

Hobart Fire Management Area



Fire Protection Plan

2014 - 2015

Document Control

Document History

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Glossary

Asset	A term used to describe anything valued by the community that may be adversely impacted by bushfire. This may include residential houses, infrastructure, agriculture, industry, environmental and heritage sites.
Bushfire	Unplanned vegetation fire. A generic term which includes grass fires, forest fires and scrub fires both with and without a suppression objective. ¹
Bushfire hazard	The potential or expected behaviour of a bushfire burning under a particular set of conditions, i.e. the type, arrangement and quantity of fuel, the fuel moisture content, wind speed, topography, relative humidity, temperature and atmospheric stability.
Bushfire risk management	A systematic process to coordinate, direct and control activities relating to bushfire risk; with the aim of limiting the adverse effects of bushfire on the community.
Consequence	The outcome or impact of a bushfire event.
Likelihood	The chance of something occurring.
Risk	The effect of uncertainty on objectives. ² (Note: Risk is often expressed in terms of a combination of the consequences of an event and the associated likelihood of occurrence.)
Risk acceptance	The informed decision to accept a risk, based on the knowledge gained during the risk assessment process.
Risk analysis	The application of consequence and likelihood to an event in order to determine the level of risk.
Risk assessment	The systematic process of identifying, analysing and evaluating risk.
Risk criteria	Standards (or statements) by which the results of risk assessments can be assessed. They relate quantitative risk estimates to qualitative value judgements about the significance of the risks. They are inexact and should be seen as guidelines rather than rules. ³
Risk evaluation	The process of comparing the outcomes of risk analysis to the risk criteria in order to determine whether a risk is acceptable or tolerable.
Risk identification	The process of recognising, identifying and describing risks.
Risk treatment	A process to select and implement appropriate measures undertaken to modify risk.

¹ Australasian Fire and Emergency Service Authorities Council 2012, *AFAC Bushfire Glossary*, AFAC Limited, East Melbourne, Australia

² Standards Australia 2009, *Risk management – Principles and guidelines, AS/NZS 31000:2009*, Standards Australia, Sydney, Australia

³ Emergency Management Australia 1998, *Australian Emergency Manuals Series – Manual 3 Australian Management Glossary*, Emergency Management Australia, Dickson, Australia

Acronyms

BC	Brighton Council
CCC	Clarence City Council
DOD	Department of Defence
DVC	Derwent Valley Council
FDI	Fire Danger Index
FDR	Fire Danger Rating
FIAT	Forest Industry Association Tasmania
FMA	Fire Management Area
FMAC	Fire Management Area Committee
FPP	Fire Protection Plan
FT	Forestry Tasmania
GCC	Glenorchy City Council
HCC	Hobart City Council
HFMA	Hobart Fire Management Area
KC	Kingborough Council
PWS	Parks and Wildlife Service
REMC	Regional Emergency Management Council
SEMC	State Emergency Management Committee
SFMC	State Fire Management Council
TFGA	Tasmania Farmers and Graziers Association
TFS	Tasmania Fire Service
WPMT	Wellington Park Management Trust

1 Introduction

This fire protection plan for the Hobart Fire Management Area was prepared by the Hobart Fire Management Area Committee (HFMAC) and State Fire Management Council (SFMC) to cover the period 2014 – 2015.

The plan is based on risk modelling provided through the SFMC and the knowledge and expertise of the committee members. With a relatively short timeline for development there have not yet been any rigorous field investigations or detailed local-scale risk assessments undertaken. It is intended that future versions of this plan will become more comprehensive in time, particularly to gather and assess the information required and to consult with landowners.

1.1 Background

Under Section 20 of the *Fire Service Act 1979*, fire management area committees are required to submit to SFMC, on an annual basis, a fire protection plan for its fire management area commencing on 1 October.

It is a requirement of the fire protection plan that it is consistent with the State Fire Protection Plan and the State Vegetation Fire Management Policy.

1.2 Aim and Objectives

The **aim** of this FPP is to document a coordinated and efficient approach towards the identification and treatment of bushfire-related risk within the Hobart FMA.

The **objective** of this FPP is to effectively manage bushfire related risk within the Hobart FMA in order to protect people, assets and other things valuable to the community. Specifically, the objectives of this plan are to:

- Guide and coordinate a tenure blind bushfire risk management program over a five (5) year period;
- Document the process used to identify, analyse and evaluate risk, determine priorities and develop a plan to systematically treat risk;
- Facilitate the effective use of the financial and physical resources available for bushfire risk management activities;
- Integrate bushfire risk management into the business processes of Local Government, land managers and other agencies;
- Ensure integration between stakeholders;
- Clearly and concisely communicate risk in a format that is meaningful to stakeholders and the community; and
- Monitor and review the implementation of the Plan, to ensure enhancements are made on an on-going basis.

This plan only deals with reducing the risks to life, property and other assets of value from bushfires, not other types of fire.

1.3 Implementation Strategy

This plan takes a risk management approach and includes a wide range of measures that would reduce the bushfire risk within the Hobart FMA. At this stage it is intended that the final fire prevention plan for the Hobart FMA will cover the following broad strategies:

- 1) Reduce the risk of bushfires starting and spreading through:
 - a) Reducing the number of ignitions within the Hobart FMA
 - b) Reducing the risk of bushfires that do start spreading
 - c) Reducing the rate of spread and intensity of bushfires that can't be immediately controlled.
- 2) Reduce the risk of persons being injured or dying as a result of bushfires.
- 3) Identify and reduce the bushfire risk to the following assets:
 - a) Residential and other Class 1 to 9 buildings as defined in the National Construction Code (for an explanation of these classes see **Appendix 5**)
 - b) Critical infrastructure including electricity supply, communications, water supply, sewerage, airport
 - c) Drinking water catchment areas
 - d) Cultural and heritage values
 - e) Natural heritage values including threatened species and plant communities, biodiversity, geoheritage, scenic values.

An outline of the measures being considered to implement this strategy is in **Appendix 1**.

1.4 Policy, Standards and Legislation

The following policy, standards and legislation were considered to be applicable to the development and implementation of the FPP.

- National Bushfire Management Policy Statement for Forests and Rangelands 2012
- Tasmanian Emergency Management Plan
- State Fire Protection Plan
- State Vegetation Fire Management Policy
- State Strategic Fuel Management Plan
- Environment Protection Policy (Air Quality) 2004
- Tasmanian Air Quality Strategy 2006
- State Policy on Water Quality Management 1997
- Forest Practices Code 2000
- Planning Directive 5 – Bushfire Prone Areas Code
- Tasmanian Electricity Code
- Wellington Park Management Plan 2013
- Hobart City Council Fire Management Strategy 2014

- Clarence City Council Bushfire Management Strategy 2011

1.4.1 Standards

- AS/NZS ISO 31000:2009 - Risk Management – Principles and Guidelines
- AS 3959 – 2009 – Construction of Buildings in Bushfire Prone Areas

1.4.2 Legislation

- *Aboriginal Relics Act 1975 (soon to be replaced)*
- *Crown Lands Act 1976*
- *Emergency Management Act 2006*
- *Environment Protection and Biodiversity Conservation Act 1999 (Federal)*
- *Environmental Management and Pollution Control Act 1994*
- *Fire Service Act 1979*
- *Forest Practices Act 1985, and Forest Practices Regulations 2007*
- *Forestry Act 1920*
- *Historic Cultural Heritage Act 1995*
- *Local Government Act 1993*
- *National Parks and Reserve Management Act 2002*
- *Nature Conservation Act 2002*
- *Threatened Species Protection Act 1995*
- *Weed Management Act 1999*
- *Wellington Park Act 1993*

2 Establishing the Context

2.1 Description of the Hobart Fire Management Area

2.1.1 Location, Boundaries and Land Tenure

The Hobart Fire Management Area (HFMA) encompasses an area of approximately 110,000 ha. It covers the greater Hobart area and surrounding suburbs. The plan area also covers satellite suburbs and outlying communities including Lauderdale, Seven Mile Beach, Richmond, Brighton, Fern Tree, Molesworth, Lachlan and Mountain River. It includes the local government areas of Hobart, Glenorchy, Clarence, Brighton and parts of Kingborough and Derwent Valley.

The HFMA has two very distinctive geographical features; firstly the area is bisected by the River Derwent, and secondly the Wellington Range borders many Hobart suburbs to the west. Because of this, altitudes within the HFMA range from sea level to 1271m above sea level at the pinnacle of kunanyi / Mount Wellington.

This fire prevention plan is only intended to cover areas within the HFMA identified as bushfire prone in accordance with the Tasmanian Bushfire Prone Areas Code⁴.

Land Manager/Agency	% of Land Managed within the FMA
Private Property	65
Wellington Park Management Trust	14
DPIPWE	6
Local Government	4
Other	11

Table 2.1 - Overview of major land management agencies within the Hobart FMA

⁴ The Bushfire Prone Areas Code defines bushfire prone land as land that is within 100m of an area of contiguous vegetation (i.e. separated by less than 20 metres) equal to or greater than 1 hectare. This includes grasses and shrubs but does not include maintained lawns, parks and gardens, nature strips, plant nurseries, golf courses, vineyards, orchards or vegetation on land that is used for horticultural purposes.

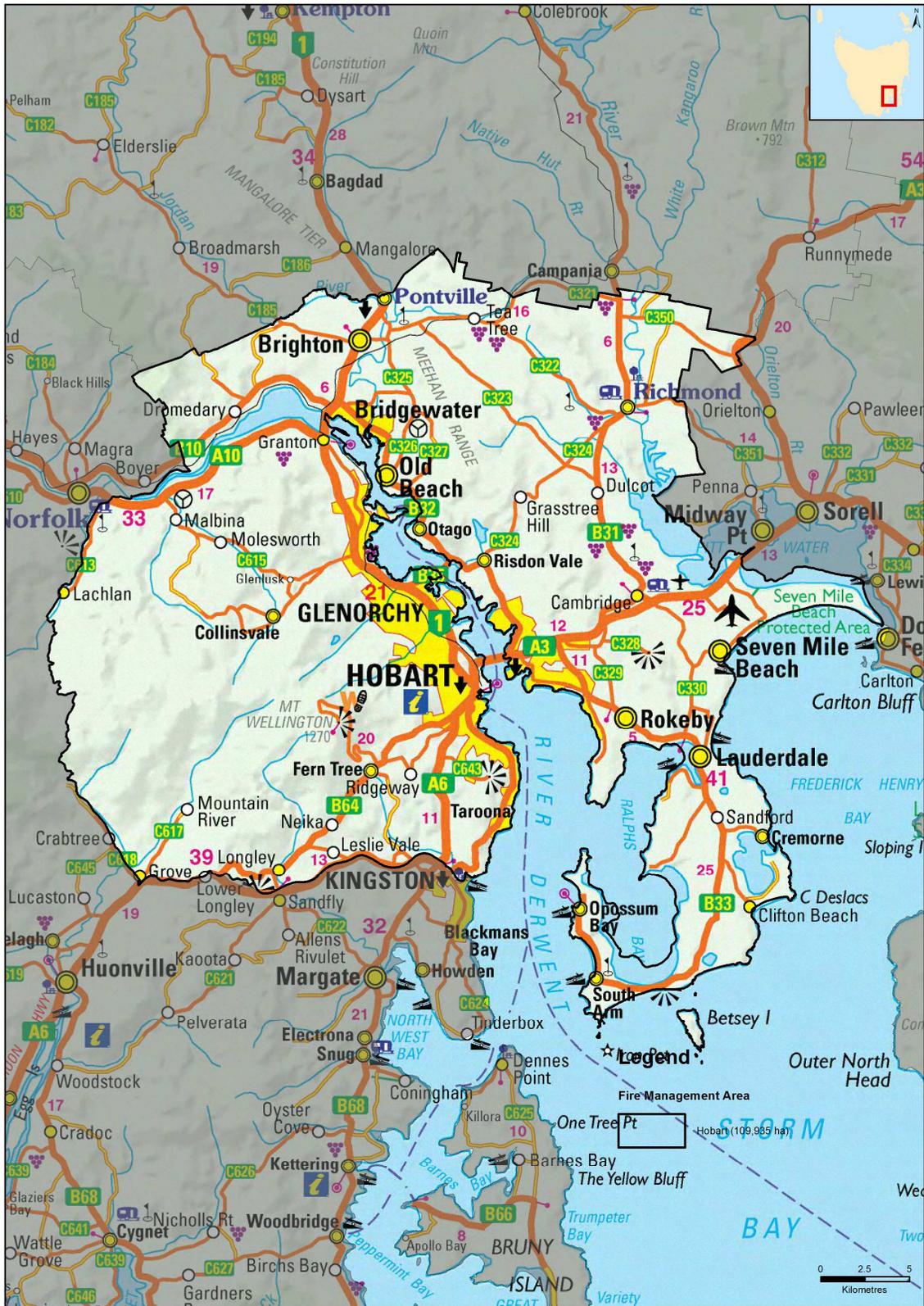


Figure 2.1: Location of HFMA with surrounding Fire Management Areas.

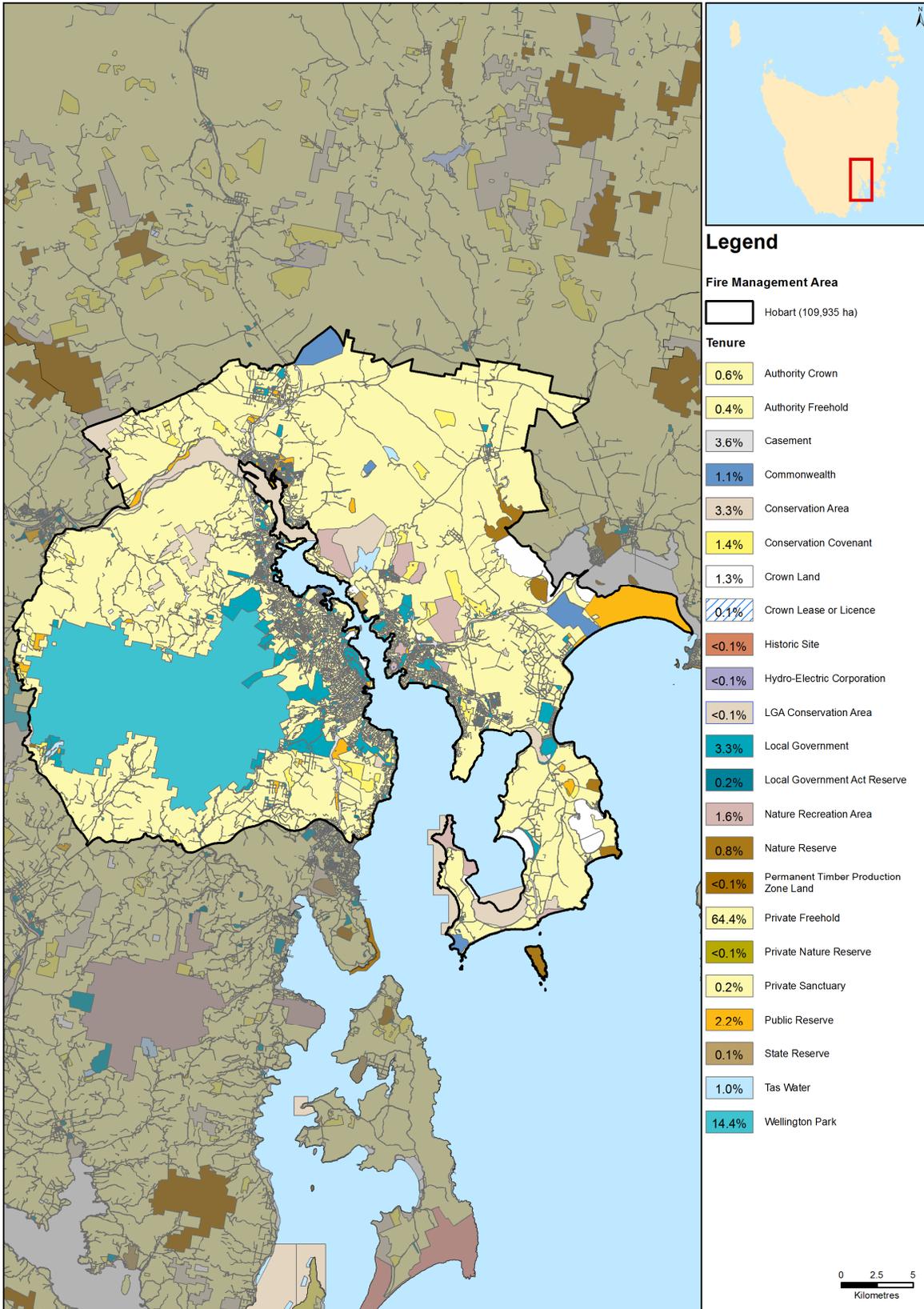


Figure 2.2: Broad land tenure across the HFMA

2.1.2 Climate and Bushfire Season

Dangerous fire weather can be expected from time to time in southern Tasmania when dry winters and springs are followed by summers where fuels are very dry. The strong north-westerly winds that often precede cold fronts in summer can contain dry air from the interior of the Australian mainland. These winds pick up some surface moisture crossing Bass Strait, but as the air stream descends from the Central Highlands dry air at a higher altitude descends to the surface resulting in extremely low humidity. This combination of strong winds and low humidity creates the ideal meteorological conditions for major bushfires in south-east Tasmania and particularly the Hobart Fire Management Area. Fires that start under these conditions can be expected to move quickly downwind, and then move more or less at right angles on a broad front when the subsequent south-westerly wind change arrives. These fires can reach a very high intensity in a short time, even in areas with relatively low fuel loads, and are very difficult to control until the weather conditions abate. These were the conditions that produced the 1967, 1998, 2006 and 2013 bushfires around Hobart.

Relevant BOM weather stations located within the HFMA:

-Grove

-Hobart

-Hobart Airport

-Mt Wellington

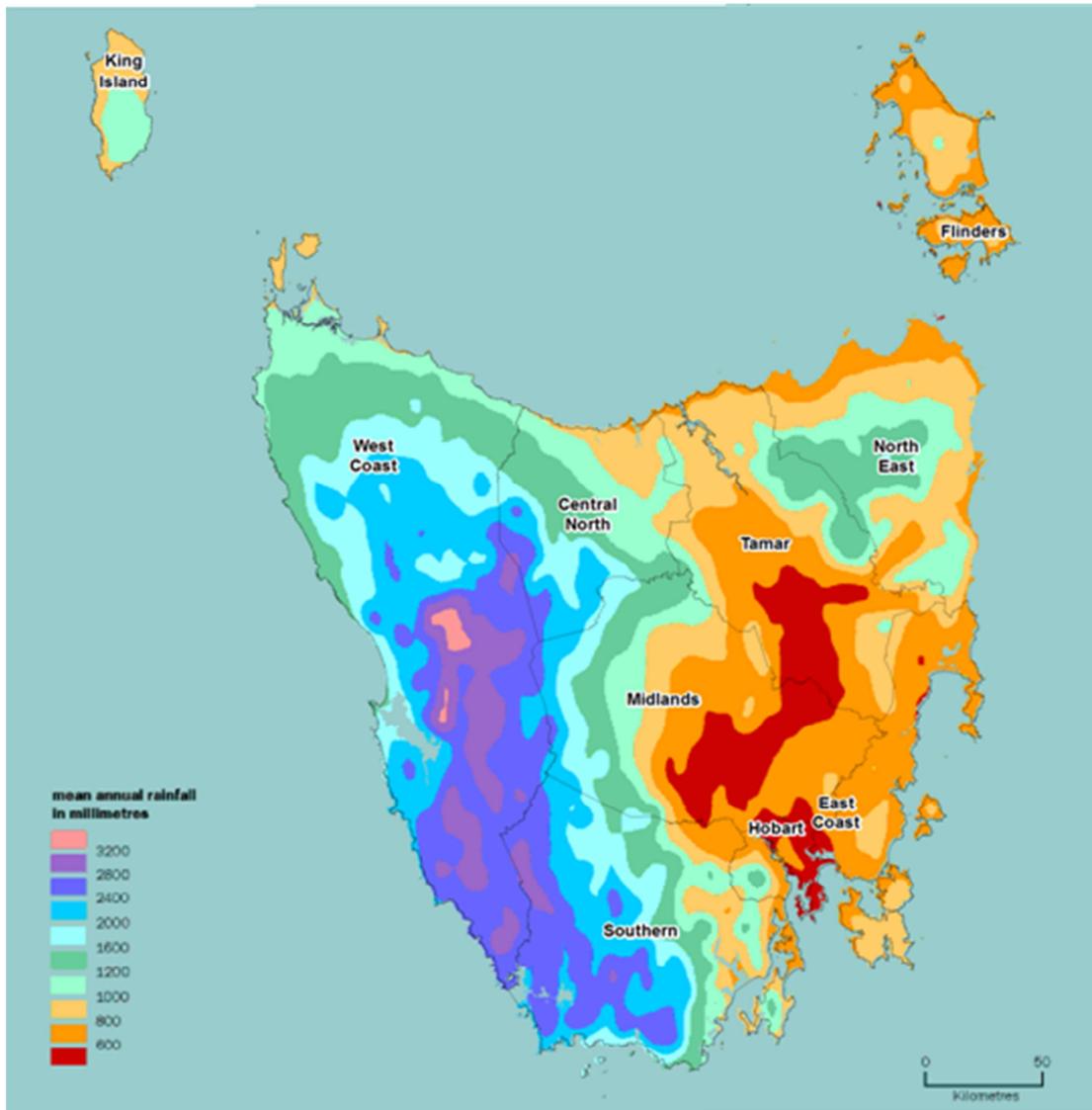


Figure 2.3: Mean annual rainfall across Tasmanian Fire Management Areas

2.1.3 Vegetation

The vegetation within the Hobart FMA has been classified into broad fuel types with similar bushfire hazard characteristics shown in figure 2.4.

Almost half the HFMA is covered by cleared land, either for urban development or for various types of agriculture. The remaining native vegetation is predominantly dry Eucalypt forest and woodland. Wet forest is mainly confined to the eastern and southern slopes of the Wellington Range.

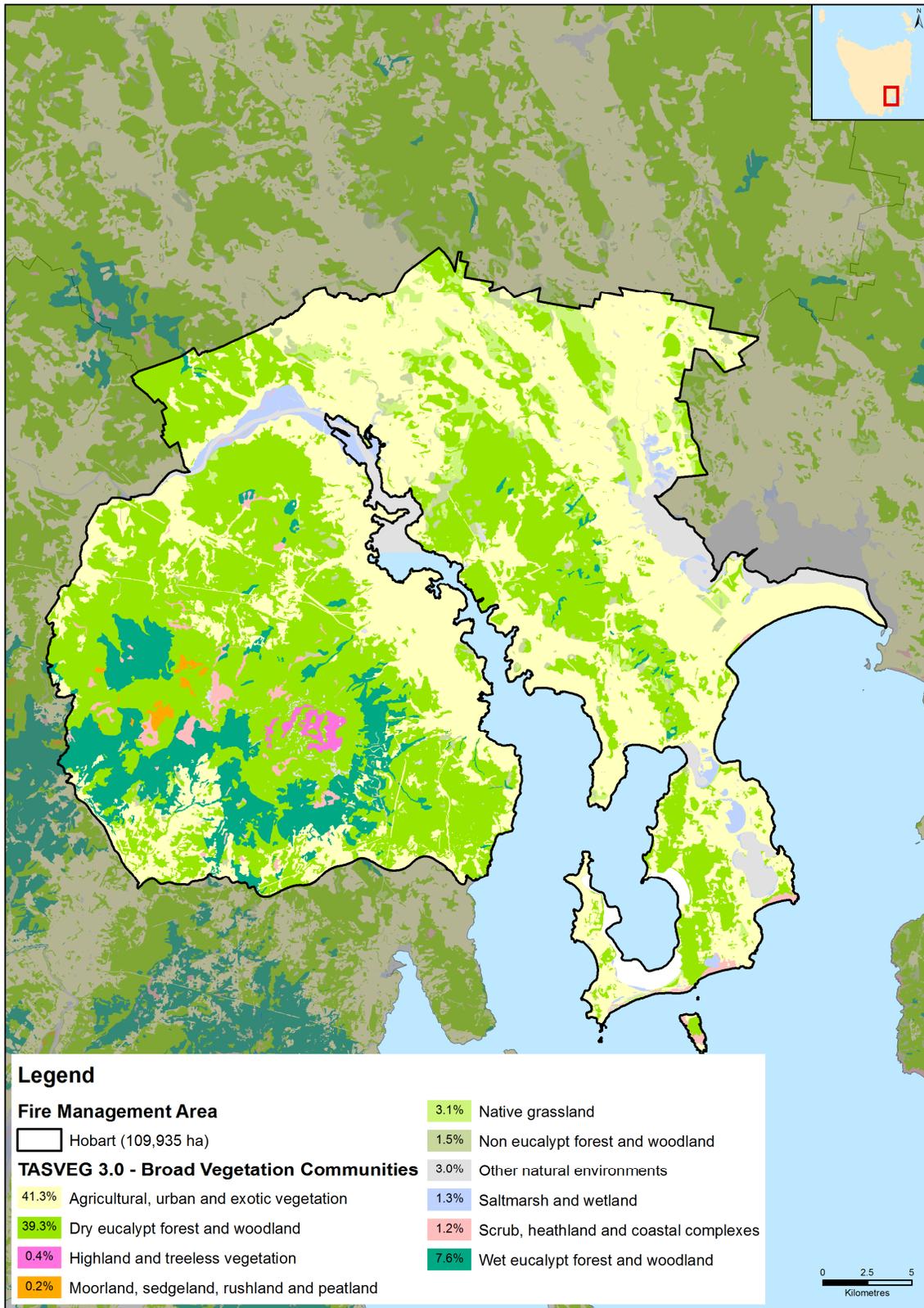


Figure 2.4 Vegetation types across the HFMA (based on grouped TASVEG vegetation mapping)

2.1.4 Population and Demographics

Settlement is concentrated along the shores of the Derwent River Estuary and Fredrick Henry Bay as shown on Figure 2.5. The only sizable settlements away from the coast are Brighton, Richmond and Risdon Vale. Settlement in the HFMA is dominated by two urban areas on either side of the Derwent River, as well as these large settlement areas there are a number of smaller towns, villages and settlement areas separated from the main urban areas by bushland (for example Risdon Vale, Ridgeway, Molesworth). The HFMA also contains areas of rural residential development, mainly ~2 ha lots where homes are scattered and there is no distinct urban/bushland boundary (for example Acton, Sandford).

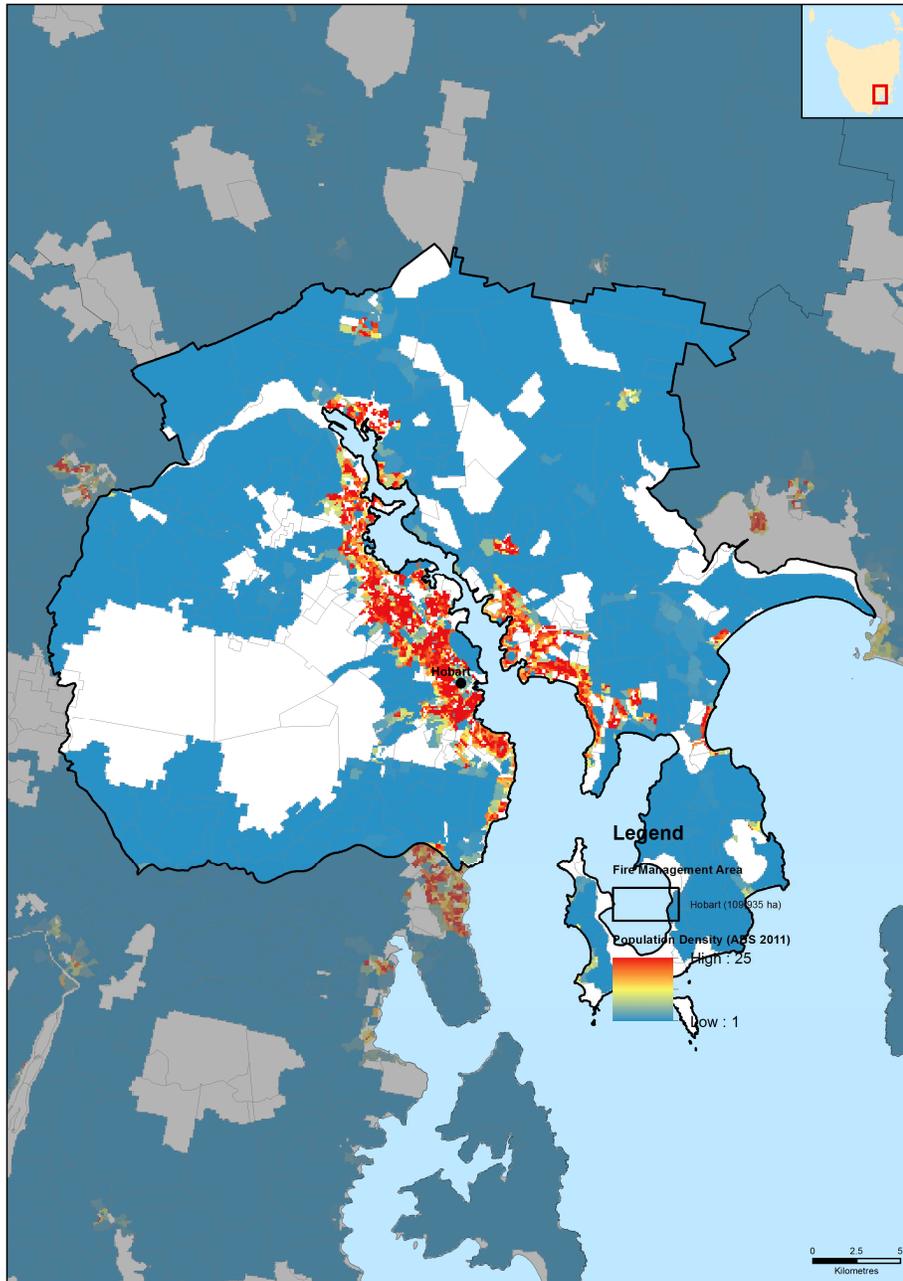


Figure 2.5 Map of population density in the HFMA

2.2 Bushfire History

2.2.1 Bushfire Frequency

Fire frequency is defined as the total number of fires that occurred in the same area. Figure 2.6 shows areas known to have been affected by fire (including prescribed burns) in the HFMA since the 1967 bushfires based on records provided by the Tasmania Fire Service, local government, Wellington Park Management Trust, Parks and Wildlife Service and other sources. However, the records are incomplete and do not include burning carried out by private landowners. The figure therefore substantially underestimates the area burnt and frequency of burning. It is anticipated that further research will produce a more accurate map.

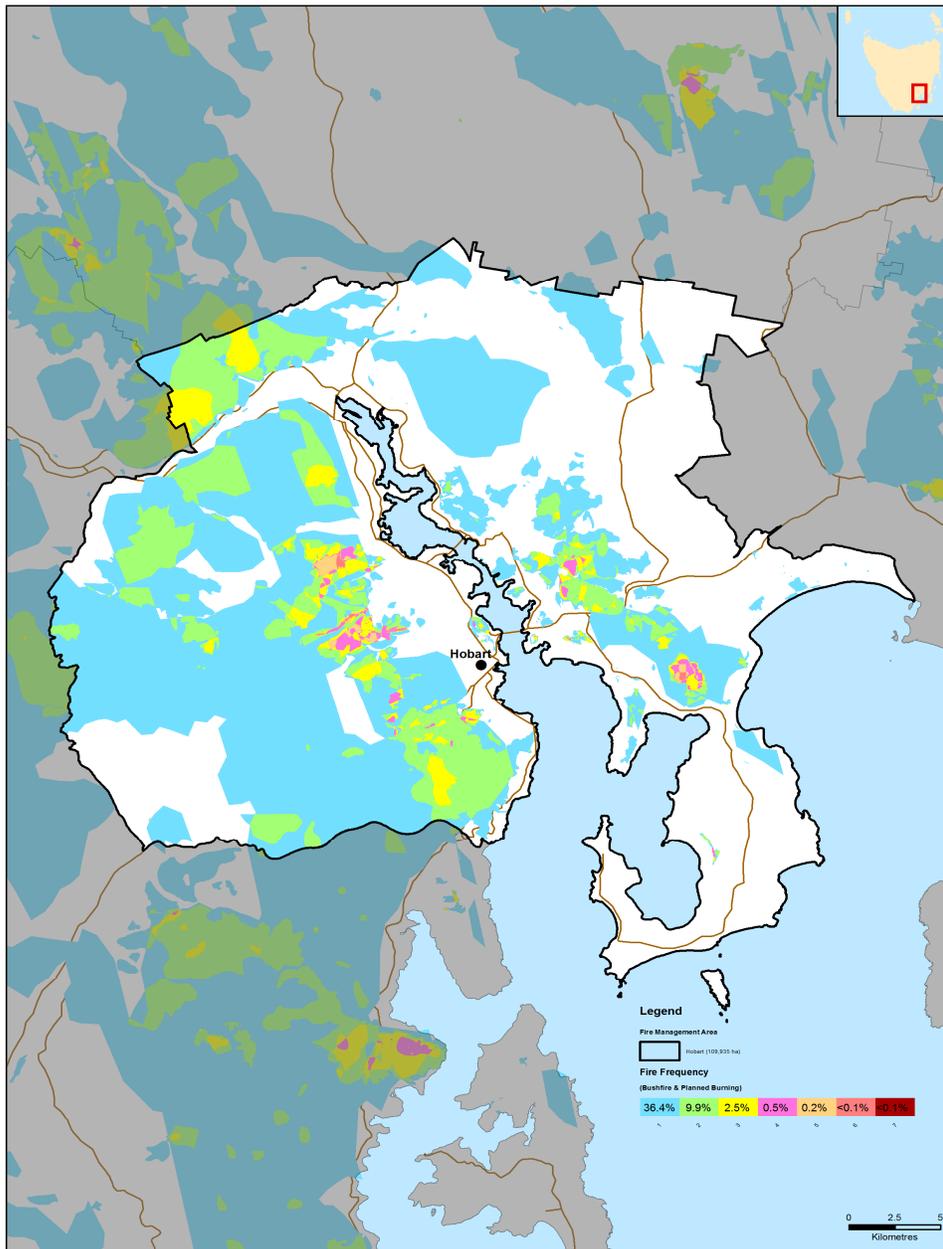


Figure 2.6 Preliminary Analysis of Fire Frequency

2.2.2 Fire Ignition Cause

The true causes of fire, either through ignition by lightning or caused by human actions have not been well documented prior to 1990. Table 2.2 give a summary of ignition causes based on available data.

Ignition source	Percentage of ignitions (%)
Unknown	44
Arson	29
Undetermined	9
Recreation	8
Escape	3
Other	7

Table 2.2 Summary of ignition sources

The number of bushfires in the HFMA started by non human related causes is very low. This indicates that a significant reduction in the risk of fires starting can be achieved through public education and vigilance.

2.3 Existing Bushfire Management Plans

Over the last 15 years a number of land owners and management agencies within the HFMA have prepared fire management plans and strategies for the land under their control. These are listed in **Appendix 2**. Some of these strategies and plans are being actively implemented, some have been partially implemented and others have not been implemented, usually due to a lack of resources or there being no obvious agency or person to take responsibility.

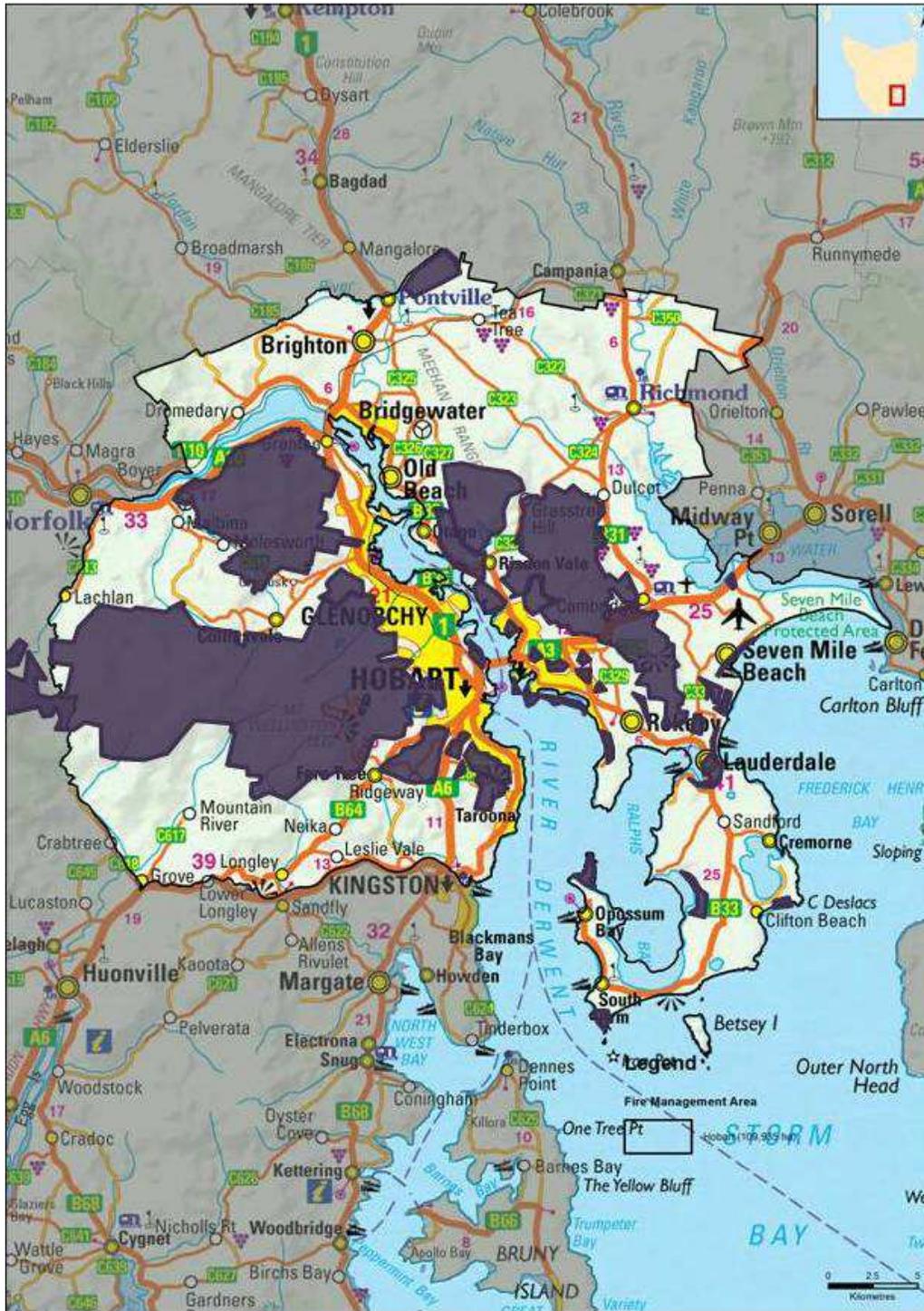


Figure 2.7 Areas of the HFMA currently under some form of fire risk management plan

Chapter 3 Analysing and Evaluating Bushfire Risk

3.1 Analysing Bushfire Risk

Following the Australian Standard of risk (ISO 3100) bushfire risk has been considered spatially, assessing a combination of likelihood and consequence (PWS 2011). The Bushfire Risk Assessment Model (BRAM), model data run of November 2013 was used to give a preliminary indication of landscape level risk for this plan. For details on the operation of the model, see **Appendix 3**.

To determine overall risk the NERAG (National Emergency Risk Assessment Guidelines August 2009) document (see Appendix 5) was used. The level of risk is determined by combining consequences and likelihood.

It must be noted that the BRAM and therefore the consequences, likelihood and risk outputs are based on available spatial data. The analysis has been undertaken on a statewide basis, and maps are presented as complete for Tasmania. There are however gaps in the data inside and outside areas of public land. This includes fire history information, particularly on private land, which contributes to ignition potential information (likelihood), and many of the agricultural values have not been well captured (consequence). Notwithstanding these limitations, the model can provide an objective spatial analysis of bushfire risk in a landscape consequence.

3.2 Likelihood and Consequence

Likelihood is defined as a qualitative method to assess the likelihood rating to the consequences occurring. The likelihood of an event was generated by the average combinations of the output generated from the following spatial information: ignition potential, suppression capabilities and fire behaviour potential, followed by assigning these output values to categories in a likelihood matrix. This is taken to mean the likelihood of a fire occurring in a specific area which surpasses the ability of the fire agencies to contain within the first 24 hours.

Consequences are defined as a qualitative rating of damage from fire to values. The consequences were taken directly from the output generated through the Values at Risk spatial layer output.

3.3 Overall Risk

A representation of risk (see **Appendix 4**) is developed when you combine the factors of likelihood and consequence. The generated output map of risk shows qualitative areas of risk, not areas of perceived risk.

The model assists in objectively defining areas where genuine risk is present. In-depth analysis will indicate what factor is driving the risk for a given area, and thus guide the determination of appropriate risk management techniques.

3.4 Risk Analysis for the Hobart Fire Management Area

The BRAM bush fire risk model, discussed above, was used to examine risk across the HFMA. The preliminary results of this risk analysis are shown in Figure 3.1. Some members of the Hobart FMAC noted possible anomalies in the bushfire risk output shown in Figure 3.1 and these will be investigated further during development of the final plan.

The Phoenix Rapidfire software package (a bushfire simulator developed by Kevin Tolhurst and Derek Chong at the University of Melbourne) was used to model the risk of fires impacting on communities present in the HFMA. This modelling was done as part of the state wide strategic fuel management assessment. The process involved modelling potential ignition points, incorporating severe fire weather components and examining fire behaviour based on current fuel loads to identify the potential impact on human settlement areas. Figure 3.2 shows a preliminary analysis of potential ignition points that may impact on communities in the HFMA with areas (ha) of impact under current fuel loads. For each ignition point the model was run for a period of 10 hours, and assumes that there is no intervention to control the bushfire.

An understanding of where the fires that are likely to impact on communities originate is crucial. It must be understood that such analysis has many limitations but does provide an indication of which communities may be under risk as well as identifying areas where strategic burning will assist in changing fire behaviour.

Strategic fuel reduction burning is one treatment to reduce risk to communities throughout the HFMA. However, not all vegetation and land use types are treatable through burning. Figure 3.3 shows treatability of fuels through broad –area fuel reduction burning in the HFMA. In summary, 41% of fuels are treatable by burning, while 54% is untreatable, the remaining 5% being water bodies. Note that figure 3.3 is a preliminary assessment that requires refinement, for example, urban areas have been shown as “untreatable fuel”. These areas will be removed from the final map when an assessment of bushfire prone areas within the Hobart FMA is completed.

The distinction between treatable and untreatable fuel was determined by considering the TASVEG flammability attributes and gives only a general indication of suitability. At an operational level the distinction between treatable and untreatable fuels will need to be determined in the field. It should be noted that fuels that are not considered treatable by large burns may be treatable by smaller planned burns and other methods of fuel reduction, particularly close to settlements and other assets at risk. These areas will be identified in the final Hobart Fire Protection Plan.

The untreatable portion (51% of the area) includes agricultural land. This is primarily because whilst agricultural land will burn, it is not generally targeted for fuel reduction burning as the risk can be seasonally variable and managed by other means. It is likely that the dryland agricultural land through the region does contain areas of grasslands that are treatable through burning, however current TASVEG mapping does not break the agricultural land mapping unit into different categories. Land use mapping may be incorporated into future risk analyses as data become available allowing refinement of this category.

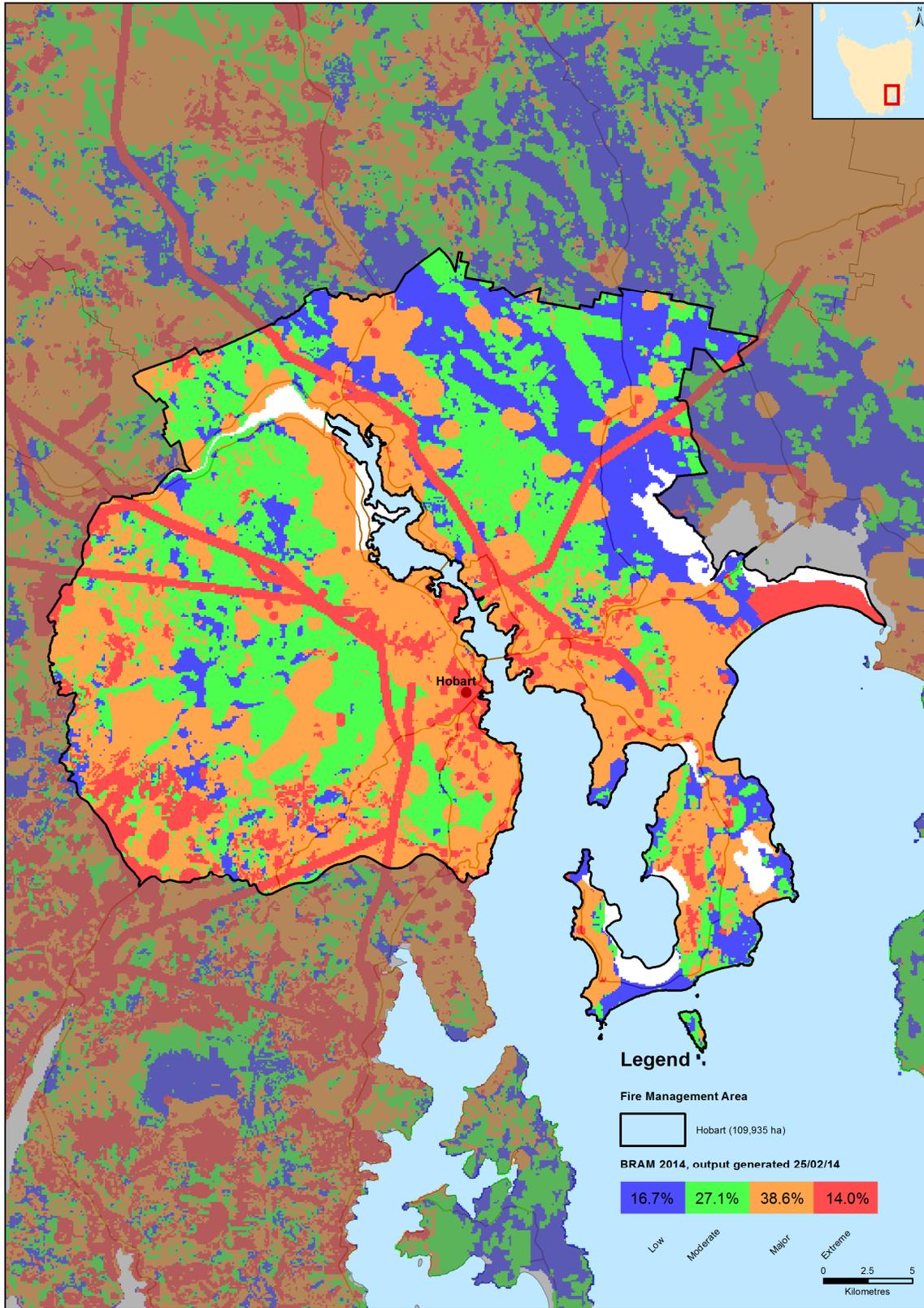


Figure 3.1: BRAM output for the Hobart FMAC

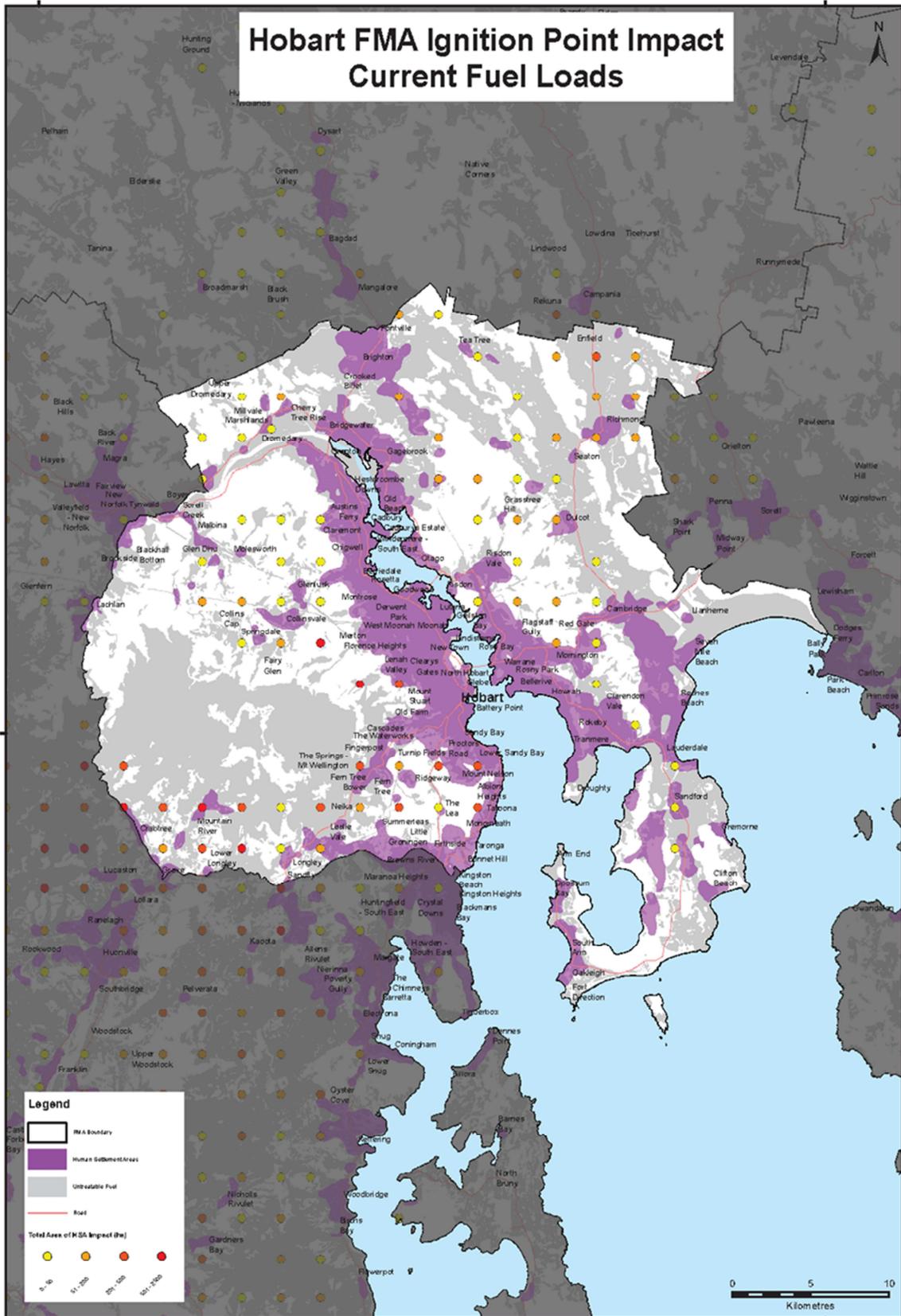


Figure 3.2: Preliminary analysis of potential ignition points that may impact on communities in the HFMA with areas (ha) of impact under current fuel loads, using the Phoenix Rapidfire simulation model

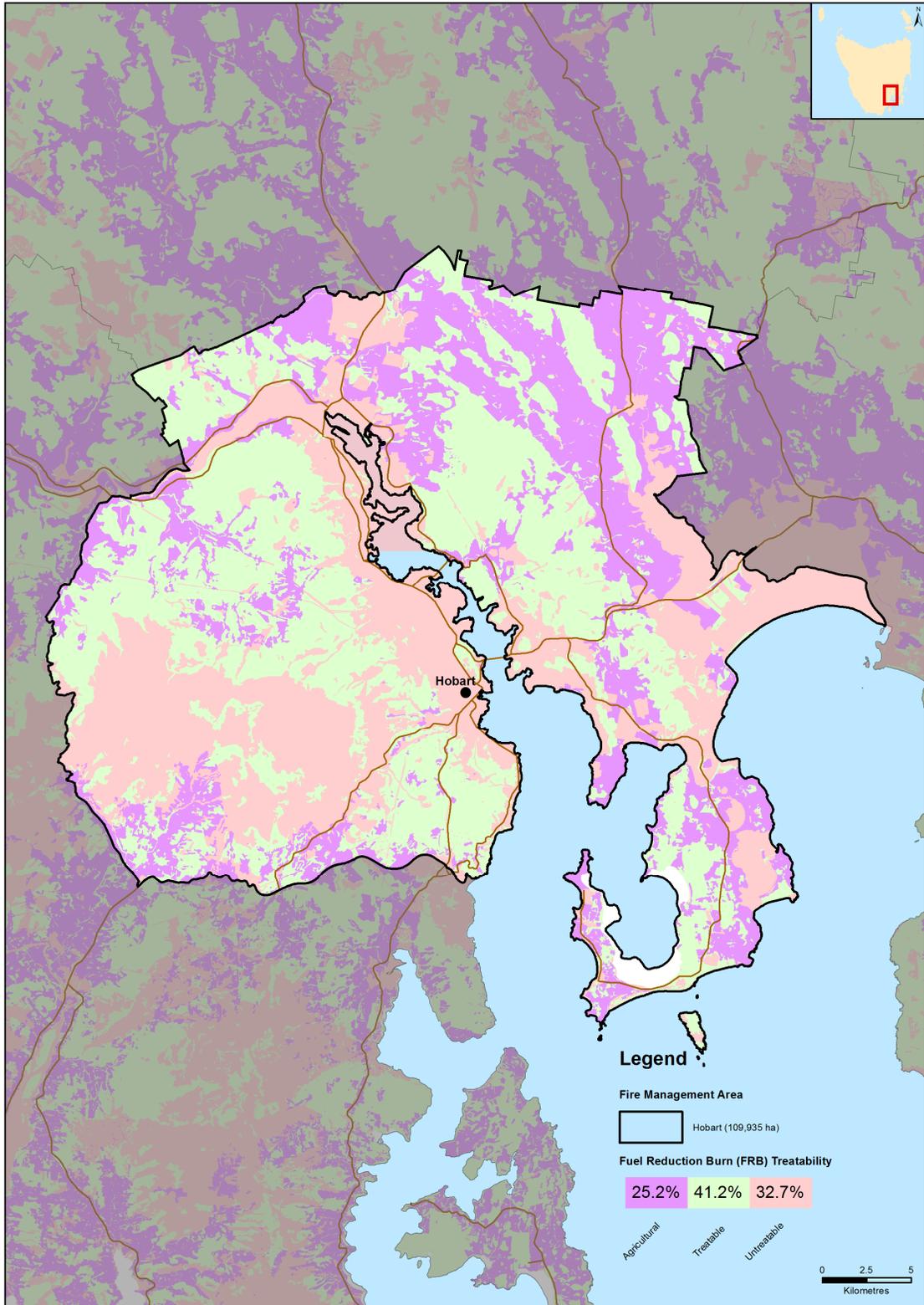


Figure 3.3: Preliminary analysis of treatability of fuels through fuel reduction burning in the HFMA

Chapter 4 Bushfire Risk Treatment

4.1 General Risk Reduction Methods

The following controls are currently in place across the Hobart FMA to assist in the strategic management of bushfire related risk:

- Legislative controls – including abatements, fire restrictions etc.
- Public education campaigns and the use of TFS and SFMC state-wide programs tailored to suit local needs; (e.g. Private land burning; Community Protection Planning; Bushfire Ready Neighbourhoods)
- State-wide arson prevention programs developed in conjunction with TAS Police and TFS;
- Setting of appropriate land subdivision and building standards in line with the Bushfire Prone Areas Code;
- Performance monitoring and reporting of FPP outcomes to the relevant Emergency Management Council and State Fire Management Council as required by the Tasmanian Emergency Management Plan and the Fire Service Act
- Bushfire management strategies developed and implemented by Hobart City Council, Clarence City Council, Wellington Park Management Trust, Department of Defence, Glenorchy City Council and the University of Tasmania.

The means of implementing the bushfire risk reduction strategies in section 1.3 are summarised as:

- Increasing the resistance of built and other assets to bushfire attack;
- Fuel management – Treatments include the reduction / modification of bushfire fuels through manual, chemical and prescribed burning methods;
- Ignition management - Treatments aim to reduce the occurrence of human induced ignitions in the landscape and reduce the risk of fires spreading out of control;
- Preparedness – Treatments focus on providing suitable access and water supply arrangements that will assist with fire fighting operations;
- Planning – Treatments relate to the development of plans that will improve the ability of firefighters and the community to respond to bushfire; and
- Community Engagement and education – Treatments seek to build relationships, raise awareness and change behaviours relating to the management of bushfire related risks within the community.

These have been grouped into 7 broad areas of action based on the type of asset at risk from bushfire and are summarised along with their current status in **Appendix 1**. The treatment strategy has been designed to set out a comprehensive framework for bushfire risk reduction. The Hobart FMAC is still gathering background information in order to make informed decisions on the actions it may recommend in future iterations of this plan.

Within the HFMA, the Parks and Wildlife Service, Tasmania Fire Service and Norske Skög have the capability to plan and carry out planned burns. Clarence and Hobart Councils also have this capability and both have active burning programs.

4.2 Treatment Selection and Priorities

The determination of priorities and potential treatment methods is based largely on the results produced by BRAM and Phoenix Rapidfire modelling, augmented with the knowledge and expertise

of the committee members. For this iteration of the plan, there have not been any systematic field investigations or fine-scale modelling. It is anticipated that future versions of this plan for the Hobart area will be based on a greater component of ground-truthing.

4.3 Community Assessment

Strategic assessment tools have been used to conduct a preliminary assessment across the Hobart Fire Management Area to identify areas of extensive bushland where relatively high intensity bushfires could occur and where, due to more rugged terrain, they are likely to be more difficult to control. Locations of these areas are shown on figures 4.1 to 4.4 in the following pages.

4.3.1 Potential burn areas that are relatively well understood to be high-risk

1. The Wellington Range, particularly the eastern slopes of kunanyi / Mount Wellington
2. The Meehan Range from Quoin Ridge to Lauderdale, particularly the Mount Rumney/Mount Canopus area
3. Mount Faulkner
4. Government Hills
5. Goat Hills
6. Mount Dromedary
7. The Mount Nelson/Tolmans Hill/The Lea areas
8. The Ridgeway and Summerleas Road areas
9. The Albion Heights and Bonnet Hill areas

These areas are shown on figures 4.1 to 4.4 in [blue boxes](#)

4.3.2 Potential burn areas requiring more detailed investigations

Communities within and bordering these areas are likely to be subjected to high intensity fires at some time in the future. Further analysis will be required to determine the appropriate bushfire risk reduction measures for individual communities.

- a. Molesworth/Collinsvale/Glenlusk area
- b. The south-eastern portion of the Mount Dromedary area
- c. Rokeby-Acton area
- d. Gathering Bush Hill north of Dulcot
- e. The Airport and immediate surrounds
- f. Summerleas Road
- g. Albion Heights west facing slope along the Southern Outlet
- h. Government Hills
- i. Cascade's ridgetop block above Huon Road running south to the Turnip Fields area.
- j. Pottery Road/Fossil Hill area (includes Cascade Brewery land)
- k. Gellibrand Drive area at Sandford
- l. Lachlan area

These areas are shown on figures 4.1 to 4.4 in [green boxes](#)

A number of communities already have specific plans in place, these are summarised in **Appendix 2**.

4.3.3 Priority list of potential burn areas in existing strategies and plans:

These burns have been included in existing plans that have either not been implemented or have only been partly implemented (see Appendix 2). They have been chosen on the basis that they will reduce high fuel loads close to urban areas and settlements and/or will reduce the risk of fires spreading from areas with a relatively high frequency ignitions, particularly where fire spread will be uphill. Specific areas identified in this table are shown on figures 4.1 to 4.4 in Roman Numerals

Location	Land Tenure	Reference in Existing Plans	Area	Map symbol
Northern slopes of Mt Faulkner west of Granton	Private	Fire Management Units F3, F4 and F5 in the Mount Faulkner Strategic Fire Management Plan	1,1225 ha	I
Lowes Ridge, Chigwell	Private	Fire Management Units F29, F31 and F32 in the Mount Faulkner Strategic Fire Management Plan	167 ha	II
Canopus Hill	Private	Fire Management Units M44, M45, M46, M52 and M54 in the Meehan Range Strategic Fire Management Plan	90 ha	III
Mount Rumney	Private	Fire Management Units M47, M48, M49, M50 and M58 in the Meehan Range Strategic Fire Management Plan	45 ha	IV
Guy Fawkes Hill	Private	Fire Management Units M68, M69, and M70 in the Meehan Range Strategic Fire Management Plan	135 ha	V
Goat Hills	Glenorchy Council and private	Fire Management Units G14, G15, G16, G17, G18, G19, G20, G21, G22, G23, G24, and G25 in the Goat Hills Fire Management Plan	110 ha	VI
Inglewood Road/Strickland Avenue	Cascade Brewery	Fire Management Unit WP34 in the Wellington Park Bushfire Management Strategy	18 ha	VII
Tolmans Hill	Private	Fire Management Units 8, 9 and 16 in the Ridgeway-Waterworks Fire Management Plan	30ha	VIII

Note that many these burns are on private property and landowner consent will be required for the burns and any associated preparation works.



Figure 4.1: Locations listed in this section; NW quadrant



Figure 4.2: Locations listed in this section; NE quadrant



Figures 4.3 Locations listed in this section; SW quadrant

4.4 Annual Works Programs

The annual program of works for several of the HFMAC member agencies is tabulated below. It includes works already planned by land management agencies and additional burns in key locations. Land managers and fire agencies are responsible for incorporating the works into their respective annual works programs and planning processes.

Scheduled management burn activity spring 2014 and autumn 2015:

Agency	Location	Approx. Area
Hobart City Council	Spring	
	Queens Domain	6ha
	Bicentennial Park (3 locations)	17ha
	Knocklofty-McRobies Gully (2 locations)	19.8ha
	Wellington Park-Strickland Ave	8ha
	Autumn	
	Queens Domain (2 locations)	4ha
	Bicentennial Park	2.1ha
Knocklofty-McRobies Gully (2 locations)		9.3ha
	Ridgeway Park (2 locations)	22.8ha
Clarence City Council	TBA	
Glenorchy City Council /TFS	TBA	
Parks and Wildlife Service	Olinda Grove college campus (Spring)	22ha
	Truganini Reserve (Autumn)	19ha

Fire trail works

- HCC: Porter Hill to Taroona

Fuel reduced area/firebreak works

- Annual programs:
 - HCC annual fire trail inspections and firebreak program
 - CCC fire trail and firebreak works
 - PWS works programs
 - GCC fire break and fire trail works
- New works [to be detailed in future versions of this plan]

Community education

- Community forums have been conducted at Mt Nelson, Lenah Valley, South Hobart-Waterworks Valley, Molesworth, and Lachlan

4.5 Implementation

When the bushfire risk reduction measures identified in this plan are implemented there are a number of issues that need to be considered by the responsible agency including environmental and social impacts, risk assessments, coordination with other management activities, setting up any required monitoring. Any planned burns will require burn plans and consideration of smoke impacts on health and viticulture.

5 Monitoring and Review

Monitoring and review processes are required to ensure that the plan remains current and valid.

5.1 Review

Once completed, this plan will be subject to an annual review of at least chapters 4 and 5, and a comprehensive review every five (5) years from the date of approval of the entire plan and appendices, unless significant circumstances exist to warrant earlier review. This would include:

- Changes to the FPP area, organisational responsibilities or legislation;
- Changes to the bushfire risk in the area; or
- Following a major fire event.

5.2 Monitoring and Reporting

Progression towards completion of the treatments will be monitored and reviewed at least every six (6) months.

6 References

- Australian Standard 3959 - 2009 *Construction of Buildings in Bushfire-prone Areas*. Standards Australia, Sydney.
- Hines F., Tolhurst K. G., Wilson A. A. G and McCarthy G. J. (2010) *Overall Fuel Hazard Assessment Guide 4th Edition*. Fire Research Report 82, Department of Sustainability and Environment. Melbourne.
- Parks and Wildlife Service (unpublished). Bushfire Risk Assessment Model Project Business Process Model (2008). Department of Primary Industries, Parks, Water and Environment, Hobart.
- Parks and Wildlife Service (unpublished). Tasmanian Bushfire Risk User Guide (2010). Department of Primary Industries, Parks, Water and Environment, Hobart.
- Parks and Wildlife Service (unpublished). Tasmanian Bushfire Risk Assessment Model (2013). Department of Primary Industries, Parks, Water and Environment, Hobart.
- Planning Directive No 5, Bushfire Prone Areas Code. Tasmanian Planning Commission, Hobart.
- National Emergency Risk Assessment Guidelines. National Emergency Management Committee (2010), Tasmanian State Emergency Service, Hobart

7 Appendices

Appendix 1 – Bushfire Risk Reduction Strategy Summary

Appendix 2 – Community Specific and General Bushfire Management Plans already in place

Appendix 3 - BRAM

Appendix 4 – NERAG risk assessment approach

Appendix 5 – Building Code of Australia building classes

Appendix 1

Bushfire Risk Reduction Strategy for Hobart FMA

To cover areas within the HFMA classified as **Bushfire Prone Areas** in the Tasmanian Bushfire Prone Areas Code.

Note that this table is incomplete but has been included to provide an indication of the strategy being considered by the Hobart FMAC. The actions and responsibility sections have been left blank as late completion of the first draft has not allowed the Committee time to discuss and agree on them.

STRATEGY	IMPLEMENTATION	CURRENT STATUS	ACTIONS	RESPONSIBILITY
1. Reduce incidence and Severity of Bushfires				
a) Reduce Ignitions (bushfire prevention)	<ul style="list-style-type: none"> Assess main causes (malicious, escapes, lightning). Identify ignition hotspots Encourage public to report arsonists Reduce accidental ignitions 	Adequate TFS and other agency data to analyse Some programs to reduce ignitions in place – need to identify	a)	•
b) Reduce risk of fires that do start spreading	<ul style="list-style-type: none"> Establish and maintain a strategic network of emergency vehicle access routes on public and private land Improve response by fire management agencies including aerial attack. Provide water supplies for fire fighting in more remote bushland areas. 	Good trail network in some reserves but poor in others, trails on private land generally poorly known.	a)	•

STRATEGY	IMPLEMENTATION	CURRENT STATUS	ACTIONS	RESPONSIBILITY
c) Reduce rate of spread and intensity of bushfires	General hazard reduction in bushland	Established hazard management programs in Hobart and Clarence Council reserves, Wellington Park and on Defence land and PWS reserves Situation in reserves managed by other Councils needs to be determined. Some major planned burn programs have not been implemented – Mt Faulkner, Meehan Range, Goat Hills Some bushland areas not covered by planned burn strategies.	a)	•
2. Bushfire risk to Persons				
a) Reduce bushfire risk to persons	Improve awareness – recognise risks, what to do in different types of bushfire emergency	Fairly well covered in TFS brochures and media campaigns. E.g. prepare and stay or leave early	a)	•
	• Ensure safe evacuation in an emergency	Good information provided during emergencies. Not much planning done? Neighbourhood safer places provided in some locations	a)	•
	• Close parks and reserves during high bushfire risk weather	Being implemented in Wellington Park and HCC reserves	a)	•
3. Reduce Bushfire Risk to Assets				

STRATEGY	IMPLEMENTATION	CURRENT STATUS	ACTIONS	RESPONSIBILITY
a) Reduce bushfire risk to residential and other class 1 to 9 buildings	Ensure all new class 1 to 9 buildings in bushfire prone areas are constructed to AS3959 -2009	Will be mandatory in all interim and new planning schemes. Being adopted by all Councils in accordance with the bushfire prone areas code. Bushfire Code needs to be revised so it is based on an FDI of 100 for the Hobart FMA rather than FDI50	a)	•
	Retrofit older houses and other important buildings to AS3959 – 2009	Private dwellings - ? Commercial - ? Public - ?	a)	•
	Building maintenance to reduce risk of ignition	Private dwellings – Some general information available in TFS brochures, DVDs etc. Commercial - ? Public - ?	a)	•
	Hazard Management Area (HMA) establishment and maintenance around all class 1 to 9 buildings in bushfire prone areas	Mandatory for all new buildings in BPAs but unlikely to be checked after construction. Not mandatory for older buildings. Some general information in TFS brochures and on DVDs	a)	•

STRATEGY	IMPLEMENTATION	CURRENT STATUS	ACTIONS	RESPONSIBILITY
	Establish and maintain fuel modified buffer zones in bushland bordering lots with buildings where there is insufficient space on the lot for an adequate Hazard Management Area.	Has generally been assessed and implemented on most Hobart and Clarence Council reserves, also on UTAS and Defence Property. Situation in reserves managed by other councils and PWS needs to be determined Some implementation on privately owned bush blocks either voluntarily or via hazard abatement notices.	a)	•
	Establish and maintain fire trails and vehicle accessible routes through FMBZs on public land where terrain allows	Has generally been assessed and implemented on most Hobart and Clarence Council reserves, also on UTAS and Defence Property. Situation in reserves managed by other councils and PWS needs to be determined	a)	•
4. Reduce bushfire risk to critical infrastructure				
a) Reduce bushfire risk to electricity supply assets	<ul style="list-style-type: none"> • Transmission lines • Transformers • Substations 	Some areas known to be in good condition, but overall knowledge is patchy.	a)	•

STRATEGY	IMPLEMENTATION	CURRENT STATUS	ACTIONS	RESPONSIBILITY
b) Reduce bushfire risk to communication assets, particularly those used by the emergency services	<ul style="list-style-type: none"> • Radio • Telephone • Mobile phone • Television • Hydro 	Known sites: Kunanyi / Mount Wellington Goat Hills Mount Faulkner Chimney Pot Hill Mt Nelson Mount Rumney Guy Fawkes Hill Sandford Radio monitoring station on northern Meehan Range	a)	•
c) Reduce bushfire risk to drinking water supply	<ul style="list-style-type: none"> • Pumps (including power supply) • treatment works (note presence of hazardous chemicals) • 	To be determined	a)	•
d) Reduce bushfire risk to sewerage system and sewage treatment infrastructure	<ul style="list-style-type: none"> • Pumps (including power supply) • treatment works (note presence of hazardous chemicals) 	To be determined	a)	•

STRATEGY	IMPLEMENTATION	CURRENT STATUS	ACTIONS	RESPONSIBILITY
e) Reduce Bushfire risk to drinking water catchments and water storages	<ul style="list-style-type: none"> Protect catchment areas and open storage reservoirs from bushfires 	<p>Major catchment areas on the Wellington Range.</p> <p>Open storages in Ridgeway Reserve, Wellington Park, Risdon Brook Reserve and Flagstaff Gully.</p>	a)	•
f) Reduce bushfire risk to key transport infrastructure	Airport ??	To be determined	b)	•
5. Reduce bushfire risk to cultural heritage values				
	Identification of cultural values, and assessment for exposure/susceptibility to damage or loss from fire	To commence	a)	•
6. Reduce bushfire risk to natural heritage values				
a) Reduce bushfire risk to biodiversity, including threatened species and plant communities.	Fire dependant plant communities require burning in accordance with their optimal fire regimes. (note: lack of fire is also a risk to biodiversity) Pre and post burn weed control required	Some areas under active management, other areas poorly known	a)	•
b) Reduce bushfire risk to other (non biological) values	Values that require protection include: geoheritage and scenic values.		a)	•

STRATEGY	IMPLEMENTATION	CURRENT STATUS	ACTIONS	RESPONSIBILITY
7. Reduce bushfire risk to primary production				
a)	<ul style="list-style-type: none"> • livestock • fencing • aquaculture • horticulture • viticulture • apiculture? 	To be determined	b)	<ul style="list-style-type: none"> •

Appendix 2

Community Specific and General Bushfire Management Plans Already in Place

Town/Area	Current Plans	Status
Bonnet Hill	TFS Response & Community Protection plans	Live
Collinsvale including Collins Cap, Glenlusk, Fairy Glen and Springdale	TFS Response & Community Protection plans	Live
Dulcot	TFS Response & Community Protection plans	Live
Fern Tree	TFS Response & Community Protection plans	Live
Lachlan area	TFS Response & Community Protection plans	Live
Molesworth Area - including Malbina and Sorell Creek	TFS Response & Community Protection plans	Live
Mount Nelson/Tolmans Hill	TFS Response & Community Protection plans	Live
Mount Rumney/Mount Canopus	TFS Response & Community Protection plans	Live
Neika/Leslie Vale	TFS Response & Community Protection plans	Live
Ridgeway	TFS Response & Community Protection plans	Live
South Hobart	TFS Response & Community Protection plans	Live
Summerleas	TFS Response & Community Protection plans	Live
Taroona area	TFS Response & Community Protection plans	Live
The Lea	TFS Response & Community Protection plans	Live

Explanation of plans:

1. Community Bushfire Response Plan:

- The purpose of a Community Bushfire Response Plan, (CBRP) is for emergency managers to better protect communities and their assets during bushfire emergencies.

2. Community Bushfire Protection Plan

- The purpose of a Community Bushfire Protection Plan, (CBPP) is for community members to be provided with local information to assist with bushfire preparation and survival.

3. Community Bushfire Mitigation Plan

- The purpose of a Community Bushfire Mitigation Plan is to provide guidance regarding bushfire fuel management; to increase community bushfire safety and provide protection to important community assets.

General Bushfire Management Plans Already in Place

PLAN NAME	TENURE	DATE	STATUS	AREA	NOTES
Wellington Park Fire Management Strategy	Wellington Park, Glenorchy City Council, Hobart City Council, private	2006	Implemented	16,090 ha	Includes some private and Council land adjoining Wellington Park. Will be revised in 2015.
PWS controlled land within the HFMA	PWS Southern Region Strategic Fire Management Plan				
Mount Faulkner Region Strategic Fire Management Plan	Mixed private and public	2005	Partly Implemented	5830 ha	Some fire trail and waterhole upgrading, planned burns not implemented
Mehan Range Region Fire Management Strategy	Private and public	2007	Partly implemented	5359 ha	Some fire trail upgrading completed, one planned burn near Risdon Vale
Risdon Brook Dam Catchment and Adjoining Areas Fire Management Plan	Mixed private and public	2001	Partly implemented	3,400 ha	Recent large burn on Mount Direction and some fire trail repairs
Pontville Small Arms Range Complex Bushfire Management Plan	Department of Defence	2012	Implemented	515 ha	
Goat Hills Fire Management Plan	Mixed private and Glenorchy City Council	2006	Partly implemented	490 ha	Maintenance of fire trails - planned burns not implemented
Ridgeway Park/Waterworks Reserve Fire Management Plan	Hobart City Council	2003	Implemented	480 ha	

PLAN NAME	TENURE	DATE	STATUS	AREA	NOTES
Knocklofty Reserve/McRobies Gully Fire Management	Hobart City Council	2005	Implemented	403 ha	
Bicentennial Park/Porter Hill Reserve Fire Management Plan	Hobart City Council	2014	Implementation commencing	230 ha	Includes a number of nearby small reserves
Pilchers Hill Bushfire Management Plan	Clarence City Council	2011	Implemented	166 ha	
Queens Domain Fire Management Plan	Hobart City Council	2008	Implemented	164 ha	
Lauderdale Wetlands Reserve Bushfire Management Plan	Clarence City Council	2011	Implemented	122 ha	
Ross Common Bushfire Management Plan	Clarence City Council	2011	Implemented	114 ha	
Fort Direction Ammunition Storage Facility Bushfire Management Plan	Department of Defence	2013	Implemented	107 ha	
University Reserve, Sandy Bay Campus Fire Management Plan (draft)	University of Tasmania	2010	Partly implemented	90 ha	Fire breaks and some fire trails maintained, planned burns not implemented
Waverley Flora Park Bushfire Management Plan	Clarence City Council	2011	Implemented	79 ha	
Mortimer Bay Coastal Reserve Bushfire Management Plan	Clarence City Council	2011	Implemented	55 ha	

PLAN NAME	TENURE	DATE	STATUS	AREA	NOTES
Gordons Hill State Recreation Area	Parks and Wildlife Service	2011	Partly Implemented	50 ha	Clarence Council plan for northern section implemented before transfer to PWS
Natone Hill Bushfire Management Plan	Clarence City Council	2011	Implemented	43 ha	
Milford Bushfire Management Plan	Private	2008	Partly implemented	40 ha	One planned burn completed
Bellerive-Howrah Foreshore Reserves Bushfire Management Plan	Clarence City Council	2011	Implemented	27 ha	
Roches Beach Reserve Bushfire Management Plan	Clarence City Council	2011	Implemented	24 ha	
Glebe Hill Reserve, Howrah, Bushfire Management Plan	Clarence City Council	2012	Implemented	22 ha	
Rosny Hill Bushfire Management Plan	Clarence City Council	2011	Implemented	21 ha	
7 Yamada Place Mornington (Knopwood Hill)	Private	2011	Unknown	21 ha	
Bedlam Walls Bushfire Management Plan	Clarence City Council	2011	Implemented	15 ha	
Rosny Foreshore Bushfire Management Plan	Clarence City Council	2011	Implemented	15 ha	
Goodwins Road Reserve Bushfire Management Plan	Clarence City Council	2011	Implemented	14 ha	

PLAN NAME	TENURE	DATE	STATUS	AREA	NOTES
Seven Mile Beach Reserve Bushfire Management Plan	Clarence City Council	2011	Implemented	11 ha	
Kuynah Reserve Bushfire Management Plan	Clarence City Council	2011	Implemented	8 ha	
Lauderdale Foreshore Bushfire Management Plan	Clarence City Council	2011	Implemented	8 ha	
Barossa Catchment/Kalang Avenue land, Lenah Valley	Hobart City Council	2006	Partly implemented	33 ha	Partly covered by the Wellington Park Fire Management Strategy

Appendix 3

The Bushfire Risk Assessment Model (BRAM)

The Bushfire Risk Assessment Model (BRAM) is a software product that was developed by the Fire Management Section of the Parks and Wildlife Service (Department of Primary Industries, Parks, Water and Environment). The aim of the model is to identify bush fire risk at a strategic level as well as to identify the elements driving actual bush fire risk.

A stakeholder group was set up to oversee the process. Stakeholders involved in developing the process included:

- Parks and Wildlife Service;
- Tasmania Fire Service;
- Forestry Tasmania;
- Tasmanian Farmers and Graziers Association;
- State Emergency Service;
- Forest Industries Association of Tasmania;
- Local Government Association of Tasmania;
- Resource management and conservation , DPIPW;
- NRM ;
- Tasmanian Aboriginal Land and Sea Council;

Additional working groups were set up to advise on specialist areas such as values at risk, suppression capabilities, ignition potential, and fire behaviour.

The process is aligned to the Australian/New Zealand Standard AS/NZS 4360:2004 Australian Standard Risk Management and the updated standard AS/NZS ISO 31000:2009 *Risk management – Principles and guidelines*. Risk is defined as the “effect of uncertainty on objectives” with a focus of the effect on the objectives

2.2.1.1 The process

The model is built in a geographic information system that utilizes various spatial orientated data, fire behaviour and fuel accumulation models and climate records. The data and values were developed by consensus of a range of stakeholders

The process applies the same set of assessment rules to the data contained in the model, thus it can be applied across the state. The process is tenure blind

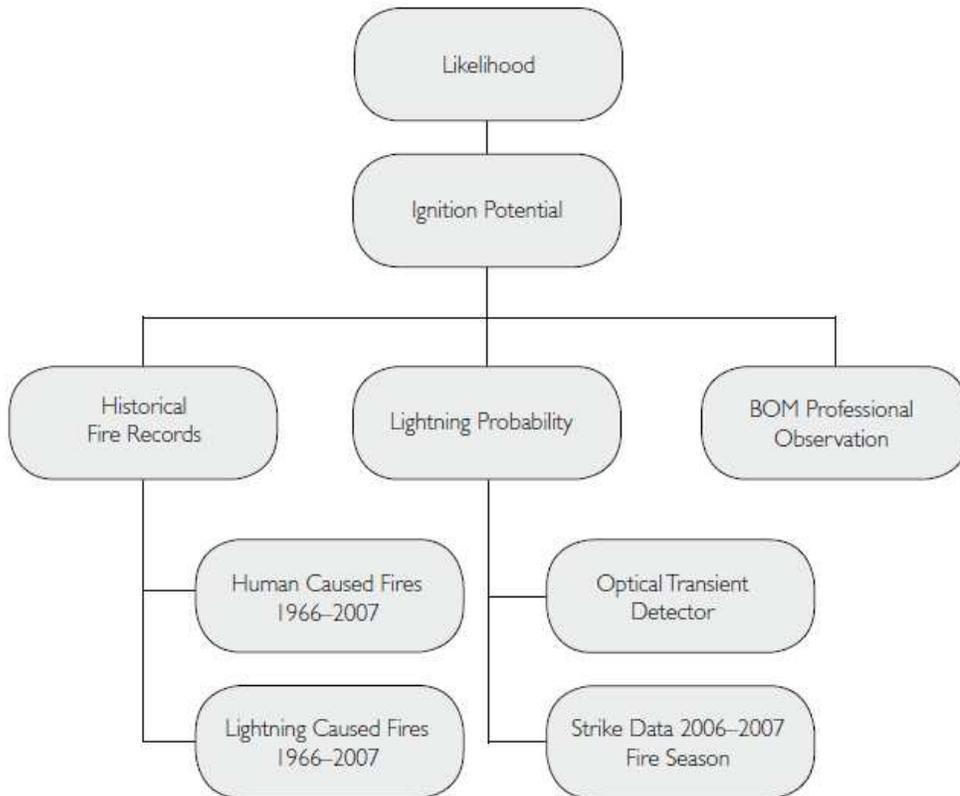
The BRAM identifies the **likelihood and consequence of a fire** at a particular point. The risk is determined through the use of a qualitative risk matrix incorporating likelihood and values at risk (consequences). The process identifies the actual risk at that point not the perceived risk. The output is in the form of layers identifying the likelihood, values at risk and actual risk

The model uses 4 major areas to calculate risk likelihood of an area for:

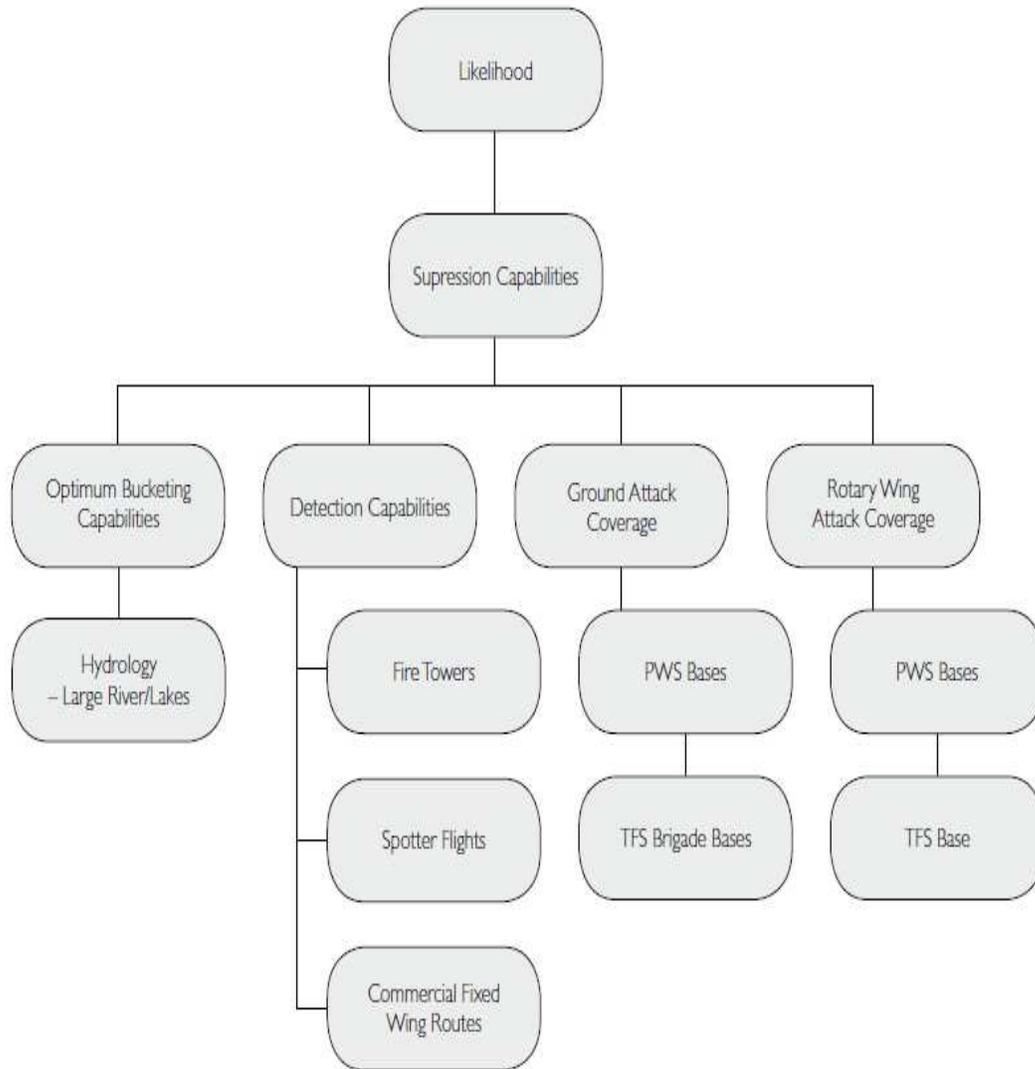
- Fire behaviour potential - the manner in which fuel ignites, flame develops, and fire spreads and exhibits other related phenomena (likelihood).
- Ignition potential - the probability or chance of fire starting as determined by the presence of causative agents (likelihood).

- Suppression capability - the factors and limitations that are related to the ability to detect, respond to, and contain a bushfire (likelihood).
- Values at risk - a specific or collective set of natural resources and man-made improvements and/or developments that have measurable or intrinsic worth, and which could potentially be destroyed or otherwise altered by fire in any given area (consequence)

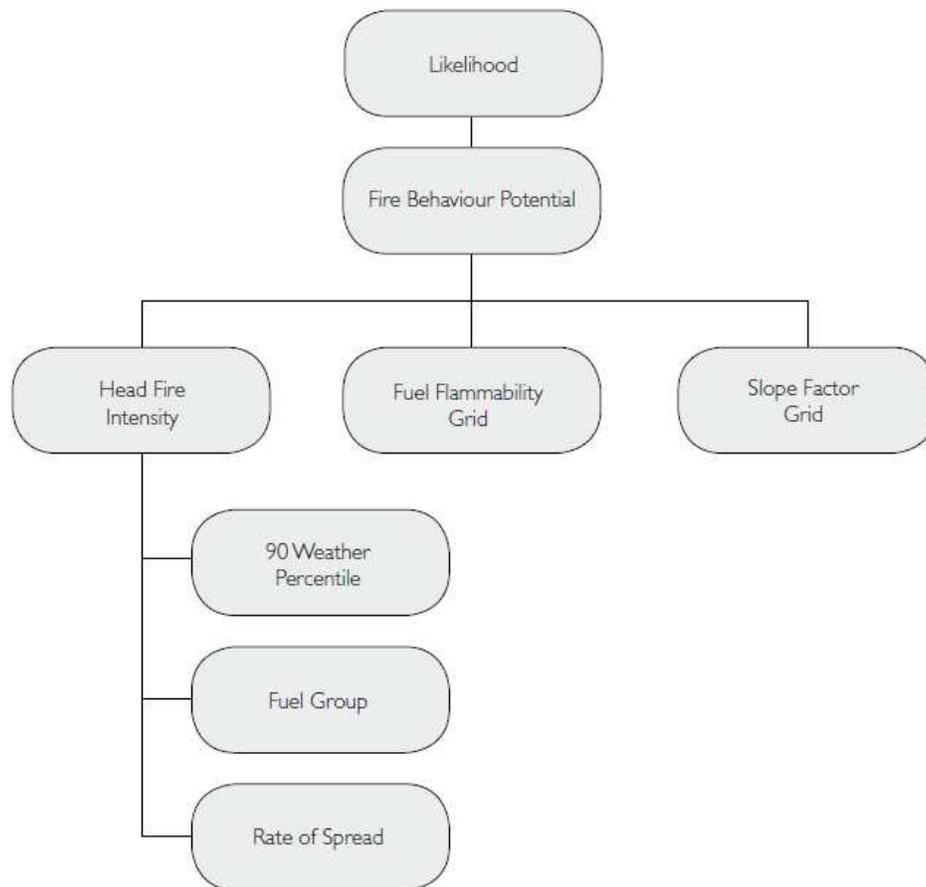
2.2.1.2 Ignition potential



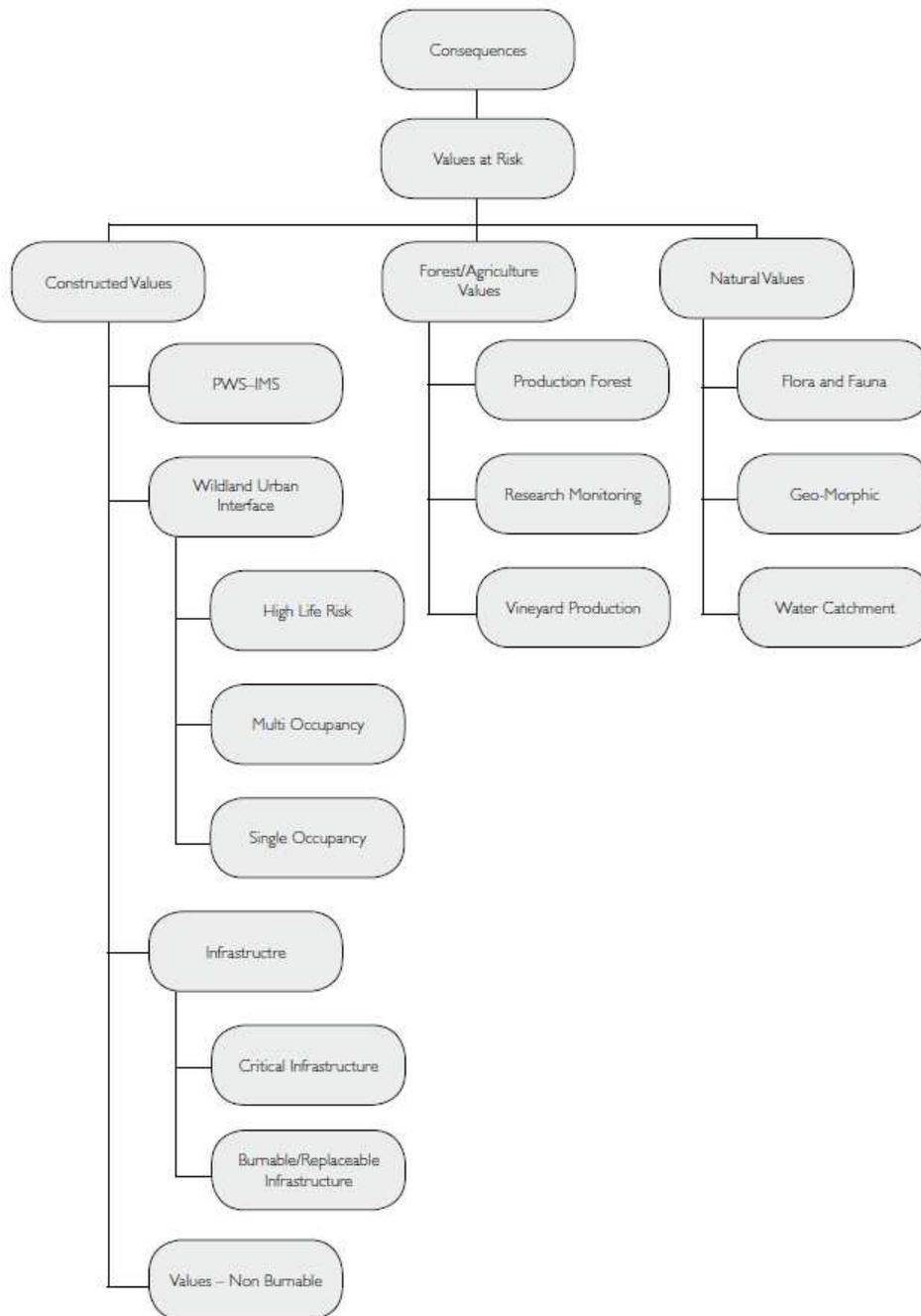
2.2.1.3 *Suppression capabilities*



2.2.1.4 *Fire Behaviour Potential*



2.2.1.5 Values at risk



2.2.1.6 Limitations of the process

- BRAM **does not** incorporate the likelihood and consequence **at the same point** from a fire occurring in an adjacent area.
- BRAM does not display the risks posed by an area adjacent to a particular point.

- Mitigation works undertaken on adjacent areas do not change the risk at a particular point.
- The process is based on available data, there are significant gaps in data eg fire history on private lands,
- Untested assumptions – may over/underestimate risk

Appendix 4

NERAG Risk Assessment Approach

(Derived from the National Emergency Management Committee (2010), *National Emergency Risk Assessment Guidelines*, Tasmanian State Emergency Service, Hobart)

The NERAG provide a methodology to assess risks from emergency events and are principally concerned with risk assessment. The NERAG methodology was utilised in development of the BRAM to develop the final risk profile

The guidelines are not intended to address the entire risk management framework or the risk management process as outlined in AS/NZS ISO 31000:2009. However, because they focus on the assessment of risks from emergency events, they ultimately direct the management of emergency risks in line with the international standards for risk management.

The guidelines aim to provide a risk assessment methodology that:

- enables focus on risks in small (e.g. municipal) or large (e.g. regional and/or state and/or national) areas
- is useable for both risk 'from' and risk 'to' (e.g. risk from bushfire, risk to infrastructure from all or specific sources of risk)
- uses a scenario-based approach
- samples risk across a range of credible consequence levels
- identifies current risk under existing controls and residual risk assuming implementation of additional controls or control improvements
- provides base-line qualitative risk assessments and triggers for more detailed analysis
- allows risk evaluation at varying levels of confidence
- Provides outputs that are comparable, which rate risk and suggests means to reduce risk.

Risk analysis is the element in the process through which the level of risk and its nature is determined and understood. Information from risk analysis is critical to rank the seriousness of risks and to help decide whether risks need to be treated or not. In this phase, control opportunities are also identified. The analysis involves consideration of possible consequences, the likelihood that those consequences may occur (including the factors that affect the consequences), and any existing control that tends to reduce risks. During this phase the level of confidence in the analysis is assessed by considering factors such as the divergence of opinion, level of expertise, uncertainty, quality, quantity and relevance of data and information, and limitations on modelling. At the conclusion of this step, all identified risks are categorised into risk levels and given a risk rating, and statements concerning existing controls and their adequacy are made.

NERAG takes an all hazards approach and provides a method that is suitable for considering other sources of risk beside fire

2.2.1.7 Consequence table

Consequence level	People	Environment	Economy	Public Administration	Social Setting	Infrastructure
Catastrophic	Widespread multiple loss of life(mortality > 1 in ten thousand), Health systems unable to cope, Displacement of people beyond a ability to cope	Widespread severe impairment or loss of ecosystem functions across species and landscapes, irrecoverable environmental damage	Unrecoverable financial loss > 3% of the government sector's revenues, asset destruction across industry sectors leading to widespread failures and loss of employment	Governing body unable to manage the event, disordered public administration without effective functioning, public unrest, media coverage beyond region or jurisdiction	Community unable to support itself, widespread loss of objects of cultural significance, impacts beyond emotional and psychological capacity in all parts of the community	Long term failure of significant infrastructure and service delivery affecting all parts of the community, ongoing external support at large scale required
Major	Multiple loss of life (mortality > 1 in One hundred Thousand), Health system over stressed, Large numbers of displaced people(more than 24 hours)	Serious impairment or loss of ecosystem functions affecting many species or landscapes, progressive environmental damage	Financial loss 1-3% of the governments sector's revenues requiring major changes in business strategy to (partly) cover loss, significant disruptions across industry sectors leading to multiple business failures and loss of employment	Governing Body absorbed with managing the event, public administration struggles to provide merely critical services, loss of public confidence in governance, media coverage beyond region jurisdiction	Reduces quality of life within the community, significant loss or damage to objects of cultural significance, impacts beyond emotional and psychological capacity in large parts of the community	Mid- to long term failure of significant infrastructure and service delivery affecting large parts of the community, initial external support required
Moderate	Isolated cases of loss of life (mortality > 1 in one million), Health system operating at maximum capacity, isolated cases of displacement of people(less than 24 hours)	Isolated but significant cases of impairment or loss of ecosystem functions, intensive efforts for recovery required	Financial loss 0.3 – 1% of the governments sector's revenue requiring adjustments to business strategy to cover loss, disruptions to selected industry sectors leading to isolated cases of business failures and multiple loss of employment	Governing body manages the event with considerable diversion from policy, public administration functions limited by focus on critical services, widespread public protests, media coverage within region or jurisdiction.	Ongoing reduced services within community, permanent damage to objects of cultural significance, impacts beyond emotional and psychological capacity in some parts of the community	Mid-term failure of(significant) infrastructure and service delivery affecting some parts of the community, widespread inconveniences
Minor	Isolated cases of serious injury, health system operating within Normal parameters	Isolated cases of environmental damage, one off recovery efforts required	Financial loss 0.1-0.3% of the governments sector's revenues requiring activation of reserves to cover loss, disruptions at business level leading to isolated cases of loss of unemployment	Governing body manages the event under emergency regime, Public administration functions with some disturbances, isolated expressions of public concern, media coverage within region or jurisdiction	Isolated and temporary cases of reduced services within the community, repairable damage to objects of cultural significance, impacts within emotional and psychological capacity of the community	Isolated cases of short- to mid-term failure of infrastructure and service delivery. Localised inconveniences
Insignificant	Near misses or minor injuries, no reliance on health system	Near missis or incidents without environmental damage , no recovery efforts required	Financial loss , 0.1% of the governments sector's revenues to be managed within standard financials provisions, inconsequential disruptions at business level	Governing body manages the event within normal parameters, public administration functions without disturbances, public confidence in governance, no media attention	Inconsequential short-term reduction of services, no damages to objects of cultural significance, no adverse emotional and psychological impacts	Inconsequential short-term failure of infrastructure and service delivery, no disruption to the public services

2.2.1.8 Impact Category Definitions

Impact Category Definitions	
People	<p>Relates to the direct impacts of the emergency on the physical health of people/ individuals and emergency services(i.e. health systems) ability to manage</p> <p>Mortality defined as the ration of deaths in a an area of the population to the population of that area; expressed as per 1000 per years</p>
Environment	Relates to the impacts of the emergency and its effects on the ecosystem of the area, including fauna and flora
Economy	Relates to the economic impacts of the emergency on the governing body as reported in the annual operating statement for the relevant jurisdiction, and industry sectors as defined by the Australian Bureau of statistics
Public Administration	Relates to the impacts of the emergency on the governing body's ability to govern
Social setting	Relates to the impacts of the emergency on society and its social fabric, including its cultural heritage, resilience of community
Infrastructure	<p>Relates to the impacts of the emergency on the areas infrastructure/ lifelines/utilities and its ability to service the community</p> <p>Long term failure = repairs will take longer than 6 months</p> <p>Mid-to long term failure = repairs may be undertaken in 3 to 6 months</p> <p>Mid-term failure = repairs may be undertaken in 3 to 6 months</p> <p>Short to mid term failure = repairs may be undertaken in 1 week to 3 months</p> <p>Short-term failure = repairs may be undertaken in less than 1 week</p>

2.2.1.9 Likelihood table

Likelihood level	Frequency	Average Recurrence Interval	Annual Exceedance probability
Almost certain	One of more per year	< 3 years	.03
Likely	Once per 10 years	3 – 30 years	0.031 – 0.3
Possible	Once per one hundred years	31- 300 years	0.0031 – 0.03
unlikely	One per thousand years	301 – 3,000 years	0.00031 – 0.003
Rare	One per ten thousand years	3,001 – 30,000 years'	0.000031 – 0.0003
Very Rare	Once per hundred thousand years	30,001 - 300,000 years	0.0000031 – 0.0003
Almost Incredible	Less than one per million years	>300,000 years	<0.0000031

2.2.1.10 Qualitative risk matrix

The qualitative risk matrix combines a level of consequence with a level of likelihood to determine a level of risk. The risk level, together with the confidence in the overall assessment process and other factors, will determine the need for detailed analysis and inform the treatment of risks

Likelihood level	Consequence level				
	Insignificant	Minor	Moderate	Major	Catastrophic
Almost certain	Medium	Medium	High	Extreme	Extreme
Likely	Low	Medium	High	High	Extreme
Possible	Low	Low	Medium	High	High
Unlikely	Low	Low	Medium	Medium	High
Rare	Low	Low	Low	Medium	Medium
Very Rare	Low	Low	Low	Low	Medium
Almost incredible	Low	Low	Low	Low	low

Appendix 5

National Construction Code building classes

Classification Summary of Buildings and Structures as defined in the Building Code of Australia

CLASSES OF BUILDING		
Class 1	Class 1a	A single dwelling being a detached house, or one or more attached dwellings, each being a building, seperated by a <i>fire-resisting</i> wall, including a row house, terrace house, town house or villa unit.
	Class 1b	A boarding house, guest house, hostel or the like with a total area of all floors not exceeding 300m ² , and where not more than 12 reside, and is not located above or below another dwelling or another Class of bulding other than a private garage.
Class 2	A building containing 2 or more sole-occupancy units each being a separate dwelling.	
Class 3	A residential building, other than a Class 1 or 2 building, which is a common place of long term or transient living for a number of unrelated persons. <i>Example: boarding-house, hostel, backpackers accomodation or residential part of a hotel, motel, school or detention centre.</i>	
Class 4	A dwelling in a building that is Class 5, 6, 7, 8 or 9 if it is the only dwelling in the building.	
Class 5	An office building used for professional or commercial purposes, excluding buildings of Class 6, 7, 8 or 9.	
Class 6	A shop or other building for the sale of goods by retail or the supply of services direct to the public. <i>Example: café, restaurant, kiosk, hairdressers, showroom or service station.</i>	
Class 7	Class 7a	A building which is a carpark.
	Class 7b	A building which is for storage or display of goods or produce for sale by wholesale.
Class 8	A laboratory, or a building in which a handicraft or process for the production, assembling, altering, repairing, packing, finishing, or cleaning of goods or produce is carried on for trade, sale or gain.	
Class 9	A building of a public nature -	
	Class 9a	A health care building, including those parts of the building set aside as a laboratory.
	Class 9b	An assembly building, including a trade workshop, laboratory or the like, in a primary or secondary school, but excluding any other parts of the building that are of another class.

	Class 9c	An aged care building.
Class 10	A non habitable building or structure -	
	Class 10a	A private garage, carport, shed or the like.
	Class 10b	A structure being a fence, mast, antenna, retaining or free standing wall, swimming pool or the like.