression activities cause minimal environmental impacts.

6. Post Fire Management and Restoration

Vision: Assessment and restoration of environmental damage becomes accepted as a normal and necessary part of all post bush fire operations.

6.1 Bush Fire Risk Management Plans must contain guidelines for post-fire restoration and rehabilitation standards developed and reviewed in consultation with Local Government, the Office of Environment and Heritage, Crown Lands, Rural Fire Service, and other relevant government agencies including utilities, academics and conservation and community stakeholder groups.

6.2 The standard of post-fire restoration works needs to be defined by an agreed set of criteria and monitored for efficacy for a period of at least 2 years post-fire. Such works should be funded from a dedicated source for this purpose. Some examples of criteria are:

a. Wherever practicable pre and post fire weed management programs should be carried out by qualified ecological restoration practitioners as a part of hazard reduction programs;

b. Prevent the invasion and spread of weeds in bushland following wildfire by complying with correct hygiene protocols for equipment, erecting if appropriate, temporary silt fences until ecological restoration work is undertaken, and constructing stormwater remediation works if necessary, especially on drainage lines from developed areas;

c. Undertake erosion control measures pre and post hazard reduction activities and following wildfires.

6.3 Section 44 emergency funding under the *Rural Fires Act 1997* should contain a component for post fire management and restoration.

6.4 Environmental damage caused by fire fighting operations should be funded for rehabilitation and post-fire management through Natural Disaster Relief and Recovery Arrangements, Section 44 (*Rural Fires Act 1997*) and other associated State and Commonwealth funding sources. RFS should investigate cost recovery from liable individuals or organisations.

6.5 NCC recognises that fire intensity can directly influence the movement of fauna during a fire, and affect post fire recruitment of flora and fauna. NCC advocates that where fire intensity can be manipulated, it should be done so based upon sound knowledge of the existing and predicted state of the ecological systems in order to maximise the ecological benefit as well as reduce the risk to the built environment.

6.6 Bush Fire Risk Management Plans should include a code of practice for dealing with post-fire management of injured wildlife as well as the removal of feral animals. Such a code should be prepared in consultation with wildlife rescue organisations.

7. Monitoring, Reporting and Review

Vision: Following all fires on public lands including hazard reduction burns, a standard set of criteria is used by all agencies to monitor, evaluate and report on the impacts of the fire, with the outcomes made publicly available.

NCC supports:

7.1   Post fire monitoring to ensure erosion and other environmental damage is not occurring.

7.2   Reporting of the monitoring to the Bush Fire Management Committee and for the monitoring results to be available to the general public.

7.3   The regular review of monitoring to improve the standard of the knowledge gained and effectiveness of monitoring.

7.4   Reporting and evaluation of hazard reduction activities to ensure risk management outcomes are maximised.

H. Bushfire Management and Wilderness

Preamble: The prime bush fire management objectives in and for wilderness should be the minimisation of all biophysical impacts and the maintenance and restoration of wilderness integrity, including natural values, natural processes and biodiversity.

1. Wilderness Fire Management Principles

All fire management in wilderness must be based upon principles of ecological sustainability and the best scientific knowledge. Wilderness values in a climate-changing world should be protected through the following principles and strategies:

1.1 Fire management in wilderness must be evidence-based but flexible and adaptive, recognising that knowledge is evolving and an ecological risk management approach may be necessary if knowledge is incomplete.

1.2 The principle performance criterion for fire management in wilderness is the maintenance of the majority of each vegetation community within its (scientifically determined) desirable limits of fire regime, including frequency, intensity, timing and variability.

1.3 The integrity of old growth forests, rainforests and other fire sensitive vegetation is of the highest priority in wilderness areas and is protected from an increased risk of wildfire arising from inappropriate fire regimes and climate change.

1.4 To ensure rapid detection of fires in wilderness areas, regular aerial surveillance is required during the bush fire danger period and particularly on days of high fire danger. Effective rapid detection provides increased opportunities in the types of response to outbreaks of fire. This approach provides flexibility and also eliminates the need for static fire observation towers in wilderness areas.

2. Fire Mitigation

Vision: Fire management planning for wilderness areas is overwhelmingly for the benefit of ecological factors and is founded on peer reviewed science.

2.1 Planned fires in wilderness areas should be undertaken for ecological reasons only, with off-wilderness assets protected on off-wilderness lands.

2.2 Wildfires should be allowed to burn in wilderness areas in appropriate circumstances, e.g. fire ignited by natural causes (lightning), the likely area to be burned, its intensity and timing falls within ecologically-determined limits, the risk to human life and property is manageable, and suppression may cause more impact than the fire.

2.3 Increased effort by state and local government to occur to prevent urban expansion within the bushland interface adjoining a wilderness area (as these are often high fire danger areas).

2.4 Planned fire in wilderness should be subject to extensive and detailed environmental assessment, and as well as prioritising ecological considerations, any streamlined assessment approach must take into account the special management considerations applicable to wilderness areas.

3. Fire Suppression

Vision: The management of unplanned fires in large natural areas such as wilderness areas aims to have minimal impact through the use of low impact strategies.

3.1 There should be greatly increased investment in the development of expert fire strategists and pre-planned low impact fire control strategies (aimed at maintaining natural processes and biodiversity in the long term) for large and remote bushland areas such as wilderness.

3.2 'Let burn' should be an approved and supported option for wildfires in wilderness under appropriate circumstances (see clause H1.2). Where suppression is considered necessary, rapid attack and close containment should be the preferred suppression response and it should be ensured that resources, capability and response times (for aerial suppression, Remote Area Fire Teams and other means) are adequate to support the highest possible success rate for such responses in wilderness areas.

3.3 It should be ensured that if initial attack fails, ongoing 'campaign' fire suppression strategies affecting wilderness have as prime objectives the protection of natural values and the minimisation of environmental impacts, and that strategies are evidence-based on a detailed understanding of the ecology, history and behaviour of fire in the local landscape, as well as the successes and failures of past suppression efforts.

3.4 In large fire campaigns that affect wilderness areas, the knowledge, skills and resourcing should be adequate to support 'surgical' and low-impact strategies (e.g. small tactical burns, use of natural containment lines and hand-tool lines, precision aerial burning and water-bombing) in preference to strategies that may be higher impact and less precise (e.g. large-scale backburns from hard containment lines).

4. Physical Intrusions in Wilderness

Vision: Infrastructure for fire management within and external to wilderness areas is constructed and maintained outside wilderness areas.

4.1 Existing constructed containment lines should only be used for back burning when they have been identified for such use in a pre-incident operations plan that has been subjected to public comment and review, and these lines are properly constructed to minimise damage to wilderness values.

4.2 Fire suppression strategies in wilderness areas that have the potential to cause significant environmental impact, such as the construction of new containment lines or large-scale backburning, are to be avoided. The value and use of such activities should be assessed and determined as part of the bush fire risk management planning process.

4.3 During a section 44 bush fire emergency or other wildfires, the installation of containment lines by bulldozers and other heavy machinery is to be avoided unless it is in an area that has been identified and mapped in a pre-incident operations plan as a necessary suppression strategy.

4.4 Any new trails constructed or upgraded during fire suppression operations are to be immediately closed and/or restored.

4.5 All non-essential fire trails and other infrastructure should be removed from wilderness areas and rehabilitated.

4.6 Fire observation towers and the accompanying access tracks to them which are located in wilderness areas are removed and replaced with other effective detection methods that do not impact upon wilderness values, such as increased aerial surveillance.

I. Cultural Burning

Preamble: Indigenous Australians have managed their country for tens of thousands of years, and despite the disruptions caused by colonisation, many communities have maintained a close association with their land and a profound interest in how it is managed. It is now widely accepted that Aboriginal peoples' traditional knowledge of the use of fire offers useful insights for managing and enhancing the natural and cultural values of country and of biodiversity.

1. Contemporary Cultural Burning

The NCC policy "Aboriginal Interests and Nature Conservation" acknowledges that the aspirations of Aboriginal people and the interests of nature conservation can be mutually beneficial, but in some cases, may conflict. Recognising this, NCC seeks to build relationships with Aboriginal communities to progress cultural burning practices while ensuring the conservation of natural values.

NCC understands contemporary cultural burning as fire management practices used by Aboriginal people to enhance the health of the country and its people. It can include burning or preventing burning for the health of particular country. Cultural burning is implemented or restricted to protect and enhance the cultural values of place. Prescribing and monitoring appropriate fire regimes requires a cultural intent to maintain the kinship relationships of species (i.e. people, plants and animals), determined by the presence or absence of key indicators on country. It may involve burning to create different fire intervals across the country or it could be used to manage fuel. It may be used to improve access to country, to clean up important pathways or as part of re-establishing responsibilities. Across different communities and lands the following are key considerations:

1.1   The responsibility people have for their country – it is important appropriate people are involved in planning and implementing fire based on their cultural connections to the land.

1.2   The importance of being on country and learning by observation and sharing.

1.3   The importance of teaching young people and passing down knowledge, including through stories.

1.4   The importance of good training, partnerships, practice and techniques.

1.5   The importance of embedding cultural connections into contemporary natural resource management.

2. Fire Management on Aboriginal Lands

Vision: To support and facilitate Aboriginal people to undertake cultural burning for the health of people and their country.

2.1   Property fire management plans should form the basis of fire planning, with a focus on identifying cultural values to inform fire implementation and restoration works.

2.2   Areas and locations where cultural burning is appropriate and does not adversely impact ecological values should be identified.

2.3   Areas where cultural burning will be advantageous for progressing other management goals e.g. weeds and vertebrate pest control, should be identified.

3. Community Empowerment

Vision: Aboriginal communities are encouraged to use ecologically sound fire management to further connection with country and build community resilience.

NCC supports the following:
3.1 Culturally integrated ecological fire management is encouraged to enable Aboriginal communities to connect with country and help to build knowledge of country including through traditional fire related stories.
3.2 Communities are encouraged to become equipped with the skills to be hands-on participants able to drive cultural burning practices and respond to wildfire events.
3.3 Community representatives should be given opportunities to have the knowledge and confidence to share skills, experience and knowledge with both Aboriginal and non-Aboriginal neighbours, and encouraged to engage with local Bush Fire Management Committees and participate in bush fire policy issues.

J. Glossary

AF: Advanced Fire Fighter; an accreditation level attained through RFS training

AI: Aerial Incendiary; fire ignition using helicopters/light aircraft and small incendiary devices.

APZ: Asset Protection Zone

AS3959: Australian Standard 3959; Construction of buildings in bushfire prone areas (2009)

AS4360: Australian Standard 4360; Risk Management

BFEAC: Bush Fire Environmental Assessment Code for New South Wales; also referred to as 'the code'.

http://www.rfs.nsw.gov.au/__data/assets/pdf_file/0014/24332/Bush-Fire-Environmental-Assessment-Code.pdf

BFCC: Bushfire Co-ordinating Committee; the state level interagency committee for the coordination of bushfire management in NSW.

BFMC: Bushfire Management Committee; the local and district level interagency committee for the coordination of bushfire management at the local level.

BFOP: Bushfire Operational Plan

BFRMP: Bushfire Risk Management Plan

BMAD: Bell Minor Associated Dieback

BMWHI: Blue Mountains World Heritage Institute;

http://www.bmwhi.org.au

BRIMS: Bushfire Risk Information Management System

CFU: Community Fire Unit; Fire and Rescue NSW static volunteer firefighting unit usually formed on the interface between bushland and urban areas.

DA: Development Application

Office of Water, under the Dept of Primary Industries

http://www.water.nsw.gov.au

DoP: Department of Planning

http://www.planning.nsw.gov.au/

EEC: Endangered Ecological Community

ESD: Ecologically Sustainable Development

FCO: Fire Control Officer (a paid RFS staff member usually housed at a district office).

Forestry Corp: Forestry Corporation of NSW,

http://www.forestrycorporation.com.au

HR: Hazard Reduction

IMT: Incident Management Teams; usually interagency control teams for a fire incident.

LEP: Local Environmental Plan

LMZ: Land Management Zone

NCC: The Nature Conservation Council of N.S.W.;

http://www.nature.org.au/

NPWS: National Parks and Wildlife Service; now part of the Office of Environment and Heritage;
http://www.environment.nsw.gov.au/nationalparks/default.aspx

NSWFA: NSW Farmers Association;

http://www.nswfarmers.org.au/

Fire and Rescue NSW (formerly NSW Fire Brigades)

http://www.fire.nsw.gov.au

OEH: Office of Environment and Heritage;

http://www.environment.nsw.gov.au

PBP06: Planning for Bushfire Protection 2006;

http://www.rfs.nsw.gov.au/__data/assets/pdf_file/0008/4400/Complete-Planning-for-Bush-Fire-Protection-2006.pdf

RAFT: Remote Area Fire Team; a group of trained firefighters that can attend fires in remote locations, usually involved with light aircraft for access.

RAMA: Routine Agricultural Management Activities

RFS: Rural Fire Service of NSW;

http://www.rfs.nsw.gov.au

RFSAC: Rural Fire Service Advisory Council

RFSC: NSW Rural Fire Service Advisory Council

RoTAPS: Rare or Threatened Australian Plants

SCS: Soil Conservation Service; (under the Dept of Primary Industries)

www.lands.nsw.gov.au/soil_conservation_service

Section 44: Commissioner's responsibility; in short, under section 44 of the *Rural Fires Act 1997* a fire where the RFS Commissioner has taken control of the fire, usually associated with an increase in emergency funding for fire suppression.

S.44: Section 44 of the *Rural Fires Act 1997*

SEPP: State Environmental Planning Policies

SFAZ: Strategic Fire Advantage Zone

SFPP: Special Fire Protection Purpose

TSC Act 2005: *Threatened Species Conservation Act 2005*;
http://www.austlii.edu.au/au/legis/nsw/consol_act/tsca1995323/

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Legislation Cited

The following were the relevant instruments cited in this policy when it was finalised on 8th September 2014. It is not a comprehensive list and may change over time as legislation is reviewed and amended.

Environmental Planning and Assessment Act 1979

Local Government Act NSW 1993

National Parks and Wildlife Act NSW 1974

Native Vegetation Act NSW 2003

Rural Fires Act NSW 1997

Rural Fires Regulation NSW 2008

State Planning Policy No. 14- Coastal Wetlands NSW

State Planning Policy No. 19- Bushland In Urban Areas NSW

State Planning Policy No. 26- Littoral Rainforest

State Planning Policy No. 44- Koala Habitat Protection NSW

Threatened Species Conservation Act NSW 1995