Office of Environment & Heritage
NSW National Parks & Wildlife Service

Fire Management Manual 2012-2013

Policy and Procedures for Fire Management

Office of Environment and Heritage NSW

DISCLAIMER: This Manual contains policies, guidelines and protocols which may be subject to change. Strict compliance with the Manual may not be possible for operational reasons in emergencies or under other unforseen circumstances. Members of the public should not rely on this Manual as evidence of the procedure NPWS as part of OEH will follow in such circumstances.

Abbreviations used in the Fire Management Manual

The following abbreviations are used throughout the Manual:

AFAC	Australasian Fire Authorities Council
AIIMS	Australasian Inter-service Incident Management System
AMS	Asset Maintenance System
APZ	asset protection zone
ARG	Aviation Reference Group
AS	Australian Standard
BDO	Branch Duty Officer
BFCC	NSW Bush Fire Coordinating Committee
BFMC	district Bush Fire Management Committee
BFRMP	Bushfire Risk Management Plan
BIP	Branch Incident Procedures
BOM	Bureau of Meteorology
Branch PaCS	Branch planning and coordination section
BRIMS	Bushfire Risk Information Management System
CASA	Civil Aviation Safety Authority
CRC	Cooperative Research Centre
DECCW	Department of Environment, Climate Change and Water > now OEH
DO	Duty Officer
EDPM	Executive Director Park Management Division
FEZ	fire exclusion zone
FFDI	Forest Fire Danger Index
FIMS	Fire Incident Management Section (previously the Fire Management Unit), comprises Policy and Planning Unit, Operations Unit and Flight Operations Unit
FMAC	Fire Management Advisory Committee
FMC	fire management circular
FNSW	Forests NSW
FOU	Flight Operations Unit
FTAG	Fire Training Advisory Group
GIS	geographic information system
GVM	gross vehicle mass
IAP	incident action plan
IMS	Incident Management System (see AIIMS)
ICON	Incident Control Online (RFS database)
IMT	Incident Management Team
IMX	Incident Management Exercise
JSA	job safety assessment
KBDI	Keetch-Byram Drought Index
L&D	Learning & Development Section
LMZ	land management zone
MoU	Memorandum of Understanding
NPWS	National Parks and Wildlife Service
OEH	Office of Environment and Heritage (formerly the Department of Environment, Climate Change and Water)
OOA	out of area
PPE	personal protective equipment
PWDG	Parks and Wildlife Directors Group
RAF	remote area firefighter
RDO	Regional Duty Officer
RFMS	Reserve Fire Management Strategies
RFS	NSW Rural Fire Service
RIP	Regional Incident Procedures
SELCALL	Selective calling
SES	State Emergency Service
SFAZ	strategic fire advantage zone
SIP	State Incident Procedures/Plan
Sitreps	situation reports
SMEACS	Situation Mission Execution Administration Command/Communication Safety
SOP/s	standard operating procedure/s
SDO	State Duty Officer
TBA	task based assessment
TOBAN	total fire ban

Office of Environment and Heritage, Premiers NSW: 59-61 Goulburn Street, PO Box A290 Sydney South 1232

Phone: (02) 9995 5000 (switchboard) Phone: 1300 361 967 (national parks information and publications requests)
Fax: (02) 9995 5999
TTY: (02) 9211 4723
Email: info@environment.nsw.gov.au Website: www.environment.nsw.gov.au

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Contents

Introduction

The NSW National Parks and Wildlife Service (NPWS) manages about 10% of the land area of NSW. Much of this estate is remote from access infrastructure, and the most rugged and bushfire-prone country in south-eastern Australia. These areas have been reserved to conserve their natural and cultural values, including their biodiversity, landscapes, Aboriginal sites, historic structures and recreational settings.

The NPWS, part of the Office of Environment and Heritage (OEH), Department of Premier and Cabinet recognises fire as a natural and recurring factor shaping the NSW environment. NPWS also acknowledges that altered fire regimes may pose a significant threat to human life, property and other values including biodiversity, cultural heritage and tourism, and that the onset of climate change may exacerbate these risks.

Fire management is one of the most important tasks in managing protected areas. Under the *Rural Fires Act 1997*, NPWS is a fire authority and is responsible for managing fire on all lands under its control. This includes detecting and suppressing fires and implementing risk management programs to protect life and property from fires. NPWS also assists with suppressing fires on adjacent lands, as may be required under plans prepared under the *Rural Fires Act 1997*. Cooperative arrangements are derived from the NSW Bush Fire Coordinating Committee (BFCC) and implemented through district Bush Fire Management Committees (BFMCs).

NPWS believes that fire management planning must be fully integrated with other aspects of protected area management, and integrated with fire management planning on adjacent land as well as fire management planning undertaken at the landscape level by the BFCC and BFMCs.

This manual details the policies and procedures for all fire management planning and fire operations on lands reserved under the *National Parks and Wildlife Act 1974* and any land managed by NPWS on behalf of the Minister for the Environment.

Introduction

About the Fire Management Manual

1 The *Fire Management Manual* ('the Manual') brings together the policy and procedural information necessary for NPWS to achieve its fire management objectives. The Manual provides guidelines for staff and also strengthens the organisation's ability to work cooperatively with other fire authorities, emergency services and the community.

2 The Manual:

- is the basis for consistent application of fire management legislation, policy and procedures on NPWS-managed land across NSW,
- is an integral component of a range of measures established to ensure the conservation of natural and cultural heritage, and
- outlines operational procedures to ensure that staff, the public and stakeholders are protected from fire.

3 In recognition of the need for a more integrated approach to fire management, the Manual addresses the full spectrum of fire-related activities, including:

- **prevention** of unplanned fire (including the prescribed use of fire and other mitigation activities to achieve specific management objectives)
- **preparedness** measures to ensure an appropriate response to fire
- **response** procedures to control fire in a safe and efficient manner, and
- **recovery** programs to mitigate the undesirable impacts of fire and fire suppression activities.

Application of the Fire Management Manual

4 The Manual applies as follows:

- The policies and procedures apply to all lands reserved under the *National Parks and Wildlife Act 1974* and any lands managed on behalf of the Minister for Environment within NSW.
- Relevant operational procedures apply to all contractors and agents working on behalf of NPWS within parks, and to all NPWS staff and volunteers operating within parks and, where assisting with fire management, off-park.
- The policies and procedures apply to bushfire and prescribed burning operations.

Relationship to legislation and other policies

5 The Manual is prepared with reference to relevant NSW and Federal legislation detailed in section 9.5 Relevant legislation.

6 The Manual relates to other policies and procedures:

- It should be read in conjunction with other policies, staff circulars and procedure manuals, including *Park Management Policies*, the *OH&S Risk Management System* and *Hazard Specific Policies and Guidelines*. These are referenced throughout.
- Key NPWS fire management policies will be incorporated into relevant BFMC bushfire risk management plans and plans of operations.
- NPWS fire management policy will be guided by the Bush Fire Coordinating Committee and Australasian Fire Authorities Council (AFAC) policy guidelines (see sections 9.1 AFAC Guidelines and 9.3 NSW BFCC policies).

Reviewing the Fire Management Manual

7 The Manual is reviewed regularly.

- The National Parks and Wildlife Advisory Council, the Bush Fire Coordinating Committee (BFCC), relevant bushfire authorities and identified key stakeholders are invited to view and comment on recommended policy amendments.
- NPWS continues to seek input and advice from relevant stakeholders, the community and park neighbours to ensure that policies and procedures benefit the community and do not compromise primary natural and cultural heritage conservation outcomes.

Table 1: Fire Management Manual review and approval process

Date	Action
March	Regional debriefs collated by Branch and provided to Fire Incident Management Section (FIMS)
April	Debriefs compiled by FIMS and circulated with recommendations and comments to Fire Management Advisory Committee (FMAC)
May	FMAC meets and finalises proposed amendments
July	Draft FMM circulated to FISC and PWDG before final approval

Access to the Fire Management Manual

8 Access to the Manual is as follows:

- A ‘control’ copy of the Manual is kept on the intranet.
- A copy of the manual is available in each Parks and Wildlife Group workplace.
- The public has access to the Manual on the Office of Environment and Heritage website.

The Fire and Incident Management Section (FIMS) posts the Manual on the intranet and the public website and is responsible for notifying staff.

Changes since 2011-2012

Changes to the Manual

The 2011-2012 Fire Management Manual was comprehensively reviewed in March 2012 by the Fire and Incident Management Section (FIMS) and the Fire Management Advisory Committee (FMAC).

Content changes include:

- **1.5.3 Key Performance Indicators** – statement that the KPIs are included in Living with Fire in NSW Parks Strategy has been removed and replaced with the EBMP Implementation Plan and Monitoring Plan.
- **2.1.5 Fire Management Zones** – Table 2 KPIs have been adjusted to reflect the EBMP Implementation and Monitoring Plans. SFAZ KPI wording has been amended for clarity.
- **2.1.7 Reserve Fire Management Strategies** –
  - Guidelines for producing hard copies of RFMS have been included stating that; RFMS will remain as live documents that change with each fire season. It is therefore not a requirement to produce revised hardcopies of RFMS (unless it is a new reserve). Relevant information, including zones, roads, operational management guidelines etc, should be kept up to date electronically on the specified GIS layers so that a current RFMS can be produced when required. When major changes to an RFMS have occurred, a new RFMS should be created for approval and the electronic copy on the OEH website must be replaced.
  - Information has been included to be considered when preparing RFMS regarding the use of retardants, gels and foams to combat wildfires in areas that contain threatened species, are highly susceptible to invasive weed species or have cultural heritage conservation issues, with a link to 4.12.2 Policies for fire suppression chemicals.
- **2.1.10 Type 3 Fire Management Strategies** – has been changed to state that Type 2 maps that accompany a Type 3 strategy are considered internal working documents, however they will still need to be publicly exhibited and placed on the public website. Formerly did not have to be publicly exhibited or on the website.
- **2.8.2 Developing a Prescribed Burn Plan –**
  - Instructions have been included on assigning a Burn Incident Controller.
  - Figure 3 has been amended to include steps for recording of information in AMS.
- **2.8.5 Notifications for Prescribed Burns** – Hyperlinks have been added to the RFS Late Hazard Reduction Advisory regional mailboxes.
- **2.13.1 Background Reporting and Documentation for Fuel Management** –
  - Policy 354 has been changed to state all prescribed burning must be entered in the OEH Fire Geodatabase to ensure currency of records. Formerly stated ‘all fuel management activities’ which was incorrect as mechanical treatments are not entered into the Fire Geodatabase.
  - A policy has been added stating that all hazard reduction activities, including prescribed burns and mechanical works, must be recorded in AMS as per the Bushfire Hazard Reduction Activities in AMS User Guide.

Changes since 2010-2011

- **2.13.2 Bushfire Risk Information Management System (BRIMS)** –
  - Reference to the BRIMS User Manual (BUM) has been moved to the top of the section due to its priority.
  - All hazard reduction proposals should be entered into BRIMS by 31 March of each year. Formerly stated by 1 July.
  - Policy on using BRIMS to generate HRCs has been amended to include the option for Regional Managers to delegate approval of final hazard reduction certificates to Area Managers, if no changes have been made to the approved draft.
- **3.1.2 Preparedness Policies** – "Before the bushfire danger period" has been extended to state that the AMS cyclic maintenance program will be loaded for pre-season fire equipment checks, and that regional managers will certify and sign off that all pre-season preparedness activities are complete and file within the region.
- **3.2.1 Communications Equipment, Background** – the examples of communications systems in brackets have been deleted to avoid confusion.
- **3.3.2 Weather Information Policies** – Has been updated to state that FIMS are responsible for advising each Branch and Regional office of fire weather warnings and total fire bans only. In the past FIMS has also distributed severe weather warnings. Fax has been deleted as a method of distributing warnings.
- **3.4.2 Fire Bans and Closure Policies** – Has been amended to include hyperlink to contact details for the State Duty Officer for after hours emergency updates to the public website for park closures or bans that cover one or more regions.
- **3.6.2 NPWS Personnel –**
  - Has been amended to state that all staff are to undertake a physical check of PPE before or at an annual fire preparedness day to ensure they have been issued with all the current approved PPE, this is to be signed off at the fire preparedness day.
  - Now states all standard issue PPE worn on the fire ground will be fire resistant and certified to Australian Standards. All clothing (other than standard issue PPE) worn on the fire ground, including undergarments, should be ideally made from natural fibres. Formerly referred to 'clothing' instead of 'standard issue PPE'.
- **3.7.3 Competency and Currency –**
  - Has been amended to state that at annual fire preparedness days, all staff will present their Fire Incident Field Guide to a unit manager or above for verification". Formerly stated verification must be by a trained assessor.
  - Crew Leader competency has been amended replacing the PUAOPE001B 'Supervise response' unit with PUAOPE012A 'Control a level 1 Incident".
  - Sector Commander information has been incorporated with Divisional Commander competency and currency policies.
  - Prescribed Burn – Incident Controller competency has been renamed "Burn Incident Controller".
  - Situation Officer competency and currency information added.
  - Incident Controller Major Incident competency and currency information added.
- **4.3.5 Establishing an IMT and Span of Control** – To avoid confusion, a note has been added to Figure 6 – AIIMS Structure, to direct the reader to Figure 8 for a clearer diagram on IMS aircraft unit structure.
- **4.5.1 IAP Policies –** Policy 754 has been amended to state that if ICON is not used to generate an IAP, the BFCC approved forms must be used with a link to IAP forms on E-hub.

Changes since 2011-2012

- **4.8.2 Policies for Remote Area Deployment –**
  - Policy 814 has been amended to state that the Joint Operational Protocol for Remote Area Firefighting replaces all previous policies regarding remote area firefighting and operations, and covers the generic requirements NPWS and the NSW RFS will operate under, whether during single agency or multi-agency remote operations.
  - Policy 815 now states: Decisions to engage in firefighting or prescribed burning in remote locations will be based on the risk relating to the potential of the fire to have significant impacts on the community, local economies or the environment. The guide these decisions a RAFT Rick Analysis for Incident Controllers is contained in the appendix to the Joint Operational Protocol for Remote Area Firefighting.
- **4.14.2 Reports on New Fires** – Figure 9 Fire reporting flowchart has been deleted and replaced with the Incident Notification Procedures flowchart, approved by PWDG in February 2012.
- **4.14.3 Incident Control Online (ICON)** –
  - Policy 987 has been amended to that ICON *must* be used to record details of all fire, formerly 'should'.
  - Policy 994 has been amended to reflect the Sitrep frequency requirements for 'Emergency Warning', 'Watch and Act', and 'Advice' level incidents.
- **4.14.4 Fire History** – Policy 997 has been changed to state "All burnt areas must be mapped using MapDesk, and the areas entered into Fire Geodatabase by the end of the fire season". Formerly mentioned the incident database.
- **7.1.1 Essential Vehicle Equipment –**
  - VRN policy amended to include the use of white characters for vehicles with a black roof.
  - Dot point amended to include that vehicles must be fitted with vehicle recovery equipment (i.e. chassis mount winch, snatch strap, tree guards, block and shackles) appropriate to its GVM, however for single and dual cab light four wheel drives a winch is optional and if deployed on a fire ground without a winch a risk assessment must be performed to assess suitability, and
- **7.2.1 Schedule 1: Personal Firefighting Equipment –** Helmet details have been changed to include that helmets must be white with red 'NPWS".
- **10.1 Definitions –** Duplicate definition of fire ground has been deleted. Remaining fire ground definition is "The area in the vicinity of fire management operations, and the area immediately threatened by the fire. It includes burning and burnt areas; constructed and proposed fire lines; the area where firefighters, vehicles, machinery and equipment are located when deployed; roads and access points under traffic management control; tracks and facilities in the area surrounding the actual fire; and may extend to adjoining areas directly threatened by the fire" as per the AFAC glossary.
- **References –** the reference to OFH 4th Edition 2010 has been replaced with OFH 3rd Edition 1999.

1.0 Fire management framework

Section 1.0 contents

1.1 Fire management objectives

1.1.1 Primary fire management objectives

9 Under the *Rural Fires Act 1997* NPWS has a statutory obligation to protect life and property.

Under the *National Parks and Wildlife Act 1974* NPWS has legislative responsibility for the protection of all Aboriginal heritage in NSW, for cultural heritage on NPWS-managed lands, and for the protection of all flora and fauna in NSW.

See section 9.5 Relevant legislation.

10 **NPWS primary fire management objectives are to:**

- **protect life, property and community assets from the adverse impacts of fire**
- **develop and implement cooperative and coordinated fire management arrangements with other fire authorities, reserve neighbours and the community**
- **manage fire regimes within reserves to maintain and enhance biodiversity**
- **protect Aboriginal sites and places, historic places and culturally significant features known to exist within NSW from damage by fire, and**
- **assist other fire agencies, land management authorities and landholders in developing fire management practices that contribute to conserving biodiversity and cultural heritage across the landscape.**

1.0 Fire management framework

1.1.2 Cooperative fire management

11 NPWS has cooperative firefighting arrangements which have been ratified through multi-agency policies and Memorandums of Understanding (MOU).

NPWS fire management is integrated with fire management and disaster planning at agency, state and national level via cooperative fire management arrangements with several agencies including:

- **Australasian Fire and Emergency Service Authorities Council** (AFAC): is a national body. NPWS is represented on a number of AFAC subcommittees (see section 9.1 AFAC Guidelines).
- **Forest Fire Management Group** (FFMG): reports to the Forestry and Forest Products Committee and provides a forum for discussion and a centre of expertise on forest fire management and control and facilitates interstates and international liaison and consultation between fire controllers and managers. NPWS is a member of the FFMG.
- **Bushfire Cooperative Research Centre** (Bushfire CRC): undertakes national research into aspects of fire suppression, planning and impacts. The resulting information is essential for increasing efficiency and effectiveness of fire management. NPWS is a Bushfire CRC partner.
- **NSW State Disaster Plan** (NSW DisPlan): NPWS is a support agency under the NSW DisPlan.
- **Cross-border liaison committees**: Coordinated arrangements are prepared with interstate fire authorities where a fire-prone reserve is located on the NSW border. Cross-border liaison committees have been established to regularly review these arrangements. NPWS is represented on the Victorian and Queensland committees.
- **NSW Bush Fire Coordinating Committee** (BFCC): sets strategic multi-agency state-wide policy for fire planning and suppression operations. NPWS is represented on the BFCC, and the Executive assists the BFCC to develop, implement and review the State Bushfire Plan and state-wide cooperative fire management policies and procedures.
- **NSW bushfire management committees** (BFMCs): are established under s. 50 of the *Rural Fires Act 1997* to develop and coordinate fire management between fire authorities. Membership extends to all fire authorities and other organisations with a role in bushfire management. NPWS is represented on all but two of the 72 BFMCs in NSW.

  BFMCs are responsible for developing and fostering coordinated firefighting arrangements and the reduction of bushfire hazards. They develop joint management plans ('bushfire management committee risk management plans'), which consist of a plan of operations to coordinate firefighting resources and risk management plans to reduce bushfire hazards.
- **District and Local Emergency Management Committees** (DEMC and LEMC): NPWS is a support agency under DEMC and LEMC Plans.
- **Park neighbours**: NPWS encourages and maintains cooperative arrangements with park neighbours. Arrangements are made at Regional level and may include cooperative synchronised prescribed burning, Asset Protection Zone management agreements and community awareness and education programs.

1.1.3 Conserving biodiversity

12 The *NSW Biodiversity Strategy* (2010-2015; currently in draft) adopts a collaborative approach to biodiversity conservation. The Strategy identifies key themes that will contribute to building ecosystems that are healthy and resilient.

13 The Strategy recognises that climate change is likely to exacerbate many other existing threats to ecosystem function, including changing fire regimes and targets this issue through objectives and actions:

- Objective 8: Actively and effectively manage the terrestrial reserve system and marine protected areas as part of a broader landscape – including undertaking reserve management on a partnership basis with surrounding landholders and the community, particularly in the critical areas of pest, weed and fire management
- Objective 10: Effectively manage and control threats through cooperative partnerships with key stakeholders – including ongoing research into appropriate fire management strategies and the incorporation of research outcomes into fire management planning

14 Fire management within NPWS-managed lands is crucial to the conservation of biodiversity in the NSW landscape. NPWS will promote biodiversity conservation as a major objective of fire management and will provide advice to and cooperate with other land managers and fire services in this regard.

15 The principal goal of NPWS fire management for biodiversity conservation is to avoid the extinction of species that occur naturally within its reserves. This entails avoiding disruption to ecosystem processes that may be associated with the decline and loss of native species. Individual plant and animal species require particular fire regimes for their long-term survival. Such requirements may vary within the ecological and geographic range of species.

16 The dynamic nature of natural ecosystems necessitates an adaptive approach to fire management. All fire management planning adopted by NPWS will be based around this premise.

17 The major mechanisms through which NPWS conserves biodiversity in relation to fire management are:

- incorporating adaptive management into reserve fire management planning and recovery planning processes
- collaborating in research activities, and
- participating in BFMCs and joint agency fire management committees.

1.1.4 Conserving cultural heritage

18 NPWS is responsible for aspects of protecting cultural heritage within the NSW landscape. In conserving cultural heritage, NPWS is committed to management principles consistent with relevant NPWS policies and procedures and also the guidelines contained within the *Burra Charter*. NPWS is also committed to working in partnership with Aboriginal people in the protection of Aboriginal heritage.

19 The major mechanisms through which NPWS protects cultural heritage in relation to fire management are:

- incorporating cultural heritage considerations in reserve fire management planning
- participating in BFMCs and joint agency fire management committees
- providing advice to other fire authorities, land management authorities and landholders in developing fire management practices to conserve cultural heritage across the landscape
- preparing post-fire rehabilitation plans that identify requirements to protect and preserve cultural heritage from fire-related impacts.

1.0 Fire management framework

1.2 Risk management

1.2.1 Background

20 NPWS confronts an array of risks related to fire management. These risks occur during planned and unplanned fire events. They can be divided into 5 major areas of responsibility:

- people – ensuring the health, safety and welfare of park visitors and all persons involved in fire management (both NPWS staff and others)
- environment and heritage – conserving natural and cultural heritage values
- community – ensuring cooperation with the public, stakeholders, NSW Government, regulatory authorities and other fire management authorities
- administration and finance – using resources cost effectively and ensuring financial accountability in its fire management activities
- compliance – ensuring fire management and suppression activities comply with all statutory and contractual obligations.

21 NPWS adopts a risk management approach throughout its fire operations. This approach is based on the Australian Standard on Risk Management (AS/NZS ISO 31000:2009). Applying a risk management approach to fire management is intended to minimise the negative impact of planned and unplanned fire. Risk minimisation underpins the majority of policies in this Manual.

Successful risk management requires a structured approach and needs to be considered at all levels of an organisation. The agency has adopted an *OHS Management System* and has committed itself to the use of risk management throughout the organisation. All fire management activities are conducted in a manner consistent with this approach.

Introducing a risk-based approach to NPWS fire management required implementing a tested risk management process. An accepted and tested Australian standard process developed by Standards Australia in 2004 (*AS/NZS: 4360*) and superseded by AS/NZA ISO 31000 in 2009, has been adopted for use in the NPWS fire management context.

NPWS adopts a risk management approach throughout its fire operations. The preparation of this Manual, and related policies and plans, is done in accordance with this approach.

1.2.2 Risks to people

22 The risk NPWS faces in relation to the health and safety of staff and visitors is the potential for injury (physical or psychological) or death.

23 The control mechanisms used to minimise this risk are the development of planning and procedural documentation for prevention, preparedness, response and recovery. The procedures detailed in this Manual are followed during decision making for fire events.

24 Risk controls relating to safety include the use of assessed and approved equipment, the Australasian Inter-service Incident Management System (AIIMS), Incident Management System (IMS), preparation and compliance with individual burn plans for prescribed burning, incident action plans (IAPs) for bushfire suppression, appropriate training and competencies for all personnel involved in fire events, and incident debriefing and counselling.

25 Individual staff members are responsible for their personal safety during all fire management activities. While diligence is carried out in the planning and procedural stages of fire management, each staff member's own decisions must also ensure personal safety in all aspects of their conduct.

26 Each staff member is required to take responsibility as a partner for other staff members' safety during all fire management operations.

27 All supervisors have additional and collective responsibilities above those of an individual. They should be trained and experienced in the role of a team leader to enable them to effectively undertake that role.

28 Fire management will be undertaken in a manner that will ensure the health, safety and welfare of all people.

- Staff will be appropriately trained, equipped and experienced to undertake the functions or roles required of them in fire management.
- The safety of park visitors, neighbouring communities, contractors and other firefighters involved in cooperative fire management operations will be ensured.

1.2.3 Risks to natural and cultural heritage

29 The protection and conservation of natural and cultural heritage values is one of the agency's key deliverables under its corporate plan.

30 The risk NPWS faces in relation to fire management in the context of natural and cultural heritage conservation is from the introduction (deliberate or not) of inappropriate fire regimes. This may cause the loss of, or an impact upon, natural or cultural heritage values. To counter this risk, NPWS identifies priority areas for specific fire management strategies and applies those strategies.

31 Natural and cultural heritage values are recognised in the preparation, implementation and monitoring of NPWS reserve fire management strategies (RFMS). These strategies detail appropriate fire regimes for specific areas of NPWS-managed lands.

32 Fire management is undertaken in such a way as to minimise pollution events associated with fire.

1.2.4 Risks to the community

33 The risk NPWS faces in relation to the community is disruption of economic activity or social structure and fabric as well as a loss of confidence in NPWS management objectives.

34 NPWS fire management is undertaken to ensure continued support for all aspects of its management through public and stakeholder input, by meeting regulatory requirements and by complying with NSW Government statutory requirements.

35 NPWS fire management is undertaken to ensure cooperation with neighbours and to minimise the impact of bushfire on private and public assets including impacts on community assets and businesses.

1.2.5 Risks to administration and finance

36 The risk NPWS faces in relation to administration and finance is an excessive level of expenditure in suppression activities. These issues are managed at 2 levels:

- Fire management operations follow the procedures established in the *Finance Manual*. These procedures are in addition to those prepared by the BFCC for management of Section 44 fires.

- At a fire event the Incident Controller has authority and responsibility, within delegation limits, for all aspects of managing the fire event and also has financial accountability for expenditure associated with the fire event.

37 Placing financial accountability in the hands of the Incident Controllers is aimed at providing controllers with the incentive to manage their resources in a cost-effective manner. Section 6.1.2 Policies for finance and insurance has more information on Incident Controllers' financial delegations.

1.3 OH&S (safety and welfare)

1.3.1 Background

38 Both OEH (as a corporate entity) and all OEH staff are responsible for maintaining a safe workplace and safe work practices.

- The safety of firefighters is always the primary consideration during fire operations.
- NPWS deploys its employees in fire management activities in accordance with their training, fitness and experience.

1.3.2 OHS policies

39 NPWS and all staff will take all practical measures to ensure the safety, health and welfare of all personnel involved in fire management activities in accordance with the *OH&S Risk Management System*, *Hazard Specific Policies and Guidelines*, *Park Management Policies* and BFCC Policy 3/2000 'Coordinated Firefighting Operations Health and Safety',

40 All firefighters will be competent and equipped to safely engage in fire management activities.

41 NPWS will at all levels meet its obligations under the *Occupational Health and Safety Act 2000* and associated regulations.

42 NPWS recognises the importance of fatigue management for both fire ground and Incident Management Team (IMT) personnel in maintaining a safe workplace.

43 Critical incident support processes will be initiated immediately on the report of a critical incident.

1.3.3 OHS procedures

44 Safety and the protection of human life is the first priority in fire management operations and the primary consideration at all times, followed by protection of community and heritage assets. These priorities will be the basis for determining fire management objectives, strategies and tactics.

- Objectives, strategies and tactics must be adopted only after assessment of their safety and risk implications.
- The Incident Controller has the overall responsibility for the safety of fire-fighting personnel, but all officers in a supervisory capacity are responsible for those under their supervision.
- All incident personnel have the responsibility to ensure that their work is carried out in accordance with safe practice and NPWS policy and instructions to ensure their own and others' safety.

1.0 Fire management framework

Standard operating procedures

45 All safe work practices and standard operating procedures (SOPs) should be adopted when planning and conducting fire management operations (prescribed burns or fire suppression operations).

Safety incidents (hazards, accidents and near misses)

46 A process of hazard identification, risk assessment and control will be implemented in all NPWS workplaces in accordance with the procedures in the OHS Risk Management System (*Section 4. Managing Hazards and Associated Risks*).

47 All safety incidents that occur during fire management activities, including safety incidents involving aircraft operations, must be reported to the immediate supervisor and Incident Controller using the *First Report* page of the *Fire Incident Reporting Booklet* in accordance with the OHS Risk Management System (*Section 5. Safety Incident Management, Reporting & Investigation*).

48 The Incident Controller will report all safety incidents to the Regional Manager and the Manager OHS Section and all safety incidents will be investigated as per the procedures in the OHS Risk Management System (*Section 5*).

49 All safety incidents will be reported via the agency's web based OHS system – WorkSafeOnline (WSO). Safety incidents should be reported using hazard type/incident sub type 'bushfire or aviation related', this will ensure an automatic notification to the Manager OHS, Manager FIMS, and Manager FOU, as well as the staff member's supervisor.

50 Reports of serious injuries, fatalities and property damage should be made immediately by the Incident Controller or Senior NPWS officer to the Regional Manager, Branch Director and DCE PWG. Notification should also be given to FIMS and Public Affairs Branch as appropriate.

51 During inter-agency or out-of-area activities, safety incidents shall be reported to the Incident Controller and to the employee's workplace of origin.

52 The DCE PWG will ensure that appropriate interagency notifications have been conducted and that appropriate welfare actions have been initiated.

53 The Manager OHS Section shall notify WorkCover in the case of serious incidents or fatalities.

54 Where a safety incident involves aircraft operations the Incident Controller or Officer In Charge should inform the State Air Desk, as per the Interagency Bushfire Aviation Standard Operating Procedures (1.1.6 Incident and Accident Reporting) and an investigation will be conducted (as per 1.1.7 Incident and Accident Investigation).

55 The Manager FOU will be responsible for reporting safety incidents that involve aircraft operations to the relevant authorities and initiating an investigation as per the Aviation Safety Management System.

56 Where a safety incident occurs during a Class 3 (s44) fire, the incident is to be reported via both reporting systems; the agency's OHS Risk Management System and Aviations Safety Management System, and the Interagency Bushfire Aviation Standard Operating Procedures.

57 Safety incident investigation outcomes will be communicated to relevant affected staff as a soon as practical, including those incidents occurring during interagency operations where NPWS is not the primary investigator.

1.0 Fire management framework

1.4 Governance (policy development & working groups)

1.4.1 Background

58 Strategic policy is produced at a number of levels within the agency. This section of the Manual outlines the relationships between the different working groups and structures within OEH and the role they play in this process.

59 Organised working groups with defined terms of reference are critical to the process of decision making and fire policy development. This section outlines the criteria for the formation, funding and reporting arrangements for working groups engaged in fire management issues.

60 NPWS continues to engage staff from a wide range of technical backgrounds and geographical locations in the formulation of fire policy.

61 The development and approval of fire policy follows the process outlined below to ensure it is integrated and consistent with other NPWS, legislative and interagency policy positions.

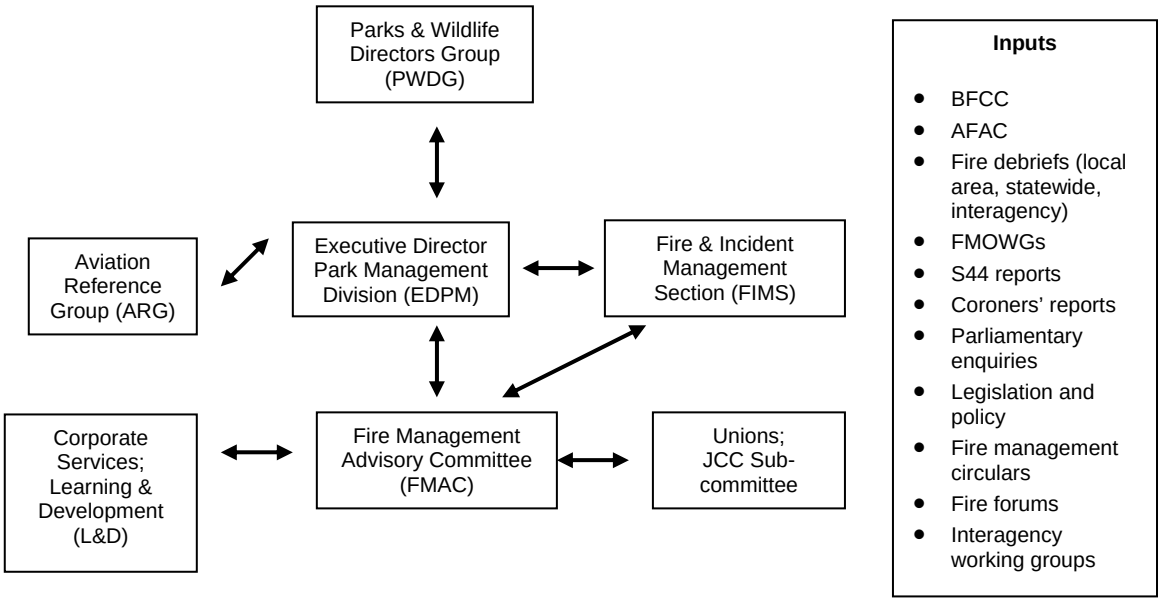
1.4.2 Fire policy review process

62 Reviewing policies and procedures is an ongoing process to ensure that fire management practice is consistent with legislation and other NPWS policies.

- NPWS reports on fire management performance annually and makes recommendations on the currency of policies and procedures within the Manual.
- FIMS is responsible for coordinating, preparing and reviewing fire management policies and procedures in consultation with all NPWS Branches and other agencies (see section 1.1.2 Cooperative fire management).
- The Manager FIMS initiates policy development processes where necessary and seeks input from FMAC, Branches, Executive Director Park Management and the BFCC.
- FIMS annually compiles and reviews fire and seasonal debrief recommendations and comments from staff at the strategic level and considers them for inclusion in the Manual.
- Upgrades to the Manual are made annually by FIMS via FMAC. Changes may also be made in response to other circumstances, such as coronial findings or changes to relevant legislation.
- The Parks and Wildlife Group Executive consider, and, where appropriate, endorse any recommendations for changes to fire management policy and procedures.
- The process for debriefing, drafting, reviewing, commenting and finalising is shown in Figure 1.

1.0 Fire management framework

Figure 1: Decision making and fire policy development



1.4.3 Interim policies

63 Interim fire management policies are set out in fire management circulars (FMCs).

- An updated list of the status of fire management circulars is contained in section 9.4 Fire management circulars and memos.
- Circulars issued throughout the year remain current until the annual review of the Manual when they may be incorporated into the Manual as policy.

1.4.4 Working groups

64 Fire working groups are committees or short-term groups devised to work on projects that require specific focus or specialist input, and usually include representatives from the three Branches and Southern Ranges Region.

Current working groups are the:

- **Fire Management Advisory Committee** (FMAC): provides advice to PWDG via the EDPM on fire management policy, procedures and other related issues and formulates and reviews policy positions for inclusion in the Manual. For more information refer to the FMAC Terms of Reference.
- **Aviation Reference Group** (ARG): provides advice to PWDG via the EDPM on priorities relating to aviation use and efficient and effective resource use and response requirements. For more information refer to the ARG Terms of Reference.

65 The Manager FIMS is responsible for coordinating FMAC and all fire related working groups convened under FIMS.

1.0 Fire management framework

1.5 Measuring performance

1.5.1 Background

66 Performance measurement is the process of quantitatively or qualitatively assessing the degree to which objectives have been achieved. Performance measurement allows scrutiny of efficiency, effectiveness, financial efficiency and benchmarking.

67 Benchmarking is a systematic process through which an agency compares its performance with alternatives. It tests an agency's functions, particularly the efficiency and price of outputs, against a standardised function or set of achievements. The objective of benchmarking is to introduce and sustain best practice by making valid comparisons with other processes or organisations, resulting in a continual improvement of activities.

68 The establishment of a national standard for fire performance reporting was recognised as a high priority within the COAG National Bushfire Inquiry Report (2004) and the Inquiry recommended (Recommendation 13.1): *that the states and territories agree to a common set of national bushfire indicators of good practice, based on the five mitigation and management factors it has identified—the 5Rs. These indicators, together with an assessment against the proposed national bushfire principles, would provide a consistent framework for review and reporting in each state and territory.*

69 AFACs Rural and Land Management Group commenced the process of building a national guideline for fire performance reporting in 2008. A standard set of performance measures has been developed and an implementation plan to roll out measures of this standard set is proposed for 2011.

70 NSW fire authorities do not currently have a standardised approach to fire performance reporting. However, the BFCC is developing fire performance measures for inclusion within the revised District Bushfire Risk Management Plans. These measures are expected to follow the AFAC standard referred to above.

1.5.2 Performance indicator policies

71 NPWS will develop performance measures to quantitatively and qualitatively assess the degree to which its fire management objectives have been achieved.

72 Performance measures should measure the efficiency and effectiveness of fire management and response activities and are to be consistent with existing reporting requirements.

73 The development of performance measures will rely on best practice research and technology from both within Australia and overseas to establish benchmarks.

1.5.3 Key performance indicators

74 NPWS has identified fire management performance measures and targets to guide hazard reduction activities, fire response, and biodiversity and cultural heritage conservation.. These key performance indicators (KPIs), included in the Enhanced Bushfire Management Program (EBMP) Implementation Plan and Monitoring Plan. follow key fire themes and reflect current fire management objectives.

2.0 Prevention and planning

Section 2.0 contents

2.0 Prevention and planning

2.1 Fire management planning

2.1.1 Background

75 Fire management planning assists in defining the strategies and actions to be implemented to achieve NPWS primary fire management objectives.

76 NPWS is a member of the BFCC and helps it to develop and review its policies and procedures relating to fire management.

77 NPWS is also a member of BFMCs where it has reserves. Under s. 52 of the *Rural Fires Act 1997* these committees are responsible for the development of bushfire risk management plans and plans of operations across local government areas in NSW. These are cooperative plans and their scope extends to NPWS operations and to the management of fire within parks and reserves. These plans integrate NPWS reserve fire management strategies (RFMS) into a wider multi-agency framework (see Figure 2).

78 NPWS fire management planning is integrated with fire management and disaster planning at agency, state and national level, via cooperative fire management arrangements (see section 1.1.2 Cooperative fire management).

2.1.2 Fire management planning framework

There are 3 tiers of fire management planning within NPWS:

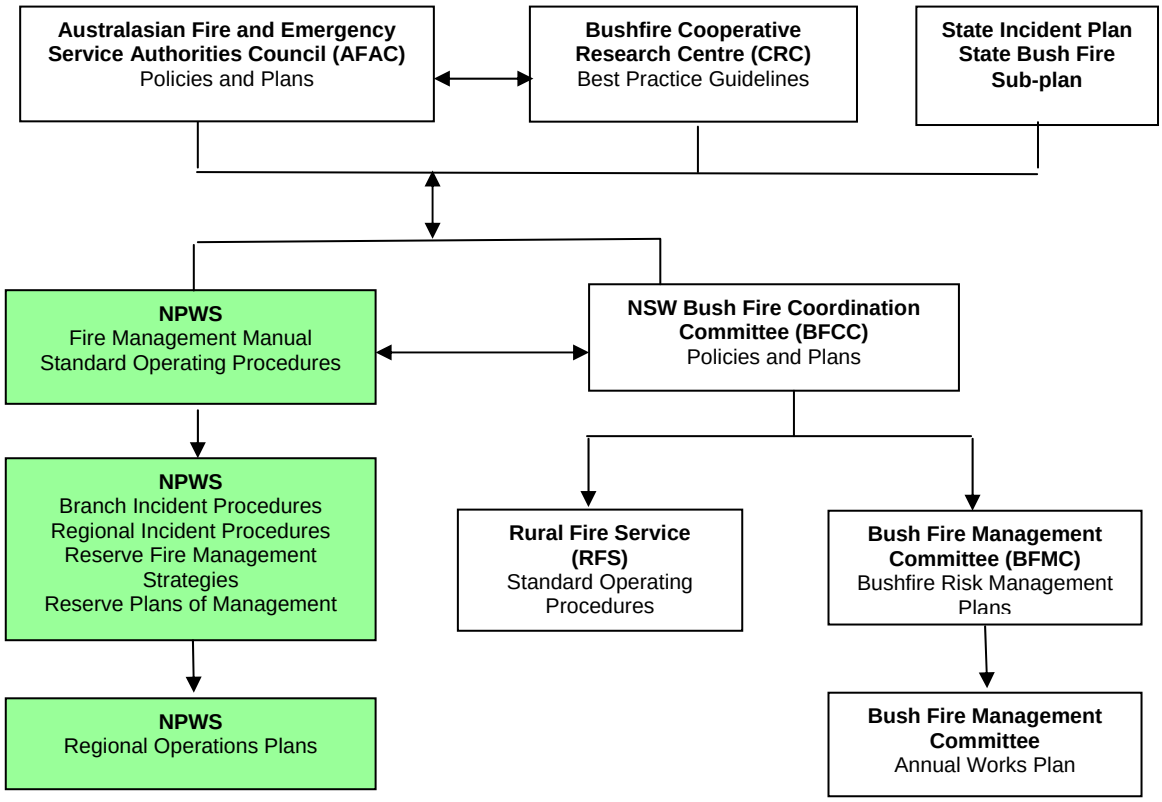
79 **Tier 1: Strategic policy** – provides for consistency within NPWS and coordination between NPWS and other fire and land management authorities. This *Manual* is an example of a state-wide policy which sets the framework for more detailed planning such as NPWS reserve fire management strategies and Branch and Regional operations plans

80 **Tier 2: Reserve fire management strategies** (RFMS) – these define management approaches for either individual or groups of protected areas, consistent with NPWS strategic policy. RFMS are the basis for preparing prescribed burning plans of operations and IAPs as well as Regional operations plans.

81 S. 38 and 44 of the *Rural Fires Act 1997* require any fire control officer and the Commissioner of the NSW RFS, respectively, to take into account 'any relevant plan' of an authority responsible for managed land prior to implementing the powers provided by those sections. In most cases, a RFMS will be such a 'relevant plan' for managing fire within parks and reserves.

82 **Tier 3: Branch and Regional operations plans** – include fire management works programs, which are prepared for the purpose of planning and prioritising the annual implementation of RFMS, and incident procedures, which provide fire suppression information and procedural guidelines. Additionally, a prescribed burn plan or IAP is prepared for each bushfire management operation on NPWS-managed land.

Figure 2: Integrated fire management planning framework



2.1.3 Risk assessment framework

83 NPWS encourages the development of objective systems and tools, including SOPs and job safety assessments, to facilitate risk management approaches to implementing hazard reduction works.

84 All fire management planning and suppression operations will be based on a risk assessment process detailed in section 1.2 Risk management.

Cultural heritage management

85 NSW has a rich cultural heritage that forms an integral part of the contemporary landscape. The landscape encompasses many aspects of Aboriginal heritage, including Aboriginal sites and artefacts, landscapes with physical evidence of Aboriginal cultural practices, natural landforms, sites of spiritual or ceremonial significance and native flora and fauna (totem species, bush foods and medicines).

86 NPWS manages a broad range of cultural heritage including structures, works such as roads, dams, cultural landscapes, modified landscapes and archaeological sites. Cultural heritage often reflects evidence of a shared history between Aboriginal and non-Aboriginal people. This shared history is recognised and recorded by NPWS.

87 NPWS is committed to cultural heritage management principles that are consistent with relevant NPWS policies and procedures, and also the guidelines contained within the *Burra Charter* for

the conservation and protection of cultural heritage. See also 1.1.4 Conserving cultural heritage and 4.2.8 Environmental considerations (Protection of cultural heritage).

88 Where applicable, RFMS will define operational and cultural heritage management guidelines and bushfire management zones that will assist in the protection and conservation of cultural heritage. Information on cultural heritage sites can be obtained from the Aboriginal Heritage Information Management System (AHIMS) and the Historic Heritage Information Management System (HHIMS). Liaison with local Aboriginal communities should also be undertaken.

89 Fire protection equipment will be installed in historic structures in accordance with conservation plans and other code requirements for historic structures.

90 Investigation and further planning to protect and conserve cultural heritage affected by bushfire and fire management activities should be considered in post-fire rehabilitation plans. Post-fire rehabilitation plans will identify requirements to identify, protect and preserve cultural heritage from after-fire impacts.

91 Conditions for access to tenures protecting aboriginal areas and places will be consistent with those specified in section 2.9.6 Access to parks by other fire authorities.

Natural heritage management

92 NPWS acknowledges that fire is an important tool for managing biodiversity and maintaining the health of ecosystems on NPWS-managed lands. The use of fire to maintain vegetation biodiversity, as well as for active weed removal, is encouraged where this does not conflict with NPWSs primary fire management objectives. See also 1.1.3 Conserving biodiversity and 4.2.8 Environmental considerations (Protection of natural heritage).

93 All fire management operations must take into account the protection of natural heritage. Fire management operations, such as prescribed burning, the construction of fire trails and breaks, use of fire suppression chemicals and the use of vehicles and aircraft for suppression activities, may compromise the conservation of native species, communities and the protection of landscape features.

The implementation of fire management operations needs to be evaluated to avoid or minimise adverse impacts on the conservation values of NPWS-managed lands. Features requiring special consideration include:

- vegetation communities and habitats of significance
- threatened species, populations and communities, and areas of critical habitat
- areas with high aesthetic value
- highly erodable areas, and
- scheduled water catchments.

94 RFMS must include a map that identifies important natural heritage features requiring protection. Fire management zones shall reflect the significance of features and include measures to protect them.

95 Management guidelines for each reserve should contain actions to protect important natural heritage. These actions will be reflected in reserve plans of management, RFMS and in the use of appropriate fire management zones. Guidelines should include actions relating to:

- access to and construction of control lines (see section 4.8 Fire control lines)
- use of fire suppression chemicals (see section 4.11 Fire suppression chemicals)
- use of earthmoving equipment (see section 4.9 Earthmoving operations)
- post-fire rehabilitation (see section 5.3 Post-fire rehabilitation)
- prescribed burning (see sections 2.8 Prescribed burn planning and 4.2 Fire response).

96 Regional managers should ensure that the above actions to protect important biodiversity and landscape features on NPWS-managed lands are included in RFMS.

97 Conditions for access to tenures protecting natural heritage (national parks, state conservation areas, nature reserves, water catchments) will be consistent with those specified in section 2.9.6 Access to parks by other fire authorities.

2.1.4 Consultation framework

98 NPWS is committed to involving stakeholders in the management of reserves; consultation is always an important part of any management approach.

Aboriginal co-management of reserves is becoming more prevalent throughout NSW. NPWS will develop policy to assist in protecting cultural heritage in these areas.

99 Regions shall consult with the local Aboriginal community regarding fire management strategies, in order to protect Aboriginal cultural heritage values.

RFMS should be drafted with the involvement of the local Cultural Heritage Officer.

Conditions for access to tenures protecting Aboriginal cultural heritage (Aboriginal areas and Aboriginal sites) will be consistent with those specified in section 2.9.6 Access to parks by other fire authorities.

100 NPWS will liaise with BFMCs to ensure that operational guidelines for natural and cultural heritage protection are included in BFMC Bushfire Risk Management Plans and Plans of Operations.

Fire management zones in BFMC Bushfire Risk Management Plans should identify areas containing recognised natural or cultural heritage values that could be affected by fire.

Operational guidelines for each fire management zone will be designed to reduce any risk of impact.

2.1.5 Fire management zones

101 The BFCC has developed a standard bushfire management zoning system for use by fire authorities across the State (Annex B to BFCC Policy 1/2008 'Bush Fire Risk Management').

102 These zones are designed to identify the fire management intent for a specific area. Four categories of bushfire management zones are identified within this zoning system:

- Asset Protection Zone (APZ)
- Strategic Fire Advantage Zone (SFAZ)
- Land Management Zone (LMZ), and
- Fire Exclusion Zone (FEZ).

103 Although Annex B to BFCC Policy 1/2008 'Bush Fire Risk Management' specifies zone characteristics, these are **guidelines** only. NPWS zone planning and zone characteristics will be based on the conservation objectives of a particular reserve, a risk assessment and RFMS, and will take into account reserve plans of management and pest management strategies. Table 2 (a modified version of Annex B) provides zone objectives and characteristics recommended for use throughout NPWS.

Key Performance Indicators (KPIs) from the NPWS EBMP Implementation Plan and Monitoring Plan, are listed for each of these zones.

2.0 Prevention and planning

Table 2: Fire management zone objectives, characteristics and NPWS KPIs

Zone	Purpose	Suppression objectives	Zone characteristics	KPI[1]
Asset Protection Zone (APZ) See also 2.6 Asset protection	To protect human life, property and highly valued public assets and values.	To enable the safe use of direct attack suppression strategies within the zone. To minimise bushfire impacts on undefended assets.	As per RFS document *Standards for Asset Protection Zones* Management practices should aim to have fuel levels maintained within the OFH[2] low to moderate range	> 90% of APZs treated at least once every 3 years
Strategic Fire Advantage Zone (SFAZ)	To provide strategic areas of fire protection advantage which will reduce the speed and intensity of bushfires, and reduce the potential for spot fire development. To aid containment of bushfires to existing management boundaries.	To improve the likelihood and safe use of: • parallel attack suppression strategies within the zone, or • indirect attack (back-burning) in high to very high fire weather conditions within the zone. To reduce the likelihood of: • crown fire development within the zone, or • spot fire ignition potential from the zone.	Zone width relates to suppression objectives and depends upon: • topography • aspect • spotting propensity • location of adjacent firebreaks • mosaic pattern of treatment. Management practices should aim to achieve mosaic fuel reduction patterns so that the majority of the SFAZ has an OFH of high or below.	> 70% of total SFAZ area treated to comply with minimum SFAZ OFH threshold or not exceeding minimum LMZ biodiversity threshold for the vegetation formation
Land Management Zone (LMZ)	To meet relevant land management objectives in areas where APZs or SFAZs are not appropriate.	As per the land management and fire protection objectives of the responsible land management agency. To undertake mosaic burning to reduce the likelihood of spread of fires.	As appropriate to achieve land management objectives (e.g. protecting heritage or broad scale mosaic burning objectives).	>50% of LMZs maintained within vegetation biodiversity thresholds[3], <35% below, <35% above.
Fire Exclusion Zone (FEZ)	Fire exclusion zones are not recommended for use by NPWS. Whilst exclusion of fire may be preferable it is not always possible. Areas of fire intolerant assets should be included in RFMS as LMZs with appropriate operational management guidelines.			

[1] KPIs as per *Enhanced Bushfire Management Program – Implementation Plan 2011-2016*

[2] OFH refers to the *Overall Fuel Hazard Guide* (Dept. of Sustainability and Environment 3rd ed. 1999)

[3] Vegetation biodiversity thresholds as per *Guidelines for Ecologically Sustainable Fire Management*, (see Table 3)

104 When locating zones as part of fire management and hazard reduction planning, NPWS considers:

- the risk management approach detailed in section 1.2 Risk management
- primary fire management objectives detailed in section 1.1 Fire management objectives
- the presence of threatened species, communities and populations and the fire biodiversity thresholds of the vegetation. Practicable alternatives should be sought where the location of an APZ or SFAZ compromises conservation objectives. Alternatives include (but are not limited to):

  relocating the zone to another area where the impacts will be less

  using a SFAZ in place of an APZ

  increasing the size of an APZ in place of using a SFAZ

  increasing the resilience of the asset; this includes changing the asset to make it less susceptible to fire, or modifying the proposed treatment of the zone to minimise impacts.

105 New fire management zones or changes to existing fire management zones must be incorporated in the Assets Geodatabase.

2.1.6 Vegetation biodiversity thresholds and fire interval guidelines

106 *Guidelines for Ecologically Sustainable Fire Management*[4], based on the NSW Flora Fire Response Database*, contains indicative fire interval guidelines to support ecologically sustainable fire management (Table 3). In these guidelines:

- the minimum interval (i.e. shortest time between fires) is based on the minimum maturity requirements of species sensitive to extinction under frequent fire regimes, and should avoid local extinction of such species.
- the maximum interval (i.e. longest time between fires) indicates the time since fire at which it may be expected that species may be lost from the community due to senescence.
- within the domains of appropriate intervals calculated, it is important that the actual inter-fire intervals experienced at a site are variable. Greatest species diversity is maintained by ensuring variation in the length of inter-fire intervals.

For further information on derivation of the fire interval guidelines refer to the summary 'Fire Interval Guidelines for Broad Vegetation Types' on the intranet.

*Note: the NSW Flora Fire Response Database was updated in 2010 with the addition of new data. The analysis has been re-run and the fire interval guidelines have remained the same.

107 When using the Bushfire Environmental Assessment Code to issue a hazard reduction certificate refer to the table in Appendix A of the Code for minimum SFAZ and LMZ thresholds. This table is modified from *Guidelines for Ecologically Sustainable Fire Management* for the specific purpose of this Code.

108 In cases where the Code does not apply the fire interval guidelines in Table 3 should be used to determine the most appropriate fire frequency for vegetation communities. However where more specific evidence-based biodiversity thresholds have been developed for a particular geographical area, using local floristic and fire response information (including critical thresholds pertaining to fire severity or season), these should be used instead.

109 For use in management at a landscape scale, it is recommended that the range of intervals indicated should prevail over at least 50% of the area within each extant vegetation formation.

[4] Kenny B, Sutherland E, Tasker E, Bradstock R (2004) *Guidelines for Ecologically Sustainable Fire Management*. NSW Biodiversity Strategy.

2.0 Prevention and planning

Table 3: Fire Interval Guidelines

Vegetation type[5]	Minimum interval	Maximum interval	Notes
Rainforest	n/a	n/a	Fire should be avoided
Alpine complex	n/a	n/a	Fire should be avoided
Saline wetland	n/a	n/a	Fire should be avoided
Wet sclerophyll forest	25	60	Crown fires should be avoided in the lower end of the interval range
Semi-mesic grassy forest	10	50	Crown fires should be avoided in the lower end of the interval range
Swamp sclerophyll forest	7	35	
Sclerophyll grassy woodland	5	40	Minimum interval of 10 years should apply in the Southern Tablelands region
Grassy dry sclerophyll forest	5	50	
Shrubby dry sclerophyll forest	7	30	
Semi-arid woodland	6*	40*	There was insufficient data to give definite intervals. Available data indicates minimum intervals should be at least 5-10 years, and maximum intervals approximately 40 years
Arid & semi-arid shrubland	6*	40*	There was insufficient data to give definite intervals. Available data indicates minimum intervals should be at least 5-6 years, and maximum intervals approximately 40 years. A minimum of 10-15 years should apply to communities containing *Callitris.* Fire should be avoided in Chenopod shrublands
Heathland	7	30	
Grassland	2	10*	Some intervals greater than 7 years should be included in coastal areas. There was insufficient data to give a definite maximum interval; available evidence indicates maximum intervals should be approximately 10 years.
Freshwater wetland	6	35	

* intervals given are tentative due to insufficient data.

[5] Vegetation type as per Keith D (2002) *A compilation map of native vegetation for New South Wales*. NSW Biodiversity Strategy.

2.1.7 Reserve fire management strategies

110 Reserve fire management strategies (RFMS) will be prepared for all parks and reserves at one of 3 levels, depending on the significance of fire within the reserve and its potential to impact on life, property and the environment, in accordance with the following guidelines:

- A **Type 1** strategy will be a short statement of the NPWS approach to fire management within the area. A Type 1 strategy may be prepared where the level of fire risk for the reserve is assessed as low or where fire management strategies are not complex and can be simply defined and presented. A Type 1 strategy should be a stand-alone document or part of a reserve plan of management (PoM).
- A **Type 2** strategy will be prepared where the level of fire risk for the reserve is assessed as medium to high and fire management strategies are complex and need to be outlined for individual management units or zones. A Type 2 strategy will be presented in a map format showing Fire Management Zones, fire advantages, assets and fire management zones, and associated textual information.
- A **Type 3** strategy is required for reasons similar to those for which a Type 2 strategy is needed, but where there is also a strong public interest in the management of fire within a reserve, or where traditional fire management practices are subject to challenge, or where the achievement of NPWS primary fire management objectives may be compromised if current and accepted fire management practices continue. A Type 3 strategy will comprise a map with the content and format of a Type 2 strategy, as well as a detailed description and analysis of fire management practices. Public comment will be sought during the development and approval process.

111 When a new reserve is acquired by NPWS a RFMS must be developed within 3 months of gazettal. A Type 1 RFMS may be prepared as an interim measure during this time. Completion of RFMS for new reserves should be scheduled as actions in Regional Operations Plans (ROPs).

112 RFMS will be reviewed annually to ensure accuracy of information (e.g. fire history). Major revision of strategies will not be required except after significant fire events or in response to receipt of new information or other developments which require rezoning or other major changes. Any major changes will be made in consultation with BFMCs. The revision of adopted strategies will require Regional Manager approval. Only strategies for new reserves will require Director approval. The review of RFMS will be recorded as a annual action in ROPs.

113 The information contained in RFMS will be referenced within relevant BFMC bushfire risk management plans, plans of management for NPWS-managed lands and Branch and Regional operations plans.

114 Priority will be given to the implementation of those RFMS which are defined or referenced within statutory fire management plans such as bushfire management plans under s. 52 of the *Rural Fires Act 1997* or protected area plans of management under s. 72 of the *National Parks and Wildlife Act 1974*.

115 NPWS will ensure compatibility between BFMC plans and RFMS by making sure that:

- RFMS under development are compatible with any existing BFMC plans, and
- any BFMC plans that are developed after the adoption of a RFMS are compatible with the existing strategy.

116 NPWS fire management strategies for protected areas will be regularly communicated to the relevant fire control officers as relevant plans for the purposes of s. 38 and 44 of the *Rural Fires Act 1997* and to BFMCs for reference within BFMC bushfire risk management plans.

117 NPWS will prepare a Regional annual works program, using BRIMS, for each NPWS Region by local government area. This program will be communicated to the relevant fire control officers

as part of the BFMCs' annual bushfire management works program. Incomplete scheduled works will, if still considered necessary, be carried forward for completion in the following year's program. (see 2.13 Reporting and documentation for fuel management)

118 Signature blocks will not be displayed on RFMS. Sign off should only occur on file copies. Other agencies will not sign off on NPWS-managed lands fire management strategies and no other agency logos should be displayed on fire management strategies.

119 RFMS will remain as live documents that change with each fire season. It is therefore not a requirement to produce revised hardcopies of RFMS (unless it is a new reserve). Relevant information, including zones, roads, operational management guidelines etc, should be kept up to date electronically on the specified GIS layers so that a current RFMS can be produced when required. When major changes to an RFMS have occurred, a new RFMS should be created for approval and the electronic copy on the OEH website must be replaced.

120 The following will be considered when preparing RFMS:

- fuels, assets and fire control advantages on adjacent land that are continuous with those on NPWS-managed lands
- threatened species and cultural heritage conservation issues that are identified in relevant reserve plans of management, species recovery plans, threat abatement plans or conservation management plans
- landscape planning instruments such as catchment blueprints, regional and local environment plans, tourism plans and vegetation and water plans, and
- areas that contain threatened species, are highly susceptible to invasive weed species or have cultural heritage conservation issues that must be avoided when fire suppressants such as retardants, gels and foams are used to combat wildfires. (see 4.12.2 Policies for fire suppression chemicals)

2.1.8 Type 1 reserve fire management strategies

121 A Type 1 RFMS may form part of a reserve PoM, or may be a stand-alone Type 1 RFMS as follows:

- Where an existing PoM does not include the equivalent of a Type 1 RFMS, a stand-alone Type 1 RFMS may be adopted with Branch Director approval. The RFMS will be consistent with the fire management direction in the PoM and may provide some additional detail, and will not require formal amendment to the PoM. The RFMS will be incorporated into the next review of the PoM.
- Where an existing PoM, or where a PoM is scheduled for adoption within the next 12 months, contains adequate information regarding fire management for a reserve, a separate stand-alone RFMS is not required.

2.1.9 Type 2 reserve fire management strategies

122 The following features of Type 2 RFMS are to be standardised across NPWS:

- A standardised title block and disclaimer should be used, including standardised colours. This title block should clearly display whether the plan is a draft or final version. Final versions should include an approval date.
- All Type 2 strategies should have a standardised border around the edge of the poster.
- Fire management zones are to be shown as follows:
  APZ: red **SFAZ: orange** **LMZ: green.**

These zones need to be distinctively hatched or labelled to ensure they can be interpreted by people who are red/green colour blind.

Mapped information for Type 2 strategies

123 Type 2 strategies need to present the following information in a map format:

The map must:

- be a topographic map, Landsat image or aerial photo, or a combination of these formats

  If Landsat or aerial photography imagery is used, contour lines and other necessary information should be superimposed onto the map.

  There is currently a transition between two different map grids and therefore two different coordinate systems. The two map grids are Australian Geodetic Datum 1966 (AGD66 and AGD84) and Geocentric Datum of Australia 1994 (GDA94). Note that some topographic map sheets have not yet been republished under this system.
- use standard IMS mapping symbols
- be superimposed with a coordinate system grid with eastings and northings printed along the borders
- show:
  - helipads, water points (vehicle and helicopter), and potentially threatened fixed-location assets
  - fire trail systems (existing) with the trails named and their vehicle carrying capacity identified (either Cat 1, Cat 7 or Cat 9) as per Annex A of BFCC Policy No. 2/2007 – 'Fire Trails'.
  - recent burns
  - fire management zones
  - other maps as required
- show operational guidelines, displayed in text boxes under the headings:
  - Aboriginal cultural heritage site management (if relevant)
  - Historic heritage management (if relevant)
  - Threatened fauna management (if relevant)
  - Threatened flora management (if relevant)

  These entities should be marked with the appropriate IMS symbol, numbered, and individually addressed in the operational guidelines.
- include contact details for, as a minimum, NPWS, local NSW RFS/NSW Fire and Rescue, Council, Police, Ambulance, State Emergency Service and those of other large neighbouring landholders (e.g. Forests NSW, Crown land)
- include all radio frequencies and phone services available in and near the potential fire ground for all agencies
- may also include geographical reception information, e.g. transmission/reception black spots

The map may:

- show neighbours' names, boundaries and contact details (names and contact details may only be displayed if the neighbour's written permission has been obtained) show fire control advantages such as cliff lines, wet gullies and fire breaks
- show threatened species or cultural sites of particular concern to the reserve
- show strategy information, displayed as maps or as text boxes under the headings:
  - Fire season information
  - Status of fire thresholds
  - Fuels and fire behaviour
  - Fire suppression strategies
  - Contacts and communications

2.1.10 Type 3 fire management strategies

124 Where the decision is taken that a Type 3 RFMS will be prepared, detailed maps in the Type 2 format must be completed (see above). The Type 2 maps that accompany a Type 3 strategy are considered internal working documents, however they will still need to be publicly exhibited and placed on the public website.

Additional information for Type 3 strategies

125 Type 3 strategies must also include the following written information:

1 Introduction

- 1.1 Scope, term and purpose of this strategy
- 1.2 Fire management objectives
- 1.3 Description of the reserves
  - 1.3.1 Location and terrain
  - 1.3.2 Planning framework
  - 1.3.3 The fire environment
  - 1.3.4 Significant natural and cultural heritage values
  - 1.3.5 Recreational use and park management facilities

2 Bushfire risks

- 2.1 Introduction
- 2.2 Life and property
- 2.3 Natural heritage
- 2.4 Cultural heritage
- 2.5 Summary of key fire risks

3 Bushfire risk management strategies

- 3.1 Introduction
- 3.2 Prevention strategies
- 3.3 Preparedness strategies
  - 3.3.1 Natural heritage management guidelines
  - 3.3.2 Cultural heritage management guidelines
- 3.4 Response strategies
  - 3.4.1 Bushfire suppression guidelines
- 3.5 Recovery strategies

4 Bushfire management zones and management units

- 4.1 Asset protection zones
  - 4.1.1 Objectives, strategies
- 4.2 Strategic fire advantage zones
  - 4.2.1 Objectives, strategies
- 4.3 Land management zones
  - 4.3.1 Objectives, strategies
- 4.4 Fire management assets and utilities
  - 4.4.1 Objectives, strategies

5 References

2.1.11 Standard requirements for Type 2 & 3 strategies

126 Works scheduling specific dates proposed for hazard reduction activities will not be displayed in RFMS (this applies to both prescribed burns and mechanical hazard reduction works). This information is more appropriately displayed as a threshold range where specific dates are not displayed. The appropriate place for displaying specific scheduling information is BRIMS (see 2.13 Reporting and documentation for fuel management).

127 Sensitive heritage sites should be generically displayed within RFMS without disclosing site-specific information. Associated information should provide protection for the site through operational prescriptions (i.e. dozer exclusion areas).

128 Neighbour contact details should only be displayed on RFMS where the written permission of the neighbour has been given.

129 Zoning is only to be displayed on tenure other than NPWS-managed lands by exception, and only if:

- the mapping only extends to the next practical control line
- the written consent of the landholder has been given
- the control works on the other land tenures are crucial to the success of the proposed works, and
- the mapping is consistent with BFMC bushfire risk management plans or agreed to by the BFMC.

130 For the purposes of mapping information on RFMS in LMZs, the following 6 categories should be used:

- too frequently burnt
- vulnerable to fire
- within threshold
- long-unburnt
- unknown
- no regime assigned

Table 4: Fire regime thresholds for LMZs

Category Name	Guidelines for interpreting fire regime threshold status
Too Frequently Burnt Consecutive fire intervals shorter than recommended minimum interval	These areas have experienced sustained (two or more) consecutive intervals between fires shorter than the recommended minimum interval for this vegetation type. Any Rainforest / Mangrove / fire exclusion vegetation that has been burnt will be in this category. *Areas of vegetation that are repeatedly burnt at intervals shorter than recommended for the vegetation type may experience a decline in the abundance of plant species sensitive to frequent fire. If inter- fire intervals shorter than the recommended minimum continue, these sensitive species are at risk of local extinction. Attempts should be made to minimise fire occurrence in these areas.*
Vulnerable to Frequent Fire Most recent fire interval shorter than recommended minimum interval	These areas have already experienced one inter-fire interval less than the minimum interval recommended for this vegetation type and/or the current time-since-fire is less than the minimum recommended interval. All unburnt Rainforest / Mangrove / fire exclusion vegetation is in this category.
Within Threshold	The time-since-fire age of the vegetation is greater than the minimum recommended inter-fire interval and less than the maximum recommended inter-fire interval. If a fire occurs before the number of years specified as the minimum interval has been reached it will move into the 'Vulnerable to Frequent Fire' category. If three or more fires occur in close succession the area will move into the 'Too Frequently Burnt' category.
Long Unburnt One or more fire intervals longer than longest suggested interval	The post-fire age of the vegetation is greater than the recommended maximum inter-fire interval for this vegetation type. *If fire continues to be absent from the vegetation for a prolonged time, it is anticipated that plant species that require fire to stimulate flowering or seed production (and their seed banks) may begin to senescence. Long unburnt areas in some vegetation types are very rare and therefore significant. Long unburnt vegetation may also have other ecological values that make it important habitat for certain species in a given area. Careful consideration should be given before burning these areas, and wherever possible the decision should be based on a scientific assessment and/or recommendation prior to burning.*
Unknown	There has been no fire mapped for this area and the maximum recommended fire interval for the vegetation type is longer than the length of time for which fire records are available in the study area. It is not possible to determine if the vegetation is in the 'Within Threshold' or 'Long Unburnt' category.
No Fire Regime	Areas which do not have recommended fire intervals assigned to them, e.g. cleared land, rock etc.

NB: Fire thresholds are defined for vegetation communities to conserve biodiversity

2.0 Prevention and planning

Community consultation

131 RFMS are developed in close consultation with the community, other land managers, fire authorities and relevant BFMCs to ensure the integration of natural, cultural and community values, and responsiveness to threats and change.

132 When preparing RFMS NPWS will seek input from neighbours and the local community to consider their needs.

NPWS officers will liaise regularly and work cooperatively with neighbours to establish good working relationships and foster an understanding of fire in their area.

Preparing and approving Type 2 and 3 fire management strategies

133 Table 5 below outlines the process for preparing and approving Type 2 and 3 strategies.

- Type 3 strategies must be publicly exhibited. The public exhibition of Type 2 strategies will be at the discretion of the Branch Director depending on the level of public interest and alternative views expressed by stakeholders during preliminary consultations and strategy development.
- Where the decision is made that a Type 2 strategy will not be publicly exhibited, there is no requirement to send hard copies of the draft strategy to the Publishing Unit and no requirement to send an electronic copy of the draft to FIMS. Final versions need to be forwarded to FIMS as outlined in the diagram below:

Table 5: Preparing and approving new Type 2 and 3 reserve fire management strategies

Initial consultation	Key stakeholders who may be included in the consultation phase of the project may include but are not limited to: • local conservation, community and recreational organisations • Local Aboriginal Land Councils • local or regional officers of land management authorities • local councils • local Members of Parliament • NPWS Regional Advisory Committees • NSW RFS • NSW Fire and Rescue • Department of Primary Industries • Nature Conservation Council • reserve neighbours.
Further consultation	In addition to initial consultation, it is important to consider involving relevant stakeholders in other stages of the strategy development and exhibition. Mechanisms for promoting stakeholder and community involvement include: • public meetings • presentations to relevant BFMCs • public exhibition of draft strategies.
Draft produced	Initial draft produced incorporating information from stakeholders, NPWS staff and relevant documents.
Draft assessed	Draft assessed and endorsed by Regional Fire Management Officer and Area Manager.
Final draft endorsed	Final draft endorsed by Regional Manager and Branch Director.
Public exhibition (where required)	Final draft is available for public exhibition for 1 month (where required). Copies of the draft strategy are to be circulated to key stakeholders. An electronic copy (in PDF format) for inclusion on the website is to be forwarded via FIMS, together with: • details of the starting and closing dates of the public exhibition period • postal address and email address which submissions can be sent to, and • clear instructions on where printed copies can be viewed, relevant officer contact details and procedures for purchasing printed copies. The electronic copy of the strategy must be forwarded to FIMS at least 3 days before the start of the public exhibition period. A display copy must be available for viewing at the local NPWS office. Strategies may be publicly exhibited in other locations where considered necessary.
Draft revised in response to submissions	Where appropriate, the draft will be modified in response to submissions by stakeholders or members of the public.
Final strategy endorsed	Final strategy endorsed by Area Manager and Regional Manager
Final strategy approved	Final strategy approved by Branch Director
Reserve fire management strategy circulated	An electronic copy (in PDF format) is to be forwarded to FIMS for inclusion on the website. Clear instructions on where printed copies can be viewed, relevant officer contact details and procedures for purchasing printed copies are also to be forwarded for inclusion on the website. Other copies distributed as required.

2.0 Prevention and planning

2.2 Research

2.2.1 Background

134 Ongoing research is required to establish a knowledge base for effective fire management. Keeping up to date with the latest research and current practices ensures that NPWS continually identifies benchmarks and improves its fire management operations in line with best practice and industry standards.

135 Research is also required to place NPWS fire management within a risk management framework, as recommended by the COAG National Bushfire Inquiry (2004). To meet its statutory obligations of protecting life and property and conserving biodiversity and cultural heritage, NPWS requires access to a wide range of knowledge across an array of fields.

2.2.2 Research policies

136 The OEH Science Statement describes the drivers, values and approaches that guide OEH science and the OEH Knowledge Strategy sets the strategic direction of the organisation so as to better align science priorities with legislative, policy and management needs.

137 NPWS will identify and promote bushfire research on the basis of priorities, established through consultation with the scientific community and staff involved in fire management and fire research. These priorities are defined in the NPWS Bushfire Research Statement.

138 NPWS will actively promote its bushfire research needs and encourage research institutions to carry out relevant projects through ongoing dialogue.

139 NPWS will continue to contribute to funding of internal, external and joint research projects. NPWS is a core partner of the Bushfire CRC.

Mapping fire

140 NPWS will map the extent, patchiness and intensity, where possible, of all bushfires and prescribed burns to enable data collection on fire frequency, intensity, rate of spread and area burnt. This data will be incorporated into fire management databases. Remote-sensing technology will be used increasingly for this purpose. NPWS commits to undertaking research for this purpose.

Research fields and personnel

141 General fields of research for effective fire management include: fuel dynamics, fire behaviour, fire weather, remote sensing of fire patterns, species dynamics in relation to fire regimes, and the effects of fire regimes on ecosystem processes.

142 NPWS recognises that a mixture of internal and external research will assist fire management. In many cases, collaborative research between NPWS and external institutions will support this purpose.

Collation of research data

143 The collation of research data will be coordinated by relevant research staff (e.g. Biodiversity Conservation Science Section) and FIMS and made available to Branches, Regions and other units to assist in the preparation of RFMS and other fire assessment works.

144 NPWS will store, use and disseminate the findings of its bushfire research. In particular it will disseminate results of research to the scientific community and other fire authorities.

2.3 Community engagement

2.3.1 Background

145 NPWS seeks to work with the community to foster an understanding and appreciation of fire and its role in the Australian natural landscape. This includes working with the community to minimise any negative impacts of bushfire on community assets which include life, property, natural and cultural assets.

- NPWS works closely with community stakeholders and other fire authorities through forums such as BFMCs to develop and implement fire prevention and suppression plans.
- Community information and the use of media services can assist fire management activities, lead to better appreciation of the organisation's fire management expertise and promote community support for fire management activities.

2.3.2 Community engagement policies

146 NPWS will work with the community to improve our understanding of fire behaviour and fire management practices in natural landscapes.

NPWS will support and participate in fire preparation and awareness programs within the community, providing information on the role of fire in the Australian natural landscape and NPWSs role in fire management.

147 NPWS will promote the following principles:

- Fire is part of the natural landscape.
- Cooperative effort is the key to effective fire management.
- Fire management practices in natural landscapes will be consistent with the principles of ecological sustainability.
- Fire management practices will reflect government legislation and policy.
- Information provided to the public will be timely, accurate and appropriate.

148 NPWS will actively engage the community in the development of RFMS (see section 2.1.8 Reserve fire management strategies).

149 NPWS will promote its cooperative work with other fire authorities and land managers, neighbours, the BFCC and BFMCs to foster community understanding and appreciation of fire and fire management.

150 NPWS will work with fire authorities, the police and park neighbours to investigate suspicious fire ignitions and ensure compliance with fire management objectives.

151 NPWS will work with local authorities and park neighbours to rationalise access to reserves and minimise unauthorised access.

152 Opportunities to increase public awareness of NPWSs role and objectives in fire management will be actively pursued including participating in community programs such as FireWise, attending field days, organising community meetings and promoting fire management practices through RFMS.

NPWS staff will conduct informal meetings or field days with neighbours, local communities and appropriate RFS brigades to develop better understanding of fire-related issues.

NPWS will help promote the BFMC risk management plan to neighbours and encourage their input to planning.

Regions will keep neighbours informed on the progress of fire prevention works, seasonal fire conditions and changes to access or infrastructure on parks.

153 Current information will be provided to park visitors on the park conditions, the safe use of fire and contacts for the reporting of fire.

2.4 Visitor safety

2.4.1 Background

154 The safety of visitors is a major consideration during the bushfire danger period and during fire management operations.

- Visitor safety can be encouraged through educational programs on the safe use of fire and by providing facilities that will prevent the ignition of bushfires.
- Steps will be taken to advise visitors of fire suppression and prescribed burning operations within NPWS-managed lands.
- To achieve visitor safety it is essential that no-one other than a firefighter or authorised support person is located on the fire ground.
- All necessary actions will be taken to ensure visitor safety in reserves that have the potential to be impacted by fire.

2.4.2 Fire prevention

155 The design and management of recreation areas and the conditions under which visitors use fire will be assessed in order to minimise the risk of bushfire ignition and escape.

156 Educational programs will be undertaken to inform visitors of the conditions for the safe use of fire.

157 In some circumstances, strategic prescribed burning or other fuel management may be conducted to ensure visitor safety (e.g. adjacent to picnic areas or access roads).

2.4.3 Communication

158 Reserve fire bans, park closures or cancellation of park activities will be implemented whenever conditions warrant that action, in accordance with section 3.4 Bans and closures.

159 The public will be advised of fire operations through use of one or more of the following means:

- advertisements in local media
- notices at park entrances or other strategic locations
- radio and television announcements
- letterbox drops
- neighbour databases
- fire and park closures website, and
- telephone message services.

2.4.4 Evacuation

160 Visitors will not be permitted into areas where fire suppression or prescribed burning operations are being undertaken. The presence of visitors in or adjacent to the fire ground will be immediately reported to the Incident Controller, who will then arrange for an evacuation if necessary, in accordance with this section.

Emergency Management Plans

161 Emergency Management Plans (EMP) that include procedures for the protection and evacuation of visitors will be prepared for all reserves (EMP template). The procedures should be developed in conjunction with Police and other emergency authorities. These procedures should be included in Regional incident procedures, BFMC plans of operations and other local emergency management plans.

162 Regions should use the Visitor Safety Regional Risk Register process (VSRRR User Guide) to prioritise the development of EMPs. All precincts within parks that are identified as having a 'high' or 'extreme' risk have an immediate need to implement these plans, thereafter EMPs will be developed for 'Medium' then 'low' risk precincts. The file path or other unique identifier for the EMP should be recorded in the VSRRR and referenced in the RFMS.

2.5 Environmental impact assessment

2.5.1 Background

163 Fire management activities can impact, both positively and negatively, on the environment and have the potential to degrade both natural and cultural heritage values across the landscape. With the exception of fire suppression operations, fire management activities can be planned and the impacts relatively well defined prior to the activities being undertaken. Though not necessarily mutually exclusive, it is recognised that on occasion the need to protect human life and property may override conservation objectives.

164 NPWS has responsibilities under part 5 of the *Environmental Planning and Assessment Act 1979* to consider the environmental impact of activities it carries out. In order to fulfil these legislative requirements, and to maintain and improve its environmental practices, NPWS has established standards and guidelines for on-park environmental assessment.

2.5.2 Environmental impact assessment policies

165 All fire suppression activities conducted on NPWS-managed lands are to comply with plans of management, RFMS and directives from senior NPWS officers.

166 NPWS will conduct an environmental impact assessment prior to undertaking prescribed fire management activities.

An environmental impact assessment is to be conducted by or on behalf of Regions for all fire management activities.

167 RFMS should identify significant areas of natural and cultural heritage and describe measures to protect these during fire suppression activities, e.g. dozer exclusion zones.

2.5.3 Application of the Bush Fire Environmental Assessment Code

168 The *Rural Fires Act 1997* and *Rural Fires and Environmental Legislation Amendment Bill 2002* provide for a streamlined approval process for carrying out bushfire hazard reduction work in APZ, SFAZ and LMZ as long as it is carried out in accordance with the *Bush Fire Environmental Assessment Code* (NSW RFS 2006) (the 'Code') and a BFMC bushfire risk management plan.

169 NPWS is a certifying authority and may issue a hazard reduction certificate under s.100G of the *Rural Fires Act 1997* for hazard reduction works on NPWS-managed lands in accordance with the Code.

Where it applies, the Code will be used as the primary environmental impact assessment for carrying out bushfire hazard reduction work in all zones on NPWS-managed lands.

170 SEPP 14 (Coastal Wetlands) and SEPP 26 (Littoral Rainforest) **do not** apply to land which has been reserved under the *National Parks and Wildlife Act 1974*, with the exception of regional parks and karst conservation areas. Bushfire hazard reduction work in land designated under SEPPs in national parks may be assessed and carried out in accordance with the Code.

Situations where the Code does not apply

171 SEPP 14 and SEPP 26 **do** apply to land which has been acquired under Part 11 but not reserved under the *National Parks and Wildlife Act 1974*. The Code does not apply to this land and a Review of Environmental Factors will be required for these areas.

172 Where the Code does not apply, or where the Code does apply but a significant impact on environmental or cultural heritage values is likely, an alternative appropriate environmental impact assessment is required.

173 Where NPWS is the proponent, *the Proponents' Guidelines for the Review of Environmental Factors* should be followed and consideration given to preparing a Review of Environmental Factors to cover an entire reserve, Region or vegetation community where possible.

2.5.4 Multi-agency or multi-tenure fire activities

174 Where hazard reduction works are being carried out as part of a multi-agency fire management operation the following provisions apply:

- Where the works are being carried out **by another agency on NPWS-managed lands**, the hazard reduction certificate must be subject to environmental assessment and approved by the relevant NPWS Regional Manager.
- Where the works are being carried out **by** NPWS **on lands other than NPWS-managed lands**, the hazard reduction certificate must be approved by the relevant authority of the associated land management agency or the RFS.
- In either case, the agency responsible for carrying out the environmental assessment is as per local arrangements.

175 All agencies engaged in bushfire suppression activities being conducted on NPWS-managed lands are to comply with (see also section 2.8.4 Prescribed burns involving other agencies):

- NPWS fire management policies
- directions in the relevant RFMS and reserve plans of management
- directions from senior NPWS officers
- BFMC plans of operations
- relevant sections of the *Rural Fires Act 1997*.

2.6 Asset protection

2.6.1 Background

176 Bushfire is a natural component of the Australian environment and cannot be excluded from occurring. An inherent risk from bushfire exists for assets situated in or in proximity to bushland and regardless of the risk treatments implemented there will always be residual risk.

177 The protection of life and property, including assets, is a legislative requirement and NPWSs primary fire management objective. NPWSs asset protection obligations extend to all assets and activities on-park as well as off-park.

178 NPWS has a responsibility for assets owned by NPWS, or assets on land owned by NPWS and leased to a third party.

NPWS also has a role in managing the risk to assets off-park if they are threatened by fire emanating from a park.

179 No matter what happens on adjoining land, NPWS has a responsibility to manage the risk of fire spreading from its property. S. 63(2) of the *Rural Fires Act 1997* imposes a duty on NPWS to take any notified steps (as notified in a bushfire risk management plan or by the BFCC) and any other practicable steps to prevent the occurrence of bushfires on NPWS land, and to minimise the danger of the spread of bushfire on or from NPWS land.

Thus NPWS has a responsibility to manage the risk of fire spreading from its property regardless of the actions taken by adjoining land owners. However, what happens on adjoining land affects the level of risk to an asset and therefore how NPWS manages this risk (the types of treatments etc.).

2.6.2 Asset protection policies

180 The protection of human life is the highest priority when managing the risk to assets.

181 NPWS will manage the risk to assets from fires within and emanating from parks.

A risk management approach based on the Australian Standard on Risk Management (AS/NZS ISO 31000:2009) will be used to manage the risk of damage to assets from fire.

182 A cooperative approach will be applied to managing risks to assets (e.g. with BFMCs and park neighbours). This means that responsibility for the protection of assets against fire is shared among those responsible for managing the fire and those responsible for managing the asset.

2.6.3 Bush-urban interface

183 The bush-urban interface is an important consideration in fire management activities because communities and property often adjoin areas of high bushfire potential.

- Bush-urban interface fire management is complex and should include prevention works, specialised suppression strategies, evacuation procedures, public education, land-use planning and specialised training.
- It is important that bush-urban interface fire management is conducted cooperatively and that all agencies with fire management responsibilities are involved in the decision-making process.

- When a complaint has been identified on NPWS-managed land via the RFS bush fire hazard complaints process, a representative from NPWS is to be invited to a joint inspection in the first instance. However, this does not mean that the inspection is to be delayed pending their availability (as per *RFS Bush Fire Hazard Complaint and Notice Guidelines, 2010*).
- The management of APZs is important for the protection of life and property on both NPWS-managed lands and adjoining land.
- The *Rural Fires Act 1997* and *Rural Fires and Environmental Legislation Amendment Bill 2002* and the *Environmental Planning and Assessment Act 1979* require developments to consider bushfire hazard and enhance bushfire protection through the development assessment process.
- An important issue which emerged from the 2002–03 fire season was the potential for telecommunications and power distribution infrastructure to be damaged by fire.

2.6.4 Protecting assets

184 BFMC bushfire risk management plans and NPWS RFMS identify where APZs are required to minimise the risk of bushfire damage to life and property.

NPWS will maintain APZs where identified in these management plans. Fuel management will be undertaken by various methods, including prescribed burning and mechanical clearing, to achieve the guidelines stated in the plans.

185 NPWS identifies and manages APZs to protect assets vulnerable to damage by fire within NPWS-managed lands.

- NPWS recognises the primary purpose of APZs is to protect life and built assets. Where areas are zoned as such, this is given due regard in the decision-making process. Lesser consideration is given to meeting biodiversity conservation and other NPWS objectives in APZs.
- Where possible NPWS facilities should be protected from bushfires by maintaining APZs.
- The management of APZs is based on risk management principles.
- Regions should prepare an annual schedule of inspections and works to ensure fire protection equipment (where necessary) and APZs are maintained in and around all facilities, in particular buildings.

Assets on private property

186 Wherever practical, construction and maintenance of APZs around assets on private property should be on that private property, rather than relying on protective measures implemented on neighbouring lands.

However, where assets occur on properties that adjoin NPWS-managed lands, a cooperative approach will be taken to ensure the establishment and maintenance of APZs (with due regard to the point above).

RFS publication: Planning for Bushfire Protection

187 *Planning for Bushfire Protection* (RFS 2006) is often referred to with regard to asset protection measures for both existing and proposed development. It is important to note that:

- *Planning for Bushfire Protection* only applies to **new development** not existing development.
- *Planning for Bushfire Protection* **does not** apply to development on-park, and although NPWS may consider the fire protection standards in this publication, neither RFS nor a consent authority has the power to impose an APZ on NPWS-managed land.

- For off-park development proposals adjoining a park, the onus is on the proponent to ensure that bushfire protection measures are contained within the development footprint.

  However, *Planning for Bushfire Protection* allows discretion in applying this requirement. It recognises that while locating a development's fire protection measures within the development site is ideal, it is not always possible, and a consent authority may approve development that does not comply with this requirement where exceptional circumstances apply.

APZs adjoining existing and infill developments

188 It can be costly to maintain APZs in a fuel-reduced condition. Prescribed burning on a regular basis requires considerable planning and may be expensive to implement. Cleared breaks in many instances require regular treatment to ensure they remain effective. It is important to consider both the initial establishment costs and the long-term maintenance costs involved in managing APZs.

189 It is also important to consider whether establishing an APZ is the most appropriate response. There may be better ways to protect the asset at threat other than through maintaining an APZ.

190 In some cases, particularly close to urban areas, APZs on NPWS land may actually be kept fuel-reduced by neighbouring landholders or volunteers. Often this will be achieved by establishing and maintaining a mown grass area.

- Whenever neighbours or volunteers are involved in works on NPWS-managed lands they must sign a standard NPWS activity consent which defines the works they are permitted to undertake.
- Experience has shown that once a cleared break has been established on land adjoining urban areas, and where neighbours have assumed responsibility for the maintenance of the break on NPWS-managed land, in some cases the width of the break can start to increase over time as people clear further and further into bushland. In some instances the established break may then be used by neighbours for a number of other purposes (gardening, recreation, facilitation of views, etc.) which may or may not be compatible with the intent of the APZ, nor with other reserve management objectives.

191 Decisions on where and how APZs should be maintained should be based on a site-specific risk assessment. This should include considering the potential for fire to spread from the reserve and impact adjoining assets, measured against the potential consequences of fire impacting on adjoining assets. Factors such as vegetation type, slope, aspect and bushfire history should be used in making this assessment. Other factors such as cost, loss of visual amenity, potential erosion, loss of natural and cultural heritage values and the indirect implications for the long-term management of the reserve should also be considered.

Cleared APZs

192 In many circumstances, particularly in bush-urban interface areas, it will be more effective to establish cleared APZs than to continually invest in hazard reduction by prescribed burning.

193 The maintenance of cleared APZs will usually be NPWSs responsibility, but such maintenance may be conducted by park neighbours or volunteers working under a standard NPWS consent.

Fences

194 The decision as to whether or not to undertake protective measures adjoining a fence line will depend on a number of factors, including:

- the risk of damage to the fence
- the cost of maintaining the APZ versus potential cost of replacing the fence, and

- commitment of the adjoining neighbour to maintaining the APZ on their side of the fence line.

195 As a general guide, where a decision is made to provide protection along a fence line, a setback of 6 m is an appropriate distance.

Protection of NPWS facilities

196 Many NPWS-managed lands contain park management infrastructure, such as visitor areas, walking tracks and buildings. These facilities require protection from both bushfires and structure fires.

- Fire protection for buildings is defined by the *Building Code of Australia*. Fire protection for high-capacity visitor facilities is also defined within this code.
- The risk of fires to existing infrastructure can be reduced by regular facility maintenance and establishment of APZs. In some cases these APZs can be incorporated into the existing facility landscape e.g. grassed or cleared areas around barbeques and picnic tables.
- The risk of fire to new facilities can be further reduced by situating them away from bushfire hazards and using design, construction and materials that reduce the possibility of ignition by fires.
- Where possible, APZs will be established to protect facilities in fire-prone areas.
- Fire protection for the redevelopment or construction of buildings, including new high-capacity visitor facilities, will conform to the *Building Code of Australia*.

Protection of other assets within NPWS-managed lands

197 There are currently no standards for the protection of assets such as telecommunication and power distribution infrastructure. However, NPWS policy for controlling risks to assets from fire should be applied when determining the level of protection required.

NPWS works with RFS to address the issue of defining setbacks and other measures for the protection of telecommunication and power distribution infrastructure throughout NSW.

Protection of new development on NPWS-managed lands

198 Development on NPWS-managed lands is not subject to approval by council or by RFS.

199 The principles and guidelines related to *Building in a Bushfire Prone Environment* (RFS) and the *Building Code of Australia* will be followed in the location and protection of new buildings and other facilities.

- NSW Fire and Rescue or RFS, where available, will be consulted on the requirements of building fire protection during the development or redevelopment of buildings.
- Fire protection equipment will be installed in accordance with a conservation plan or guidelines for that structure and the requirements of NSW Fire and Rescue.
- The provision of fire protection will take into account the conservation of historic buildings and fabric. In some cases the provision of fire protection may require a part 5 approval under the *Environmental Planning and Assessment Act 1979*, and may also need approval from the NSW Heritage Council.

Land-use planning

200 NPWS supports provisions for bushfire protection planning to be included in development control plans, local environment plans and development approvals for fire-prone land adjacent to NPWS-managed lands.

- The management of any interface between a designated asset and any NPWS-managed land must be a shared responsibility between NPWS and the landholder or the owner of the

asset. Responsibility for the protection of the asset should not fall solely on NPWS-managed lands.

- In most cases the only way to achieve effective protection of assets is to come to a negotiated position with neighbouring landholders in which each party accepts responsibility for fire protection. Each party must take appropriate measures on their land to ensure the risk of damage by bushfire is minimised.

Community preparedness (education and evacuation)

201 Neighbours are encouraged to protect their properties from fire through the establishment of fuel-reduced zones and other measures on their own property.

202 Bushfire preparedness and home-survival strategies are actively promoted to NPWS neighbours. Where possible, education programs are devised and implemented in conjunction with other fire authorities.

203 BFCC Policy 2/00 'Residential evacuation' governs the actions of all fire authorities in NSW.

NPWS assists in developing evacuation plans for communities adjoining NPWS-managed lands in conjunction with other fire authorities and local emergency management committees.

For visitor evacuation on NPWS-managed lands see 2.4.4 Evacuation.

Environmental impact assessment

204 The primary role of APZs is the protection of life and property. However, the potential environmental impacts of any treatments applied within APZs require consideration (see section 2.5 Environmental impact assessment).

2.7 Fuel management

2.7.1 Background

205 Fuel management is the practice of maintaining fuels at acceptable levels in areas where assets are at risk from bushfires, or in order to assist in the suppression of fires.

- The principles for identifying bushfire risk are detailed in Annex B to BFCC Policy 3/2007 'Bush Fire Risk Management'. Factors that contribute to bushfire risk include vegetation type (available fuel), terrain and prevailing weather conditions. The most easily controlled of these is fuel.
- Bushfire risk and fuel management strategies are outlined in NPWS RFMS and should be replicated in BFMC bushfire risk management plans. These documents specify the fuel standards that apply to different fire management zones within the landscape.
- Fuel standards specified in RFMS are based on a risk assessment process and consideration of cultural and environmental heritage.
- Fuel management includes a range of activities which modify fuel characteristics, which in turn reduce the behaviour (rate of spread, flame height, intensity and spotting distance) of subsequent fires. This enables bushfires to be suppressed under a wider range of weather conditions than would otherwise be possible.

2.7.2 Fuel management policies

206 NPWS supports the use of fuel management programs, and will plan and undertake fuel management programs to protect life, property, and assets from identified bushfire hazards.

Fuel management programs will be developed and undertaken in accordance with NPWS reserve plans of management, RFMS, and guidelines included in BFMC bushfire risk management plans.

207 The fire management zoning system implemented by NPWS will be compatible with the system adopted by the BFCC for use in BFMC bushfire risk management plans (Annex B to BFCC Policy 3/2007 'Bush Fire Risk Management').

208 Assessments of the level of risk posed by different fuel types will be done in accordance with the *Overall Fuel Hazard Assessment Guide*[6]. This method is consistent with that used by all other fire authorities in NSW.

2.7.3 Fuel hazard assessment

209 Fuel hazards or Overall Fuel Hazard (OFH) determine bushfire rate of spread, intensity and suppression difficulty and provide an indication of resources required for bushfires or prescribed burns. They also trigger the need for hazard reduction in SFAZ and APZ.

210 NPWS will adopt a consistent approach to the assessment of bushfire fuels to provide information:

- to identify the distribution of fuel hazard across the landscape to determine potential risks to firefighters and assets
- to identify where triggers for prescribed burning or fuel reduction have been met
- to determine prescriptions for and the potential success of prescribed burning
- to develop fuel accumulation models
- to provide validation data for CSIRO and input into the national fire behaviour model for dry eucalypt forests.

211 Fuel hazard needs to be systematically assessed where it is a trigger for fuel treatment, across APZ and SFAZ in all reserves. Assessment programs should be developed considering time since fire, to target measurement as fuels approach their treatment thresholds.

212 Fuel sampling is also undertaken as part of prescribed burn planning and post-burn assessment, and may be undertaken opportunistically to fill targeted information gaps.

Sampling method

213 To achieve state-wide consistency and consistency with national best practice, fuel hazard assessment will be done in accordance with the *Overall Fuel Hazard Guide*.

Data management

214 Results must be recorded in a centralised database (preferably GIS) in each Branch.

[6]Tolhurst KG, McCarthy GJ, Chatto K, (1999) *Overall fuel hazard guide, 3rd ed*. Fire and adaptive management, report no. 47. Department of Sustainability and Environment, Victoria.

2.7.4 Fuel management practices

215 Fuel management can be achieved using a variety of practices including:

1. **Prescribed burning:** the planned application of fire, either on the ground or from the air, under prescribed weather conditions and within defined boundaries, to modify fuel characteristics including overall fuel hazard, continuity and arrangement.
2. **Mechanical activities:**
   a. **Slashing or mowing** – the use of mechanical mowers, slashers or brushcutters to reduce fuel height and increase fuel compaction.
   b. **Under scrubbing** – the use of mechanical scrub mulchers, slashers or brushcutters to cut the understorey in forests, which reduces the height and increases the compaction of understorey fuels.
   c. **Complete fuel removal** – the complete removal of all flammable material by ploughing, grading, bulldozing or the use of herbicides.

216 NPWS may prescribe the use of other fuel management strategies in some circumstances. Other potential methods include grazing, pruning, herbicide application, trail construction, watering, irrigation, and fuel replacement (replacing highly flammable vegetation types with less flammable vegetation types).

Reporting and documenting fuel management

217 BRIMS is the mechanism for tracking all fuel management activities (refer to section 4.13 Fire reporting and documentation).

2.7.5 Preparation of fuel management programs

218 Each Region will prepare an annual works program for fuel management, for submission to the BFMC. The works program will include the following provisions:

- All proposed prescribed burning operations should be planned in coordination with the appropriate and relevant authorities.
- The Regional Manager will ensure that a competent NPWS officer will be present during all prescribed burning operations undertaken by another authority on NPWS-managed lands.

2.8 Prescribed burn planning

2.8.1 Background

219 A prescribed burn is a managed fire lit for a specific purpose and conducted according to a specific plan. A prescribed burn plan will define the control lines to contain the burn, the required fire intensity to achieve objectives, the weather and seasonal conditions required during the burning operation and the light-up methods and sequences.

220 NPWS conducts prescribed burns for several reasons. These are:

- reducing overall fuel hazard to assist in the protection of life, property and community assets
- managing biodiversity to maintain the reproductive viability of a species or a community of species
- managing introduced species, their spread and impact on native fauna and flora, and
- researching fire behaviour and ecological response to fire.

NPWS considers the use of prescribed burning to be essential to achieve life and property protection and biodiversity objectives.

221 Each prescribed burn is a complex process. It involves a number of steps and requires the involvement of a number of people. The 3 components of organising a prescribed burn are:

- planning and preparation
- operations management, and
- reporting.

2.8.2 Developing a prescribed burn plan

222 A designated person will be appointed to be responsible for the planning, preparation and reporting phases of the prescribed burn. This person will have the relevant competency for developing prescribed burn plans as detailed in section 3.7.3 Competency.

The Area Manager and Regional Operations Coordinator will assist the prescribed burn planner in obtaining the personnel and resources necessary for the proposed burn. Figure 3 details the steps involved in planning and implementing a prescribed burn.

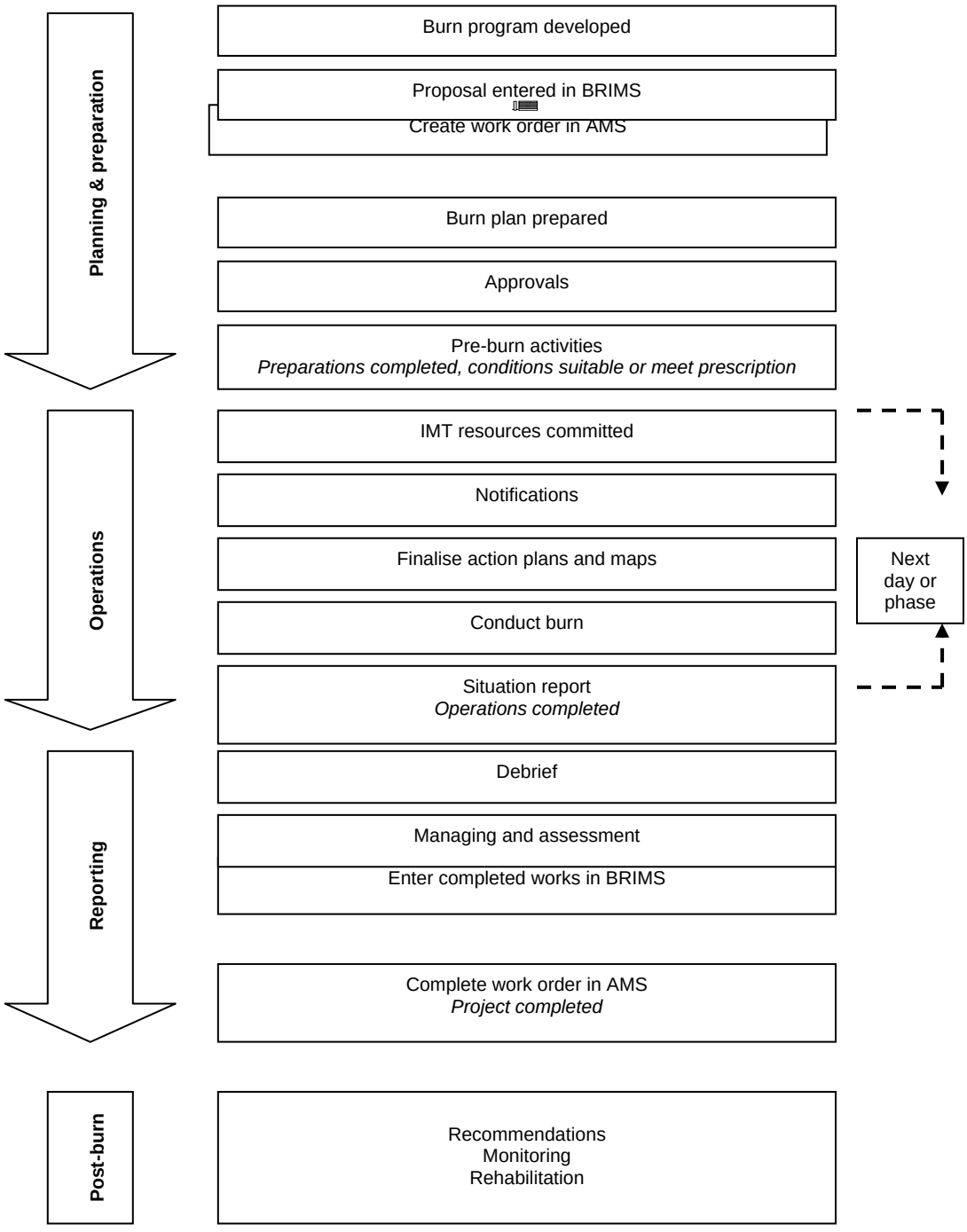
223 Prescribed burn plans will be developed in accordance with the NPWS prescribed burn plan template and with consideration to the operational guidelines contained in RFMS and BFMC plans of operations.

- Risk assessment must be a component of prescribed burn planning.
- All prescribed burning must be planned so that the fire will be contained within pre-defined control lines.
- The Burn Incident Controller must be identified in the burn plan and be confirmd by the signed approval or the delegated officers as listed in Policy 252 on initial approval of the burn plan. Any subsequent change to the Burn Incident Controller must be approved in writing by the Regional Manager.
- Approved Burn Incident Controllers must hold the “Conduct Prescribed Burn” competency, and be a qualified Divisional Commander.

224 The prescribed burn plan will incorporate the management and operational guidelines specified in the applicable RFMS, conservation management plan, PoM, site protection plan, pest management plan, threatened species recovery plan or other relevant plan.

225 All persons on the fire ground are to have access to a prescribed burn plan.

Figure 3: Steps involved in planning and implementing a prescribed burn



2.0 Prevention and planning

Safety and hazard identification

226 The prescribed burn plan will take into account the safety of the public, the safety of the personnel participating in the burn operations, the protection of life and property, smoke dispersal and public health, and the protection of environmental values.

227 A comprehensive check of the area of the proposed burn will be conducted for potential hazards. These hazards are related to operational personnel, visitors, road users and neighbours.

- Identified hazards should include post-fire threats to personnel and public safety.
- Identified hazards will be listed in the prescribed burn plan. In preparing a plan an assessment of potential hazards should be carried out and actions identified in the plan to eliminate, minimise or mark the hazard. This includes visual checks for non-operational personnel, including visitors and staff from other organisations.

228 Hazards to personnel may include:

- localised steep slopes
- wind funnels
- localised areas of high fuel
- vegetation with flash fuels
- areas of elevated fuels
- communication black spots
- rocky ground
- scree slopes
- changes in aspect, slope, vegetation or fuels
- mine shafts
- subsidence areas
- cliffs
- powerlines
- gas pipelines, and
- dead trees and tree limbs.

229 Checks will be conducted before the ignition of a prescribed burn to ensure burn personnel safety, public safety and operational success. Refer to section 4.2.7 Safety considerations.

230 Extreme caution must be used if cleared easements under powerlines are being considered for control lines. Due to the risk of arcing, smoke must not come within 25 m of transmission lines as a general rule.

Do not position crews to burn underneath powerlines.

Smoke considerations in prescribed burn planning

231 Smoke from bushfires and prescribed burns can impact significantly on communities. It is a particular problem in major urban areas where bushfire smoke may combine with vehicular and industrial emissions, or fog, and contribute to significant brown haze and smog events. It can also affect smaller communities when smoke is trapped low in the atmosphere, completely shrouding townships and scenic amenities.

232 Bushfire smoke may cause health problems by aggravating respiratory conditions and causing eye irritations in some people. It may also increase the risk of traffic accidents, disrupt air traffic and place firefighters' health at risk. Dense smoke may be a safety hazard near powerlines.

233 The NSW Government's air quality management plan, *Action for Air*, recognises both the impact of prescribed burning on air quality, and the necessity for prescribed burning to protect life and property from bushfires and to manage biodiversity.

234 When planning and conducting prescribed burning operations NPWS will consider the following in relation to smoke:

- In or near urban areas, prescribed burns should not be conducted under weather conditions that are likely to produce persistent fogs or significant brown haze and smog events (e.g. when stable atmospheric conditions are forecast to persist for long periods).

- Prescribed burning will be avoided, where practicable, when the risk of adversely impacting on the community is high (e.g. on certain public holidays, weekends, school holidays or during significant community events).
- In wine growing areas there has been evidence to suggest that smoke detrimentally affects grape quality. Smoke has also been found to potentially affect nurseries.

235 Prescribed burn plans will identify

- known smoke-sensitive areas, and
- strategies and tactics to minimise smoke impacts on and hazards to firefighters.

236 Operational guidelines for minimising impact from smoke during prescribed burns will be prepared, and will include appropriate prescriptions for weather and fuel conditions and appropriate tactics, including, where practicable and safe to do so:

- lighting techniques and patterns that reduce the smouldering phase of combustion and minimise burning of material during times of the day where atmospheric dispersion is poor
- avoiding the burning of smoke-producing debris (e.g. tyres, dumped rubbish, and garden clippings)
- using aggressive mop-up procedures (e.g. maximum use of water and the breaking up or dousing of large fuel particles such as logs and stags), so as to minimise the smouldering phase of combustion at times of poor atmospheric dispersion, and
- using backing fires (i.e. fires burning down slope or against the prevailing wind direction to maximise combustion and minimise smoke emissions.

237 Environmental impact assessments prepared for prescribed burns will identify the potential smoke impacts on smoke-sensitive environments and evaluate different strategies for conducting the prescribed burn.

Guidelines for obtaining smoke dispersion forecasts from the BOM are detailed in FMC 2006/03 'Smoke Dispersion Forecast Procedures'.

238 Smoke risks and management strategies will be incorporated in neighbour notification advice in smoke-sensitive areas.

239 NPWS will apply BFCC Policy 3/01 'Smoke management' to achieve best smoke management outcomes.

240 Prescribed burning and bushfire control actions will be planned and conducted so as to minimise the risk of smoke on sensitive areas, to the extent that firefighter and public safety are not compromised.

241 Fire control and safety requirements will not be compromised in accommodating smoke dispersal objectives.

242 Where a high risk of adverse smoke impacts is likely, NPWS will consider alternative hazard reduction or risk management strategies (e.g. mechanical fuel hazard reduction) to protect smoke-sensitive areas from bushfire damage.

Traffic management

243 Traffic management planning considerations must be factored into the development of the prescribed burn plan (refer to the Traffic Control and Safety Near Roads policy).

244 Where there is potential for smoke or activities from prescribed burning to impact on public road traffic or public transport (or where road traffic has the ability to impact on staff carrying out prescribed burns) and traffic needs to be slowed, directed or controlled, the following must be undertaken:

- liaison in advance with the relevant authority (e.g. RTA, RailCorp, local council) will take place,
- a Traffic Control Plan will be developed and put in place prior to prescribed burning being undertaken (refer to the Traffic Control at Worksites manual, RTA 2010),
- smoke signs where required will be put in place to warn motorists of any smoke hazard.

245 The Incident Controller will deploy RTA-certified Traffic Controllers for traffic control where required. Where considered necessary, Police assistance may be requested.

Liaison with other OEH groups and other agencies

246 NPWS will liaise as necessary with BOM on bushfire smoke emissions from current and planned fire operations.

247 NPWS will liaise with the OEH Environment Protection and Regulation Group on:

- bushfire smoke emissions from current and planned fire operations
- research into air quality management in sensitive air catchments
- the preparation and ongoing review of smoke management policies, procedures and guidelines, and
- RFMS in sensitive air catchments.

Document management and reporting

248 Each prescribed burn plan will be filed using the TRIM system. All elements of the prescribed burn plan should be filed, including:

- the prescribed burn plan
- environmental assessment
- approvals
- BRIMS hazard reduction certificate
- situation reports
- action plans
- operations maps
- weather information
- post-burn reports

249 Digital copies of all documents and GIS operations maps should also be kept in an approved archive system.

Budgeting

250 Prescribed burning costs money and each prescribed burn project must have sufficient funds to ensure all elements of the burn can be achieved including follow-up monitoring and regeneration required.

2.8.3 Approval for prescribed burn plans

251 All prescribed burn plans will be reviewed by a prescribed burn plan assessor (see 3.7.3 Competency)

The prescribed burn plan assessor should be independent from the planning process.

252 NPWS maintains a formal process of approval for prescribed burn plans.

- Branches will establish an audit process for prescribed burn procedures, implementation and reporting
- A prescribed burn may only proceed after signed approvals from the following delegated officers:

Area Manager
Accredited prescribed burn plan assessor
Regional Manager, and
Incident Controller.

The process for prescribed burn plan approval is outlined in Figure 4.

253 Where a plan has been approved, and it is subsequently found necessary to substantially amend the plan, the amended plan must be reassessed via the same approval process as for a new plan.

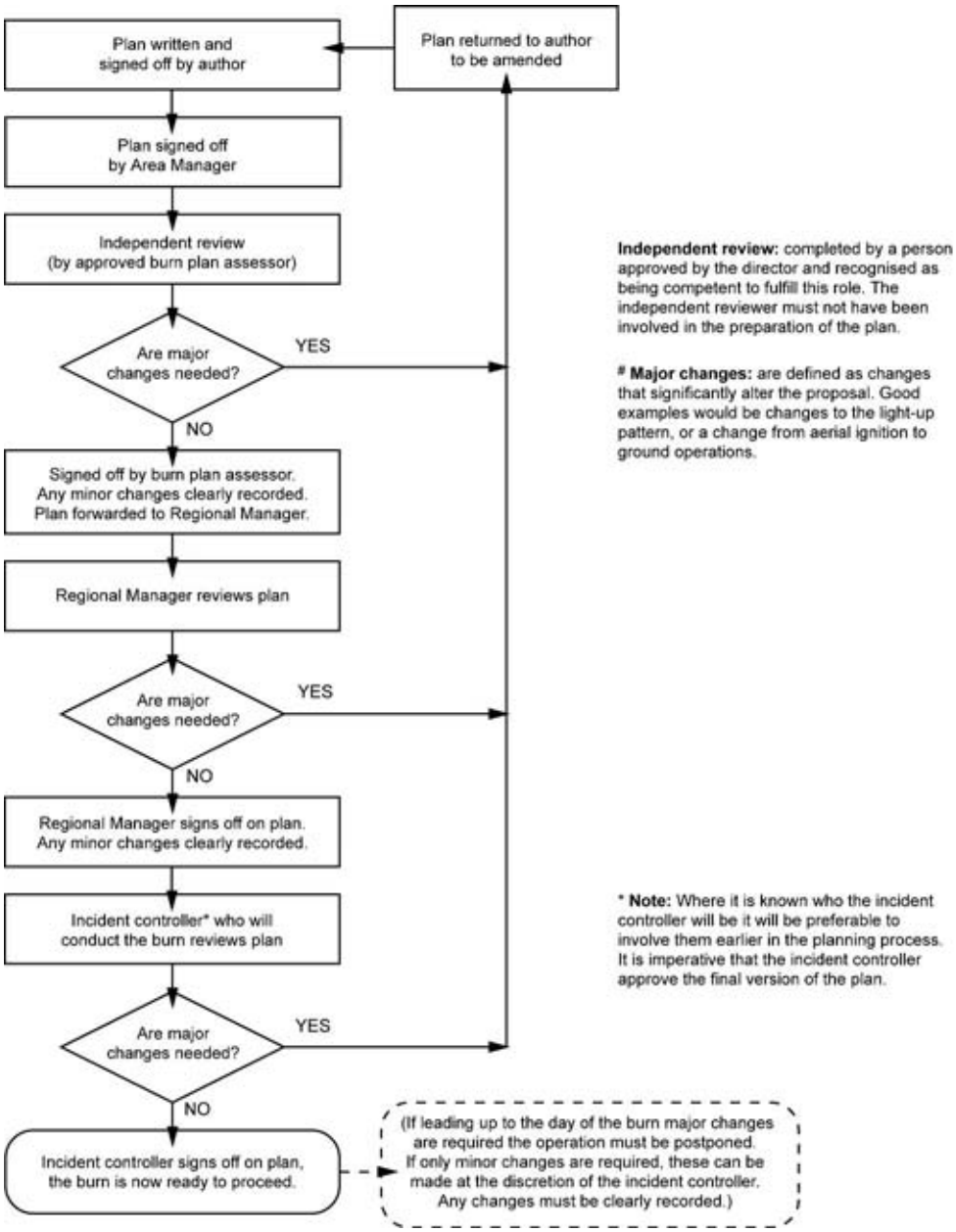
254 If a burn is not undertaken or completed within the indicated period, re-approval for the delayed burn need only be sought if the plan of operations requires significant amendment.

255 Each burn proposal must be registered in BRIMS. Registration records that an environmental assessment has been completed and that NPWS is conforming to the *Bush Fire Environmental Assessment Code* where this has been applied. A burn will be identified by a BRIMS number.

256 Private landholders are required to hold a permit to burn when burning during the bushfire danger period. The NPWS IC must ensure that a permit has been issued to the landholder when operations are conducted over a burn area that also includes private property.

The NPWS IC must also ensure that the landholder has provided written approval for operations to be undertaken on their land.

Figure 4: Approval process for NPWS prescribed burn plans



2.8.4 Prescribed burns involving other agencies

257 For multi-agency cooperative prescribed burns **on or affecting NPWS managed lands**, NPWS must ensure that:

- the environmental impact assessment is adequate and fulfils all NPWS requirements for the portion affecting NPWS-managed lands, if prepared by another agency
- the prescribed burn plan is adequate and fulfils all NPWS requirements if prepared by another agency
- supporting agencies are satisfied that the prescribed burn plan and operational arrangements (e.g.: IMT and resourcing requirements) are adequate if prepared by NPWS, and
- the relevant land owner has provided permission in writing for works to extend off-park.

258 For multi-agency cooperative prescribed burns undertaken **entirely off** NPWS**-managed lands**, NPWS may provide crews to assist if:

- the relevant fire authority is the Incident Controller
- the NPWS prescribed burn plan assessor and Regional Manager are satisfied that the prescribed burn plan is adequate
- appropriate operational controls consistent with this *Manual* are in place including briefings, command, control and communications, and
- NPWS crews are allocated appropriate operational control (generally managing a sector or division with NPWS crews).

2.8.5 Notifications for prescribed burns

259 At least a fortnight before the anticipated ignition of a proposed burn, advice should be given to:

- reserve neighbours adjacent to the proposed burn, and
- organisations and contractors likely to have personnel working in or near the area.

260 Signs may be erected at locations bordering the burn area well in advance of the burn. These should specifically target entry points.

261 All fire authorities, neighbours and pertinent organisations and contractors will be given 24-hours notice that ignition of the burn will be proceeding.

262 Regions will ensure the prescribed burn scheduled date in BRIMS is updated and the required notifications are given to Branch, FIMS and Public Affairs as per Incident Procedures.

263 For late notifications (i.e. previously scheduled burns that are brought forward to take advantage of opportune conditions) Regions should add the relevant RFS Late Hazard Reduction Advisory regional mailbox to their existing mailing list:

- HRLateAdvisory.North@rfs.nsw.gov.au
- HRLateAdvisory.East@rfs.nsw.gov.au
- HRLateAdvisory.South@rfs.nsw.gov.au
- HRLateAdvisory.West@rfs.nsw.gov.au

264 Regions are responsible for updating the public website with fire and park closure information as per 3.4 Fire bans and closures and the fire and park closure web update process.

2.8.6 Conducting a prescribed burn

265 Prescribed burns will be conducted according to the IAP prepared within the approved prescribed burn plan.

266 The control and command of the burn operation will be in accordance with the IMS, under overall supervision by the Incident Controller. Additional supervision will be provided by divisional commanders and crew leaders depending on the scale of the operation.

267 All prescribed burning operations will be implemented in accordance with the policies and procedures in this Manual.

268 All members participating in the burn operation must be accredited and currently competent to undertake assigned tasks (see section 3.7.3 Competency and currency).

Briefing and safety checks

269 All persons involved in the burn will be adequately briefed (see 4.10.4 Briefing and safety checks).

Smoke management during prescribed burning operations

270 Operational guidelines for minimising impact from smoke during prescribed burns will be prepared in accordance with 2.8.2 Developing a prescribed burn plan.

271 Prescribed burn crews will be briefed regarding smoke-sensitive areas and the planned smoke impact mitigation strategies and tactics.

272 Nominated staff will monitor weather conditions and forecasts and fuel conditions to ensure the prescribed burn is conducted during suitable conditions and that smoke management prescriptions are met.

The timing of weather conditions that provide for good smoke dispersal should be used to advantage during the conduct of a burn.

273 Prescribed fires burning on declared ‘no burn days’ will be contained and suppressed, where practicable.

274 NPWS officers who approve other agencies to undertake prescribed burns on NPWS-managed lands must consider the risk of smoke impacts on sensitive areas, and impose conditions upon any consent and make available appropriate educational materials in order to minimise the impacts of smoke.

2.8.7 Debriefing

275 All personnel involved in the prescribed burn operation should participate in an operational debriefing. The debriefing will be conducted according to the procedures in 5.1 Debriefing and incident analysis. For large operations, debriefing may be conducted for individual sectors or divisions.

2.8.8 Post-burn reporting

276 Regions will ensure a post-burn report is completed within 7 days of completion of the burn. Burn data will be included in geographical information system databases and BRIMS. It should include:

- a copy of the plan of operations
- weather forecasts
- weather data
- fire behaviour information and observations
- operational debriefs
- rehabilitation works required and conducted
- post-burn analysis and assessment
- property and asset damage
- safety incidents, and
- maps of the burn area.

2.9 Fire roads and trails

2.9.1 Background

277 This policy applies to permanent roads and trails on NPWS-managed lands.

Issues relating to trails can be divided into 5 categories:

- Access for fires – use of a trail during an incident will depend on the outcomes of an appreciation of the incident.
- Identification and classification of fire access – classification of reserve roads and trails that are strategically important for fire management.
- Construction and maintenance of fire roads and trails – trails are developed and maintained to a consistent standard.
- Signage for fire roads and trails, fire control advantages and warnings.
- Access to NPWS-managed lands by other fire authorities – other fire authorities may require access to reserves for a variety of reasons.

2.9.2 Access for fires management

278 The following policies and provisions apply to access for fire management.

- NPWS will maintain a fire access system for reserves to support fire management operations.
- NPWS will facilitate the appropriate use of trails for fire authorities, including use for training, reconnaissance, fire management activities and fire control.
- All Regions will maintain current reserve road and trail data within the Asset Maintenance System (AMS).
- Fire trails will be inspected regularly to ensure they are accessible to fire-fighting vehicles.
- Primary access to parks and within parks should be inspected annually to confirm status.
- Remote area firefighting provides a legitimate alternative method of accessing fires in rugged, undeveloped or difficult-to-access landscapes.

2.9.3 Identification and classification of fire trails

279 All fire trails and roads are to be classified in accordance with BFCC Policy No. 2/2007 – 'Fire Trails'. This BFCC Policy defines a fire trail as a trail whose primary purpose is for fire access; without this primary role it is unlikely that it would exist.

Fire trails may be combined with other works to provide fire breaks, fire containment lines and the like. Fire trails do not, of themselves, constitute these other entities, although they may occupy the same place in the landscape, and provide a part of those features.

BFMCs must determine which access ways in their area are to be classed as 'fire trails'. This decision is to be reached by consensus, with a view to the entire fire access network within the area, and adjoining areas where this is relevant.

280 Once the fire trails are identified, they are to be classified on the basis of strategic importance and vehicle carrying capacity, as specified below.

281 Two sets of classifications are to be made for each fire trail: on current circumstances, and on desired future circumstances. Many trail classifications will be the same in both circumstances.

Two classifications are required so that the current condition information is available for use during firefighting operations, while the desired future condition information is essential for the BFMC and land owner/managers to make strategic decisions about ongoing management, maintenance and upgrading.

Strategic importance – fire trail classifications

282 **Essential**: This is a fire trail without which fire response and suppression in an area would be severely compromised.

All reasonable efforts must be made to ensure that this trail is trafficable to the agreed vehicle carrying capacity at all times. Sudden problems such as tree falls and land slips should be rectified as soon as identified.

This trail should be checked on occasions throughout each year, and particularly before the start of the local bushfire season.

Physical barriers (e.g. locked gates) to vehicle access must not be deliberately installed unless they are readily broached by firefighters.

283 **Important**: This is a fire trail that is required for fire management. If this trail was unusable due to temporary circumstances, other trails could be used to contain a fire, albeit with some loss of fire management efficiency.

This trail should be trafficable to the agreed vehicle carrying capacity at all times.

This trail should be checked before the start of the local bushfire season.

284 **Dormant**: This is a track or trail that has been used as a fire trail at some time in the past, but there is no requirement for it to be constantly maintained in a trafficable state.

The status of dormant trails should be reviewed annually. When regeneration of vegetation or the trail condition means that it cannot be readily returned to service, then it should be removed from the BFMC or NPWS register.

Vehicle carrying capacity

285 Information in the criteria required to specify the vehicle carrying capacity of various roads, tracks and trails used for fire management purposes is provided at **Annex A** of BFCC Policy No. 2/2007 – 'Fire Trails'.

- **Cat 1**: This is a fire trail that can be safely traversed by a Category 1 firefighting appliance.
- **Cat 7:** This is a fire trail that can be safely traversed by a Category 7 firefighting appliance.
- **Cat 9**: This is a fire trail that can be safely traversed by a Category 9 firefighting appliance.

286 Vehicle carrying capacity of a trail is determined by whether a vehicle can physically pass from A to B, not whether it will be safe to do so in certain fire conditions. The decision as to whether or not to use a trail under fire conditions must be made by the officer in charge at the time of the fire, taking into account prevailing conditions.

Map depiction of fire trails

287 Fire trails are to be depicted on maps in a consistent manner by all land managers/owners. Depictions are to be in accordance with **Annex C** of BFCC Policy No. 2/2007 – 'Fire Trails'.

Depicting strategic importance:

Essential Fire Trails:

Important Fire Trails:

Dormant trails:

Depicting vehicle carrying capacity:

Fire trails with vehicle carrying capacity **Cat 1 tanker:**

Fire trails with vehicle carrying capacity **Cat 7 tanker:**

Fire trails with vehicle carrying capacity **Cat 9 tanker:**

288 Care must be taken when producing maps containing fire trail data to ensure that the data is accurate and up-to-date. A note about the currency and reliability of the data must be included on any map.

289 Care must also be taken to ensure that maps are clearly marked to indicate whether they are displaying data relating to current or desired future condition.

Fire trail registers

290 BFMCs must regularly maintain and update a Fire Trail Register for their area of responsibility. Fire Trail Registers record information for administrative, planning and operational purposes including location, strategic value and vehicle carrying capacity. Fire trail register specifications are provided at **Annex B** of BFCC Policy No. 2/2007 – 'Fire Trails'.

291 NPWS will assist BFMCs to create and maintain Fire Trail Registers by providing relevant information where available.

2.9.4 Construction and maintenance of fire roads and trails

292 The following policies and provisions apply to construction and maintenance of fire roads and trails:

- Trail construction and maintenance may have social, environmental and economic implications, so new trail proposals should proceed only where the benefit is not outweighed by the impact.

  Environmental impact assessment procedures will be carried out before the construction of non-emergency access trails or major upgrade activities.
- Construction and maintenance of fire trails will be in accordance with NPWS specifications as per the *PWG Roads Policy*. Minimum standards for the planning, construction and maintenance of roads are those in the *PWG Roads Manual* and the *Field Guide for Erosion and Sediment*

Control on Unsealed Roads. All trails will be constructed, maintained and rehabilitated to the standards prescribed in these guidelines. BFCC standards (**Annex E** of BFCC Policy No. 2/2007 – 'Fire Trails') for fire trails will be implemented where appropriate and according to assessed risk.

- Fire roads and trails should be constructed and maintained in accordance with their identified strategic importance for fire control, subsequent BFMC classification and general use.
- Gravels and soils used in the construction and maintenance of trails should be from local, lithologically similar sources. Where this is not possible, the impacts of imported gravels and soils should be kept to a minimum by the use of appropriate control measures. Materials used should not increase the soil fertility of areas adjacent to the trail. Trail edges should be monitored for the introduction of exotic species and remedial action undertaken when required.
- Trails should avoid, where possible, important vegetation types, fauna habitats, rare flora sites, habitats for threatened species, populations and/or ecological communities, geological sites, Aboriginal sites and historic sites.
- Risk assessment should be progressively undertaken to assess the location of turning circles and passing bays, trail width, clearances, signposting and other safety issues.

293 All fire trail maintenance will be recorded in the Asset Maintenance System (AMS).

2.9.5 Signage for fire roads and trails

294 The purpose of marking fire trails is to convey sufficient information to fire crews on the identification of the trail for firefighting purposes.

295 Consistent standards for signposting of fire trails across NSW are provided at **Annex D** of BFCC Policy No. 2/2007 – 'Fire Trails' and the *NPWS Park Signage Manual*.

296 The following policies and provisions apply to signage for fire roads and trails:

- The decision whether or not to erect signage on NPWS-managed lands and the dimensions of signs is NPWSs responsibility and is based on assessed risk and need.
- Regardless of the provision of signage, firefighters are responsible for inspecting the condition of a trail before use, driving within their capacities and using maps.
- NPWS and BFCC standards for safety signage will be implemented where appropriate and according to assessed risk.
- Fire trails should be named in accordance with the NPWS *Park Signage Manual.*
- The minimum BFCC standard for trail identification is the 'chevron' sign design. Regions may consider the use of this design on a replacement basis, where appropriate.
- Signs should be sited in accordance with the NPWS *Park Signage Manual* and so that they:

  are visible to road/trail users considering the design speed of the road/trail, the potential to be obscured by vegetation (background and foreground), parked cars or physical features of an area and illumination by headlights at night

  clearly indicate the road/trail direction or location of fire control advantages or hazards, and

  are not safety hazards for road users through coming into contact with signs, or requiring persons to stop at a hazardous location to read or maintain signs.
- Maps are the main tool for identifying access, with signage only used to confirm the location in the field using the name of road or trail only. Identification of the BFMC classification type or other information (such as if a trail is '*Cat 9 access only*') on a sign is permitted, but is not specifically required. Only BFCC-endorsed symbols are to be used.
- BFCC-endorsed fire warning and fire control advantage signs should be used where appropriate, based on need and assessed risk. Only endorsed symbols are to be used.

2.9.6 Access to NPWS-managed lands by other fire authorities

297 Authorised access to reserves may be undertaken by fire authorities, support agencies and utility companies.

- All access will be subject to predetermined conditions.
- Keys may be issued to relevant authorities to facilitate access for emergency and approved incident preparation and management purposes.
- Float access should be with local knowledge supervision at all times.

298 Other agencies may require access to reserves for a variety of reasons, including emergency response, maintenance of infrastructure and familiarisation with the terrain. A cooperative and coordinated policy for access to NPWS-managed lands will ensure an equitable and consistent approach for all agencies.

299 Different management objectives apply in the various categories in the reserve system in NSW. Consequently, access arrangements may vary in different national parks, state conservation areas, nature reserves, wilderness and catchment areas, for example.

Conditions for key holders

300 Conditions for key holders are as follows:

- Keys will be issued to a central agency representative who will maintain a register of keys issued to staff. The key holder will be responsible for key security and use, and ensure compliance with the conditions for holding keys.
- All vehicle access into a reserve will require NPWSs prior agreement, except in the case of an emergency response.
- The appropriate Area Manager or the Regional Duty Officer will approve access arrangements. All emergency access is to be reported to the Duty Officer as soon as possible. Emergency activities will be in accordance with the coordinated policies outlined in BFMC plans of operations.

Access to national parks and state conservation areas

301 The agency representative will coordinate any requirements for notification and consent. The agency representative will act as the first filter, by being the arbiter of the suitability of the request. The agency representative will then liaise with the officer nominated by NPWS.

Notification requirements for legitimate purposes to access national parks and state conservation areas are outlined in the following table:

Table 6: Access requirements for national parks and state conservation areas

Purpose	Permission
Response to report a fire	No prior arrangements necessary. Fire agencies to advise NPWS as soon as practicable
Patrol of high-risk areas on days of very high fire danger	Arrangements can be made on the day concerned before entry to NPWS-managed lands.
Operations in support of other agencies (Police, State Emergency Service, etc.)	The primary agency will provide notification to NPWS as soon as practicable.
Orientation of new personnel	Prior arrangements are to be made.
Hazard reduction planning	All hazard reduction planning will be undertaken in conjunction with NPWS officers.

Checking dwellings located in in-holdings within NPWS areas (e.g. mines, rifle ranges)	If the response is in relation to a fire, no advance consultation is required. If the patrol is routine, prior arrangements are required.
Checking trail conditions	Prior arrangements are to be made.
Training	Prior arrangements are to be made.

Note: these conditions do not apply for access to areas that are nature reserves, Aboriginal areas or places, wilderness areas or catchment areas.

Access to nature reserves

302 Nature reserves are valuable refuge areas with significant natural processes, phenomena and wildlife.

- Access to trails in nature reserves is limited to emergency response, where agencies must notify NPWS as soon as practicable on accessing a nature reserve. Access for other purposes requires prior written approval.
- Access to nature reserves must not impact on research programs or sites, identified significant communities, species or processes.

Access to Aboriginal areas and Aboriginal places

303 Aboriginal areas and Aboriginal places are areas of land high in significance to Aboriginal people. They may contain high concentrations of Aboriginal objects, including burial sites, or be places associated with ceremony or creation stories. Under s. 90 of the *National Parks and Wildlife Act 1974* it is an offence to damage, deface or destroy an Aboriginal object or place without the consent of the Chief Executive. In addition, s. 86 makes it an offence to harm or desecrate, on any land, an object that is the property of the Crown.

- Due to their significance and sensitive nature, access to Aboriginal Places or Areas is limited to emergency responses, in which case agencies must notify NPWS as soon as practicable after accessing an Aboriginal place or Aboriginal area. Access for other purposes requires a written request submitted no less than 28 days before the scheduled date to ensure contact can be made with relevant Aboriginal communities.
- Access must not impact on objects or other values associated with the Aboriginal area or place and, wherever possible, the planning of any activity should involve the local Aboriginal community and NPWS Aboriginal Heritage Conservation Officer.

Additional considerations regarding access to water catchment areas

304 The *Water Board Act 1987* binds Catchment Management Authorities and NPWS to protect the environment in the catchment and the associated water quality.

Relevant incident management personnel may be permitted access to catchment areas for incident response, management and preparation purposes only. Authorised personnel may include fire control officers, their deputies and RFS brigade captains. Catchment areas are classified into 2 categories – schedule 1 and schedule 2.

- Schedule 1 areas are considered sensitive. Access to schedule 1 areas is restricted to incident response and management and to chaperoned incident preparation purposes.
- Access to schedule 2 areas is less restricted.

Notification requirements for legitimate purposes to access water catchment areas are outlined in the following table:

Table 7: Access requirements for catchment areas

Access	Schedule 1 areas	Schedule 2 areas
Annual familiarisation	Catchment authorities and NPWS will identify the personnel to be involved in familiarisation activities in consultation with the BFMC.	Written request is required no less than 28 days before the scheduled date.
Exercises	Incident management exercises will not be permitted in schedule 1 areas	Written request is required no less than 28 days before the scheduled date.
Incident	Catchment authorities and NPWS must be notified as soon as practicable in the event of emergency services entering special areas.	Catchment authorities and NPWS must be notified as soon as practicable in the event of emergency services entering special areas.

305 In addition to the criteria specified for access to national parks, all requests for access to a schedule 1 or 2 catchment area should meet the following criteria, and any approval for access must include appropriate conditions to ensure they are met:

- There must be no adverse impact on water quality.
- Appropriate ablution facilities must be identified and used.

2.10 Fire detection

2.10.1 Background

306 Detecting a fire soon after it ignites assists in the early assessment of risk and the development of strategies to deal appropriately with that risk.

- Early detection and response may lessen the task of suppressing the fire, reduce the cost and lessen the damage caused by the fire.
- Arrangements for detection and reporting of fires are made at the Regional level through coordination with other fire authorities and with reserve neighbours. In some circumstances Branch-level coordination may be appropriate.
- Systems for reporting the detection of fires as soon as possible following ignition are incorporated in BFMC plans of operations and in State, Branch and Regional incident procedures.

2.10.2 Fire detection procedures

307 NPWS develops and enhances procedures and resources to facilitate rapid fire detection and continues to review other technology as it becomes available.

308 Fire detection procedures are prepared as a schedule of actions and arrangements and are included in Regional incident procedures and BFMC plans of operations.

Fire detection schedules operate during the fire season. The level of detection capability increases with increasing levels of fire danger.

Neighbour contacts

309 Where applicable, a list of neighbours who can assist with fire detection and reporting will be included in Regional incident procedures.

2.0 Prevention and planning

Aerial surveillance

310 Consideration should be given to conducting aerial surveillance during very high to catastrophic bushfire danger periods or after thunderstorm activity in large areas where there is no adequate ground detection system.

Surveillance flights and staffing of vantage points will be organised with adjoining Regions, land management authorities, neighbours and other fire authorities.

Towers

311 NPWS will continue to maintain fire towers as a method of early detection where it has been agreed that they are a significant part of the BFMCs detection system. These towers will operate cooperatively with towers operated by other fire authorities.

Other detection measures

312 Other methods of fire detection include lightning detection systems, patrols, use of lookouts and other vantage points and remote sensing.

2.11 Communications planning

2.11.1 Background

313 The aim of effective communications during fire operations is to provide the ability for all participants to communicate without undue delay.

Planning for effective communications during fire operations is achieved by:

- assessing the effectiveness of existing communication systems including black spot mapping
- developing strategies to best utilise and augment existing systems, using the scenarios of large fire events during extreme conditions, and
- preparing and implementing communications plans during fire operations as part of the IAP or prescribed burn plan.

Community contacts

314 Regions will maintain a register of neighbour and community contacts as agreed with the community, to facilitate quick response and the provision of information on fire management and fire control operations.

315 Regions will provide local NPWS contact details and fire response procedures to neighbours and the community to ensure responsiveness to fire issues within the area.

Media and public information arrangements

316 Public Affairs Branch will prepare media procedures and contact lists for inclusion in Branch and Regional incident procedures.

317 A media protocol will be developed between all fire authorities to ensure coordinated and accurate reporting on fire management activities.

- For Class 1 fires on NPWS-managed lands, media reporting will be facilitated through the Public Affairs Branch, in consultation with the Incident Controller.

- For Class 2 fires involving NPWS-managed lands, Public Affairs Branch and the media units of other combating agencies involved will develop a cooperative media strategy giving appropriate consideration to the lead agency status, Incident Controller and respective resources committed to the fire.
- For Class 3 fires, RFS will coordinate all media comment related to fire management strategies and impacts of fire.

2.11.2 Pre-planning

Communications planning

318 Communications planning will be undertaken for all fire management activities.

319 Each Region will assess the effectiveness of the NPWS radio system and mobile phone coverage across reserves, including the preparation of radio and mobile phone coverage maps, and they may be included in the Regional incident procedures.

320 Communications strategies will be developed for each area. These strategies will include procedures for specialist resources, ground-to-air communications and augmentation of permanent infrastructure, and they may be included in the Regional incident procedures.

321 Assistance will be provided to BFMCs to develop communications sub-plans, as part of BFMC plans of operations, for landscapes that include NPWS-managed lands.

2.11.3 Call signs

322 Call signs at all fires and prescribed burning operations will follow the standard IMS terminology outlined below. Ground crews should continue to use their agency call sign.

Aircraft are allocated a call sign prefix, based on their type, followed by an identifying number. Aircraft types and associated prefixes are shown below.

Table 8: Standard IMS terminology for call signs – aircraft

Aircraft type	Call sign prefix
Light helicopters	Firebird
Medium helicopters	Helitak
Fixed-wing fire bombers	Bomber
Fixed-wing observation or air attack	Recon
NPWS-owned aircraft and Sydney catchment contract aircraft	Parkair

Table 9: Standard IMS terminology for call signs – IMS position

IMS position	Call sign
Incident Controller	IC or Incident Controller
Deputy Incident Controller	Deputy 1, 2, 3 etc. (number sequentially)
Liaison Officer	NPWS Liaison Officer (Identify the officer's agency, e.g. RFS, NSW Fire and Rescue, ForestsNSW)

IMS position	Call sign
Operations Officer	Ops Officer
Planning Officer	Planning Officer
Logistics Officer	Logs Officer
Divisional Commander	Div Comm (Identify which division, e.g. Div Comm North, Div Comm Greenlands etc.)
Sector Commander	Sect Comm (Identify which sector, e.g. Sect Comm Alpha, etc.)
Strike Team Leader	Strike Team 1, 2, 3 etc. or home location
Task Force Leader	Task Force 1, 2, 3 etc. or home location
Air Operations Manager	Air Operations
Air Observer	Air Observer
Air Attack Supervisor	Air Attack
Air Base Manager	Air Base Manager
Heli Base Manager	Heli Base Manager
Fire Investigations Officer	Fire Investigations
Medical Officer/Unit	Medical Officer or Ambulance Officer (as appropriate)
Safety Advisor	Safety Advisor
Media Officer	Media Officer
Fire Crew Leader	Normal agency call sign
Fire Crew Member	Normal agency call sign
Non-active Personnel	Normal agency call sign

2.12 Dangerous goods

2.12.1 Background

323 Dangerous goods are substances and articles which, due to their physical, chemical and toxicological properties, present an acute risk to life, health, property and the environment, especially when being transported.

324 Substances classed as dangerous goods in NPWS fire operations include petroleum fuels, helicopter fuel and oxidising agents. Petroleum fuels include petrol and diesel. Potassium permanganate is a strong oxidising agent and is used in incendiary capsules.

325 Requirements for the transport of dangerous goods are set out in the Australian Dangerous Goods Code (ADG Code), which is supported by the *Dangerous Goods (Road and Rail Transport) Act 2008* and associated Regulations.

326 Dangerous goods transport regulation is undertaken in NSW jointly by OEH and WorkCover NSW.

327 NPWS officers will have certain legal responsibilities for the transport of dangerous substances where they undertake any of the roles of Consignor, Prime Contractor, Loader or Driver. These legal responsibilities are outlined in the *Guidelines for the Transport of Dangerous Goods on Parks and Wildlife Group Vehicles*.

2.12.2 Dangerous goods policies

328 Dangerous goods used in fire management will be stored, handled and transported in accordance with the *Guidelines for the Transport of Dangerous Good on Parks and Wildlife Group Vehicles* and the requirements of the Occupational Health and Safety Regulation and manufacturers' instructions.

2.12.3 Dangerous goods transport

When dangerous goods transport controls may not apply

329 In certain circumstances, small quantities of dangerous goods are exempt from transport controls. Under Regulation 1.1.6 Exempt transport, dangerous goods transport law would not apply to any NPWS vehicle transporting less than 25% of a placard load (e.g. a small oxy/acetylene set + 5 L chainsaw fuel).

330 In addition, under Regulation 1.1.5 Dangerous situations, dangerous goods transported *'by, or at the direction of, an authorised officer or an officer of an emergency service, to the extent necessary to avert, eliminate or minimise a dangerous situation'* are not subject to the Regulations (e.g. transport of aviation fuel in a bushfire emergency). In emergency situations, such transport may only be carried out with the knowledge and approval of the Incident Controller.

331 **Exemptions only apply within NSW** and in all cases, dangerous goods may only be transported with proper regard for OHS principles and public safety.

Transport of 'empty' drums or gas cylinders

332 When determining what transport controls should apply, it is the actual quantity of dangerous goods that needs to be taken into account, not the capacity of the containers. For example, a load of used aviation fuel drums being returned to a depot after firefighting operations may contain only a few litres of residues. This would fall under the exempt transport provisions (see Figure 5).

333 In the case of a load of 'empty' and full drums, the total quantity would need to be calculated or estimated.

334 Gas cylinders are counted according to their capacity in litres. Typical sizes and capacities are:

- D cylinder = 9.4 L
- E cylinder = 23 L
- G cylinder = 47 L
- LPG 9 kg cylinder = 21.6 L
- LPG 45 kg = 108 L

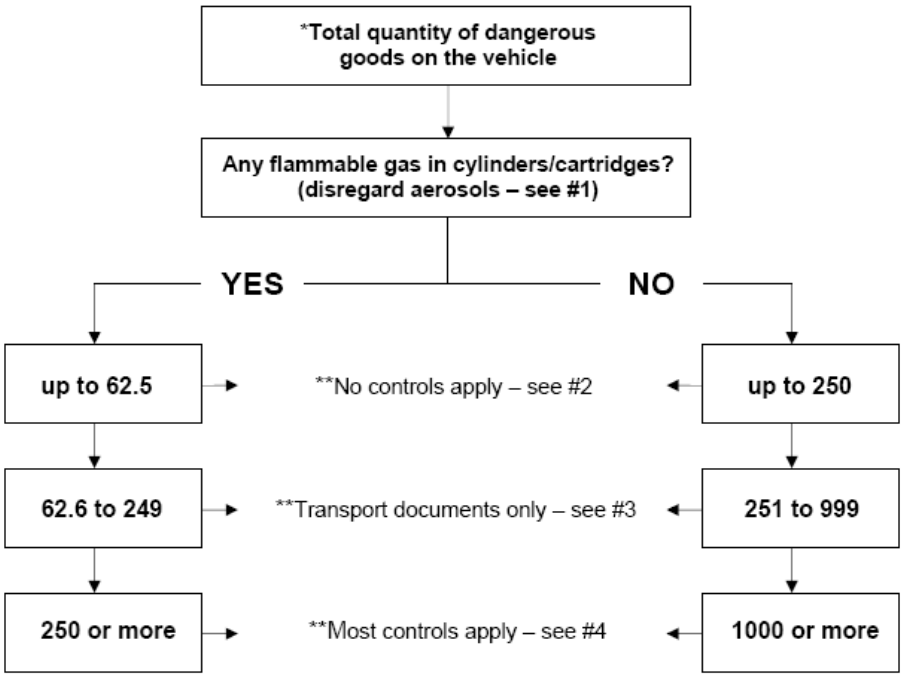
Dangerous goods transported by contractors

335 Where a contractor is engaged for the routine transport of dangerous goods, NPWS and NPWS officers become the Consignor.

336 A Consignor must complete and provide the transporter with a transport document which fully describes the items transported, in accordance with the ADG Code (the pre-printed transport documents included in these guidelines are not acceptable).

A Consignor is also responsible for various other matters relating to how that load is transported.

Figure 5: Decision tree – do controls apply?



Additional controls

337 The dangerous goods transport Regulations apply the following controls to loads of dangerous goods (see below for further information):

- transport documents
- emergency information
- placarding
- fire extinguisher
- protective and safety equipment
- stowage rules
- segregation rules
- general requirements relating to container and vehicle suitability, and
- transport documents

Transport documents

338 Transport documents are required for the transport of any quantity of dangerous goods, except in the case of 'exempt transport' (< 25% of a placard load – Regulation 1.1.6).

339 Three types of pre-printed transport documents have been developed for use by NPWS:

1. For aerial operations support, when transporting aviation fuel only, the transport document at **Appendix A** of the *Guidelines for the Transport of Dangerous Goods on Parks and Wildlife Group Vehicles* should be used.
2. When transporting aviation fuel and incendiaries only, the transport document at **Appendix B** of the *Guidelines for the Transport of Dangerous Goods on Parks and Wildlife Group Vehicles* should be used. In either case ensure that the vehicle is not transporting any other dangerous goods.

3. In more routine operations where a range of dangerous goods is transported, the more general transport document at **Appendix C** of the *Guidelines for the Transport of Dangerous Goods on Parks and Wildlife Group Vehicles* should be used.

340 If you have less than a placard load, the relevant transport document must be carried in a conspicuous place in the cabin of the vehicle.

341 If you have a placard load, the relevant transport document must be carried, along with emergency information, in the emergency information holder described in the next section.

Emergency information

342 Emergency information is required for the transport of placard loads of dangerous goods.

343 Emergency information consists of a Standards Australia *HB:76 Initial Emergency Response Guide*. This must be carried in an emergency information holder, fitted to either door of the vehicle or in a conspicuous position in the cabin.

Placarding

344 Placards (i.e. class labels) are required to be displayed front and rear of vehicles transporting placard loads of dangerous goods.

Fire extinguisher

345 NPWS vehicles transporting placard loads must be fitted with at least a 30B (rating) dry powder fire extinguisher, preferably located near the driver's door.

Protective and safety equipment

346 The ADG Code requires that vehicles transporting placard loads must be equipped with 3 double-sided reflector signals, and drivers must carry protective and safety equipment.

Stowage

347 The ADG Code also sets out rules on how placard loads of dangerous goods are to be stowed on vehicles.

348 A significant rule to be aware of is that a placard load of flammable gas in cylinders may not be transported in an enclosed vehicle or enclosed compartment unless it is ventilated to prevent the build-up of vapours.

349 In order to allow normal operations, an exemption from stowage requirements has been granted to allow transport of dangerous goods on NPWS vehicles that do not have gates, or rigid sides and tailgates at least 2/3 the height of the containers. This exemption is conditional on the dangerous goods being properly restrained on the vehicle.

2.12.4 Dangerous goods storage

Storage of fuels

350 Fuels will be stored as follows:

- All petroleum products will be stored in accordance with AS 1940-2004: *The storage and handling of flammable and combustible liquids*.

- Drums of aviation fuel may be stored temporarily at helipads and staging areas during fire operations.
- Limitations apply to the amount of dangerous goods that can be stored on unlicensed premises. The limit for Jet A-1 fuel is 1,000 L. The limit for petroleum fuels is 100 L.
  A Dangerous Goods Licence must be obtained if more than this is to be stored.

Commercial bulk fuel supply will be used whenever available and feasible.

Incendiaries

351 The following provisions apply to incendiaries:

- Incendiaries should be stored in a dry, clean and elevated place, in a separate room and away from any possible reagents and petroleum fuels.
- Potassium permanganate and glycol must not be stored in close proximity to each other.
- Incendiary capsules should be stored and transported within a lockable box.
- Potassium permanganate and glycol incendiary capsules should be transported in separate leak-proof containers.

2.13 Reporting and documentation for fuel management

2.13.1 Background

352 The documentation of prescribed burning and hazard reduction activities is essential for fire management. Information is used to establish fire histories and assess the effectiveness of fire management strategies, as well as to allow the assessment of the ecological implications of fire. This information is used to prepare RFMS and prescribed burn plans.

353 Documents and systems used for reporting and documenting fire management activities include: prescribed burn plans, situation reports (SITREPs) and the Bushfire Risk Information Management System (BRIMS) which tracks hazard reduction proposals and activities, permits, complaints, certificates and other related information.

354 All prescribed burning must be entered in the OEH Fire Geodatabase to ensure currency of records.

355 All fire trail maintenance will be recorded in the Asset Maintenance System (AMS) as per the AMS Fire Trail Maintenance Guide.

356 All hazard recuction activities, including prescribed burns and mechanical works, must be recorded in AMS as per the Bushfire Hazard Reduction Activities in AMS User Guide.

357 Sitreps for prescribed burns will be made at the start of the burn and on each subsequent day of the burn. A final sitrep for the prescribed burn will be made at the completion of the burn.

358 A standardised system of fire management documentation and reporting (used by all NSW fire authorities) is used for fire management activities on NPWS-managed land, and for incidents outside NPWS-managed land attended by NPWS personnel. This system is consistent with national documentation standards.

359 NPWS uses the IMS structure and approved forms for the planning and operation of prescribed burns.

2.13.2 Bushfire Risk Information Management System (BRIMS)

360 NPWS policy, procedures and requirements for the input and extraction of BRIMS data is as per the NPWS BRIMS User Manual (Business Rules and Guidelines for Use).

361 Fuel management proposals and activities, including the issuing of hazard reduction certificates, will be recorded using the Bushfire Risk Information Management System (BRIMS), a web based, multiagency system. All NSW firefighting and land management agencies with bushfire risk reporting requirements are responsible for ensuring that the relevant information is available in BRIMS.

362 Responsibility for entering hazard reduction proposals into BRIMS lies with the field Branches.

363 The agency that enters the proposal in BRIMS is responsible for updating activities against that proposal, particularly in joint operations. This ensures BRIMS records are not duplicated across agencies.

364 All hazard reduction proposals being considered by BFMCs should be entered into BRIMS by 31 March of each year. Further proposals can be added to BRIMS as they are submitted to BFMCs for consideration. Proposals may be altered or cancelled in response to BFMC or agency discussion, as long as the activity has not commenced.

365 FIMS uses BRIMS when preparing housefolder notes, Ministerials and advice for the Minister and Public Affairs Branch. NPWS officers must update activities undertaken within the timeframes shown in Table 10. Regional Managers are responsible for ensuring data is available and correct for these deadlines.

366 BRIMS should be used to record the type of environmental assessment undertaken. Where the Bush Fire Environmental Assessment Code (BFEAC) is used BRIMS should be used to generate the hazard reduction certificate noting that:

- the issuing agency is responsible for the management of documents generated from BRIMS (e.g. certificates) including correctness, distribution and filing,
- creating a hazard reduction certificate in BRIMS may not constitute all the requirements for an environmental assessment using the *Bush Fire Environmental Assessment Code*, and
- following the approval of a draft hazard reduction certificate, Regional Managers have the option to delegate the responsibility of approving final hazard reduction certificates to Area Managers, when there have been no changes to the approved draft hazard reduction ceterificate,

Issuing a hazard reduction certificate must be conducted in accordance with the standards documented in the *Bush Fire Environmental Assessment Code*.

Table 10: BRIMS reporting requirements

What - event/requirement	When - deadline	Who to or How
Enter all hazard reduction proposals for forthcoming season	Enter proposals into BRIMS as soon as possible after lodgement with BFMC and no later than **1 July** each year.	Region/Area - enters new proposals in BRIMS
Nominate hazard reduction Scheduled Date	A scheduled date MUST be set for each proposal. The scheduled date must be kept current.	Region/Area - updates BRIMS entry with Scheduled Date
Update planned hazard reduction activities during season	Update BRIMS entry (including scheduled date) 7-10 days prior to planned activity date	Region/Area – updates BRIMS entry with any changes

2.0 Prevention and planning

What - event/requirement	When - deadline	Who to or How
Commence hazard reduction burn	Notify Branch prior to ignition on day or commencement of activity *NB. Replace Branch with Region for Southern Ranges Region*	RDO notifies BDO as required. BDO provides update to FIMS DO as required.
Completion of hazard reduction works	Within 7 days of activity end date/completion	Region/Area - update BRIMS entry with completed works
Monthly reports produced (all data entered and correct in BRIMS)	Within 5 days after end of month	FIMS
Annual hazard reduction reporting to be administered	Annual reports for the preceeding financial year will be run in July each year, to allow data to be analysed to meet reporting deadlines.	FIMS

3.0 Preparedness

Section 3.0 contents

3.1 Preparedness planning

3.1.1 Background

367 Preparedness is an essential component of effective fire suppression. It allows for the establishment of cooperative arrangements for coordinated fire suppression, the readiness of trained staff and pre-deployment of equipment to areas which will facilitate a rapid response.

3.1.2 Preparedness policies

368 FIMS, each field Branch, Region and Area will annually review and maintain its organisational competency to respond to and manage incidents, protect its assets and assist where required under bushfire coordination arrangements.

369 NPWS will provide a level of preparedness for bushfire suppression that:

- is appropriate to mount sufficient initial attack capability given the existing and forecasted fire danger
- recognises the possibility of extreme fire conditions, and
- aims to reduce the impact of bushfires on private property and natural and cultural heritage values.

370 In determining fire suppression and response capability, each Region will take into account:

- an evaluation of bushfire risk
- identification of, and appropriate reduction of hazards
- identification of infrastructure and information systems necessary for fire suppression
- the provision of a strategically located firefighting force with appropriate training, equipment and readiness
- the provision of a bushfire detection and response system that is responsive to changes in fire danger, and
- identification and maintenance of access roads and helipads.

371 Before the bushfire danger period:

- FIMS and each field Branch and Region will prepare incident procedures to ensure there is an effective and timely response to any bushfire occurring on NPWS-managed land or within the 8 km (or other specified distance) statutory response limit from NPWS-managed lands (s. 133, *Rural Fires Act 1997*).
- All Regions will conduct an annual fire preparedness day.
- Exercises will be undertaken within NPWS and, in some circumstances, in conjunction with other fire authorities, to test equipment, undertake an annual physical check of personal protection equipment and review all parts of incident detection, response and suppression.
- All Regions will undertake maintenance of all communications systems.
- AMS cyclic maintenance program will be loaded for pre-season fire equipment checks.
- Regional managers will certify and sign off that all pre-season preparedness activities are complete and file within the region.

372 During the bushfire danger period each Region will respond to bushfires in a manner appropriate to the level of risk and bushfire potential and in accordance with the relevant Regional incident procedures and BFMC plans of operations.

3.1.3 Incident procedures

373 Each year FIMS will update the *State Incident Plan* for circulation to field Branches and Regions before the start of the bushfire danger period.

374 FIMS, Branches and Regions will prepare incident procedures and review this document annually before the start of each fire season. The review must ensure that incident procedures are consistent with NPWS policy. Branch and Regional incident procedures will be communicated to the relevant fire control officers as relevant plans for the purposes of s. 38 and 44 of the *Rural Fires Act 1997* and to BFMCs for reference within BFMC plans of operations.

These documents are to be referred to by the following standard names and abbreviations: State Incident Plan (SIP), Branch incident procedures (BIPs), and Regional incident procedures (RIPs).

375 Incident procedures will include:

- telephone numbers and addresses for all relevant bushfire authorities, emergency response and support agencies
- contacts for support, including equipment, accommodation and welfare arrangements
- regional fire preparedness guidelines, including preparedness levels
- fire detection procedures – prepared as a schedule of actions and arrangements
- procedures for detection of and response to any incident
- an outline of the process for declaring and de-declaring incidents

- information on hazards, risks and procedures relevant to the area
- all coordinated firefighting arrangements
- the timing and characteristics of the Region's critical fire season
- procedures for the protection and evacuation of visitors for all reserves, developed in conjunction with Police and other emergency authorities
- a schedule setting out regular checks to be conducted on radio and communications equipment
- information about the NPWS radio system and radio systems of other agencies that will allow effective communication during incidents
- standardised and consistent Duty Officer guidelines.

376 The following will also be included in BFMC plans of operations:

- fire detection procedures – prepared as a schedule of actions and arrangements
- procedures for the protection and evacuation of visitors for all reserves, developed in conjunction with Police and other emergency authorities.

377 Each Region will identify indicators, based on the Keetch-Byram Drought Index (KBDI), fire danger rating (FDR) and other local indicators as guides to assess the need for bans and closures. These will be set out in the preparedness levels table included in the Regional incident procedures.

378 All firefighting and support vehicles must carry a copy of the incident procedures relating to their home Region.

379 Under privacy laws, staff home contact details (and RIPs or BIPs containing staff home contact details) may not be distributed externally without the staff member's consent.

Critical fire season

380 Each Region will define its own 'critical fire season' – for the Region and for each Area or group of reserves. Predictions will be made annually on the extent of the critical fire season, based on current rainfall deficit and Southern Oscillation Index trends.

381 Regional Managers will ensure the predicted range of the critical fire season is incorporated into Regional and Area works programming, ensuring maximum availability of resources during this predicted range.

Preparedness levels

382 Each Region will include preparedness guidelines in its incident procedures, based on Table 11: Fire Danger Ratings: preparedness guidelines and public warnings.

The preparedness guidelines should incorporate local conditions such as:

- fire detection methods (fixed points and aircraft)
- resources available (equipment, personnel and competencies, assembly and control areas)
- fire weather conditions (KBDI, FFDI, GFDI)
- ignition potential, fire history and broad fuel types (forest, grass, heath)
- communications
- fire precautions and public safety (reserve fire bans and closures, public advice, evacuations).

383 Preparedness levels are to be implemented during the bushfire danger period (whether locally declared or during the state-wide declaration period) in all Branches, Regions and Areas.

3.0 Preparedness

Regions will ensure that appropriate systems are in place to initiate the correct level of preparedness.

384 Branches, Regions and Areas should determine the daily preparedness level using either the FFDI issued daily by BOM during the bushfire danger period, or local weather station information.

As the FFDI may vary from area to area, Regions and Areas should each day implement the preparedness level that is most applicable for their Region or Area.

385 Table 11: Fire Danger Ratings: preparedness guidelines and public warnings, is a guide for defining preparedness levels in relation to the FDR. Branches, Regions and Areas should use this as a template and amend it to suit local conditions and response capacity.

386 Preparedness levels are provided as a guideline and Regions may wish to increase or decrease them in response to specific circumstances, e.g. lightning, arson, other fires (local or out-of-area) absorbing firefighting resources (all agencies).

3.0 Preparedness

Table 11: Fire Danger Ratings: preparedness guidelines and public warnings

Fire Danger Rating	FDI	Preparedness	Public warnings
CATASTROPHIC	100+	As for Extreme plus: • Staff to work from local depots and be prepared for immediate response • Heavy plant items should be loaded ready for transport if not already pre-deployed • Consideration should be given to establishing preformed IMTs in consultation with other fire agencies	• All parks to be closed by EDPM unless otherwise determined in consultation with the relevant Branch Director or the Regional Manager in the case of Southern Ranges Region only. • Enact specific emergency plans for reserves where these exist • Implement systems to warn public in visitor facilities, lessees and park residents (e.g. information on the website, campground managers, radio messages, phone calls, staff attendance on ground)
EXTREME	75-99	As for Severe plus: • All fire units loaded and available for initial attack • Regional Manager to consider suspending flex leave and adjusting rosters to ensure maximum staffing levels • Notify local FCC of crew availability and locations	As for Severe plus: • Implement systems to warn public in visitor facilities , lessees and park residents (e.g. information on the website, campground managers, radio messages, phone calls, staff attendance on ground)
SEVERE	50-74	As for Very High plus: • Consideration given to deploying staff to strategic locations to enable rapid response • Initiate arrangements for rapid response of heavy plant and/or aircraft • Activities on NPWS-managed lands that may cause accidental ignitions must be suspended (e.g. slashing, welding, machine operations in continuous fuel with rock present)	• At the Regional Manager's discretion, parks or sections of park may be closed or evacuated where: - escape routes and refuge areas for visitors are limited - visitor use areas are not defendable against bushfire, or - resources are limited.
VERY HIGH	25-49	As for High plus: • Work programs adjusted to reduce response times. • At the Area Manager's discretion, fire units may be taken home by rostered staff if this will reduce response times. • Activities on NPWS-managed lands that may cause accidental ignitions must be suspended (e.g. slashing, welding, machine operations in continuous fuel with rock present) unless after consideration of risk and mitigation measures the Regional Manager approves otherwise.	• Consider implementing Park Fire Bans
HIGH	12-24	As for Low-Moderate plus: • All fire units fully loaded and available for initial attack unless otherwise approved by the Regional Manager. The Regional Manager's approval to vary this requirement may be specific or general and may include provision for deferral of this requirement until a higher FDI is forecast or reached. • Fire towers to be staffed and other ground-based detection measures implemented as per local MoUs and protocols. • Aerial observation may be initiated in consultation with Branch Duty Officer, RFS and Forests NSW if lightning has occurred, visibility is reduced from normal vantage points or arson activity is suspected.	• Normal operations • Nil public warnings
LOW-MODERATE (at all times during the declared Fire Danger Period)	0-11	• Duty Officers rostered at Region, Branch and FIMS consistent with RIPS, BIPS and SIPS. • Personal firefighting equipment carried with all firefighting staff either in vehicles or close at hand during working hours. • At least 1 fire unit per Area fully loaded and available for initial attack.	• Normal operations • Nil public warnings

3.0 Preparedness

3.1.4 Duty Officer system

387 During the designated and local bushfire danger periods, FIMS and field Branches may activate a 'Duty Officer' system to coordinate response to fires.

388 The Duty Officer will be an officer who is competent to make initial assessment of any fire and activate and coordinate a response. Management of the fire will then be assumed by the appointed Incident Controller.

389 The Duty Officer (or Regional Manager or Fire Management Officer in the Duty Officer's absence) will monitor and evaluate the bushfire risk and activate detection and response procedures appropriate to the level of risk.

390 Duty Officers must be contactable as required by the Branch Manager or Regional Manager during the bushfire danger period.

391 During the bushfire danger period the Duty Officer must be within 30 minutes of an Area, Region or other NPWS office, unless suitable infrastructure exists within their home to allow the monitoring and activation of local NPWS response to bushfire.

3.1.5 Fire preparedness days

392 Each Region will undertake an annual fire preparedness day to assess, replace and maintain equipment, refresh staff skills and currencies and provide information on new policy and procedure developments.

393 All staff must be recorded in Aurion as having attended an annual fire preparedness day to be eligible to go to fires (see section 3.7.3 Competency).

394 The main aims of undertaking annual fire preparedness days are to:

- fulfil policy requirements
- ensure all staff have a refresher of basic firefighting training and safety principles
- identify areas of deficiency in training or equipment preparedness for Regions
- learn about new policies and policy changes
- collect data on currency hours from the previous fire season (to be forwarded to L&D)
- learn about new equipment and standards, and
- obtain valuable feedback from staff regarding current fire practices, equipment standards etc.

395 It is recommended that, where possible, fire preparedness days be undertaken in conjunction with another agency to help foster good relationships and assist cooperative firefighting.

396 The duration of a fire preparedness day must be sufficient to encompass all learning opportunities and team-based roles. In some cases regions will run these as two day events.

397 FIMS, in conjunction with L&D, has produced a Fire Preparedness Day Resource Kit as a tool to help Regions run fire preparedness days. A series of resources, including PowerPoint presentations, are included and may be adapted for use at Fire Preparedness Days.

398 The following must be undertaken at annual fire preparedness days:

Annual check/review	Related policy
Review new policy and procedures including Regional and Branch incident procedures and preparedness levels including: • fire detection methods • seasonal conditions / fire weather (KBDI, FFDI, GFDI, DF) • ignition potential • fire precautions / public safety / park closures • response systems	3.1.3 Incident procedures 3.1.4 Duty Officer system
Conduct vehicle burnover / entrapment training for all staff.	Fire Management Circular 2009/3 'Vehicle Entrapment Exercise'
Conduct full inspection of PPE (if not already conducted as a pre-season check)	3.6 Personal firefighting equipment
Review hazardous tree management (tree risk policy and procedures)	4.3.5 Hazardous trees
Review staff competency and currency (undertaken by an assessor) and record of staff attendance at fire preparedness days.	3.7 Learning and development

399 Consideration should be given to undertaking the following at annual fire preparedness days:

Annual check/review	Related policy
Inspect and test all communications equipment and undertake a communications exercise using RFS radio equipment. Brief all staff of communications black spots in the Region	3.2 Communications equipment
Inspect and test the serviceability of all firefighting vehicles and equipment (if pre-season checks have not already been completed).	3.5 Equipment standards
Undertake GPS orientation/refresher exercise.	

Assessments to be undertaken at fire preparedness days

400 At annual fire preparedness days, all staff will present their Fire Incident Field Guide to a trained assessor for verification.

401 The *Fire Preparedness Day Attendance and Currency Record form* included in the Fire Preparedness Day Kit is required to be filled out by all attendees, signed by an Assessor and forwarded to L&D for entry into Aurion.

402 Assessments that can be undertaken at Fire Preparedness Days include:

- final assessment decisions for Crew Member competency (proof of completion presented in Crew Member passport)
- assessment of Crew Member currency
- assessment of Crew Leader currency

3.0 Preparedness

3.2 Communications equipment

3.2.1 Background

403 The use of communications equipment is an essential component of fire management operations. Control and coordination relies on the timely flow of information between all personnel and between the fire ground and the control centre. Effective communication is essential to the safety of personnel during all fire management operations.

404 Communications systems include radio networks, telephone equipment, computer networks and mobile telephone systems.

405 NPWS operates 2 radio systems – a mid-band very-high-frequency system (VHF) in eastern NSW, and a high-frequency system (HF) in western NSW. The VHF system may be augmented with portable repeaters during incidents. NPWS also uses radios with frequencies assigned to other fire authorities for coordinated fire management. Each vehicle that may be used during fire operations is fitted with a radio programmed to a NPWS system.

406 Information and operating procedures for the NPWS mid-band VHF network are contained in the *VHF Radio Operations Guide*.

3.2.2 Communications equipment policies

407 NPWS will maintain effective radio communication systems to facilitate efficient and safe fire management operations.

- Each Region will acquire and operate communications equipment that is required for implementing efficient and safe fire management operations.
- Each Region will establish incident management facilities equipped with the communications technology required for implementing efficient and safe fire management operations.
- No vehicle will be allowed on the fire ground unless it has effective communications within the chain of command.

Radio equipment

408 Each Region will appoint an officer who is responsible for overseeing the maintenance of the Region's radio system.

409 All NPWS radio system equipment will undergo an annual maintenance check prior to the critical fire season.

410 Each Region will maintain VHF radio coverage maps, where appropriate, and stored for ready access during incidents.

411 Regional incident procedures will include a schedule of regular radio and communications equipment checks to be conducted.

412 Regional incident procedures will include information on the NPWS radio system and the systems of other agencies that will allow effective communication during incidents.

413 Where there is an identified need, Regions will acquire radio equipment to allow communication with other fire agencies on their primary systems.

414 Consideration will be given to fitting each vehicle that may be used in command roles with an additional radio to facilitate vehicle-to-vehicle radio communications with other agencies or neighbours. Such communication may be on the RFS network or on the UHF-CB network, depending on the location in NSW.

Use of UHF radios in NSW is regulated by the Australian Communications and Media Authority (ACMA) and covered under the Radio communications (Citizen Band Radio Stations) Class Licence 2002. UHF CB radios must comply with the standard *Specification for UHF Radio Equipment Employed in the Citizen Band Radio communication Service* also known as RB250 published by the Postal and Telecommunications Department in October 1978.

UHF CB radios should only be used for short range tactical communications. The NPWS VHF system should be the primary communications system for command and strategic purposes during incidents.

415 NPWS will endeavour to program its radios on the NPWS system to include the frequencies used by other fire agencies in the same frequency band.

416 All NPWS vehicles associated with fire operations will be fitted with a NPWS mobile radio. If the mobile radio has a selective calling (SELCALL) number it will be displayed at the top of the radio screen.

417 All NPWS vehicles associated with fire operations will have a vehicle roof number (VRN) as per Appendix 1 (7.1.1 Essential vehicle equipment)

Telephone equipment

418 Each Region will assess the effectiveness of mobile telephone coverage across reserves and acquire the equipment necessary for effective communication during fire management operations.

419 Each Region will fit designated command vehicles and communications units with mobile phones to ensure effective communication during fire management operations.

420 Each Region will acquire when necessary, telephone and other equipment to effectively operate incident management facilities during incidents.

421 Incident management centres should have at least 2 telephone lines connected directly to a public telephone exchange.

Computer networks

422 Each NPWS administrative office will be connected to a computer wide-area-network that facilitates incident reporting and access to weather information.

3.3 Weather information

3.3.1 Background

423 Meteorological information is used to plan and implement fire management operations, anticipate potential for fire activity and determine appropriate levels of preparedness.

Up-to-date meteorological information and forecasts are essential for developing and implementing fire suppression strategies and prescribed burns, and for ensuring the safety of personnel on the fire ground.

3.0 Preparedness

424 The Bureau of Meteorology (BOM) is the main provider of meteorological information. There are a number of other agencies and companies that also provide meteorological information, including lightning data.

- Most weather information is available on the internet, either on publicly accessible sites or through subscription services. Most information pertinent to fire operations can be accessed through a BOM webpage provided for NPWS (BOM registered user).
- BOM can also prepare site-specific special fire weather forecasts for fire operations.

3.3.2 Weather information policies

425 Weather information will be accessible as follows:

- Each Branch and Regional office will have internet access to BOM weather data.
- FIMS will conduct annual negotiations with BOM on the services and information available on the internet through the NPWS fire weather page.
- Access to internet and weather services will be set up as soon as possible after the establishment of an incident control centre.
- Permanent incident management facilities will be equipped with weather monitoring equipment.
- Regions will implement appropriate on-site weather monitoring equipment where this is deemed necessary.

Monitoring weather for fire preparedness

426 Each Area office will

- check seasonal data and weather forecasts on a daily basis during periods of fire risk to:
  determine the local risk of fires, and
  implement the appropriate fire preparedness procedures, and
- have access to and be able to use the lightning detection system accessed via the intranet.

Fire weather warnings, severe weather warnings and total fire bans

427 FIMS will email or SMS to each Branch and Regional office the appropriate notices, advising of fire weather warnings and total fire bans only.

428 Each Regional office will ensure that fire weather warnings, severe weather warnings and total fire bans are appropriately disseminated to key visitor areas, workplaces and staff working in remote areas.

Automatic weather stations

429 FIMS will negotiate with BOM and operations support and coordination units to progressively improve coverage of automatic weather stations across the state.

3.3.3 Monitoring weather during fire management operations

430 Weather conditions will be regularly recorded on the fire ground by divisional and sector commanders and logged at the incident control centre.

431 Weather forecasts and information will be displayed in incident control centres and assembly areas, and updated on a regular basis.

432 Portable remote weather stations may be placed in suitable locations close to the fire ground.

Requests for special fire weather forecasts

433 Requests for special fire weather forecasts can be made for both suppression and prescribed burn operations.

- Requests for special fire weather forecasts must be submitted by 14:00 pm the day before on a daily basis for both bushfires and prescribed burns. One forecast will be issued for each request.
- Requests should be faxed to the RFS State Operations Centre. A copy of the special fire weather forecast request form can be accessed on both the intranet or the BOM 'registered users' fire weather webpage.
- To ensure the most accurate forecast, include the following on the request form:
  specific and current locations (latitude and longitude coordinates)
  elevation and aspect for the bushfire or prescribed burn, and
  weather observations from the fire ground or burn site (including the elevation the observation was taken at and the position relevant to the fire ground).

434 Forecasts are not automatically issued for Section 44 fires. Daily requests for Section 44 fires will receive an afternoon forecast and a 6:00 am forecast. The daily request form should include current information on fire location, the name of the Incident Controller and weather details.

3.4 Fire bans and closures

3.4.1 Background

435 During severe fire danger, or when an active bushfire is in or adjacent to a reserve, it may be necessary for a reserve or a section of a reserve to be closed or activities within the reserve to be cancelled. This action is taken to protect the safety of the public, and is used to free resources to fight existing fires.

3.4.2 Fire bans and closure policies

436 Fire danger warning signs should be installed at locations with maximum visibility to visitors during the bushfire danger period.

437 Each Region will identify indicators, based on Table 11: Fire Danger Ratings: preparedness guidelines and public warnings, and other local indicators as guides to assess the need for bans and closures. These will be placed in Regional incident preparedness level tables and included in Regional incident procedures.

438 Regions are responsible for updating the public website with individual park fire ban and reserve closure information and will ensure a suitable number of staff are trained in TeamSite and licenses are available to facilitate these updates.

439 FIMS is responsible for updating the public website with TOBAN information and after hours emergency updates and can assist with park closures or bans that cover one or more regions. For assistance please contact the State Duty Officer.

3.0 Preparedness

Reserve fire bans

440 The Regional Manager can declare an individual reserve fire ban.

- Reserve fire bans may be declared when fuel and weather conditions are conducive to severe fire behaviour.
- Reserves, or parts of reserves, may be closed to the public when the fire danger poses a risk to the safety of visitors.

441 Directors may declare a reserve fire ban affecting all reserves within their Branch if they believe that current or forecasted weather conditions, or current committed resource status, or other such requirements, merit the declaration of such action.

442 Partial reserve fire bans, such as a ban on solid fuel, can be considered.

443 Before proceeding with a reserve fire ban, Regional Managers should consider weather outlook, visitation, threats to property, usage, staffing and fire activity.

444 Regional web updaters are responsible for updating the public website via TeamSite with details of reserve fire bans as per the fire and park closure web update process.

445 Regional Managers will advise the following of a reserve fire ban:

- FIMS
- Public Affairs Branch
- Branch Planning and Coordination Section, and
- all staff within the relevant NPWS Area.

Regional Managers should also consider notifying:

- the executive officer of the relevant BFMC
- other relevant fire authorities
- relevant public utilities
- concessionaires
- neighbours, and
- local media.

446 Reserve fire ban signs will be erected at selected locations, as per local arrangements, when a ban is declared for the reserve.

447 The use of gas-fired and electrical appliances may be permitted for cooking during a reserve fire ban where:

- the appliance is under the direct control of an adult
- the appliance is placed or located in an area where there is no combustible material within 3 m, and
- there is an adequate water supply to extinguish fire adjacent to the appliances.

448 Designated fireplaces will be clearly identified.

Total fire bans

449 A Total Fire Ban (TOBAN) is declared for days when fires are likely to escape and be difficult to contain.

450 The BOM provides advice on forecast weather conditions and Fire Danger Ratings (FDR) during the Bushfire Danger Period. The RFS Commissioner declares TOBANS based on this advice and other information

451 FDRs and TOBANs are declared for NSW Fire Areas, which group together a number of local government areas (LGAs) with similar weather conditions and terrain.

FDRs are generally produced twice daily by the BOM during the bushfire danger period, by 8:30 am and 16:30 pm.

A decision to declare a TOBAN is generally made at around 5pm each afternoon during the Bushfire Danger Period and applies for the following day, starting from midnight and lasting 24 hours.

General weather forecasts are based on NSW weather districts (rather than NSW Fire Areas).

452 Regions can apply through FIMS (for application to RFS) for the declaration of a TOBAN within a NSW Fire Area.

453 All relevant staff within the Region will be advised of the declaration of a TOBAN.

454 'Total Fire Ban' signs will be erected in selected locations, as per local arrangements, and FIMS will place TOBAN information on the public website.

455 A TOBAN declaration prohibits the lighting of a fire in the open (including wood or charcoal barbeques) and suspends fire permits.

456 Gas-fired or electric barbeques or cookers can be used if the following conditions are met:

- they are on a residential property and within 20 m of the building, or in a public picnic or camping area where the appliance and this area have been approved by the land manager for this purpose
- they are under the direct control of a responsible adult, who is present at all times while the appliance is operating
- all flammable materials have been removed from the ground within 2 m of the appliance while it is operating, and
- a system of applying an adequate stream of water to the appliance and its surrounds is available for immediate and continuous use.

Total fire ban exemptions

457 TOBANs do not restrict the use of gas or electric cookers within a caravan or 3-sided enclosed annexe of a caravan.

458 During TOBANs and reserve fire bans, members of the public are permitted to use permanent fixture gas or electric appliances with totally enclosed flames in park picnic areas. A system for supplying an adequate stream of water must be available for emergency use.

459 Where no such permanent fixture gas or electric appliances exist in a park picnic or camping area, Regions may facilitate the use of gas or electric appliances during TOBANs or reserve fire bans by the demarcation of specific cooking areas e.g. by identifying a cooking area with signs and roping it off. Local conditions and risk factors will determine if it is appropriate to permit the use of gas or electric appliances at specific sites.

- Such areas must have adequate water supplies i.e. a system of applying an adequate stream of water to the gas or electric appliance and its surrounds must be available for immediate and continuous use.
- These conditions should be determined by the Area Manager, given due regard to the above.
- Systems for supplying an adequate stream of water for emergency use must be identified by the Area Manager. Such systems could include hose water supply, buckets of water, gravity feed water tanks, knapsacks, etc.

Reserve closures and cancellation of activities

460 The Regional Manager can close all or part of a reserve.

3.0 Preparedness

461 The decision to declare a reserve closure, or to cancel activities, will be based on whether:

- there is a TOBAN in force
- there is a fire weather warning issued for the weather district covering the reserve
- the Regional Manager considers, after an assessment of the fuel and weather conditions, that there is an unacceptable risk to the safety of visitors
- there is an active fire in or adjacent to the reserve
- fire behaviour predictions indicate a very high to extreme fire danger
- there is a high risk of arson occurring on the day and the weather conditions are conducive towards the rapid development of a fire should an outbreak occur
- there is a requirement to do so based on law enforcement of other incident or emergency response activities being conducted within the reserve
- there is a requirement to do so based on pest species management programs, or
- Regional resources are, or are likely to be, committed elsewhere.

462 Triggers for considering the closure of a reserve should be included in the Regional preparedness levels table and included in the Regional incident procedures.

463 Directors may close all reserves within their Branch if they believe that current or forecasted weather conditions, or current committed resource status, or other such requirements merit this action (see Table 11)

464 Regional web updaters are responsible for updating the public website via TeamSite with details of reserve closures as per the fire and park closure web update process.

465 Regions must notify FIMS and Public Affairs Branch about reserve closures or cancellation of activities.

466 Notices advising of reserve closures and cancellation of activities should be displayed at selected locations.

Risk assessment and the reopening of reserves after a fire

467 No reserve or part of a reserve affected by fire activity should be opened to the public until a formal risk assessment has been conducted and, where necessary, any appropriate remedial actions have been undertaken.

468 Branches, Regions and Areas should use the risk assessment procedure and form. If necessary this procedure should be modified to reflect any local or Regional requirements.

469 The risk assessment must include the inspection of access roads and trails, walking tracks, facilities and infrastructure used by the general public. It may also, at Regional discretion, include other assessment provisions not directly related to the safety of the general public, such as wildlife rescue and rehabilitation.

470 Where considered necessary, a job safety analysis (JSA) and job safety briefing (JSB), in accordance with the *OH&S Risk Management System* should be carried out before crews enter the area to conduct a more detailed risk assessment.

471 Where required, qualified expert assessors should be used to estimate the level of risk posed by fire damage to facilities, infrastructure or trees and to identify what remedial works may be required. Advice is contained in Safety Circular 09/04 Hazardous trees.

Staff and qualified expert assessors are to wear appropriate personal protective equipment when conducting risk assessments.

3.5 Equipment standards

3.5.1 Background

472 NPWS is equipped with a variety of firefighting vehicles and equipment. This equipment can be deployed across NSW or interstate and is maintained to the prescribed standards listed below. All equipment must be constructed to NPWS standards in order to maintain interchangeability.

473 FIMS works in consultation with other agencies to review standards of fire equipment and new equipment, and, where appropriate, to update approved equipment lists.

474 The schedules in Appendix 1 outline these standards and have been developed by FMEC using AFAC guidelines and BFCC recommendations.

3.5.2 Equipment standards policies

475 Firefighting units and support equipment will be designed according to Australian Standards, or NPWS standards where an Australian Standard does not exist, and must meet occupational health and safety standards.

Firefighting units will comply with the engineering specifications for the tray exchange lockdown system.

476 FIMS (Operations Unit) maintains and coordinates the setting of NPWS fire equipment standards through FMAC.

477 Firefighting equipment will be:

- provided in accordance with approved schedules – see Appendix 1.
- in accordance with NPWS-approved equipment lists and the *Fire Equipment Catalogue*
- inspected before the start of the critical fire season to ensure OHS and RTA standards are met, and
- used by appropriately trained and licensed personnel.

478 NPWS vehicles will not be equipped with sirens or combinations of red and blue lights that require State Rescue Board approval. Red lights are acceptable with the Regional Manager's approval.

479 Regional Managers must ensure these policies and procedures are communicated and implemented throughout their Region.

3.5.3 Firefighting vehicles

480 Firefighting units and support equipment will be fitted with the equipment and meet the standards detailed in 7.1 Vehicle equipment schedules

Fire unit weights and placarding

481 The total weight of the vehicle and its full and totally equipped fire unit must be less than the vehicle's gross vehicle mass (GVM) and individual axle loading as specified by the vehicle manufacturer or authorised upgrade agent, and as noted by the RTA.

- Firefighting vehicles must have their GVM and maximum payload displayed in the cabin within easy view of the driver.

- Fire units must have their full and totally equipped weight, for comparison, displayed on their exterior.
- Vehicle weight stickers may be purchased via FIMS

Vehicle fuel

482 The use of petrol-powered vehicles on the fire line is currently not permitted.

Maintaining equipment

483 All firefighting units and equipment must be checked and serviced or repaired:

- before the start of the bushfire danger period AND immediately following use in firefighting

  The standard firefighting vehicle equipment checklist should be signed off by the current driver as a 'release' prior to the vehicle resuming firefighting operations, and,
- before being stored at the end of the bushfire danger period.

  To avoid equipment being removed and not returned, fire unit cabinet doors are to be sealed with dated servicing stickers at this final check.

484 Senior Field Supervisors must undertake regular audits to ensure that the required equipment checks are being undertaken.

3.5.4 Chainsaws

485 All personnel using a chainsaw must be appropriately trained and competent for the task they are performing.

NOTE: Burning trees must only be felled by trained and competent problem tree fellers.

486 Chainsaws must not be used on the fire line without the appropriate safety equipment. This includes both fire PPE and chainsaw safety equipment (as outlined in the Chainsaw Operation Policy).

487 Chainsaws should not be used at night during either firefighting operations or prescribed burns other than in exceptional circumstances, for example:

- when fallen timber is obstructing crew access along fire trails, or
- when a tree is burning, and there is a high probability that it will allow the fire to escape the containment lines, and there are no other practical measures to secure the fire perimeter.

The use of chainsaws at night must only occur with the approval of the Crew Leader. The person using the chainsaw must also be satisfied they can perform the operation in a safe manner.

488 Once total time on duty exceeds 16 hours, staff are no longer permitted to operate chainsaws during that shift, as set out in section 1.3 OHS (safety and welfare).

3.5.5 Incendiary launchers and flamethrowers

489 Powered hand-held incendiary launchers (PHIL) or other equipment as approved by FMAC and FIMS may be used in fire management operations.

Incendiary launchers must only be used by appropriately licensed and trained operators and in accordance with Section 12.1 of the *Firearms Management Manual*.

490 Regional Managers and Incident Controllers may approve the use of vehicle-mounted flamethrowers only after they are subject to a safety inspection and a JSA.

3.5.6 Pumps

491 Vehicle-mounted pumps must:

- operate on diesel fuel (diesel pumps are a mandatory requirement for firefighting appliances following the recommendations of the 1994 January Bushfire Emergency Coronial Inquiry)
- have heat protection guards fitted
- have metal fuel lines
- be recoil or electric start with a manual recoil override
- deliver at least 100 psi through live reel
- have spark arresters fitted to pump exhausts, aimed away from pump and valve controls, and
- have rotating parts enclosed.

492 Non-vehicle mounted pumps must have:

- spark arresters fitted to pump exhausts, aimed away from pump and valve controls
- rotating parts enclosed, and
- heat protection guards fitted.

3.6 Personal firefighting equipment

3.6.1 Background

493 NPWS provides specific equipment for firefighting personnel. This equipment has been designed not only to be effective in firefighting, but to meet both current occupational health and safety standards and appropriate Australian firefighting equipment standards.

494 All personal firefighting equipment must meet occupational health and safety standards and Australian design standards where they exist. Where required, equipment must also be constructed to meet NPWS design standards.

495 AFAC is continually developing standards for firefighting equipment and these become the Australian Standards. NPWS will adopt these standards as they are developed.

3.6.2 NPWS personnel

496 All NPWS staff required to engage in active fire management activities, such as fire suppression and prescribed burns, must be issued with the approved personal firefighting equipment as specified in 7.2 Personal protective equipment schedules.

Schedule 1 details mandatory equipment issued to each individual

Schedule 2 details additional equipment issued to crews, rather than to each individual.

Schedule 3 lists equipment that should be carried by crews undertaking out-of-area firefighting operations.

497 All personnel working on active fire management activities or entering a fire ground, including IMT members, wildlife rescuers and media personnel who travel to the fire ground, must wear or carry on their person the personal protective equipment (PPE) listed in Schedule 1(a).

They must also have available on the fire ground, but not necessarily carry on their person, the other essential firefighting equipment listed in Schedule 1(b). This could be either carried in a backpack or carried in a vehicle, as long as the equipment can be adequately deployed if required.

In addition, each crew must have the equipment listed in Schedule 2 AND, if undertaking firefighting activities out of area, the equipment listed in Schedule 3.

498 All personnel on the fire ground must at all time wear uniform, boots and helmets as prescribed in Schedule 1(a). The only exception to this is that jackets may be removed for trail construction, patrol, mop-up and blackout work, on the condition that:

- there is no active fire in the area
- there is no risk of fire overrun, and
- jackets are carried by the firefighter.

499 Supervisors and crew leaders must ensure their staff or crew members use and wear the equipment as outlined in this policy and procedures.

500 Each crew member required to undertake out-of-area firefighting is to be issued before deployment an out-of-area crew member kit containing the equipment listed in Schedule 3.

501 Staff will be instructed in the maintenance, uses and limitations of issued personal firefighting equipment.

502 All staff are to undertake a physical check of PPE before or at an annual fire preparedness day to ensure they have been issued with all the current approved PPE, this is to be signed off at the fire preparedness day.

503 Other personal equipment which may assist fire ground staff includes a fire resistant jumper, off-duty clothes (shorts or trousers), toiletry gear, money and driver's licence. Individual officers are expected to provide these items.

504 All standard issue PPE worn on the fire ground will be fire resistant and certified to Australian Standards. All clothing (other than standard issue PPE) worn on the fire ground, including undergarments, should be ideally made from natural fibres.

505 Consideration should be given to the wearing of tabards to identify Incident Management positions and Divisional Commanders.

3.6.3 Wildlife carers, non-firefighting volunteers, plant operators and media personnel

506 All wildlife carers, non-firefighting volunteers, media personnel, plant operators and any other persons entering the fire ground must be approved by the Incident Controller. These visitors must wear approved protective clothing detailed in Schedule 1(a) and fulfil the requirements specified in 4.3.2 Safety considerations – Visitor safety

3.6.4 Inspection and maintenance of equipment

507 Staff must ensure that all equipment issued to them, including uniforms, is maintained in good working order according to the manufacturers' instructions. Any equipment or uniforms that cannot be put into service must be replaced immediately. Staff must determine whether

equipment can be put into service before proceeding to the fire line. All PPE is required to be used and maintained as per the Australian Standard and specific manufacturers' instructions.

508 There will be an annual inspection of the condition of personal firefighting kits, including PPE. Equipment that cannot be put into service will be replaced as necessary. This inspection will take into account the prescribed life of some items.

509 Staff in the possession of equipment that cannot be put into service must notify their supervisor immediately to arrange for a replacement.

510 Staff transferred to another work area will take their Schedule 1 personal equipment to that location.

511 Regional Managers must ensure that these policies and procedures are communicated and implemented throughout the Region.

3.7 Learning and development

3.7.1 Background

512 Fire management is a specialised activity with a number of associated hazards. It requires comprehensive skills and expertise.

513 The Public Safety Training Package provides the national competency standards and assessment guidelines for fire management. NPWS will work within these standards and there will be commonality with the training materials developed by other fire management agencies.

514 NPWS has a statutory obligation to ensure its staff are adequately assessed as competent to fulfil the fire management roles they are expected to perform.

3.7.2 Learning and development policies

515 NPWS policy on learning and development is as follows:

- Competency-based training and assessment will be conducted for all fire management activities. Opportunities for learning and development will be based on the need to provide an appropriate response to fire management across NSW. NPWS will continue to assess the most appropriate mechanisms for implementing fire training across the organisation.
- National competencies from the Public Safety Training Package will be adopted for all roles in fire management. Minimum competency standards for firefighting have been set in accordance with AFAC guidelines.
- Only those staff that are assessed as competent against the requirements in this policy, or under supervision for the purposes of completing the designated role passport, will be appointed to crew leader, crew member, remote firefighting, divisional commander and prescribed burning roles.
- A database of staff competency will be maintained on Aurion by the Learning and Development Section (L&D). This database will be used to task staff to firefighting roles for which they are qualified and current.

Training course development

516 OEH is a registered training organisation (RTO):

- OEH will develop and conduct training programs in conjunction with other agencies where appropriate.
- Staff who have been trained and assessed as competent in fire management roles will be expected to undertake these roles.
- Training courses will be monitored and updated on an ongoing basis by L&D, FTAG, ARG, FIMS, FISC and subject matter experts.
- As an RTO, OEH offers Recognition of Prior Learning (RPL). The training for fire management roles can be completed as described in the sections below, or through a recognition pathway. See L&D Recognition Process for more information.
- Appropriately trained and qualified NPWS staff will be used to develop, deliver and assess training for fire roles.
- OEH will align training to existing AFAC standards where these exist.

Deployment

517 A competency database is maintained in Aurion by L&D. The database currently manages competencies for crew member, crew leader, divisional commander, prescribed burning roles and fire aviation roles. Deployment of personnel in these roles is to be based on the competencies listed in this database. Competency lists are not to be kept in hard copy formats or listed in regional incident procedures.

3.7.3 Competency and currency

518 Competency-based training and assessment for roles beyond divisional commander will be progressively implemented over the next 3 years.

As the competency requirements for each fire role are released, all employees who perform that role must comply with the requirements set.

519 All staff will maintain a record of their firefighting currency by noting shifts and tasks performed in their Fire Incident Field Guide (Reporting Booklet) at every incident.

- At annual fire preparedness days, all staff will present their Fire Incident Field Guide to a unit manager or above for verification. The information will then be transferred to the competency database kept in Aurion.
- For each year after, the currency period will generally be aligned with the financial year period, with data collected at annual fire preparedness days.

Crew Member competency

520 Following completion of the Crew Member Training Course, to obtain competence as a crew member the following units of competency from the Public Safety Training Package (Crew Member Passport) must be achieved:

Unit code	Unit title
PUACOM001C	Communicate in the workplace
PUAVEH001B	Drive vehicle under operational conditions
PUAOHS002B	Maintain safety at incident scene
PUAOPE002B	Operate communications systems and equipment
PUAFIR309B	Operate pumps
PUAEQU001B	Prepare maintain and test response equipment
PUAFIR201B	Prevent injury

Unit code	Unit title
PUALAW001B	Protect and preserve incident scene
PUAEME001B	Provide emergency care
PUAFIR204B	Respond to wildfire
PUATEA001B	Work in a team
PUAFIR209B	Work safely around aircraft (WSAA)

521 WSAA may be completed post attendance at a Crew Member Course and is not required prior to undertaking supervised experience on a fire.

WSAA must be completed as soon as possible following completion of a Crew Member Course.

522 The following NPWS requirements must be achieved prior to beginning supervised fire fighting experience:

Completion of a moderate task based assessment

Senior first aid certificate

4WD training

A current driver's license

523 To obtain sign-off as a Crew Member a minimum of 20 hours supervised experience and completion of the Crew Member Passport is required.

Crew Member currency

524 To maintain currency, Crew Members must:

- undertake training unit 'Work safely around aircraft' (PUAFIR209B) every 3 years,
- attend a regional fire preparedness day each year,
- undertake senior first aid refresher training every 3 years
- complete an annual moderate task based assessment

As all Crew Members work under the supervision of a Crew Leader there is no additional requirement for hours on the fire line as a Crew Member to maintain currency.

Crew Members should still record shifts in their Reporting Booklet for the purpose of entering fire hours into Aurion and for evidence of pre-requisites for more senior fire roles.

Crew Leader competency

525 Crew Member competency is a pre-requisite for Crew Leader training/assessment.

526 To obtain competence as a Crew Leader, the following units of competency from the Public Safety Training Package must be achieved:

Unit code	Unit title
PUAOPE003B	Navigate in urban and rural environments
PUAOPE004B	Conduct briefings–debriefings
PUAOPE012A	Control a level 1 incident (replaces equivalent unit Supervise Response)
PUAFIR303B	Suppress wildfire
PUATEA002B	Work autonomously

3.0 Preparedness

527 The following NPWS requirements must also be achieved:

180 hours as a Crew Member over at least 3 years
OHS Risk Management for supervisors/line managers
IMS Awareness course
Chainsaw qualification (any level)
Knowledge of Fire Management Manual, RIPs, fire/incident documentation and map reading/GPS
20 hours supervised on-the-job experience following initial training

Crew Leader currency

528 To maintain currency, Crew Leaders must:

- perform in a Crew Leader role at a prescribed burn or wildfire for a minimum of three 12-hour shifts, within the past 3 season period.
- undertake training unit 'Work safely around aircraft' (PUAFIR209B) every 3 years
- undertake senior first aid refresher training every 3 years
- undertake chainsaw re-accreditation (to minimum cross-cut level) every 3 years
- complete an annual moderate task based assessment
- attend a regional fire preparedness day each year.

Maintaining Crew Leader currency automatically maintains Crew Member currency.

529 The Regional Operations Coordinator is responsible for checking compliance and endorsing the currency of a Crew Leader.

If a Crew Leader is not endorsed as current, they will need to work under supervision as a Crew Leader for a minimum of one shift.

Remote Area Firefighter competency

530 To obtain competence as a Remote Area Firefighter, the competency requirements for Crew Member or Crew Leader must be met. The following units of competency from the Public Safety Training Package must also be achieved: (see also Winching and Hover Exit Operations competency).

Unit code	Unit title
PUAFIR211B	Undertake helicopter winch operations
PUAFIR210B	Undertake hover exit operations from a helicopter

Remote Area Firefighter currency

531 To maintain currency, Remote Area Firefighters must:

- maintain Crew Member/Leader competency
- complete an annual arduous task based assessment to participate in an Arduous Remote Area Firefighting Team (RAFT) and a moderate task based assessment to participate in a Moderate RAFT (see section 4.7.2 Policy for remote area deployment)
- maintain currency in helicopter winch operations and hover exit operations (see Winching and Hover Exit Operations currency) .

Winching and Hover Exit Operations competency

532 To obtain competence in winching and hover exit operations the following units of competency from the Public Safety Training Package must be achieved:

Unit code	Unit title
PUAFIR211B	Undertake helicopter winch operations
PUAFIR210B	Undertake hover exit operations from a helicopter

533 Notwithstanding any other provisions of this manual, re-accreditation in these competencies must be undertaken no later than 3 years after initial achievement of competency or most recent re-accreditation.

534 Personnel who do not hold relevant Public Safety Training Package competencies 'Undertake helicopter winch operations' (PUAFIR211B) and 'Undertake hover exit operations from a helicopter' (PUAFIR210B), are not to be winched or involved in hover exit operations respectively unless they are at risk of death or injury.

Winching and Hover Exit Operations currency

535 To allow for lead time so that staff can adequately document their operational winch/hover exit activities the following currency requirements will become effective for the 2011-12 fire season.

536 Personnel who hold relevant Public Safety Training Package competencies 'Undertake helicopter winch operations' (PUAFIR211B) and 'Undertake hover exit operations from a helicopter' (PUAFIR210B) must undertake no less than two winching activities and two hover exit activities (either operational or non-operational) per 14 month period in order to remain current. Evidence of safe and competent completion must be certified in the officer's Fire Incident Reporting Booklet by the officer's immediate fireground supervisor at the time or the pilot/crewperson of the relevant aircraft, and preferably by a trainer/assessor.

537 For the purposes of this clause:

- One "winching activity" is either an insertion or extraction by helicopter-mounted winch
- One "hover exit activity" is either an exit from, or entry to, a helicopter in a hover configuration in close-enough proximity to the ground to enable the exit or entry to be carried out safely.

538 Personnel who hold competencies 'Undertake helicopter winch operations' (PUAFIR211B) and 'Undertake hover exit operations from a helicopter' (PUAFIR210B) but who do not maintain currency as per above must not be winched or undertake hover exit activities prior to being re-accredited in the relevant competencies unless they are at risk of death or injury.

539 Regions are required to report continuing currency of regional personnel to L&D arising from operational and non-operational winch/hover exit activities immediately after each fire preparedness day. Flight Operations Unit will continue to report training and assessment and/or re-accreditation of personnel undertaken in connection with non-operational winch/hover exit activities directly to L&D.

Regions must remember that they will need to gather evidence from staff that have retained currency through operational Winch/Hover Exit activities during the previous fire season as soon as possible after the fire season. This will allow any necessary non-operational winch/hover exit activities for currency purposes to be planned and completed prior to the next fire season.

3.0 Preparedness

Divisional Commander and Sector Commander competency

540 To obtain competence as a Divisional Commander/Sector Commander, the following units of competency from the Public Safety Training Package must be achieved:

Unit code	Unit title
PUAOPE016A	Manage a multi-team sector

541 The following NPWS requirements must also be achieved:

Qualified Crew Leader

180 hours experience as Crew Leader

20 hours supervised as Divisional Commander/Sector Commander (over at least 2 shifts)

Divisional Commander currency

542 To maintain currency, Divisional Commanders/Sector Commanders must:

- maintain Crew Leader currency (except the chainsaw currency component)
- perform in a Divisional Commander/Sector Commander role at prescribed burns or wildfires for at least 60 hours over a 3 year period

543 Maintaining Divisional Commander/Sector Commander currency automatically maintains Crew Leader and Crew Member currency.

Prescribed Burn Planner competency

544 All staff *developing* prescribed burn plans must attend the Prescribed Burning Course and the following units of competency from the Public Safety Training Package must be achieved:

Unit code	Unit title
PUAFIR406B	Develop prescribed burning plans

545 The following NPWS requirement must also be achieved:

Qualified Crew Leader

Post-course assessment activities

Prescribed Burn Plan Assessor competency

546 All staff *assessing* prescribed burn plans must attend the Prescribed Burning course and the following units of competency from the Public Safety Training Package must be achieved:

Unit code	Unit title
PUAFIR406B	Develop prescribed burning plans
PUAFIR407B	Conduct prescribed burns

547 The following NPWS requirements must also be achieved:

Qualified Crew Leader

Post-course assessment activities

Branch Director approval

548 Regions should maintain a list of prescribed burn plan assessors that are approved by the Branch Director and can amend the list and add competent and approved staff as required.

Prescribed Burn - Burn Incident Controller competency

549 To obtain competence as a Burn Incident Controller of a prescribed burn staff must attend the Prescribed Burning course and the following units of competency from the Public Safety Training Package must be achieved:

Unit code	Unit title
PUAFIR407B	Conduct prescribed burns

550 The following NPWS requirement must also be achieved:

Qualified Divisional Commander

Post-course assessment activities

Incident Management Team – principal roles competency

551 Training for Incident Management Team (IMT) principal role competencies are presently being developed.

552 A current driver's license is not a mandatory requirement for the following IMT roles where all four functional areas in an IMT have been established:

- Incident Controller
- planning and situations
- air observer and air attack

The use of unlicensed personnel in an IMT must be approved by the Incident Controller or Regional Manager.

Incident Management Team – principal roles currency

553 To maintain currency, staff in incident management team principal roles must:

- attend a regional fire preparedness day each year
- complete a range of professional development activities that will enable the incident management team member to acquire and continue to develop skills and abilities in incident management. Some of these activities may include;

  Joint agency activities such as active participation in an IMX joint agency working parties etc.

  Undertaking IMT role during prescribed burn or wildfire

  Undertaking role of mentor/coach for staff undertaking IMT roles

  Reverse mentoring/coaching

  Preparation of fire related fact sheets or position papers

  Structured activities including seminars, workshops, conferences and short courses in fire management or in administration/management or technology related to incident management roles

  Involvement in development of resources, training and/or assessment for fire roles, providing training or information in new or advance firefighting techniques/equipment use

  Independent or peer directed study focusing on fire management including professional reading, DVDs, internet, discussion groups, lessons learned activities, special interest group meetings

Research including active participation in planning, implementation, analysis and write up of research in the area of fire management

Formal study that are offered by tertiary institutes that relate to fire/incident management

554 Managers are responsible for checking compliance as part of the work and development system process.

Situation Officer competency

555 To obtain competence as a Situation Officer the following units of competency from the Public Safetly training Package must be achieved:

Unit code	Unit title
PUAFIR502B	Develop incident control strategies
PUACOM003B	Manage information

556 The following NPWS requirements must also be achieved:

Qualified Crew Leader

60 hours supervised experience over a minimum of 5 shifts as a Situation Officer

Incident Controller Major Incident competency

557 To obtain competence as an Incident Controller Major Incident (IC 3) the following unit of competency from the Public Safety Training Package must be achieved:

Unit code	Unit title
PUAOPE019A	Control a level 3 incident

558 The following NPWS requirements must also be achieved:

Complete the RFS Incident Controller Major Incident (ICMI) program

Incident Controller Major Incident currency

559 To maintain currency, Incident Controller Major Incident (IC 3) must over a 5 year period:

- perform in the Incident Controller Major Incident (IC 3) role at Wildfires or other level 3 incidents
- participate as IC 3 at IMX programs undertake professional development activites (e.g. attend relevant conferences, AFAC, CRC presentations etc)

Aviation roles

560 Due to the importance of maintaining a core of skilled, trained and accredited aviation specialists to ensure safe and efficient operation, currency and reaccreditation requirements have been endorsed nationally by AFAC for the roles of Air Observer, Air Attack Supervisor, Air Base Manager, Aircraft Officer and Air Operations Manager.

Air Observer competency

561 Crew Leader competency and currency is a pre-requisite for Air Observer training/assessment (except chainsaw qualification and currency).

562 To obtain competence as an Air Observer, the following units of competency from the Public Safety Training package must be achieved:

Unit code	Unit title
PUAFIR209B	Work safely around aircraft
PUAFIR315B	Navigate from an aircraft
PUAFIR401B	Obtain incident intelligence (role specific)
PUAFIR408B	Plan aircraft operations (role specific)

Air Observer currency

563 To maintain currency, Air Observers must:

- perform the role of Air Observer in operations or simulated operations within a 14 month period
- complete an annual *light* task based assessment

564 The period of certification for Air Observer is 5 years.

Air Attack Supervisor competency

565 Air Observer competency and currency is a pre-requisite for Air Attack Supervisor training/assessment.

566 To obtain competence as an Air Attack Supervisor, the following unit of competency from the Public Safety Training package must be achieved:

Unit code	Unit title
PUAFIR409B	Develop air attack strategies

Air Attack Supervisor currency

567 To maintain currency, Air Attack Supervisors must:

- perform the role of Air Attack Supervisor in operations or simulated operations within a 14 month period.
- complete an annual *light* task based assessment

568 Maintaining air attack supervisor currency automatically maintains air observer currency.

569 The period of certification for Air Attack Supervisors is 5 years

3.0 Preparedness

Air Base Manager competency

570 Crew Leader competency and currency is a pre-requisite for Air Base Manager training/assessment (except chainsaw qualification and currency).

571 To obtain competence as an Air Base Manager, the following units of competency from the Public Safety Training package must be achieved:

Unit code	Unit title
PUAFIR313B	Operate aviation support equipment (role specific)
PUAFIR408B	Plan aircraft operations (role specific)

Air Base Manager currency

572 To maintain currency, Air Base Managers must:

- perform the role of Air Base Manager in operations or simulated operations within a 14 month period.
- complete an annual *light* task based assessment

573 The period of certification for Air Base Managers is 5 years.

Aircraft Officer competency

574 Air Base Manager competency and currency is a pre-requisite for Aircraft Officer training/assessment.

575 To obtain competence as an Aircraft Officer, the following units of competency form the Public safety Training Package must be achieved:

Unit code	Unit title
PUAFIR408B	Plan aircraft operations (role specific)

Aircraft Officer currency

576 To maintain currency, Aircraft Officers must:

- perform the role of Aircraft Officer in operations or simulated operations within a 2 year period.
- complete an annual *light* task based assessment

577 Maintaining Air Operations Manager currency automatically maintains Aircraft Officer currency.

578 The period of certification for Aircraft Officers is 5 years.

Air Operations Manager competency

579 Training/assessment for Air Operations Manager can be entered through either the Air Attack Supervisor or Aircraft Officer pathway;

Air Attack Supervisor competency and currency is a pre-requisite to enter through the Air Attack Supervisor pathway

Aircraft Officer competency and currency is a pre-requisite to enter through the Aircraft Officer pathway

580 To obtain competency as an Air Operations Manager, the following units of competency from the Public Safety Training package must be achieved:

Unit code	Unit title
PUAOPE005B	Manage a multi team response

Air Operation Manager currency

581 To maintain currency, Air Operations Managers must:

- perform the role of Air Operations Manager in operations or simulated operations within a 2 year period.
- complete an annual *light* task based assessment

582 The period of certification for Air Operations Managers is 5 years.

3.8 Personal health and fitness

3.8.1 Background

583 Bushfire firefighting is a very strenuous and physically demanding activity that requires good health, aerobic fitness, muscular strength and endurance. Incident management roles can also be physically and mentally demanding and require good health.

Firefighting staff must have fitness and health levels sufficient for tasks assigned to them. Individuals with the necessary levels of health and fitness are better prepared to meet the demands of firefighting and incident management. A satisfactory health and fitness level leads to reduced numbers of injuries, lower stress, safer work and greater productivity, all of which reduce the total cost of firefighting.

584 The objectives of this policy are to:

- improve employee safety
- maintain a safe and healthy work environment
- identify potential health problems
- ensure the physical fitness of employees is appropriate for the tasks assigned to them
- encourage and educate staff in developing positive attitudes and behaviour and personal responsibility for health and fitness
- reduce the frequency of incident-related injuries and illness
- improve employee performance during firefighting and incident management, and
- improve staff morale and wellbeing.

3.8.2 Policies for personal health and fitness

585 All NPWS personnel engaged in firefighting and incident management will meet NPWS health and fitness standards, which are aligned with AFAC national standards.

586 Medical and fitness assessments (task-based assessments) will be in accordance with *Guidelines for Fire Fighter Health and Fitness*.

3.0 Preparedness

587 Incident personnel will be assigned duties compatible with their health and fitness levels.

588 Time will be provided for approved staff to undertake specified training for moderate and arduous fitness tests.

Medical assessments

589 NPWS has developed medical guidelines for managing its firefighter health and fitness program. These are detailed in the *Guidelines for Fire Fighter Health and Fitness*.

590 All firefighters and selected incident management personnel that need to enter the fire ground will be required to complete a medical assessment to determine their physical capacity to undertake firefighting duties and a task-based fitness assessment.

Medical examinations will be carried out every 1 to 3 years as determined by a medical practitioner.

591 Staff are required to answer physical activity readiness questionnaires (PAR-Q: *Guidelines for Fire Fighter Health and Fitness* – Appendix A) in the years they are not required to undertake a medical or if there has been a change to their health status since their previous medical.

592 Personnel whose normal duties include firefighting and incident management but who have a health condition, or take medication which may affect their ability to safely participate in these activities, may be restricted to duties of which they are capable as determined by a medical practitioner.

593 Personnel who are classified as medically unfit for general firefighting tasks may be assigned to logistical, planning, administrative or other support functions, according to their physical capacity.

594 Fire medical assessment results are retained on personnel files, and recorded on Aurion with access made available to the local health and fitness coordinator only.

595 A new injury, illness or medical condition that may affect performance in fire management activities will require completion of a physical activity readiness questionnaire (PAR-Q) to determine if the person requires another medical examination to be cleared for firefighting duties.

Task-Based Assessments (TBA)

596 The physical capacity or fitness of staff to undertake a firefighting or support role will be assessed through an annual TBA.

A task-based assessment will be valid until 30 September the following year.

597 Firefighters that are medically cleared must complete an annual TBA before engaging in firefighting.

598 Fire-fighting personnel will be expected and encouraged to maintain the required level of fitness throughout the fire season.

599 Task-based assessment (TBA) requirements for specific firefighting roles are detailed in the *Guidelines for Fire Fighter Health and Fitness* - Appendix E.

600 A task-based assessment will be of one of 4 types, as shown in the table below. Each assesses the level of fitness required to undertake specific firefighting roles. Satisfactory completion of these tests is a minimum requirement as follows:

Table 12: Task based assessment types

Test	Minimum requirement for:	Distance	Pack/Vest Weight	Time Limit
Light walk test	Entering a fire ground and carrying out certain support roles	1,610m walk	Not required	15 minutes
Moderate pack test	All general firefighters	3,220m walk	11.3kg	30 minutes
Modified Arduous pack test	Arduous remote area fire team participation for participants weighing 68 kg or less	4,830m walk	15.4kg	45 minutes
Arduous pack test	Arduous remote area fire team participation and some interstate and international deployments	4,830m walk	20.4kg	45 minutes

601 A reduction in the pack-weight requirement for smaller framed persons undertaking the *Arduous* pack test has been implemented in 2008. The revised *Guidelines for Fire Fighter Health and Fitness* – Appendix H, now provide that persons weighing 68 kg or less may complete the Arduous-level TBA carrying a pack weighing 15.4 kg. This category is now called *Modified Arduous.*

602 Successful completion of the *Moderate* TBA is required for all field-based positions excluding some remote area deployments which require successful completion of the *Arduous* or *Modified Arduous* TBA – refer to section 4.7 Remote area deployment.

603 Completion of the *Arduous* TBA carrying a pack weighing 20.4 kg is recommended for staff wishing to apply for overseas deployments, however specific TBA requirement is dependent on the host country.

Training for task-based assessments

604 Details of the TBA criteria and training required to obtain fitness ratings will be provided to all firefighters well in advance of when the assessments will be conducted.

605 Staff undertaking firefighting roles that require the moderate or arduous levels of fitness (and have the corresponding medical clearance) will have access to 24 hours over 8 weeks to undertake training within work hours.

It is strongly recommended that all staff prepare for the TBA by training to improve the likelihood of passing the TBA and reduce the risk of injuries.

606 Where possible, exercise is to be carried out as a group activity (by work centre). Individual exercise programs may be permitted in exceptional circumstances with manager's approval.

607 The 8-week training program should be conducted according to the 'Fit to Fight: firefighter health and fitness program' brochure and in accordance with NPWS guidelines and safety policies.

Implementing task-based assessments

608 All TBAs will be conducted and supervised according to agreed procedures approved by the Occupational Health and Safety Section.

609 Individual TBA results (i.e. level achieved) will be recorded on Aurion because this information is required for deployment to fires.

610 Compiled assessment statistics may be used for TBA program evaluation.

4.0 Response

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4.0 Response

4.1 Coordinated fire management

4.1.1 Background

611 The *Rural Fires Act 1997* provides for cooperative arrangements to enable fire authorities to control fires.

- BFMCs have been established under s. 50 of the *Rural Fires Act 1997* to develop and coordinate fire management between fire authorities.
- BFMCs are responsible for the development of coordinated firefighting arrangements and the reduction of bushfire hazards. They develop joint management plans ('BFMC bushfire risk management plans') which consist of a plan of operations to coordinate firefighting resources and risk management plans to reduce bushfire hazards.

612 Coordinated arrangements may be prepared with interstate fire authorities where a fire-prone reserve is located on the NSW border.

4.1.2 Policies for coordinated fire management

613 A delegate of the OEH PWG represents NPWS on the BFCC.

614 NPWS has a representative (preferably an Area Manager) on all BFMCs in areas where it has significant reserves that may potentially be impacted by fire.

615 NPWS participates with other fire authorities in preparing and implementing BFMC bushfire risk management plans and in other joint fire operation planning.

616 The NPWS committee representative ensures that the BFMC plan of operations:

- states conditions that apply for suppression, prevention, control and command structure for fire management activities on NPWS-managed lands, in accordance with section 2.1 Fire management planning, and
- promotes protection of biodiversity and cultural heritage on lands other than those managed by NPWS.

617 FIMS will develop MoUs with other NSW fire authorities, including RFS, NSW Fire and Rescue, Forest NSW, and land management agencies and fire authorities in other states.

618 For Class 1 and 2 fires, when the Incident Controller is not a NPWS officer and the fire is on NPWS-managed lands, approval for the hire of major plant items (earthmoving machinery and aircraft) must be obtained from NPWS. NPWS will not cover the cost of unauthorised hire of major plant items.

4.1.3 Coordinated response arrangements

619 **For Class 1 fires**, control and coordination will be maintained by the first response fire authority until such time as it can be handed over to the relevant land manager where appropriate (see section 4.2.3 First response arrangements for NPWS-managed lands).

620 RFS is able to respond to fires on NPWS-managed lands, and NPWS is able to respond to fires within 8 km of NPWS-managed lands. Adequate notification of the relevant land manager is to be given in accordance with section 4.13 Fire reporting and documentation.

4.0 Response

621 **For Class 2 fires**, control and coordination will be in accordance with the provisions of a plan of operations for the affected rural fire district.

622 **For Class 3 fires**, control and coordination will be by a person appointed by the Commissioner of the RFS.

623 NPWS will have trained and experienced staff listed as nominees for Class 2 and 3 Incident Controllers for each BFMC district where there are significant areas of NPWS-managed lands that may be affected by fires.

624 NPWS and RFS will cooperate on resourcing when a number of Class 2 or Class 3 fires occur across NSW. This will be coordinated by RFS State Operations.

NPWS will have a State Operations Liaison Officer (SOLO) at RFS State Operations when requested by the EDPM.

625 RFS will be made aware of all relevant plans that need to be taken into consideration and account during suppression operations.

626 NPWS will notify the BFMC of any conditions specified in NPWS RFMS for the suppression, prevention, and control of fires within NPWS-managed lands. Such conditions will be incorporated into plans of operations.

627 The local NPWS representative on each BFMC should ensure that the relevant contents of the BFMC plan of operations are consistent with NPWS RFMS and adopted reserve plans of management.

628 All coordinated firefighting arrangements will be included in Regional incident procedures.

Assistance requested by other authorities

629 The Regional Duty Officer should coordinate any requests from other authorities for the assistance of NPWS firefighters, under the BFMC plan of operations. Outside these local arrangements, FIMS will coordinate via State Operations.

630 NPWS may provide an IMT and support personnel to take charge of a fire outside NPWS-managed lands.

Interstate and international coordinated arrangements

631 MoUs will be developed with interstate fire authorities to cover Regions with fire-prone reserves along the NSW border.

632 NPWS currently maintains international arrangements with other countries. Requests for assistance and deployment of crews to international locations will be coordinated by FIMS.

Liaison Officer appointment

633 Where the Incident Controller for a Class 2 or 3 fire is not a NPWS officer, and the fire is on NPWS-managed lands or has the potential to impact upon them, a NPWS Liaison Officer or deputy Incident Controller will be appointed.

634 The Liaison Officer will brief the Incident Controller on matters relating to the protection of NPWS-managed lands, including drawing the Incident Controller's attention to any relevant planning documents (particularly BFMC plans of operations and NPWS fire management strategies).

635 The use of earthmoving equipment, retardant and aerial burning techniques will only be permitted subject to the approval of the NPWS Liaison Officer at the incident, or in accordance with the directives stated in BFMC plans of operations.

636 Where actual or proposed fire suppression works will conflict with planning documents or with the Liaison Officer's advice, the Liaison Officer will report this information to the Regional Manager responsible for the NPWS Region of concern, and in the case of Class 3 fires, to the State Operations Liaison Officer.

Use of Local Emergency Management Committees (LEMO and LEOCon)

637 The Local Emergency Management Committee (LEMC) is a legislative committee under s. 28 of the *State Emergency and Rescue Management Act 1989*. The LEMC is made up of representatives of local agencies involved in providing emergency services, such as the local council, NSW Police Force, NSW Fire and Rescue, RFS, Ambulance Service, and State Emergency Service (SES), and is responsible for plans in relation to emergency prevention, preparation, response and recovery in the local government area for which it is constituted.

638 The Local Emergency Management Officer (LEMO) is appointed under the Local Emergency Management Plan (LEMP) and is an employee of the local council. They have access to resources such as barricades, toilets and rubbish facilities and, among other things, can be called on to assist other agencies such as the SES or to organise access to local sports fields etc. for helicopter landings or marshalling areas.

639 The Local Emergency Operations Controller (LEOCon) is also appointed under the LEMP for the local government area. LEOCon is the Local Police Commander and has access to Police resources. Among other things, LEOCon can be called on for assistance in organising evacuations, road closures or investigations.

640 Emergency operations which involve more than one local government area are controlled at district level, with District Emergency Operations Controllers (DEOCon) operating from a District Emergency Operations Centre.

641 Emergency operations involving more than one district, and other major operations when considered necessary, are controlled at state level. The State Emergency Operations Controller controls operations from the State Emergency Operations Centre. Emergency Service Organisation Controllers and Functional Area Coordinators operate from their own control or coordination centres.

642 Emergency operations requiring NPWS assistance are managed through the NPWS representative on the LEMC for local level emergencies, or through FIMS for state level emergencies.

4.2 Fire response

4.2.1 Background

643 Fire suppression constitutes all the actions or operations undertaken to contain, manage or control fire, from the time it is detected until it is declared out.

644 The following control procedures apply to fire management activities for fires on or threatening NPWS-managed lands. For Class 2 and 3 fires these procedures need to be read and used in conjunction with those outlined in section 4.1 Coordinated Fire Management.

4.0 Response

645 Under the *Rural Fires Act 1997*, NPWS has a statutory responsibility for fire management and control on the land it manages, and to protect human life, property, the environment and natural and cultural heritage from the adverse effects of fire.

646 It is essential that fire management operations are undertaken in such a way as to minimise adverse impacts and, where possible, foster community support for NPWS fire management practices.

4.2.2 Incident declaration and de-declaration

647 The process for declaring and de-declaring incidents will be outlined in Regional incident procedures.

648 Only the Regional Manager, Branch PaCS Manager, Branch Director, DCE PWG or Chief Executive may declare an incident.

649 The incident number generated in ICON should be used as the incident declaration number. All incident declaration forms and lifting of the declarations must be signed, dated and timed by the Regional Manager, Director or Manager PaCS, and forwarded to Branch and Corporate Finance (fire.insurance@environment.nsw.gov.au), for more detail refer to 6.1 Finance and Insurance.

650 Only the Commissioner of the RFS can declare incidents under section 44 of the *Rural Fires Act 1997*.

651 A fire may be declared an incident for the purposes of industrial relations awards, but it is not necessary to declare an incident to draw on the NSW Treasury Managed Fund.

Incident declaration/de-declaration triggers

652 The *Crown Employees (DECCW-PWG) Field Officers and Skilled Trades Salaries and Conditions 2009 Award* and the *Crown Employees (DECCW-PWG) Conditions of Employment Award* define an incident as:

> 'an unscheduled activity such as wildfire suppression, wildlife rescue, flood and storm relief, search and rescue, cetacean stranding, accident and substance spill attendance, or as otherwise approved by the Director General* or delegate. (Note this does not include hazard reductions)'.
>
> *The Director General is now called the Chief Executive, OEH

These awards also define incident duties as being:

> 'all work involved in emergency incidents effort in which there is Departmental participation from when an event is declared an incident until it is declared over by the Incident Controller. Duties may include: the initial reporting, reconnaissance, organisation of resources, control, mop-up, patrol and completion of incident duties, and may involve office duties in the organisation and direction of the emergency response as well as work at the scene'.

653 Incident declarations for field and incident-management team operations will be made when they meet the following provisions:

- An incident:
  a. will be declared if it involves participation in a declared Class 2 or Class 3 wildfire, or an incident which has been declared as a State of Emergency under the *State Emergency and Rescue Management Act 1989* or any successor legislation; or
  b. may be declared if it involves attendance at an incident which goes beyond rostered hours of work as defined in the award and where there is an expectation that the

operation will continue for at least another 12 hour shift within a 24 hour period from incident commencement; and where there are c.8 or more personnel involved in the management of the incident[1],

- An incident may be declared whether it is on-park or off-park, but incidents will not be declared for international deployment;
- An incident may be retrospectively declared but only within 48 hours of the first callout, unless otherwise approved by a Branch Director for exceptional circumstances;
- An incident may be de-declared once it is classified in the sitrep as being at 'Patrol' status[2], or at the end of the last 12 hour shift, whichever is sooner.

[1]Declarations may be made when the incident requires much more than a minor or routine incident response, e.g. incidents involving two or more 12 hour shifts of about 8 personnel per shift (including non-NPWS personnel) commencing within a 24 hour period of each other, before 'Patrol' status is reached;

[2]An incident is usually classified as being at 'Patrol' status when the fire perimeter is behind identifiable control lines, major re-ignition is unlikely; mopping up activities have substantially been completed and where firefighting resources are primarily required for patrol purposes only.

4.2.3 First response arrangements for NPWS-managed lands

654 First-response arrangements for fires on NPWS-managed lands will be included in BFMC plans of operations.

In most cases, the coordination of first-response activities for a Class 1 fire on NPWS-managed lands will be undertaken by the Regional Duty Officer or the Area Manager.

Once first-response arrangements have been established, control of the fire will be by an Incident Controller, appointed by the NPWS Regional Manager.

655 All Incident Controllers of Class 1 fires on NPWS-managed lands will coordinate fire management activities in accordance with the provisions of the reserves PoM, the relevant RFMS, and NPWS fire management policies and procedures.

656 Where NPWS is not the first responding fire authority to arrive at a fire on NPWS-managed lands, a competent officer of the first fire authority will direct fire management activities until a competent NPWS officer assumes control (unless prior agreements have been made).

In the interim, the NPWS Area Manager or Regional Duty Officer will establish and maintain contact with the first fire authority to confirm fire management objectives and strategies.

657 The management of fire operations on NPWS-managed lands will be in accordance with the IMS, based on AIIMS.

4.2.4 Structural firefighting

658 Structural firefighting involves entering a structure to suppress a fire.

NPWS personnel are not trained in structural firefighting and must not enter a structure in order to undertake structural firefighting.

Fire suppression activities may be undertaken from outside a structure in accordance with the policies in this Manual, in order to protect a built asset.

4.0 Response

4.2.5 Establishing an IMT and span of control

659 Once first response has been initiated, a competent Incident Controller will assume control of the incident at the earliest practicable opportunity.

660 In accordance with AIIMS and IMS, the span of control for fire positions will not exceed 1:5, that is, no more than 5 people reporting to a single person. This span of control applies to both IMT and field-based operations (e.g. no more than 5 crew members to report to 1 crew leader).

661 In consideration of the span of control, Incident Controllers should identify and resource key IMT positions required to effectively manage the fire.

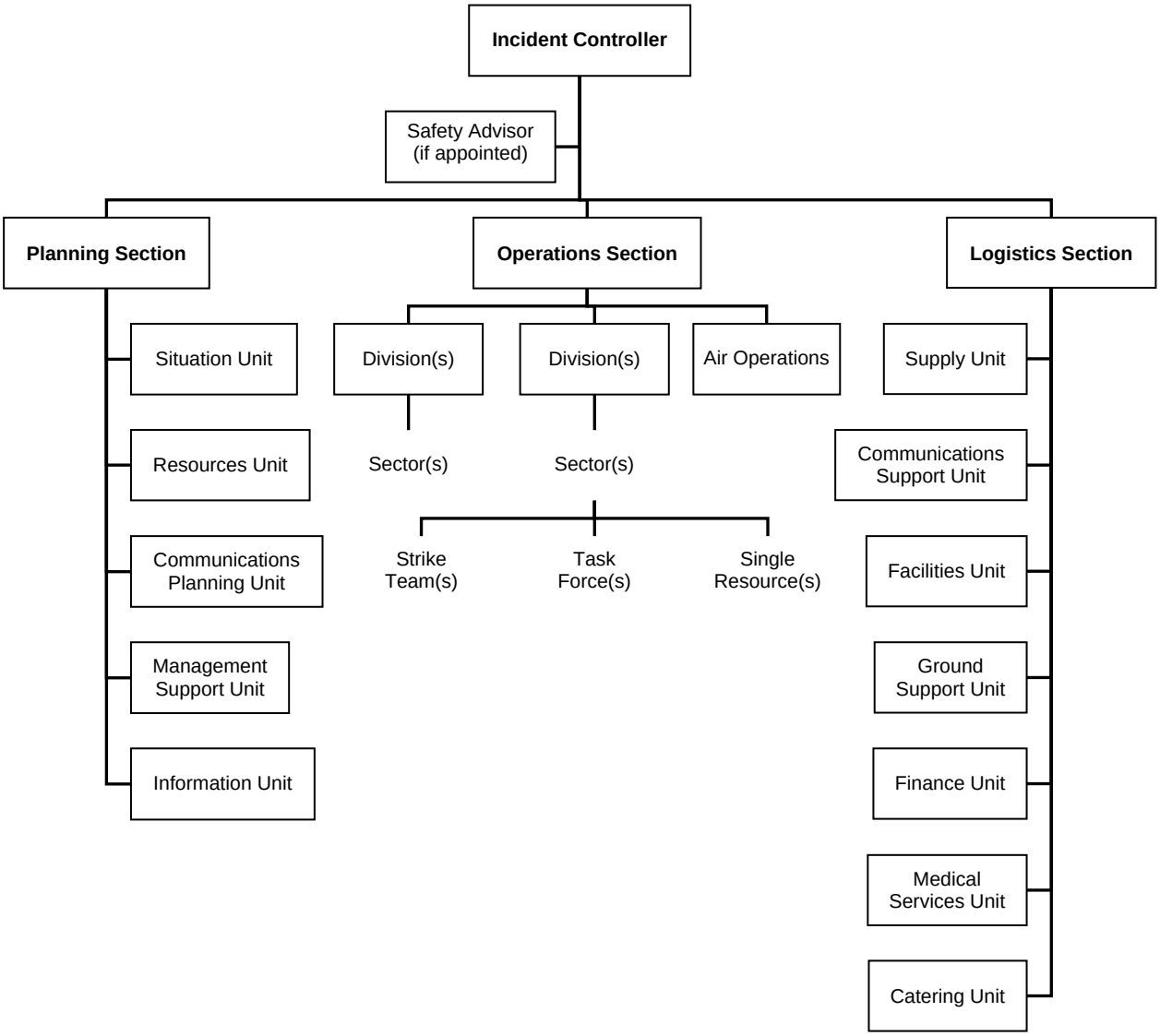
662 Where required, Incident Controllers should give special consideration to resourcing the following positions:

- **Safety Advisor**, to monitor fire ground safety (see Safety Advisor appointment in section 4.2.7)
- **Liaison Officer**, to undertake interagency liaison for large fires involving multiple agencies (see Liaison Officer appointment in section 4.1.3)
- **Information Officer** and **Neighbour Liaison Officer**, to develop a media and community information strategy (see Information Officer appointment and Neighbour Liaison Officer appointment in section 4.2.10)
- **Strategic Planning Officer,** to be located in the Situation Unit, to provide long-term strategies and tactics and resourcing predictions for strategic forward planning
- **Resource Officer**, to develop a resourcing plan with a 5 day minimum outlook (see section 4.12.2)
- **Communications Planner**, to establish effective communications strategies for fires in remote areas or large fires involving multiple divisions or agencies (see Communications Planner appointment in section 4.5.2)
- **ICON Officer**, to be located in the Planning Section, to enter information into ICON and update ICON sitreps
- **Plant Manager**, to be located in the Operations Section, to maintain plant safety and effectiveness and track plant resources at fires where 3 or more heavy plant are deployed
- **Staging Area Manager**, to record and coordinate resource and crew arrivals (for deployment) and departures (stood down) and to establish essential amenities including toilets, refuelling areas etc. for large fires
- **Operations Support**, dedicated to managing crew changeovers
- **Operations Support**, dedicated to providing local knowledge, e.g. road and trail condition, safety issues, community issues, natural and cultural heritage issues, etc.

663 Field support positions should also be considered for large fires, including Ground Observers to assist Divisional Commanders where the Divisional Commander needs to take on an overview and communications role.

Ground Observers can collect essential field intelligence, including weather, resource tracking, fire behaviour and rate of spread, and can report on the success of tactics etc.

Figure 6: Example AIIMS structure (can be scaled up/down)



For Air Operations structure see Figure 8: Model IMS aircraft unit structure.

4.2.6 Strategies for responding to fire

664 Response to fire will be determined by incident appreciation and situation analysis and will consider warnings and safety messages contained in standard operating procedures (SOPs).

665 IMTs will undertake fire spread mapping to determine the current rate of spread and predict the future rate of spread and direction of the fire. Response strategies should be based on the current and forecast rate of spread and direction of the fire.

666 Strategies used in fire management operations may include, but are not limited to, any combination of:

- reconnaissance
- direct, parallel or indirect attack
- defence
- monitoring

- mop-up, and
- patrol

Strategies employed will be appropriate to the situation and approved by the Incident Controller.

Selected strategies will protect human life and community assets, aim to minimise environmental disturbance and be cost-effective.

Decision tool – rapid response and tight containment v. extended perimeter containment

667 Under the provisions of the *Rural Fires Act 1997*:

- it is the duty of owners, occupiers or public authorities to take practicable steps to minimise the risk of fires spreading from lands under their control, and
- actions to mitigate the environmental risks of fires and fire operations may be identified in RFMS *or* reserve plans of management, and considered during fire management operations.

668 NPWS has particular expertise and has developed specialised training in natural area fire management. This involves developing and implementing strategies and tactics that minimise the lasting impacts of fire management and fuel management operations.

669 Fire management approaches that may be taken in natural areas include:

- aggressively attacking fire when there is an assessed risk to life and property, or an assessed risk of a large fire event, and
- allowing the fire to burn within a defined area when the assessment of current and forecast seasonal conditions indicates a minimal risk to life and property.

670 The acceptable strategies and tactics for a natural area should be prepared as part of a RFMS.

671 Initial attack strategies and tactics should be implemented to contain fires to the smallest area possible, if:

- seasonal conditions or forecast conditions indicate the potential for a single large fire event, or
- assets or biodiversity values are assessed to be at serious risk from a fire event.

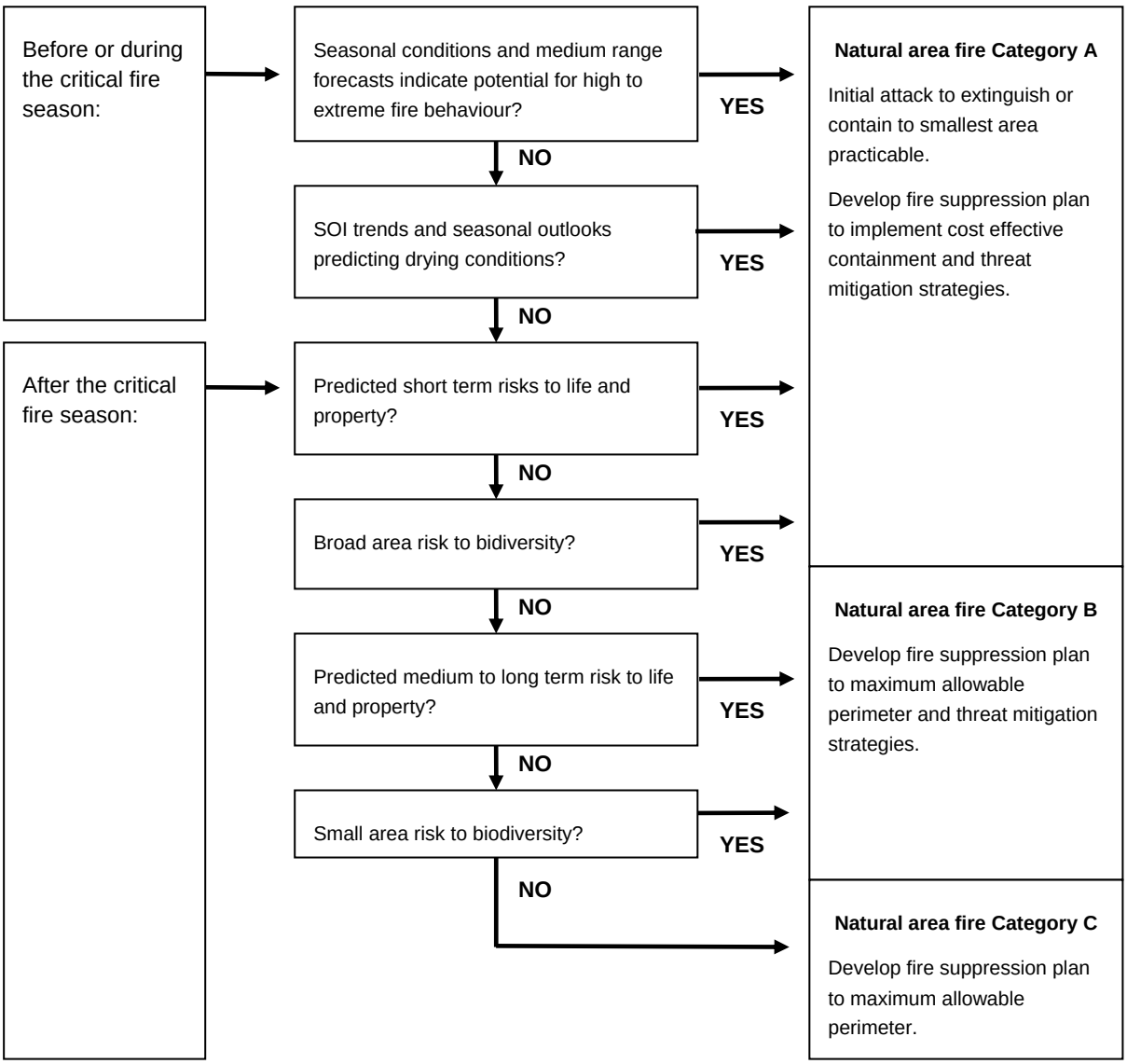
672 An IAP should be prepared for ‘natural area fires, categories B and C’ (see Figure 7) describing:

- the maximum allowable perimeter for the fire
- seasonal conditions and trends, and medium-range forecasts
- anticipated fire behaviour
- the decision points where active management activity will be undertaken
- the time span in which the plan will be effective
- the decision points for revising the action plan, and
- liaison activities with neighbours and brigades.

The action plan should be communicated to the executive officers of the BFMCs and land management authorities.

673 A post-fire rehabilitation plan must be prepared if the fire management strategies and tactics have produced, or have the potential to produce, long-lasting impacts.

Figure 7: Natural area fire management planning



Strategic Planning Officer appointment

674 Consideration will be given to the early establishment of a Strategic Planning Officer within the IMT to develop long-term strategies for fires with complicated issues.

675 The Strategic Planning Officer will report to the Planner and liaise closely with Operations and Logistics to develop strategies and options based on local knowledge, forecast weather conditions and resource capacity.

676 Triggers for the establishment of a Strategic Planning Officer include, but are not limited to:

- Class 2 or 3 fires with an estimated duration of more than 5 days
- a fire with multiple ignition points or spot-overs
- a fire threatening multiple assets or where evacuation of towns or closure of major roads or rail lines is expected, or
- a fire in inaccessible terrain where resources are limited.

4.2.7 Environmental considerations

677 Ensuring all safety considerations are addressed (see 4.3 Fire safety), the strategies and tactics selected for managing fire will be those that are effective while causing the least impact on the environment.

Strategies for protecting natural heritage, including decision tools to help managers choose an appropriate fire management approach (i.e. rapid response or broad containment strategies) are detailed in section 4.2.6 Strategies for responding to fire.

678 Fire management strategies will take into account operational guidelines in relevant RFMS and BFMC plans of operations.

Protection of cultural heritage

679 During fire operations, IMTs should obtain information about Aboriginal and historic heritage. Information sources include relevant:

- RFMS or reserve plans of management
- BFMC bushfire risk management plans and plans of operations
- specialist advice, and
- information from the geographical information system database
- information from the Aboriginal Heritage Information Management System (AHIMS).

680 Generally, Cultural Heritage staff released for the purpose of fire suppression activities should operate in a specialist planning capacity, as part of an IMT, to ensure adequate protection of cultural heritage assets during fire suppression activities.

681 Suggested procedures for minimising the impacts of fire on known Aboriginal heritage sites are outlined in the following table:

Table 13: Procedures for protecting Aboriginal heritage sites

Site type	Procedures
Scarred or carved trees	All fuel should be cleared from around identified trees when carrying out prescribed burning. Fuel will be cleared around identified trees, where possible, as part of firefighting. Identified trees should be marked clearly before any control lines are constructed.
Stone arrangements, ceremonial rings, rock engravings, rock art, grinding grooves	Fuel must be cleared from in, on and around all identified stone or rock sites. Fuel clearing methods must not damage the site.
Burials, artefact scatters, middens	Sites must be clearly defined and marked wherever possible, and control lines must avoid (and attempt to protect) all Aboriginal sites whenever possible.

Protection of natural heritage

682 Where possible during fire operations, in developing an IAP the Incident Controller must ensure that information regarding natural heritage is obtained and considered by the IMT. Information sources may include relevant:

- NPWS RFMS or reserve plans of management

- BFMC bushfire risk management plans, plans of operations or conservation management plans
- pest management plans
- recovery plans
- threat abatement plans
- specialist advice, and
- information from the geographical information system database.

683 New fire control lines should be located in areas that will avoid adverse impacts on threatened species and their habitats, key species and other species of conservation concern and their habitats.

684 Where required, IMTs should obtain expert advice on the protection of species and their habitat.

685 Locations where fire suppression chemicals have been used should be recorded in geographical information systems to enable post-fire monitoring of impacts.

686 Fire rehabilitation planning will identify the requirements to conserve natural heritage resources.

687 NPWS RFMS, reserve plans of management or interim operational guidelines prepared for reserves will contain:

- strategies and tactics that will minimise the impact of fire management activities
- locations where earthmoving equipment and retardants may be used
- information on seasonal conditions and the times of year when various strategies and tactics should be applied, and
- fuel management strategies.

688 NPWS will work with BFMCs to develop cooperative fire management plans for landscapes that include natural areas.

4.2.8 Cost effectiveness

689 Fire management operations will be cost effective. Cost efficiency will be achieved by considering the appropriate allocation of resources and level of response based on best practice and implementing levels of preparedness as detailed in the Regional incident procedures.

690 The largest expense during fire management operations relates to the use of aircraft (section 4.6 Aircraft operations).

691 Refer to the *Finance Manual* *Part 18 'Insurance'* and section 6.1 Finance and insurance for more detail.

4.2.9 Community support for fire management

692 The need for winning community support will be considered by the IMT when determining objectives, strategies and tactics for all fire management operations.

693 Media, public relations and community relations strategies will be prepared in accordance with the policies and procedures in sections 2.3 Ignition reduction, 2.11 Communications planning, and 4.13 Fire reporting and documentation. Media personnel will only be permitted on the fire ground in accordance with section 4.2.7 Safety considerations.

694 During incidents NPWS will work cooperatively with other fire agencies to provide timely and accurate information on threats, proposed fire control strategies and reserve access information.

4.0 Response

695 NPWS will update public information about park access and warnings during the bushfire danger period and during fire incidents.

696 With the written approval of neighbours, contact details and cooperative arrangements with neighbours may be listed in Regional incident procedures.

Information Officer appointment

697 Where required, the Incident Controller may appoint an Information Officer to a fire incident. The appointment of an Information Officer will be made in consultation with Public Affairs Branch.

The Information Officer will be responsible for:

- developing a media and community information strategy, if required
- preparing and distributing information to media services, in consultation with Public Affairs Branch
- establishing a range of community information services appropriate to the scale and nature of the incident
- coordinating and managing visits to the fire ground by media services, ministerial or elected representatives from government (local or state) and approved key stakeholder representatives
- maintaining maps and general incident information for use by the community and media, and
- maintaining records of media releases and community information services.

Neighbour Liaison Officer appointment

698 The Incident Controller may consider appointing neighbour liaison officers to help the Information Officer provide specific information to neighbours. This is especially relevant when neighbours' resources, materials or equipment are sought to help with fire suppression.

4.3 Fire safety

4.3.1 Background

699 Safety and the protection of human life is the first priority in fire management operations and the primary consideration at all times, followed by protection of community and environmental assets. These priorities will be the basis for determining fire management objectives, strategies and tactics.

- Objectives, strategies and tactics must be adopted only after assessment of their safety and risk implications.
- The Incident Controller has the overall responsibility for the safety of firefighting personnel, but all officers in a supervisory capacity are responsible for those under their supervision.
- All incident personnel have the responsibility to ensure that their work practices are in accordance with safe practice and NPWS policy and instructions to ensure their own and others' safety.

700 AFAC has approved the use of LACES as the national standard safety guide for firefighters: LACES is:

- **L**ookouts
- **A**wareness
- **C**ommunications

- **E**scape routes
- **S**afety zones

LACES will be used to identify and report on safety issues during briefings.

701 All crews on a fire line are to be provided with an appropriately scaled map.

702 The ratio of crew members to crew leader will not exceed the AIIMS recommended span of control of 5, i.e. 5 crew members reporting to 1 crew leader. When crews are engaged in vehicle based firefighting the ratio of crew leaders to crew members must be sufficient to ensure an adequate level of supervision.

4.3.2 Safety considerations

Safety Advisor appointment

703 Safety Advisors must be appointed in accordance with BFCC Policy 3/03 Safety Advisor

704 A dedicated Safety Advisor must be appointed to:

- a fire classified as a Class 2 or a Class 3 (Section 44) incident
- a fire that has the potential to escalate to a Class 2 or a Class 3 (Section 44) incident
- a fire where the number of personnel or resources allocated to the incident is such that the fire ground needs to be sectorised
- a multi-agency prescribed burn
- a multi-agency training exercise, and
- incidents where an agency attending requests that a Safety Advisor be appointed.

705 The appointed Safety Advisor is to:

- identify and ensure that action is taken to rectify any unsafe condition or practice
- exercise delegated authority (in consultation with the Incident Controller) to immediately suspend any activity where there is an immediate threat of significant injury or fatality, and;
- operate in accordance with BFCC Policy 3/03 ‘Standard Operating Procedure: Safety Advisor’ and the *OH&S Risk Management System*.

Ambulance officers

706 Placement of ambulance officers or an ambulance meeting point should be considered in conjunction with medivac plan provisions in the IAP or Prescribed Burn Plan.

Managing exposure to noise from pumps

707 Staff conducting fire suppression activities shall not spend more then a total of 2 hours in any 1 day or shift within 1 m of a running diesel engine pump. Where staff may anticipate this happening, measures should be taken to reduce exposure time within the 1 m range – for example job rotation. Hearing protection will allow longer exposure, but may compromise normal voice and radio communications with other officers on the fire ground.

Smoke management

708 Incident Controllers will ensure that smoke-sensitive areas, smoke management issues, and actions to mitigate bushfire smoke impacts, particularly for firefighter, aircraft and public safety, are considered and evaluated during the preparation of IAPs. See also 2.8.2 Smoke

considerations in prescribed burn planning and 2.8.6 Smoke management during prescribed burning operations.

Risks to firefighter health from exposure to high smoke concentrations will be mitigated through fire ground task management, such as crew rotation, to reduce exposure levels.

Smoke management will be included routinely during fire debriefs.

Crew changeovers

709 Crew changeovers are a time of disruption and inconsistency on the fire ground and this can lead to safety issues.

710 Hot changeovers occur where incoming crews are deployed directly to field locations to assume control from outgoing crews. It is important to ensure adequate shift length time is allowed for incoming crews to travel to the desired location and be adequately briefed by the outgoing crew and for the outgoing crew to brief the incoming crew and travel back to the staging area.

Possible alternatives to hot changeovers include utilising 'swing shifts' where a short shift is arranged to overlap the outgoing and incoming shifts, thus maintaining a consistent presence in the field so the fire is not left unsupervised.

711 Where it can be done safely and within the other constraints of fire management, consideration should be given to leaving firefighting vehicles on the fire ground and arranging alternate forms of transportation for crews. This practice allows regions to reduce the number of firefighting vehicles in their fleet whilst still maintaining the same standard of fire cover.

712 Where required, consideration should be given to the employment of an Operations Support position in the IMT dedicated to organising crew changeovers.

4.3.3 Fatigue management

713 Fatigue is an acute or ongoing state of tiredness that affects an employee's performance, safety and health, and requires rest or sleep for recovery. Fatigue can be caused by:

- number of consecutive night shifts
- shift lengths and total hours worked in 7 days
- type of work (physically hard, mentally demanding, boring)
- environmental conditions (hot temperatures, smoke, excessive noise), or
- driving.

714 The effects of fatigue will be considered in safety briefings and crew shift management.

715 No employee should put themselves or others at risk by undertaking firefighting activities or driving when they are tired or if they feel they cannot do so safely.

716 The Incident Controller is to ensure that shifts are planned and managed to minimise the impact of fatigue. The Incident Controller is responsible for the timing of the changeover and setting the level of personnel to be employed on the incoming shift.

717 The Planning Officer should regularly update the Incident Controller on shift management issues.

718 Crew leaders and other fire crew supervisors must assess environmental factors that increase fatigue levels and monitor crew fatigue during shifts.

719 Crew leaders, Safety Advisors and Incident Controllers will consider crew fatigue when releasing crews to be stood down, and a risk assessment should be undertaken before allowing crews to drive excessive distances at the end of their shift. This risk assessment will consider:

- length of break between work and proposed travel
- distance to travel
- number of people travelling (more than 1 is better)
- if driving will be shared
- length of shift worked (3 days, 5 days, 7 days)
- type of work undertaken (night, physically demanding etc.), and
- an assessment of the general wellbeing of the person made by the person and their crew leader.

720 The operation of vehicles by personnel who have been on shift more than 24 hours should be limited to exceptional circumstances. In particular, open road driving should be limited to safe staging areas or collection points.

721 Arrangements should be put in place to transport fatigued employees from the work site to the rest location if required.

4.3.4 Powerlines

722 When fighting fires near powerlines the first rules to follow are:

- Always assume that all lines are energised (hot).
- Contact the local power supply authority if their employees are not already there. (Contact numbers should be detailed in Regional incident procedures.)
- At all times keep personnel and vehicles a minimum of 25 m clear of a head fire or a flank fire burning under or within 25 m of the powerlines.

723 If fire has extended into the area within 25 m of the outer electric phase or under powerlines, then firefighting tactics must anticipate and consider the personnel hazards associated with the powerlines.

724 Heavy smoke plumes on powerlines may cause a phase-to-ground short and direct attack must be abandoned. The situation should be assessed to determine where to establish a new control line. This should anticipate the rate of spread of the fire to allow crews to remain more than 25 m from both the powerlines and heavy smoke where it passes through the powerlines at all times.

725 When working near or under live powerlines, only approach closer than 25 m from the fire edge to conduct mop-up of grass fires. Mop-up may include knock-down of low (less than 1 m high) isolated flames, spots or smouldering logs which are not producing a convection column or heavy smoke plume. In such cases:

- Never direct the hose stream into the powerline.
- Never direct the hose stream into a smoke plume that is less than 25 m from powerlines.
- Keep the stream no higher than a person's head height.
- Never direct the hose stream at a burning bush or tree (more than head height) in a powerline easement.

726 Bushes or trees burning in power line easements present a real threat of creating a phase-to-ground short – KEEP AT LEAST 25 m CLEAR.

727 Firefighting vehicles must also remain 25 m from the outer electrical phase of powerlines wherever possible. When it is necessary to cross a powerline easement in a vehicle or earthmoving machine, a distance of 25 m must be maintained between the vehicle and any flames or smoke plumes reaching the lines. Drivers should consider removing aerials and antennae from the vehicle prior to crossing the easement.

728 Firefighting operations 25 m beyond the edge of the overhead outer phase powerline require no unusual firefighting tactics but should consider the powerline to be an exposure requiring protection when threatened by fire. Where possible, establish a control line to prevent the spread of fire to an area within 25 m of and parallel to the edge of the overhead outer phase powerline.

4.3.5 Hazardous trees

729 Tree risk is an important safety issue for staff and park visitors. The Tree Risk Management Policy and Procedures provides guidance on the systematic approach to tree risk management across a broad range of landscapes.

730 Hazardous trees are those that have structurally weakened trunks or branches. Falling trees and limbs pose an extreme hazard during bushfire operations. (Refer to photo sheet for key tree hazard indicators)

731 The risks associated with tree or branch fall may be greater at times due to other factors (e.g. high winds, saturated soils, recent fires, nearby aircraft, earthmoving equipment or chainsaw operations).

732 Staff should ensure hazardous trees on the fireground have been assessed and appropriate mitigation actions undertaken (refer to Safety Alert 09/04 'Hazardous Trees') including:

- Marking hazardous trees, but only if safe to do so
- Posting a lookout and identifying at least two escape routes
- Identifying and enforcing an exclusion area around the tree which is twice the tree height in radius
- Parking vehicles at least two tree lengths away from any hazardous trees
- Closing the area, road, track or trail to members of the public
- Engaging an appropriately trained problem tree feller or machine operator to fell or push over the tree
- Always wearing appropriate PPE

733 L&D has developed a training package to provide staff with the skills and knowledge to be able to implement the Tree Risk Policy and Procedures at the level appropriate for their role. The training package includes a Facilitator Guide, Participant Guide and a PowerPoint presentation. Field Branches may also send select staff to advanced tree risk assessment training.

4.3.6 Visitor safety

734 Visitors will not be permitted into areas where fire suppression or prescribed burning operations are being undertaken.

735 All wildlife carers, non-firefighting volunteers, media personnel, plant operators and any other persons entering the fire ground must be approved by the Incident Controller. These visitors must:

- wear approved protective clothing (PPE)
- receive a full safety briefing prior to entering the fire ground
- be accompanied by a competent crew leader or more senior officer, appointed by the Incident Controller, and
- always follow the directions of NPWS firefighters.

736 The presence of visitors in or adjacent to the fire ground will be immediately reported to the Incident Controller, who will then arrange for an evacuation if necessary.

737 The requirements of the *Traffic Control at Work Sites manual* (RTA 2010) will be followed for works undertaken in, or in the vicinity of RTA, NPWS and local government controlled roads (refer to the *Traffic Control and Safety Near Roads policy*).

738 Before undertaking prescribed burning, 'Park closed' or 'Smoke hazard' warning signs, or both, must be placed near areas used by visitors. All devices used for traffic control will comply with the requirements of the *Traffic Control at Work Sites manual* (RTA 2010).

4.4 Briefings and safety checks

4.4.1 Background

739 Briefings will be conducted before undertaking any fire management activities and **all** staff should receive a briefing before starting each shift.

740 The IMT will consider assigning briefing responsibilities for crew changeovers in the development of the IAP.

4.4.2 Conducting a briefing

741 The Situation Mission Execution Administration Command/Communication Safety (SMEACS) process will be used to brief all staff about incident and prescribed burning operations. IAPs and prescribed burn plans use the SMEACS formula to facilitate this process.

742 Briefings must occur on all fire events, at all levels, at the start of each shift or in the event of significant changes in fire activity, strategy or task.

743 Briefings will include information on:

- history of the fire and fire location
- objective
- tasks to be completed during the work shift
- fuel conditions including fuel type, fuel moisture, overall fuel hazard
- access, control lines, escape routes and safety refuges
- potential hazards
- weather forecasts and current conditions
- fire behaviour and weather monitoring equipment available
- command structure
- location of other crews
- communication arrangements
- equipment and resources available, and
- maps of operational areas provided for all personnel.

In many cases ground checks will be required to verify this information.

744 LACES will be used to identify and report on safety issues during briefings (see section 4.2.7 Safety considerations).

745 The effects of fatigue will be considered in safety briefings and crew shift management.

4.0 Response

4.4.3 Safety checks

746 Safety checks and the identification of potential hazards will form an essential part of all fire operations briefings.

747 Safety checks will verify that:

- operational personnel are wearing and carrying personal protective equipment
- weather conditions are within safe limits
- equipment is available and operational
- communications equipment and facilities are available and operational
- control line preparation has been completed
- hazard advice signage has been erected
- notifications have been undertaken, and
- visual checks have been conducted for visitors and non-operational personnel.
- Hazardous trees have been assessed and appropriate mitigation actions undertaken (refer to Safety Alert 09/04 “Hazardous Trees”

748 Safety checks will be reviewed on a daily basis or as new information regarding hazards is obtained from the field.

4.5 Incident action plans (IAPs)

4.5.1 Incident action planning policies

749 An incident action plan (IAP), in the BFCC-approved SMEACS format, will be prepared for all fire management operations on NPWS-managed lands.

750 The type of IAP will be in accordance with the size and complexity of the incident and will include:

- operation objectives
- strategies
- tactics and tasks
- an appropriately scaled incident map, and
- resources and organisational structure.

751 Consideration should be given to incorporating strategic suppression plans that span the expected duration of the fire, or specific periods, to identify long-term objectives and resourcing requirements.

752 A remote area firefighter plan will be developed and attached to the IAP where required. A RAF checklist covering all aspects of RAF deployments has been developed to assist in this purpose.

753 The Incident Controller must approve all IAPs and any subsequent amendments. The Incident Controllers must ensure that reasons supporting amendment of existing, previously approved IAPs are appropriately recorded in-line with the operational significance of the amendment/s.

754 The use of ICON to generate IAPs is optional (see 4.13.4 ICON). However if ICON is not used, the BFCC approved forms must be used (IAP Forms).

4.5.2 Fire ground maps and marking

755 Fire ground maps and marking are an important means of communicating information to and between fire ground crews and the IMT. The marking of fire ground features also helps with the effective and safe deployment of firefighting crews and support staff.

756 A transition between two different map datums is currently underway. The two map datums are Australian Geodetic Datum 1966 (AGD66 and AGD84) and Geocentric Datum of Australia 1994 (GDA94). Staff engaged in mapping should be aware of this, particularly when using global positioning system (GPS) applications.

757 Fire ground maps will be prepared for use in conjunction with all fire management operations and will be attached to all operational plans (i.e. IAPs and prescribed burn plans).

- All fire ground personnel and IMT members will be fully briefed on the information provided on those maps.
- Maps will be updated as revised operational plans are developed and updated maps will be produced for each new shift.
- Revised maps will be clearly marked as such and distributed to all fire ground personnel and IMT members as above. Amendments will be brought to the attention of all fire ground personnel and IMT members during briefings.
- When black and white photocopies of maps are made, the essential, important and dormant fire trails marked on them must be named as ‘essential’, ‘important’ and ‘dormant’ trails to ensure they are not confused with the symbols for control lines and predicted fire edge.

758 Training and assessment in map interpretation is included in the national competency ‘Navigate in urban and rural environments’ (PUAOPE003B) for crew leaders (see section 3.7.3 Competency). Familiarisation with IMS symbols and practical navigation symbols is also included in this competency unit.

759 Map reading prompts and IMS symbols will be included and updated as required within the Fire Incident Field Guide.

760 All maps used for fire ground operations will be prepared in a manner consistent with this section.

Map requirements

761 Fire ground maps will comply with the following requirements:

- Fire ground base maps will be at a scale and of a type which is most appropriate for the operation. Maps will be legible and easy to interpret.
- Fire ground maps will include all tactical information necessary for the safe conduct of the operation, with particular consideration for the identification of safe refuge areas.
- Standard reference procedures will be used to communicate locations i.e. map name followed by easting and then northing.
- Standard IAP Bushfire Mapping Symbols as approved by the BFCC will be used on all fire ground maps to indicate fire ground features, organisation, ignition patterns and to communicate safety information.
- All fire ground maps will include date and time of preparation, map source or name, key, orientation (e.g. magnetic north), scale and marks and lines sufficient for crews to provide either a 6-figure grid reference (consistent with the mapping base currently available) or a UBD map reference.

762 Mapping symbols for planning documents (including IAPs) are to show essential, important and dormant fire access as detailed in BFCC Policy 2/07. ‘Fire Trails’

Supplementary information

763 For the purpose of effectively managing contingencies, Sector Commanders and Divisional Commanders will carry onto the fire ground such other mapped information necessary for the safe conduct of the operation e.g. adjoining map sheets, air photos or orthophoto maps.

764 Tactical sketch maps may also be provided to fire ground personnel in order to supplement or provide further clarity to base maps.

Field truthing and flagging

765 Sector and Divisional Commanders are responsible for field truthing fire ground maps and for marking significant features on the fire ground.

Sector Commanders are also responsible for referring amendments to the Divisional Commander and to crew leaders or crew members.

Divisional Commanders are responsible for referring amendments to the planning team.

766 All personnel are provided with flagging tape as part of their firefighting kit. Flagging tape will be used to mark any significant features on the fire ground, and to mark any notable hazards which might pose a risk of injury to firefighters.

4.6 Communications planning during incidents

4.6.1 Background

767 Communications planning is an essential component of fire suppression operations because it is the means by which firefighters receive direction in the field and communicate field conditions back to the IMT.

4.6.2 Communications planning policies

768 Communications planning will take into account radio black spots, gaps in mobile and satellite phone coverage and other local circumstances.

769 The primary means of communication is by the agency VHF radio system; all other forms of communications will be considered as part of the communications plan for the incident.

UHF CB radios should only be considered for short range tactical communications in order to compliment, but not replace, agency radio systems.

The following communication methods should be considered when preparing a communications plan.

Table 14: Recommended communication methods – Class 1 fires

Communication level	Mode of communication
Coordination: Incident Control Centre to Operations Officer, Divisional Commander	Mobile telephone NPWS repeater channel HF channel
Command: Divisional Commander to crews	NPWS repeater channel

Communication level	Mode of communication
	HF channel
Tactical: crew members	NPWS simplex channel UHF-CB simplex channel
Aircraft: Ground-to-air	NPWS simplex channel UHF-CB simplex channel Approved aviation frequency

Table 15: Recommended communication methods – Class 2 and 3 fires

Communication level	Mode of communication
Coordination: Incident Control Centre to Divisional Commander, Air Operations Manager	Phones (landline, mobile phones) RFS GRN/PMR HF channel
Command: Divisional Commander to Sector Commander	Agency network repeaters RFS GRN/PMR
Tactical: Sector Commanders to strike teams, task forces, crews, single resources	NPWS simplex channel UHF-CB simplex channel Augmented radio systems RFS GRN/PMR/Simplex
Aircraft: Incident Control Centre, Air Operations Manager or Helipad Managers to Aircraft, Ground-to-air	Air band channels Agency simplex channels UHF-CB simplex channel

Communications log

770 Divisional Commanders and all positions above engaged in prescribed burn and suppression operations will maintain a log of activities and decisions.

For Class 3 fires, a communications officer should be appointed to help these positions in maintaining communications logs.

771 Records of all fire management operations will be kept on the prescribed forms and entered into the prescribed information systems in accordance with the policies and procedures in section 4.13 Fire reporting and documentation.

Communications Planner appointment

772 Consideration should be given to the employment of a Communications Planner within the IMT to establish effective communications strategies for fires in remote areas or large fires involving multiple divisions or agencies.

4.0 Response

4.7 Aircraft operations

4.7.1 Background

773 Aircraft, when used appropriately, have proved to be a safe, efficient and effective resource for managing fire. They are used for a variety of purposes in fire management.

774 Fixed-wing aircraft are used to detect fires, undertake reconnaissance of fire behaviour and boundaries (including via infra-red line scan), transport fire crews from various parts of NSW, provide a platform for airborne radio repeaters and undertake water bombing.

775 Helicopters are used to transport fire crews onto the fire ground (including winching), provide operational support for crews on the fire ground, identify hotspots via infra-red sensors, undertake reconnaissance, perform as air attack supervision, command or observational platforms and undertake aerial ignition and water bombing.

776 Aircraft and aircrew also provide an important resource for ensuring fire crew safety and welfare by monitoring fire behaviour and development and fire management operations.

777 Whilst pilots have ultimate accountability for the safety of aircraft and all those on board, it is important to recognise that all personnel involved in aviation operations have a responsibility for safety. This includes assessing risks, reporting hazards and monitoring operations.

4.7.2 Policies for aircraft operations

778 NPWS may engage aircraft to suppress fires where this has been assessed as an appropriate and cost-effective method of suppression. IMTs should refer to the document *Guidelines for effective use of aircraft* to assist in determining effective aircraft types and levels.

779 All aviation operations will be in accordance with the Aviation Management Framework, the Aviation Safety Management System and the Aviation Safety Policy.

780 NPWS will actively participate in the Interagency Aviation Working Group to promote safe and efficient use of aircraft.

781 Only aircraft and pilots on the NSW Fire Agencies Approved Operators List (AOL) will be used by NPWS in fire management operations.

782 All aircraft operations will be in accordance with NSW & ACT Fire Agencies Bushfire Aviation Standard Operating Procedures to ensure safe, effective and efficient aircraft operations.

783 Operations are to be carried out in accordance with Civil Aviation Safety Authority (CASA) requirements, joint-agency standard operating procedures and relevant air operations manuals.

4.7.3 Aircraft deployment and coordination

784 Processes for obtaining aircraft are detailed in the NSW & ACT Fire Agencies Bushfire Aviation Standard Operating Procedures.

785 Only aviation operators on the NSW Fire Agencies Approved Operators List can be used for fire operations. The AOL is administered by the NSW RFS on behalf of fire agencies. The AOL is updated annually and is available on the intranet. Staff will be informed of any major changes or updates to the AOL via a Fire Management Circular.

Engagement of other operators is not permitted without specific approval of the Regional Manager and Manager Flight Operations Unit.

786 During periods of high fire activity, state-wide aircraft coordination arrangements may be invoked (aviation coordinated periods). The State Air Desk (SAD) will be responsible for coordination of aircraft deployment to fire operations and provision of logistical support during this time.

787 The Aviation Coordinator will represent the interests of NPWS at the SAD. Additional staff may be required to assist the SAD in its daily functions.

788 The SAD will liaise with FIMS Flight Operations Unit in relation to the availability of Parkair aircraft including the operational status of the Catchment Remote Area Team (CRAFT) contract aircraft.

789 Two distinct processes apply to deploying aircraft. These are described as:

- Aviation coordinated periods, and
- Aviation non-coordinated periods

FMS will advise staff when periods of coordination are declared and revoked.

Aviation coordinated periods

790 During periods of high demand for aviation resources, for example when there are multiple Section 44 fires or a high demand for specialised aircraft, or continual hot weather patterns and high FDIs, a 'period of aviation coordination' may be declared following agreement by all fire agencies. During these periods:

- All requests for aircraft to support fire operations must be made through the SAD (Aircraft Request Form)
- The SAD will allocate aircraft to incidents based on state-wide priorities
- Regions should request the SAD to preferentially supply NPWS aircraft for any Class 1 or 2 fires as a priority, when they are, or become, available.
- Requests to retain aircraft deployed must be made to the SAD on a daily basis and the SAD must be notified once it is known that aircraft are to be released from a fire so they can be redeployed (Aircraft Request, Retain, Release form).
- The SAD will maintain a daily summary of NPWS-tasked aircraft. This information will be supplied to FIMS.
- NPWS will provide staff to assist the SAD at RFS State Operations as required.

Aviation non-coordinated periods

791 During aviation non-coordinated periods:

- Regions may engage aircraft directly from the AOL
- Regions may contact the FIMS Aviation Coordinator for advice on the AOL.
- Regions should consider the suitability and availability of NPWS aircraft before contracting external aviation services from the AOL.
- Following deployment of aircraft, during business hours the Aviation Coordinator must be advised verbally of deployments within 30 minutes, and in writing within 2 hours on the

NPWS Aircraft Notification form. (After business hours the State Duty Officer is to be notified).

Cooperative arrangements for aircraft operations

792 For fires across multiple land tenures, NPWS will liaise and negotiate with the other fire authorities involved to agree on cost sharing for aircraft use. Where possible, these arrangements should be established before completion of suppression operations.

793 NPWS will participate in the Interagency Aviation Working Group to facilitate the development of a coordinated aerial fire management operations policy, aviation plan and standard operating procedures with other fire agencies for approval by the BFCC. This Group will also coordinate training arrangements and will address other interagency issues relating to aviation management.

Effective and cost-efficient aircraft management

794 Although the benefits of using aircraft for fire management are clear, the increasing costs associated with air operations mean that greater scrutiny must be applied to ensuring that operations are effective and cost-efficient.

795 Basic principles of fire aviation operations include:

- Aircraft do not extinguish fires. While aircraft can assist in 'knocking down' fire and reducing ROS, ground crews are critical to ensure containment.
- All air operations must be fully integrated with ground operations and incident management to ensure safety and maximise effectiveness.
- IAPs need to set realistic and achievable objectives and strategies for aircraft operations. IAPs and operations also need to maintain a degree of flexibility to accommodate changing circumstances.
- Aircraft effectiveness can be significantly compromised by many factors, including:
    - weather conditions
    - fire behaviour
    - fuel types and loadings
    - terrain and elevation
    - adequacy of logistical support
    - turnaround times for aircraft to and from water sources
    - communications
    - aircraft and pilot capability, or
    - level of supervision.
- Suitably experienced staff or aviation specialists must direct air operations.
- Air operations need to be continually monitored for effectiveness, with objectives and strategies modified accordingly. All fire personnel need to be encouraged to provide continual feedback on operations.

796 The following questions need to be considered and regularly reviewed to determine the initial and ongoing use of aircraft:

- Will an aircraft increase the effectiveness of the firefighting operation?
- What role will the aircraft play in the suppression strategies?
- What sort of aircraft will best do the job?
- Is the proposed use of aircraft cost-effective?
- Are suitable aircraft available?

4.7.4 Aviation safety

797 All aviation operations will be in accordance with the Aviation Safety Policy.

798 All staff involved in aviation operations must have completed and be current in Working Safely Around Aircraft training

799 The use of qualified and experienced personnel is required for the following specialist positions: Air Operations Manager, Air Attack Supervisor, Aircraft Officer, Air Base Manager, Helibase Manager, Air Observer and Bombardier.

Qualified personnel will be identified on the 'Aviation Specilalists List' available from FIMS. Personnel listed on the Aviation Specialist List are considered to be state-managed resources. Where possible, local resources will be used first, to maximise local knowledge. Consideration will also be given to local requirements, including potential fire danger, before tasking staff to out-of-area deployments.

800 When multiple aircraft are assigned to the same incident, an aircraft unit should be established under the operations section in line with the NSW & ACT Fire Agencies Bushfire Aviation Standard Operating Procedures.

801 Flight following procedures are detailed in the NSW & ACT Fire Agencies Bushfire Aviation Standard Operating Procedures and must be implemented for any aviation operations. Procedures for flight following should include;

- Nomination of a flight following officer (FFO)
- Establishment of communications arrangements with back up communications
- Flight notification including; aircraft call sign, location, destination, POB (people on board), destination, ETA (estimated time of arrival) fuel endurance next SAR (search and rescue) call

In the event of an overdue aircraft, the following SAR procedures should be initiated:

15 minutes overdue: contact aircraft by primary and secondary communications

15 – 30 minutes overdue: Call ground personnel and other aircraft in area to assist in making contact

30 – 60 minutes overdue: advise IC, task available aircraft and ground personnel to last reported location, contact neighbours or anyone else that may have sighted aircraft

60 + minutes: Notify AusSar on 1800815257, call 000 and provide all details and follow instructions. Enlist all required assistance

4.7.5 Guidelines for air operations

Fire intensity

802 Fire intensity is a key factor in determining the effectiveness of a fire bombing operation. Once fire intensities exceed a moderate threshold, aerial fire bombing is unlikely to retard fire advance.

Under extreme weather conditions, increased fire intensity and reduced aircraft performance will further limit effectiveness. Operations need to be continually monitored for effectiveness and promptly called off if not proving successful, or if safety is compromised.

Retardants, surfactants and gels

803 Use of straight water in fire bombing operations should only be considered where large volumes are available with rapid turnarounds, or when environmental constraints need to be considered.

Foam surfactants significantly increase the effectiveness of fire bombing operations, and should be used whenever possible.

Retardants are very effective over longer periods of time, but are expensive, require specialist mixing and loading equipment and require significant logistical support. Retardants may not be appropriate in some habitats and are less effective for forest fuel types. The red colour of retardant is for higher visibility over the drop zone and is designed to fade with exposure to sunlight.

Gels can either be used to suppress fires quickly or to provide a gelled water barrier to prevent the spread of fires. With the addition of red or blue colourants gels can be seen by pilots at altitudes of 2500 feet or more.

804 Retardants, surfactants and gels can have environmental impacts, particularly if use is considered near watercourses, wetlands or threatened species habitats. Section 4.11 Fire suppression chemicals and relevant RFMS should be considered before use.

Impacts of distance, elevation and atmospheric conditions

805 Fire bombing effectiveness decreases with increased distance to the fire, as well as with increased elevation and warmer atmospheric conditions.

- Aircraft are less efficient at higher elevations and may not be able to carry full loads.
- Hotter weather conditions also reduce aircraft efficiency and strong winds reduce manoeuvrability and accuracy.
- Poor visibility due to smoke and inversions can also compromise operations.

806 Aircraft turnaround times can be minimised by staging aircraft closer to operations and establishing temporary water points using buoy walls and portable pumps.

Firebombing strategies

807 The following strategies should be employed when utilising aircraft for bombing with water surfactants or retardants:

- Air operations need to be fully integrated with ground operations and the IMT.
- Fire bombing operations should always be supported by ground crews.
- Fire bombing is most effective early in the day when fire activity is lowest.
- Always use natural or constructed fire advantages.
- Continually monitor the effectiveness of the operation. If fire bombing is not productive, has a poor chance of success or is unsafe, call it off and consider other strategies.
- Use the most appropriate aircraft available for the task (See Table 16: Indicative aircraft cost and application).

Mop-up

808 While the use of strategic water bucketing may be appropriate when closely directed by ground crews, unsupported helicopter mop-up operations are generally ineffective and should be discouraged.

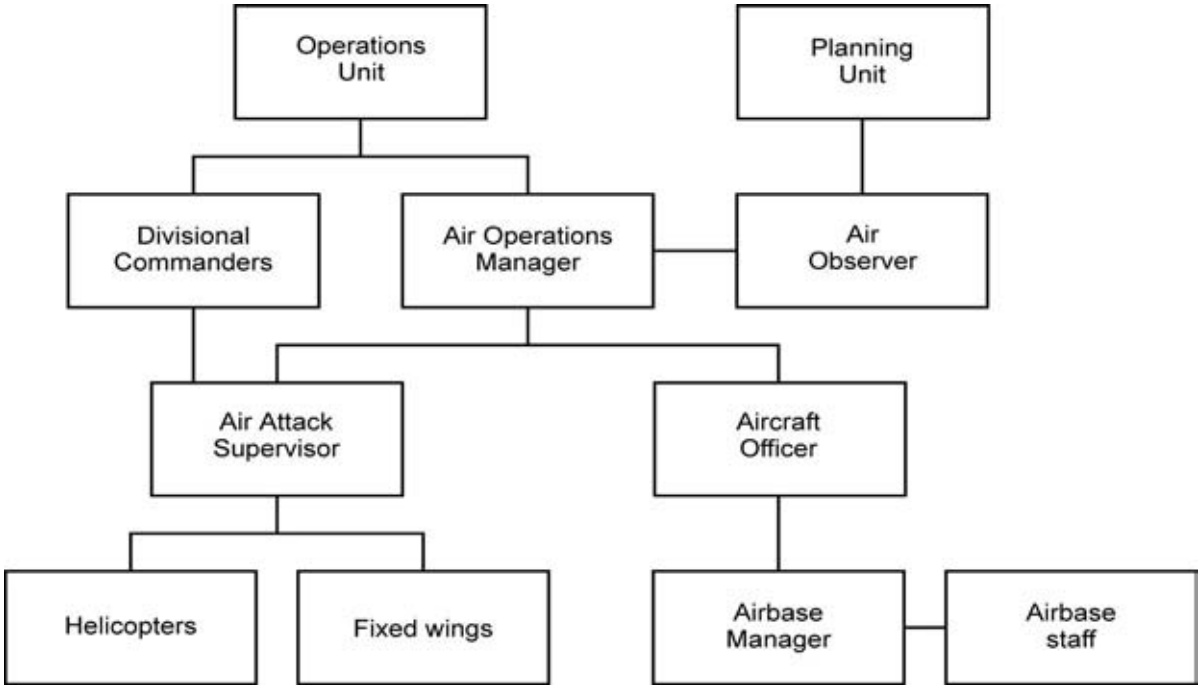
Air operations management

809 Effective and efficient air operations require competent aviation management personnel, adequate ground support, good administration systems and effective integration into the total fire organisation.

810 Establishing an Aircraft Unit within the IMT should be considered as soon as multiple aircraft are deployed. Strong linkages with the planning function are essential to ensure feedback on strategy development and implementation.

Unit structure is shown in Figure 8. The model structure represents a large fire incident with multiple aircraft. Unit structures can be scaled up or down, depending on the fire situation.

Figure 8: Model IMS aircraft unit structure



4.0 Response

Aircraft cost

811 Table 16 indicates aircraft cost and application for each category of aircraft commonly used in fire operations. It is important to note that the costs do not include fuel, which can add substantially to operational costs. Standby charges are often levied for heavy and medium helicopters. These charges are typically one to two times the hourly rate, per day.

Table 16: Type of aircraft, application and indicative cost

Role:	Aircraft type:				
	Light fixed-wing	**Fixed-wing ag**	**Light helicopter**	**Medium helicopter**	**Heavy helicopter**
Detection	Suitable	Some circumstances	Suitable	Not suitable	Not suitable
Reconnaissance	Suitable	Not suitable	Suitable	Some circumstances	Not suitable
Infrared Camera (FLIR)	Suitable	Not suitable	Suitable	Some circumstances	Not suitable
Aerial incendiary	Some circumstances	Not suitable	Suitable	Some circumstances	Not suitable
Crew transport	Out of area	Not suitable	Suitable	Suitable	Not suitable
Air attack supervision	Suitable	Not suitable	Suitable	Some circumstances	Not suitable
Fire mapping	Suitable	Not suitable	Suitable	Not suitable	Not suitable
Fire bombing	Not suitable	Suitable	Some circumstances	Suitable	Suitable
Crew insertion/ extraction	Not suitable	Not suitable	Suitable	Suitable	Not suitable
Mop-up	Not suitable	Not suitable	Suitable	Suitable	Some circumstances
Cost per hour	$500 – $1200	$1500 – $3,000	$1200 – $1650	$3000 – $3800	$4000 – $15,000
Fuel usage per hour	60-80	60-80	100-200	300-400	600-2080 (Skycrane)
Example aircraft	Cessna 182, Cessna 206, Partnavia	Airtractor, Dromader, Thrush	Jetranger, Squirrel, Longranger	BK117, Bell 204, (Huey)	Aircrane

4.8 Remote area deployment

4.8.1 Background

812 NSW has large areas of bushland where rapid response by vehicle is not possible due to access, topography or the distances involved. Fire agencies have developed a high level of organisational skill, expertise and experience in the suppression of fires in remote locations using dry firefighting techniques. Early suppression of fires in remote terrain will often prevent large fires developing and becoming a major threat.

813 NPWS has a duty of care to ensure that its staff, volunteers and contractors required to conduct remote area firefighting operations are competent and capable of undertaking the tasks allocated to them and that those tasks are undertaken as safely as possible.

4.8.2 Policies for remote area deployment

814 The Joint Operational Protocol for Remote Area Firefighting replaces all previous policies regarding remote area firefighting and operations, and covers the generic requirements NPWS and the NSW RFS will operate under, whether during single agency or multi-agency remote operations.

815 Decisions to engage in firefighting or prescribed burning in remote locations will be based on the risk relating to the potential of the fire to have significant impacts on the community, local economies or the environment. The guide these decisions a RAFT Rick Analysis for Incident Controllers is contained in the appendix to the Joint Operational Protocol for Remote Area Firefighting.

816 There are two classifications of RAF; Moderate RAF and Arduous RAF. In order to participate in an Arduous RAFT, all team members must have completed the Arduous level TBA. In order to participate in a Moderate RAFT, all team members must have completed the Moderate level TBA.

817 Arduous RAFT will typically be deployed to:

- areas that are only accessible by helicopter winch/hover exit insertion;
- areas where crews are more than 40 minutes walk from mechanical means of extraction (e.g. vehicles, boats, aircraft at airstrips), and;
- carry out tasks that require a high level of fitness and endurance, over extended periods of time in steep and uneven terrain. Such tasks include extended periods of rake-hoe work and carrying equipment.

818 Moderate RAFT will only be deployed to areas where:

- crews are less than 40 minutes walk from mechanical means of extraction (note: Moderate RAF personnel may be deployed by winch to areas that are more than 40 minutes walk from mechanical means of extraction provided the primary task is to cut a helipad).
- the tasks are achievable for personnel with a moderate level of fitness.

819 The deployment of personnel to remote areas is to be implemented only after a risk assessment has been carried out which considers the following:

- actual and forecast fire danger conditions
- terrain
- fire activity
- availability of 2 means of escape and time required to reach extraction point of refuge
- fire management activities to be undertaken, and
- firefighter health and fitness accreditation.

A remote area pre-deployment checklist has been developed which should be used to assist in this process.

820 Personnel deployed to remote locations as defined above must have current accreditation in helicopter safety, hover entry and exit and winching, and be deemed suitable to undertake remote area tasks and have successfully completed the corresponding current task-based assessment (fitness test).

821 When determining whether an operation is to be classified as Remote, the Incident Controller will take into account all aspects that would affect crew egress to a point of mechanical

extraction. This would include the capability of the crew, the activities proposed to be undertaken, terrain, accessibility, vegetation and forecast weather conditions.

Remote area firefighting equipment

822 Each remote area crew must be adequately resourced to ensure it is self-sufficient for the duration of its deployment plus 24 hours.

823 Each remote area crew member must carry all relevant remote area equipment. See schedules 1, 2 and 3 in section 7.2 Personal protective equipment schedules. Each remote area crew is provided with a global positioning system (GPS) unit.

824 Consideration is to be given to providing remote area crews with

- a back-up form of communication (e.g. satellite phone), and
- a personal locator beacon (PLB).

Remote area fire team briefing

825 Before being deployed to a remote location, all remote area crew members must be provided with a specific briefing which must include the safety, tactical, communication and reporting arrangements of their deployment as detailed in the IAP, and details of current and expected weather and fire behaviour. Operational maps will be provided to each remote area crew member.

Deployment and extraction

826 It is preferable for crews deployed by helicopter to be inserted and extracted as close to anchor point or safe refuge as practicable. The pilot, in consultation with the remote area crew leader, will determine the insertion or extraction point for crews deployed by helicopter.

827 The remote area crew leader will advise the pilot or aircrew if they are not satisfied with the proposed deployment, insertion or extraction locations, or if they believe that fire behaviour or weather conditions have made or may make deployment unsafe for on-ground fire management activities. The remote area crew leader's decision is final.

828 Wherever possible, winching operations should be kept to a minimum. Every effort should be made to locate a more suitable landing site as close to anchor point as possible.

829 The Incident Controller will ensure that all remote fire management activities in remote locations have adequate and timely air support.

830 An extraction time must be nominated, taking into consideration the task, current and forecast weather conditions, available daylight and pilot flight hour duty time.

831 Crews walking in or walking out (or both) should traverse burnt ground where practicable.

Crew deployment

832 All personnel deployed to remote locations will maintain the capacity to communicate with the crew leader, and the crew leader will maintain the capacity to communicate with the Divisional Commander and aircraft or Incident Control Centre or other suitable monitoring point for the duration of the operation.

833 Once deployed, the Crew Leader will test communications. If at any stage during the deployment the communications are found to be inadequate, the crew will be withdrawn.

834 If at any stage during the operation the remote area Crew Leader determines that conditions on the ground are unsafe, then it is that Crew Leader's decision to request that the crew be withdrawn. The Crew Leader's decision is final.

835 Once deployed, the Crew Leader will confirm with the air crew or Divisional Commander that the refuge areas and escape routes are suitable. There will be at least 2 escape routes known and assessed.

836 The Incident Controller will ensure arrangements are in place to closely monitor weather and fire behaviour on the fire ground and have that information regularly relayed back to the control centre.

837 The Incident Controller will ensure that current and predicted weather information is regularly assessed with regard to the safety of crew deployment, and the weather information and assessments are relayed to crews on the ground.

838 Decisions to withdraw crews due to deteriorating weather or extreme fire behaviour will be made well in advance of any significant change.

839 Only firefighting personnel trained and currently accredited in helicopter safety, winching and hover entry and exit will be deployed.

Standards of training

840 RAF Crew Members will be trained to the following standards:

- Crew Member or Crew Leader competency, and
- helicopter safety, hover entry and exit and winch accreditation

For further information refer to section 3.7 Learning and Development.

4.9 Fire control lines

4.9.1 Background

841 Fire control lines can vary in width and are constructed by various methods. The width of a control line will depend on the strategy used and the intensity of the fire it is to contain. Mineral earth control lines can be constructed either by ground crews using hand tools or by earthmoving equipment. 'Wet' control lines can be created using retardants applied either by helicopter, fixed-wing aircraft or fire tankers.

842 Natural fire control advantages include any area or natural feature that cannot support fire or will inhibit the passage of a fire. These include watercourses and water bodies, moist vegetation types such as rainforests, low-fuel areas, recently burnt areas and rocky outcrops, including cliff faces.

843 Permanently constructed fire control lines can include roads, tracks, walking trails and APZs (see section 2.9 Fire roads and trails). Constructed control lines will often link into natural fire control advantages.

844 Temporary control lines may be constructed either as part of the fire suppression operation or as part of the preparations for a prescribed burn.

4.9.2 Policies for fire control lines

845 Existing constructed or natural fire control advantages should be used for containing bushfires wherever possible.

Existing natural fire control advantages should be used as fire control lines or to link into constructed fire control lines wherever practicable, and should be mapped in GIS and identified in RFMS.

846 Temporary fire control lines may be constructed or established to contain bushfires and prescribed burns within predetermined boundaries.

Consideration should be given to the marking of temporary control lines with signs or flagging tape.

Where necessary, rehabilitation or restoration of temporarily constructed control lines will be undertaken.

Location and preparation of fire control lines

847 The following guidelines will be considered for the location and preparation of control lines for burning operations:

- Use existing tracks and trails where suitable.
- Exercise caution in using natural control advantages, particularly during periods of drought.
- Wherever possible, locate control lines to avoid leaving unburnt fuels down-slope.
- Avoid if possible:
  areas of heavy fuel concentrations and potential tree fall
  powerlines, and
  steep terrain.
- Keep control lines as straight as possible.
- Avoid sharp and hairpin bends.
- Widen trails on bends and where fuel concentration increases.
- Reduce fuel concentrations on the very edge of control lines.
- Rake fuel away from the base of fibrous-barked trees, and from around logs close to the edge of control lines.
- Remove overhanging vegetation from control lines.
- Mark safety hazards for personnel.
- Consider dangerous trees. Guidelines are contained in Safety Circular 09/04 Dangerous Trees

848 The location of fire control lines should consider:

- the safety of firefighters
- the protection of life and property
- the protection of natural and cultural heritage
- the minimisation of erosion and pollution

- trafficability where appropriate, and
- the effectiveness of control.

849 Before the completion of an incident, consideration will be given to rehabilitating control lines.

4.10 Earthmoving operations

4.10.1 Background

850 Earthmoving equipment, including bulldozers, tractors and graders, can be the most effective means of rapidly constructing fire control lines.

851 The use of earthmoving equipment can cause serious damage to the environment including soil erosion, damage to natural and cultural heritage and the translocation of weeds and pathogens. Conditions apply to use earthmoving equipment within NPWS-managed lands to maintain conservation values and meet environmental legislative requirements.

852 NPWS operates a range of earthmoving equipment. These are managed to ensure availability for firefighting.

853 Earthmoving equipment can be hired during fire operations. All contract operators must be insured and appropriately certified to ensure safe operation of equipment. Operators should also be able to follow instructions to minimise environmental damage when constructing control lines.

4.10.2 Policies for earthmoving equipment

854 Earthmoving equipment may be used for fire operations, based on predicted success of fire suppression and anticipated impacts to sensitive environments.

855 Earthmoving equipment should be used in accordance with operational guidelines within RFMS and within BFMC plans of operations.

856 NPWS earthmoving equipment will be in a state of readiness for each fire season.

857 All earthmoving equipment used in fire management operations must be fully insured and fitted with appropriate safety devices maintained as specified by the manufacturer.

858 All earthmoving equipment operators engaged in fire management operations must wear the approved protective clothing detailed in Schedule 1(a)

859 Where more than three pieces of earthmoving equipment are operating on a fire at one time, a Plant Manager should be established within the operations section of the IMT.

4.10.3 Guidelines and restrictions on use of earthmoving equipment

860 For Class 1, 2 and 3 fires when the Incident Controller is not a NPWS officer, approval must be gained from the Regional Manager or other senior officer before earthmoving equipment is deployed for use on NPWS-managed land.

861 Delegates to BFMCs will ensure that the guidelines and restrictions on the use of earthmoving equipment on NPWS-managed land included within RFMS are reflected within BFMC plans of operations.

862 Where considered necessary, RFMS and BFMC plans of operations will include details of sensitive environments within reserves where specific conditions apply to using earthmoving equipment.

Using earthmoving equipment on NPWS-managed land

863 Earthmoving equipment must be guided and supervised by an experienced NPWS officer or a person recognised to be appropriately experienced.

864 All earthmoving equipment employed in fire operations must be accompanied by a support vehicle that has equipment available to contact support personnel in an emergency. Earthmoving equipment involved in direct or parallel attack must be accompanied by either a Cat 9 fire unit or fire tanker for safety purposes.

865 At the start of a shift, all operators and guides must be briefed on safety considerations and actions to prevent damage to sensitive natural and cultural heritage. All equipment used at night must have appropriate lighting.

866 All earthmoving equipment should be washed down before entering NPWS-managed land in order to prevent the potential relocation of weeds or pathogens.

NPWS earthmoving equipment

867 Fire management operations will normally have priority over all other operations for equipment use.

868 Equipment will be operated by appropriately certified operators.

869 All earthmoving equipment used in firefighting activities must be fitted with appropriate ‘falling object protection structures’ (FOPS) and ‘roll over protection structures’ (ROPS), in accordance with AS 2294.1-1997 and AS 1636.1-1996.

870 Earthmoving equipment must be fitted with a seatbelt for the operator. The seatbelt must be correctly mounted, be in good condition and be adjustable to suit a variety of operators. Seatbelts must be used whenever machinery is being operated and be maintained according to the manufacturer’s specifications.

Using interagency earthmoving equipment

871 A MoU may be entered into with other local fire authorities on conditions for the use of earthmoving equipment on NPWS-managed lands.

Contract operators and equipment hire

872 Plant and operators will only be hired under formal contract arrangements using the NPWS standardised Comprehensive Plant Hire Agreement.

873 Contract operators must have current insurance cover for workers compensation, public risk, and preferably, comprehensive damage and loss cover on all their equipment. The contractor should ensure that fire suppression is covered by their insurance policy. Producing evidence of such insurance cover is a condition for inclusion on the list of contract operators for fire suppression activities.

874 All contract machinery operators should complete fire awareness and soil erosion mitigation training before being engaged in fire management activities.

875 Machinery operators engaged in fire management activities must wear appropriate protective equipment as prescribed in section 7.2 Personal protective equipment schedules.

876 Contracted earthmoving machinery must be fitted with:

- a seatbelt for the operator; seatbelts must be used whenever machinery is being operated,
- and appropriate 'falling object protection structures' (FOPS) and 'roll over protection structures' (ROPS) in accordance with AS 2294.1-1997 and AS 1636.1-1996.

4.11 Burning operations

4.11.1 Background

877 This section covers the procedures to be observed when implementing all burning operations, including back-burning during fire suppression and ignition of prescribed burns on NPWS-managed lands.

878 Back-burning is a tactic used in the control and containment of fires. It involves igniting another fire to consume fuel in the path of the main fire. This tactic has proven to be an effective fire suppression tactic that can be both cost-effective and environmentally sustainable.

A back-burn is generally lit from a secure control line and allowed to burn towards the main fire. The aim of the back-burn is to gain sufficient depth so the movement of the main fire will be stopped and spotting will not occur across the control line. Back-burning operations can be assisted by the placement of incendiaries to 'deepen' the burn, either from aircraft or with the use of incendiary launching devices.

A back-burn should be conducted only when both fuel and weather conditions are suitable for the containment of the burn. This may be at night when it is cooler and more humid, after a wind shift or lull, or after a cool change. Aerial ignition, and other means of ignition, should be considered as a means of achieving suppression strategies within the necessary timeframe and at the desired fire intensity.

4.11.2 Management framework for burning operations

879 Burning operations should be undertaken with consideration to the operational guidelines contained in RFMS and BFMC bushfire risk management plans

880 The control and command of the burn operation will be in accordance with the IMS, with overall supervision by the Incident Controller. Additional supervision will be provided by the Operations Officer, Divisional Commanders and crew leaders depending on the scale of the operation.

881 Burning operations will be conducted according to:

- the IAP during fire suppression, or
- the action plan prepared within the prescribed burning plan.

882 Changes to the conduct of the burning operation, before and during implementation, must be referred to the Operations Officer or Incident Controller for approval.

4.11.3 Basic principles of burning operations

883 Burning operations should **not** be undertaken when:

- people and property are within the burn area without adequate protection
- long-distance spotting is occurring or likely to occur

- the fire edge is too close to the control line to permit safe operations
- control lines are inadequate for containing the burn
- there is insufficient time and resources available, or
- firefighting personnel believe the conditions are unsafe.

884 Burning operations should be conducted in accordance with the following principles:

- All burning operations will be planned.
- All personnel participating in the burn operation must be accredited to undertake assigned tasks.
- The safety of personnel is paramount during all phases of the burn operation.
- Adequate resources must be committed to ensure the safety of personnel and containment of the burn in the time specified for the operation.
- Adequate means of communication must be available to all personnel involved in burning operations.
- Crews must be briefed on all phases of the burn operation.
- Conditions must be suitable for the containment of the burn.
- The light-up methods and sequences will ensure containment of the burn and safety of firefighters.
- The intensity of the light-up should be planned to minimise spotting and to reduce the mop-up and patrol effort.
- Control lines must be sufficient to contain the burn under the conditions anticipated.
- The burn must be deep enough to prevent the approaching fire front crossing the control line.
- Burning out areas within control lines is an acceptable form of indirect attack.

4.11.4 Briefing and safety checks

885 Safety Advisors will be appointed to all fires of Class 2 or above in accordance with BFCC Policy 3/03 'Safety Advisor – Standard Operating Procedure'.

886 Operational briefings and safety checks will be conducted before the ignition of a burn to ensure personnel safety, public safety and operational success.

4.11.5 Burn light-up

887 Lighting-up of an area will only begin on the instruction of the Incident Controller.

888 Lighting-up using power hand-held incendiary launchers (PHIL) or vehicle mounted flamethrowers must be in accordance with section 3.5 Equipment standards and 'Light-up pattern and sequence' and 'Determining the light-up pattern and speed' below.

889 The start of the light-up will be reported to the Incident Controller.

890 Light-up should begin only

- from a safe area or where the crew has a safe escape route, and
- following confirmation that weather conditions are within those prescribed.

891 The initial light-up should be a test burn to assess the potential fire behaviour and to indicate the light-up pattern that will permit effective containment, patrol and mop-up. The test burn should be extinguished if it exceeds the desired fire intensity and the Incident Controller or the appropriate commander advises this.

892 Divisional Commanders, Sector Commanders and crew leaders will:

- implement light-up patterns that are appropriate to the terrain and vegetation and will maximise personnel safety and minimise the risk of fire outside containment lines, and
- regularly report progress of the light-up to their supervisor.

893 Crew Leaders will

- specify and supervise the number, positioning and use of drip-torch operators, and
- ensure that the length of the control line edge lit-up at any one time does not exceed the crew's capacity to mop-up and patrol.

894 Lengths of control line edge should only be lit-up once the previous lengths have burnt to a safe distance from the control line.

The lengths of control line edge that are lit-up at any one time and lighting techniques should vary according to changes in overall fuel hazards and fire behaviour.

895 All Divisional and Sector Commanders are to continually assess weather conditions on the fire ground and ensure readings are regularly measured and reported both to Incident Control and to all field crews. Particular attention should be given to changes in wind speed, wind direction, temperature and humidity.

896 Crew Leaders will rotate tasks among Crew Members to reduce exposure to smoky conditions and to spread workloads.

897 Consideration will be given to the posting of lookouts to monitor the progress of the fire and the location of crews.

898 An under-burnt shrub layer will be considered as a potential safety hazard.

Light-up pattern and sequence

899 The following guidelines will be considered during the light-up to ensure appropriate pattern and sequence:

- The light-up direction should be into the wind, down-slope and towards safe ground.
- Light-up pattern will be specified in the burn plan, and will depend on topography and weather.
- The light-up of a saddle should involve lighting the high points on both sides and working to the lowest point.
- The length of the control line edge lit at one time may vary from a single point ignition every 50 m to a continuous strip.
- Care should be taken when lighting control lines that will burn upslope. The amount of fire edge lit-up at any one time should be minimised to avoid a broad high intensity front.
- Where there are 2 control lines, light the upslope or downwind line first.

Determining the light-up pattern and speed

900 When determining light-up pattern and speed the crew leader must take into account the following:

- **McArthur forest fire spread table under-predicts**: The fire spread table on the back of the McArthur Mk 5 Forest Fire Danger Meter under-predicts the potential ROS over most fire danger indices.

- **Shrub fuel is important in fire spread:** Forest fires in fuels with a developed shrub layer taller than 1 m can spread up to 3 times faster than predicted by McArthur's forest fire spread table. Fires in litter fuels with a low shrub layer can spread 2 times faster.
- **Watch out when the wind speed is 15 km/hour:** There appears to be a threshold wind speed around 12–15 km/hour in the open that makes a huge difference in the behaviour of forest fires. Fires in heavy fuels may spread deceptively slowly, well below their potential ROS, when the wind speed is below the threshold. A slight increase in wind speed can result in a big jump in fire behaviour.
- **Forest winds are spatially very variable:** Fire behaviour observed at one location is not the same elsewhere in the forest. Detailed wind measurements showed that gusts under the canopy did not travel more than 40 m. 5-minute mean wind speeds at one location can be ± 20% of the measured value at another location. This can make a big difference in fire behaviour, particularly around the threshold wind speed.
- **Line fires don't wait:** A fire starting from a line greater than 100 m long will burn at its potential ROS immediately. It may take 2–4 minutes for the flames to develop their full dimensions but the fire is already travelling at full speed before this happens. Conversely, a fire lit from a point ignition and whose head fire remains narrow may spread all day and still not reach its potential ROS.
- **Don't underestimate distance:** Research indicates that even experienced firefighters will frequently underestimate the distance between the approaching fire front and control line by up to 50%.

Lighting-up inside control lines

901 Lighting-up inside a control line may be attempted only if the drip-torch operator is accompanied by another crew member. Lighting-up should take place only under the supervision of the crew leader and when:

- light-up crews are exiting to the control line, and
- there is no fire between the control line and the crew.

902 The crew leader will maintain radio contact and, where possible, visual contact with the light-up crew.

903 The use of incendiary devices should be considered for deepening heavy and closed fuels.

Multi-line ignition

904 The policies and procedures for lighting-up inside control lines must be observed when undertaking multi-line ignition, and:

- Multi-line ignition must be undertaken only with the supervision of the crew leader.
- Multi-line ignition should not be conducted during conditions of high fire intensity and during unstable weather conditions.
- Multi-line ignition should only be conducted in low and open fuels.
- No more than 2 short lines are to be lit at any one time, except in discontinuous fuels.
- The use of incendiary devices should be considered for deepening heavy and closed fuels.
- The light-up crew deepest from the control line must be ahead of the other light-up crew. Multi-line ignition will not be conducted if there is any risk a light-up crew is located between lines of fire.

- When a multi-line ignition is being lit down-slope of a control line, additional crew planning and briefing will be required to ensure safety and minimise the risk of fire escape.

905 The crew leader will advise the appropriate commander if multi-line ignition is essential and seek approval to proceed.

Aerial ignition

906 Aerial ignition must follow the following procedures:

- Aerial ignition of an area will only commence on the instruction of the Incident Controller.
- Aerial ignition will only be undertaken by accredited bombardiers.
- The pattern for aerial ignition will be specified in:

  the IAP during fire suppression, or

  the action plan prepared within the prescribed burning plan.

4.12 Fire suppression chemicals

4.12.1 Background

907 The fire suppression chemicals NPWS uses for bushfire control are retardants, surfactants and gels.

- **Retardants** decrease the flammability of fuels. They are composed of either ammonium phosphate or ammonium sulphate. They are useful in limiting the spread of low intensity sections of a fire. They are applied aerially by agricultural aircraft and by helicopter water buckets.

  The use of retardants can increase soil nutrient levels, which may have impacts on the native plant community and encourage weed invasion. The use of retardants in reserves should therefore meet conditions to minimise impacts on native vegetation communities.

- **Surfactants** include wetting agents and foaming agents. Wetting agents increase the effectiveness of water as an extinguishing agent by reducing its surface tension, thus increasing its penetration of fuels. Foaming agents are applied either to extinguish fire or as foam blankets to form a control line. The environmental effects of the repeated use of surfactant are still largely unknown.

  Direct contact with concentrated surfactant may result in skin irritations. Some brands can cause severe and chronic irritations and are highly corrosive.

- **Gels** adhere to surfaces to absorb heat and form a protective layer that prevents objects from heating, charring and catching alight. When added to water these products absorb many times their own weight to reduce drift and evaporation.

  'Thermo-Gel' and 'Phos-Check AquaGel' are the two products currently approved for use.

908 Salt water used in fire operations is classed as a fire suppression chemical due to the potential for environmental impacts. Salt water is occasionally used for water bombing operations in reserves along the coast and estuaries. The adverse impact of salt water on vegetation increases the further the location is from the coast. This is because the further vegetation communities are from the coast the less tolerant they are of salt.

909 Monitoring the impacts of fire suppression chemical use may become necessary where the chemicals have been applied to a potentially sensitive environment.

4.12.2 Policies for fire suppression chemicals

910 Fire suppression chemicals may be used selectively on the basis of:

- the estimated effectiveness in assisting the planned fire suppression operation
- the fire threat to life and property
- the potential impacts on biodiversity, water quality and other ecosystem processes, and
- safety considerations.

911 RFMS will list any restrictions (and the areas where the restrictions apply) on the use of fire suppression chemicals within a reserve. Areas where restrictions may apply include wetlands, watercourses and habitat of threatened species or communities.

912 When draughting water in environmentally sensitive areas, care should be taken to minimise the disposal of firefighting chemicals. Measures to achieve this include ensuring foot valves are fitted to all suction hoses or using pumps that have a non-return valve flap fitted to the suction side of the pump.

Use of fire suppression chemicals

913 The use of retardants is costly and can have significant environmental impacts:

- For Class 1 and 2 fires, the use of retardants must first be approved by the Regional Manager or delegated officer.
- For Class 3 fires, the Incident Controller or NPWS liaison officer must notify the Regional Manager of the intention to lay retardant.

914 Retardants should only be applied where there is a high probability that their use will be successful. Retardants must be used in accordance with the operational guidelines listed in the NPWS RFMS and BFMC plans of operations.

915 Circumstances where the use of retardants is inappropriate include:

- combating high-intensity bushland fires
- areas where there is thick canopy cover
- areas where there are thick shrub or sub-canopy layers, or
- areas where there is a high probability of spot fires.

916 Whenever retardants are to be used, preference should be given to using retardants based on ammonium sulphate.

917 Aircraft engaged in water bombing should use surfactants wherever possible in order to increase the cost-effectiveness of the operation.

918 Gels will predominantly be used in aerial applications by fixed-wing aircraft for direct attack or as a short term retardant. Gel products are effective for at least six hours and can also be reactivated with addition of more water once it has dried.

Gels are most suited to hot, dry weather conditions where foam quickly dries out and loses effectiveness

919 As a precautionary approach gels should not be used within 100m of waterways and aquatic environments.

Safety considerations for chemical handling and storage

920 All chemicals will be used, stored and disposed of according to the directives contained within their respective material safety data sheets (MSDS).

921 Staff handling concentrated retardants, surfactants or gels must:

- handle them using a closed-circuit pumping system where possible
- always use and handle them according to the products' material safety data sheets
- wear protective clothing, including gloves, masks and eyewear/face shield
- avoid breathing vapours
- wash off immediately if there is contact with exposed skin, and seek medical treatment where appropriate
- wash down any surfaces where spills have occurred
- take care when working in areas treated with gel as treated surfaces will be slippery, and
- avoid brands of surfactant known to be excessively corrosive to aircraft or to cause a higher incidence of skin irritations.

922 Aircraft involved in dispersing foam, retardant and gel must be made aware of any crews working in the area. All staff must be well clear of foam, retardant and gel drops.

Monitoring the use of fire suppression chemicals

923 The intensive application of fire suppression chemicals must be mapped and recorded as part of the fire history and fire management of the reserve. This information should be stored in the OEH Fire Geodatabase, and used for possible future monitoring.

4.13 Out-of-area firefighting support

4.13.1 Background

924 NPWS firefighters are trained and equipped for firefighting anywhere in Australia and in some overseas locations. The use of personnel and equipment from another NPWS Region to assist in fire operations (prescribed burns or fire suppression) is referred to as out-of-area support. NPWS support personnel are also available to provide assistance to other fire authorities.

925 The use of out-of-area (OOA) support is necessary where a Region does not have sufficient resources to carry out the necessary firefighting operations and associated logistics, planning and administrative functions.

926 OOA support is one means of maintaining competency and currency requirements.

927 OOA arrangements across Branch borders are a means of minimising the costs of deploying staff to fires.

928 The allocation of OOA support personnel is coordinated by the Branch for inter-Region support and by FIMS for inter-Branch, interstate and overseas support.

4.13.2 Policy for out-of-area support

929 Firefighters and support personnel will be available, trained and equipped for fire suppression for any area in NSW.

Staff who are assessed as competent and have undertaken the relevant task-based assessment should be available for OOA support across NSW.

930 25% of staff within each Region should be available for OOA support at any one time.

931 As a guide, no more than 25% of staff from work units will be permitted to be on leave at any one time during the declared fire season.

932 Where possible, Regions will consider developing agreed levels of resourcing and rolling crews where fires of long duration are anticipated.

933 On day one of escalating fires IMTs should dedicate a Resources Officer to develop a resourcing plan with a minimum 5 day outlook, to avoid last minute OOA requests.

To assist with the forward planning requirements of IMTs a new forward planning tool is being developed.

934 A Liaison Officer will be assigned to interstate and overseas support personnel to assist with coordinating transport, accommodation and information requirements. The Liaison Officer will be part of the IMT.

935 In addition to a Liaison Officer, a Task Group Leader will be appointed for interstate and overseas support personnel to ensure their welfare and safety on the fire line.

936 Staff with technical and specialist skills, including those related to cultural heritage, media, geographical information systems or threatened species etc., may be made available for specialist fire roles:

- Technical specialists must wear full Schedule 1 PPE (as detailed in section 7.2 Personal protective equipment schedules) while on the fire ground.
- Technical specialists must be accompanied at all times by an experienced and competent Crew Leader.
- Technical specialists who are not competent firefighters should have completed fire awareness training and must be given a full briefing before being engaged.

Resourcing principles

937 All available Regional resources must be allocated to fire operations before an OOA request is initiated.

938 Where applicable, available RFS resources should be confirmed prior to making an OOA request (noting some RFS Regions require 2 weeks notice for resource requests).

939 OOA crew requirements should be forecast for proposed burns in advance, and forecasts shared across Regions and Branches on a weekly basis using existing communication arrangements (e.g. Duty Officers).

940 Requests for OOA resources must be endorsed by the Regional Manager (may be delegated to the ROC).

941 Reasonable notice of requests must be provided. At least 48 hours notice, and preferably a minimum of 72 hours, should be given when requesting crews.

942 All requests must include standard OOA information, plus a WBS code, confirmation of travel, OT, meal provisions and accommodation arrangements where applicable. Note that incident shift patterns do not apply to prescribed burning (i.e. 3-1-3 shifts do not apply).

943 Any request to extend an OOA deployment must be made via existing deployment channels prior to the extension (i.e. Region-Branch-Region, or Region-Branch-FIMS-Branch-Region).

944 Prescribed burning is an agency priority, and if fire management resources are available within a Region and are not committed to fire operations, they should be made available for OOA deployment.

If a Region is unable to supply crews for an OOA request this decision must be endorsed by the Regional Manager.

4.13.3 Requests for firefighters and support personnel

945 Requests for firefighters and support personnel should follow the procedures listed below:

- When requesting that resources and equipment be provided from another Branch, it is essential that resources in the home Branch have already been committed. The exception to this is where a fire occurs close to a Branch boundary and it is more cost effective to utilise staff from an adjoining Branch.
- All requests for firefighters and support personnel should be made to the Branch Duty Officer, via Regional offices.
- All requests must be entered into the relevant resource request tracking spreadsheet available on share drives.
- Each request is to be allocated a unique identification code including the fire name/date/consecutive number for the day of the request (i.e. Banda fire 271009 – 01).
- Each request will identify the crew type, components and capabilities required (i.e. the number of personnel, crew skills, level of training and equipment (chainsaws, hand-held radios, etc.) required.
- Each request should include supporting information including assesmbly area, travel times, contacts and reporting instructions.
- All resource requests, regardless of class of fire, must be signed off by the Incident Controller.
- All verbal requests received after hours must be followed up by the appropriate paperwork as soon as is practicable.
- Crews (including IMT personnel) requested for OOA support should expect to be away from home location for up to thirteen days.
- Before the fire season, staff may negotiate with their manager the number of days they are available for OOA support.

Requests for Class 1 and 2 fires

946 If OOA support can be sourced from within a Region, the request for support will be coordinated by the Regional Duty Officer.

If OOA support can be sourced from within a Branch, the request for support will be coordinated by the Branch PaCS.

When a fire occurs close to a Branch Boundary, the nearest available OOA support may be from a Region in an adjoining Branch. Where this is the case, the resource request can be

organised directly between the two adjoining Branch PaCS. FIMS (or the State Operations Liaison Officer if appointed) must be notified of this arrangement.

If OOA support will need to be sourced from another Branch (not withstanding the situation detailed above), from interstate, or for significant emergencies, the request for support will be coordinated by FIMS (or the State Operations Liaison Officer if appointed).

Requests for Class 3 (Section 44) fires

947 For Class 3 (Section 44) fires, a request for OOA support should be sent to RFS State Operations, and:

- If the request is for NPWS or 'any agency' resources, the State Operations Liaison Officer will discuss with the relevant Branch PaCS or Duty Officers whether the resources can be supplied from within Branches.
- If the requirement is specifically for NPWS resources, the request should be registered in the relevant resource request tracking spreadsheet.
- If the requirement is specifically for RFS resources, the request should be made using the RFS form 'SAP1' (for RFS response team) or 'SAP4' (for incident management personnel and aviation specialists).
- If the request can be filled from any agency, the RFS forms should be used, with the words 'From any agency' clearly appearing on the form.

948 If RFS State Operations are not able to meet the request (or if NPWS resources are the specific requirement) the request will be handled by the NPWS State Operations Liaison Officer at RFS State Operations.

The NPWS State Operations Liaison Officer will discuss with the relevant Branch PaCS or Duty Officer whether the resources can be supplied from within the Branch.

- If the Branch **can** supply the resources, the Branch PaCS or Duty Officer will fulfil the request and complete the dispatch component of the resource request tracking spreadsheet and advise the IMT and send a copy to the NPWS State Operations Liaison Officer.
- If the Branch **cannot** supply the resources, the NPWS State Operations Liaison Officer will work with FIMS for sourcing from other Branches. When arranged, FIMS will complete the dispatch component of the resource request tracking spreadsheet and advise the IMT and Branch, with a copy to the NPWS State Operations Liaison Officer.

4.13.4 Dispatching firefighters and support personnel in IRIS

949 All crews will be dispatched to events using the Incident Resource Information System (IRIS). Dispatch details will include crew names, specific skills and equipment.

950 Any requests from other authorities for NPWS firefighters' assistance and subsequent dispatch should be reported to the Branch Duty Officer and to FIMS. If NPWS firefighters attend a fire managed by another agency that agency must supply the providing Branch and FIMS with daily situation reports.

4.13.5 Resource tracking in IRIS

951 IRIS will maintain a standardised resource tracking system for tracking the location of personnel and equipment, including staff, strikers and tankers committed to an incident. Branch and FIMS will maintain a standardised resource tracking spreadsheet of all OOA deployments.

952 The maintenance and upkeep of IRIS will ensure information regarding the location and status of OOA crews is available to the crews' home Regions.

4.13.6 Out-of-area crews

953 OOA crews and teams should bring the equipment outlined in the resource request.

954 OOA crews and teams are expected to carry their NPWS portable radio and spare batteries (where available), camping gear (if required), fire equipment as requested and personal gear for the required duration when deployed to another Region. The host Region is to arrange for recharging facilities and the supply of spare radio batteries during extended incident operations.

955 If air transport is required, coordination is generally coordinated by the home region to the incident. Because aircraft weights must be known before flight, staff will be required to advise in advance of their dressed body weight plus the weight of any equipment they are carrying. Some firefighting equipment, including chainsaws, drip torches and flammable items, may be prohibited from carriage on aircraft. Staff should check with the Pilot In Charge prior.

956 Where changes to a request are made (particularly to roles or shift lengths) the home Branch must approve these changes.

957 OOA crews are representatives of NPWS and their conduct and performance will be in accordance with the NPWS policies and the OEH Code of Ethical Conduct when working out of area.

4.13.7 Costs incurred for out-of-area support

958 All costs relating to the allocation of resources to OOA support will be charged to the fire operations. These costs should be incorporated into the claim against the NSW Treasury Managed Fund by the host Region. Details of costs incurred by the OOA crews are to be supplied to the host Region.

4.13.8 Accommodation

959 Staff who live within 1 hours travel should consider sleeping at home.

960 If travel times exceed 1 hour, consideration should be given to providing on-site or near-site accommodation, such as establishing a base camp.

961 In determining the most appropriate accommodation for night crews, weather factors (particularly temperature and humidity) and proximity to helibases and air bases should be considered.

962 NPWS will examine different options for providing accommodation, including contract arrangements and NPWS-owned and operated camp facilities.

4.13.9 Interstate and overseas support arrangements

963 International agreements are maintained with some countries for deployment of NPWS personnel overseas. NPWS also maintains interstate deployment arrangements with DSE in Victoria.

964 In order to expedite rapid oversees deployment and ensure equal opportunity for staff, FIMS will annually release an Expression of Interest (EOI) for potential overseas deployment.

Nominees who meet all the criteria, qualifications and requirements of the EOI will be placed on an approved oversees deployment list for consideration if a formal request is received.

965 All interstate and overseas deployments require the prior approval of the Regional Manager, plus the Branch Director and Chief Executive. Overseas dispatches also require Ministerial approval.

966 A competent and appropriate officer is to be assigned as Task Group Leader responsible for overall supervision of each Task Group dispatched to an incident.

967 Media Liaison and Interagency Liaison Officers may be nominated for the Task Group – reporting to the Task Group Leader – or the Task Group Leader may undertake these roles.

All contact with the media must be through nominated Media Liaison Officers. Preferably the Interagency Liaison Officer should be deployed for this task, ahead of the Task Group.

968 Before dispatch, the Task Group will be briefed, preferably in person and as a group. Briefings will include deployment, shift and accommodation information, expected standards of behaviour, reporting structure and uniform requirements.

969 Roles, shift patterns and responsibilities assigned to NPWS staff may be varied in line with the requirements established by the requesting authority for the purposes of supervision and occupational health and safety.

970 Additional procedures may be required for each interstate or overseas request.

4.13.10 Family notification

971 Regions will notify families within 4 hours when staff are deployed to fire management duties. Information supplied will include locations to which staff have been sent and expected time of return home. Families will also be notified when circumstances change.

972 For OOA crews within Branches, Incident Controllers will notify the Branch office of work locations and expected return home dates so the Branch can relay this to home Regions and families.

973 For out-of-Branch crews, host Branches will notify FIMS, and FIMS will relay this information to contributing Branches. Branches will then be responsible for forwarding this information to home Regions, which in turn, will be responsible for notifying families.

4.13.11 Staff availability and leave

974 Throughout the fire season each Region should maintain a list of available staff.

975 Regions must maintain a level of staff resourcing that is appropriate to the level of bushfire risk. As a guide, it is suggested that at both the Regional and Area level no more than 25% of staff should be on leave at any given time during the bushfire danger period.

976 The Regional Manager may cancel leave or recall staff where, in the Manager's opinion, the level of bushfire risk or activity warrants additional staff being available.

4.14 Reporting and documentation for fire response

4.14.1 Background

977 Timely reporting of fires enables the coordination of firefighting resources within NPWS and between the various fire authorities in NSW.

978 The documentation of fire is essential for fire management. Information is used to establish fire histories and assess the effectiveness of fire management strategies, as well as to allow the assessment of the ecological implications of fire. This information is used to prepare RFMS and IAPs.

979 Documents and systems used for reporting and documenting fire management activities include: situation reports (SITREPs), Incident Action Plans (IAPs), and Incident Control On-Line (ICON) which records wildfires.

980 A standardised system of fire management documentation and reporting (used by all NSW fire authorities) is used for fire management activities on NPWS-managed land, and for incidents outside NPWS-managed land attended by NPWS personnel. This system is consistent with national documentation standards.

981 NPWS uses the IMS structure and approved forms for firefighting operations.

4.14.2 Reports of new fires

982 Initial notification and on-going reporting of all fires will be in accordance with the following table and flowchart.

983 Reports to Branch Duty Officers should be via the reporting arrangements in the relevant Branch and Region Incident Procedures (BIPs & RIPs).

984 Regions are responsible for updating the public website with fire and park closure information as per 3.4 Fire bans and closures and the fire and park closure web update process.

Table 17: Initial notification and on-going reporting of fires

How	When	Who
Notify by phone	Within 1 hour	Notify Branch* Duty Officer who then advises State Duty Officer
SITREP entered into ICON	Within 12 hours and then as required for incident level.	Area/Region staff to enter

**Replace Branch Duty Officer with Region Duty Officer for Southern Ranges Region*

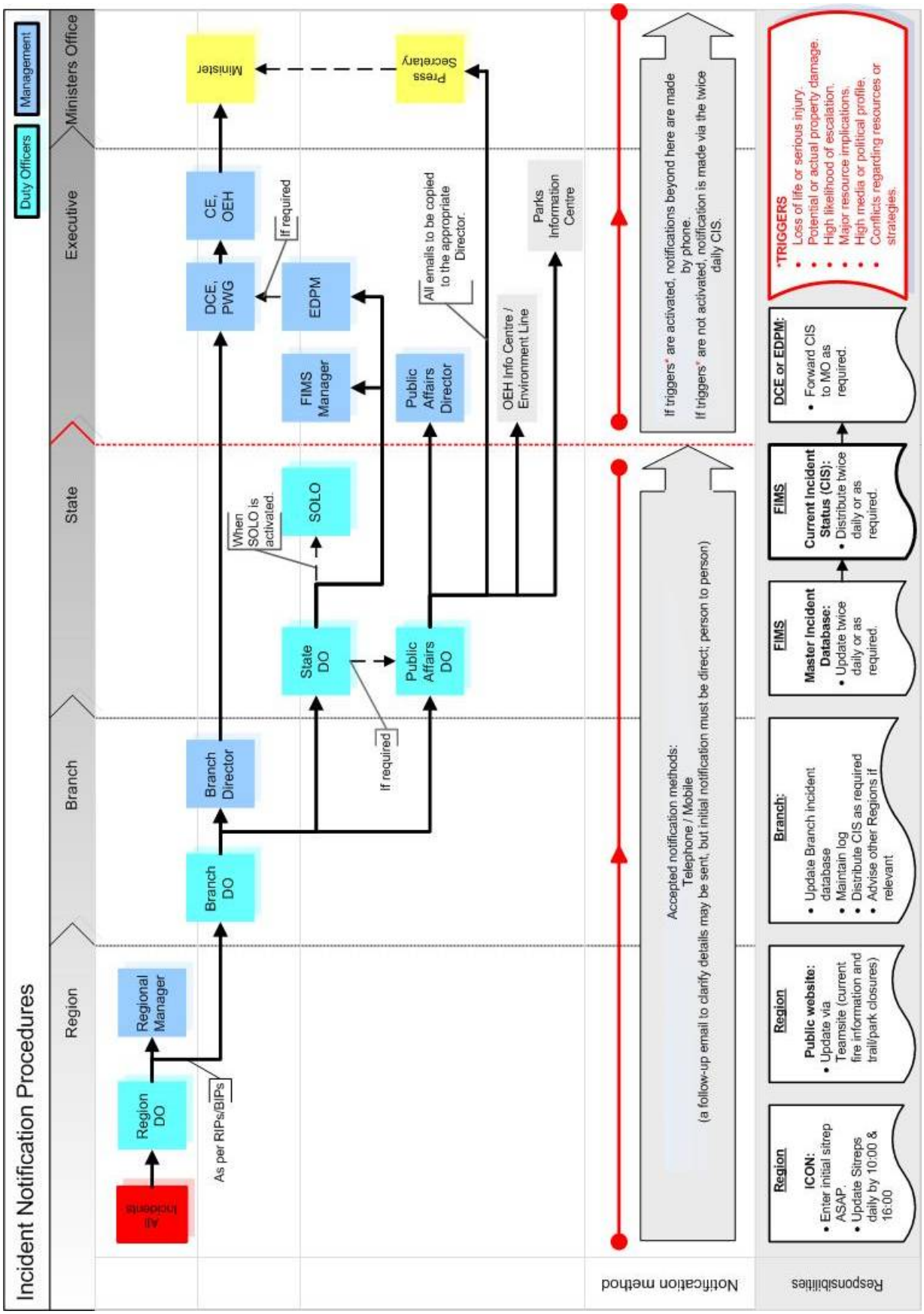
Reports of injuries, death and property damage

985 Reports of serious injuries, fatalities and property damage should be made immediately to the Regional Manager, Branch Director and DCE PWG. Notification should also be given to FIMS and Public Affairs Branch as appropriate.

986 The DCE PWG will ensure the appropriate interagency notifications have been conducted (including WorkCover in the case of injuries or fatalities) and that the appropriate welfare actions have been initiated.

4.0 Response

Figure 9: Fire reporting flowchart



4.14.3 Incident Control Online (ICON)

987 ICON must be used to record details of all fires (Class 1, 2 and 3) at NPWS offices where IT capability (e.g. bandwidth) is sufficient to operate ICON satisfactorily and where staff are available who are appropriately trained and authorised in its use.

Where Areas or Regions have **not** been able to enter fire details into ICON the Region or Branch Duty Officer should endeavour to enter the fire details into ICON at a later date.

988 Reference to the reserve **must** be included in the 'Incident Name' or 'Incident Location Field' (e.g. Turon NP) within ICON.

989 In serious or rapidly developing incidents more frequent sitreps may be requested to inform Public Affairs and the Executive. Incident action plans (IAP) may be called for if additional information is also required.

990 Any incidents involving NPWS use of aircraft must be in accordance to Appendix F SOP State Air Desk.

991 Fire boundaries should be mapped using MapDesk and uploaded to ICON.

ICON IAPs

992 The use of ICON to generate IAPs is optional. A full IAP or a field IAP (A3 IAP) may be produced in ICON.

ICON Authorising officers

993 'Authorising Officers' in ICON have the ability to approve Sitreps and IAPs for release. Once approved, the Sitreps and IAPs will contain the name and date of the Authorising Officer and this person will be held accountable for accuracy and detail of the information contained within these reports. As ICON is a web-based program, Sitreps and IAPs may be generated by any ICON user and then authorised by an ICON Authorising Officer in another location. In order to be an ICON Authorising Officer a person must:

- for Class 1 fires – fulfil the requirements of a Divisional Commander
- for Class 2 and 3 fires – fulfil the requirements of an Incident Controller or Prescribed Burn Incident Controller, and
- for Section 44 fires – be an approved Section 44 Incident Controller.

Situation reports

994 Situation reports of each fire will be generated in ICON. As a minimum, the Sitrep frequency requirements are:

- for "Emergency Warning" level incidents - every 30 minutes
- for "Watch and Act" level incidents – every 2 hours
- for "Advice" level incidents – by 11:00 and 16:00 hours daily.

Additional Sitreps or Situps should be created whenever there is a significant change to fire activity or resourcing. Reports to other authorities will be in accordance with BFMC plans of operations.

995 FIMS will maintain state-wide records of all incidents attended by NPWS staff or on NPWS-managed land by updating the NPWS Wildfires Database from information contained in ICON. Regions and field Branches are responsible for ensuring that all sitreps are correct and entered

into ICON according to the procedures set out in this Manual. FIMS will use these records to prepare an annual report on NPWS fire management activities.

4.14.4 Fire history

996 A fire history, including date of ignitions, causes, area burnt and intensity, will be prepared and maintained for each reserve.

997 All burnt areas must be mapped using MapDesk, and the areas entered into Fire Geodatabase by the end of the fire season.

4.14.5 Miscellaneous incidents

998 Miscellaneous incidents comprise any type of on-park incident that is not a fire (e.g. marine mammal incident, search and rescue (SAR), hazardous material (HAZMAT), accident, flood, storm or pollution).

999 ICON does not replace the recording of *miscellaneous incidents* on the NPWS Incident Database. The 'Miscellaneous Incidents' section of the Incident Database will continue to be updated by Regions as per Table 18 below.

Field Branches will ensure this information is emailed to FIMS by 5 days from the end of the month.

Table 18: Reporting of miscellaneous incidents

What - requirement	When - deadline	Who to
Notification of miscellaneous incident	As per RIP/BIP guidelines	Duty Officers as per RIP/BIP
Sitreps for miscellaneous incidents	Ongoing - Sitreps completed twice daily	Forward to Branch and FIMS
Update miscellaneous incident database	Within 5 days after end of month	Email to FIMS

4.15 Fire investigation

4.15.1 Background

1000 Human-induced fires may constitute offences against the law and require formal and prompt investigation. Illegal burn-offs, burn-offs that escape because of improper care and suspected arson fires are serious offences that can threaten life and property and have a major impact on the biodiversity of NPWS-managed lands. These fires can incur major suppression costs, divert NPWS resources away from other functions and expose firefighters to unnecessary risk of injury.

4.15.2 Policies for fire investigation

1001 OEH fire investigation policies are as follows:

- OEH will work within the Joint Agency Fire Investigation Protocol Schedule developed between OEH, NSW Police, NSW RFS, NSW Fire and Rescue and Forests NSW.

- OEH will work closely with NSW Police, NSW RFS and NSW Fire and Rescue to investigate fires on NPWS-managed land.
- OEH will train appropriately skilled and experienced staff in bushfire investigations.
- All suspicious fires occurring on NPWS-managed lands will be investigated as soon as practicable.
- OEH will obtain a NSW Police event number for all fires occurring on NPWS-managed lands that start under suspicious circumstances.

Training

1002 All NPWS firefighters and support personnel will be trained in fire area of origin site protection and observations, as contained in Crew Member competency 'Protect and preserve incident scene - PUALAW001B'.

1003 Branches will work with the Learning and Development Section to ensure that adequate numbers of field-based staff are trained and accredited in bushfire investigations.

1004 FIMS, Legal Services Branch and Learning and Development Section will maintain a list of accredited bushfire investigators.

Record keeping procedures

1005 Record keeping procedures are as follows:

- Under the *Memorandum of Understanding between the Department of Environment, Climate Change and Water and the NSW RFS*, RFS will provide OEH with a copy of fire investigation reports into fires that start on other tenures and then impact on NPWS-managed lands.
- All fire investigations will be recorded on approved OEH forms supplied to investigators.
- Copies of fire investigation reports will be kept by FIMS and Specialist Investigation Section for further reporting and will be recorded on a central database for analysis in future incidents.
- The original fire investigation report will be kept and managed by the bushfire investigators who conducted the investigation.
- Where there is no clear evidence of the cause, the Incident Controller must ensure the Sitrep shows the cause as 'unknown'. The Sitrep should also clearly show whether the fire does or does not require further investigation.

Investigation procedures

1006 Investigation procedures are as follows:

- OEH bushfire investigators will be made available to investigate fires on NPWS-managed lands.
- Upon request, OEH bushfire investigators will be made available to assist fire investigators of other agencies on fires outside NPWS-managed lands as per the Joint Agency Fire Investigation Protocol Schedule.
- Fire investigations will occur as close to the time of ignition as possible, and preferably within 24 hours.
- If, in the opinion of the Incident Controller, a fire is of natural causes but warrants further investigation that fire should be investigated as soon as possible.

4.0 Response

- Initial fire investigations by OEH bushfire investigators on NPWS-managed lands will be conducted in accordance with training standards, and, where possible, be conducted by two investigators for reasons of transparency.
- Information pertaining to the investigation will be discussed with the Incident Controller, local Police (if not already part of the investigation team) and the executive officer of the BFMC.
    - Note: all evidence relating to circumstances surrounding fires of a suspicious origin must be immediately brought to the attention of NSW Police.
- Total cost recovery will be asked for as part of any prosecution.

5.0 Recovery

Section 5.0 contents

5.1 Debriefing and incident analysis

5.1.1 Background

1007 Debriefings provide an important forum for staff to discuss the management effectiveness of fire operations and the need for changes to policies and operational procedures. They are an important opportunity to openly recognise and capture good performance and shortcomings during incident management operations.

1008 Debriefings can take place at many different levels, from informal debriefings within the workplace to more complex multi-agency investigations.

1009 NPWS applies the recommendations from debriefs to implement policy development and operational change at field, agency and interagency levels resulting in improved incident management coordination.

1010 Incident analysis is the process of assessing the effectiveness of fire operations and the identifying causes of any problems encountered, and then determining solutions, or mitigating or preventive actions, to improve operations and prevent problems reoccurring.

5.1.2 Conducting operational debriefings

1011 Debriefings, either local or joint agency, should be conducted as soon as possible at the conclusion of firefighting operations, regardless of the scale of the event. These can range from a quick chat after the event to a formal joint-agency debrief.

End of shift debriefings

1012 Shift debriefs of crews should be conducted at the end of a shift or after a critical incident occurs. The findings and recommendations of shift debriefings should be provided to members of the IMT.

NPWS post fire debriefings – standard agenda and template

1013 Post fire debriefs should be held as soon as practicable after the fire event.

5.0 Recovery

1014 The Regional Manager will be responsible for organising the debriefing, coordinating the chairing of the debrief and preparing a report at the conclusion of the debrief.

1015 Personnel involved in fire operations should be invited to attend post-incident debriefings.

1016 NPWS post-fire debriefings must follow the standard format which is as follows:

- 1 Overview by Incident Controller
- 2 Preparedness
- 3 Declaration/revocation
- 4 Response
- 5 Access to fire ground
- 6 Strategies
- 7 Incident control centre
- 8 IMT
- 9 Field operations and coordination
- 10 Agencies involved
- 11 Resources:
  - firefighting (all agencies)
  - aviation
  - plant
  - welfare
- 12 Communications
- 13 Catering
- 14 Accommodation
- 15 Base camp
- 16 Transport
- 17 Health and safety (including near misses)
- 18 Injuries
- 19 Media and public awareness
- 20 Equipment not returned
- 21 Agency reports
- 22 Any other issues
- 23 Summary of resolutions and recommendations.

1017 Information from debriefs should be collated using the standard NPWS debrief template and forwarded to FIMS for collation by end of March each year.

Receiving all debrief issues by this deadline is critical to the timely revision of the State Incident Plan, Fire Management Manual and other operational documents.

Multi-agency post fire debriefings

1018 BFCC Policy No. 2/2006 – 'Management of Bush Fire Operations', details a standard debrief format to be followed by BFMCs for multi-agency post-fire debriefs.

Section 44 debriefings

1019 For Section 44 fires, the Appointee is responsible for compiling the report and presenting it within 30 days to the RFS Commissioner.

1020 BFCC Policy No. 2/2006 Annex I has key themes that govern debrief structures for s. 44 fire incidents.

End of season debriefings

1021 End-of-fire-season debriefing will be conducted at Region or Branch level, or both.

1022 Branches will collate and forward a summary of debrief recommendations to FIMS for input into the Fire Management Manual review.

1023 NPWS will review all outcomes of debriefings. Recommendations will be made at:

- tactical or fire ground level – Regional Manager's responsibility

- operational or management level – field Director's responsibility, and
- strategic or corporate level – Manager FIMS' responsibility.

5.1.3 Incident analysis

1024 Incident analysis may be carried out during an incident or after an accident, near miss, breach of IAP, failure of a plan, or major complaint from one fire authority against another.

1025 The decision to conduct an incident analysis can be made by the senior management of any fire authority or by the Incident Controller. It will be carried out by a person (or persons) independent of the operation.

1026 Key factors to be investigated include:

- competency of key personnel
- adequacy of incident and action plan — objectives and strategies
- analysis of options
- briefings of all staff, including crews
- opinions of IMT, crews and other staff
- adherence to policies, procedures, codes
- the tasks to be completed during the work shift
- fuel conditions, including fuel type, fuel moisture, overall fuel hazard
- access, control lines, escape routes and safety refuges
- potential hazards
- weather forecasts and current conditions
- the command structure
- the location of other crews
- communication arrangements
- equipment and resources available
- fire behaviour and weather monitoring equipment available, and
- maps of operational areas provided for all personnel.

5.1.4 Community relations

1027 Following a fire incident NPWS will:

- consider conducting debriefings with the local community and neighbours to seek feedback on fire preparedness and response
- provide information to the public on any proposed changes to fire management planning and works
- provide information on support services available to those impacted by fire and, where required, direct members of the community to appropriate agencies for assistance, and
- review preparation, preparedness and response components to improve systems of operations, and update community contact details.

5.0 Recovery

5.2 Staff support services

5.2.1 Critical incident support services

1028 NPWS provides support services to help staff cope with stress and other issues. Information about these services can be found on the intranet.

1029 The provision of professional counselling services for NPWS staff will be via the Employee Assistance Program (EAP).

Contact numbers for professional counsellors, peer support and chaplains should be included in Branch and Regional incident procedures.

1030 Information on critical incident stress management will be included in Regional annual fire preparedness training.

1031 The Incident Controller will contact critical incident support services personnel for any incident involving a fatality, serious injury or other event that could result in critical incident stress.

1032 Based on the nature of the critical incident, the Incident Controller will take advice about:

- immediately withdrawing affected staff from the fire ground
- standing staff down from further involvement with the fire operation, and
- offering affected staff a critical incident debriefing.

The Incident Controller will advise the managers of personnel who have been involved in a critical incident.

1033 During large multi-agency incidents, the NPWS liaison officer will ensure that critical incident support services are available to NPWS staff involved in critical incidents.

1034 Critical incident debriefings will not be recorded, and will be conducted separately from operational debriefings.

5.3 Post-fire rehabilitation

5.3.1 Background

1035 Recovery is an integral component of fire management. The *NSW State Disaster Plan (*Displan) defines recovery as encompassing human support services and reconstruction and rehabilitation services.

Emergency recovery may be required when a fire has had an impact on the economic or social wellbeing of a community (e.g. effect on power or water supply, access, stock or income) or when severe environmental degradation is likely to occur without immediate intervention.

For NPWS, the major component of recovery operations is post-fire rehabilitation.

5.3.2 Policies for post-fire rehabilitation

1036 The rehabilitation process should be addressed in incident action planning.

Assessing the potential requirement for post-fire rehabilitation should begin at the appreciation stage of an incident. Where necessary, a post-fire rehabilitation plan should be initiated as early as possible during the incident and be approved in the IAP by the Incident Controller.

1037 Where necessary, a Situation Officer (recovery and rehabilitation) should be appointed to facilitate the rehabilitation planning process.

1038 Rehabilitation activities should be started as soon as possible for immediate works (e.g. erosion controls, neighbour livelihood and welfare impacts).

5.3.3 Strategies for post-fire rehabilitation

1039 Post fire rehabilitation is a staged process involving the identification of disturbances, assessment of rehabilitation options, determination and implementation of the most effective rehabilitation options and monitoring the results of implementation.

Identification and description of the disturbance

1040 Disturbances may include:

- destruction of vegetation from
  - construction of trails
  - widening or clearing of existing trails
  - construction of helipads, staging areas, etc.
  - construction of hand-tool lines
  - high fire intensity
- damage to infrastructure (e.g. creek crossings, bridges, fences)
- impacts on water quality from
  - use of foams, retardants and salt water
  - sedimentation and siltation
  - exposure of acid sulphate soils
- weed invasion

Acid sulphate soils

1041 Acid sulphate soils are widespread along the margins of the NSW coast. Potential acid sulphate soils are naturally occurring soils containing iron sulphides (pyrite). They become actual acid sulphate soils when the pyrite is exposed to air. In air, pyrite is oxidised, resulting in production of sulphuric acid. This sulphuric acid can impact soil water, groundwater and surface water (streams and rivers).

Planned and unplanned fire, as well as bushfire management and suppression operations involving earthmoving equipment, can result in vegetation removal and thus enable soil erosion. The erosion of topsoil can expose potential acid sulphate soils where they occur.

Sedimentation of waterways

1042 The majority of freshwater streams and waterways in NSW have a tolerance of some level of sedimentation. Vegetation removal and soil erosion may substantially increase natural sedimentation levels and detrimentally effect freshwater fish species and invertebrates.

5.0 Recovery

Flood risk

1043 Where vegetation has been removed the risk of flooding is increased as rainwater does not have the opportunity to be slowed and absorbed into the soil as it does in vegetated areas. This can result in increased run-off which may lead to localised or widespread flooding.

Assessment of rehabilitation options

1044 The following table provides examples of potential options for remediating common causes of disturbance during fire management operations.

Table 19: Options for remediating disturbances

Cause	Condition (effect)	Management strategy
New trails constructed	• Bulldust present • Poor drainage • No erosion controls • Location not desirable for future management	• Use heavy machinery to close and rehabilitate • Use machinery to install erosion controls
Old trails	• Bulldust present • Eroded • Widened to an unacceptable width	• Use machinery to install erosion controls
Retardant or foam	• Unknown impacts	• Map sites and assess impacts
Helipads	• Area cleared • Resources remaining (e.g. fuel) • Rubbish on site	• Use heavy machinery to close and rehabilitate • Use machinery to install erosion controls • Collect resources and rubbish
Staging area and assembly area control points	• Area cleared • Resources remaining • Rubbish on site • Erosion	• Use heavy machinery to close and rehabilitate • Use machinery to install erosion controls • Collect resources and rubbish
Vegetation removed	Issues include: • Known threatened species, populations and communities • Pests • Slopes > 18 degrees (high erosivity) • Fire frequency greater than recommended threshold	• Survey vegetation burnt for patchiness and intensity • Develop a monitoring plan for natural revegetation • Develop intervention strategies (e.g. reconstruction of habitats, erosion controls)
Cultural sites	• Known sites impacted by fire • Vegetation removed so unknown sites can be identified	• Survey and document known and unknown sites and their condition • Contact local Aboriginal land council and OEH sites officer
Damage to neighbouring property or other assets	• Water supply depleted • Roads damaged • Fence lines damaged	• Organise meetings to discuss the impacts with neighbours • Discuss the need to activate sub-plans of the Displan with the Incident Controller if impacts are severe

Determining the most appropriate options

1045 Factors to consider include:

- environmental and safety risks and their impact on priorities for rehabilitation
- timeframes for implementation

- determining which agencies or organisational units will be responsible for implementing rehabilitation strategies
- total cost of rehabilitation strategies and how these costs will be met, and
- determining key performance indicators.

Monitoring results

1046 Rehabilitation works should be monitored to ensure continuity with planning processes and to ensure performance targets are met.

Rehabilitation costs

1047 The following rehabilitation works are claimable against the NSW Treasury Managed Fund:

- regenerating natural areas cleared to gain access to fires if they generate erosion, degradation or security problems
- cleaning up debris from existing fire trails if this work is required to make the trail safe
- removing soil that has been piled up on existing fire trails if this work is required to make the trail safe, and
- cleaning up trees that have been felled and left lying on the side of public roads if this work is required to make the road safe.

Works funded by the NSW Treasury Managed Fund must be completed within twelve months of fire ignition.

1048 Any regeneration or revegetation costs required for existing fire trails as a result of widening, clearing or heavy traffic use during fire suppression cannot be claimed against the NSW Treasury Managed Fund.

1049 Fire trails or clearings created during fire suppression may be maintained if they have strategic value. However, the costs of maintaining these areas cannot be claimed against the NSW Treasury Managed Fund.

5.4 Fauna rescue

5.4.1 Background

1050 Fire may have a direct impact on animals through injury and loss of habitat. NPWS and wildlife rescue volunteers rehabilitate and treat native animals affected by fires.

Under the *NSW State Disaster Plan* (Displan), NSW Agriculture is responsible for the humane care of injured fauna during large-scale fires. The IMT liaises with NSW Agriculture to coordinate the care of injured fauna. This applies to Class 3 fires only.

For Class 1 and 2 fires, NPWS has legislative responsibilities for native fauna and duty-of-care obligations for other fauna.

5.4.2 Policies for rescuing fauna

1051 Necessary action for rescuing injured fauna will be undertaken during and following fire events. Rescue priority will be given to native fauna listed under the *Threatened Species Conservation Act 1995*.

5.0 Recovery

1052 Where necessary, fauna rescue and rehabilitation organisations will be notified of fire impacts on fauna.

1053 Where necessary, strategies for the rescue of injured fauna will be prepared as part of the post-fire rehabilitation planning process conducted by the IMT. For large-scale fires, the IMT will liaise with NSW Agriculture to coordinate caring for injured fauna.

1054 Areas affected by the passage of fire are potentially hazardous environments for humans. Fauna rescue following fire should be managed so as to not place any NPWS personnel or wildlife carers at risk of injury.

1055 The following provisions apply to rescuing fauna:

- Personnel from wildlife carer organisations will not be permitted onto the fire ground to rescue injured fauna until it is safe to do so. Approval can be given by the Incident Controller during an incident and the Regional Manager after an incident. This should occur after the fire has passed, when there is no active fire edge in the area and the area has been burnt out. All relevant personnel will be informed before carer organisations can work in the area.
- Wildlife carers must be accompanied by a competent, fire-trained crew leader appointed by the Incident Controller when rescuing injured fauna from the fire ground.
- Wildlife carers must receive a full safety briefing before entering the fire ground and always follow the directions of NPWS firefighters.
- Wildlife carers must wear safety equipment on the fire ground (as identified in section 3.6 Personal firefighting equipment).

1056 Guidelines should be prepared for assessing injured fauna at the fire ground. If necessary, injured fauna may be humanely euthanased on the fire ground by persons who have a s. 171 authority under the *National Parks and Wildlife Act 1974*. Any use of firearms must be in accordance with the *Firearms Management Manual*.

6.0 Administration

Section 6.0 contents

6.1 Finance and insurance

6.1.1 Background

1057 Allocations are made within NPWSs annual budget for funding fire management activities. This includes funding for equipment, insurance, trail works, fuel management, planning, databases, research and training.

Extraordinary expenditure incurred during fire suppression operations is claimed against the NSW Treasury Managed Fund. NPWS contributes to the NSW Treasury Managed Fund as a component of its annual budget.

6.1.2 Policies for finance and insurance

1058 The *Finance Manual* outlines all financial, accounting and related administrative procedures. Fire management budgeting and expenditure is undertaken in accordance with the *Finance Manual* Part 10 ‘Insurance’.

1059 Cost effectiveness is taken into account when planning and implementing fire management activities.

1060 Under the *OEH Financial instrument of delegation*, Incident Controllers and logistics officers have financial delegations, including authority to incur expenditure on hiring aircraft. Aircraft hire costs may only exceed the delegated limits where this is deemed essential and unavoidable. An officer with the financial delegation must countersign the order as soon as practicable.

RFS is yet to specify delegations for a Section 44 appointee. In the interim OEH delegations will be used.

6.0 Administration

Financial delegations – excluding the hire and maintenance of aircraft

Role	Class 1 fires	Class 2 & 3 fires
Incident Controller	$20,000	$100,000
Logistics Officer	$10,000	$50,000

Financial delegations – in respect to the hire of aircraft

Role	Class 1, 2 & 3 fires
Incident Controller	$100,000
Logistics Officer	$50,000

1061 Incident Controllers and logistics officers operating above their normal delegations must complete the 'Fire Suppression – Financial Delegation Notification' via SAP.

- The form should be competed on line for processing by the SAP Systems Support Section for entry into the SAP system.
- SAP Systems Support Section will notify the requesting officer that the delegation has been increased. Delegation will be increased for a period of 1 month. If the increased delegation is required past this date, a second form needs to be submitted close to expiry of the month.

Fire management budgets

1062 Annual estimates for fire management expenditure will be included in estimates for capital works and recurrent fund budgets.

Estimates should include funds required for vehicles, equipment, all fire operations, trail works, fuel management, planning, databases, penalty and standby rates, overtime, research and training.

Fire suppression expenditure

1063 The Incident Controller should estimate expenditure for the suppression operation after the fire's initial attack. Estimates should be provided with each situational analysis.

- Estimates for expenditure exceeding the Incident Controller's delegation are to be forwarded to the appropriate delegated officer for approval.
- Suppression operations are to continue while covering approval is being sought.
- Where necessary, administrative staff should be rostered to assist the Regional Duty Officer or Incident Controller with accounting functions.

Expenditure records

1064 All expenditure on firefighting operations will be recorded and itemised.

- The progressive expenditure for a fire will be estimated and recorded.
- All local orders will record the incident number for which the cost is to be charged and claimed against.

Managed Fund claims on fires

1065 Extraordinary costs that are incurred for suppression-related activities or NPWS personnel are claimable against the NSW Treasury Managed Fund (refer to the *Finance Manual*).

1066 It is not necessary to declare an incident to draw on the NSW Treasury Managed Fund, and the Fund may still be drawn on after an incident has been de-declared.

1067 Unless an ignition has occurred, expenses cannot be claimed to the NSW Treasury Managed Fund nor can they be claimed to the RFS Section 44 Bushfire Emergency Fund.

This is the case even when a pre-emptive Section 44 incident is declared by RFS and as yet no fire ignition exists within that area of declaration. However, once an ignition has occurred, costs are claimable to the NSW Treasury Managed Fund from the time of the ignition onwards.

Regional Managers and Incident Controllers need to reinforce that funds claimable from the NSW Treasury Managed Fund and the RFS Section 44 Bushfire Emergency Fund are not linked to the declaration of an 'incident' under the NPWS general award.

1068 Costs incurred during a Section 44 incident that are not OEH-specific are the responsibility of RFS, and a non-OEH purchase order book should be used for the procurement of goods and services. Where this is not possible, OEH will prepare a claim or invoice RFS to recover costs.

Refer to the *Finance Manual* Part 10 'Insurance' for more detail on what can be claimed from RFS.

1069 Some items, such as uniforms, equipment, minor tools and personal fire gear replacements, may be claimable on a separate insurance policy as 'Property' if damaged during fire operations or by the fire.

1070 Documents required with claims include:

- incident number, and
- copies of all invoices for:
  - purchase card or petty cash expenditure (all other documents are available via SAP)
  - vehicle or plant running cost sheets including the journal.

1071 Separate insurance claims for damage to NPWS premises, facilities or other property will be required because these claims fall within NPWSs property or motor vehicle insurance coverage.

1072 Claims for damage to non-NPWS property require:

- NSW Treasury Managed Fund incident claim form
- public liability incident report by NPWS personnel
- relevant additional information (e.g. maps, diagrams, photographs), and
- correspondence received from the third party.

1073 All claims are to be submitted to the Asset Accountant. Documentation to be forwarded with the firefighting claim must include:

- NSW Treasury Managed Fund incident claim form
- insurance firefighting claim record
- WBS no. report from the SAP financial system
- itemisation of other costs, and
- vehicle or plant mileage claim record and journal.

Costs incurred for OOA support

1074 All claimable costs relating to allocating resources to OOA support will be charged to the fire operations.

6.0 Administration

Overtime and incident claim approvals

1075 The Regional Duty Officer or Incident Controller can approve staff to work overtime for firefighting. Claims for work carried out under declared incident conditions may be approved by either a NPWS Regional Managers or above or the Incident Controller (or deputy Incident Controller) provided that person is a NPWS staff member.

1076 Staff who work outside normal hours after an incident has been de-declared will be paid in accordance with normal overtime provisions.

1077 All overtime for fuel management works must be approved by the Area Manager. Requests for overtime approvals must be submitted on the prescribed form, with cost estimates.

6.2 Working conditions

6.2.1 Background

1078 NPWS staff are covered by various industrial awards and conditions when engaged in fire management (refer to Awards and Agreements on the intranet for details).

NPWS and all its staff have a responsibility to maintain a safe workplace and safe work practices.

NPWS staff are required to be aware of all current policies relating to individual responsibility for conduct and performance.

6.2.2 Policies for working conditions

1079 Conditions associated with industrial awards and NPWS policies will be adhered to at all times. Specific incident conditions will be adhered to during during declared incidents.

1080 The following policies relating to shift lengths and patterns are applicable to all firefighting during declared incidents (they do not apply to prescribed burning activities).

1081 Policies relating to conduct and performance as determined from time to time by NPWS must be adhered to at all times, and in travelling to and from incidents, whether local, intrastate, interstate or international.

6.2.3 Shift lengths during a declared incident

On the first day of a new fire

1082 On the first shift of a new fire:

- Staff may work a maximum of 24 hours including travel, briefing, debriefing, clean-up time and time worked on non-fire related duties. Time worked on non-fire related duties will not be paid at incident rates.

  For example: An officer starts normal duties at 8:00 am but is called to respond to a newly-declared bushfire incident at 15:00 pm that day. The officer **must** have returned home (or to alternate lodging) by no later than 8:00 am the following day. All hours between 15:00 pm and finish of the shift are paid at incident rates. Hours worked before 15:00 pm are **not** paid at incident rates.

- During the first shift of the fire only, time worked on the fire ground should not exceed 16 hours.

On subsequent shifts

1083 On subsequent shifts:

- Staff may work a maximum of 16 hours including travel, briefing, debriefing, clean-up time and time worked on non-fire related duties. Time worked on non-fire related duties will not be paid at incident rates.

  For example: An officer starts normal duties at 9:00 am but is called to respond to a previously-declared bushfire incident at 16:00 pm that day. The officer **must** have returned home (or to alternate lodging) by no later than 1:00 am on the following day. All hours between 16:00 pm and finish of the shift are paid at incident rates. Hours worked before 16:00 pm are **not** paid at incident rates

- On subsequent shifts, time worked on the fire ground should not exceed 12 hours.

Breaks

1084 A minimum break of 8 hours between shifts is mandatory, and a break of at least 10 hours should be taken. A break of at least 10 hours is mandatory after working a shift longer than 16 hours. The break will not include travel, briefing, debriefing and clean-up time.

Extending shift lengths

1085 Extending shift lengths (both total time on duty and time worked on the fire ground) beyond the lengths specified above requires the Incident Controller's authorisation.

In providing such authorisation, the Incident Controller must evaluate other risk factors such as threats to life and property, and the potential implications of ignoring or disregarding watchout procedures such as changing crews over at night. Where shift lengths are extended, specific consideration needs to be given to managing fatigue-related safety and logistical issues.

1086 Once total time on duty exceeds 16 hours:

- drivers should be arranged to transport staff between the fire ground and accommodation where required (this includes IMT members).
- staff will no longer operate chainsaws or earthmoving machinery. Where it is impractical to avoid this situation, close attention must be given to managing the situation. In particular:
  - supervisors must pay close attention to identifying fatigue, and
  - operations should be limited to situations where there is no practical alternative.

1087 If, on any occasion, the time on duty for staff involved in fire duties:

- exceeds 24 hours on the first shift of the fire, or
- exceeds 16 hours on subsequent shifts, or

if time worked on the fire ground:

- exceeds 16 hours on the first shift of the fire, or
- exceeds 12 hours on subsequent shifts

then the Director (for the Branch in which the fire occurs) will require the Incident Controller to prepare a report. The Director will send a report and recommendations to the DCE, PWG for each occasion when shift lengths have been exceeded.

Responsibilities of the incident controller

1088 The Incident Controller (or, where the Incident Controller is not from NPWS, the senior NPWS officer at the fire) is responsible for ensuring that staff work reasonable shifts and have adequate rest periods.

The Incident Controller will ensure adequate resource monitoring systems are in place.

1089 Incident Controllers should consider a range of strategies for reducing risks. These may include (but are not limited to):

- resting crews during the shift (i.e. resting while on duty)
- arranging drivers to and from the fire ground or to and from accommodation
- preparing strategies or assigning duties consistent with fatigue levels that do not require critical decision-making or high level physical coordination
- extending break periods
- minimising travel times, or
- limiting time worked on the fire ground.

6.2.4 Shift patterns during a declared incident

1090 Where staff have been engaged in both incident and normal duties, no more than 8 consecutive days can be worked without a rest day if they were engaged in a declared incident for any one, or more, of those days.

1091 A staff member who works fewer than 3 (or 5) consecutive incident shifts will be required to return to normal duties after a 10-hour break.

1092 Staff performing aviation specialist roles are considered to be IMT staff for the purposes of shift patterns.

Fire ground staff and night-shift IMT staff

1093 All **fire ground staff** and **night-shift IMT staff** will work no more than 3 incident shift days consecutively, followed by 1 paid rest day before a return to either normal or incident duties (3 – 1 pattern).

After a subsequent 3 incident shifts have been worked, the 3 – 1 – 3 shift pattern will be followed by

- 1 paid rest day for those staff returning to normal duties, or
- 2 paid rest days for those staff returning to further incident duties.

Each rest day must constitute a 24-hour period respite from duty.

Day-shift IMT staff

1094 **Day-shift IMT staff** will work according to **a)** or **b)** below:

a) no more than 3 incident shift days consecutively, followed by 1 paid rest day before a return to either normal or incident duties can occur (3 – 1 pattern).

After a subsequent 3 incident shifts have been worked, the 3 – 1 – 3 shift pattern will be followed by

- 1 paid rest day for those staff returning to normal duties, or

- 2 paid rest days for those staff returning to further incident duties.

Each rest day must constitute a 24-hour period respite from duty.

b) at the discretion of the staff member, if requested by the Incident Controller, no more than 5 incident shift days consecutively, followed by 1 paid rest day before a return to either normal or incident duties can occur (5 – 1 pattern).

After a subsequent 5 incident shifts have been worked, the 5 – 1 – 5 shift pattern will be followed by

- 1 paid rest day for those staff returning to normal duties, or
- 2 paid rest days for those staff returning to further incident duties.

Each rest day must constitute a 24-hour period respite from duty.

IMT support staff

1095 All IMT **support staff** (e.g. in administrative or catering roles) will work no more than 5 incident shift days consecutively, followed by 1 paid rest day before a return to either normal or incident duties can occur (5 – 1 pattern).

After a subsequent 5 incident shifts have been worked, the 5 –1 – 5 shift pattern will be followed by

- 1 paid rest day for those staff returning to normal duties, or
- 2 paid rest days for those staff returning to further incident duties.

Each rest day must constitute a 24-hour period respite from duty.

Flight officers

1096 Working hours and conditions for flight officers are specified in the DECCW Flight Officers Enterprise Agreement 2006 and include the following Civil Aviation Authority limitations on working hour arrangements:

- **Flying hours** are to be not more than:
  8 hours in 1 day
  30 hours in 7 consecutive days
  100 hours in 30 consecutive days, or
  900 hours in 1 year.

- **Duty hours** are to be not more than:
  11 hours of duty in 1 day
  90 hours of duty in 1 fortnight, or
  6 consecutive days of duty.

These limitations are not absolute. Civil Aviation Order Number 48.0 and 48.1 allows for extension of hours in certain circumstances. Similarly, the hours to be worked by the employees of the Flight Operations may be extended in accordance with the order.

Applications to extend flight hours are to be made by the Incident Controller via RFS.

Responsibilities of the Incident Controller

1097 The Incident Controller must have strategies in place to monitor and manage fatigue, especially where staff are working up to 8 consecutive days or 5 consecutive-day incident shifts. Shift patterns may be modified where considered necessary to ensure a safe working environment.

1098 During protracted fire seasons where staff are working multiple shift cycles, the Incident Controller should consider giving staff a break from fire duties (either a return to normal duties or time away from work). It is the Regional Manager's responsibility to manage the Incident Controller's welfare in this regard.

6.2.5 Staff availability

Staff responsibility for reporting unfit or unable

1099 Staff will report to their supervisors when they assess themselves or their colleagues to be **unfit for their assigned duties**. Circumstances where this may occur include (but are not limited to):

- mental or physical fatigue
- injury
- drug or alcohol effects, or
- insufficient rest.

Staff considered unfit will be stood down from firefighting duties.

1100 Staff will report to their supervisors when they assess themselves or their colleagues to be **unable to perform their assigned duties**. Circumstances where this may occur include, but are not limited to:

- lack of competence for the role or circumstances, or
- insufficient physical fitness.

Staff considered unable to perform their assigned duties may be reassigned to alternative firefighting duties.

Casual employees

1101 Casual employees who meet competency and fitness requirements may be used for firefighting roles. Incident conditions do not apply to casual employees who are not entitled to rest days and will be paid in accordance with usual overtime provisions from Regional budgets.

Casual employees may be used to backfill permanent staff that are on firefighting duties.

Cadet rangers and trainee field officers

1102 Cadet rangers employed under the cadetship program and field officers employed under the traineeship program who meet competency and fitness requirements may perform as a crew member at Class 1 and 2 fires for a maximum of one 3 – 1 – 3 shift per 28-day period.

In the event of these fires being declared Class 3, cadets and trainees are to assist the IMT for the remainder of their shift.

Staff availability and leave

1103 Regions must maintain a level of staff resourcing that is appropriate to the level of bushfire risk. As a guide it is suggested that at both the Regional and Area level no more than 25% of staff should be on leave at any given time during the bushfire danger period.

Throughout the fire season each Region should maintain a list of available staff.

The Regional Manager may cancel leave or recall staff where, in the Manager's opinion, the level of bushfire risk or activity warrants additional staff being available.

Staff on leave

1104 Staff on sick leave, workers compensation or leave without pay will not be used for firefighting duties.

Staff will not cancel or return from recreation leave unless directed to do so by their Regional or Unit Manager.

6.2.6 Allowances and payments

1105 Allowances will be paid in accordance with those specified in the relevant award or enterprise agreement.

1106 Payment is calculated on the basis of the staff member's award conditions and rosters.

Incident claims

1107 In accordance with EDPM Memo No. 47/2008, EDPM Memo 1/2010 and SC-PS11 Fact Sheet:

- Incident claim forms may be approved by either NPWS Regional Managers or above ***or*** the designated Incident Controller for the incident concerned, provided that person is a NPWS staff member.
- There is no requirement for both a Regional Manager's signature and the Incident Controller's signature on claim forms where the Incident Controller is a NPWS employee.
- Only staff performing an 'identified incident responsibility role' are entitled to incident payments and conditions. See EDPM Memo 47/2008 for a list of roles. This role must be listed in the 'role performed' column on form SC-PS11 for correct processing.

1108 In addition to the above, all staff involved in processing incident claims should ensure they are forwarded to the relevant Service Centre staff as a matter of priority so that incident payments are not unduly delayed and that:

- claim forms (i.e. timesheets) are regularly checked by the Logistics Officer during an incident
- claim forms are batched for authorisation by Logistics and Incident Controller
- claim forms for Class 1 & 2 fires are batched and forwarded to the Service Centre immediately following de-declaration of the incident by the Region, and
- claim forms for Class 3 fires are batched and submitted to the Service Centre immediately following the end of a shift pattern.

Food and drink

1109 Firefighters need to plan to be self-sufficient for meals and snacks for 24 hours or 4 meals.

1110 NPWS will generally provide adequate, appropriate and healthy meals, including breakfast, lunch and dinner. Catering arrangements at the staging area and operations room should be implemented as soon as possible and at least within 24 hours of the initial response. Where NPWS is unable to provide meals, relevant meal allowances will be paid.

Provision of accommodation

1111 Accommodation will be selected taking into consideration:

- firefighter fatigue
- travel times

- containing shift lengths
- safety factors
- comfort, and
- special needs of night crews.

If travel times are greater than 1 hour, consideration must be given to establishing a base camp.

6.2.7 Conduct

Alcohol and other drugs

1112 No alcohol will be provided by NPWS to staff (on or off duty) while they are involved in firefighting duties. When engaged in firefighting activities, NPWS staff are not to consume alcohol while on duty. The definition of 'while on duty' has been extended to all days in the field – which includes rest days between firefighting shifts.

1113 Any employee observed in an intoxicated, hung-over or drug induced state must be stood down, without pay, and the Incident Controller must be notified. All such instances will be referred to the relevant field Branch Director in accordance with the guidelines on conduct and performance (part 2.7 of the *Public Sector Employment and Management Act 2002*).

More detailed procedures relating to alcohol and other drugs are contained in the *Guide to Managing Alcohol and Other Drugs in the Workplace*.

Discipline and welfare

1114 The Incident Controller has management responsibility for counselling, disciplinary and welfare matters relating to the incident.

The Regional Manager (or Director where the Regional Manager is deployed to fire duties) is responsible for welfare and discipline matters for the Incident Controller.

1115 A Liaison Officer will be assigned to interstate and overseas support personnel to help with coordinating transport, accommodation and information requirements. The Liaison Officer will be part of the IMT.

In addition to a Liaison Officer, a Task Force Leader will be appointed for interstate and overseas support personnel to ensure their welfare and safety on the fire line.

6.3 Annual reporting requirements

6.3.1 Background

1116 FIMS will:

- annually revise and disseminate updates to the appendix of the *National Parks and Wildlife Act State Incident Plan*; this appendix will include formats and mechanisms for fire reporting and documentation
- maintain state-wide records of all incidents attended by NPWS staff or on NPWS-managed land, and
- prepare an annual report on NPWS fire management activities across NSW.

1117 Each Region will:

- prepare reporting procedures as part of its Regional incident procedures, based on the *National Parks and Wildlife Act State Incident Plan* and BFMC plans of operations
- maintain records of incidents and fire management activities; these will be recorded in
  - ICON (for wildfires),
  - BRIMS (for prescribed burning and mechanical hazard reduction works), and
  - a miscellaneous incidents database
- submit a copy of its miscellaneous incidents database to the Branch and FIMS at the end of each month, and
- prepare an annual report on fire management activities within its operational area.

6.4 National medal

6.4.1 Background

1118 In NSW the National Medal can be awarded to staff working for NSW Police, the Ambulance Service of NSW, the Australian Protective Service and NSW fire authorities.

All NPWS staff trained in firefighting will be eligible for nomination for the National Medal once they have completed 15 years of diligent and active service as a firefighter.

Staff will be eligible for award of a clasp to the National Medal for each subsequent 10 years of diligent and active service as a firefighter.

6.4.2 Policies for the National Medal

1119 NPWS will encourage all eligible staff to apply for the National Medal.

Demonstrating involvement in firefighting

1120 Staff who can adequately demonstrate their involvement in firefighting before the introduction of national fire training modules will be required to verify their involvement initially and show sufficient continuity of firefighting service over 15 years.

1121 Officers who can confirm active membership and participation in a bushfire brigade or who can gain the support of a supervisor to confirm active participation in firefighting and continuous periods of involvement for 15 years will be supported by NPWS in their applications.

Applications and presentations

1122 Applications for the National Medal should be made in the prescribed manner and endorsed by Regional Manager or Branch Director and then submitted to the Manager FIMS for processing.

All applications endorsed by NPWS are submitted to the RFS Commissioner for approval and forwarding to the Australian Government Honours Secretariat.

1123 Formal presentations of the National Medal will be made through the DCE PWG office when the medals are received from the Australian Government.

7.0 Appendix 1

Section 7.0 contents

7.1 Vehicle equipment schedules

7.1.1 Essential vehicle equipment

1124 Each NPWS firefighting vehicle, and NPWS support vehicle entering the fire ground, must:

- ❑ be diesel powered
- ❑ be fitted with an operational NPWS mobile radio; if the mobile radio has a selective calling (SELCALL) number it will be displayed at the top of the radio screen
- ❑ have a vehicle roof number (VRN) which is:

comprised of 4 characters, in which the first 2 characters are letters representing the Region and the last 2 characters are digits representing an individual vehicle in that Region

displayed on the roof or bonnet of the vehicle to permit identification from the air; the characters must be at least 530 mm high, 257 mm wide and 80 mm thick, in black characters (in white characters if the roof is black); the top of the characters must be towards the front of the vehicle

displayed on the door (1 set on each side) of the vehicle; the characters must be at least 100 mm high

VRN characters must be displayed on the vehicle and not on fire units

- ❑ carry a first aid kit appropriate for the number of personnel the vehicle carries; the location of this kit must be clearly identified
- ❑ be fitted with an appropriately sized fire extinguisher
- ❑ carry a Wildland Firefighting (ISO 15384) fire blanket for each person the vehicle is permitted to carry during fire management operations, and, in plant support vehicles, an additional blanket for the plant operator
- ❑ be fitted with vehicle recovery equipment (i.e. chassis mount winch, snatch strap, tree guards, block and shackles) appropriate to its GVM. However for single and dual cab light four wheel drive vehicles a winch is optional, and if deployed on a fire ground without a winch a risk assessment must be performed to assess suitability, and
- ❑ carry a copy of the Regional incident procedures of the home Region.

7.1.2 Additional vehicle equipment

Additional equipment for Category 9 firefighting units

1125 Category 9 firefighting units (300, 400 & 500 L) must also be fitted with:

- ❑ 8 L of drinking water, with its location clearly marked
- ❑ 1 x 4 m-long (minimum) suction hose fitted with float and foot valve
- ❑ 2 rake hoes
- ❑ 2 drip torches (300 L unit: one drip torch only)
- ❑ 10 L of drip torch fuel
- ❑ 10 L of diesel pump fuel
- ❑ 1 L of diesel pump oil
- ❑ 1 x 2.5 kg axe and cover
- ❑ 1 x 250 mm flat file (10')
- ❑ 1 chainsaw
- ❑ 1 pair of Proban-treated chainsaw chaps
- ❑ 1 chainsaw fuel and oil container
- ❑ 1 chainsaw kit including:
  - 2 alloy wedges
  - 1 spare chain
  - 1 stump vice
  - 1 socket spanner
  - 1 small flat screwdriver
  - 1 flat file
  - 2 round files
  - 1 sharpening guide
  - 1 depth gauge
- ❑ 2 x 25 mm x 30 m lay flat hoses
- ❑ 1 x 38 mm x 30 m lay flat hose
- ❑ 1 x 25 mm x 5 m lay flat vehicle protection hose
- ❑ 1 spare hose nozzle (primary nozzle remains attached to live line)
- ❑ 1 adjustable Storz spanner
- ❑ assorted spare Storz fittings including:
  - 1 x 65 mm – 38 mm reducer
  - 1 x 38 mm – 25 mm reducer
  - 2 x 25 mm with tails
  - 1 x 25 mm blank
  - 1 x 38 mm blank
  - assorted stainless steel hose clamps
- ❑ 1 x 10 L collapsible bucket
- ❑ 1 siphon hose
- ❑ 1 funnel
- ❑ 1 pair of suitably sized bolt cutters
- ❑ 1 pair of fencing pliers
- ❑ 10 m of light rope.

1126 A laminated copy of this equipment list must be fixed to the interior of the unit, positioned within easy view of the operators.

1127 Category 9 fire units operating in urban or bush-urban interface areas may also carry the following additional Storz fittings:

- ❑ 1 stand pipe
- ❑ 2 x 38 mm – 25 mm reducers
- ❑ 2 x 38 mm with tails, and
- ❑ 1 x 38 mm controlled branch.

1128 The equipment listed above has been selected taking into consideration compliance with RTA regulations on weight restrictions. Hence, Category 9 firefighting units must not carry equipment in addition to that specified in the equipment schedules. Any proposals to modify the equipment schedules must be formally adopted in policy before being implemented.

1129 For safety and weight reasons, Category 9 firefighting units will not carry more than 2 personnel when engaged in fire management operations.

1130 Cabin spray protection systems will not be fitted to Category 9 firefighting units.

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Additional equipment for Category 7 firefighting units

1131 Category 7 firefighting units must be fitted with all equipment listed for Category 9 firefighting units, plus:

- ❑ 1 suitably rated 3 m (minimum) tow chain
- ❑ extra lay flat hose lengths appropriate to the unit's area of operation, and
- ❑ extra drip torch and diesel pump fuel.

Additional equipment for Category 1 and 2 firefighting units

1132 Category 1 and 2 firefighting units must be fitted with all equipment listed for Category 9 and 7 firefighting units (excepting a tow chain), plus:

- ❑ 2 suitably rated 4 m (minimum) tow chains
- ❑ an access ladder to the side of the tanker
- ❑ crew heat shields, and
- ❑ a heavy timber jack.

Category 1 and 2 firefighting vehicles

1133 Category 1 and 2 firefighting vehicles must be fitted with:

- ❑ common air hoses and couplings
- ❑ a spare compressor drive belt
- ❑ removable front body rail-locking pins
- ❑ operator warning signs on PTO controls
- ❑ 2 chassis-mounted front-towing points
- ❑ a single rear pintle hook.

Plumbing for all vehicles

1134 Plumbing for all Category 1, 2, 7 and 9 vehicles should include:

- ❑ Storz couplings on all flexible pressure hoses
- ❑ hose clamps of stainless steel, screw type
- ❑ plumbing that remains within vehicle alignment
- ❑ live reels with at least 30 m of hose
- ❑ live reels fitted with stop valves at pump manifold or live reel spindle
- ❑ strainer and float fitted to suction hose
- ❑ Y-strainer fitted between pump manifold and tank, and
- ❑ valve and pump controls positioned for operation from the ground.

7.2 Personal protective equipment schedules

7.2.1 Schedule 1: Personal firefighting equipment

Every firefighting person on the fire ground must have the following PPE, issued by Region.

Schedule 1(a): Personal protective equipment to be worn or carried on person on the fire ground

Item	Quantity
Uniform: 2-piece, consisting of trousers and jacket, rated to AS 4824:2006 and ISO 10528:1995 fabric standard	2 trousers and 1 jacket
Boots: Bushfire boots rated to AS 4821:2006 (Type 1)	1 pair
Gloves: Bushfire gloves rated to AS 2161.6:2003 (Level 1)	2 pairs
Goggles: Bushfire goggles rated to AS 1337	1 pair
Helmet: Bushfire helmet rated to AS 1801 (Type 3) .White with red 'NPWS'	1 item
Hood: Bushfire hood rated to ISO 11613:1999 fabric standard	1 item
Smoke mask: Disposable particle filter for bushfire smoke rated to AS 1716 (Class P2)	1 item
Fire Incident Field Guide	1 item
Whistle	1 item

Schedule 1(b): Other essential equipment

Item	Quantity
Personal first aid kit	1 item
Water containers – minimum 2 L capacity in total	1 item
Day-pack (30 L capacity) and/or bum-bag attached to web belt	1 item/2 items
Compass	1 item
Sunglasses rated to AS 1337 and 1338.2:1992	1 pair
Pocket knife	1 item
Wind and waterproof matches	1 packet
Flagging tape – high visibility	1 roll
Head lamp – helmet mounted	1 item
Sunscreen – SPF 30	1 item
Ration pack – 24 hour	1 item

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7.2.2 Schedule 2: Additional equipment that must be carried by each crew*

Every crew must have the following additional equipment, issued by Region.

Item	Quantity
Portable NPWS standard hand-held radio and spare battery (minimum requirement)	2 items *All RAF members must carry a radio *each*
Weather reading equipment	1 item

7.2.3 Schedule 3: Additional equipment that must be carried by out-of-area crew members

The following equipment is in addition to that listed in schedules 1 and 2.

Item	Quantity
Solid fuel stove	1 item
Sleeping bag liner	1 item
Sleeping mat	1 item
Sleeping bag	1 item
Ground sheet	1 item
2-person tent	1 item
Poncho	1 item
Cutlery, plate, mug	1 item each
Small billy	1 item

These kits must be made available by the dispatching Region to crew members sent for OOA firefighting. Regions must ensure that sufficient kits are available to cater for OOA staff during a busy fire season and that OHS requirements are met.

Note: Some Regions may provide swags instead of tents and sleeping mats.

8.0 Appendix 2

Section 8.0 contents

8.1 Responsibilities and accountabilities

1135 Responsibilities are tasks or decisions that are required of a person or a position.

Accountability is the level to which a person may be held answerable for the completion of those tasks or decisions.

For example: a person or a position may have certain responsibilities (tasks/roles to undertake) but may not be accountable for their successful completion. This accountability may be held by a more senior or supervisory position.

8.1.1 Responsibilities under the National Parks and Wildlife Act

1136 NPWS meets its fire management and conservation responsibilities under the *National Parks and Wildlife Act 1974* by:

- maintaining and improving its fire management, suppression and response capability
- preparing fire management strategies for all NPWS-managed lands
- ensuring that fire management strategies will protect natural and cultural heritage resources
- promoting appropriate fire regimes within NPWS-managed lands for the conservation of native plant and animal communities, and
- engaging in research for the conservation of native plant and animal communities.

8.1.2 Responsibilities under the Rural Fires Act

1137 NPWS meets its fire suppression responsibilities under the *Rural Fires Act 1997* by:

- being a member of the BFCC and BFMCs where it has managed lands

- maintaining an effective, efficient, highly mobile and skilled fire-suppression capability of personnel and equipment
- assisting with preparing and implementing bushfire management plans for suppressing fire and mitigating fire hazards across NSW
- entering into coordinated arrangements with other fire authorities to ensure a rapid and effective deployment of staff and resources to detect and control fires across NSW
- taking control of fires in accordance with the policies in this Manual and BFMC plans of operations
- initiating appropriate fire suppression actions on all fires detected within all NPWS-managed lands and up to 8 km from NPWS-managed land boundaries
- assisting other fire authorities, when requested, to suppress fires on tenures other than NPWS-managed lands
- managing fires on NPWS-managed lands in accordance with the provisions of BFMC plans of operations and NPWS RFMS
- ensuring that appropriate arrangements exist with other fire authorities for cooperative and coordinated firefighting
- conducting fuel management programs in accordance with the provisions of BFMC bushfire risk management plans and NPWS reserve fire management strategies, and
- training NPWS staff for appropriate roles in fire and incident management.

8.1.3 Responsibilities under BFMC plans of operations

1138 Under BFMC plans of operations, NPWS, when requested, assists other fire authorities to extinguish fires on lands under their control by providing personnel, information and equipment on the basis that:

- NPWS has not fully committed its own personnel and resources to fires on NPWS-managed lands, and
- sufficient resources will be held in reserve for the control of any fires that occur on NPWS-managed lands.

Policies and procedures within this Manual should be incorporated into BFMC plans of operations.

8.1.4 Deputy Chief Executive Parks and Wildlife Group

1139 The Deputy Chief Executive Parks and Wildlife Group (DCE PWG) is responsible for:

- approving the deployment of NPWS resources to another state or overseas
- approving the use of interstate resources to assist NPWS fire operations
- ensuring that adequate ‘standards of cover’ for fire management are maintained, and
- ensuring that adequate numbers of staff are appropriately trained to guarantee an incident response capability.

8.1.5 Executive Director Park Management Division

1140 The Executive Director Park Management Division (EDPM) is accountable for:

- state-wide monitoring and reporting of incident and fire operations and resources within NPWS
- assigning priorities for allocating resources between Branches in consultation with Branch Directors
- reviewing and developing state-wide policies and procedures relating to fire management
- collecting, collating, reporting and disseminating incident information affecting NPWS
- developing state-wide systems to ensure the cost effectiveness of incident management, and
- maintaining the NPWS Incident Database, which records all required information associated with fire suppression, including ongoing incidents, for reporting purposes.

1141 The Executive Director Park Management Division is responsible for:

- reporting to the DCE PWG and the Executive on the number of fires, class of fires and issues arising from fires
- maintaining contact with other fire authorities on the availability of resources to support the NPWS requirement at a state level, and to contribute to assessing state-wide priorities for fire-suppression resourcing
- advising Branches of:
  - the appointment of Incident Controllers for major incidents, and
  - the existence of Class 2 or 3 fires elsewhere in NSW
- requesting that all resources are placed in an appropriate state of preparedness
- developing schedules of equipment and personal equipment standards throughout NPWS
- for planning purposes, liaising with RFS and providing advice to the DCE PWG in regard to the BFCC, and
- in relation to operations, appointing a State Operations Liaison Officer during incidents and SAD Officer during an agreed period.

8.1.6 Manager Fire and Incident Management Section

1142 The Manager Fire and Incident Management Section is responsible for:

- coordinating the FMAC and all working groups convened under FIMS
- providing advice and assistance to the NPWS representative on the BFCC
- initiating policy development processes where necessary and seeking input from FMAC, BFCC and the office of the DCE PWG
- providing a quality control and leadership role
- annually compiling and reviewing fire and seasonal debrief recommendations and comments from staff at the strategic level for inclusion in the Manual, and
- invoking and coordinating the State Duty Officer.

8.1.7 Director Legal Services Branch

1143 The Director Legal Services Branch is accountable for responding to requests for advice on OEH policies, procedures and practices to ensure they accord with relevant legislation.

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8.1.8 Branch Directors

1144 Branch Directors are accountable for the overall coordination of incident and fire operations and resources within their Branch, and for assigning priorities for allocating resources between Regions in consultation with Regional Managers.

1145 Branch Directors are responsible for:

- supporting the EDPM by providing advice on incident operations issues
- declaring as an incident a prescribed burn subsequently requiring suppression using the NSW Treasury Managed Fund
- ensuring compliance with NPWS policy and procedures relating to incident management and OOA deployment
- ensuring compliance with NPWS systems which promote the cost effectiveness of incident management
- approving the extension of shift lengths beyond specified maximums, and
- monitoring staff availability throughout the Branch.

8.1.9 Regional Managers

1146 Regional Managers are accountable and responsible for:

- overall coordination of fire management planning
- supervising the implementation of programs
- determining the allocation of finances for fire management within their Regions
- declaring incidents and providing an adequate detection and response capability, and
- reporting serious injuries, death or property damage to the Director, Occupational Health & Safety Manager and WorkCover.

1147 Regional Managers are accountable for:

- ensuring that standards and schedules of equipment are adopted within the Region
- ensuring suppression objectives are aligned with the Region's management objectives, and
- ensuring staff within their Region are assessed as competent in the fire management duties they are required to perform.

1148 Regional Managers are responsible for:

- maintaining the NPWS Incident Database, which records all required information associated with fire suppression, including ongoing incidents, for reporting purposes
- reporting all incidents and prescribed burning to FIMS and Branch through BRIMS
- maintaining data entry into BRIMS which records all required information associated with fire mitigation activities
- ensuring staff undertaking the role of Incident Controllers are supported
- approving the appointment of Incident Controllers for Class 1 fires
- recommending Class 2 and 3 Incident Controller nominees to BFMCs
- declaring reserve fire bans and reserve closures

- making staff within the Region available for firefighting duties within the Region or in another Region
- ensuring equitable access to training, competency development and deployment to fire roles, and
- monitoring the implementation of NPWS RFMS and measuring the success of strategies in achieving desired fire regimes and levels of protection.

8.1.10 Trusts

1149 Trusts are responsible for the care, control and management of some state conservation areas and regional parks. Within areas under their jurisdiction, trusts are responsible for:

- declaring reserve fire bans
- cancelling activities, and
- declaring reserve closures.

8.1.11 Boards of Management

1150 Boards of Management are responsible for the care, control and management of some reserves pursuant to part 4A of the *National Parks and Wildlife Act 1974*. Within areas under their jurisdiction, Boards of Management are responsible for:

- declaring reserve fire bans
- cancelling activities, and
- declaring reserve closures.

8.1.12 Authorised officers and appropriate officers

Rights and responsibilities as a firefighting authority

1151 As a 'firefighting authority' NPWS staff may:

- enter (as an 'authorised officer') land within 8 km of NPWS-managed lands and undertake activities reasonably necessary to suppress, or prevent the spread of, a bushfire from that land to NPWS-managed land.
- be notified (as an 'appropriate officer') by occupiers of adjacent lands of the occurrence and location of bushfires on their land during the bushfire danger period
- enter (as an 'authorised officer') unoccupied Crown land and other NPWS-managed lands for the purposes of conducting hazard reduction burning, subject to a bushfire hazard reduction certificate or determination under Part 5 of the *Environmental Planning and Assessment Act 1979* from the relevant authority.

Rights and responsibilities as a public authority

1152 As a 'public authority' NPWS has a number of rights and responsibilities, including:

- to take any notified steps (as defined by either the BFCC or any bushfire risk management plan), and any other practicable steps, to prevent the occurrence of bushfires on, and to minimise the danger of the spread of a bushfire on or from, land vested in or under its control or management, and to bear the costs associated with this

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- to be notified in writing of any complaint which might be made to the RFS Commissioner about the existence of a bushfire hazard on NPWS-managed lands, and to carry out bushfire hazard reduction work as is specified in a notice issued by the Commissioner following the investigation of a complaint
- on failure to properly perform the above, or failure to carry out bushfire hazard reduction work, to permit an 'authorised officer' (officer of a firefighting authority) to have entry to NPWS-managed lands for the purposes of conducting hazard reduction works at NPWS expense, subject to a bushfire hazard reduction certificate issued by the Commissioner (in accordance with s. 100G of the *Rural Fires Act 1997*)
- to seek prior approval from a local authority for a bushfire hazard reduction certificate for any proposed NPWS work on private lands in accordance with s. 100F of the *Rural Fires Act 1997*, including the approval of the property owner concerned
- before the lighting of any fire (anywhere and at any time of the year other than for a back-burn) to give, be given, or cause to be given, written or oral notice that includes particulars of the:
    - location
    - purpose
    - period, and
    - time of the fire proposed to be lit
    - at least 24 hours before the fire is lit, to the occupiers (or, if there are no occupiers, the owners) of all land contiguous to, or that is separated merely by a lane, road or waterway (whether fenced or unfenced) from, the land on which the fire is to be lit, and to also give such notice to the relevant local authority being a NSW Fire and Rescue Station Officer (within a Fire District) or RFS Fire Control Officer (within a Rural Fire District)
- to be notified by the appropriate authority of the issue of a fire permit within 24 hours if the burn is within 8 km of NPWS-managed lands
- to be notified by the appropriate authority of the intention to enter land and to light a fire in accordance with s. 70 of the *Rural Fires Act 1997*, within 24 hours, if the burn is within 8 km of NPWS-managed lands
- to be notified (i.e. receive a copy of the notice) by the local authority of the issue of a hazard reduction notice within 24 hours of the issue of the notice, if the proposed work is within 8 km of NPWS-managed lands
- to adopt and carry into effect a relevant bushfire management plan
- to be protected (as a protected person or body) from action, liability, claim or demand arising from a matter or thing done in good faith for the purpose of executing any provision (other than s. 33) of the *Rural Fires Act 1997*, and
- to report to the RFS Commissioner no later than 3 months after the end of the financial year on its activities to reduce bushfire hazards on NPWS-managed lands during the preceding financial year.
    - The report is to include details of the extent of implementation of any scheme for the reduction of bushfire hazards on NPWS-managed lands as set out in the bushfire risk management plan that applies to the land.

9.0 Appendix 3

Section 9.0 contents

9.1 AFAC Guidelines

Australasian Fire Authorities and Emergency Services Council (AFAC) guidelines, position papers and publications are available on the AFAC Knowledge Web (http://knowledgeweb.afac.com.au).

Type	Subject	Date adopted
Guideline	An Approach to Knowledge Creation	February 2009
Guideline	Guidelines for people in cars during bushfires	January 2008
Guideline	Mutual Aid and Resource Sharing	October 2003
Guideline	Health and Fitness Guidelines	April 2003
Position Paper	Climate Change and the Fire and Emergency Services Sector	September 2009
Position Paper	A National Systems Approach to Community Warnings	September 2009
Position paper	Fire Risk from the Management of Gamba Grass in Northern Australia	April 2008
Position paper	Use of the LACES System for Wildfire Firefighters Safety on the Fire Ground	April 2008
Position paper	Use Of Personal Fire Shelters In Wildfires	April 2008
Position Paper	Common Hose Couplings for AFAC Member Agencies	March 2008
Position Paper	Class A Recycled Water for Firefighting Purposes	September 2007
Position paper	Bushfires and Community Safety (under review)	November 2005
Publication	Wildfire Glossary	January 2009

9.2 Bushfire CRC

Bushfire CRC 'Fire Notes', fire updates, reports and presentations are available on the Bushfire CRC website (http://www.bushfirecrc.com), under 'Publications'.

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9.3 BFCC policies

NSW Bush Fire Coordinating Committee (BFCC) policies are available via the NSW Rural Fire Service website (www.rfs.nsw.gov.au). On the pull-down menu under 'Operations' select 'Publications', then 'Law and Policy' then 'BFCC Policy Documents'.

Policy no.	Current Policies – Subject	Date adopted	Date issued
1/2008	Bush Fire Risk Management Annex A: Model Risk Management Plan Annex B: Bush Fire Risk Management Guidelines Annex I: Bush Fire Risk Plan exhibition and Approval Process	26 June 2008	30 September 2008
2/2007	Fire Trails	28 June 2007	1 August 2007
1/2007	Section 44 Payment and Reimbursement Criteria and Payment Procedures (Amended)	29 March 2007	3 April 2007
2/2006	Management of Bushfire Operations (Amended)	1June 2006	20 June 2006 16 October 2006
1/2006	Bush Fire Management Committees	1June 2006	20 June 2006
3/2005	Fire Mitigation Works Funding	2 June 2005	8 June 2005
1/2005	Aviation Support to Bush Firefighting	30 March 2005	18 May 2005
4/2003	Communication	20 November 2003	27 November 2003
3/2003	Safety Advisor - Standard Operating Procedure	25 September 2003	3 October 2003
2/2003	Ecologically Sustainable Development	20 February 2003	4 March 2003
6/2001	Notified Steps for the Establishment & Maintenance of Native Forest'	18 October 2001	31 October 2001
3/2001	Bushfire Smoke Management'	18 October 2001	24 October 2001
3/2000	Coordinated Firefighting OH&S'	23 March 2000	10 April 2000
2/2000	Residential Evacuation'	23 March 2000	10 April 2000
1/2000	Dispute Avoidance / Dispute Resolution (Policy & Guidelines)	23 March 2000	10 April 2000

9.4 Fire management circulars and memos

NPWS fire management circulars (current and archived) are available on the intranet. Fire management circulars issued for information only will be marked 'for information only'. Fire management circulars that are issued relating to policy change will be followed by the updating of the relevant policy or procedure in the 'control copy' of the Fire Management Manual which will be maintained on the intranet.

Deputy Chief Executive (DCE PWG) and Executive Director of Park Management (EDPM) Memos are also available on the intranet.

Circular no.	Circular name (current circulars only)	Date of issue	Status
2012/03	Recording of Asset Protection Zone works in BRIMS	31 May 2012	Current
2012/01	Distribution of the updated BRIMS User Manual (v3.0) and update to the NWPS BRIMS HR Reporting Tool	2 April 2012	Current
2011/16	EBMP – Enhanced Burshfire Management Program Business Rules	28 november 2011	Current
2011/15	Joint Operational Protocol for Remote Area Firefighting (RAF)	16 November 2011	Current
2011/14	Updating the pulbic website with and park closure information	31 October 2011	Current
2011/13	GIS Fire Applications – Fire Geodatabase, FireTools & MapDesk	27 September 2011	Current
2011/10	Automated Fire Trail Reporting using AMS	26 July 2011	Current
2011/09	Bidding Process – Bush Fire Mitigation grant Programmes	7 June 2011	Current
2011/08	New Fire Fighter Health and Fitness/TBA Guidelines & Forms	13 May 2011	Current
2011/07	New PWG Fire Uniform	11 May 2011	Current
2011/06	Work Safety Around Aircraft	11 May 2011	Current
2011/05	EOI for pr-emptive overseas firefighter deployment 2011	9 May 2011	Current
2011/04	Aviation Approved Operators List (AOL) 2010-11 Update	11 March 2011	Current
2011/03	Revised process for issuing hazard reduction certificates in BRIMS	15 March 2011	Current
2011/02	GIS Fire Applications – Fire Geodatabase, Fire Tools & MapDesk	23 February 2011	Current
2011/01	Nomex Fire Trousers	20 January 2011	Current
2010/20	Bush Fire Alert Messaging Guidelines	6 December 2010	Current
2010/19	Safety Alert – Identified error in SAI Global Standards Publication: HB 76:2010. Dangerous Good – Initial Emergency Response Guide	16 November 2010	Current
2010/18	New fire systems access request and support process – now managed through 'My IT Support'	17 November 2010	Current
2010/17	New ICON Features – New Field IAP and Situation Update Reports (SITUPS)	8 November 2010	Current
2010/16	Changes to the Fire Danger Rating System	10 November 2010	Current
2010/15	BRIMS Hazard Reduction Reporting tool Upgrade and Hazard Reduction Late Notification Process	19 October 2010	Current
2010/14	Emergency Management Plan template	23 November 2010	Current

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Circular no.	Circular name (current circulars only)	Date of issue	Status
2010/13	New 60kn/h speed limit on all Forests NSW unsealed gravel roads	5 October 2010	Current
2010/12	Pre-season reminders and new contact details	27 September 2010	Current
2010/11	Upgrade to NSW and ACT Forecast and Warning Systems	9 September 2010	Current
2010/10	Use of 'splat mats' for mopping up	27 August 2010	Current
2010/09	Fuel Container Colour Codes	27 August 2010	Current
2010/08	Fire trail Maintenance and AMS	10 August 2010	Replaced by FMC 2011/10
2010/07	Distribution of the Fire Management Manual 2010-11	10 September 2010	Information only
2010/06	Release of the Fire Incident Field Guide Sixth Edition 2010	30 August 2010	Current
2010/05	Fire Suppression Gels	10 May 2010	Current
2010/04	Fire Helmet Care and Replacement	7 May 2010	Current
2010/03	Fire Management Equipment Committee (FMEC)	7 May 2010	Current
2010/02	Compliance Date for Prescribed Burn Assessors	22 April 2010	Current
2010/01	Make Safe Funding from S44 Declarations	24 February 2010	Current
2009/09	Engaging Aircraft for Wildfire Operations 2009-10	19 October 2009	Current
2009/07	Distribution of the 2009-10 Fire Management Manual	10 September 2009	Information only
2009/06	Recording Attendance at Fire Preparedness Days	4 September 2009	Current
2009/05	Compliance Dates for Divisional Commander, Plan & Conduct Prescribed Burns	4 September 2009	Current
2009/04	New Prescribed Burning Plan Template and Guidelines	19 August 2009	Current
2009/03	Vehicle Entrapment Exercises	21 July 2009	Current
2009/02	Amendments to the Remote Area Deployment Policy in the NPWS Fire Management Manual	16 March 2009	Current
2009/01	IRTS Training Module on DECCW Citrix	15 Jan 2009	Current
2008/13	Fire & Incident Management Structure on PAWS	17 November 2008	Information only
2008/12	Corporate Badging on Existing Firefighting Uniform	17 November 2008	Current
2008/11	Alcohol and Other Drug Testing for Aviation Safety-Sensitive Personnel	22 October 2008	Current
2008/08	Managing Bulk Aviation Fuel	7 August 2008	Current
2008/07	Amendment to the Fire Incident Field Guide – Vehicle entrapment during Burn-over guidelines	31 July 2008	Current
2008/06	Release of the Fire Incident Field Guide	6 June 2008	Information only
2008/05	Fire and incident systems support and new system access form	6 June 2008	Information only
2008/02	Bush Fire Risk Management Plans and implications for DECCW Reserve Fire Management Strategies	3 April 2008	Information only
2007/12	Important changes to fire mitigation works funding	16 December 2007	Information only
2007/10	Correct installation of drip torch wands	1 November 2007	Information only
2007/07	Bush fire management process explained	17 September 2007	Information only
2007/06	Satellite distress beacons are going digital	29 July 2007	Information only
2007/05	Fire Preparedness Day Guideline (Prototype)	16 July 2007	Information only
2001/06	Macarthur Forest Fire Meter Under-predicts: Important Safety Message	25 October 2001	Information only
2001/04	Vehicle Entrapment Exercise	24 October 2001	Incorporate into Fire Preparedness Day Resource Kit
2001/02	Proban: It does not come Out in the Wash	17 July 2001	Information only
2001/01	How Far Away is the Fire Front: serious over-estimations by experienced firefighters	17 July 2001	Incorporate into Fire Preparedness Day Resource Kit

9.5 Relevant legislation

9.5.1 Introduction

1153 A number of Acts and Regulations govern the powers and responsibilities of the DCE PWG and NPWS in respect to fire management and suppression:

- *Coroners Act 2009*
- *Crimes Act 1900*
- *Dangerous Goods (Road and Rail Transport) Act 2008 & Regulations 2009*
- *Environmental Planning and Assessment Act 1979* and *SEPPs*
- *Environment Protection and Biodiversity Conservation Act 1999 & Regulations 2000 (Commonwealth)*
- *Fire Brigades Act 1989*
- *National Parks and Wildlife Act 1974 & Regulations 2002*
- *Native Vegetation Act 2003*
- *Occupational Health and Safety Act 2000*
- *Protection of the Environment Operations Act 1997*
- *Rural Fires Act 1997 & Regulations 2008*
- *State Emergency and Rescue Management Act 1989*
- *Threatened Species Conservation Act 1995*
- *Wilderness Act 1987*
- *Workers Compensation (Bush Fire, Emergency and Rescue Services) Act 1987*
- *Workplace Injury Management and Workers Compensation Act 1998*

1154 In addition, OEH has specific obligations under the *Public Sector Employment and Management Act 2002* and the *Public Finance and Audit Act 1983*. These are equally as applicable to firefighting as to normal NPWS operations. The regulations of both Acts affect the hire and purchase of equipment and contract services, and indicate what constitutes a claimable item versus non-claimable expenses. Procedures outlined within the *Finance Manual* explain the requirements under both of these Acts. The *Human Resources Delegations Manual* outlines the powers delegated to NPWS officers in relation to the authorising of financial and personnel matters.

1155 Where disputes arise about the interpretation of any legislation, refer to the original legislation and consult with the Legal Services Branch, or Employee Relations where the matter involves a OEH officer, or the Occupational Health and Safety Unit if it involves interpretation of OHS or workers compensation legislation.

9.5.2 Overview of legislation

Coroners Act 2009

The *Coroners Act 2009* requires coroners to hold inquests into deaths and suspected deaths and inquiries into fires and explosions. The legislation specifies when a coroner must hold an inquiry into fires and explosions. Where a police officer informs the coroner that a fire has

destroyed or damaged any property in NSW, an inquiry must be held. If the coroner believes that the circumstances of the fire have been sufficiently disclosed, the coroner may dispense with holding an inquiry. A coroner must hold an inquiry if requested by NSW Fire and Rescue for a fire in a fire district, or by the RFS Commissioner in the case of a bushfire, or by the Minister for the Environment or the State Coroner.

Crimes Act 1900

The *Crimes Act 1900* describes criminal offences in NSW. Within the Act, there are provisions relating to crimes using fire. It is an offence to:

- maliciously destroy or damage property by fire
- maliciously destroy or damage property by fire with the intention of causing bodily harm to another person
- maliciously destroy or damage property with the intention of endangering the life of another person
- make a threat that property will be damaged or destroyed, that the life of another person is endangered or that bodily injury will occur, and
- make or send a statement that is likely to make another person fear for the safety of a person or property or both.

Dangerous Goods (Road and Rail Transport) Act 2008 & Regulations 2009

The *Dangerous Goods (Road and Rail Transport) Act 2008* and associated regulations set out various responsibilities and controls in relation to the road transport of dangerous goods. The legislation is jointly administered by OEH and NSW WorkCover (with OEH responsible mainly for on-road transport issues).

The *Australian Code for the Transport of Dangerous Goods by Road and Rail* (7th edition) sets out the technical requirements for classifying, identifying, packing, labelling and transporting dangerous goods. The ADG Code is given effect by the transport legislation.

Environmental Planning and Assessment Act 1979 & Regulations 2000

Under the *Environmental Planning and Assessment Act 1979*, OEH is the determining authority for all fire management activities on NPWS-managed land. A determining authority has a duty to consider the environmental impact of its activities and shall not carry out an activity or grant approval for an activity that is likely to significantly affect the environment, including threatened species, unless an environmental impact statement has been considered. If an activity will affect the environment, the determining authority should impose conditions on or modify or stop the proposed activity.

The *Rural Fires Act 1997* and *Rural Fires and Environmental Legislation Amendment Act 2002* provide that certain planning instruments and provisions of the Environmental Planning and Assessment Act 1979 no longer apply to emergency firefighting acts and Part 5 does not apply to bushfire hazard reduction work on most lands if the activity is carried out in accordance with the *Bush Fire Environmental Assessment Code*.

OEH has taken key components of this legislation and incorporated it into the *Environmental Planning and Assessment Manual* and the Proponents Guidelines for the Review of Environmental Factors which must be complied with in hazard reduction work.

The *Environmental Planning and Assessment Regulation 2000* relates to factors to be taken into account by a determining authority when assessing the environmental impact of activities under the *Environmental Planning and Assessment Act 1979*. OEH has taken key components of this legislation and incorporated it into the *Environmental Planning and Assessment Manual.* The Department of Natural Resources has published guidelines called *'Is an EIS Required?'.*

OEH has refined those guidelines in the *Proponents' Guidelines for the Review of Environmental Factors*, which must be complied with in hazard reduction work.

State Environmental Planning Policies

State Environmental Planning Policies (SEPPs) are made by the Minister for Planning under the *Environmental Planning and Assessment Act 1979* and specify policies and procedures to be applied when dealing with environmental issues which are significant to the state and people of NSW.

A number of SEPPs affect fire management planning within and adjoining NPWS-managed lands including:

SEPP 4: Development Without Consent and Miscellaneous Complying Development (Permits OEH to carry out bushfire hazard reduction activities on NPWS-managed lands that are in accordance with a BFMC bushfire risk management plan).

SEPP 19: Bushland in Urban Areas (Permits vegetation disturbance within identified SEPP 19 bushland to be undertaken for bushfire hazard reduction purposes).

SEPP 14 (Coastal Wetlands) and SEPP 26 (Littoral Rainforest) do not apply to land which has been reserved under the *National Parks and Wildlife Act 1974* with the exception of regional parks and karst conservation areas, and bushfire hazard reduction work may be assessed and carried out in accordance with the *Bush Fire Environmental Assessment Code*.

SEPP 14 and SEPP 26 do apply to land which has been acquired under Part 11 but not reserves under the *National Parks and Wildlife Act 1974*. The *Bush Fire Environmental Assessment Code* does not apply to this land and a Review of Environmental Factors will be required.

Environment Protection and Biodiversity Conservation Act 1999 & Regulations 2000 (Commonwealth)

The objectives of the *Environment Protection and Biodiversity Conservation Act 1999* and associated regulations are to:

- provide for the protection of the environment, especially those aspects of national environmental significance
- promote ecologically sustainable development through the conservation and ecologically sustainable use of natural resources
- promote conservation of biodiversity
- promote a cooperative approach to protecting and managing the environment, which involves governments, the community, landholders and indigenous peoples
- assist in the cooperative implementation of Australia's international environmental responsibilities, and
- recognise the role of indigenous people in the conservation and ecologically sustainable use of Australia's biodiversity.

Fire Brigades Act 1989

The *Fire Brigades Act 1989* relates to the protection of persons and property from fire. Fire districts may be declared over land within a local government area and NPWS-managed lands. In addition, the Act covers the authority of the officer in charge and the actions that may be undertaken by an officer in charge of a fire to protect and save life and property, and to extinguish a fire.

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National Parks and Wildlife Act 1974 & Regulations 2002

Under the *National Parks and Wildlife Act 1974*, the Director General* is responsible for the care, control and management of national parks, nature reserves, Aboriginal areas, historic sites, karst conservation reserves, regional parks and state conservation areas. The Director General* is also responsible for the protection and care of native fauna and flora and Aboriginal places and relics throughout NSW. As a result of enactment of the *Rural Fires and Environmental Assessment Legislation Amendment Act 2002*, certain provisions of the *National Parks and Wildlife Act 1974* do not apply to, or in respect of, the carrying out of an emergency firefighting act.

The *National Parks and Wildlife Regulation 2002* describes the permitted and prohibited activities in areas of NPWS-managed lands. The regulation covers closure of parks and reserving parts of a park for particular uses as well as the authority to prohibit certain activities, such as the lighting of fires.

*The Director General is now called the Chief Executive, OEH

Native Vegetation Act 2003

The *Native Vegetation Act 2003* governs the clearing of native vegetation in NSW. Clearing is not permitted on NPWS-managed lands. However, there are provisions for clearing of these lands where the clearing is authorised under the *Rural Fires Act 1997* or the *State Emergency and Rescue Management Act 1989*.

Occupational Health and Safety Act 2000 & Regulations 2001

The *Occupational Health and Safety Act 2000* covers the health, safety and welfare of persons at work. Every employer has the responsibility of ensuring the health, safety and welfare of all employees and other people in the workplace by providing safe plant and systems of work, and training and supervision. Employees also have a responsibility to take care of others in the workplace. In the event of an accident, the proper authorities must be notified as prescribed in the regulation.

The *Occupational Health and Safety Regulation 2001* sets out specific provisions to ensure the requirements of the *Occupational Health and Safety Act 2000* are met.

Protection of the Environment Operations Act 1997

The *Protection of the Environment Operations Act 1997* and subsequent *Protection of the Environment Operations Amendment Act 2005* have provisions to protect the NSW environment from human activities. In particular, this relates to policies that need to be taken into account by:

- a determining authority when considering the likely impact of an activity under the *Environmental Planning and Assessment Act 1979*; or
- a public authority when there is an inconsistency with the authority's statutory or legal obligations.

The Act also enables the Environment Protection Authority to prohibit the burning of fires in the open or in incinerators.

Rural Fires Act 1997 & Regulations 2008

The *Rural Fires Act 1997* established the RFS, comprising the Commissioner and other staff of the RFS, fire control officers and deputy fire control officers, and volunteer rural firefighters. The Act also has provisions relating to:

- the prevention, mitigation and suppression of bushfires
- the coordination of bushfire firefighting and bushfire prevention
- the protection of persons and property, and

- the protection of the environment by requiring that activities are ecologically sustainable.

The responsibilities of the BFCC are specified in the Act. The *Rural Fires Act 1997* was amended by the *Rural Fires and Environmental Assessment Legislation Amendment Bill 2002* with respect to bushfire prone land, bushfire hazard reduction and other matters, including:

- empowering the Commissioner to require or carry out bushfire hazard reduction work on public land, including NPWS-managed lands
- introducing a bushfire hazard complaints process
- requiring subdivision or certain developments on bushfire prone land to meet certain fire mitigation and protection standards, and
- requiring annual reporting by NPWS on bushfire hazard reduction.

The *Rural Fires Regulation 2008* details the eligibility for membership of and the functions of BFMCs. The regulation specifies when it is permitted to burn in rural fire districts. Safety issues for rural fire districts, fire safety equipment, roadside fire protection, lighting of fires for cooking, in rural areas are detailed under the regulation. There are clauses setting out the types of notices and the manner in which they are issued.

State Emergency and Rescue Management Act 1989

The *State Emergency and Rescue Management Act 1989* relates to coordinated arrangements for managing emergencies across NSW. The Act contains provisions for coordinating the State Emergency Management Committee and preparing the NSW State Disaster Plan (Displan). The Act also details the provisions for the declaration of a state of emergency.

Threatened Species Conservation Act 1995

Updated by the Threatened Species Legislation Amendment Act 2004, the *Threatened Species Conservation Act 1995* provides for the protection of all threatened plants and animals native to NSW (with the exception of fish and marine plants). One of the objects of this Act is to ensure that the impact of any action affecting threatened species, populations and ecological communities is properly assessed. The Act also provides for the conservation and recovery of threatened species and for the abatement of threats to species, populations and ecological communities. As a result of enactment of the *Rural Fires and Environmental Assessment Legislation Amendment Act 2002*, certain provisions (stop work orders) of the *Threatened Species Conservation Act 1995* do not apply to, or in respect of, the carrying out of an emergency firefighting act.

Wilderness Act 1987

The *Wilderness Act 1987* provides for the identification, protection and management of wilderness areas. OEH will manage wilderness areas so as to:

- restore and protect the unmodified state of the areas and their plant and animal communities
- ensure the areas can evolve without human interference, and
- enable solitary and self-reliant recreation to take place.

The use of fire can be employed to achieve these objectives.

Workers Compensation (Bush Fire, Emergency and Rescue Services) Act 1987

Amended by the *Workers Compensation Legislation Amendment Act 2000*, the *Workers Compensation Legislation Further Amendment Act 2001* and the *Workers Compensation Legislation Amendment Act 2005*, the *Workers Compensation (Bush Fire, Emergency Rescue Services) Act 1987* provides for OEH personnel who assist in firefighting activities within a rural

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fire district under a captain or deputy captain of a rural fire brigade or a group captain or deputy group captain of any rural fire brigades, to be covered by workers compensation.

Workplace Injury Management and Workers Compensation Act 1998

The objectives of the *Workplace Injury Management and Workers Compensation Act 1998* are to:

- assist in securing the health, safety and welfare of workers and, in particular, preventing work-related injury
- provide for treatment, management and rehabilitation of injuries
- provide injured workers and their dependants with income support, and
- ensure contributions by employers are commensurate with the risks faced, taking into account strategies and performance in injury prevention, injury management, and return to work.

10.0 Appendix 4

10.1 Definitions

The following definitions are taken from the Australasian Fire and Emergency Service Authorities Council (AFAC) *Bushfire Glossary* and terminology specific to NPWS operations.

A B C D E F G H I J K L M N O P Q R S T U V W

Term	Definition
A	
Accelerant	Any substance (such as oil, gasoline, etc.) that is applied to a fuel bed to expedite the burning process.
Adaptor	A fitting used to couple different sized hoses, hoses of the same size with different threads, or different types of couplings, or to connect the male to male, or female to female parts of the same type of coupling.
Adsorption	The taking in of water vapour from the air by dead plant material.
Advance burn	A prescribed fire that reduces fuel through a forest area before felling operations. It is intended to improve the safety of timber harvesting operations and as a silvicultural tool to protect lignotubers and standing trees.
Advancing fire	That portion of the fire with rapid fire spread and higher intensity which is normally burning with the wind and/or upslope.
Aerial detection	The discovering, locating and reporting of fires from aircraft.
Aerial fuels	See *Elevated fuels.*
Aerial ignition	Ignition of fuels by dropping incendiary devices or materials from aircraft.
Aerial ignition device (AID)	Inclusive term applied to equipment designed to ignite Wildland fuels from an aircraft.
Aerial Observer	See *Air Observer.*
Aerial reconnaissance	Use of aircraft for detection of fires and observing fire behaviour, values at risk, suppression activity, and other critical factors to facilitate command decisions on strategy and tactics needed for fire suppression.
Aerosol	Airborne solid or liquid particles dispersed or suspended in a gas stream.
Agency representative	An individual, allocated to an incident from an assisting agency, who has delegated full authority to make decisions on all matters affecting that agency's participation at the incident.
AIIMS structure	The combination of facilities, equipment, personnel, procedures, and communications operating within a common organisational structure with responsibility for the management of allocated resources to effectively accomplish stated objectives relating to an incident (Australasian Inter-service Incident Management System, AIIMS).
Air attack	The direct use of aircraft in the suppression of bushfire.
Air Attack Supervisor (AAS)	Primarily responsible for the safety and efficient tactical coordination of aircraft operations when fixed and/or rotary firebombing aircraft are operating at a fire (Air Attack Supervisor Training Manual).
Airbase Manager (ABM)	An experienced, trained person who is appointed to manage all the functions and personnel on an airbase or helicopter base.
Air mass	A meteorological term referring to an extensive body of air within which the conditions of temperature and moisture in a horizontal plane are essentially uniform.
Air Observer (AOB)	The primary role of the Air Observer is to aerially obtain intelligence to assist the planning of fire suppression operations. (RFS)
Air operations	The use of aircraft in support of an incident for the purposes of suppression, transportation of personnel, equipment or supplies, or for aerial reconnaissance.
Air Operations Manager (AOM)	The Air Operations Manager position is responsible for overall coordination of air operations and air support activities in support of an incident.
Aircraft Officer (AOF)	The Aircraft Officer is responsible for ground operations and overall provision of support, enabling a safe and efficient air operation to be conducted.

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Term	Definition
Airside	The parts of an airport not normally open to unauthorised people. It comprises the apron, taxiways, runways and the areas containing them.
Allocated resources	Resources working at an incident (AIIMS).
Anchor point	An advantageous location, usually a barrier to fire spread, from which to start constructing a fire line. The anchor point is used to minimize the chance of being flanked by the fire while the line is being constructed (NWCG)
Anemometer	A meteorological instrument used to measure wind speed.
Anti-cyclone (high)	An area of relatively high atmospheric pressure. In the southern hemisphere, pressure gradients and the earth's rotation will cause air to move in an anti-clockwise direction around the anti-cyclone.
Aqueous film forming-foam (AFFF)	A synthetic amber coloured liquid concentrate mixed with water to form an agent that is capable of forming water-solution films on the surface of flammable liquids that prevent the escape of fuel vapours, excludes oxygen and maintain the surface when disturbed (self healing).
Arduous task-based assessment	An annual fitness test or task-based assessment that can be attempted once medically cleared. It consists of a 4.83 km walk with a 20.4 kg pack (or 15.4 kg pack for modified) in 45 minutes on flat ground.
Area ignition	Ignition of several individual fires throughout an area, either simultaneously or in rapid succession, and so spaced that they add to and influence the main body of the fire to produce a hot, fast-spreading fire condition. Also called simultaneous ignition.
Area of origin	General location where the fire started.
Arson	The deliberate setting of a fire where the intent of the person responsible was to cause harm or destruction to life or property.
Aspect	The direction towards which a slope faces.
Asphyxiates	Substances which interfere with the respiratory process.
Assembly area	An area where resources are organised and prepared for deployment. It includes the provision of welfare and equipment maintenance facilities. Non-preferred term. See *Staging Area*
Assessment	The process of determining if an individual has the prescribed skills, knowledge and experience needed to acquire a specific capability.
Asset Protection Zone (APZ)	An area surrounding a residential or other significant building, managed to reduce the bushfire hazard to an acceptable level. The width of an APZ will vary depending on slope and construction type.
Assets	Anything valued by people which includes houses, crops, forests and, in many cases, the environment.
Assets at risk	The natural resources, cultural heritage, or improvements that may be jeopardised if a fire occurs. Examples include threatened species habitat, rainforests, forestry compartments, human-built structures or infrastructures, park information signs, transmission poles etc., and may also include scenic values. For the fire manager, it may also include natural values that may be threatened by a fire (e.g. water catchment quality).
Assisting agency	An agency directly contributing suppression, support or service resources to another agency.
Atmospheric stability	The degree to which the atmosphere resists turbulence and vertical motion.
Attack time	See *Elapsed time.*
Attack, methods of	Direct attack: to extinguish a fire by directly applying water, fire suppression chemicals or pushing burning fuel into the fire area with the use of hand tools or machinery. Parallel attack: to construct a fire control line adjacent to a flame front and then burn out the intervening area. Indirect attack: to construct a fire control line some distance from the flame front and then burn out the intervening area. Head attack: to knock down the fire at its fastest and hottest section and then move to the sides of the fire to control it. Flank attack: to commence the control of the fire by attacking the sides and moving to the head of the fire.
Australasian Inter-service Incident Management System (AIIMS)	A nationally adopted structure to formalise a coordinated approach to emergency incident management.

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Term	Definition
Automatic dispatch	See *Pre-planned dispatch.*
Automatic weather station (AWS)	The Bureau's standard AWSs use sensors to monitor temperature, humidity, wind speed and direction, pressure and rainfall. Various advanced sensors are available for specialised applications. These sensors can monitor cloud height (ceilometers), visibility, present weather, thunderstorms, soil temperature (at a range of depths) and terrestrial temperature. (Developed from BOM.)
Available fuel	The portion of the total fuel that would actually burn under various environmental conditions.
Available resources	The resources at an incident and available for allocation at short notice. (AIIMS)
B	
Back	See *Rear.*
Back-burn	A fire started intentionally along the inner edge of a fire line to consume the fuel in the path of a bushfire.
Backfire	See definitions for 'Heli torch' and 'Ignition pattern' and 'Indirect attack'.
Backing fire	The part of a fire which is burning back against the wind, where the flame height and rate of spread is minimal.
Bark fuel	The flammable bark on tree trunks and upper branches.
Bark heaps	Accumulations of bark and branch material resulting from timber harvesting operations. Soil may be mixed with bark heaps, but generally the heap is formed by a machine dropping fresh bark on the top of the heap.
Barometer	A meteorological instrument used to measure atmospheric air pressure. Expressed in hectopascals.
Basal accumulation	Bark fallen from a tree and forming an exceptionally high and localised accumulation of fine fuel.
Base camp	A location where personnel are accommodated and fed for a period of time. A base camp usually contains catering, ablution and accommodation facilities, a water supply and a lighting system, and may include other facilities such as car parking, maintenance and servicing. (AIIMS)
Bay(s)	A marked indentation in the fire perimeter usually located between 2 fingers.
Beaufort wind scale	A system for estimating wind speeds based on observation of visible wind effects. A series of descriptions of visible wind effects upon land objects or sea surfaces is matched with a corresponding series of wind speed ranges, each being allocated a *Beaufort number.*
Being controlled	See *Fire status.*
Biodiversity	The variety of life forms, the different plants, animals and micro-organisms, the genes they contain and the ecosystems they form.
Blacking out	See Mop-up.
Blank cap	The metal cap used on delivery outlets and on the suction inlet of the pump to prevent discharge of water.
Blow down	See Wind throw.
Blow up	Sudden increase in fire line intensity or rate of spread of a fire sufficient to preclude direct control or to upset existing suppression plans. Often accompanied by violent convection and may have other characteristics of a fire storm. (NWCG)
Bole	The trunk of a tree.
Bole damage	The damage to the trunk of a living tree by fire, mechanical equipment or disease.
Bracken	Bracken fern varies significantly in height and density. If bracken is generally upright (either alive or dead) with the majority of its biomass in the top half of the plant and only the stems in touch with the ground, then it is considered to be part of the elevated fuel. If however, it has collapsed and most of its biomass is in touch with the ground, then it is considered to be near-surface fuel.
Branch	A tapered pipe, fitted to the end of a hose line, which increases the velocity (converting pressure energy to kinetic energy) of the water or foam solution travelling through the hose, and forms an effective firefighting jet or spray.
Branch Duty Officer (BDO)	The Branch officer rostered to take responsibility for initial incident response, until an Incident Controller is appointed.
Branch	Administrative unit of NPWS, comprised of operational regions and functional sections.

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Term	Definition
Breakaway	The points at which a fire, after it has been contained, escapes into unburnt areas across a fire line or fire edge.
Breeching	A device to divide 1 hose line into 2 or collect 2 hose lines into 1.
Briefing	A general overview of an operation.
Broad area hazard reduction	Large-scale removal of selected fuel before the onset of a bushfire danger period.
Broadcast burning	See *Prescribed burning* (preferred term).
Buffer	A strip or block of land on which the fuels are reduced to provide protection to surrounding lands.
Buildings	The collective term for facilities and premises operated or owned by OEH, including offices, workshops, residences, historic buildings, camping facilities and visitor centres.
Bulk water carrier	A large tanker used for replenishing water to firefighting tankers.
Burn back	The effect of flames spreading back over an area previously extinguished. See *Reburn*
Burn off	See *Burning off*
Burn off illegal (BOI)	Any prescribed burn undertaken **without** authorisation or permission from a fire authority during the permit period
Burn off legal (BOL)	Any prescribed burn undertaken **with** authorisation or permission from a fire authority or during the **non** permit period
Burn over	A section of fire that overruns personnel and/or equipment.
Burn plan	The plan which is approved for the conduct of prescribed burning. It contains a map identifying the area to be burnt and incorporates the specifications and conditions under which the operation is to be conducted. Also referred to as 'Prescribed burn plan'.
Burning brands	Lofted burning material such as bark, usually flaming.
Burning conditions	The state of the combined components of the fire environment that influence fire behaviour and fire impact in a given fuel type. Usually specified in terms of such factors as fire weather elements, fire danger indices, fuel load and slope.
Burning off	Generally setting fire – with more or less regard to areas carrying unwanted vegetation such as rough grass, slash and other fuels.
Burning out	To intentionally light fires to consume islands of unburned fuel inside the fire perimeter.
Burning program	A program of prescribed burns scheduled for a designated area over a nominated time, normally looking ahead over one fire season (for the coming spring to the following autumn), but can also look ahead 5 years or more.
Burning rotation	The period between re-burning of a prescribed area for management purposes.
Burning unit	A specified land area for which prescribed burning is planned.
Burnover	See *Burn over.*
Bush	A general term for forest or woodland, but normally used to describe indigenous forest.
Bushfire	A general term used to describe a fire in vegetation.
Bushfire alert	A promulgation by the Commissioner that there is a very high probability of a bushfire occurring in designated area(s) due to extremes of weather and prevailing drought indicators.
Bushfire control plan	See *IAP.*
Bush Fire Coordinating Committee (BFCC)	A committee established under part 3 of the *Rural Fires Act 1997* to coordinate the planning for bushfire prevention and coordinated bush firefighting.
Bushfire Danger Period	The statutory Bushfire Danger Period runs from October 1st to March 31st, however it may vary due to local conditions.
Bushfire hazard	The condition of fuel in an area and the associated difficulty of suppression should the fuel ignite.
Bushfire hazard reduction work	The establishment or maintenance of fire breaks on land. It includes the controlled application of appropriate fire regimes or other means for the reduction or modification of available fuels within a predetermined area to mitigate against the spread of a bushfire, but does not involve the construction of trails.

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Term	Definition
Bush Fire Management Committee (BFMC)	Constituted under the *Rural Fires Act 1997* for coordinated fire management and operations within a rural fire district.
Bushfire management plan	A plan of operations or a bushfire risk management plan prepared by a Bush Fire Management Committee.
Bushfire management units	Management areas of a variable size that define containment blocks in the event of a bushfire. Alternatively they have also been designated as areas of specific ecosystem types defined by management authorities in order to monitor the long-term effects of fire upon those areas.
Bushfire management zones (BFMZ)	Management areas (usually subsets of bushfire management units) where a specified fire management operational objective, strategy and performance indicator has been developed to mitigate against the threat of a bushfire. Note: a bushfire management unit is usually a monitoring and containment block while a BFMZ is a sub-unit of a bushfire management unit where fire managers undertake activities, such as prescribed burning, in order to achieve a set outcome (e.g. provide protection or slow the advance of a bushfire).
Bushfire record	A record of the occurrence of a bushfire in a reserve.
Bushfire risk management plan	A plan prepared by a Bush Fire Management Committee for the reduction of bushfire hazards within a rural fire district.
Bushfire threat	A sum of all factors that affect the ignition, spread and suppression of a bushfire and the damage to assets and natural and cultural heritage that may result.
Bushfire	A general term used to describe a fire in vegetation.
Bushfire danger period	A period of the year either established by legislation or declared by the relevant agency, when restrictions are placed on the use of fire due to dry vegetation and the existence of conditions conducive to the spread of fire.
Bushfire management	All those activities directed to prevention, detection, damage mitigation, and suppression of bushfires. Includes bushfire legislation, policy, administration, law enforcement, community education, training of firefighters, planning, communications systems, equipment, research, and the multitude of field operations undertaken by land managers and emergency services personnel relating to bushfire control. (WA BF) See Fire management (preferred term).
Bushfire Risk Information Management System (BRIMS)	A computer program used to track hazard reduction proposals and activities, permits, complaints, certificates and other related information.
Bush–urban interface	The line, area or zone where structures and other human development adjoin or overlap with undeveloped bushland. Also known as the urban interface, urban–bush interface or urban–rural interface.
Byram-Keetch Drought Index (BKDI)	See *Keetch-Byram Drought Index*
C	
Cache	A predetermined complement of supplies stored in a designated location. (See CIMS)
Campaign fire	A fire normally of a size or complexity that requires substantial firefighting resources, and possibly several days or weeks to suppress.
Candle (candling)	A tree (or small clump of trees) is said to ‘candle’ when its foliage ignites and flares up, usually from the bottom to top.
Candle bark	Long streamers of bark that have peeled from some eucalypt species that form fire brands conducive to very long distance spotting.
Canopy	The crowns of the tallest plants in a forest – the over-storey cover.
Canopy cover	Canopy cover refers to 2 dimensions (i.e. plan view, area coverage)
Canopy density	Canopy density refers to 3 dimensions (i.e. mass, volume)
Central ignition	A method of prescribed burning in which fires are set in the centre of an area to create a strong convective column. Additional fires are then set progressively closer to the outer control lines causing indraft winds to build up. This has the effect of drawing the fires towards the centre.
Chaining	The process of flattening vegetation (usually mallee or scrub) by dragging a heavy chain or cable between 2 large tractors or bulldozers.
Charged line	A line of fire hose filled with water under pressure and ready to use.

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Term	Definition
CIMS	Coordinated Incident Management System used in New Zealand.
Class 1, 2 or 3 fire	See Fire classification.
Class A foam	See *Foam Class A.*
Class labels	Class labels identify the type of hazardous material being stored or transported. These are grouped under broad classifications according to the predominant type of risk involved.
Climate	The atmospheric conditions of a place over an extended period of time.
Clinometer	An instrument used to measure the angle of a slope.
Cloud cover	The amount of sky covered or obscured by cloud, expressed in eighths. 8 eighths is complete cloud cover.
Coarse fuels	Dead woody material, greater than 25 mm in diameter, in contact with the soil surface (fallen trees and branches). Some researchers categorise forest fuels as: fine <6 mm diameter; twigs 6–25 mm diameter; coarse >25 mm diameter.
Code of Practice	Document giving methods developed to assist compliance with Acts and Regulations in the performance of work.
Cold front	A cold front is the delineation between cold polar air moving towards the equator and undercutting warm tropical air moving poleward. The temperature differences across a cold front can be extreme and associated with strong winds. The warm tropical air is forced to rise and become unstable with the development of large cumuliform clouds. Severe weather such as thunderstorms, squall lines and severe turbulence may accompany these cold fronts. (BOM)
Cold trailing	A method of determining whether or not a fire is still burning, involving careful inspection and feeling with the hand, or by use of a hand-held infrared scanner, to detect any heat source.
Collecting head	A collecting head is used to collect (usually from 2 to 4) lines into the suction inlet of a pump.
Combat agency/authority	See Control authority.
Combustible matter	Any matter or substance capable of ignition by the application of heat, fire, flame or sparks or that can spontaneously combust.
Combustion	Rapid oxidation of fuels producing heat, and often light.
Command	The direction of members and resources of an agency in the performance of the agency's role and tasks. Authority to command is established in legislation or by agreement within an agency. Command relates to agencies and operates vertically within an agency.
Communications centre	An office designated to disseminate information pertinent to fire management operations.
Communications plan	Details the methods and systems for people to communicate with each other, the incident management structure, including the actual radio channels/mobile phone numbers. (AIIMS)
Compartment	(1) Forestry definition – A basic administrative unit of a managed forest. (2) Building definition – An enclosed space with floor, walls and ceiling.
Competency	Skills and knowledge and their application within an occupation to the standard of performance required in the workplace. (Vic report)
Conduction	See Heat transfer.
Contained	The status of a bushfire suppression action signifying that a control line has been completed around the fire, and any associated spot fires, which can reasonably be expected to stop the fire's spread. (NWCG)
Contour lines	Contour lines connect points of equal elevation on a topographical map.
Control	The overall direction of response activities in an emergency situation. Authority for control is established in legislation or in an emergency response plan, and carries with it the responsibility for tasking and coordinating other agencies in accordance with the needs of the situation. Control relates to situations and operates horizontally across agencies.
Control authority	The agency, service, organisation or authority with legislative responsibility for control of the incident. (Also referred to as the responsible authority or agency.) (AFAC)
Control line	See Fire line.
Controlled	The stage during fire suppression activities at which the complete perimeter of a fire is secured and no breakaway is expected.

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Term	Definition
Controlled burning	See Prescribed burning.
Convection	1. As applied in meteorology, atmospheric motions that are predominantly vertical, resulting in vertical transport and mixing of atmospheric properties; distinguished from advection. 2. As applied in thermodynamics convection, along with conduction and radiation, is a principal means of energy transfer.
Convection burn	See Central ignition.
Convection column	The rising column of smoke, ash, burning embers and other particle matter generated by a fire.
Convective activity	General term for manifestations of convection in the atmosphere, alluding particularly to the development of convective clouds and resulting weather phenomena, such as showers, thunderstorms, squalls, hail, and tornadoes. (NWCG)
Convergence zone	1. The area of increased flame height and fire intensity produced when 2 or more fire fronts burn together. 2. In fire weather, that area where 2 winds come together from opposite directions and are forced upwards often creating clouds and precipitation. (NWCG) See also Junction zone.
Convoy	2 or more vehicles driving together under the control of a single Convoy Leader.
Coordinated firefighting plans	Plans for coordinated arrangements for fire prevention, detection and suppression, prepared by Bush Fire Management Committees. See Bushfire management plan.
Coordination	The bringing together of agencies and elements to ensure effective response to an incident or emergency. It is primarily concerned with the systematic acquisition and application of resources in accordance with the requirements imposed by the emergency or emergencies. Coordination relates primarily to resources and operates both vertically within an agency as a function of the authority to command, and horizontally across agencies as a function of the authority to control.
Cordon	A cordon is the means to maintain an area and is used to restrict movement into and out of an area.
Coupe	A defined forest area in which timber harvesting takes place.
Crew	The basic unit of a bushfire suppression force. It normally consists of 2 or more personnel.
Crew leader	Person responsible for the supervision and management of crews
Critical burnout time	Total time a fuel can burn and continue to feed energy to the base of a forward-travelling convection column.
Critical fire season	The period during the year that has a high incidence of weather patterns that cause sustained high-to-extreme fire behaviour. This is often indicated by the fire history as the period when large fire events have occurred in the past. The timing of this period will vary across the state.
Critical habitat	Habitat declared to be critical habitat under the *Threatened Species Conservation Act 1995* (i.e. habitat critical to the survival of a species, population or an ecological community).
Critical incident stress	Unusually strong emotional reactions which have the potential to interfere with the ability of personnel to function, either at the incident scene or later, arising from any situation faced during operations.
Critical incident stress debriefing	The process in which teams of professional and peer counsellors provide emotional and psychological support to incident personnel who are or have been involved in a critical (highly stressful) incident.
Critical incident	An event involving death, serious injury or a ‘near miss’ that threatens the safety of staff and others.
Cross bearings	Intersecting lines of sight from 2 or more points on the same object; used to determine the location of bushfire from lookouts.
Crown fire	A fire that advances from top to top of trees or shrubs.
Crown scorch	Browning of the needles or leaves in the crown of a tree or shrub caused by heat from a fire.
Crowning	A fire ascending into the crowns of trees and spreading from crown to crown.
Crowning potential	A probability that a crown fire may start, calculated from inputs of foliage moisture content and height of the lowest part of the tree crowns above the surface. (NWCG)
Cultural heritage	Aboriginal places and objects as defined by the *National Parks and Wildlife Act 1974* or the Aboriginal community, and historic sites, structures and features.
Curing	Drying and browning of herbaceous vegetation due to mortality or senescence.

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Term	Definition
Currency	Currency is assessed through periodic evaluations of skills and knowledge required for a unit of competence. This is particularly important for competencies that are critical to safety, particularly where relevant skills and knowledge are not frequently practiced.
D	
Dead fuel	Fuels with no living tissue in which moisture content is governed almost entirely by absorption or evaporation of atmospheric moisture (relative humidity and precipitation). (NWCG)
Debriefing	A review of operations during or after an event that analyses what happened, outlines the consequences and makes recommendations. Debriefings can take the form of: Shift debrief — conducted at regular intervals throughout a fire management operation, particularly at the end of each shift. Local debrief — conducted after an event and with limited personnel. Generally run to an agenda and records are made of actions/recommendations. Usually single agency. Operational debrief — can be single/dual/multi-agency in which everything is written down and a formal report produced that has wide distribution and numerous recommendations. Has a chairperson and set formal agenda.
Declared incident	A fire may be declared an incident for the purpose of industrial relations awards (see 4.2.2). Different conditions apply when an incident is a *declared incident* as opposed to an *incident* which has a broader definition (see *Incident*)
Deep-seated fire	A fire burning far below the surface – in duff, mulch, peat or other combustibles – as opposed to a surface fire.
Defensive strategy	A firefighting strategy used where the protection of life and assets is a priority but a fire is: (i) located in inaccessible or remote location OR (ii) too intense to be safely or effectively attacked directly.
Dehydration	Excessive loss of water from the body's tissues. Dehydration may follow any condition in which there is a rapid depletion of body fluids.
Delayed aerial ignition device (DAID)	An incendiary device that will ignite after a pre-determined time.
Deliberate fire	A fire resulting from a person placing burning material to cause ignition. The intent of the person may have been to cause harm or destruction to life or property (arson, criminal offence) or to modify fuels or vegetation for land management purposes (summary offence). See also Arson.
Delivery hose	Hose used to transport water under pressure.
Delivery valve	On a pump, the valved outlet through which water is discharged.
Demobilisation	The orderly release of resources no longer required at an incident.
Department of Environment, Climate Change and Water (DECCW)	See *Office of Environment and Heritage (OEH).* OEH was formerly the Department of Environment, Climate Change and Water NSW.
Depth of burn	The reduction in forest floor thickness (cm) due to consumption by fire; most commonly used in connection with prescribed burning.
Desiccant	A chemical that, when applied to a living plant, causes or accelerates the drying out of its aerial parts.
Desorption	The loss of moisture to the atmosphere from dead plant material.
Detection	The discovery of a fire. Individuals, fire towers, reconnaissance aircraft and automatic devices may be used, either alone or in combination.
Dew	The moisture which collects in small droplets on the surface of substances and vegetation by atmospheric condensation, chiefly at night.
Dew point temperature	This is a measure of the moisture content of the air and is the temperature to which air must be cooled in order for dew to form. The dew point is generally derived theoretically from dry and wet-bulb temperatures, with a correction for the site's elevation. (BOM)
Dieback	The progressive dying, from the top downward, of twigs, branches or tree crowns.
Diffused pattern	A spray pattern (as opposed to straight stream) of water or foam.

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Term	Definition
Direct attack	A method of fire attack where wet or dry firefighting techniques are used. It involves suppression action right on the fire edge which then becomes the fire line.
Dispatch	The act of ordering attack crews or support units to respond to a fire, or from one place to another.
Division	A portion of the incident comprising of 2 or more sectors. The number of sectors grouped in a Division should be such as to ensure effective direction and control of operations. Divisions are generally identified by a local geographic name.
Divisional Commanders	Personnel operating under the direction of an Operations Officer, each of whom is responsible for the implementation of the incident action plan relating to their Division.
Dominant height	The average of the height of the 3 largest diameter trees selected on a plot by a technique of variable probability sampling.
Downwind	Away from the wind; in the direction opposite to the direction from which the wind is blowing.
Dozer	A crawler tractor fitted with a blade which can be transported to a fire on a tray truck or trailer. Dozer is a shortened form of 'Bulldozer'.
Dozer line	Fire line constructed by the front blade of a dozer.
Drain time	The time (minutes) it takes for foam solution to drop out from the foam mass; for a specified % of the total solution contained in the foam to revert to liquid and drain out of the bubble structure.
Drift	The effect of wind on smoke or on a water drop.
Drip torch	A canister of flammable fuel fitted with a wand, a burner head and a fuel flow control device. It is used for lighting fires for prescribed burning, back-burning and burning out.
Drop pass	Indicates that the air tanker has the target in sight and will make a retardant drop on this run over the target.
Drop pattern	The distribution of an aerially delivered retardant drop on the target area in terms of its length, width, and momentum (velocity x mass) as it approaches the ground. The latter determines the relative coverage level of the fire retardant on fuels within the pattern.
Drop zone (DZ)	Target area for airtankers, helitankers, or cargo dropping.
Drought	Prolonged absence or marked deficiency of precipitation (rain). (BOM)
Drought index	A numerical value reflecting the dryness of soils, deep forest litter, logs and living vegetation.
Dry-bulb temperature	Technically, the temperature registered by the dry-bulb thermometer of a psychrometer. However, it is identical to the temperature of the air. (Degrees Celsius).
Dry firefighting	The suppression of a fire without the use of water. This is normally achieved by removing the fuel by the use of hand tools, burning or machinery.
Duff	The layer of decomposing vegetative matter on the forest floor below the litter layer, the original structure still being recognisable.
Duty Officer	The officer rostered to coordinate incident response across NPWS.
E	
Ecological burning	A form of prescribed burning. Treatment of vegetation with fire in nominated areas to achieve specified ecological objectives.
Ecologically sustainable development (ESD)	Using, conserving and enhancing the community's resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be increased.
Ecosystem	The interacting system of a biological community, both plant and animal, and its non-living surroundings.
Edge burning	Perimeter burning of an area in mild conditions prior to large-scale prescribed burning. This practice is used to strengthen buffers and to reduce mop-up operations.
Elapsed time	Time from ignition of fire
Elevated fuels	The standing and supported combustibles not in direct contact with the ground and consisting mainly of foliage, twigs, branches, stems, bark and creepers.
Embers	Glowing particles cast from the fire (as 'showers' or 'storms'). (Vic report)
Emergency centre	A facility where the coordination of the response and support to the incident is provided.
En route resources	Resources despatched to an incident that have not yet checked in. (AIIMS)

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Term	Definition
Endangered	A species, population or ecological community that is specified within the *Threatened Species Conservation Act 1995* as in danger of becoming extinct.
Entrapment	A situation in which individuals are exposed to life threatening or potentially life threatening conditions from which they cannot safely remove themselves.
Environment	All aspects of the surroundings of humans, whether affecting them as individuals or in their social groupings.
Equilibrium moisture content (EMC)	The moisture content that a fuel element would attain if exposed for an infinite period in an environment of specified constant dry-bulb temperature and relative humidity. When a fuel element has reached its EMC, it neither gains nor loses moisture as long as conditions remain constant.
Equipment	All material supplied to an incident excluding personnel and vehicles.
Escape route	A planned route away from danger areas at a fire.
Evacuation	The temporary relocation of persons from dangerous or potentially dangerous areas to safe areas.
Exposures	Parts of the same structure, or other structures, or property not directly involved in the fire, but at risk of being burnt or damaged if the fire is not controlled. In the bushfire context: 1. Property that may be endangered by a fire burning in another structure or by a bushfire. In general, property within 12 m of a fire may be considered to involve an exposure hazard, although in very large fires the danger may exist at much greater distances. 2. Direction in which a slope faces, usually with respect to cardinal directions (N, S, E, W). 3. The general surroundings of a site, with special reference to its openness to winds and sunshine.
Extinct	A species no longer in existence or not located in the wild during the past 50 years.
Extinguishing agent	A substance used to put out a fire by cooling the burning material, blocking the supply of oxygen or chemically inhibiting combustion (or a combination of these).
Extreme fire behaviour	A level of bushfire behaviour characteristics that ordinarily precludes methods of direct suppression action. One or more of the following is usually involved: • high rates of spread • prolific crowning and/or spotting • presence of fire whirls • a strong convective column. Predictability is difficult because such fires often exercise some degree of influence on their environment and behave erratically, sometimes dangerously.
F	
Facilities	Permanent and temporary facilities where personnel sleep, cook, maintain and repair equipment. (AIIMS)
Fallback fire control line	Any fire control line which is at a distance from the fire perimeter, and is the second control line at which the fire perimeter may be stopped should it cross the first fire control line. Also known as 'fallback line'.
Fine fuel	Fuel such as grass, leaves, bark and twigs less than 6 mm in diameter that ignites readily and is burnt rapidly when dry.
Fingers	Long and narrow slivers of fire which extend beyond the head or flanks. (AFAC)
Fire	The chemical reaction between fuel, oxygen and heat. Heat is necessary to start the reaction and once ignited, fire produces its own heat and becomes self-supporting.
Fire access track	A track constructed or maintained expressly for fire management purposes.
Fire action	Reconnaissance – the assessment of the fire behaviour and assessment and checking of its perimeter; no firefighters are committed to either extinguish or contain the fire. Attack – firefighters have been committed to extinguish or contain the fire. It may be parallel, direct or indirect. Defence – firefighters have been deployed to protect life and property. Mop-up – firefighters are extinguishing all possible sources for the re-ignition of the fire along established fire control lines. Patrol – firefighters are checking that no re-ignition will occur along established fire control lines.
Fire authorities	Organisations, including land management authorities, vested by the *Rural Fires Act 1997* with the responsibility to suppress fires.
Fire behaviour	The manner in which a fire reacts to the variables of fuel, weather and topography.

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Term	Definition
Fire behaviour analyst	Person responsible for developing fire behaviour predictions based on fire history, fuel, weather, and topography. (NWCG, amended)
Fire behaviour model	A set of mathematical equations that can be used to predict certain aspects of fire behaviour.
Fire behaviour prediction	Prediction of probable fire behaviour usually prepared by a fire behaviour analyst in support of fire suppression or prescribed burning operations. (NWCG)
Fire behaviour prediction system	A system that uses a set of mathematical equations to predict certain aspects of fire behaviour in fuels when provided with data on fuel and environmental conditions.
Fire bombing	A technique of suppressing a bushfire by dropping water, foam or retardants on it from an aircraft.
Fire brand	A piece of flaming or smouldering material capable of acting as an ignition source e.g. eucalypt bark.
Fire break	See Asset Protection Zone
Fire classification	One of 3 categories which describe the resource commitment to a fire, and one factor (along with fire size, fire status and the degree of threat) which indicates the degree of potential seriousness of a fire: Class 1 — a bushfire under the control of the responsible fire authority, whether or not incident/ low-level assistance is provided by other agencies Class 2 — a fire that, by necessity, involves more than one agency and where the Bush Fire Management Committee executive has appointed a person to take charge of firefighting operations. Class 3 — a major bushfire or fires where an appointment has been made, or is imminent, under the provisions of Section 44 of the *Rural Fires Act 1997*.
Fire climate	The composite pattern or integration over time of the fire weather elements that affect fire occurrence and fire behaviour in a given area.
Fire control	See *Fire suppression.*
Fire control advantage	Any natural or built feature that assists in fire suppression activities.
Fire control centre	A facility established to coordinate firefighting operations, which may be located in the offices or premises of a fire authority.
Fire control line	See *Fire line.*
Fire control officer	A fire control officer is, subject to any direction of the Commissioner, responsible for the control and coordination of the activities of the NSW RFS in the rural fire district for which he or she has been appointed (under section 37 of *Rural Fires Act 1997*). The powers of fire control officers on NPWS-managed lands are described by section 38(4) of the *Rural Fires Act 1997*.
Fire crew	A general term for 2 or more firefighters organised to work as a unit. (NWCG)
Fire danger	Sum of constant danger and variable danger factors affecting the inception, spread, and resistance to control, and subsequent fire damage; often expressed as an index. (NWCG)
Fire danger class	A segment of a fire danger index scale identified by a descriptive term (e.g. low-moderate, high, very high, severe, extreme, catastrophic) and/or a colour code. The classification system may be based on more than one fire danger index and an assessment of risk exposure.
Fire danger index (FDI)	A relative number denoting an evaluation of rate of spread, or suppression difficulty for specific combinations of temperature, relative humidity, drought effects and wind speed. The numbers range from 1 to 100.
Fire danger rating	A relative class denoting an evaluation of rate of spread, or suppression difficulty for specific combinations of temperature, relative humidity, drought effects and wind speed, indicating the relative evaluation of fire danger. The classes in NSW range from low-moderate, high, very high, severe, extreme, or catastrophic.
Fire district	An area of land recognised as a management unit under the *Fire Brigades Act 1989*.
Fire ecology	The study of the relationships between fire, the physical environment and living organisms.
Fire edge	Any part of the boundary of a going fire at a given time. NOTE: The entire boundary is termed the 'fire perimeter'.
Fire effects	The physical, biological and ecological impact of fire on the environment. (NWCG)
Fire environment	The surrounding conditions, influences, and modifying forces of topography, fuel and weather that determine fire behaviour. (NWCG)
Fire exclusion zone (FEZ)	An area zoned to exclude bushfires. Fire exclusion zones are not recommended for use by NPWS.

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Term	Definition
Fire extent	The area burnt by a bushfire, measured in hectares. Within that area, there will be 'islands' of unburnt vegetation. These islands are generally included in the total fire extent.
Firefighting apparatus	All vehicles, equipment and other things used for, or in connection with, the prevention or suppression of fire or the protection of life or property in the case of fire.
Fire frequency	A general term referring to the recurrence of fire in a given area over time (NWCG). See also Fire regime.
Fire front	The part of a fire within which continuous flaming combustion is taking place. Unless otherwise specified, the fire front is assumed to be the leading edge of the fire perimeter. In ground fires, the fire front may be mainly smouldering combustion. (NWCG)
Fire hazard	A fuel complex, defined by volume, type condition, arrangement, and location, that determines the degree of ease of ignition and of resistance to control.
Fire hazardous area	An area where the combination of vegetation, topography, weather and the threat of fire to life and property create difficult and dangerous problems.
Fire history	A map of fire occurrence for an area, or the records of fire occurrence for a site.
Fire intensity	See *Fire line intensity.*
Fire line	A natural or constructed barrier, or treated fire edge, used in fire suppression and prescribed burning to limit the spread of fire. (Also referred to as fire control line.)
Fire line intensity	The intensity of the fire on the fireline (usually the flank or heel)
Fire lookout	A structure strategically located and manned to detect the occurrence and the location of fires. It may be a tower or a structure on a high point.
Fire management	All activities associated with the management of fire prone land, including the use of fire to meet land management goals and objectives.
Fire management operations	Activities associated with the suppression of fires and/or prescribed burning.
Fire management zones	Zones within an area of fire-prone land that each have a specified fire regime for conservation and management purposes.
Fire perimeter	The entire outer boundary of a fire area.
Fire permit	A permit issued under section 89 of the *Rural Fires Act 1997* to conduct hazard reduction burning.
Fire prevention	All activities associated with minimising the incidence of bushfire, particularly those of human origin.
Fire progress map	A map providing information on a fire, detailing the location of its perimeter, deployment of suppression forces and the progress of suppression activities.
Fire regime	The history of fire in a particular vegetation type or area including the frequency, intensity and season of burning. It may also include proposals for the use of fire in a given area. (AFAC)
Fire report	An official record of a fire, generally including information on cause, location, action taken, damage, costs, etc., from start of the fire until completion of suppression action. These reports vary in form and detail from agency to agency (NWCG). See also Report of fire
Fire retardant	A chemical, generally mixed with water, designed to retard combustion. It is applied as slurry from the ground or the air.
Fire risk	Processes, occurrences or actions that increase the likelihood of fires occurring.
Fire run	A rapid advance of a fire front. It is characterised by a marked transition in intensity and rate of spread.
Fire scar	1) A healing or healed-over injury caused or aggravated by fire on a woody plant. 2) A mark left on a landscape by fire.
Fire season	The period during which bushfires are likely to occur, spread and do sufficient damage to warrant organised fire control.
Fire simulator	See *Fire training simulator.*
Fire spread	Development and travel of fire across surfaces.

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Term	Definition
Fire status	Can be described by one of a number of terms, depending on the degree to which a fire is under control. Going – indicates any fire that is spreading on one or more flanks and effective control strategies are not in place for the entire perimeter. Being contained – effective strategies are in operation or planned for the entire perimeter. Contained – indicates a fire's spread has been halted, but it may still be burning freely within the perimeter or fire control lines; the whole of the fire perimeter is behind identifiable control lines and mop-up and/or patrol are proceeding. Patrol – the fire is at a stage where firefighting resources are only required for patrol purposes. Out – the fire is at a stage where no further work is required, which allows its removal from the list of current fires.
Fire storm	Violent convection caused by a large continuous area of intense bushfire often characterised by destructively violent surface indrafts, a towering convection column, long distance spotting, and sometimes by tornado-like whirlwinds. (AFAC)
Fire suppressant	An additive designed to reduce the surface tension of water and/or to hold water in suspension thus increasing water's efficiency as a fire extinguishing agent. Suppressants are applied directly to the burning fuels. See also Fire retardant. (NZ)
Fire suppression	Actions to control a fire, from the time of detection to extinguishment.
Fire suppression organisation	1. The personnel and equipment collectively assigned to the suppression of a specific fire or group of fires. 2. The personnel responsible for fire suppression within a specified area. 3. The management structure, usually shown in the form of an organisation chart of the persons and groups having specific responsibilities in fire suppression. (NWCG)
Fire suppression plan	See Incident action plan.
Fire tetrahedron	An instructional aid in which the sides of the tetrahedron (comprising 4 triangular-shaped figures) are used to represent the 4 components of combustion and the flame production process: fuel, heat, oxygen and the chemical chain reaction.
Fire threat	The impact a fire will have on a community.
Fire tower	Tower strategically located and manned to detect and report the occurrence and location of fires. A type of fire lookout.
Fire trap	Any location or situation in which it is highly dangerous to implement fire suppression activities.
Fire triangle	Diagrammatic expression of the 3 elements that are necessary for a fire to occur: fuel, heat, oxygen. The removal of any one of these will extinguish a fire.
Fire weather	Weather conditions which influence fire ignition, behaviour, and suppression. (NWCG)
Fire weather forecast	A weather prediction specially prepared for use in bushland fire operations and prescribed fire. (NWCG)
Fire whirl	Spinning vortex column of ascending hot air and gases rising from a fire and carrying aloft smoke, debris, and flame. Fire whirls range in size from less than 1 foot to over 500 feet in diameter. Large fire whirls have the intensity of a small tornado. (NWCG)
Fire wind	The inflow of air at the fire source caused by the action of convection. It is not to be confused with a prevailing wind.
Fire bombing	A technique of suppressing bushfire by dropping water, foam or retardants on it from an aircraft.
Fire brand	A piece of burning material, commonly bark from eucalypts.
Fire break	Any natural or constructed discontinuity in a fuel bed used to segregate, stop and control the spread of a bushfire, or to provide a fire line from which to suppress a fire.
Firefighter	Any employee, volunteer or agent of any firefighting agency who occupies, or is designated, to undertake a role for the purpose of fire suppression.
Firefighting operations	Any work or activity directly associated with control of fire.

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Term	Definition
Fire ground	The area in the vicinity of fire management operations, and the area immediately threatened by the fire. It includes burning and burnt areas; constructed and proposed fire lines; the area where firefighters, vehicles, machinery and equipment are located when deployed; roads and access points under traffic management control; tracks and facilities in the area surrounding the actual fire; and may extend to adjoining areas directly threatened by the fire.
Fire line	A natural or constructed barrier, or treated fire edge, used in fire suppression and prescribed burning to limit the spread of fire.
Fire line intensity	The rate of energy release per unit length of fire front, usually expressed in kilowatts per metre (Kw/m). The rate of energy release per unit length of fire front is defined by the equation I=Hwr, where I = fire line intensity (kW/m), H = heat yield of fuel (kJ/kg)-16,000 kJ/kg, w = dry weight of fuel consumed (kg/m^2) (mean total less mean unburnt), r = forward rate of spread (m/s). The equation can be simplified to I = w r/2, where I = fire line intensity (kW/m), w = dry weight of fuel consumed (tonnes/ha), r = forward rate of spread (m/hr).
Fire line sector	A defined section of the fire line being constructed or used to contain or suppress a bushfire, or being constructed as a backup to other lines being used to suppress a bushfire.
Fire suppression	Activities and actions taken to suppress a fire
Fire suppression organisation	The management structure, usually in the form of an organisation chart, of the personnel collectively assigned to the suppression of a fire.
Fire suppression plan	See *IAP.*
First attack	See *Initial attack.*
Fixed-wing aircraft	A heavier than air aircraft which obtains lift for flight by forward motion of wings through the air.
Flame angle	The angle of the flame in relation to the ground, caused by wind direction or the effect of a slope.
Flame depth	The depth of the zone within which continuous flaming occurs behind the fire edge.
Flame height	The average maximum vertical extension of flames at the leading edge of the fire front. Occasional flashes that rise above the general level of flames are not considered. This distance is less than the flame length if flames are tilted due to wind or slope. (NWCG)
Flame length	The distance between the flame tip and the midpoint of the flame depth at the base of the flame (generally the ground surface), an indicator of fire intensity. (NWCG)
Flammability	The ease with which a substance is set on fire.
Flammable	Capable of being ignited and of burning with a flame.
Flank attack	Obtaining control of a fire by attacking its side/s (flank).
Flanks of a fire	Those parts of a fire's perimeter that are roughly parallel to the main direction of spread. (NWCG)
Flare-up	Any sudden acceleration of fire spread, or intensification of fire, or a part of the fire. A flare-up is of relatively short duration and does not radically change existing control plans. (NWCG)
Flash fire	A fast moving fire consuming most of the fine fuels available.
Foam	Foam is a mass of bubbles formed by mixing air with water and a foam concentrate in specific proportions. It is used as a firefighting agent to form a smothering, cooling or ignition-preventing layer of the surface over a fuel.
Foam blanket	A layer of foam which forms an insulating and reflective barrier to heat and is used for fuel protection, suppression and mop-up. (NWCG)
Foam Class A	A mixture of foam concentrate and water specifically formulated for extinguishing bushfires. The foam is biodegradable, non-toxic and is used at very low concentrates. It may be delivered aspirated or non-aspirated. See also Foam solution.
Foam Class B	A foam formulated for application on Class B fires
Foam concentrate	The concentrated foaming agent as received from the manufacturer which, when added to water, creates a foam solution; use only those approved for use in bushland fire situations by the authority having jurisdiction. (NWCG)
Foam inductor	Equipment consisting of an inlet connection, ejector pump and a discharge assembly, for the induction of foam concentrate.
Foam solution	The mixture of water and foam concentrate.
Forest	An area of land thickly covered with an ecosystem of trees and bushes.

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Term	Definition
Forest fire	A fire burning mainly in forest or woodland.
Forest type	A description of the predominant tree species in a forest.
Forward control point	A selected location at or near a fire which provides coordination, control and communication for the sectors at the fire ground.
Forward looking infrared (FLIR)	Hand-held or aircraft-mounted device designed to detect heat differentials and display them. FLIRs have thermal resolution similar to IR line scanners, but their spatial resolution is substantially less; commonly used to detect hot spots and flare-ups obscured by smoke, evaluate the effectiveness of firing operations, or detect areas needing mop-up. (NWCG)
Forward rate of spread	The speed with which a fire moves in a horizontal direction across the landscape. (NWCG)
Front-end loader	Earthmoving equipment designed to move loose earth or loads into vehicles. A multi-purpose bucket is fitted to articulated arms at the front of the vehicle. May be either wheeled or tracked.
Frontal fire intensity	See Fire line intensity.
Fuel	Any material such as grass, leaf litter and live vegetation which can be ignited and sustain a fire. Fuel is usually measured in tonnes per hectare. Related terms: available fuel, coarse fuel, dead fuel, elevated dead fuel, fine fuel, total fine fuel, ladder fuels, surface fuel.
Fuel age	The period of time lapsed since the fuel was last burnt.
Fuel arrangement	A general term referring to the spatial distribution and orientation of fuel particles or pieces. (NWCG)
Fuel array	The totality of fuels displayed in a location: fine and coarse, live and dead. (Vic report)
Fuel assessment	The estimation or calculation of total and available fuel present in a given area.
Fuel bed	The arrangement and vertical profile of all readily combustible materials lying on the ground.
Fuel bed depth	Average height of surface fuels contained in the combustion zone of a spreading fire front. (NWCG)
Fuel break	A natural or manmade change in fuel characteristics which affects fire behaviour so that fires burning into it can be more readily controlled.
Fuel break	See Asset Protection Zone and Strategic Fire Advantage Zone
Fuel break system	A series of modified strips or blocks tied together to form continuous, strategically located fuel breaks around land units.
Fuel continuity	The degree or extent of continuous or uninterrupted distribution of fuel particles in a fuel bed thus affecting a fire's ability to sustain combustion and spread. This applies to aerial fuels as well as surface fuels.
Fuel depth	The average distance from the bottom of the litter layer to the top of the layer of fuel, usually the surface fuel.
Fuel load	The oven-dry weight of fuel per unit area. Commonly expressed as tonnes per hectare. (AFAC). (Also known as fuel loading.)
Fuel management	Modification of fuels by prescribed burning or other means. (AFAC)
Fuel map	A map showing areas of varying fuel quantities and types and usually indicating past fire history.
Fuel model	Simulated fuel complex for which all fuel descriptors required for the solution of a mathematical rate of spread model have been specified. (NWCG)
Fuel modification	Manipulation or removal of fuels to reduce the likelihood of ignition or lessen potential damage and resistance to control (e.g. lopping, chipping, crushing, piling or burning). (NWCG)
Fuel moisture content	The water content of a fuel expressed as a % of the oven-dry weight of the fuel particle. (% ODW)
Fuel moisture differential	Describes the situation where the difference in the moisture content between fuels on adjacent areas results in noticeably different fire behaviour on each area.
Fuel plan	A plan showing areas of varying fuel quantities and types and usually indicating past fire history.
Fuel profile	The vertical cross-section of a fuel bed down to mineral earth.
Fuel quantity	See Fuel load.
Fuel reduction	Manipulation, including combustion or removal of fuels, to reduce the likelihood of ignition or lessen potential damage and resistance to control.
Fuel reduction burning	The planned application of fire to reduce hazardous fuel quantities; undertaken in prescribed environmental conditions within defined boundaries.

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Term	Definition
Fuel separation	The action of separating fuel for the purpose of providing a mineral earth firebreak. Also means the actual gap between fuel layers or particles e.g. gap between individual hummock grasses or gap between surface and canopy fuels.
Fuel type	An identifiable association of fuel elements of distinctive species, form, size, arrangement, or other characteristics that will cause predictable rate of spread or difficulty of control under specified weather conditions. (AFAC)
Fuel weight	See Fuel load.
G	
General origin area	The larger area where the fire started that is readily identifiable based on macro-scale indicators and witness statements. (NWCG)
Geographical information system (GIS):	A computerised information system that stores, analyses and displays spatial and geographic data.
Going fire	Any bushfire on which suppression action has not reached an extensive mop-up stage. (NWCG)
Grass fire	Any fire in which the predominant fuel is grass or is grass-like. (NWCG)
Grassland curing	The proportion of dead material in grasslands – usually increases over summer as tillers die off and dry out, increasing the risk of grassland fire.
Grid ignition	A method of lighting prescribed fires where ignition points are set individually at a predetermined spacing through an area.
Ground crew	See Hand crew.
Ground fire	Fire that consumes the organic material beneath the surface litter ground, such as a peat fire. (NWCG)
Ground fuels	All combustible materials below the surface litter, including duff, roots, peat and sawdust dumps that normally support a glowing combustion without flame. Synonym: subsurface fuels. Note: aerial, surface and ladder fuels.
H	
Habitat	The place in which an animal or plant lives.
Hand crew	A fire suppression crew trained and equipped to fight fire with hand tools.
Hand line	A fire line constructed with hand tools. (NWCG) (Bushfire context)
Hand trail	See Hand line (above).
Hang up	A situation in which a tree is lodged in another and prevents it from falling to the ground.
Hardwood	A conventional term used to describe a tree, or the timber of a tree, belonging to the botanical group of flowering plants that include red gum, ironbark and jarrah.
Hazard	A source of potential harm or a situation with potential to cause loss.
Hazard reduction	See *Fuel management.*
Hazchem incident	The release or potential release of substances classified as dangerous in the *Australian Code for the Transport of Dangerous Goods by Road and Rail*.
Head	See Head fire.
Head attack	Directly knocking down the head of a fire. Recommended only for low intensity fires where firefighters can be sure that the fire will not flare-up unexpectedly.
Head fire	The part of a fire where the rate of spread, flame height and intensity are greatest, usually when burning downwind or upslope.
Heat exhaustion	A form of shock, due to depletion of body fluids resulting from overexposure to a hot environment.
Heat stress	Illness caused by the body overheating.
Heat stroke	A life-threatening condition that develops when the body's temperature-regulating and cooling mechanisms are overwhelmed and body systems begin to fail.
Heavy fuels	See *Coarse fuels.*
Heavy tanker	See *Tanker.*
Heel	See *Rear.*
Heel fire	See *Backing fire.*

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Term	Definition
Heli torch	An aerial ignition device hung from or mounted on a helicopter to disperse ignited lumps of gelled gasoline. Used for backfires, burnouts, or prescribed burns. (NWCG)
Helibase (HB)	A location for parking, refuelling and maintenance of helicopters operating in support of an incident.
Helicopter	A form of heavier-than-air, rotor-wing aircraft whose lift is produced by engine-driven rotors which behave as if they were both propellers and wings.
Helipad (HP)	A designated location which meets specific requirements for a helicopter to take off and land.
Helitack crew	An initial attack crew specially trained in the tactical and logistical use of helicopters for fire suppression.
High intensity fire	Fires with an average intensity greater than 3,000 $kW.m^{-1}$ and flame heights greater than 3 m, causing complete crown scorch or possibly crown fires in forests. Uncontrollable by direct attack. The term is also applied to stationary fires burning in very high fuel loads (such as logging slash).
Hold-over fire	See *Sleeper*
Hop over	See *Breakaway*
Hose bandage	A temporary repair to a canvas or synthetic hose.
Hose strangler	A crimping device for stopping the flow of water in a hose.
Hot refueller	A trained person responsible for the operation of the equipment for the 'hot' refuelling of helicopters.
Hot spot	A particularly active part of a fire.
Humus	Layer of decomposed organic matter on the forest floor beneath the fermentation layer and directly above the soil. It is that part of the duff in which decomposition has rendered vegetation unrecognisable and mixing of soil and organic matter is underway. See also both Duff and Litter
Hygrometer	An instrument which measures the humidity in the air.
I	
I zone	See *Urban–rural interface*
IAP (Incident Action Plan)	A statement of objectives and strategies to be taken to control or suppress an incident, and approved by the Incident Controller.
Ignition	The beginning of flame production or smouldering combustion; the starting of a fire.
Ignition pattern	The manner in which a prescribed burn, backfire or burnout is set, determined by weather, fuel, ignition system, topographic and other factors having an influence on fire behaviour and the objective of the burn.
Ignition source	A source of energy sufficient to initiate combustion.
IMT (Incident Management Team)	The group of incident management personnel comprising the Incident Controller, and the personnel he or she appoints to be responsible for the functions of operations, planning and logistics. Positions and responsibilities of IMT members are: Incident Controller – responsible for the management of all incident operations; Operations Officer – responsible for combating the incident; Planning Officer – responsible for the collection, evaluation, dissemination and use of information about the incident and status of resources; Logistics Officer – responsible for providing facilities, services and material in support of the incident; Divisional Commander – when activated, is under the direction of the Operations Officer. Divisional Commanders are responsible for the implementation of portions of the IAP relevant to their Division; Sector commander – reports to the Operations Officer (or Divisional Commander when activated). Sector Commanders are responsible for the implementation of designated portions of the IAP to which they are tasked, allocation of resources within the sector, and reporting on the progress of command operations and status of resources within the sector.
Incendiarism	See *Arson*
Incendiary	A burning compound or metal used to produce intense heat or flame, like a bomb.
Incendiary device	Device designed and used to start a fire.
Incident	Any unplanned event requiring emergency intervention. (AIIMS).

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Term	Definition
Incident Action Plan (IAP)	The plan used to describe the incident objectives, strategies, resources and other information relevant to the control of an incident. (AIIMS)
Incident analysis	Analysis carried out during an incident usually as a result of an accident, a breach of the IAP or a procedural failure. Conducted by an individual or a small team to collect evidence, data and information, analyse what occurred, determine causal factors and make recommendations.
Incident control	See Incident management
Incident control centre	The location where the Incident Controller and, where established, members of the IMT, provide overall direction of response activities in an emergency situation.
Incident control system (ICS)	A command structure to systematically and logically manage suppression of emergency incidents including bushfires, from small, simple incidents to large, difficult or multiple situations. It is designed to develop in modular fashion from the top (Incident Controller) downwards. Refer NIMS, AIIMS, CIMS
Incident Controller	The individual responsible for the management of all incident control activities across a whole incident. (AIIMS)
Incident database	A computer program used to store data on bushfire occurrence, fuel management programs and miscellaneous incidents.
Incident management	The process of controlling the incident and coordinating resources. (EMA)
Incident Management Team (IMT)	The group of incident management personnel comprising the Incident Controller and the personnel he/she appoints to be responsible for the functions of Operations, Planning and Logistics (AIIMS).
Incident objective	An incident objective is a goal statement indicating the desired outcome of the incident. Incident objectives guide the development of the Incident Action Plan and must reflect the policies and needs of the control authority and supporting agencies. All factors affecting the incident and its potential impact must be considered before determining the objective. (AIIMS)
Incident strategies	The incident strategies will be developed from the incident objectives and will describe how the Incident Management Team plans to resolve the incident. There is a requirement for strategies to be developed throughout the incident and they should be reviewed for each operational period. (AIIMS)
Indirect attack	A method of suppression in which the control line is located some considerable distance away from the fire's active edge. Generally done in the case of a fast-spreading or high intensity fire and to utilise natural or constructed fire breaks or fuel breaks and favourable breaks in the topography. The intervening fuel is usually backfired; but occasionally the main fire is allowed to burn to the line, depending on conditions.(NWCG)
Induced wind	See *Fire wind*
Information Officer	Person responsible for media and public liaison during fire operations.
Infrared scanning	Use of an optical-electronic system for identifying or obtaining imagery of thermal infrared radiation to detect non-smoking fires or fire perimeters through smoke.
Initial attack	The first suppression work on a fire.
Instability	The tendency for air parcels to accelerate when they are displaced from their original position; especially, the tendency to accelerate upward after being lifted. Instability is a prerequisite for severe weather – the greater the instability, the greater the potential for severe thunderstorms. (Weather Zone)
Interface	See *Urban–rural interface*
Inversion	A layer of the atmosphere in which temperature increases with increasing elevation. A condition of strong atmospheric stability.
Island	An unburnt area within a fire perimeter.
Isobar	Lines on weather maps joining places which have the same air pressure. (BOM)
J	
Jump fire	See *Spot fire*
Junction zone	An area of greatly increased fire intensity caused by 2 fire fronts (or flanks) burning towards one another.
K	
Keetch-Byram Drought Index (KBDI)	A numerical value reflecting the dryness of soils, deep forest litter, logs and living vegetation, and expressed as a scale from 0–200 where the number represents the amounts of rainfall (mm) to return the soil to saturation.

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Term	Definition
Key species	(1) Species that are the potential dominants of a community and whose removal will significantly change the structure of the community. (2) Species that can be used to indicate the behaviour of a larger group of similar species. (3) Threatened species, populations and ecological communities identified under the *Threatened Species Conservation Act 1995*, their habitat, and other species of conservation concern.
Knock down	To reduce the flame or heat on the more vigorously burning parts of a fire edge. (NWCG)
L	
Ladder fuels	Fuels that provide vertical continuity between strata. Fire is able to carry surface fuels into the crowns of trees with relative ease.
Lag time	The time delay in fuel moisture content responding to changing environmental conditions (for example, relative humidity). Technically, it is the time necessary for a fuel particle to lose approximately 63% of the difference between its initial moisture content and its equilibrium moisture content.
Land Management Zone (LMZ)	An area of land zoned to meet relevant land management objectives.
Lead agency	The organisation with the legislative or agreed authority for control of an incident.
Lee (leeward)	Away from the wind; on the sheltered side of something that the wind is blowing on.
Legislation	A set of rules made by a State, Territory or Federal Government; includes Acts and Regulations.
Liaison officer	Senior officer of an agency who represents the interests of that agency.
Light fuel	An assessment of fuel quantity indicating a low weight.
Light patrol unit	See *Tanker*
Light tanker	See *Tanker*
Lighting formation:	See *Ignition pattern*
Lighting pattern	See *Ignition pattern*
Lightning	The flash of light accompanying a sudden electrical discharge which takes place from or inside a cloud, or less often from high structures or the ground or from mountains. A large electrical spark. Caused when the negative charge in the lower part of the cloud and the positive charge in the upper part of the cloud become so great that they can overcome the natural resistance of the air and a discharge between negative and positive takes place. (BOM)
Lightning fire	A fire caused by lightning.
Lightning formation	See *Lightning*
Litter	The top layer of the forest floor composed of loose debris of dead sticks, branches, twigs, and recently fallen leaves and needles, little altered in structure by decomposition. (The litter layer of the forest floor). (NWCG)
Litter bed fuel	Dead fine fuel, including surface fuel and fuel lower in the fuel profile.
Litter fall	The addition of litter that falls from vegetation to the forest floor.
Living fuels	Fuels made up of living vegetation.
Living shrub fuel	Living understorey fine fuel less than 2 m above ground level.
Local winds	Winds which are generated over a comparatively small area by local terrain and weather. They differ from those which would be appropriate to the general pressure pattern. (NWCG)
Log	Documentation of information and actions arising during an incident.
Logistics	The provision of facilities, services and materials in support of an incident.
Logistics officer	The person responsible for providing the facilities, services and materials required in support of an incident.
Lookout	1. A person designated to detect and report fires from a fixed vantage point. 2. A member of a fire crew designated to observe the fire and warn the crew when there is danger. 3. For structure see Fire lookout.
Lookout tower	See *Fire tower*

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Term	Definition
Low intensity fire	A fire which travels slowly and only burns lower storey vegetation, like grass and lower tree branches, with an average intensity of less than 500 kW.m^{-1} and flame height less than 1.5 m. Usually causes little or no crown scorch and is easily controlled.
M	
Managed lands	Areas under the care and management of a statutory authority as defined under the *Rural Fires Act 1997*. This includes NPWS-managed lands.
Medium fuels	See *Course fuels*
Mineral earth	When used in the context of fire control refers to a non-flammable surface (either natural or prepared) which provides a break in understorey, litter and humus fuels and hence a barrier (of varied effectiveness depending, amongst other things, on its width and the intensity of the approaching fire) to fire travelling on or near the ground surface.
Mobilisation	The processes and procedures for organisations to activate, assemble and transport the requested resources to an incident.
Moderate task-based assessment	An annual fitness test or task-based assessment that can be attempted once medically cleared. It consists of a 3.22 km walk with a 11.3 kg pack in 30 minutes on flat ground.
Moisture content	See *Fuel moisture content*
Mop-up	The practice of making a fire safe after it has been suppressed, by extinguishing or removing burning material along or near the fire line, felling stags, trenching logs to prevent rolling, and the like.
Mosaic	Used in reference to the spatial arrangement of burnt and unburnt fuels at either a local or a landscape scale.
Move-up method	Progressive method of fire line construction on a bushfire without changing relative positions in the line. Work is begun with a suitable space between workers; whenever one worker overtakes another, all of those ahead move one space forward and resume work on the uncompleted part of the line. The last worker does not move ahead until work is completed in his/her space. Forward progress of the crew is coordinated by a crew boss.
Multi-agency response	An incident of high fire incidence over short periods of time in any administrative unit, usually overtaxing the normal initial attack capability of the unit.
Multi-line ignition:	The practice of lighting 2 or more parallel lines of fire as part of a prescribed burning or firefighting operation. Where this practice involves ground crews, it will often involve the crews leaving the control line and traversing areas of unburnt fuels.
N	
National Parks and Wildlife Service (NPWS)	The National Parks and Wildlife Service is part of the Office of Environment and Heritage (OEH), an office within the NSW Department of Premier and Cabinet. NPWS manages national parks and reserves in NSW.
Natural area fire	Fires burning in natural areas and classified into different categories according to the potential area of the fire, threats to life, property and biodiversity.
Natural barrier	Any area where lack of flammable material obstructs the spread of vegetation fires.
Natural resources	All elements of the natural environment.
Near miss	An incident that, had it occurred, either earlier or later, would have had real potential to cause injury or death.
Near-surface fuels	Fuels with a vertical component to their structure and generally less than about 30 cm above the ground, but may be as high as 60 cm.
Needle bed	A fuel bed consisting mainly of pine needles.
Neighbour	Landholder with properties adjoining or adjacent to NPWS-managed lands.
Notifiable fire	A fire that must be reported according to the requirements of section 64 of the *Rural Fires Act 1997.*
Nozzle	A fitting that is used with a branch to control the size, pattern or velocity of water or extinguishing medium being discharged.
NPWS lands	NPWS lands or NPWS-managed lands are areas administered by NPWS under the *National Parks and Wildlife Act 1974*. For the purpose of this definition, these include national parks, nature reserves, historic sites, state conservation areas, karst conservation reserves, regional parks and Aboriginal areas. These areas constitute managed lands under the *Rural Fires Act 1997*; accordingly fire management activities on such lands are NPWS responsibility.

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Term	Definition
O	
Objective	A goal statement of what is to be achieved.
Objective strategy	See *Strategy*
Occupier of lands	The person who has the management or beneficial use of the land (whether a resident on the land or not) or, if the land is a public reserve or park, the trustees or any person having the care, control and management of the land.
Office of Environment and Heritage (OEH)	The Office of Environment and Heritage is a separate office within the NSW Department of Premier and Cabinet. OEH is an environmental regulator and a manager of parks and gardens in NSW and develops and leads policy and reform in sustainability, biodiversity and native vegetation, coastal protection and Aboriginal cultural heritage. OEH was formerly known as the Department of Environment, Climate Change and Water (DECCW).
One-lick method	A progressive system of building a fire line on a bushfire without changing relative positions in the line. Each worker does one to several 'licks', or strokes, with a given tool and then moves forward a specified distance to make room for the worker behind. (NWCG)
Operations	The direction, supervision and implementation of tactics in accordance with the Incident Action Plan.
Operations Officer	The person responsible for directing and supervising all work on the fire ground under the direction of the Incident Controller.
Operations point	The location from which the overall field operations are commanded by the Operations Officer. (AIIMS)
Operations room	A room or area within a office or other fire authority's premises that is used to coordinate fire operations and other emergencies.
Out	See *Fire status*
Out-of-area support	Staff assisting in fire operations outside their own district.
Oven-dry weight	The weight of wood or other cellular material that has been dried in an oven at 105^0C until it ceases to lose moisture.
Overall fuel hazard (OFH) assessment	Method of assessing the level of risk posed by different fuel types.
P	
Paid rest day	Rest day at single time to be taken after the prescribed shift pattern.
Parallel attack	Method of fire suppression in which a fire line is constructed approximately parallel to, and just far enough from the fire edge to enable workers and equipment to work effectively, though the fire line may be shortened by cutting across unburned fingers. The intervening strip of unburned fuel is normally burned out as the control line proceeds but may be allowed to burn out unassisted where this occurs without undue delay or threat to the fire line. (NWCG)
Parallel fire suppression	See *Parallel attack*
Parallel method	See *Parallel attack*
Parkair	The call sign prefix for NPWS-owned aircraft.
Parts of a fire	See definitions for *Bays, Fingers, Flanks of a fire* and *Head.*
Patch burning	Burning in patches to prepare sites for group planting or sowing or to form a barrier to subsequent fires. (NWCG)
Patrol	1. To travel over a given route to prevent, detect, and suppress fires. Includes interaction with the public for bushland fire prevention and educational purposes. 2. To go back and forth vigilantly over a length of control line during or after construction to prevent breakaways, suppress spot fires, and extinguish overlooked hot spots. 3. A person or group of persons who carry out patrol actions. (NWCG)
Peat	An amorphous organic material formed by anaerobic decomposition which usually means that the area is seasonally or permanently inundated with water. Peat fires burn by smouldering combustion and generate very high amounts of energy per unit area.
Perimeter	See *Fire perimeter*
Permit burn	A burn carried out under permit from a Fire Authority.

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Term	Definition
Personal Protection Equipment (Personal Protective Clothing)	The equipment and clothing designed to mitigate the risk of injury from the chemical, physical and thermal hazards that may be encountered at an incident.
Plan of attack	See *Incident Action Plan* (preferred term).
Plan of operations	A strategy developed by Bush Fire Management Committees and respective fire agencies to coordinate firefighting resources.
Planned burning	See *Prescribed burning*
Planning Officer	The individual responsible for the collection, evaluation, and dissemination of information about the incident, under the direction of the Incident Controller. This individual is also responsible for the preparation and documentation of the IAP.
Pocket	See *Island*
Point of attack	The part of the fire on which work is started when suppression forces arrive.
Point of origin	The specific location where the fire started.
Portable dam	A temporary water storage used in conjunction with power pumps and hose lines.
Power hand-held incendiary launcher (PHIL):	Gas-powered incendiary launcher.
Predicted rate of spread	The rate of spread predicted by the application of fire spread models using appropriate inputs of fuel conditions, topography and weather. Also see Rate of spread.
Pre-incident plan	Advanced planning and preparation for an emergency situation.
Prepared community	A community that has developed effective emergency management arrangements at the local level, resulting in: • An alert, informed and active community that supports its voluntary organisations • An active and involved local government • Agreed and coordinated arrangements for prevention, preparedness, response and recovery.
Preparedness	(1) The degree to which an agency is prepared to respond to a potential fire situation. (2) A mental readiness to recognise changes in fire danger and to act promptly when action is appropriate.
Pre-planned dispatch	The pre-planned dispatch of designated suppression forces to fires in predetermined zones. It is usually dependent on the location of the fire, and the forecast fire danger.
Prescribed burn	A fire used for prescribed burning.
Prescribed burn plan	See *Burn plan*
Prescribed burning	The controlled application of fire under specified environmental conditions to a predetermined area and at the time, intensity, and rate of spread required to attain planned resource management objectives. It is undertaken in specified environmental conditions.
Prescribed fire	Any fire ignited by management actions to meet specific objectives. A written, approved burn plan must exist, and approving agency requirements (where applicable) must be met, prior to ignition
Prescription	A written statement defining the objectives to be attained during prescribed burning.
Pre-suppression plan	See Pre-incident plan.
Prevention	See Fire prevention.
Profile litter moisture content	The moisture content, expressed as a % of oven-dry weight, of the entire leaf litter bed above the mineral soil surface.
Profile moisture content	See *Fuel moisture content*
Psychrometer	The general name for instruments designed for determining the relative humidity of the air. A psychrometer consists of a wet-and-dry-bulb thermometer, generally with the aid of psychrometric tables or a psychrometric slide rule. (BOM)
Pulaski tool	A combination chopping and trenching tool widely used in fire line construction, which combines a single-bitted axe blade with a narrow adze-like trenching blade fitted to a straight handle. (NWCG)
Pulsation	See *Flare-up*
Pumper	A firefighting vehicle equipped with a large capacity pump, water tank and hose. Generally intended to be operated when stationary, from reticulated or static water supplies.

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Term	Definition
Q	
Quick-fill pump	A high volume water pump used for filling tankers.
R	
Rain gauge	The general name for instruments designed to measure the amount of rain that has fallen.
Rakehoe (McLeod tool)	A hand tool used for bush firefighting, consisting of a combination of a heavy rake and hoe.
Rare flora	Species listed in the latest edition of *Rare or Threatened Australian Plants* by J.D. Briggs and J.H. Leigh. Also includes flora species listed within schedules 1 and 2 of the *Threatened Species Conservation Act 1995*.
Rate of spread	The forward progress per unit of time of the head fire or another specified part of the fire perimeter.
Reaction time	The time taken between the report of a fire or incident and the departure of the crew. See also Response time.
Readiness	See *Preparedness*
Rear	1. That portion of a fire spreading directly into the wind or downslope. 2. That portion of a fire edge opposite the head. 3. Slowest spreading portion of a fire edge. Also called heel of a fire. (NWCG)
Reburn	Repeat burning of an area over which a fire has previously passed, but left fuel that later ignites when burning conditions are more favourable. (NWCG)
Reconnaissance	Examination of a fire area to obtain information about current and probable fire behaviour and other related fire suppression information. (NWCG)
Recovery	The coordinated process of supporting affected communities in the reconstruction of physical infrastructure and restoration of emotional, social, economic and physical wellbeing.
Recovery plan	A document that identifies the actions to be taken to promote the recovery of a threatened species, population or ecological community.
Regeneration burn	A burn lit under prescribed conditions for the purpose of achieving regeneration of a particular vegetation type.
Region	NPWS administrative region, comprising a number of Areas.
Regional Duty Officer (RDO)	The regional officer rostered to take responsibility for initial incident response, until an Incident Controller is appointed.
Regional incident procedures (RIPs)	Procedures prepared annually by NPWS Regions to coordinate incident response within those Regions.
Re-ignition	The action of a material that ignites again after it has been extinguished.
Relative humidity (RH)	The amount of water vapour in a given volume of air, expressed as a % of the maximum amount of water vapour the air can hold at that temperature.
Relay pumping	Using a series of pumps positioned at intervals along a line (or lines) of hose to share the workload of pumping water over a long distance.
Relief and relief crew	The replacement of personnel whose period of time at the incident has concluded.
Remote area firefighting	Fire management activities in areas that are accessible only by helicopter winch or hover exit insertion or where crews are more than 40 minutes walk from mechanical means of extraction.
Remote area crew	A crew tasked to a remote area.
Report of fire	The notification of the detection of a fire to the fire service. (AFAC)
Reserve fire management strategy (RFMS)	(Previously known as ‘reserve fire management plan’.) A document that details the desirable fire management regimes and objectives for NPWS-managed land. It assesses bushfire threats within the area, the type and nature of natural and cultural heritage, assets and other facilities within the reserve and includes guidelines for any suppression activities or hazard reduction work to be undertaken within that area.
Reserve	See NPWS-managed lands. Area managed by NPWS, and defined as ‘managed lands’ under the *Rural Fires Act 1997*.
Residence time	The time required for the flaming zone of a fire to pass a stationary point; the width of the flaming zone divided by the rate of spread of the fire.
Resources	All personnel and equipment available, or potentially available, for incident tasks.

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Term	Definition
Response	Actions taken in anticipation of, during, and immediately after an incident to ensure that its effects are minimised, and that people affected are given immediate relief and support.
Response time	The time between the report of a fire or incident and arrival at the scene. It includes both reaction time and travel time.
Responsible authority	See *Control authority*
Retardant	See *Fire retardant*
RFS	The NSW Rural Fire Service.
Risk	The exposure to the possibility of such things as economic or financial loss or gain, physical damage, injury or delay, as a consequence of pursuing a particular course of action. The concept of risk has 2 elements: the likelihood of something happening and the consequences if it happens. (AS 4360)
Risk analysis	A systematic use of available information to determine how often specific events may occur and the magnitude of their likely consequences.
Risk control	That part of risk management which involves the implementation of policies, standards, procedures and physical changes to eliminate or minimise adverse risks.
Risk treatment	Selection and implementation of appropriate options for dealing with risk.
Rural	Any area wherein residences and other developments are scattered and intermingled with forest, range, farmland, native vegetation or cultivated crops.
Rural fire district:	An area proclaimed under the *Rural Fires Act 1997* for administration and management by the district Bush Fire Management Committee and rural fire brigades. These are proclaimed over the whole or part of local government areas. NPWS-managed lands may be included in these districts.
Rural fire officers	Collective term for fire control officers and rural fire brigade officers.
Rural–urban interface	See Urban-rural interface.
S	
Safe	The stage of bushfire suppression or prescribed burning when it is considered that no further suppression action or patrols are necessary.
Safety incident	Any event which causes an injury or disease, or has the potential to cause an injury or disease.
Safety zone	An area cleared of flammable materials used for escape if the line is outflanked or in case a spot fire outside the control line renders the line unsafe. In fire operations, crews progress so as to maintain a safety zone close at hand, allowing the fuels inside the control line to be consumed before going ahead. Safety zones may also be constructed as integral parts of fuel breaks. They are greatly enlarged areas which can be used with relative safety by firefighters and their equipment in the event of a blow-up in the vicinity. (Vic report)
Scorch height	1. The height above ground level up to which foliage has been browned by a fire. 2. A measurement for determining the acceptable height of flame during prescribed burning.
Scout	A person who checks and reports on conditions in the fire area.
Scrub	Refers to vegetation such as heath, wiregrass and shrubs, which grows either as an understorey or by itself in the absence of a tree canopy.
Scrub fire	Fires burning in scrub.
Secondary fire control line	See *Fallback fire control line*
Sector	A specific area of an incident which is under the control of a Sector Commander who is supervising a number of crews.
Seen area	The ground, or vegetation, that is directly visible from an established or proposed lookout point, or aerial detection flight route.
Shift	The period resources are allocated during an operation at the incident or on the fire ground.
Shift change	Replacement of allocated crews and or equipment during operations.
Shift length	A normal shift is 7 hours. However, employees may only be required to work a maximum of 12 hours on site. The initial shift following the declaration of an incident may extend to maximum of 16 hours on site (according to Award section 31(v)).
Shift pattern	A pattern of incident shift days and rest days; either 3–1–3 or 5–1–5 (according to Award section 31(vii)).

10.0 Appendix 4

Term	Definition
Situation report (Sitrep)	Situation report of an incident usually given at regular intervals.
Size up	The evaluation of a fire to determine a course of action for suppression.
Slash	Accumulated fuel resulting from such natural events as wind, fire, snow breakage, or from such human activities as logging, cutting or road construction.
Slash burn	A prescribed burn conducted to consume slash for fire hazard reduction or silvicultural purposes.
Sleeper	1. A fire that starts up again after appearing to have been extinguished. 2. A fire that is detected some time after an ignition opportunity (usually from lightning or hop-over events).
Slip-on or slip-on tanker	See *Tanker*
Slip-on unit	A tank, a live hose reel or tray, a small capacity pump, and an engine combined into a single one-piece assembly that can be slipped onto a truck bed or trailer and used for spraying water or foam on bushfires.
Smoke management	Used by land managers and meteorologists planning a prescribed burn to ensure that smoke does not cause problems downwind of the burn.
Smoker	An isolated small burning item such as a log, stump or tree, in an area of fire otherwise mopped-up.
Smoke-sensitive areas	Environments and assets that could be impacted by bushfire smoke, including residential areas, schools, hospitals, retirement villages, other community assets and transport corridors.
Softwood	A conventional term used to describe a tree, and the timber of trees, belonging to the group of plants with cones, such as pine and cypress.
Soil Dryness Index (SDI)	A form of drought index, usually with slightly more detailed inputs than the Keetch-Byram Drought Index. May be on a scale of 0–200 like the KBDI, but some versions have different scales (for example, Western Australia : 0–2000).
Southern Oscillation Index (SOI)	The Southern Oscillation Index compares surface air pressure differences between Tahiti and Darwin and shows a strong correlation with rainfall.
Span of control	A concept that relates to the number of groups or individuals controlled by 1 person. A ratio of 1:5 is recommended.
Spark arrestor	A device fitted to the exhaust system of machinery for trapping carbon sparks.
Species	A group of organisms that are biologically capable of breeding and producing fertile offspring with each other, but not with members of other species.
Spot fire	1. Isolated fire started ahead of the main fire by sparks, embers or other ignited material, sometimes to a distance of several kilometres. 2. A very small fire that requires little time or effort to extinguish.
Spotting	Behaviour of a fire producing sparks or embers that are carried by the wind and start new fires beyond the zone of direct ignition by the main fire. (NWCG)
Stag	A large, old tree, either dead or with significant dead upper branches, often hollow with an opening at ground level. Once alight, a stag represents a major hazard.
Staging area	An area where resources are mustered and prepared for allocation to an incident. It may include the provision of welfare and equipment maintenance facilities. (AIIMS)
Stand by	The period during which personnel are to be immediately available at home or other location for fire suppression purposes.
Standards of cover	The minimum protection required – will be an Australian Standard or OEH standard.
Standing Committee	See *Work groups*
State Air Desk (SAD)	The state-level unit responsible for coordinated aviation operations.
State Duty Officer	The FIMS officer rostered to coordinate incident response across NPWS.
State emergency agencies	Agencies with the legislative role of responding to state emergency declarations and natural disasters under the *State Emergency Response and Rescue Management Act 1989*. Within NSW, both RFS and State Emergency Service (SES) have this responsibility.
State incident procedures (SIPs)	Procedures prepared annually by FIMS to coordinate NPWS-managed fire activities, including formats and mechanisms for reporting and documentation. Prepared as an appendix to the State Incident Plan.
Static water supply	A supply of water in a reservoir or pond, of limited capacity.

10.0 Appendix 4

Term	Definition
Strategic Fire Advantage Zone (SFAZ)	Land zoned to provide strategic areas of fire protection advantage
Step-up method	A method used by a team of firefighters to construct a firebreak in which each firefighter completely constructs a section of the firebreak after which the entire team 'steps up' to the next section.
Stevenson screen	A white-painted timber box with louvered walls, designed to give standardised conditions of ventilation to weather recording instruments, commonly thermometers.
Strategy	A statement detailing how an objective is to be achieved.
Strike teams	A set number of resources of the same type that have an established minimum number of personnel. Strike teams always have a leader (usually in a separate vehicle), and have a common communications system. Strike teams are usually made up of 5 resources of the same type such as vehicles, crews, earthmoving machinery, etc. (AIIMS).
Striker	A small 4-wheel drive fire tanker capable of carrying from 400 to 600 L of water for firefighting purposes. Also known as a Category 9 fire tanker.
Strip burning	1. Burning by means of strip firing. 2. In hazard reduction, burning narrow strips of fuel and leaving the rest of the area untreated by fire. (NWCG) 3. Setting fire to a narrow strip of fuel adjacent to a fire line and then burning successively wider adjacent strips as the preceding strip burns out.
Strip ignition	See *Strip burning*
Stripping	See *Strip burning*
Structure	A constructed object, usually a free-standing building above ground.
Subsurface fire	See *Ground fire*
Suction hose	Hose used to draught from static or open water. It has a hard, usually reinforced, exterior to prevent it collapsing when a partial vacuum exists within the hose.
Supply hose	Hose feeding from a water supply to a pump.
Support agency	An organisation contributing services or resources directly to a lead agency.
Suppression	See Fire suppression.
Surface fire	Fire that burns loose debris on the surface, which includes dead branches, leaves, and low vegetation. (NWCG)
Surface fuel	Fuels lying on or near the surface of the ground, consisting of leaf and needle litter, dead branch material, downed logs, bark, tree cones, and low-stature living plants. (NWCG)
Surface moisture content	The moisture content expressed as a % of oven-dry weight of the top 5–10 mm of leaf litter.
Suspicious fire	Any fire starting under suspicious circumstances and where the cause of the fire is not readily apparent.
T	
Tactics	The tasking of personnel and resources to implement the incident strategies. Incident control tactics are accomplished in accordance with appropriate agency procedures and safety directives. (AIIMS)
Tail fire	See Backing fire.
Tanker	A mobile firefighting vehicle equipped with a water tank, pump, and the necessary equipment for spraying water or foam on bushfires.
task	A job given to any firefighting force or unit.
Task-based assessment (TBA)	Fitness test modelled on the tasks firefighters are required to undertake in their jobs. 3 hike tests have been developed to test the physical fitness, strength and endurance of firefighters. They provide a fair, equitable and objective measure of fitness.
Task force	A combination of resources assembled for a specific purpose. Task forces always have a leader (usually in a separate vehicle), and have a common communications system. Task forces are established to meet tactical needs and may incorporate a mixture of different resources types. (AIIMS)
Task force leader:	Person delegated responsibility for the welfare of a task force.
Technical advisors	Advisors with special skills needed to support incident activities or functions. (AIIMS)
Temperature (dry-bulb)	The ambient air temperature recorded by an exposed thermometer.

10.0 Appendix 4

Term	Definition
Temperature (wet-bulb)	Wet bulb temperature is measured by placing a moist, single-layer, muslin sleeve over the bulb of a dry bulb thermometer. The difference between dry- and wet-bulb readings is used to determine relative humidity and dew point values.
Test fire	A controlled fire ignited to evaluate fire behaviour.
Thermal imagery	A display or print out from an infrared scanning device.
Thermohygrograph	An instrument that simultaneously and continuously measures and records temperature and relative humidity, normally by tracing each onto a revolving chart. Charts can either cater for 1 day or 1 week of continuous recording.
Threat abatement plan	A document under the *Threatened Species Conservation Act 1995* that identifies the action to be taken to abate, ameliorate or eliminate the adverse impacts of threatening processes on threatened species, populations or ecological communities.
Threatening processes	Processes such as habitat disturbance or destruction or pollution that threaten the survival, abundance or evolutionary development of a species, population or ecological community. Inappropriate fire regimes, whether too frequent or infrequent, may threaten specific threatened species, populations or ecological communities.
Time lag	See Lag time.
Tongues	See Fingers.
Topography	The surface features of a particular area or region. It may include mountains, rivers, populated areas, roads and railways and fuel types.
Tops disposal burning	The burning of forest debris resulting from harvesting operations.
Torch and torching	See *Candle*
Travel time	The time taken between the departure of a crew and arrival at the incident. See also Response time.
Trust	The authority appointed under the *National Parks and Wildlife Act 1974* to a state conservation area with the responsibility of care, control and management of that area.
U	
Understorey	The lowest stratum of a multi-storeyed forest.
Unplanned bushfire:	See *Bushfire*
Urban	Area in which residences and other human developments form an essentially contiguous covering of the landscape; includes most area within cities and towns, subdivisions, commercial and industrial parks, and similar development whether inside city limits or not.
Urban interface	See *Urban–rural interface*
Urban–rural interface	The line, area, or zone where structures and other human development adjoin or overlap with undeveloped bushland.
V	
Values at risk	The natural resources or improvements that may be jeopardised if a fire occurs.
Vehicle-mounted flamethrower	Mobile incendiary device.
W	
Warning device	Audible device fitted to fire bombing aircraft to alert ground crews of pending drop.
Water bombing	The dropping of water onto a bushfire from an aeroplane or helicopter.
Water point	Any natural or constructed supply of water that is readily available for fire control operations.
Water tank	A container capable of storing a large volume of water.
Weather District	A BOM administrative area for which weather forecasts are issued.
Wetting agent	A chemical added in low concentration to water. It is used in firefighting to break down the surface tension of the water and to improve its penetration into fuels.
Widow maker	See Hang up.
Wildfire	An unplanned vegetation fire. A generic term which includes grass fires, forest fires and scrub fires.
Wildfire control plan	See *Incident Action Plan*

10.0 Appendix 4

Term	Definition
Wildland Urban Interface (WUI)	See *Urban–rural interface*
Wind direction	The direction from which the wind blows.
Wind speed	The rate of horizontal motion of the air past a given point expressed in terms of distance per unit of time. In the NZ Fire Danger Rating System, wind speed is measured at the standard height of 10 m in the open, averaged over a 10-minute interval and in km per hour.
Wind throw	An area of previously standing timber which has been blown over by strong winds or storms.
Windfall	See *Wind throw*
Windrow	A long line of piled slash or debris resulting from forest or scrub clearing.
Windrow burning	The burning of windrows.
Windward	Towards the wind. You are windward if the wind is blowing on your face.
Woodland	A plant community in which the trees form only an open canopy, the intervening area being occupied by lower vegetation, usually grass or scrub
Work groups	Short-term groups devised to work on projects that require a specific focus or specialist input. They usually include representatives from the 4 field Branches. Also referred to as ‘Standing Committees’.