NSW GOVERNMENT

BUSH FIRE COORDINATING COMMITTEE

Annexure B Guidelines for Preparation of Bush Fire Risk Management Plans

Planning **together**

Glossary / Terminology

Term	Definition
Assets	Anything valued by the community which includes houses, infrastructure, utilities, crops, plantations, and environmental and cultural values.
Bayesian Network Model	A Bayesian network is a probabilistic graphical model that represents a set of variables and their conditional dependencies.
Bush Fire	A general term used to describe unplanned fire in vegetation, includes grass, shrub and forest fires.
Bush Fire Hazard	As defined in AS ISO 31000:2018, the potential severity of a bush fire, which is determined by fuel load, fuel arrangement and topography under a given climatic condition.
Bush Fire Management Committee	A statutory committee appointed under the Rural Fires Act to advise on bush fire risk and bush fire operations within a defined district.
Bush Fire Risk	The chance of a bush fire igniting, spreading and causing damage to the community or the assets they value.
Bush Fire Risk Management	A systematic process that provides a range of treatments which contribute to the well-being of communities and the environment, which suffer the adverse effects of bush fire.
Community Protection Plan	A fine scale, detailed tactical bush fire planning document prepared at a community level.
Consequence	As defined in AS ISO 31000:2018, outcome or impact of a bush fire event. A consequence can be certain or uncertain and can have positive or negative direct or indirect effects.
Firefighting Authorities	The NSW Rural Fire Service, Fire & Rescue NSW, the National Parks & Wildlife Service and Forestry Corporation of NSW.
Focus Area	Focus Areas are groups of assets or areas in the landscape that the BFMC has identified as having significant or unacceptable risk and require targeted treatment strategies. A Focus Area can be a geographic location or group of assets which have similar risks and treatments.
Fuel	Living and dead vegetation that influence the speed and intensity of a bush fire
Likelihood	As defined in AS ISO 31000:2018, the chance of a bush fire igniting and spreading
PHOENIX Rapid Fire	PHOENIX RapidFire is a dynamic fire behaviour simulator that can respond to changes in conditions of the fire in addition to changes in fuel, weather and topographic conditions as a fire grows and moves across the landscape.
Recovery	The capacity of an asset to recover from the impacts of a bush fire.
Risk Analysis	A systematic process to understand the nature of and to deduce the level of risk.
Risk Assessment	As defined in AS ISO 31000:2018, the overall process of risk identification, analysis and evaluation.
Risk Identification	The process of determining what, where, when, why, and how something could happen.
Risk Treatment	As defined in AS ISO 31000:2018, the process of selection and implementation of measures to modify risk, such as ignition prevention, hazard reduction and strengthening community resilience.
Social Vulnerability Index	The index is a tool for quantifying and assessing the vulnerability of communities to bush fire. It refers to the characteristics of a person or group that influence their capacity to prepare for, respond to and recover from the impact of a bush fire.
Treatment Strategies	Activities undertaken to reduce bush fire risk.
Vulnerability	The susceptibility of an asset to the impacts of bush fire.

Abbreviations

Abbreviation	Definition
ACH	Aboriginal Cultural Heritage
AHIMS	Aboriginal Heritage Information Management System
APZ	Asset Protection Zone
Area Command	NSW RFS Area Command Community Risk
ASDST	Aboriginal Sites Decision Support Tool
AWP	Annual Works Program
BFCC	Bush Fire Coordinating Committee
BFMC	Bush Fire Management Committee
BFMZ	Bush Fire Management Zone
BFPL	Bush Fire Prone Land
BFRMP	Bush Fire Risk Management Plan
BIP	BFMC Information Portal
CPP	Community Protection Plan
DPE	Department of Planning & Environment
FAFT	Fire Access & Fire Trail
FCNSW	Forestry Corporation of NSW
FRNSW	Fire & Rescue NSW
GIS	Geographic Information System
HHIMS	Historic Heritage Information Management System
IPP	Ignition Prevention Plan
ISO31000	AS ISO 31000:2018 Risk management - Guidelines
LEP	Local Environmental Plan
Model Plan	Annexure A – Model Plan
NPWS	National Parks & Wildlife Service
NSP	Neighbourhood Safer Place
NSW	New South Wales
PBP	Planning for Bush Fire Protection
PHOENIX	PHOENIX RapidFire
PIP	Pre-incident Plan
PPRR	Prevention, Preparation, Response, Recovery
RFS	Rural Fire Service
SEPP	State Environmental Planning Policy
SFPP	Special Fire Protection Purpose
SoVI	Social Vulnerability Index
The Act	Rural Fires Act 1997
The Guideline	Annexure B – Guidelines for Preparation of Bush Fire Risk Management Plans

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Section 1 – Introduction

A Bush Fire Risk Management Plan is a strategic level document that aims to reduce the risk of the adverse impacts of bush fires on life and property, infrastructure, environmental, economic, cultural and community assets. In New South Wales, Bush Fire Management Committees must prepare a draft Bush Fire Risk Management Plan within 12 months of their constitution and they must review their plan within each successive five-year period (S52, Rural Fires Act, 1997).

This Guideline has been prepared to assist Bush Fire Management Committees (**BFMCs**) in the development of a Bush Fire Risk Management Plan (**BFRMP**). It provides a detailed structure and methodology that must be applied by BFMCs. The Guideline forms part of **BFCC Policy 01/2023** and should be read in conjunction with Annexures A through to F.

1.1 RISK MANAGEMENT

The prevention, preparation, response and recovery (**PPRR**) model provides a comprehensive approach to emergency management in Australia. The BFRMP focuses on the prevention and preparation aspects of risk management, but it is also a valuable tool that should be used by BFMCs to inform and support their response and recovery arrangements.

The bush fire risk management process applied in this Guideline is based on the Australian Standard for Risk Management (ISO 31000:2018), but also incorporates new science, technology and research. The process will be regularly reviewed and modified to ensure that it remains in line with best practice. **Figure 1** provides an outline of the risk management process outlined in ISO 31000. It covers identification, analysis, evaluation and treatment of risks and identifies the need for community consultation, monitoring, and reporting to be undertaken throughout the process. It is a cyclical methodology in that the outputs inform subsequent plans.

Figure 1 *An interpretation of the risk management planning process outlined in the ISO 31000:2018 Risk management – Guidelines*

1.2 BFRMP AIM AND OBJECTIVES

The aims and objectives of a BFRMP are set out by the BFCC in **BFCC Policy 01/2023**. The aim of a BFRMP is to reduce the risk of adverse impacts of bush fires on life and property, infrastructure, environmental, economic, cultural, agricultural and community assets.

The objectives of a BFRMP are to:

Objective 1: Reduce the number of human-induced bush fire ignitions and their potential to cause damage to life and property, infrastructure, environmental, economic, cultural, agricultural and community assets.

Objective 2: Manage fuel to reduce the rate of spread, intensity and impact of bush fires on life and assets while minimising damage to environmental and cultural values.

Objective 3: Increase the community's resilience to bush fires by improving its preparedness, response and recovery.

Objective 4: Provide advice and strategies to plan, prepare and implement activities to effectively contain fires with the potential to cause damage to life, property, infrastructure and environmental, economic, cultural, agricultural and community assets.

1.3 BFRMP STRUCTURE AND TIMEFRAME

The process outlined in this Guideline provides a consistent, objective, tenure-blind approach to bush fire risk management planning. A quantitative bush fire risk analysis is undertaken using fire behaviour modeling and risk is assessed for the following four asset types (under both current and future fuel scenarios):

- Human settlement (residential and Special Fire Protection Purpose) assets,
- Economic assets,
- Environmental assets, and
- Cultural (including historic and Aboriginal cultural heritage) assets

The BFMC and stakeholders review the asset risk data (and other supporting map products) and develop a practical and locally relevant BFRMP.

The final, publicly available BFRMP is made up of three components.

1. **A Model Plan.** This document provides an overview of the process. It also identifies the Focus Areas and lists the key BFMC treatment strategies.
2. **Risk Maps.** Risk maps display the current risk to the different asset types. They assist BFMCs in understanding risk and they support the decision making process.
3. **Fuel Management Register and Focus Area Map.** This map displays the Focus Areas and the 5-year fuel management plan.

A draft BFRMP is developed across 4 BFMC workshops and it takes approximately six to nine months to complete. This timeframe includes 30 days of public consultation at the start of the process, as well as a period of 42 days for public exhibition of the draft plan.

1.4 DOCUMENTATION

It is important that BFMCs record each step of the BFRMP process. Including BFMC meeting minutes, business papers and related submissions, outcomes, decisions and results. The documentation should:

- Demonstrate the risk assessment process has been undertaken in line with **BFCC Policy 01/2023** and all BFMC members have been engaged in the process;
- Provide a record of community feedback;
- Provide a record of decisions made;
- Provide the relevant decision makers with a draft BFRMP for approval and subsequent implementation; and
- Record on-going monitoring and review.

Documenting the BFMC activities and deliberations will assist with auditing as well as any reporting requirements. Good record keeping will also provide the BFMC with important information for the next revision of the BFRMP.

Refer to the BFMC Handbook for more information on BFMC documentation.

1.5 LEGISLATIVE FRAMEWORK

Legislation (Acts and Regulations), policies and supporting documentation provide the framework for prevention, mitigation and suppression of bush fires as well as coordinated firefighting and bush fire prevention across NSW.

The *NSW Rural Fires Act, 1997* requires the preparation of a BFRMP as well as a Plan of Operations and a Fire Access and Fire Trail (**FAFT**) Plan. The *Rural Fires Regulation, 2022* provides further guidance on how the provisions of The Act are applied.

The BFCC have developed a number of policies which provide a strategic framework for BFMCs. BFCC policy which support bush fire risk management include:

- Policy 1/2000 Guidelines for Dispute Avoidance / Dispute Resolution;
- Policy 1/2011 Allocation Principles for Funding of Bush Fire Mitigation Works;
- Policy 2/2012 Notified Step for the protection of Neighbourhood Safer Places;
- Policy 1/2017 Fire Trails;
- Policy 1/2020 Bush Fire Management Committees; and
- BFMC Handbook.

A BFRMP may also require the preparation of other types of plans including:

- Ignition Prevention Plans (**IPPs)**;
- Pre-Incident Plans (**PIPs**);
- Community Protection Plans (CPP); and
- Agency specific plans.

1.6 BFMC INFORMATION PORTAL AND DATA GOVERNANCE

A BFMC Information Portal (BIP) has been developed for BFMC members, RFS Area Command and the RFS and NPWS Project Teams to aid in the preparation of BFRMPs. The online spatial portal enables BFMC members to view the BFRMP input data and risk assessment data. It also has a number of tools which assist the BFMC in validating their data, providing feedback on risk and recording BFRMP treatment strategies.

The RFS and NPWS have data licencing agreements for all input data used in the BFRMP process. For this reason, the input data that is made available (e.g., assets and vegetation data) can be viewed in the BIP and printed as a map, but cannot be extracted (downloaded) and used for other purposes.

The output data (risk data) is available for BFMC members. The BFMC member can request (in writing) a copy of the data from the RFS. The data can only be used for the purpose of Bush Fire Risk Management Planning. If a

BFMC member intends to use the data for other purposes or wants to provide it to a third party, then a data licence agreement would be required.

Further information on the BIP and detailed user instructions are provided in the **BIP User Manual**.

1.7 GUARDIAN

Guardian is a multi-agency, spatial, bush fire risk information system. It aims to assist in the planning, preparation, implementation and reporting of all bush fire mitigation activities, by all agencies. The Treatments from endorsed BFRMPs will be uploaded into Guardian and progress can be tracked through the BFMC Annual Works Program and Annual Report.

1.8 PUBLIC INFORMATION

The Rural Fires Act, 1997 (Division 5), requires public participation in the preparation of plans. It also requires that BFRMPs and draft BFRMPs be available for public inspection. In addition, the *Final Report of the NSW Bushfire Inquiry* (**the Inquiry**) into the 2019-2020 fire season recommended that regional priorities for hazard reductions are clearly communicated to the public (including how they were identified).

To achieve the requirements of The Act and the recommendations of the Inquiry, each BFMC will develop a Communications Strategy. BFMCs will also have their own webpage on which the BFRMP will be displayed. The webpage will be used to provide an overview of the BFMC as well as provide information on the status of the review of the BFRMP, including community consultation at the start of the process and the public exhibition of the draft BFRMP.

1.9 HOW TO USE THE GUIDELINE

There are 9 sections in this Guideline.

Section 1 (above) has set out the aims and objectives of a BFRMP and provided an overview of the process.

Section 2 provides an overview of the steps involved in developing a BFRMP and outlines the core roles and responsibilities of the BFMC and supporting agencies.

Section 3 provides detail on the assessment process used to determine bush fire risk to assets.

Section 4 outlines the core communication and community consultation requirements during the development of a BFRMP.

Section 5 describes the process in Stage 1; **Introduction and Data Validation**.

Section 6 describes the process in Stage 2; **Risk Analysis and Treatment**.

Section 7 describes the process in Stage 3; **Risk Evaluation and Public Exhibition**.

Section 8 describes the process in Stage 4; **Review and Endorsement**.

Section 9 Provides an overview of BFRMP review, monitoring and audit.

Section 2 – BFRMP Development Process

The BFRMP is developed over 4 key stages and takes 6 to 9 months to complete.

This section provides an overview of the process and sets out the roles and responsibilities of each of the key stakeholders.

2.1 KEY STAGES

The development of a BFRMP involves 4 key stages and at least 4 BFMC Workshops. The steps are summarised below. Sections 5-8 of the Guideline will provide more detail on each stage.

Stage 1	**Introduction and Data Validation – Workshop 1** The BFMC will be introduced to the BFRMP through a facilitated presentation outlining the risk assessment methodology and development process. Following the presentation, the BFRMP subcommittee will undertake Workshop 1 (a data validation process).
Communications Strategy	**Community Insights** The subcommittee will develop a BFRMP Communication Strategy. The strategy may include an online "Have Your Say" survey through the RFS website as well as face to face workshops with key stakeholders. The strategy will be implemented throughout the development of the BFRMP and will be submitted to the BFCC with the draft BFRMP.
Processing	**Bush Fire Risk** The RFS and NPWS Project Teams will process the data to assess the bush fire risk to all asset types.
Stage 2	**Risk Analysis and Treatment- Workshop 2a and 2b** The BFMC will be presented with the modelled bush fire risk data for each asset type. Over two workshops, the BFRMP subcommittee will analyse the data and use local expert knowledge to identify Focus Areas, Treatment Strategies and a proposed Fuel Management Register.
Processing	**Predicted Risk Reduction** The RFS and NPWS Project Teams will process the Fuel Management Register to assess the predicted risk reduction to all asset types and to help BFMCs to assess various strategies to reduce bush fire risk.
Stage 3	**Risk Evaluation & Public Exhibition- Workshop 3** The BFMC will be provided with the evaluated risk results (Risk Reduction with Future Treatments) for each asset type. The BFMC will review the draft BFRMP and endorse the BFRMP for public exhibition. The BFRMP will be placed on public exhibition for 42 days and the community are invited to provide feedback on the draft plan.
Stage 4	**Review – Workshop 4** The BFMC will review the submissions from public exhibition and may make modifications to the BFRMP. The BFRMP will be endorsed for submission to the BFCC.
Publication	**Publication** The BFCC endorsed BFRMP will be published on the BFMC Webpage.

2.2 ROLES AND RESPONSIBILITIES

There are a number of stakeholders in the development of a BFRMP including the BFCC, BFMC, RFS Project Team, NPWS Project Team and the RFS Area Command. These key stakeholders and their roles are outlined below.

Bush Fire Coordinating Committee

The BFCC is a Statutory Body responsible for planning in relation to fire prevention and coordinated bush fire management. Its committee members advise the RFS Commissioner on bush fire prevention and mitigation and coordinated bush fire suppression.

The BFCC is responsible for approving the Bush Fire Risk Management Policy, and the RFS Commissioner is responsible for approving BFRMPs under delegation from the BFCC. .

RFS Project Team

On behalf of the BFCC, the RFS Project Team has developed the bush fire risk management methodology, as well as the Policy, Guidelines, Technical Manual and supporting documents. The team coordinates the preparation and processing of bush fire risk data and manage the provision of data through the BFMC Information Portal.

The RFS Project Team coordinate the BFRMP implementation schedule across NSW. BFMCs are divided into clusters based on their location, fire weather area and previous BFRMP review dates.

The RFS Project Team prepare an Economic Asset profile for each BFMC and provide advice on assets at risk.

The RFS Project Team also provides training and support to the RFS Area Command to ensure consistency across the state and adherence to timeframes. The team provides assistance to the RFS Area Command in the facilitation of Workshops, GIS technical support and advice regarding the assessment of residential, SFPP and economic assets.

NPWS Project Team

The Bushfire Risk & Evaluation Unit at NPWS has developed the risk assessment methodology for environmental and cultural assets. The NPWS Project Team assists the RFS with the preparation and processing of data and has supported the RFS in the development of the Bush Fire Risk Management Policy and associated documents.

The NPWS Project Team prepare an Environmental and Cultural Asset profile for each BFMC and provide advice on assets at risk.

The NPWS Project Team provides assistance to the RFS Area Command in the facilitation of Workshops and presentations.

Bush Fire Management Committee

BFMCs are made up of a range of stakeholders including landholders, land managers, fire fighting authorities and community organisations. These representatives work collaboratively under the guidance of BFCC policies to deliver comprehensive bush fire management to the community. Every rural fire district and fire district in NSW with a reasonable risk of bush fires is covered by a BFMC.

Each BFMC is responsible for developing a BFRMP which sets out the treatments to manage the risk of bush fires in their fire district.

BFMC members are responsible for active participation in the preparation of the draft BFRMP. All members are encouraged to attend the presentations and have input into the BFRMP. A BFMC subcommittee may be established to provide expert knowledge at BFRMP workshops in relation to:

- data validation;
- analysis of risk data;
- identification & mapping of proposed fuel management treatments;
- identification of Focus Areas, Treatment Strategies and Bush Fire Management Zones; and
- preparation of the Model Plan.

All BFMC members should review the draft BFRMP, endorse the BFRMP for public exhibition, review public submissions and endorse the BFRMP for submission to the BFCC.

The BFMC Executive Officer is responsible for ensuring the BFRMP is prepared in accordance with this Guideline and has a number of specific tasks allocated throughout the Guideline.

RFS Area Command

The RFS Area Command, Community Risk (**Area Command**), serves as the functional link between the BFMC and the RFS and NPWS Project Teams. They provide guidance and direction to the Executive Officer and BFMC in the development of the BFRMP. Area Command is to provide direct support to BFMCs in the preparation of their draft BFRMP and ensure strategic consistency across all BFRMPs in their Area.

Key functions include:

- facilitating BFRMP workshops and delivering presentations;
- GIS technical support and advice regarding the development of a Fuel Management Register;
- access and training regarding the BFMC Information Portal;
- support with community consultation and public exhibition; and
- support with the preparation of the Model Plan.

It is also important that Area Command manages the BFMC timeframes as per the BFMC Implementation schedule as delays in the preparation of one draft BFRMP may affect the timeframes of other BFMCs in their area.

2.3 PROCESS MAPS

Process maps and summary boxes are provided throughout the Guideline. They highlight the key steps in each section, and clearly identify who is responsible for each step (**Figure 2**).

Figure 2: *Responsible team colour key for process maps*

Section 3 – BFRMP Risk Assessment Process

The risk assessment process uses a fire spread simulator (PHOENIX RapidFire) and a Bayesian Network Model to produce quantitative bush fire risk data for the BFRMP. This section provides an overview of the risk assessment methodology. It will assist users in understanding and interpreting the suite of risk maps that are produced. Further detail regarding the bush fire modelling and risk analysis process (including Bayesian Network Models, vulnerability curves, expert elicitation process and scientific references) is provided in the **BFRMP Technical Manual.**

3.1 FIRE SIMULATION

PHOENIX RapidFire (PHOENIX) is a deterministic fire charactisation model that is used in the BFRMP methodology to simulate fire behaviour and determine the likelihood of fire spread and potential bush fire exposure across the BFMC area. PHOENIX uses two basic fire behaviour models: the CSIRO southern grassland fire spread model and a modified McArthur Mk5 forest fire behaviour model. PHOENIX also applies a range of other modules to account for factors such as fuel accumulation, wind modification and fire spotting. PHOENIX requires a number of spatial inputs which are prepared by the RFS Project Team. The inputs include:

- Fuel type;
- Fire history;
- Topography;
- Fuel disruptions;
- Weather;
- Suppression resources; and
- Ignition locations.

Bush fire simulations in PHOENIX are run using 180m resolution grid cells. The output is a bush fire characterisation (**Figure 3**) which provides:

- Fire extent and size;
- Intensity;
- Flame height; and
- Spotting.

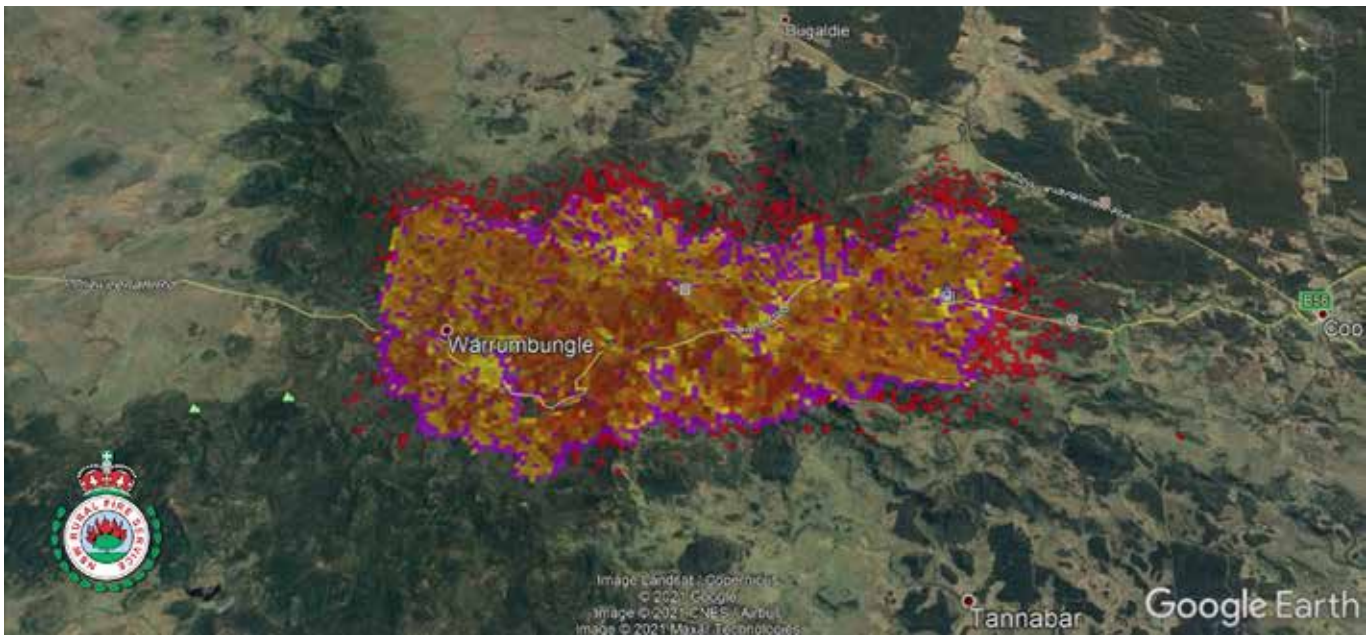


Figure 3: *An example of a fire characterisation in PHOENIX RapidFire. The software predicts flame height (depicted in colours yellow and brown), ember attack (red) and locations where the fire edge will stop and extinguish (purple).*

3.2 MODELLED IGNITIONS AND WEATHER

An ignition location is required to undertake the fire simulation process in PHOENIX. In the BFRMP methodology, modelled ignition locations are identified across the BFMC area. The ignitions are modelled using a weighted probabilistic approach which considers human-caused ignitions and lightning ignitions. The dominant drivers of human-caused ignitions are distance to roads (closer to a road, the more likely an ignition), housing density (as housing density increased, the likelihood of an ignition increased and then declined when at very high housing density) and fire weather as represented by Forest Fire Danger Index (FFDI) (the higher the FFDI, the more likely an ignition). For lightning ignitions, the dominant drivers are FFDI (the higher the FFDI, the more likely an ignition), annual rainfall (the likelihood of an ignition increased as rainfall increased and then decreased as rainfall exceeded 940 mm per year) and distance to road (further from a road, the more likely an ignition).

The number of ignitions modelled in each BFMC area is predominantly based on the area of fuel within the BFMC. Large BFMCs will have up to 1500 ignition points and smaller BFMCs will have less than 100. Ignitions extend up to 20km outside the BFMC boundary to account for ignitions that start outside the BFMC boundary and spread to impact assets within the BFMC (**Figure 4**).

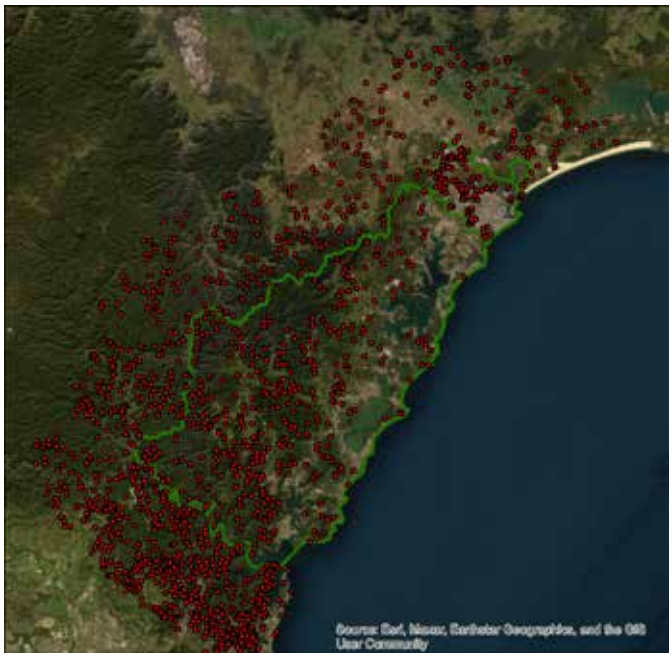


Figure 4: *An example of a modelled fire ignitions (red points) in the Central Coast and Newcastle BFMC areas.*

Local automatic weather station data is used to determine the weather scenarios applied in the PHOENIX bush fire simulations for each BFMC. To capture variability in weather, three weather types were selected within each of the six Fire Danger Rating categories* based on the predominant Forest Fire Danger Index driver: 1. Strong wind with a significant directional change; 2. Strong wind; and 3. High air temperature. Therefore for each BFMC, up to 18 different weather scenarios were used for each ignition point.

Individual fires are ignited at 1100h to allow PHOENIX to generate stable and realistic estimates of fuel moisture pre-ignition. Fires are propagated for 12 hours until 2300h, unless self-extinguished or suppressed within the model during this period.

The PHOENIX simulation outputs are then processed for each Fire Danger Rating category. The processing provides the following factors, which are used in the risk assessment of assets (likelihood and exposure):

- The average number of times that a grid cell has been exposed to embers, flames < 2 metres, flames 2- 10 metres and flames >10 metres; and
- The average flame height, ember density and convective strength for each grid cell.

* FDI was used at the time of development. This has since been replaced with Fire Behaviour Index.

3.3 ASSET RISK ASSESSMENT

The BFRMP methodology divides assets into four asset types; Human settlement, Economic, Environmental and Cultural. Assets are identified using GIS data and are validated by the BFMC in Stage 1.

The risk analysis is undertaken using Bayesian Network (BN) models, which are graphical models of variables and their interactions. Four conceptual BN frameworks were developed, one for house loss, one for Special Fire Protection Purpose and economic assets, one for environmental assets, and one for cultural assets.

A brief description of each of the four asset types and the risk assessment process applied is provided below.

Human settlement

There are two subcategories of Human Settlement assets:

- Residential – all homes and dwellings
- Special Fire Protection Purpose (SFPP) – this includes hospitals, child care providers, schools, places of worship, town halls, major campsites and other public buildings

The probability of house loss is calculated as a function of ember density, flame length and convection using the modified Tolhurst and Chong (2011)* house loss equation. The probability of an SFPP asset being damaged or destroyed by a fire is calculated using vulnerability curves developed from expert elicitation workshops.

* Tolhurst KG and Chong, DMO (2011) Assessing potential house losses using PHOENIX Rapidfire. In 'Bush fire CRC & AFAC 2011 Conference Science Day'. Sydney Australia. (ed. RO Thornton pp 74-86. (Bush fire CRC)

Economic

There are eight subcategories of economic assets:

- Agricultural – all agricultural assets, including grazing land, cropping and orchards, major machinery sheds, intensive animal production and fencing
- Commercial and Industrial – all commercial and industrial buildings including factories and manufacturing facilities
- Electrical – all forms of electricity generation and transmission assets
- Forestry – publicly and privately run forestry assets
- Infrastructure – all infrastructure, including airports, roads, railways and communications towers
- Mining – all mines and mining activity, including surface and underground mining
- Recreation – all recreation localities, including campsites, major sporting and recreation complexes
- Drinking water catchments

The probability of an economic asset being damaged or destroyed by a fire is calculated based on the vulnerability of the asset to the fire exposure (calculated using vulnerability curves), the damage cost and the recovery time for the asset to be replaced or repaired.

Environmental

There are 12 subcategories of environmental assets:

- Threatened flora, fauna and populations;
- Assets of Intergenerational Significance;
- Threatened Ecological Communities;
- Protected and regulated lands;
- Private Land Conservation Agreements;
- Coastal wetlands;
- Littoral rainforests;
- Ramsar wetlands;
- Wilderness Areas;
- Flora Reserves;
- Species management sites (including rewilding sites); and
- World Heritage Properties and their Outstanding Universal Values.

The probability of an environmental asset being damaged or destroyed by a fire is calculated based on the sensitivity of the asset to the fire, the conservation status, the significance of impact and the history of fire impacts.

Cultural

This asset type includes:

- Known and predicted Aboriginal Cultural Heritage –including tangible objects (i.e modified trees, rock art, grinding grooves, and occupational deposits) and intangible values (i.e. places associated with stories and ceremonies passed through generations)
- Historic Heritage – including buildings, infrastructures, streets/roads/trails, towns/precincts, landscapes, and movable items.

The probability of a cultural asset being damaged or destroyed by a fire is calculated based on the vulnerability of the asset type to bush fire.

3.4 RESULTS

Risk is calculated for current and future fuel scenarios and is mapped for each of the asset types using five categories; highest, high, moderate, low and lowest risk. Section 6 provides further information on the risk results and interpretation of data.

Section 4 – Community Consultation

4.1 COMMUNICATIONS

Involvement of stakeholders and the community is an integral component of developing a comprehensive and inclusive BFRMP. Effective communication requires time, discussion and exchange of information. Input of local knowledge from a range of stakeholders will contribute to a more robust plan. Accordingly, communication and community participation must be facilitated throughout the BFRMP process to guide the workshops, formal consultation periods and overall plan development.

Key communication milestones occur during every stage of the BFRMP development and include:

- Preparation of a communication strategy
- Briefings on the process
- Workshops with BFMC and key stakeholders
- Targeted engagement with key agency subject matter experts
- Have Your Say: formal public consultation period
- Public exhibition: formal public consultation period

In order to facilitate communications during each of the stages, the BFMCs should consider the range of stakeholder groups, such as local volunteer brigades, group officers, local conservation and farming groups, community associations, utility providers, major landholders and Aboriginal community groups.

4.2 FORMAL COMMUNITY CONSULTATION

Engaging with the local community early in the preparation of a draft BFRMP enables a BFMC to understand what assets are important to their community and ensures these assets are considered for inclusion in the plan.

There are two periods of formal community consultation during the development of the draft BFRMP:

1. The 'Have Your Say' survey for a minimum 30 days during stage 1 (may also be undertaken concurrently with stage 2 if necessary).
2. The public exhibition period for a minimum 42 days as part of stage 3 and 4.

Each BFMC will have a webpage hosted by the RFS that will contain general information about demographics, fire history and plan development. During periods of formal consultation, the webpage will contain a link to an online survey. While the survey is the minimum requirement, BFMCs will need to be flexible and consider alternative and multiple engagement methods. In documenting their communication strategy, BFMCs should consider their community demographics and select appropriate communication methods, channels and timing to promote the consultation in order to reach a wide audience.

All submissions from consultation should be recorded and considered by BFMCs.

Reference should be made to **Annexure D – Communications** for more details on each of the consultation periods and requirements.

4.3 ENGAGE SUBJECT MATTER EXPERTS WITHIN AGENCIES

The next generation BFRMP process requires the input of key agency stakeholders in the preparation of their BFRMP through their BFMC representative(s). BFMC members and their sub-committee representatives are required to participate in several workshops outlined in sections 5-8 of this document. Outside of the workshops BFMC members should also engage with their key agency stakeholders to capture the extensive knowledge and experience of the local experts regarding bush fire risk to assets in their area and effective strategies to protect their communities and assets. This information will be tabled at the BFMC for consideration in the development of the BFRMP.

BFMC members are encouraged to engage with their key agency stakeholders early in the draft BFRMP process to ensure this information is used in the development process.

Reference should be made to **Annexure D – Communications** and the **BFMC Handbook** for more details on engagement with BFMC members, sub-committees and subject matter experts.

Section 5 – Process

Stage 1: Introduction and Data Validation

WHAT'S COVERED IN STAGE 1?

This section outlines the steps involved in Stage 1 of the BFRMP development process. In Stage 1, the BFMC begins the review of their BFRMP and validates the input data that will be later used in the risk analysis process. **Box 1** provides a brief summary of the steps and **Figure 5** provides a process diagram. A more detailed flowchart for the BFRMP process can be found in Appendix 1.

Stage 1 summary – Introduction and data validation in Workshop 1

Key steps in Stage 1 include:

- RFS Project Team makes contact with the relevant Area Command and provides a briefing to Area Command and BFMC Executive Officers on the BFRMP development process.
- BFMC Executive Officer contacts the BFMC, provides information on the BFRMP process and schedules BFMC meeting and Workshop 1.
- Data preparation is undertaken by the RFS and NPWS Project Teams.
- NPWS Environmental and Cultural Asset Report prepared by NPWS Project Team is provided to the BFMC for review.
- Area Command delivers Presentation 1 to BFMC (support is provided by the RFS and NPWS Project Teams).
- Area Command provides BFMC members with access to BIP.
- BFMC to develop Communications Strategy, request activation of BFMC webpage and commence 30 day community consultation period ('Have Your Say' survey).
- BFMC undertakes targeted engagement with key agency stakeholders, such as RFS senior volunteers, FRNSW senior firefighters, FCNSW foresters, NPWS rangers, local government rangers and planners and the local Aboriginal community.
- Area Command facilitates Workshop 1 with BFMC (support is provided by the RFS and NPWS Project Teams). BFRMP subcommittee validates the input data.
- Executive Officer reviews recommended changes to input data in BIP and endorses the data for processing. Area Command notifies RFS Project Team.
- RFS Project Team updates the input data based on BFMC recommended changes.
- Validated input data is used for PHOENIX modelling and processing to generate bush fire risk data.

Box 1: *Summary of the steps in Stage 1*

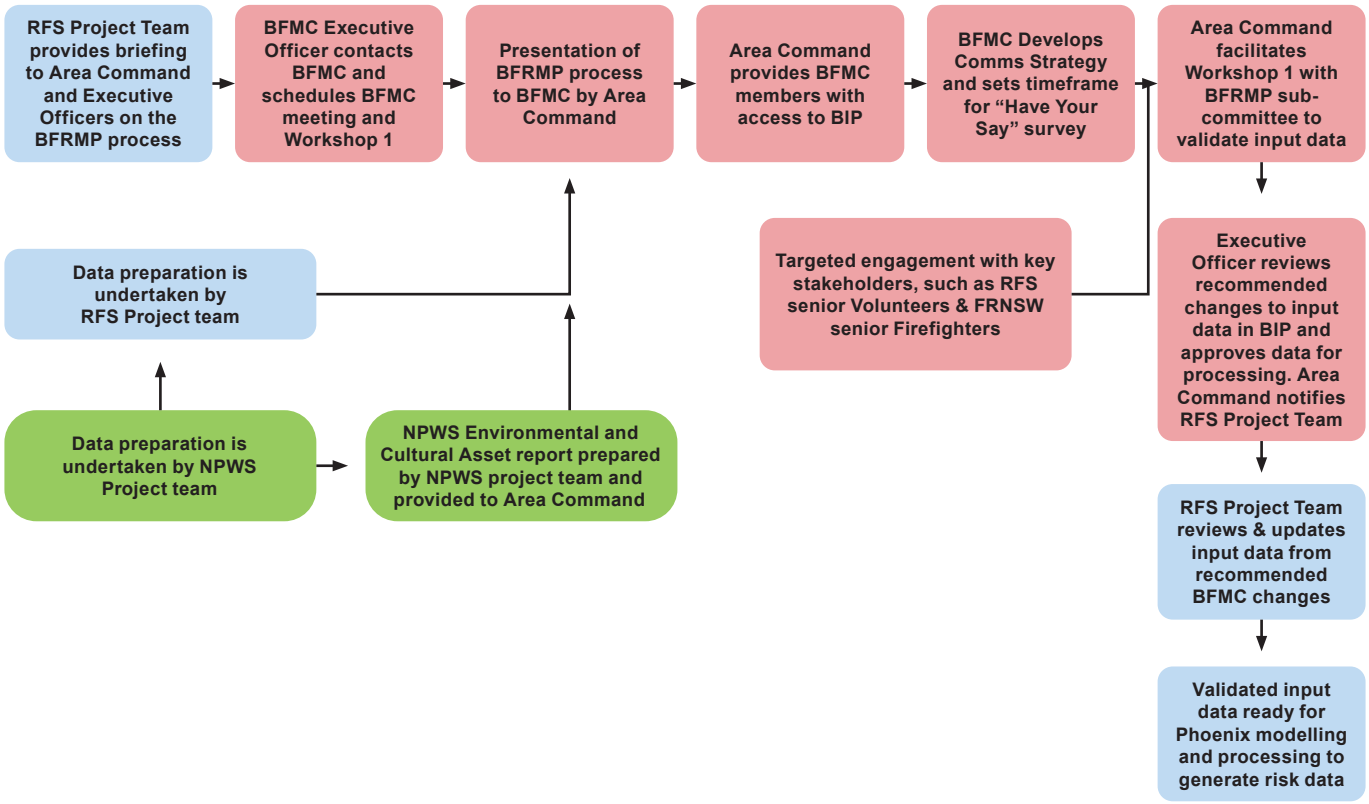


Figure 5: *Process diagram for Stage 1*

5.1 BEFORE WORKSHOP 1

The RFS Project Team have developed an implementation schedule for the rollout of the new BFRMP process. As part of the schedule, BFMCs in NSW have been clustered into groups based on their fire weather area and current BFRMP review period. The RFS Project Team will make contact with Area Command to initiate the process and brief Area Command and BFMC Executive Officers on the BFRMP process and timeline. Following the briefing, the BFMC Executive Officer should contact their BFMC to arrange BFMC Presentation 1 and Subcommittee Workshop 1.

The RFS Project Team will begin data preparation of residential, SFPP and economic asset data and will run preliminary PHOENIX modelling to test the input layers.

The NPWS Project Team will prepare an Asset Profile Report identifying environmental and cultural assets in the BFMC area. The report will be distributed to each BFMC in the cluster.

In preparation for Workshop 1, BFMC members should review any legislation or planning documents which may be applicable to land within their area and may influence treatments in the BFRMP. This may include, but is not limited to:

- The current BFMC Bush Fire Risk Management Plan;
- BFMC Community Protection Plans;
- State Environmental Planning Policies (SEPPs) (such as SEPP Koala Habitat Protection 2021);
- The Local Environmental Plan (LEP); and
- Agency specific Fire Management Plans.

5.2 PRESENTATION AND WORKSHOP 1

Presentation 1 provides an introduction to the next generation BFRMP process. It is delivered to the BFMC by RFS Area Command (with support from the RFS and NPWS Project Teams). This introduction provides an overview of the methodology, process, timeline, BIP as well as roles and responsibilities. If the BFMC does not already have a BFRMP subcommittee convened to oversee the development of the BFRMP, then they may chose to establish a subcommittee at this meeting. The BFRMP subcommittee will be expected to actively participate in all the Workshops and will be responsible for developing the BFRMP.

The BFMC should draft their Communications Strategy (as described in Section 4). The Communications Strategy will form part of the final BFRMP.

The BFMC is required to complete and fact check the information for their BFMC webpage. The template document can be found in **Appendix 3 of Annexure D – Communications**. The RFS Area Command may assist BFMCs in preparing this information.

Area Command will work with the BFMC, and RFS Project Team to activate the webpage and 'Have Your Say' survey as soon as possible following Presentation 1. The BFMC webpage will provide information relating to each BFMC, including BFMC meeting minutes, as well as display the status of a BFRMP (in development, draft, public exhibition, approved).

At Workshop 1 the BFRMP subcommittee will review the input data for the risk assessment process.

The aims and actions for Presentation 1 and Workshop 1 are provided below.

BFMC PRESENTATION 1 – INTRODUCTION	
AIM 1:	Introduce BFMC members to the next generation BFRMP methodology, the process and the timeline for developing a draft BFRMP
AIM 2:	Discuss strategies for community engagement during the BFRMP development
AIM 3:	Provide introduction to BIP
ACTION 1:	Establish an BFRMP subcommittee and if not already arranged, set a date for Workshop 1 – Data validation.
ACTION 2:	Executive Officer to complete and fact check the information for the BFMC webpage.
ACTION 3:	Executive Officer to draft a Communications Strategy and distribute to BFMC for comment.
ACTION 4:	Area Command to contact RFS Project Team and request activation of the BFMC webpage and 30-day 'Have Your Say' survey.
ACTION 5:	Area Command provide BFMC members with access to BIP.

SUBCOMMITTEE WORKSHOP 1 – DATA VALIDATION	
AIM 1:	Present any relevant planning documents and any comments from internal stakeholder consultation.
AIM 2:	Review and validate the preliminary PHOENIX modelling and input data including, residential and economic assets, fire history (15 years) and modelled ignition points.
AIM 3:	Review the NPWS Environmental and Cultural Asset Profile Report.
ACTION 1:	Executive Officer to record any recommended changes to input data in the BIP and approve the data for processing.
ACTION 2:	Implement strategies from the Communications Strategy

5.3 VALIDATING DATA IN WORKSHOP 1

This section outlines the datasets that are available to the subcommittee during Workshop 1, and provides guidance for reviewing and validating the data.

To ensure the development of the BFRMP is collaborative and locally relevant, subcommittee members are encouraged to engage with their stakeholders prior to Workshop 1 (as per their Communications Strategy). For example, the RFS will engage with senior volunteers to capture their local knowledge and expertise. Subcommittee members may also (with approval from the Executive Officer) invite relevant stakeholders to Workshop 1 to assist with the data validation process.

Datasets to be validated at Workshop 1

At Workshop 1, attendees will be asked to review and validate the input data for PHOENIX and the asset layers. It takes up to 6 weeks to process the risk data for each BFMC cluster so it is important that the input data is checked and validated before being processed.

Workshop 1 will be facilitated by RFS Area Command using printed maps and online spatial data in BIP. **Table 1** provides a list of the data layers, a description and tips for validation.

The Executive Officer (with support from Area Command) will record recommendations to modify data in the BIP.

Data Provided	Description	Validation
Preliminary burn frequency map	This map is developed to trial the current PHOENIX input layers. PHOENIX is run for each ignition point but only under 2 weather scenarios (rather than the 18 that will be used later in the process). The Burn Frequency map shows how many times a fire reached each grid cell.	Look for any anomalies in this data. Identify areas where the frequency is lower or higher than expected. This could be an indication of missing ignition points, incorrect fuel type or fuel load. For areas that you have identified, check the relevant input layers to investigate what might be causing the anomaly. Note, some anomalies may be due to the limited weather scenarios used in the trial.
Preliminary residential risk map	This map is developed to trial the current PHOENIX input layers and the residential asset layer. PHOENIX is run for each ignition point but only under 2 weather scenarios (rather than the 18 that will be used later in the process). This map shows the risk to residential assets based on the two scenarios.	Look for any anomalies in this data. Check areas depicted as having no impact (grey colour in the grid cell). This means that houses are present in the grid but were not impacted by fire. If 'no impact' is unexpected, it could be an indication of missing ignition points, incorrect fuel type and fuel load. Check the relative risk rating. Identify areas where the risk is lower or higher than expected. When reviewing the risk, please note that density of housing is an important factor and increases the risk rating. For areas identified, check the relevant input layers to investigate what might be causing the anomaly. Check areas of new residential development. If the grid cell does not have a colour, then the new residential structures are not in the data and need to be added. New assets should only be added to the data if construction has commenced or is imminent. Note, some anomalies may be due to the limited weather scenarios used in the trial.

Data Provided	Description	Validation
Modelled Ignition points	The location of modelled ignition points for the BFMC area are shown on this map.	Review the modelled ignition points. Check areas that you know have a high probability of ignition or areas where you are worried about getting an ignition. For example, an area where there is a history of arson, busy unpatrolled campsites and lightning paths. If there is not a modelled ignition point in an area of concern, add a request for an additional ignition point. Also check for areas that you believe have too many modelled ignition points.
Fire History	Recent fire history (bush fire and prescribed burns) are shown on this map. The Fire History map is used in th Phoenix model to determine time since fire and therefore predicted fuel load. Fire Extent and Severity Mapping (FESM) data may be available for areas burnt in the 2019/20 fire season. This data shows the potential unburnt areas within the fire boundary. The Fire History map will also be useful later on in the BFRMP process when the BFMC is developing their fuel treatment plan.	Check the fire history map and consider whether any significant (>10 hectares) and recent (<10 years) fires are missing. Also check for any significant errors in the boundaries of fires. To the best of your knowledge, check that the FESM data reflects the areas that were unburnt.
Fuel Type (vegetation)	This map shows broad fuel (vegetation) types derived from the latest available NSW native vegetation extent data layer and land-use mapping. Vegetation classes from Keith (2004)* are classified into 59 fuel types. * Keith, D (2004) 'Ocean shores to desert dunes: the native vegetation of New South Wales and the ACT ' (Dept. of Environment and Conservation Hurstville, NSW).	If anomalies are identified in the Phoenix trial maps, check the Fuel Type Map to confirm the input data is correct. Check that the vegetation has been removed in areas of recent clearing or land use change. For example new residential development areas. Changes to fuel or vegetation type must be identified by Fuel Type Number and Fuel Type Name as per the PHOENIX Fuel Classifications. Consider the scale of the modelling. Minor discrepancies in fuel type (<10ha) are not likely to affect the modelling results.
Fuel load	This map provides the fuel load per hectare (ha) for the BFMC in its current state (year 1 of the new BFRMP)	If anomalies are identified in the Phoenix trial maps, check the Fuel Load Map to confirm the input data is correct. Consider the scale of the modelling. Minor discrepancies (<10ha) are not likely to affect the modelling results.
Assets	Spatial data for SFPP and economic assets	Consider any new (<12 months) or significant (at risk) Economic and SFPP assets that may not yet be included in the standard GIS data layers. For example, any major land use changes (intensive agriculture production) or major assets (e.g. a solar farm or new communications tower, or road). Only include actual changes (not proposed changes) to asset data. Construction must have commenced or imminent.

Data Provided	Description	Validation
Environmental and Cultural Asset Profile Report	Prepared by NPWS, the report provides a high-level snapshot of environmental and cultural (including historic and Aboriginal cultural heritage) assets located within the BFMC. The report is based on a desktop analysis of the current authoritative set of spatial datasets used in routine environmental and cultural impact assessment processes for bush fire risk planning in NSW.	Identify any environmental, Aboriginal cultural or historic heritage assets that may be missing from the Asset Profile Report.

Table 1 *Data for BFMC Validation*

Changes to input data can have a significant impact on the final risk results and therefore data will only be modified by the RFS Project Team if clear justification or evidence is provided. Executive Officers should ensure that all requests for modification are justified. For example *'fuel load is too high (in the area indicated). Local fuel analysis by NPWS in May 2022 indicates that the fuel load is between 15-20 t/ha', or 'Additional ignition point required as this area is frequented by campers, open fires are allowed and there is a high potential for ignition'*.

5.4 WHAT HAPPENS NEXT – AFTER WORKSHOP 1

Following Workshop 1, the BFMC Executive Officer will work with Area Command to review all comments and data amendment requests. The RFS Area Command will notify the RFS Project Team when the comments are in BIP and ready to be actioned.

The RFS Project Team and NPWS Project Team will review the suggested data amendments and make the necessary changes to the input data before the data is processed in the risk assessment model. The Project Team may seek further clarification from the BFMC if amendments are not justified.

When the BFMC has completed their Communications Strategy, they should go on to implement the tasks outlined and review as necessary.

In preparation for Stage 2 (Workshop 2b), BFMCs should initiate a review of their current fuel management plan, which includes Asset Protection Zones, fire breaks and any hazard reduction proposals for the next 5 years. BFMC members will be required provide their spatial data to the Executive Officer for collation and consideration at Workshop 2.

Section 6 – Process

Stage 2: Risk Analysis and Treatment

WHAT'S COVERED IN STAGE 2?

This section outlines the steps involved in Stage 2 of the BFRMP development process. In Stage 2, the risk data for each asset type is presented to the BFMC. Over 2 Workshops (2a and 2b), the BFMC subcommittee analyses the risk data and develops a draft BFRMP. This includes identifying Focus Areas and their treatment strategies as well as drafting a Fuel Management Register. **Box 2** provides a brief summary of the steps and **Figure 6** provides a process diagram. A more detailed flowchart for the BFRMP process can be found in Appendix 1.

Stage 2 summary – Risk Analysis and Treatment – Workshop 2

Key steps in Stage 2 include:

- PHOENIX modelling and risk analysis is undertaken by the RFS and NPWS Project Teams.
- RFS Project Team notifies Area Command that the Current Risk, Future Risk (*without treatment*) and *Risk Increase (without future treatment)* data is available in the BIP.
- Executive Officer contacts BFMC to arrange Workshops 2a and 2b.
- BFMC reviews 'Have Your Say' Feedback report from BFMC webpage.
- BFMC continues targeted engagement with key agency stakeholders as per their Communications Strategy.
- Area Command to provide Presentation 2 to BFMC (supported by RFS & NPWS Project Teams).
- Area Command to facilitate Workshop 2a with the subcommittee to analyse the risk data and identify Focus Areas (supported by RFS & NPWS Project Teams).
- Executive Officer to record draft Focus Areas, risk profiles and treatments in BIP.
- BFMC members (land management agencies and firefighting authorities) to provide draft Fuel Management Register data (spatial) to Area Command for collation.
- RFS Project Team to collate draft Fuel Management Register data and upload into BIP for BFMC review.
- Area Command to facilitate Workshop 2b with BFMC subcommittee to review Focus Areas, analyse *Risk from Source data* and review the draft Fuel Management Register.
- The draft Fuel Management Register is endorsed by the BFMC.
- Area Command submits the draft Fuel Management Register to the RFS Project Team for processing.
- Executive Officer prepares draft BFRMP Model Plan (Annexure A)

Box 2: *Summary of the steps in Stage 2 of the BFRMP process*

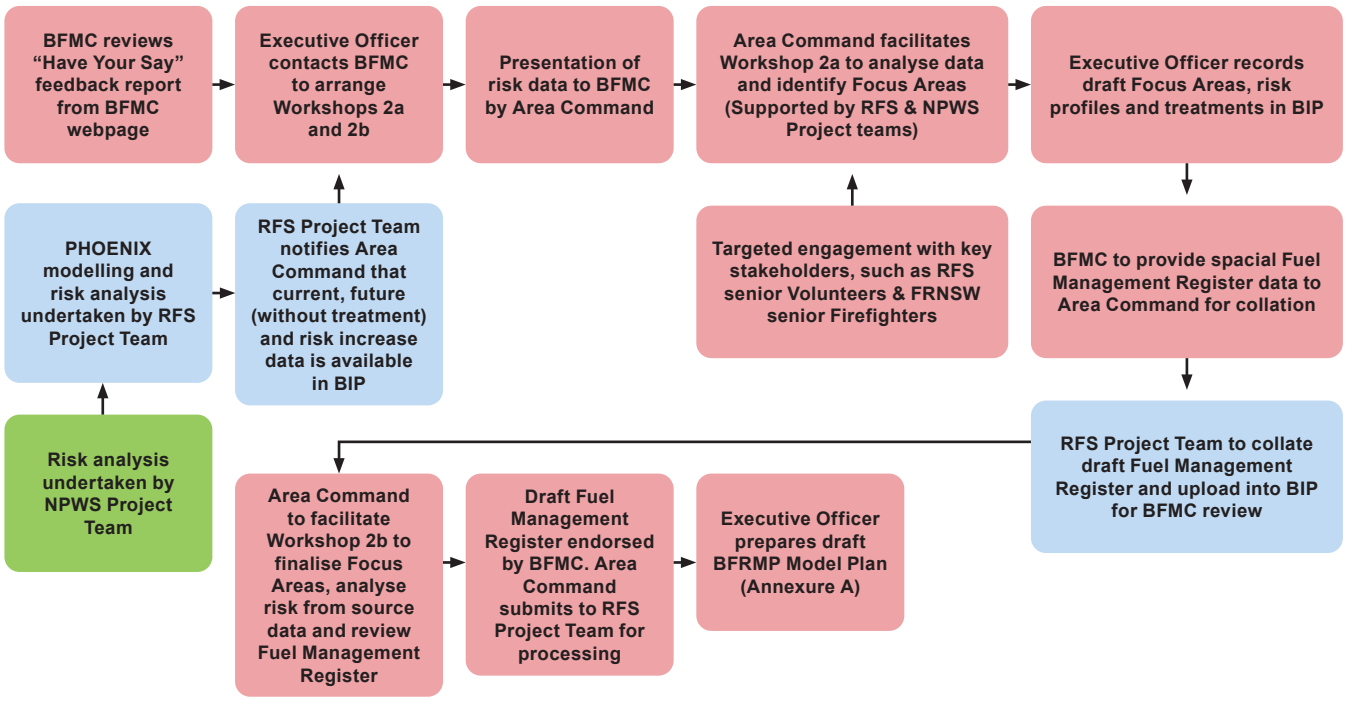


Figure 6: *Brief visual summary of the steps involved in Stage 2*

6.1 BEFORE WORKSHOP 2A

The RFS and NPWS Project Teams process the risk analysis for each asset type (using the validated input data layers from Workshop 1).

The RFS Project Team will notify Area Command when the risk data is available on BIP and will provide factsheets summarising the bush fire risk to economic and SFPP assets. BFMC members can review the data on BIP prior to Workshop 2a.

Area Command will provide the BFMC with the feedback report from the 'Have Your Say' survey for review. It is important that agencies continue to engage with their agency experts and other stakeholders as per the Communications Strategy. For example, senior RFS volunteers or FRNSW Firefighters.

The BFMC subcommittee members should review their current fuel management strategies, which includes Asset Protection Zones (**APZ**s), firebreaks and proposed prescribed burns and should prepare to provide the spatial data to Area Command for collation as soon as possible following Workshop 2a. The Fuel Management Register is reviewed and discussed in Workshop 2b, however, early preparation of data enables BFMC members to understand what is already in place, allows them to view fuel management in relation to the quantified risk data, and assists in the identification of additional strategies that may be required.

6.2 PRESENTATION AND WORKSHOP 2

Stage 2 is undertaken over two separate Workshops (2a and 2b) due to the complexity of the aims and actions. In Workshop 2a, the risk data is presented to the BFMC (Presentation 2). The subcommittee must review the data, provide expert local knowledge and identify Focus Areas and treatments. In Workshop 2b, the subcommittee should review their Focus Areas and develop a Fuel Management Register.

PRESENTATION 2 – RISK DATA AND THE BFRMP	
AIM 1:	Present the risk data for each asset group to the BFMC
AIM 2:	Outline the tasks associated with the BFRMP treatment process

WORKSHOP 2a –RISK ANALYSIS, FOCUS AREAS AND RISK TREATMENT	
AIM 1:	Review and analyse the risk data provided.
AIM 2:	Provide expert local knowledge on bush fire risk and consider any feedback from community consultation.
AIM 3:	Determine proposed Focus Areas and treatments, using the risk data and local knowledge.
ACTION 1:	Record Focus Areas and treatments in BIP.
ACTION 2:	Request Focus Area profile data from NPWS and RFS.
ACTION 3:	Record minutes for the meeting, including discussion of areas that were considered, but not identified as Focus Areas.
ACTION 4:	Executive Officer to draft the Model Plan. This includes preparing risk profiles for each Focus Area.
ACTION 5:	Within two weeks of Workshop 2a, land management agencies and firefighting authorities to provide Area Command with spatial data for the draft Fuel Management Register.
ACTION 6:	Continue the implementation of the Communications Strategy.

WORKSHOP 2b – FUEL MANAGEMENT REGISTER	
AIM 1:	Review the Focus Areas from Workshop 2a and finalise Focus Area Treatments
AIM 2:	Review the risk from source data
AIM 3:	Review the Bush Fire Management Zone objectives
AIM 4:	Analyse the draft Fuel Management Register in relation to the Focus Areas and risk data
ACTION 1:	Modify the Fuel Management Register and determine Bush Fire Management Zones. BFMC endorse data for processing.
ACTION 2:	Area Command to provide endorsed Fuel Management Register to RFS Project Team for processing.

6.3 INTERPRETING BUSH FIRE RISK DATA IN WORKSHOP 2A

The BFMC will be provided with three key risk data products for each asset type; Current Risk, Future Risk (without treatment) and Risk Increase (without future treatments). These maps will assist the BFMC in determining the bush fire risk to assets in their BFMC area.

Current Risk maps show the current modelled risk for year 1 of the draft BFRMP (calculated for January). **Future Risk** (**without treatment**) maps show the modelled risk for year 5 of the draft BFRMP (calculated for January). **Future Risk (without treatment)** assumes that no hazard reduction or bush fires events occur during the 5 year period. The only variable that changes between the current and future maps is the fuel load. Fuel accumulation curves are used to estimate the fuel load change over the 5 year period.

Risk for current and future scenarios is categorised into five risk classes:

- Lowest Risk;
- Low Risk;
- Moderate Risk;
- High Risk; and
- Highest Risk.

The maps display the comparative risk across the BFMC area from a landscape perspective, that is, where in the BFMC are the highest risk areas compared to other areas. If an asset is located in the lowest risk category, this does not mean that the asset could not be damaged in a bush fire, it is just less likely to be damaged compared to an asset in a higher level risk category.

If a grid cell has no colour displayed, it means that an asset has not been mapped in that cell (for that asset type).

Risk Increase maps show the increase in risk from the current to future scenario for each asset type and **Risk from Source** maps show the risk from an ignition location..

There are also number of additional supporting mapping products available to BFMC members which may assist the BFMC in interpreting risk. More information on these mapping products and information sources can be found in **Appendix 2 and 3**. These include:

- Social Vulnerability Index (SoVI);
- Residential risk embers only;
- Burn Frequency; and
- Fire History.

The risk data is available for BFMC members on the BIP. Although the BFMC has access to a number of data layers for discussion, please note that only a small subset will be publically available in the endorsed BFRMP.

The subcommittee should use local knowledge and expertise to review the risk maps and assess whether these maps demonstrate the bush fire risk to assets in the BFMC area. The BFMC should be aware of the methodology used to produce the maps and should take into account that the quantitative process does not consider social factors (social vulnerability, behaviour and preparedness) or operational factors (building standards, access/egress etc.) and that it should be used at a landscape scale.

If the BFMC has any concerns about the representation of bush fire risk to a specific asset type or area, they should inform the RFS Project Team about the nature of the concern so it can be investigated further and amended if necessary.

6.4 BUSH FIRE RISK ASSESSMENT FOR ASSET TYPES

As described in Section 3 the BFRMP methodology divides assets into four asset types; Human settlement, Economic, Environmental and Cultural.

6.4.1 Risk to Human Settlement and Special Fire Protection Purpose Assets

The risk to Human Settlement assets is divided into Residential and Special Fire Protection Purpose (SFPP).

On the Residential Risk map (Figure 7), each coloured grid square represents the risk to a home or a group of homes. Risk is calculated by determining the likelihood of a bush fire starting, spreading and reaching a grid square, combined with the potential damage to the homes, given the likely fire exposure.

The number of homes in each grid square is also considered. This means that the risk results are influenced by housing density. If two grids squares have the same likelihood of a bush fire starting, spreading and damaging homes, but one grid has three houses and the other only one, then the grid square with three houses will be three times the risk of the grid with one house.

The 180m grid cells are aggregated to 540m grid cells (i.e. nine grids together) and the risk values summed to calculate the risk for the larger grid size. The risk is then classified into five categories from lowest to highest based on their risk value. The 540m grid map allows for a more strategic level of assessment and decision making.

The data is not intended to show the risk to individual houses. The map displays the comparative risk across the BFMC area from a landscape perspective, that is, where in the BFMC are the highest risk areas compared to other areas. If a house is located in the lowest risk category, this does not mean that the asset could not be damaged in a bush fire, it is just less likely to be damaged compared to assets in a higher level risk category.

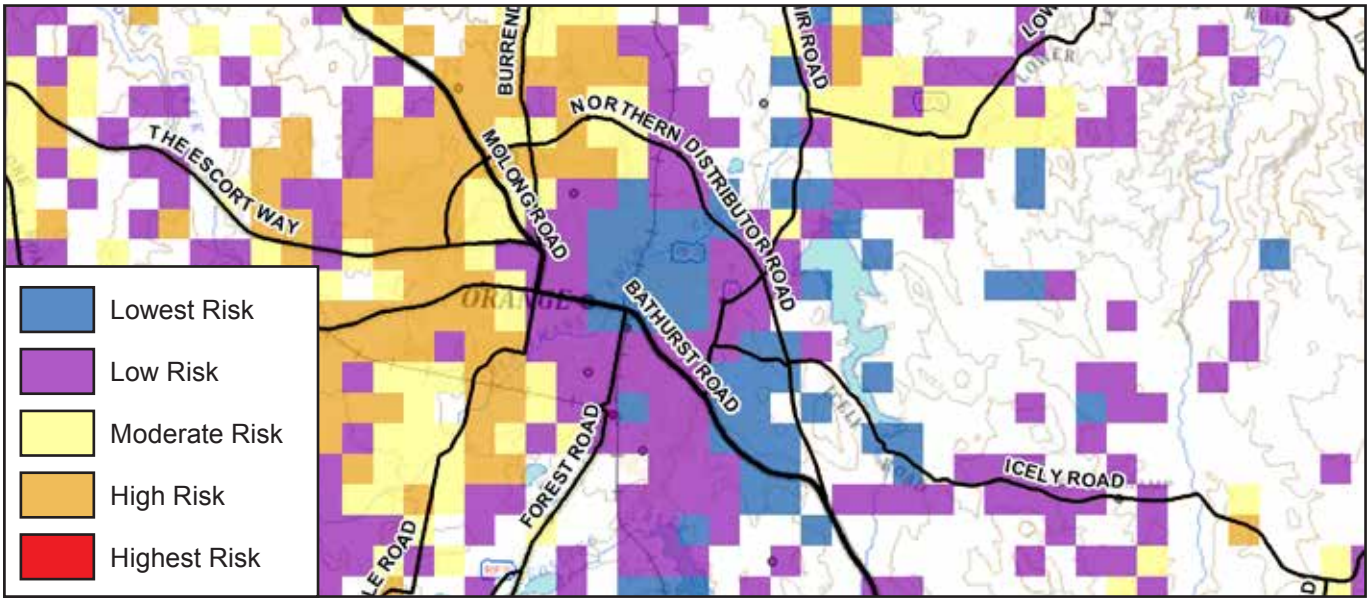


Figure 7. *An example of a Residential Risk Current map*

Special Fire Protection Purpose (SFPP) assets include schools, child care providers, universities, hospitals, retirement villages, accommodation buildings, prisons, fire stations, places of worship, halls and other public buildings where the public are likely to assemble. To determine the risk to SFPP assets, the likelihood of a bush fire starting, spreading and reaching an SFPP asset was determined and combined with the potential damage to these assets given the likely fire exposure at each grid. No adjustments were made to the risk result for the number of buildings identified as SFPP assets within each grid square.

The map displays the comparative risk across the BFMC area from a landscape perspective, that is, where are the highest risk areas compared to other areas. If a SFPP asset is located in the lowest risk category, this does not mean that the asset could not be damaged in a bush fire, it is just less likely to be damaged compared to a SFPP asset in a higher level risk category.

6.4.2 Economic Risk

The Economic asset group covers a large number of asset types, including agriculture, commercial and industrial buildings, plantations and utilities (Section 3). On the Economic Risk map (Figure 8), each coloured square represents the risk to one or more economic assets. To determine the risk to economic assets, the likelihood of a bush fire starting, spreading and reaching an asset, is determined and combined with the potential damage to these assets given the likely fire exposure at each grid square. The risk was calculated based on the economic loss of the modelled damage (dollar value) and the recovery time (the time it would take to repair or replace that asset). These risk values were then added together to calculate the risk to all economic assets within each grid square.

The 180m grids are aggregated to 540m (i.e. nine grid squares together) and the risk values summed to calculate the risk for the larger grid size. The risk is then classified into five categories from lowest to highest based on their risk value.

The map displays the comparative risk across the BFMC area from a landscape perspective, that is, where are the highest risk areas compared to other areas. If an economic asset is located in the lowest risk category, this does not mean that the asset could not be damaged in a bush fire.

Figure 8. *An example of an Economic Risk current map*

6.4.3 Environmental risk

The Environmental Risk map (Figure 9) shows the current level of modelled bush fire risk to predicted Environmental assets across the BFMC area. Environmental assets used in the model are based on the best available Threatened Ecological Community mapping, Threatened Species mapping, protected land regulation mapping and other key datasets. Environmental assets have been subject to a quantitative risk modelling process that considers the environmental significance, vulnerability, fire history, fire management guidelines of Environmental assets, and the likelihood that Environmental assets will be exposed to a bush fire event that could cause a destructive impact. Each coloured square on the map represents the relative level of risk to Environmental assets across the BFMC area. Environmental assets in the lowest risk category can still be damaged by a bush fire. Environmental assets in lower risk levels are less likely to be exposed to a fire that will cause it damage relative to Environmental assets that are in a higher-level risk category.

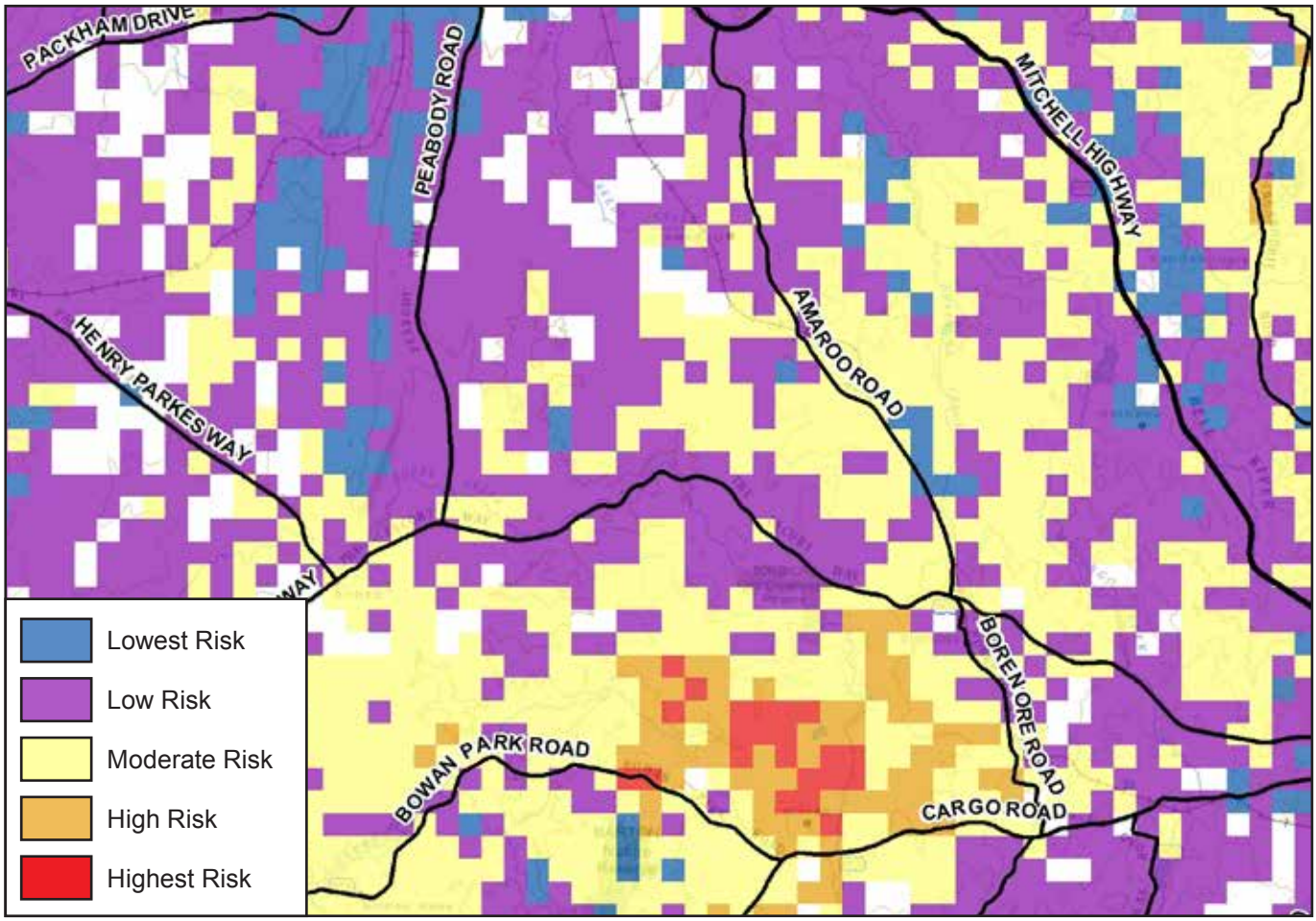


Figure 9. *An example of an Environmental Risk current map*

6.4.4 Cultural heritage risk

The risk to Cultural heritage assets is divided into Aboriginal cultural heritage assets and historic heritage assets. The Aboriginal cultural heritage assets are also divided into known sites and predicted sites.

Known Aboriginal cultural heritage risk map

The Known Aboriginal cultural heritage risk map shows the current level of modelled bush fire risk to Aboriginal site locations across the BFMC area. Aboriginal site locations used in the model are based on data from the NSW Aboriginal Heritage Information Management System (AHIMS). Site locations have been subject to a quantitative risk modelling process that considers the vulnerability of sites, the accumulated impact of non-indigenous land use on sites and the likelihood that sites will be exposed to a bush fire event that could cause a destructive impact. Each coloured grid square on the map represents the relative level of risk to Aboriginal sites across the BFMC area. Site locations in the lowest risk category can still be damaged by a bush fire. Site locations in lower risk levels are less likely to be exposed to a fire that will cause it damage relative to other areas that are in a high-risk level category.

Predicted Aboriginal cultural heritage Risk map

The Predicted Aboriginal cultural heritage Risk map shows the current level of modelled bush fire risk to predicted Aboriginal site locations across the BFMC area (Figure 10). Aboriginal site locations used in the model are based on data from the NSW Aboriginal Sites Decision Support Tool (ASDST). Predicted site occurrences have been subject to a quantitative risk modelling process that considers the vulnerability of sites, the accumulated impact of non-indigenous land use on sites and the likelihood that sites will be exposed to a bush fire event that could cause a destructive impact. Each coloured square on the map represents the relative level of risk to Aboriginal sites across the BFMC area. Site locations in the lowest risk category can still be damaged by a bush fire. Site locations in lower risk levels are less likely to be exposed to a fire that will cause it damage relative to other areas that are in a high-risk level category.

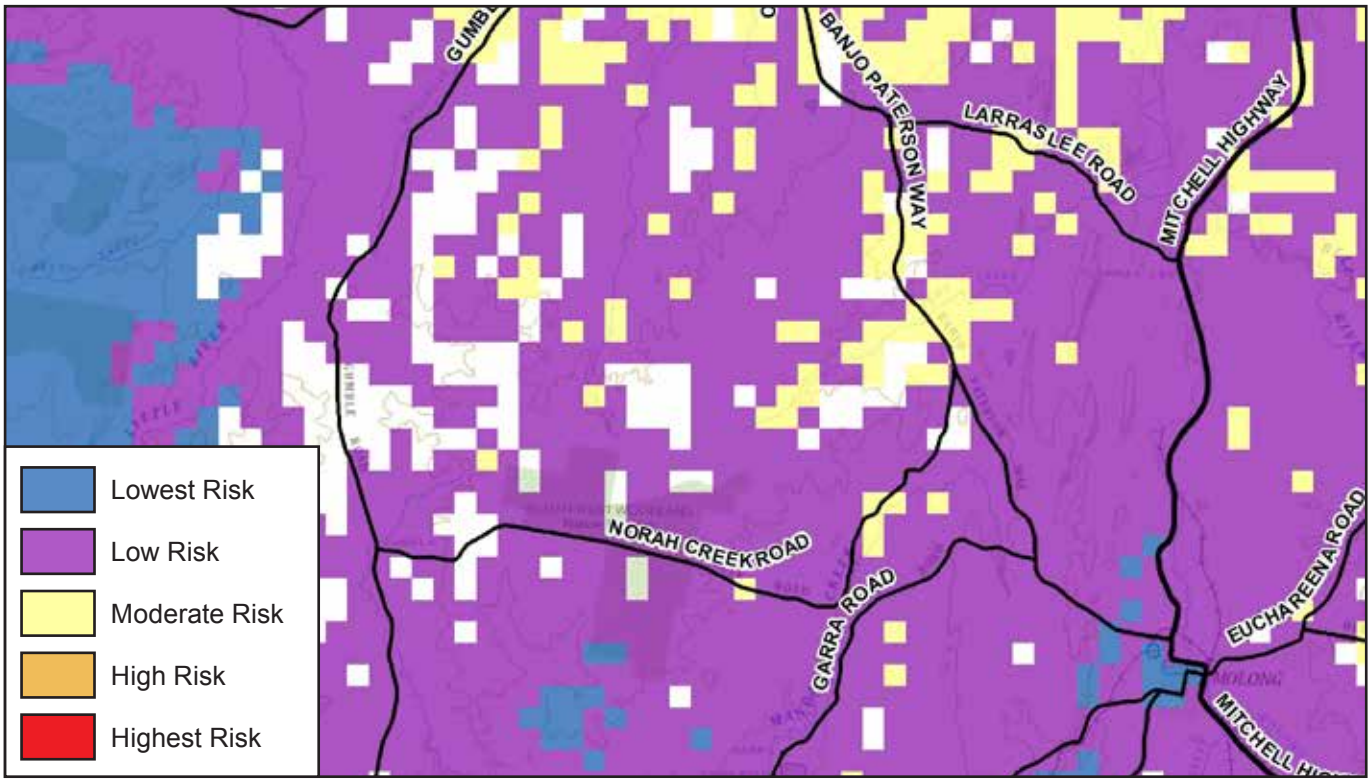


Figure 10. *An example of an Aboriginal Predicted Sites Risk Current map*

Historic Heritage Sites Risk map

The Historic Heritage Sites Risk map shows the current level of modelled bush fire risk to predicted historic site locations across the BFMC area. Historic site asset locations used in the model are based on data from the Department of Planning and Environment's (DPE) State Heritage Register and NPWS Historic Heritage Information Management System (**HHIMS**). Site locations have been subject to a quantitative risk modelling process that considers the significance of sites, the vulnerability of sites and the likelihood that sites will be exposed to a bush fire event that could cause a destructive impact. Each coloured square on the map represents the relative level of risk to Historic Heritage sites across the BFMC area. Historic Heritage site locations in the lowest risk category can still be damaged by a bush fire. Historic Heritage site locations in lower risk levels are less likely to be exposed to a fire that will cause it damage relative to Historic Heritage sites that are in a higher-level risk category.

6.4.5 Risk Increase Maps

The Risk Increase (without future treatments) maps show the increase in risk between the current and future risk scenarios for each asset type (Figure 11). Risk Increase maps can highlight areas where the current risk is low, but the risk is likely to significantly increase over the 5 year period.

These maps depict four classes of change:

- **No change:** there was no change in bush fire risk between the current risk scenario (year 1) and the future (*without treatment*) scenario (year 5).
- **Within category increase:** there was a slight increase in bush fire risk. Either the risk value was already in the highest risk category so there was no change in risk category, or an increase in risk was recorded, but it was not sufficient to move the risk value into the next category.
- **One category increase:** the risk value increased by a sufficient margin to move it into the next category e.g. from the high risk category to the highest risk category.
- **Two or more category increase:** means the risk value increased by enough to increase the risk category by two or more e.g. from moderate risk to the highest risk category.

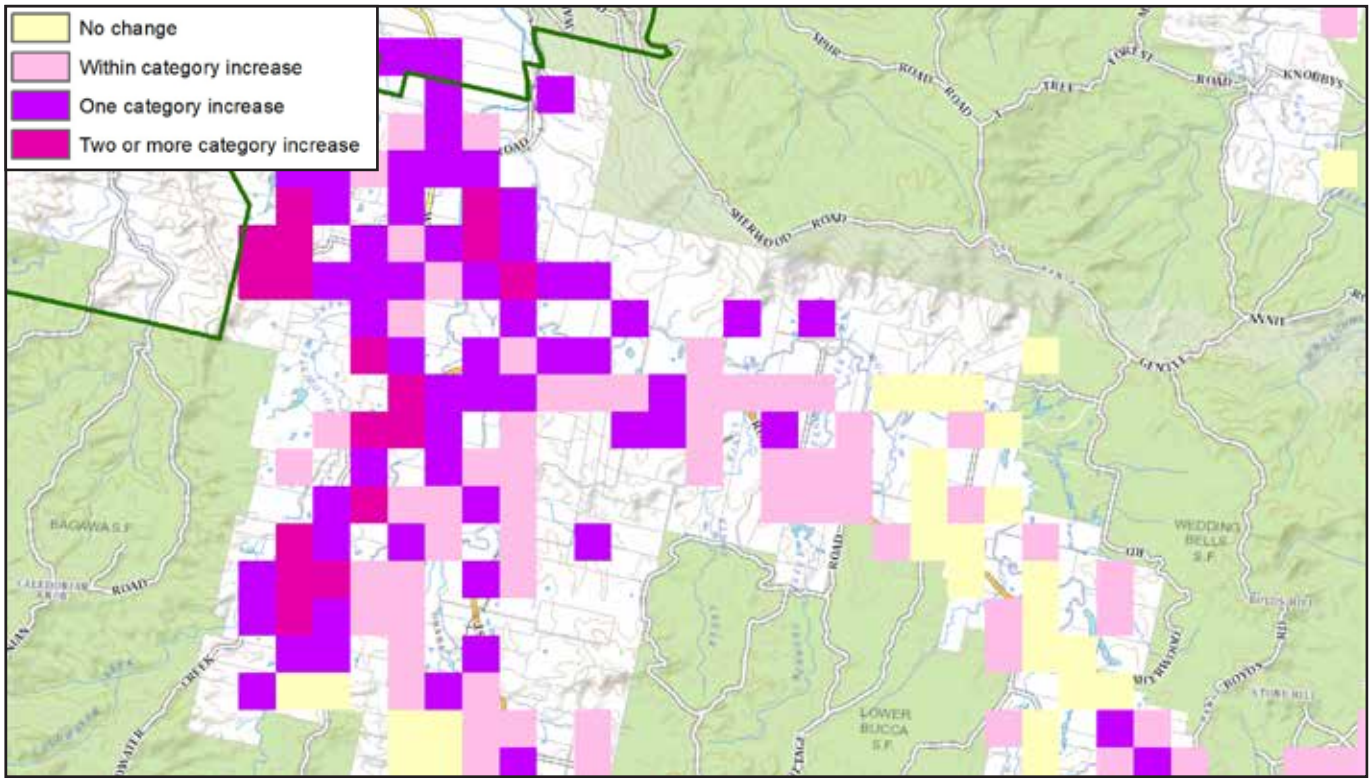


Figure 11. *An example of a Risk Increase (without future treatments) map for residential assets*

6.5 RISK FROM SOURCE MAPS

The Risk from Source maps are a supporting data set which may assist the BFMC in understanding the bush fire risk from a different perspective. Rather than identifying the assets at risk, these maps highlight areas that may be the source of the risk (from an bush fire ignition perspective). These data sets may assist with the development of the Fuel Management Register and the identification of appropriate bush fire management zones. There are two types of Risk from Source maps:

- Residential Risk from Ignition
- Fire Size from Ignition

Residential Risk from Ignition

The Residential Risk from Ignition map (Figure 12) categorises each modelled ignition point by its potential to cause damage to residential assets. The risk from source is calculated by averaging the predicted house loss from all weather streams (weighted to consider the likelihood of each weather stream).

Ignition points with higher residential risk from source value are more likely to damage residential assets. This could be due to the proximity of the ignition point to residential assets or extensive fire spread.

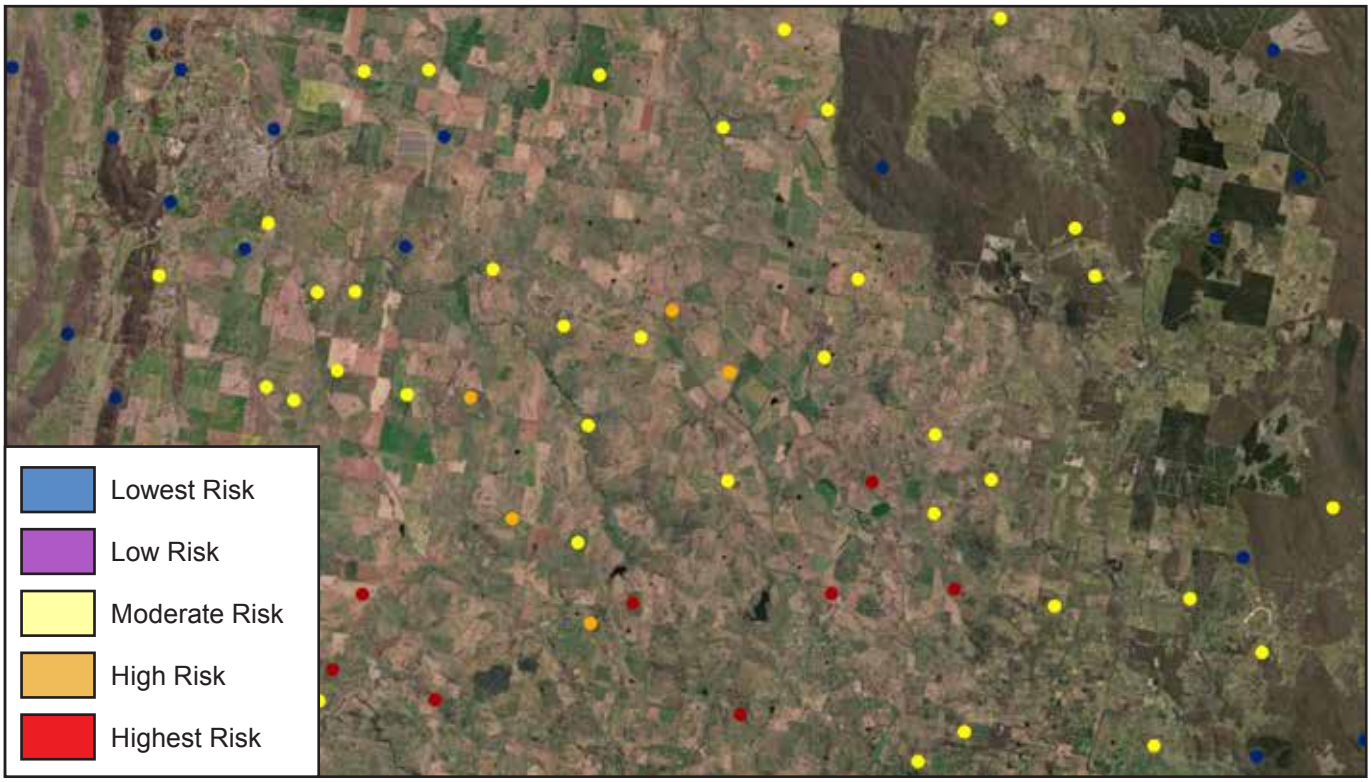


Figure 12. *An example of a Residential Risk from Ignition Source map*

Fire Size from Ignition

The Fire Size from Ignition map (Figure 13) shows the average predicted fire size for each modelled ignition point after 12 hours. The average fire size is calculated by averaging the results across each weather stream. Note, at the 12 hour mark, fires may or may not be extinguished and some fires may be extinguished before 12 hours.

Ignition locations with large predicted fire sizes have a greater potential to impact more assets.

Figure 13. *An example of a Fire Size from Ignition map*

6.6 TREATMENT OPTIONS TO MANAGE BUSH FIRE RISK

The purpose of risk treatments in a BFRMP is to reduce the likelihood and/or harmful consequences of bush fire to the community and environment, through a process of selecting and implementing risk treatment options that modify the characteristics of the hazard, the community or the environment.

The management of bush fire risk involves a coordinated approach from the BFMC and the community. Even with the combined resources of stakeholders, it is not possible or practical to actively treat all bush fire risks across the landscape. This is why it is important for BFMCs to determine which areas will form the focus for the application of specific Treatment Strategies in the BFRMP.

There are three types of treatments considered in the BFRMP process:

1. BFMC Wide Treatments (6.6.1);
2. Focus Area Treatments (6.6.2); and
3. Fuel Management Treatments (6.6.5).

BFMC members and land managers routinely implement risk treatment strategies in accordance with legislative requirements, policy and asset management. Treatment strategies may include agency specific fire management plans, vegetation management, restrictions on development in bush fire prone areas, bush fire education and fire suppression activities. These are referred to these as BFMC Wide Treatments.

The risk assessment data and risk analysis process applied in the BFRMP should assist BFMCs in identifying areas that require additional, strategic treatments (in addition to the BFMC Wide Treatments). These are Focus Areas.

Focus Areas are groups of assets or areas in the landscape that the BFMC has identified as having significant risk, areas where current treatment may be inadequate, and/or areas that require treatment as a priority. The BFMC will identify Focus Areas for their BFRMP and will identify specific Treatment Objectives and Strategies for those areas.

Fuel Management Treatments (hazard reduction burns and vegetation management) are identified in the BFRMP and aim to protect life, property and the environment from intense bush fires across the BFMC area. While they will not completely stop bush fires from starting and spreading, these treatments can help protect firefighters, assist with containment strategies and reduce the potential damage to community assets and environmental values. Fuel Management Treatments are strategically determined to reduce the risk across the whole BFMC area, but will be prioritised in Focus Areas.

In Workshop 2a, the BFMC subcommittee will identify Focus Areas (and their associated treatment strategies).
In Workshop 2b the BFMC subcommittee will identify Fuel Management Treatments (Fuel Management Register).

The Focus Area treatments and all the supporting fuel management treatments listed in the Fuel Management Register are considered *notified steps* under Section 63 of the *Rural Fires Act, 1997*.

6.6.1 BFMC Wide Treatments

BFMC Wide Treatments are activities which are routinely undertaken to reduce the overall bush fire risk within the BFMC area (Table 2). They occur outside of the BFRMP. BFMC wide treatment strategies are recognised in the BFRMP as assisting with risk reduction and are listed as generic text within the BFRMP Model Plan.

BFMCs can add additional BFMC Wide Treatments to the Model plan where appropriate.

Treatment	Description
Plan of Operations	Under Part 3 Division 4 section 52 and section 53 of the Rural Fires Act 1997, BFMCs are required to prepare and submit to the BFCC a Plan of Operations and must review the Plan every two years. The Plan of Operations details the co-ordinated firefighting arrangements and fire management practices and ensures that each BFMC member is able to execute its role and specific responsibilities.
Treatments in the Fire Access and Fire Trail Plan Treatment (FAFT) Register	Under section 52 of The Act, BFMCs must develop a FAFT Plan for their area and must review the FAFT Plan every five years. Fire trails are an important part of ensuring firefighters can access fires and safely contain them. Fire trails may also be used as fire control lines for hazard reduction burns, however this is not their primary purpose. In accordance with the RFS Fire Trail Standards the BFMC may prepare a Treatment Register which sets out a schedule of works for the construction and maintenance of fire trails. The Standards provide that the Treatment Register is updated annually and typically forms part of a FAFT Plan. The treatments contained in the Treatment Register for the BFMC (as amended from time to time) are BFMC Wide Treatments under the BFRMP.
Ignition Prevention Plan (IPP)	The BFMC will develop an IPP. The purpose of the IPP is to provide firefighting authorities, NSW Police and Local Authorities with localised strategies to prevent ignitions. In particular, deliberate or careless ignitions & illegal fires.
Land & Asset Management	There are organisational plans, standard Policies, Regulations and Procedures for the management of assets and/or land managed by BFMC members. These may include vegetation clearance around power lines, maintenance of public land, and agency specific fire management plans.
Local Environmental Plan (LEP)	LEPs guide planning decisions for local government areas. They do this through zoning and development controls, which provide a framework for the way land can be used. LEPs can be used to exclude development in significant bush fire risk areas or in areas where bush fire protection measures cannot be incorporated.
Environmental Approval for all Hazard Reduction	Land Management agencies will obtain environmental approval (through the Bush Fire Environmental Assessment Code, Part 5 *Environmental Planning and Assessment Act, 1997*, or other approval process) to undertake any activities that have the potential to impact the environment e.g. hazard reduction burning or vegetation removal. The environmental assessment process considers flora, fauna, threatened species, cultural assets, soil erosion, riparian areas, biodiversity fire regimes, weeds and air pollution (smoke).
Bush Fire Prone Land Mapping and ***Planning for Bush Fire Protection (PBP)***	Section 10.3 of the *Environmental Planning & Assessment Act 1979* requires the land subject to a BFRMP to be mapped in accordance with Guide for Bush Fire Prone Land Mapping. Bush Fire Prone Land (BFPL) Maps are used as a trigger mechanism to ensure that new development is approved in accordance with the Planning for Bush Fire Protection (PBP) 2019. PBP sets planning specifications which aim to increase the likelihood of structures surviving a bush fire, and in combination with Australian Standard 3959 Building in Bush Fire Prone Areas which specifies building standards. All new development on Bush Fire Prone Land will be assessed in accordance with PBP.
Hazard Complaints	It is the duty of land owners to prevent the occurrence of bush fires on, and to minimise the danger of the spread of bush fires on or from, their land. Under section 66 of the *Rural Fires Act 1997*, a Bush Fire Hazard Reduction Notice can be issued, directing a hazard be removed. This Notice can be issued to private and public landowners. If the Bush Fire Hazard Reduction Notice is not complied with, the NSW RFS will remove the hazard, and may pursue the cost from the landowner. Under section 73 and section 74E of The Act, the RFS Commissioner may direct hazard reduction works to be undertaken.

Treatment	Description
Community Engagement	This includes State wide public awareness initiatives as well as local community interactions between fire agencies, land managers and local communities.
BFMC Bush Fire Danger Period	The *Rural Fires Act 1997* sets the statutory Bush Fire Danger Period. A Fire Permit is required for burning activities during the Bush Fire Danger Period in Rural Fire districts and at all times in Fire and Rescue (FRNSW) districts around the state. Fire Permits help ensure fire is used safely during the Bush Fire Danger Period. A permit imposes conditions on the way a fire is lit and maintained, and can only be issued by authorised Permit Issuing Officers. The permit provides landholders who intend to burn, with the conditions they are to adhere with to ensure adequate and appropriate measures are in place, and that fires remain under control.
Firefighting Response	All firefighting authorities in NSW have legislation, regulations, policies and procedures for responding to bush fire events within their area of jurisdiction.
Regulatory Actions	Under the Rural Fires Act 1997, persons may be prosecuted for a range of offences. These offences include: – deliberately setting fire to the land of another person without consent; – lighting a fire without notifying the relevant authority; – breaching the conditions on a fire permit; – lighting a fire during a Total Fire Ban; – allowing fire to escape their property; or – other breaches of The Act.

Table 2: *BFMC wide treatments*

6.6.2 Focus Areas

Focus Areas are an innovative method of helping BFMCs to prioritise strategic works to reduce the risk to people, properties and assets in significant at-risk areas. A Focus Area identifies an area, or group of assets within a BFMC area, that are considered to be at a significant risk from bush fire and require additional, targeted Treatment Strategies within the five-year BFRMP (in addition to the standard BFMC Wide Treatments). Considerations for Focus Areas are provided below in Table 3. A Focus Area is not necessarily asset specific. Most Focus Areas include a combination of different asset types in one area.

Asset Type	Examples
Geographic area	Suburb, township, brigade area or group of suburbs with a number of asset types at high risk
Community	Discrete communities in <area>, isolated cabins in the <name> National Park, rural isolated properties in <area>, riverside communities, tourist and holiday rental areas in <area>
Significant at risk environmental assets or areas	World Heritage Site, Koala habitat in <area>, critically endangered flora/fauna species, Saving our Species Priority Management Site, feral predator-free area
Significant at risk cultural assets or areas	<name> National Park Heritage Buildings, Aboriginal cultural sites in the <area>
Significant at risk economic assets or areas	Mixed agricultural production in <area>, intensive animal production in <area>, mines in <area>, <name> Plantation, significant utility complex

Table 3: *Considerations for Focus Areas*

There a number of factors which should be taken into consideration when identifying Focus Areas. The quantitative risk data provides a consistent approach to assessing risk and should be used in the first instance. The risk maps will identify areas most likely to be at risk from bush fire (see section 6.4). However, while the risk maps provide a standardised risk assessment based on the latest science, it is not possible for PHOENIX and the risk analysis process to capture every factor that can influence an asset's risk from bush fire. BFMC members need to consider the factors that are not quantified and support or enhance the risk data with local knowledge and expert opinion. Of particular importance, is the consideration of social vulnerability factors that affect risk (community demographics, behaviour and preparedness) and operational factors (building standards, property preparation and access/egress). The SoVI data can be valuable in highlighting areas with a significant social vulnerability (see Appendix 3).

The BFMC subcommittee should seek stakeholder input (see section 4) to ensure a holistic understanding of the risk (e.g., volunteer firefighters and local environmental groups, public feedback from the 'Have Your Say' survey and additional local datasets).

The following five steps may assist the BFMC subcommittee in identifying Focus Areas in Workshop 2a.

Step 1. Review the residential and SFPP risk data and begin highlighting areas for consideration as Focus Areas. The subcommittee may wish to highlight areas on a printed map, or on a screen using the redline tool in BIP. For each area identified, look at all the data layers (current risk, future risk, risk increase, as well as other asset types at risk in the area). Discuss the factors that are not quantified in the data, such as, access and egress, building standards and community preparedness. Social vulnerability data is available as a supporting data layer in BIP (see Appendix 3) and may assist in identifying vulnerable communities.

From the areas the BFMC have highlighted and discussed, determine which have a significant risk and require targeted Treatment in the BFRMP.

Avoid identifying every township in the BFMC as a Focus Area as this will limit the BFMCs ability to prioritise and complete Treatments over the 5 years. The aim is to identify the highest risk areas. Keep in mind that areas not identified as Focus Areas in this BFRMP will still be treated through BFMC Wide Treatment Strategies and Fuel Management activities.

Local knowledge (and an understanding of factors that are not quantified in the data) may highlight areas that are not mapped in the highest risk category, but still require consideration as a Focus Area. For example, an area mapped as low risk may be judged by the BFMC to be particularly vulnerable due to a high proportion of the population being born overseas and not being familiar with the dangers of bush fires in Australia. Or an isolated population mapped as moderate risk, may have a higher risk due to limited access and egress and a transient tourist population.

Conversely, a BFMC may choose not to identify an area mapped as highest risk as a Focus Area because the houses are built to appropriate construction standards and the community are well prepared.

Step 2. Review the economic risk data. Discuss each area that has been highlighted as being at risk. Use the Economic Asset Profiles, the input data layers and local knowledge to determine which asset type is driving the economic risk (industry, agricultural, forestry etc.). Identify those areas that the subcommittee agree have a significant risk and require additional, targeted Treatment in the BFRMP.

Step 3. Review your environmental risk maps. Discuss each area that has been highlighted as being at risk. Use the input data layers and local knowledge to determine what assets and/or values are driving the environmental risk (threatened species, regulated lands, fire sensitive vegetation communities etc.). The Environment and Cultural Asset Profile provided by NPWS can assist you in understanding the assets or areas that may be at risk. Identify the areas that the subcommittee agree have a significant risk and require additional, targeted Treatment in the BFRMP.

Step 4. Review your cultural risk data. Discuss each area that has been highlighted as being at risk. Use the input data layers and local knowledge to determine what assets and/or values are driving the cultural risk (tangible and intangible Aboriginal cultural heritage and historic heritage). Further consultation will be needed with Aboriginal stakeholders in the BFMC area to determine the vulnerability, significance and required treatments for Aboriginal cultural heritage assets. The Environmental and Cultural Asset Profile report provided by NPWS can assist you in understanding the assets or areas that may be at risk. Identify the areas that the subcommittee agree have a significant risk and require targeted Treatment in the BFRMP.

Step 5. Review all the draft Focus Areas identified for consideration. Focus Areas are not asset specific, in fact they usually include many different asset types. Combine Focus Areas together where they are within close proximity, have similar risks, and treatments are likely to be the same. For example, a residential Focus Area immediately adjacent to or overlapping with an economic Focus Area.

Use the Focus Area map tool in the BIP to finalise the Focus Area shapes and give each a relevant name. Focus Areas are mapped as polygons by the BFMC in the BIP, however, in the final BFRMP they will be represented with an indistinct boundary (refer Figure 14). They are designed to represent an area in the landscape, rather than being viewed as a hard line.

Some Focus Areas may not have a specific location and a polygon may not be appropriate e.g. a threatened species that has a broad distribution across the BFMC area. These non-spatial Focus Areas will be described in the BFRMP but not mapped.

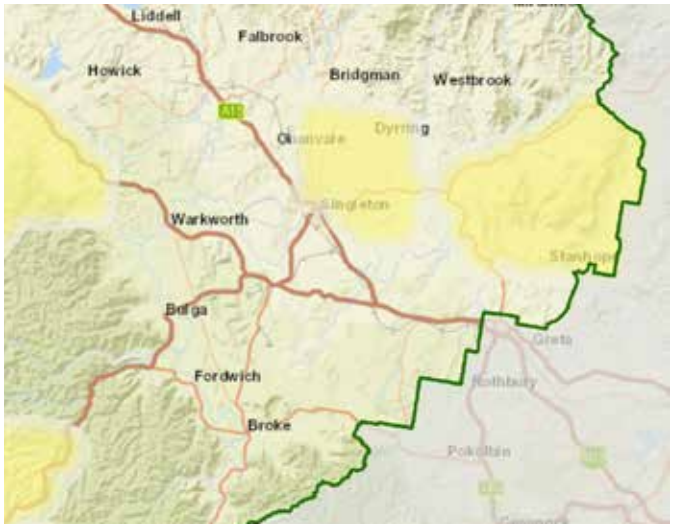


Figure 14. *Example of Focus Areas displayed on a BFRMP Map*

Tips for identifying Focus Areas:

- Identify draft Focus Areas in the BIP using the Focus Area map tool. If the BFMC has identified too many draft Focus Areas, it may help to ask the subcommittee to compare the risks between them and prioritise them. The top priority areas will then go on to be draft Focus Areas, and the others may be treated as Focus Areas within subsequent BFRMPs.
- Focus Areas are not asset specific so they do not need to be separated into residential, environmental, economic and cultural. Aim to identify groups of asset types or areas.
- Do not identify every town at risk as a Focus Area. The intent of a Focus Area is to identify the most significant at risk areas and to assist the BFMC to prioritise treatments. Which assets or areas have an unacceptable level of risk, despite current treatments?
- Be specific. Do not identify a whole Local Government Area or multiple, large townships together as a Focus Area. Narrow down the area of concern.
- Focus Areas should identify assets at risk, not the source of the risk. For example, a known fire path should not be considered as a Focus Area.
- Record meeting minutes during the Focus Area discussion. This will enable the BFMC to document a list of all the areas that were considered and may assist with subsequent BFRMPs. It will also assist with writing risk profiles and identifying treatment strategies later on in Workshop 2b (6.6.3).

6.6.3 Focus Area Treatment

The BFMC subcommittee must consider how best to reduce the likelihood and/or consequence of bush fire in each of the draft Focus Areas. There are four broad Objectives available to manage the bush fire risk in a Focus Area and each treatment Objective has a number of associated treatment Strategies (Table 4). The intent is that the broad Treatment Strategies will provide direction for the BFMC over the five-year plan and guide the development of a detailed BFMC Annual Works Program (**Annexure F**). This structure allows the BFMC to set clear Objectives, yet have the flexibility to continuously review the current environment (weather, community events, bush fires, activities undertaken) and determine how the Focus Area Treatment Strategies will be met each year in the Annual Works Program.

The BFMC should consider each Focus Area and identify the most appropriate Treatment Objectives and Strategies to reduce the risk. The BFMC will record the Objectives and Strategies in the BIP.

Objective	Focus Area Treatment Strategy
Fuel Management Reduction or modification of bush fire fuel with the intent of slowing the spread of bush fire and aiding firefighting operations.	Asset Protection Zone (APZ)
	Ignition Management Zone (IMZ)
	Strategic Fire Advantage Zone (SFAZ)
	Land Management Zone (LMZ)
	Fire Break; Linear
	Fire Break; Transport Corridor
	Grazing Program
Ignition Prevention Prevention or reduction of bush fire ignitions (arson & accidental).	Community Engagement – Risk Awareness
	Fire Break; Linear
	Fire Break; Transport Corridor
	Access Restriction; addressed in BFMC IPP
	Patrol; addressed in BFMC IPP
Community Preparedness Measures to enhance community preparedness for bush fire in order to reduce risk to life and assets.	Community Engagement; Risk Awareness
	Community Engagement; Planning
	Community Engagement; Preparation
	Community Engagement; Community Resilience
	Community Engagement; Response
Response Area specific response requirements in addition to standard procedures	Operational Readiness Arrangements; addressed in BFMC Plan of Operations
	NSP; addressed in BFMC Plan of Operations
	Pre-Incident Plan; addressed in BFMC Plan of Operations
	Fire Access or Fire Trail; addressed in BFMC FAFT Plan

Table 4: *Key Objectives for Treatment Strategies.*

Community Engagement Strategies have been divided into 5 categories. **Table 5** provides a definition of each category along with examples of activities.

Community Engagement Treatment Strategy	Description	Example Activities
Community Engagement; Risk Awareness	Activities that aim to increase and improve people's awareness and understanding of bush fire risk.	– Prepare Act Survive – Grassfire sub-campaign – Prepare Act Survive – Grain harvesting sub-campaign – Pre-season community meeting – School visit
Community Engagement; Planning	Activities that aim to increase the number of people with a quality plan for what they will do in the event of a bush fire.	– Prepare Act Survive – General campaign – Prepare Act Survive – Tourists & Travellers sub-campaign – Bush Fire Survival Plan Workshop – Farm Fire Plan Workshop – Local events and engagement – Threatened species/ecological risk communication – Engagement at local events
Community Engagement; Preparation	Activities that aim to increase the number of people who take action to prepare their home, property and/or business for bush fire.	– Prepare Act Survive – Safe burning sub-campaign – Get Ready Weekend – Hotspots – Property Assessment – AIDER
Community Engagement; Community Resilience	Activities that aim to increase community-level planning and preparation for bush fire.	– Gum Tree Meeting – Community Protection Plan – Project Firestorm – Street meeting – Local events and engagement – Community-led initiatives
Community Engagement; Response	Activities that aim to facilitate effective community responses to bush fire.	– Triple Zero Classroom Challenge – Community Fire Unit – Community Field Liaison – Incident Community Meeting

Table 5: *Community Engagement Treatment Strategies and Activities*

In each Focus Area, there may be multiple community engagement treatment strategies that are appropriate based on the community composition and levels of preparedness. As greater proportions of the community become more prepared, preparation and community resilience activities may become more suitable than risk awareness.

The RFS Project Team are available to support BFMCs in their decision making, including facilitating an optional workshop for a sub-committee to inform the selection of community engagement activities for each Focus Area. The BFMC should also consider seeking input from the community and relevant community stakeholders.

6.6.4 Focus Area Risk Profiles

For each Focus Area, the BFMC will prepare a Risk Profile. The Risk Profile should describe the risk to the assets in the Focus Area, and provide a justification as to why it was selected.

The Risk Profile should include any recent significant fire history, a description of the bush fire risk and the assets at risk, the risk levels to each of the asset types, any relevant social vulnerability (SoVI) factors and BFMC considerations such as access and egress, community preparedness or values.

The Risk Profile also provides the opportunity for the BFMC to describe the proposed treatments e.g. community engagement may need to target a transient tourist population, or a BFMC may identify why some treatment options are considered to be inappropriate to protect these assets e.g. areas where Fuel Management is excluded due to previous fire history or for environmental species protection.

A Focus Area Risk Profile template can be found in **Annexure A – Model Plan**. BFMCs should ensure that Risk Profiles reflect their own area and concerns, rather than use the example wording from the template.

The BFMC may choose to request an asset report from the NPWS Project Team to provide additional information on cultural and environmental data within the Focus Areas. Additionally, the BFMC may choose to request a social vulnerability report (SoVI data) from the RFS Project Team. These reports may assist with the preparation of risk profiles.

6.6.5 Fuel Management Treatments

Fuel Management (hazard reduction) is an important component of managing bush fire risk across the BFMC area. Hazard reduction involves removing or reducing the fuel (vegetation) in order to modify the potential fire behaviour, reduce the impact of fire and assist in fire suppression. BFMCs must develop a five-year strategic fuel management plan (the Fuel Management Register) which carefully considers Bush Fire Management Zone objectives. The Fuel Management Register will be mapped and described in the final BFRMP as part of the Treatment Plan.

Fuel Management Treatments include:

- Mechanical vegetation management around assets;
- Fire break vegetation management (linear fire breaks and transport corridor fire breaks);
- Burning; and
- Grazing (for specific hazard reduction purpose).

BFMCs should apply a tenure blind approach to identify strategic fuel management treatments across the BFMC area. The Focus Area objectives, quantitative risk data (including Risk from Source) and Fire History will assist the BFMC in determining appropriate Fuel Management Treatments and associated Bush Fire Management Zone types. It is essential that the BFMC seek input from stakeholders (through their Communications Strategy) and from neighbouring BFMCs.

Existing Community Protection Plans (CPPs) should be reviewed as part of this process to ensure that CPP fuel management treatments are incorporated.

The current Asset Protection Zones, firebreaks and burn proposals that were collated prior to Workshop 2b provide a good starting point for discussion. At Workshop 2b, the subcommittee must review and finalise the Fuel Management Register.

Each treatment area in the Fuel Management Register must be mapped as a polygon (not a line) and include the associated details listed in **Table 6**.

Attribute	Description
Name	Each treatment should have an appropriate name that can be used as a reference
Bush Fire Management Zone/ Fire Break type	The Bush Fire Management Zone (zone) objectives should be reviewed by the BFMC and one of the following zone types must be identified for each fuel management treatment; – Asset Protection Zone; – Ignition Management Zone; – Strategic Fire Advantage Zone; – Land Management Zone; or – Fire Exclusion Zone. The BFMC should review the zone purpose, characteristics and suppression objectives outlined in **Annexure C – Bush Fire Management Zones** to assist them with the zone determination. Linear Fire Breaks and Transport Corridor Fire Breaks are defined in the *NSW Bush Fire Environmental Assessment Code, 2021*. The BFMC should review the definitions and consider whether there are areas that require a strategic fire break to reduce the risk.
Responsible agency	The agency or fire fighting authority responsible for undertaking the works.
Proposed Treatment year (burns only)	The indicative treatment year. This is used for modelling purposes only (change in risk map) and will not be listed in the final BFRMP.
Focus Area	If the treatment is associated with a Focus Area record the name of the Focus Area. Note, the treatment does not have to be within the Focus Area boundary to be associated with a Focus Area.
Priority	Treatments associated with a Focus Area are Priority 1. All other treatments are priority 2.

Table 6: *Fuel Management Register details*

There is an expectation that all fuel management treatments listed in the Fuel Management Register will be completed within the five year BFRMP. Mapped APZs and fire breaks should be maintained at reduced fuel loads throughout the life of the BFRMP and prescribed burns should be undertaken at least once within the five years. Focus Areas will assist BFMCs in prioritising works as fuel management treatments linked to a Focus Area will be listed as **priority one** and should be treated first. Fuel management treatments not linked to a Focus Area will be listed as **priority two**.

The BFMC must submit a spatial draft Fuel Management Register to Area Command as soon as possible following Workshop 2b. Area Command and the RFS Project Team can provide GIS technical assistance where required.

The Fuel Management Register will be processed by the RFS and NPWS Project Teams to determine the *Risk Reduction (with treatment)* data. This step enables BFMCs to assess and evaluate their fuel management treatments in Stage 3 and determine whether they adequately address the bush fire risk.

Considerations for developing a Fuel Management Register

- Are the currently managed APZs sufficient? Are additional APZs or APZ modifications required?
- Are the proposed burns in the most strategic locations? Do they address the bush fire risk to assets and consider the risk from source data?
- Are additional Fuel Management activities required to reduce the risk in Focus Areas?
- What is the appropriate Bush Fire Management Zone for each prescribed burn? Have the Zone objectives been considered?
- Is the five year plan realistic? How many prescribed burns can the BFMC achieve in a five year period?
- Have Fuel Management Treatments from CPPs been included?
- Has stakeholder feedback been considered and incorporated?

6.6.6 Neighbourhood Safer Places

All Neighbourhood Safer Places (**NSP**s) in a BFMC area require ongoing treatment by the applicable land owner to ensure that the asset remains viable as a place of last resort for people during a bush fire (see **Neighbourhood Safer Places – Guidelines for the Identification of Neighbourhood Safer Places in NSW**). Current NSPs should be reviewed by the BFMC and listed in the draft BFRMP. The BFMC should also assess whether additional NSPs may be required, particularly in Focus Areas.

6.7 WHAT HAPPENS NEXT – AFTER WORKSHOP 2

Following Workshop 2b, the Area Command will provide the RFS Project Team with the BFMCs draft Fuel Management Register. The RFS Project Team will support Area Command and the BFMC with the spatial data collation process.

The RFS Project Team will then review the proposed Fuel Management Register and ensure that all data requirements have been provided. Using the indicative treatment year, the PHOENIX fuel load layer will be adjusted and the data processed for the *future with treatment* scenario. For modelling purposes, it is assumed that proposed APZs and firebreak treatments will be undertaken when required and the fuel load will be maintained at a minimal level. For prescribed burns, the modelled fuel load will be reduced on the year listed as the proposed burn year.

In preparation for Workshop 3, the BFMC should finalise Focus Areas, (including the Risk Profiles and Treatment Strategies in the BIP), and update **Annexure A - Model Plan**.

Stage 3: Risk Evaluation & Public Exhibition

WHAT'S COVERED IN STAGE 3?

This section outlines the steps involved in Stage 3 of the BFRMP development process. In Stage 3 the *Future Risk (with treatment)* and *Risk Reduction* (with treatment) data is presented to the BFMC and the BFMC uses this data to evaluate their proposed Fuel Management Register. The Focus Areas and treatment strategies are finalised and the BFRMP is endorsed for public exhibition. **Box 3** provides a brief summary of the steps and Figure 15 provides a process diagram. A more detailed flowchart for the BFRMP process can be found in **Appendix 1**.

Stage 3 summary – Risk Evaluation and Public Exhibition – Workshop 3

Key steps in Stage 3 include:

- *Future Risk (with treatment)* data is processed.
- RFS Project Team notifies Area Command that the data is available in the BIP.
- RFS Project Team prepares *Current Risk maps and Focus Area map* for inclusion in Model Plan
- Executive Officer contacts BFMC to arrange Workshop 3.
- Executive Officer circulates draft Model Plan to BFMC for review.
- Presentation of *Future Risk (with treatment)* and *Risk Reduction* data to BFMC by Area Command.
- **Workshop 3:** BFMC reviews data, evaluates the Fuel Management Register and makes modifications (if necessary).
- BFMC endorse the BFRMP for public exhibition.
- Area Command provides the RFS Project Team with the updated Model Plan and Fuel Management Register (if modified) for public exhibition.
- The RFS Project Team prepares the BFRMP maps and initiates the public exhibition process through the RFS webpage.
- Draft BFRMP publicly exhibited for 42 days
- Continue to implement Communications Strategy.

Box 3: *Summary of the steps in Stage 3 of the BFRMP process*

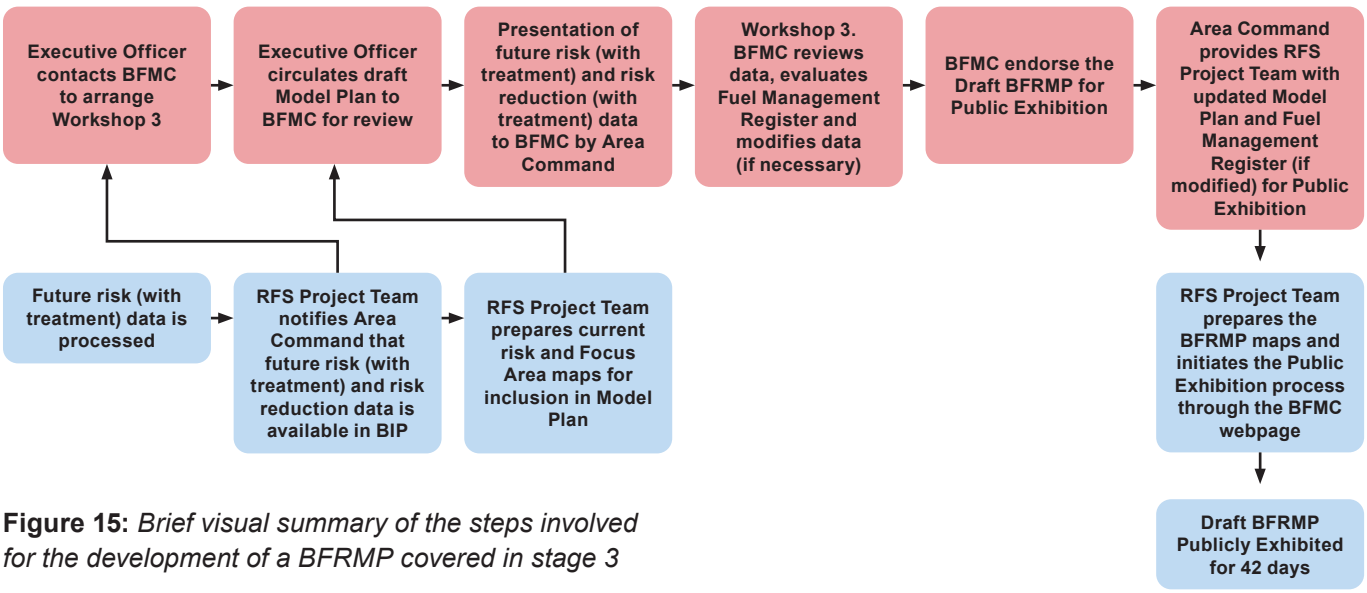


Figure 15: *Brief visual summary of the steps involved for the development of a BFRMP covered in stage 3*

7.1 BEFORE WORKSHOP 3

Before Workshop 3, the RFS Project Team and NPWS Project Team will use the proposed Fuel Management Register to re-run PHOENIX (with reduced fuel loads in place) and process the data for the Risk Reduction (with future treatment) data.

While the data is being processed, BFMCs should finalise their draft BFRMP using the template in **Annexure A – Model Plan** so that a draft plan can be circulated to the BFMC for review prior to Workshop 3.

BFMCs are required to complete the 'blanks' in the Model Plan template (e.g. <NAME>, <NUMBER> and <DATE>) and prepare the Focus Area and Communication Strategy appendices. Changes should not be made to the standard text, font style, size, line spacing and formatting. Some sections, where indicated, can be removed if not required. Recognition of certain local considerations may be incorporated only in consultation with the Area Command, RFS Project Team and, where relevant, NPWS Project Teams. This is to ensure the documents maintain consistency with the approved BFCC format.

The RFS Project Team will prepare the following maps for inclusion with the Model Plan;

- Map: Residential and SFPP Risk Current;
- Map: Economic Risk Current;
- Map: Aboriginal Predicted Sites Risk Current;
- Map: Environmental Risk Current; and
- Map: Focus Areas and Fuel Management Register (displaying Bush Fire Management Zone type).

7.2 WORKSHOP 3

In Workshop 3, the Future Risk (with treatment) and Risk Reduction data is presented to the BFMC for evaluation. The BFMC should review the draft BFRMP and if no significant changes are required, the BFMC should endorse the draft BFRMP for public exhibition.

WORKSHOP 3 – REVIEW, RISK EVALUATION & PUBLIC EXHIBITION	
AIM 1:	Review the draft Model Plan
AIM 2:	Present the Future Risk (with treatment) and Risk Reduction (with future treatment) data for evaluation
AIM 3:	Review the Fuel Management Register in line with the Risk Reduction data
AIM 4:	Plan the public exhibition process
ACTION 1:	Modify the BFRMP or Fuel Management Register as necessary
ACTION 2:	Endorse the plan for public exhibition (with or without suggested changes) and record endorsement in BFMC Minutes
ACTION 3:	Determine communication methods to be applied during Public Exhibition (Communications Strategy)

7.3 INTERPRETING DATA AND EVALUATING THE FUEL MANAGEMENT REGISTER

The BFMC will be provided with two risk evaluation products for each asset type; Future Risk (with treatment), and Risk Reduction (with treatment). The data will be available for BFMC members on the BIP. Area Command may also choose to print the key maps for discussion at Workshop 3.

The BFMC should use the future and risk reduction data to evaluate and reassess their Fuel Management Register.

Considerations for evaluating the Fuel Management Register:

- Do the proposed Fuel Management treatments adequately reduce the risk to assets in Focus Areas (check the risk profiles and strategies for each Focus Area)?
- Are additional Fuel Management treatments required to reduce the risk in other areas?
- Does the Risk Reduction map highlight any areas where a proposed fuel management activity does not significantly reduce the risk to assets? Discuss why.
- Is the benefit of each proposal worth the cost of implementing the treatment? Or are there other treatment types that may be more effective?
- Are there an appropriate number of treatments for a five year plan? Or are the number of treatments realistically achievable? Identify the fuel management treatments needed, but also consider the number, size and complexity of those treatments.
- Do the proposed Fuel Management treatments address the public perceptions of risk? Consider whether the fuel management concerns raised during community consultation have been addressed?
- Have private land owners been consulted for works on private land?
- Do the proposed Fuel Management treatments adequately address cultural and environmental values?
- Has the Fuel Management Register decision-making process been transparent and collaborative?
- Have the Bush Fire Management Zones been considered and do they reflect the objectives of each proposed burn area?

7.3.1 Future Risk – with treatment

The Future Risk (with treatment) data shows the modelled risk in year five of the BFRMP if the proposed Fuel Management program has been undertaken and no bush fires occur. The PHOENIX fuel load layer has been adjusted and the modelled ignition points are simulated and processed with reduced fuel areas in place. For prescribed burns, the fuel load is modified to post burn fuel loads on the year listed in the Fuel Management Register as the proposed burn year. For APZs and firebreaks, the fuel load is reduced to a minimal level. Fuel accumulation curves are used to estimate the fuel load change over the 5 year period. If the current year is 2023 and an area was proposed to be treated in 2026 for example, the *Future Risk – with treatment* map, which has a date of 1/1/2028, will calculate the fuel load at two years post-fire.

The Future Risk (with treatment) scenario is categorised into the same five risk classes as the other risk maps:

- Lowest Risk;
- Low Risk;
- Moderate Risk;
- High Risk; and
- Highest Risk.

The data displays the comparative risk across the BFMC area from a landscape perspective, that is, where in the BFMC are the highest risk areas compared to other areas. If an asset is located in the lowest risk category, this does not mean that the asset could not be damaged in a bush fire, it is just less likely to be damaged compared to an asset in a higher level risk category.

This data is produced using a 540m pixel grid. The larger grid size is produced by aggregating nine 180m pixel grids and the risk values summed to calculate the risk for the larger grid size.

7.3.2 Risk Reduction (with treatment)

The Risk Reduction data will help the BFMC to assess the difference between the current and future risk (with treatment) scenarios. The data shows areas where the risk has been reduced as a result of the Fuel Management Register treatments. This data will assist BFMCs to understand where fuel management treatments might have the greatest impact. It should also highlight areas where there is no reduction in risk.

The Risk Reduction map (Figure 16) depicts four classes of change:

- **No change**: there was no change in bush fire risk between the current risk scenario (year 1) and the future (with treatment) scenario (year 5).
- **Within category decrease**: there was a slight decrease in bush fire risk. Either the risk value was already in the lowest risk category so there was no change in risk category, or a decrease in risk was recorded, but it was not sufficient to move the risk value into the lower category.
- **One category decrease**: the risk value decreased by a sufficient margin to move it into a lower category, for example from the high risk category to the moderate risk category.
- **Two or more category decrease**: means the risk value decreased by enough to decrease the risk category by two or more, for example from highest risk to the moderate risk category.

As with the Future Risk data, the Risk Reduction map uses a 540m pixel grid.

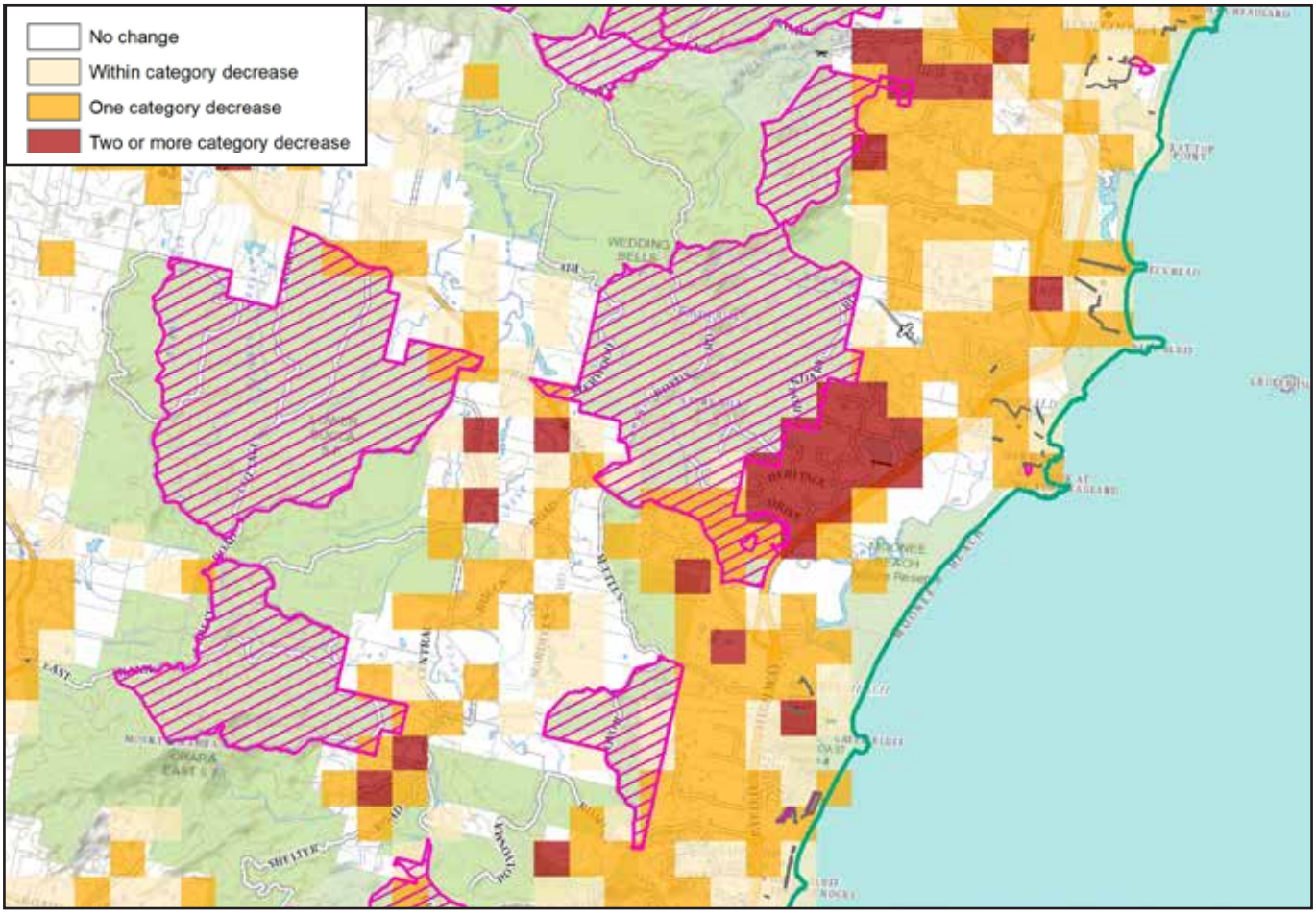


Figure 16. *An example of a Risk Reduction map for residential assets*

It is important to note that the risk reduction data only evaluates the fuel management treatments from the BFRMP. All other proposed treatments (community engagement, ignition prevention etc) are not reflected in the risk reduction model outcomes.

7.4 BFMC ENDORSEMENT FOR PUBLIC EXHIBITION

The BFMC must formally endorse the draft BFRMP for public exhibition. The BFMC must ensure that the BFRMP has been prepared in accordance with the Guidelines (or other alternate BFCC approved process and Plan) and the Model Plan has been drafted (**Annexure A – Model Plan**). The BFMC must consider whether the Focus Areas are appropriate and the treatments are adequate to reduce the risk of bush fire to those Focus Areas. The BFMC must also ensure that all agencies have reviewed the Fuel Management Register, evaluated the treatments and have committed to the actions. Once the BFMC is satisfied that the draft BFRMP is ready for public exhibition, the BFMC must endorse the draft BFRMP and resolve to place it on public exhibition (refer to the **BFMC Handbook** regarding decision making by consensus). The BFMC must ensure that the Checklist for Public Exhibition (**Annexure D – Communications**) is completed prior to the commencement of the exhibition. The decision to publicly exhibit must be explicitly recorded in the minutes of the BFMC meeting (refer to 'consensus' in the BFMC Handbook).

The RFS Project Team will receive the endorsed Model Plan and Fuel Management Register, perform a final formatting check and prepare the public exhibition maps. The public exhibition process (via the BFMC webpage) will be initiated by the RFS Project Team in liaison with RFS Communications, Area Command and the BFMC Executive Officer. In preparation for commencement of the public exhibition period, reference should be made to the prepared communication strategy to confirm the steps for displaying and promoting the plan.

For further information on public exhibition refer to **Annexure D - Communications**.

7.5 PUBLIC EXHIBITION

In accordance with The Act, a draft BFRMP must be exhibited to the public for 42 days. This is to occur through each BFMC's webpage. A notice will also appear on the NSW Government's "Have Your Say" website. BFMCs may also choose to put a notice in the local papers for their area and to provide a link to the BFMC Webpage from their own agency webpage and/or social media profiles. Digital platforms and resources are available to support and promote engagement. Refer to **Annexure D – Communications and the Social Media Kit**.

Publically exhibited documents include:

- The draft BFRMP Model Plan (including Focus Area profiles, the Fuel Management Register and a list of Neighbourhood Safer Places);
- Map: Residential and SFPP Risk Current;
- Map: Economic Risk Current;
- Map: Aboriginal Predicted Sites Risk Current;
- Map: Environmental Risk Current; and
- Map: Focus Areas and Fuel Management Register.

There is a legislative requirement that the current or draft Operations Coordination Plan (redacted where appropriate) be made available for viewing (not comment) during the public exhibition of the draft BFRMP.

In accordance with clause 7.6 of **BFCC Policy 01/2023**, a BFMC may also wish to make other plans available on the webpage such as:

- the current or draft FAFT Plan;
- the current or draft IPP; and
- any other Agency plans which the BFMC deems appropriate.

Additional detail regarding public exhibition requirements and record-keeping are provided in **Annexure D – Communications**.

Stage 4: Review and Endorsement – Workshop 4

WHAT'S COVERED IN STAGE 4?

This section outlines the steps involved in stage 4 of the BFRMP development process. In Stage 4 the BFMC reviews the comments from public exhibition, modifies the BFRMP (if necessary) and submits the BFRMP to the BFCC for endorsement. **Box 4** provides a brief summary of the steps and Figure 17 provides a process diagram. A more detailed flowchart for the BFRMP process can be found in **Appendix 1**.

Stage 4 summary

Key steps in Stage 4 include:

- *RFS Project Team provide Public Exhibition Report* from public website.
- **Workshop 4:** *The BFMC review comments and consider whether amendments to the BFRMP are required.*
- **The BFRMP is endorsed for submission to the BFCC**
- If amendments are made to the Fuel Management Register, the RFS Project Team will update the map and re-process the change in risk and risk reduction data.
- BFCC approves the BFRMP and BFRMP is adopted for implementation and reporting.

Box 3: *Summary of the steps in Stage 3 of the BFRMP process*

Figure 17: *Brief visual summary of the steps involved in stage 4*

8.1 BEFORE WORKSHOP 4

Before Workshop 4, BFMC members should review the comments from public exhibition. They should also review their Communications Strategy and ensure that they have completed the required tasks.

8.2 WORKSHOP 4 – REVIEW AND ENDORSEMENT

In Workshop 4, the BFMC should discuss each of the comments from public exhibition and the BFMC should endorse the draft BFRMP for submission to the BFCC (with or without changes).

WORKSHOP 3 – REVIEW, RISK EVALUATION & PUBLIC EXHIBITION	
AIM 1:	Review the comments from public exhibition and where appropriate make amendments to the draft BFRMP
AIM 2:	Endorse the BFRMP for submission to BFCC
ACTION 1:	Modify the final Draft BFRMP as necessary
ACTION 2:	If no significant changes are made to the plan following public exhibition, endorse the plan for submission to the BFCC If significant changes are made to the plan following public exhibition, endorse the plan for re-exhibition.

8.3 REVIEW OF PUBLIC SUBMISSIONS

The draft BFRMP will be on public exhibition for at least 42 days. Following public exhibition, the RFS Project Team will provide the BFMC with a report of comments that were provided through the BFMC webpage. In accordance with the public exhibition requirements, submissions may also be received via email, in writing or in person. A record of all submissions that are received separate to the online survey should be kept and reviewed in conjunction with survey results.

The BFMC is to determine if changes are to be incorporated into the draft BFRMP after considering the matters raised in submissions received during public exhibition.

If significant changes are made to the plan after public exhibition, the draft BFRMP will need to be placed on exhibition again for an additional 42 days. If changes are made to the Fuel Management Register, the RFS Project Team will re-process the data and maps.

8.4 BFRMP SUBMISSION TO THE BFCC

Following exhibition and the completion of any modifications, the draft BFRMP must be endorsed for submission to the BFCC. Consensus on the draft BFRMP must be reached before it can be submitted to the BFCC for approval. This is to be actioned by the BFMC, either at a BFMC meeting with endorsement minuted, or out of session, via email correspondence. BFMCs are encouraged to ensure that their draft BFRMP has been prepared in accordance with the Policy and without typographical errors.

In order for the BFCC to approve a draft BFRMP, supporting documentation must be provided. A consideration and 'Review of Submission' table must be completed by the BFMC for submission, with the draft BFRMP, to the BFCC. The 'Review of Submissions' must follow the format provided in **Annexure E – Submission and Approval**.

The RFS Project Team will undertake an assessment of the draft BFRMP after it has been endorsed by the BFMC to ensure consistency with the Policy including annexures. If the assessment identifies any major oversights or inconsistencies, the draft BFRMP will be returned to the BFMC with suggested modifications. If the BFMC disagrees with the modifications identified they may present a case to the BFCC outlining their reasons why.

The BFCC will make its determination upon assessment as outlined in **Annexure E – Submission and Approval**.

8.5 BFRMP DISPLAY

The approved BFRMP is a publicly available document. It will be displayed on the BFMC webpage.

In accordance with s62 of The Act, a BFRMP, or draft BFRMP, must be available for public inspection at, and be able to be obtained free of charge from, the office of the local authority for the area to which it relates during ordinary office hours. It also should be made available at the RFS Fire Control Centre.

Section 9 – BFRMP Monitoring, Review and Auditing

9.1 MONITORING

The BFMC is required to monitor progress towards the completion of treatment works listed in the BFRMP, and the timeliness of the works. This is done through an Annual Works Program and also an Annual Report. Reference should be made to **Annexure F – Reporting, Monitoring & Auditing** for further information.

9.2 REVIEW

A BFRMP must be reviewed and updated within each successive five-year period as per the constitution of the BFMC. A BFMC may need to review the BFRMP more frequently to account for any changes in context or risk, for example: to account for any changes in context or risk on account of changes to:

- a BFMC amalgamation;
- organisational responsibilities or legislation;
- new assets or significant land use change; or
- a major fire event.

9.3 AUDIT

Under The Act the RFS Commissioner may conduct a performance audit of the implementation of the BFRMP. These audits may also be undertaken at the request of the BFCC.

Reference should be made to **Annexure F – Reporting, Monitoring & Auditing** for more information.

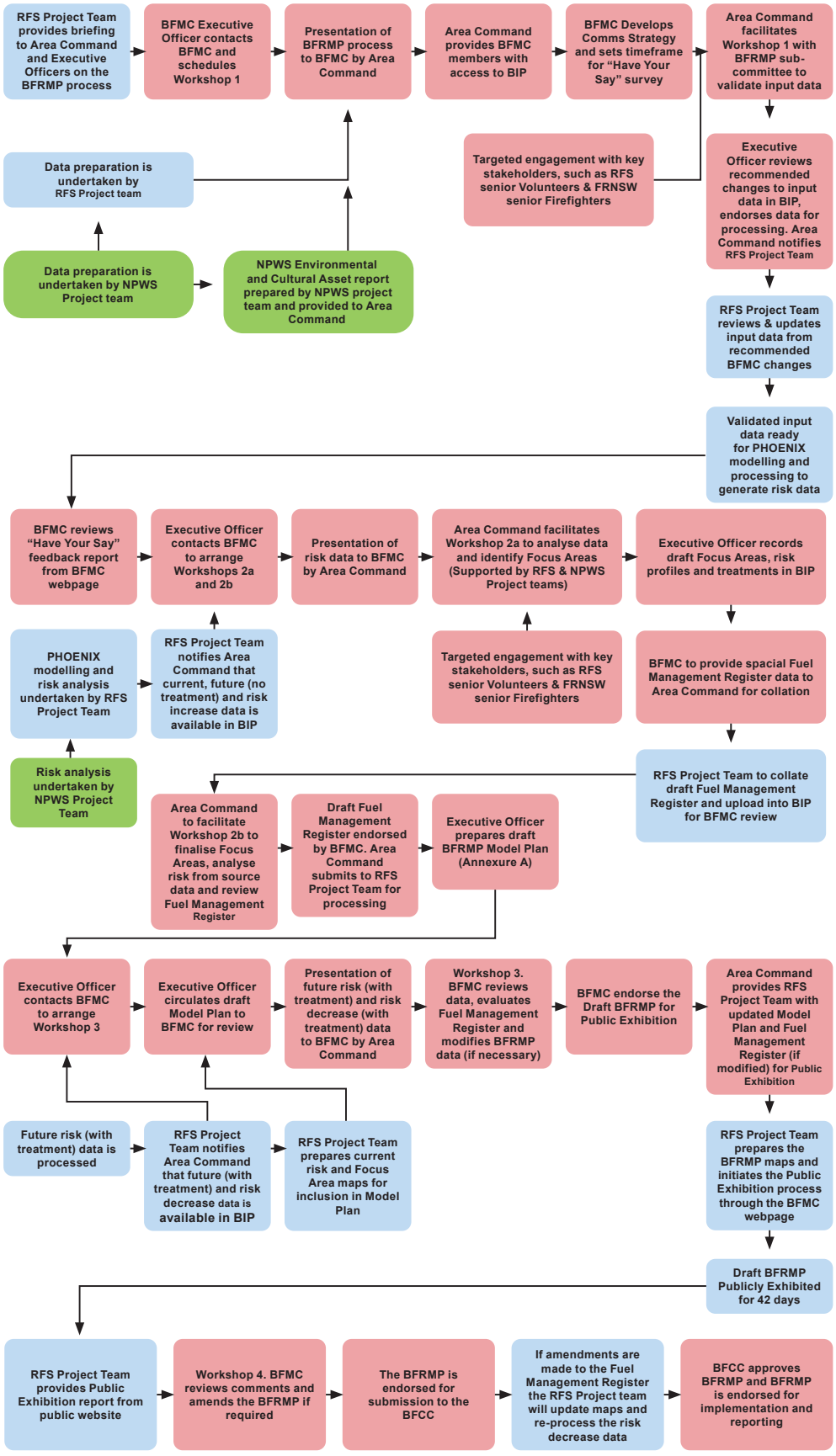
References

1. Keith, D (2004) ‘Ocean shores to desert dunes: the native vegetation of New South Wales and the ACT ‘ (Dept. of Environment and Conservation Hurstville, NSW).
2. McArthur, AG (1967) Fire behaviour in eucalypt forests. Leaflet 107. (Commonwealth of Australia, Forestry and Timber Bureau: Canberra, ACT)
3. Tolhurst KG and Chong, DMO (2011) Assessing potential house losses using PHOENIX Rapidfire. In ‘Bush fire CRC & AFAC 2011 Conference Science Day’. Sydney Australia. (ed. RO Thornton pp 74-86. (Bush fire CRC)

Appendices

Appendix 1 – BFRMP Development Flowchart

The below flowchart shows the key steps in developing the next generation BFRMP.



Appendix 2 – Supporting Data Layers

Additional mapping products used by the BFMC to support the risk planning process but will not form part of the final BFRMP.

Residential ember risk attack map

In the BIP, this map type is displayed as Residential Embers. The 180m grids are aggregated to 540m pixels (i.e. nine grids together) and the risk values summed to calculate the risk for the larger grid size. This map is similar to the Residential Risk map outlined in **Section 6.4**, however only the risk to houses from ember attack is considered. The risk to houses from direct flame contact or convection is not considered.

Risk house loss per grid

In the BIP, this map type is displayed as Residential by Grid. Each coloured square on the map represents the risk to a home or a group of homes. To determine the risk, a 180m grid is created across the BFMC area and the number of homes within each grid is identified. Then the likelihood of a bush fire starting, spreading and damaging homes at each grid is determined and multiplied by the number of homes in the grid to calculate the risk. This means that the risk results are influenced by housing density. If two grids have the same likelihood of a bush fire starting, spreading and damaging homes but one grid has three houses and the other only one, then the grid with three houses will be three times the risk of the grid with one house. This map shows house loss risk without the density calculated.

The 180m grids are aggregated to 540m (i.e. nine grids together) and the risk values summed to calculate the risk for the larger grid size. The data is then classified into a maximum of five categories from lowest to highest based on their risk value.

The map displays the comparative risk across the BFMC area from a landscape perspective, that is, where in the BFMC are the highest risk areas compared to other areas. If a house is located in the lowest risk category, this does not mean that the home could not be damaged in a bush fire, it is just less likely to be damaged compared to a home in a higher level risk category.

If you wish to determine the bush fire risk for an individual home, please use the Bush Fire Household Assessment Tool on the RFS website.

Burn Frequency

This map shows the relative number of times each 180m grid was burnt in the PHOENIX simulations. This map is a combination of all weather streams weighted by their probability of occurrence and the probability of the ignition occurring. This raster is then classified into five categories from lowest to highest times burnt with each interval between classes equal to the highest value of the lowest class, except for the highest class. Please note that the Burn Frequency map only provides an indication of how often fire reached a grid cell and does not consider the fire exposure (flame height and intensity) for the grid and is therefore not necessarily indicative of the likely consequence to assets in that grid.

Social Vulnerability Index

The Social Vulnerability Index or SoVI data is not applied in the risk assessment process, however, it can assist BFMCs in the risk analysis process. It is a tool for quantifying the vulnerability of populations to bush fire using demographic data on a variety of social and economic measures. More information can be found in **Appendix 3**

Table 7 provides a summary of the data layers provided throughout the BFRMP process.

Standard risk maps	Current Risk	Future Risk (no treatment)	Risk Increase	Future Risk (with treatment)*	Risk reduction (with treatment)*	Format	Included in Final BFRMP
Human settlement - residential	✓	✓	✓	✓	✓	Online – BIP	✗
Human settlement – Special Fire Protection Purpose (SFPP)	✓	✓	✓	✓	✓	Online – BIP	✗
Human settlement - combined residential and SFPP	✓	✓	✗	✓	✗	For public exhibition only	✓ Current
Economic	✓	✓	✓	✓	✓	Online – BIP	✓ Current
Environmental	✓	✓	✓	✓	✓	Online – BIP	✓ Current
Cultural – Known Aboriginal cultural heritage	✓	✓	✓	✓	✓	Online – BIP	✗
Cultural – Predicted Aboriginal cultural heritage	✓	✓	✓	✓	✓	Online – BIP	✓ Current
Cultural - Historic heritage	✓	✓	✓	✓	✓	Online – BIP	✗
Additional maps							
Residential Risk from Ignition	✓	✗	✗	✗	✗	Printed Map only	✗
Fire size from Ignition	✓	✗	✗	✗	✗	Printed Map only	✗
Risk house loss per grid	✓	✓	✗	✓	✗	Online – BIP	✗
Residential risk – embers only	✓	✓	✗	✓	✗	Online – BIP	✗
Social Vulnerability Index	✓	✗	✗	✗	✗	Online – BIP	✗
Burn Frequency	✓	✗	✗	✗	✗	Online – BIP	✗
Fire History	✗	✗	✗	✗	✗	Online – BIP	✗

Table 7: *Risk maps provided to BFMCs during the BFRMP process to assist in the development of Focus Areas and treatments*

Appendix 3 – Social Vulnerability

Social Vulnerability

Social vulnerability refers to the characteristics of a person or group that influence their capacity to prepare for, respond to and recover from the impact of a bush fire. A range of factors and characteristics influence people's vulnerability to bush fire such as age, gender, ethnicity, disability, education, and income, among others. For example, the elderly and people with a physical disability may find it more difficult to prepare their home and property due to the physical nature of bush fire preparation. Others may be new to an area and have limited awareness and knowledge of bush fire risk.

Social Vulnerability Index

The SoVI is a tool for quantifying and assessing the vulnerability of communities to bush fire. It uses demographic data, primarily from the Australian Census of Population and Housing. Data on a range of social and economic variables is combined into the Index, allowing areas to be ranked and compared, from the least to the most vulnerable. Each dataset within SoVI has a unique weighting which contributes to the overall index for a defined area. Data Indicators used to inform SoVI are summarised in **Table 8**.

Indicator	Variable
Wealth	% population on low income (<$15,599 per year)
Age	% population aged under 4 years and over 65 years
Employment	% population unemployed
Housing	% population living in rental housing from a State housing authority
Language	% population born overseas; speak language other than English; poor English
Multicultural	Level of cultural diversity
Indigenous	% population Indigenous
Industry	% population employed in 'Electricity, Gas & Water Supply' and/or 'Public Administration and Safety' sectors
Family	% population single-parent with dependant
Volunteering	% population that has not volunteered in last 12 months
New to region	% population with different address to last year
Education	% population highest education Year 10 or below
Assistance	% population needing assistance in an emergency
Vehicle ownership	% population without registered vehicle at address
Unoccupied dwellings	% dwellings unoccupied
Population growth	Projected population growth (in bands from 5% to 12.5+%)

Table 8 *Indicators for construction of SoVI*

Application of SoVI data

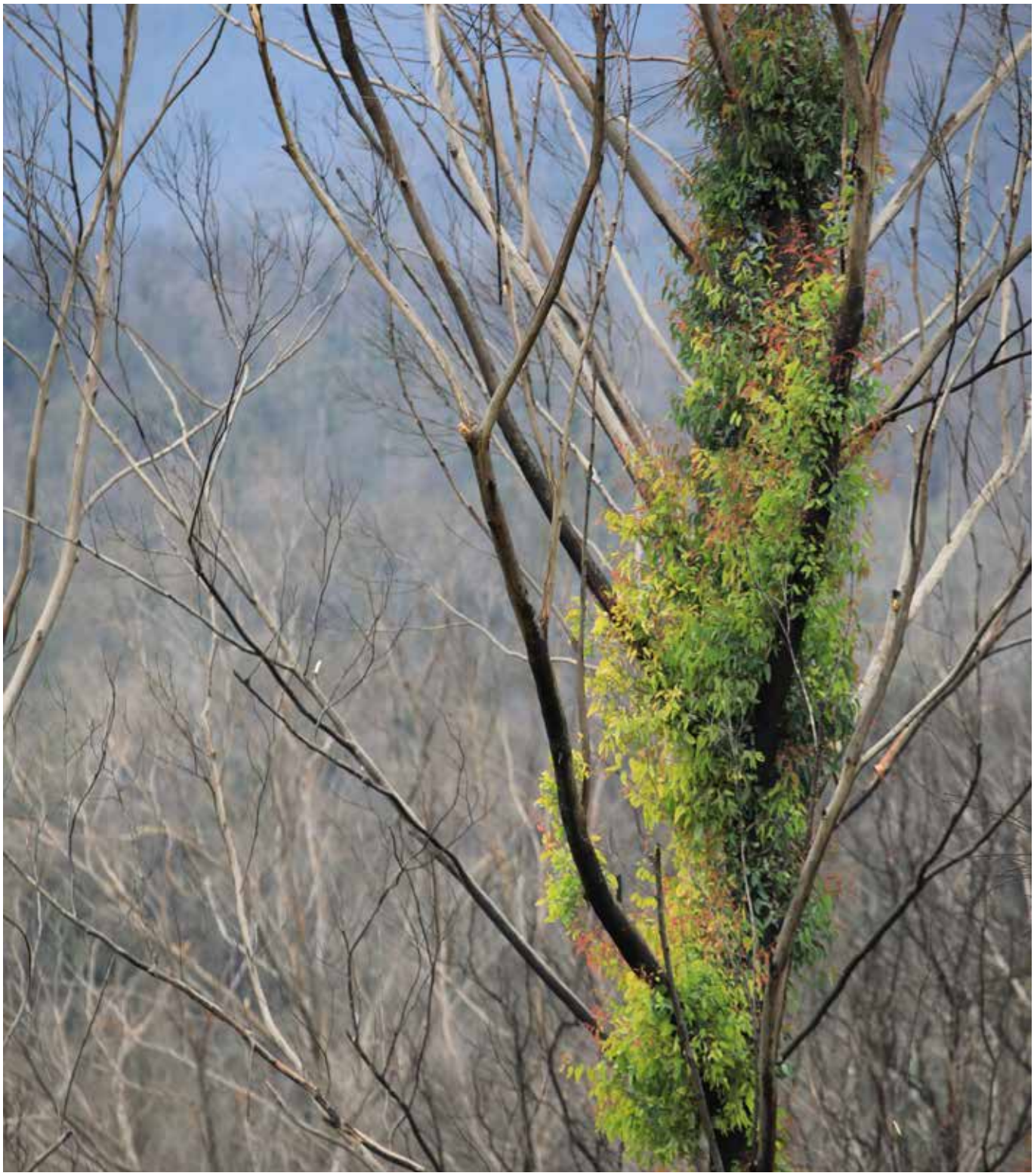
SoVI data is not applied in the risk quantification process, but it can be a valuable supporting dataset for BFMCs to consider in the planning process.

Identification of Focus Areas

SoVI can be used to help identify Focus Areas in BFRMPs. It may highlight areas that have both quantitative and social vulnerability risks or it may highlight areas that are identified as moderate quantitative risk, but have a significant social vulnerability. For example, a residential area at moderate risk that has been highlighted in the SoVI data as having a large number of new residents who speak a language other than English may be identified as a Focus Area above an area that is identified as high risk with no SoVI factors.

Selection of risk treatments

SoVI as well as other datasets such as the Get Ready NSW Survey, can help to include a more suitable community engagement activity in the Annual Works Programs. For example, communities with low levels of risk awareness for bushfire as defined in the Get Ready NSW Survey may benefit from the Pre-Season Community Briefings as an activity. SoVI may also reveal that multiculturalism is a key factor in that community, and therefore it should be delivered catering for a multicultural audience.



Planning **together**

Bush Fire Coordinating Committee – Policy No 01/2023
Adopted by the Bush Fire Coordinating Committee
– Meeting No 104/2023

Prepared by the NSW Rural Fire Service
On behalf of the Bush Fire Coordinating Committee