



BUSHFIRE MANAGEMENT STRATEGY 2022

A PLAN FOR THE FUTURE



City of **HOBART**

Acknowledgment of Country

The City of Hobart acknowledges and pays respect to the Tasmanian Aboriginal Community, past and present, as the traditional and original owners, and continuing custodians of this land.

Prior to European colonisation, Aboriginal people actively used fire as a sophisticated tool to continually manage and modify the landscape. A detailed knowledge of the patterns of burning and fire regimes applied by Aboriginal people is incomplete, however, there is good evidence that the patterns of vegetation observed in the landscape today are strongly influenced by past Aboriginal burning.

The broad patterns of vegetation in the Tasmanian landscape shaped by Aboriginal fire regimes over thousands of years are still significant to Aboriginal people.

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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 houses, infrastructure, agriculture, production forests, industry, environmental and heritage sites.
Asset Protection Zone (APZ)	An area adjacent to or near Asset Zones, the primary management purpose of which is to protect human life, property and highly-valued assets and values. Treatment can include intensive fuel reduction, manipulation of fuel moisture, construction and/or maintenance of the asset to reduce the risk of ignition, or response plans. For the City of Hobart the three primary treatments of APZs are prescribed burning, the creation and maintenance of fuel breaks and mechanical thinning of vegetation.
Asset Zone (AZ)	The geographical extent of an asset.
Bushfire	Unplanned vegetation fire. A generic term that includes grass fires, forest fires and scrub fires both with and without a suppression objective.
Bushfire hazard	The potential negative consequence 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.
Bushfire-prone areas	Land that is within 100 metres of bushfire-prone vegetation equal to or greater than one hectare.
Community Bushfire Protection Plan	A bushfire plan for community members that provides local, community-specific information to assist with bushfire preparation and survival. The focus of the Bushfire Protection Plan is on bushfire safety options, and the intent of the plan is to support the development of personal Bushfire Survival Plans. Bushfire Protection Plans are produced by the Tasmania Fire Service.
Community Bushfire Response Plan	An Emergency Management Plan for emergency managers and responders. The Bushfire Response Plan aims to better protect communities and community assets during bushfire emergencies through the identification of protection priorities and operational information. Bushfire Response Plans are produced by the Tasmania Fire Service.
Consequence	Impact(s) of an event on five key areas: environment, economy, people, social setting and public administration.
Control	A measure that modifies risk. This may be an existing process, policy, device, practice or other action that acts to minimise negative risk or enhance positive opportunities.
Fire Behaviour Index	A scale of fire danger calculated from fire behaviour models from eight different fuel types and various weather parameters such as temperature, humidity, wind speed and soil dryness. The relative number provides information about the expected fire behaviour and suppression difficulty.
Fire Danger Rating	A rating based on fuel type (grass or forest) and weather parameters determined for an area. Fire Danger Ratings use broad bands designed to quickly communicate to the public the expected level of danger should a

	bushfire start.
Fire management zoning	Classification system for areas to be managed. The zoning system indicates the primary purposes for fire management for an area of land.
Fuel break	A natural or constructed change in fuel characteristics that affect fire behaviour so that fires burning into them can be more readily controlled.
Hazard Management Area (HMA)	The area between a building and bushfire-prone vegetation that provides access to a fire front for firefighting. These areas are maintained with minimal fuel loads and with no other hazards present that will significantly contribute to the spread of a bushfire.
Land Management Zone (LMZ)	An area managed to meet the objectives of the relevant land manager such as: Traditional Owner practices, biodiversity conservation, production forestry, farming or recreation. Management can include planned burning, experimental treatments, fire exclusion or no planned action.
Likelihood	Chance of an event happening. It is used as a general description of probability and may be expressed qualitatively or quantitatively.
Prescribed burn	A form of land management in which fire is intentionally applied to bushland vegetation. Prescribed fires are conducted under desired conditions to meet specific objectives, such as to restore fire regimes in adapted ecosystems or to reduce the available fuel. Sometimes called 'Fuel Reduction Burn', 'Hazard Reduction Burn', 'Planned Burn' or 'Controlled Burn'.
Strategic Fire Management Zone (SFMZ)	An area close to or a distance away from assets (e.g. the urban–bushland interface), the primary management purpose of which is to provide a mosaic of reduced fuel loads in strategic locations to minimise the size, speed and intensity of bushfires and potential for spot-fire development. Fuel reduction is generally achieved by mechanical treatment, burning and other bushfire protection measures such as fire trails, water points, detection measures and response plans. Mitigation measures in SFMZs are generally less intensive than in APZs.
Treatable vegetation	Types of vegetation suitable for prescribed burning, for example, dry eucalypt forest, scrub, heathland and buttongrass.

Acronyms

AFAC	The Australian and New Zealand National Council for fire, emergency services and land management.
AFDRS	Australian Fire Danger Rating System
APZ	Asset Protection Zone
AS 3959	Australian Standard 3959 Construction of buildings in bushfire-prone areas
BAL	Bushfire Attack Level
BHMP	Bushfire Hazard Management Plan
BNHCRC	Bushfire and Natural Hazard Cooperative Research Centre
BoM	Bureau of Meteorology
BRMP	Bushfire Risk Management Plan
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CSMS	Co-ordinated Smoke Management Strategy
EPA	Environment Protection Authority
FBI	Fire Behaviour Index
FDR	Fire Danger Rating
FFDI	Forest Fire Danger Index (also known as FDI)
FMA	Fire Management Area
FMAC	Fire Management Area Committee
GFDI	Grass Fire Danger Index
COH	City of Hobart
IPCC	Intergovernmental Panel on Climate Change
LGA	Local Government Area
LMZ	Land Management Zone
masl	Metres above sea level
MEMP	City of Hobart Municipal Emergency Management Plan
NERAG	National Emergency Risk Assessment Guidelines
NHRA	Natural Hazards Research Australia
NRE	Department of Natural Resources and Environment
PPRR	Prevention-Preparedness-Response-Recovery
PWS	Tasmania Parks and Wildlife Service
SFMC	State Fire Management Council
SFMZ	Strategic Fire Management Zone
STT	Sustainable Timber Tasmania
TERAG	Tasmania Emergency Risk Assessment Guidelines
TSNDRA	Tasmanian State Natural Disaster Risk Assessment
TFS	Tasmania Fire Service

Introduction

Bushland and the urban fringe

The protected bushland reserves in and around Hobart are a hallmark of the city and one of the reasons people love living here. They are intrinsic to our sense of place and wellbeing. However, they also pose a bushfire threat.

No reasonable management options exist that will ever fully eliminate the potential danger from bushfires to the City of Hobart and significant bushfires will almost certainly occur in the future. However, certain management actions can be taken to substantially reduce the bushfire threat. As such, Hobart's bushland reserves will continue to be managed in a way that seeks to minimise the bushfire risk to people, homes and infrastructure, whilst also protecting natural values.

The city's urban fringe cuts into the steep valleys and ridges of Mt Nelson, West Hobart, Ridgeway and the foothills of kunanyi/Mt Wellington. Most of these areas were developed when there were few, if any, planning controls requiring the consideration of bushfire risk as a factor in design, location and construction of new homes, subdivisions and infrastructure.

The Building Code of Australia has enforced provisions on the construction of buildings in bushfire-prone areas under the planning scheme since 2009.

The City of Hobart's most recent bushfire management strategy was developed in 2014 and incorporated findings from both the 2009 Victorian Bushfires Royal Commission¹ and the 2013 Tasmanian Bushfires Inquiry².

The 2022 Bushfire Management Strategy builds on the strengths of previous strategies and incorporates new knowledge, experience, legislation, policy, science and community expectations together with what we have learnt from Tasmanian fires in 2016, 2018/19 and from the *2020 Royal Commission into National Natural Disaster Arrangements*³.

Above all, the City of Hobart is keen to ensure that every member of our community is prepared for the next major bushfire event and that all of us make the changes needed to reduce the risk of fire impacting our lives by protecting our homes and our community. It is not a matter of if a bushfire will impact Hobart but of when and to what extent.

In the final report from the 2009 Victorian Bushfires Royal Commission, chapter nine in volume two was devoted to the concept of shared responsibility.

"...responsibility for community safety during bushfires is shared by the State, municipal councils, individuals, household members and the broader community. A fundamental aspect of the Commission's recommendations is the notion that each of these groups must accept increased responsibility for bushfire safety in the future and that many of these responsibilities must be shared."

- Victorian Bushfires Royal Commission Final Report

Hobart Community Vision

The Hobart Community Vision⁴ describes what people love and value about Hobart and how they want Hobart to evolve.

Its purpose is to guide all of the City's work, so that Council decisions help create the Hobart our communities want, for current and future generations. In particular, the vision guides and directs the City of Hobart's strategic plan, which outlines Council's priority actions from across the organisation over 10 years.

The Vision has eight pillars that represent the major parts of city life. Each pillar has a number of focus areas – specific ways the pillars should guide strategic thinking about Hobart.

All Council strategies and plans are designed to implement and deliver on the intentions written into the vision. This bushfire management strategy works to fulfil elements in the following Pillars:

Pillar 1. Sense of Place

1.1 *Our Spirit of Place is Strong*

1.1.4 We recognise that what we value is beyond words and not easy to quantify - we embrace rather than fight this complexity.

1.1.5 Our spirit of place fills us with pride and inspiration. If we had to leave Hobart, our sense of place is what it would break our hearts to lose.

1.2 *Our Place is Our Identity*

1.2.5 We don't take our sense of place for granted. We learn and apply lessons from elsewhere at the same time that we avoid changes that weaken it.

1.2.6 Our sense of place supports growth and progress that is consistent with our vision. The strength of our connection to our current way of life does not encourage us to stagnate but rather provides guidance for us to move forward.

Pillar 2. Community Inclusion, Participation and Belonging

2.4 *We Are Informed and Always Learning*

2.4.1 We are informed about our community and the services and opportunities that are open to us.

Pillar 6. Natural Environment

6.1 *Our City is a Part of Nature and Nature is a Part of Our City*

6.1.1 Hobart is defined by its natural environment and relies on it to exist. We cherish the mountain and the river.

6.2 *We are Ecologically Conscious, Aware and Empowered*

6.2.2 We are aware of the impacts of our individual and collective actions.

6.2.3 We feel and are empowered to make good environmental decisions.

6.5 We are Prepared for and Resilient to Natural Disasters

6.5.1 We have designed and maintained our city's infrastructure so it can handle extreme weather events.

6.5.2 Our city is prepared to prevent and confront bushfires, floods and other natural disasters. We have effective systems in place, where community members are aware of how to protect themselves and their homes and where to go for help.

The objectives of this strategy

This strategy outlines the bushfire threat to the City of Hobart and actions that have and will be undertaken by the City to reduce, to the extent possible, future bushfire-related risks.

The guiding principle of this strategy is that any reduction in bushfire risk is a shared responsibility between all spheres of government, other agencies and all members of the community.

This strategy also recognises the role of fire outside of an emergency management context. Fire is an important land management tool, vital for maintaining certain ecosystems, threatened species and wildlife habitat and an inappropriate fire regime will result in environmental risk.

To mitigate the bushfire risk to the Hobart community the primary objectives of this strategy are to:

1. Outline the City of Hobart fire management practices and operational procedures that minimise the bushfire threat to:
 - life and property
 - ecological diversity and function
 - sustainability of natural systems
 - cultural and Aboriginal values
 - essential and community services and infrastructure
 - industries and the economy.

People's lives, including firefighters' lives, will be afforded priority over all other considerations.

2. Maintain or improve the resilience of natural ecosystems.
3. Identify actions the City of Hobart is undertaking or will undertake in each of its five major areas of responsibility to reduce bushfire risk:
 - land management
 - building community resilience
 - statutory planning
 - regulatory responsibilities (legislative compliance and enforcement)
 - emergency management.
4. Operate in accordance with relevant federal and state legislation and policies as well as City of Hobart policies and management practice.

Some notes on prescribed burning

Prescribed burning is a key tool used by land managers for mitigating bushfire risk and maximising ecological outcomes. Prescribed burning refers to planned fire lit under specified weather and fuel conditions (the prescriptions) in order to meet an identified objective. Objectives can include ecological outcomes, fuel reduction targets, or a combination of both. It is important to remember that all burns will reduce fuel levels and all burns will have some sort of impact on the ecology and achieving both objectives does not have to be mutually exclusive.

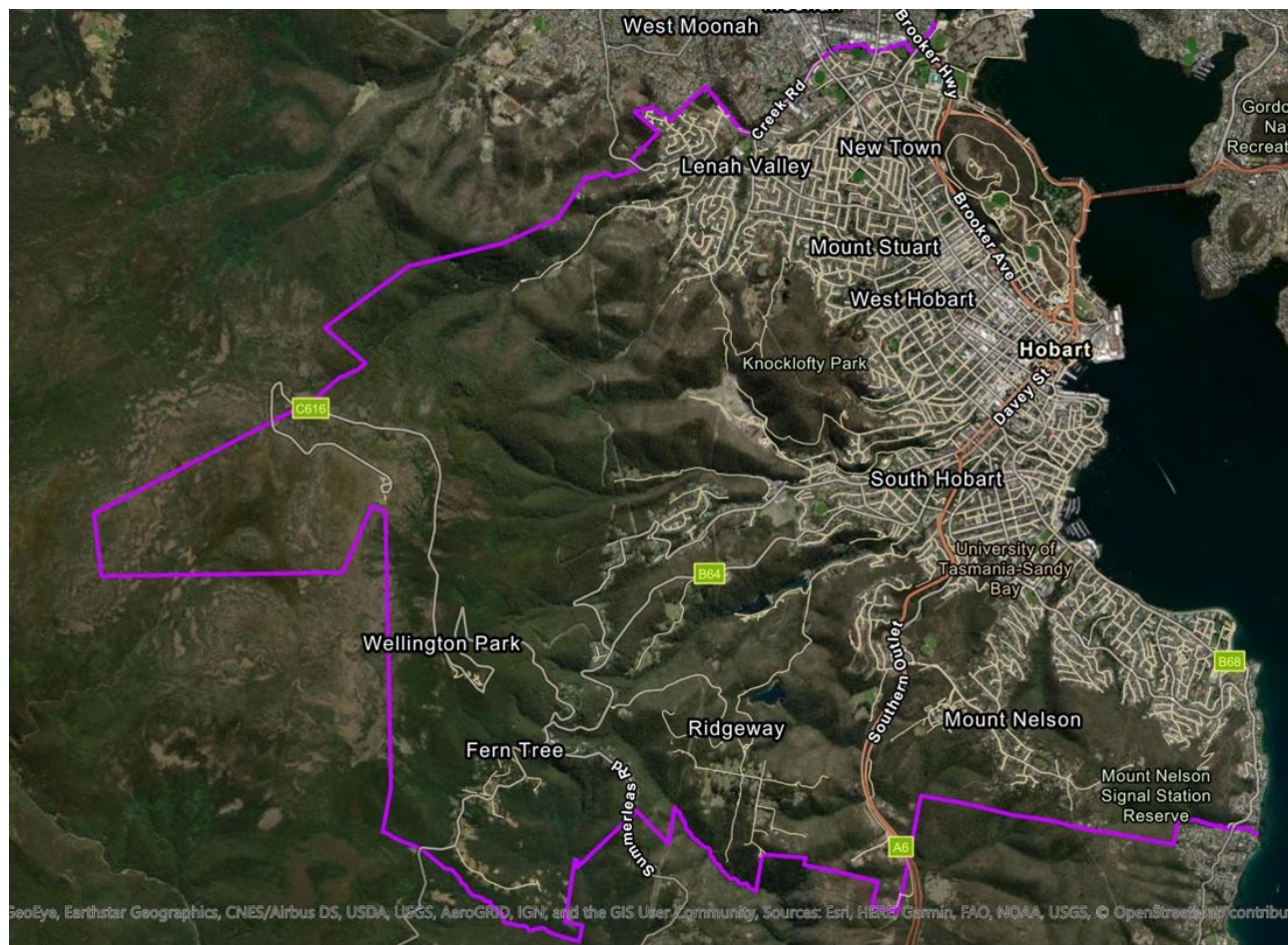


Figure 1. City of Hobart Municipal Area.

Why we need a Bushfire Management Strategy

Bushfire has long been recognised as the most significant natural disaster risk to Hobart. Changes to the planet's climate mean this risk is now greater, with bushfires increasing in frequency, intensity and extent around the world, including here in Tasmania.

As both the owner and manager of an extensive bushland reserve system, the City of Hobart plays a critical role in managing and mitigating bushfire risk.

Prevention

The City of Hobart undertakes bushfire prevention activities through its annual prescribed burn program. The prescribed burn program is co-ordinated within the City's Fire and Biodiversity program area and draws on suitably trained staff from across the organisation. All fire management staff are trained to industry standards and capable of not only completing prescribed burns, but also responding to a bushfire emergency within bushland reserves if required.

Other actions taken or managed by this team that help reduce the bushfire risk include:

- construction of fuel breaks
- mechanical removal of certain flammable vegetation such as dense stands of she-oak (*Allocasuarina verticillata*).

Preparation

The City of Hobart maintains a level of preparedness for bushfire events. Activities include public information campaigns, fire trail maintenance, the preparation of emergency management strategies and maintenance of evacuation centres.

Response

The Tasmania Fire Service is the primary response agency with respect to bushfires on private land in Tasmania. However, as for any land owner, the City of Hobart takes its land management responsibilities seriously and is ready to respond to early bushfire suppression where a fire is found to have ignited within the City's bushland and to aid the Tasmania Fire Service if requested.

The City can be requested to assist in many other ways and has a number of locations that can be used as evacuation centres to provide shelter to vulnerable community members during and after an emergency. These evacuation centres include:

- | | |
|---------------------|-------------------------------|
| ▪ City Hall | ▪ Princess Wharf 1 |
| ▪ Criterion House | ▪ Sandown Park |
| ▪ Lenah Valley Hall | ▪ South Hobart Community Hall |
| ▪ Mathers House | ▪ Tasmanian Hockey Centre |

The City has a range of resources available during an emergency, including recovery equipment stored in a mobile trailer that can be rapidly deployed at short notice.

It also has operational equipment such as excavators, generators, pumps and trucks that can

be deployed in an emergency. Operational staff can also be reassigned to emergency roles as needed.

In a large or complex emergency event, the City can activate the Hobart Emergency Operations Centre (HEOC). The centre performs the following functions:

- management of agency tasking, personnel and resources
- establishment and monitoring of communication networks
- coordination of response operations
- management of requests for additional support
- coordination of logistical support for own operations.

The Hobart Emergency Operations Centre is located within the administration building at Cleary's Gates Depot, Brooker Highway.

Recovery

The City of Hobart Emergency Management Committee specifies strategic and tactical arrangements for the provision of a wide range of recovery services to the community following an emergency event.

Table 1 summarises the main aspects for managing and coordinating recovery in the longer term.

Table 1: Summary of City of Hobart Recovery Responsibilities⁵

Element and Examples	Council Position	Affected Area Recovery Committee
Social <ul style="list-style-type: none"> personal support emergency accommodation emergency catering emergency cash grants/relief 	Municipal Recovery Coordinator (with recovery partners e.g. NGOs, THCS and THS/DHHS)	DPAC
Economic <ul style="list-style-type: none"> long-term legal, insurance and financial problems disbursement of funds from appeals property restoration (urban/rural) stock assessment / destruction / emergency feed for animals 	Economic Development Coordinator	DSG
Infrastructure <ul style="list-style-type: none"> priorities for the restoration of services and assets (power, water, telecommunications, transport networks/corridors) environmental/public health 	Engineering/Works Manager Environmental Health Coordinator/Officer	DSG DHHS – PHS Asset owners/managers e.g. Telstra, TasPorts, Hydro Tasmania, TasNetworks

Environment		NRE
<ul style="list-style-type: none"> • impact assessments (environment focus) • environmental rehabilitation • disposal of animal carcasses, plant material or other infected matter 	Environmental officer	

Managing the bushfire risk is a balancing act between trying to reduce the bushfire threat while maintaining the significant environmental, social, recreational, aesthetic and economic values the Hobart's bushland reserve system provides. Our Bushfire Management Strategy must help ensure ongoing community support and involvement in enhanced bushfire planning and management.

The role of fire in and around Hobart

Before European colonisation of Australia, Aboriginal people actively used fire as a sophisticated tool to manage and modify the landscape. The detailed knowledge of the patterns of burning and fire regimes applied by Aboriginal people is incomplete - especially in Tasmania - however, there is good evidence that the patterns of vegetation observed in the landscape today are strongly influenced by past Aboriginal burning practices.

An example of this fire-shaped landscape can be seen in the open buttongrass moorlands found throughout western Tasmania. The broad patterns of vegetation shaped by Aboriginal fire regimes over thousands of years are still significant to Aboriginal people.

Relatively frequent Aboriginal burning was noted by early visitors and settlers⁶ and the grassy woodland vegetation covering much of the Queens Domain is a remnant of a more extensive landscape that stretched through the Midlands, created and maintained by Aboriginal people through frequent burning.

Aboriginal fire practices across Australia were severely disrupted by the arrival of Europeans and as a nation we did not take the time to learn from Aboriginal people how to manage fire across the landscape.

Aboriginal cultural practices

The City of Hobart Aboriginal Commitment and Action Plan⁷ identifies a range of strategies to empower Aboriginal people living in and/or connected to the area that is now Hobart.

The landscape that existed in the past is different to the present landscape. Land management, land tenure, the location of assets and infrastructure, proximity of dwellings, climate change, the type and extent of vegetation has all been significantly modified from the pre-European landscape.

The use of fire by Aboriginal people is complex and includes more than simply the notion of 'cool burning' – ecological outcomes and cultural outcomes both require consideration.

The City of Hobart recognises the need to support the Tasmanian Aboriginal community to

practise their traditions, skills and customs so that they may be passed on to future generations. The City is committed to working with Aboriginal people to ensure cultural practices are supported and maintained into the future.

How often do we have major bushfires in Hobart?

Fire records from the recent past are limited and almost non-existent from the early days of European occupation of Tasmania, however the patterning of vegetation and the ecology around Hobart provides some clues. Hobart is situated within a tall eucalypt forest environment with both wet and dry forest types present. Eucalypt forests are fire-adapted, and their presence within the Hobart landscape indicates a regular fire return interval. Furthermore, considering wet forest stands usually only burn during the extreme fire weather conditions associated with bushfires and require fire for their continued existence, it is likely that bushfires have been a regular occurrence within the Hobart landscape.



Figure 2. Major bushfires in Tasmania's recent history.

Climate change projections will provide ideal climatic conditions for an increase in fire frequency and intensity.

A history of bushfire around Hobart

In 1954 a new Bushfires Act was legislated in Tasmania in an attempt to limit the damage caused by fires lit inappropriately and escaping onto other properties.

However, it was not until the 1967 bushfires that the Rural Fires Board was established, leading to the formation of the Tasmania Fire Service.

1967 - Black Tuesday

The 1967 Hobart bushfire^{8,9} remains a defining event in Tasmanian history. It moved so fast that many people had very little time to prepare for its catastrophic impacts.

On 7 February 1967, 110 separate fire fronts took just five hours to burn through

approximately 264 000 ha of land in southern Tasmania, including a large part of Hobart. This was a national tragedy that claimed 62 lives in a single day and became known as the Black Tuesday bushfire.



Figure 3. Charles Roberts and his dog Elsa, survey the ruins of the Fern Tree store.

Property loss was extensive, with 1293 homes and more than 1700 other buildings destroyed across southern Tasmania. In Hobart, more than 500 houses were lost. The fires destroyed 80 bridges, 4800 sections of power lines, 1500 motor vehicles and over 100 other structures. An estimated 62,000 farm animals were also killed. The total damage bill was put at \$40 million in 1967 Australian dollar values¹⁰.

Figure 4 shows just how fast the fires moved through Mt Nelson and down into Sandy Bay.



Figure 4. Fire progression map of the 1967 Hobart bushfire.

Of the many fires burning across southern Tasmania on February 7 1967, two impacted Hobart. The Collinsvale fire burned across the face of kunanyi/Mt Wellington and through Fern Tree, while the Limekiln Gully fire came in from behind Glenorchy, through Lenah Valley, West Hobart, South Hobart and Mt Nelson. The orange lines show the approximate location of the Limekiln Gully fire in 15 minute intervals as it passed through South Hobart, Dynnyrne and Mt Nelson. The small arrows show the flanks of the fire widening after 3 pm, and the three large arrows show the flanks of the Collinsvale fire approaching Hobart later in the afternoon.

Bushfires do not have to be as intense or widespread as the 1967 Hobart fires to have significant impacts on people's lives.

A changing landscape

Over time, the memories and experiences from major bushfires fade. People are continually moving to Hobart from elsewhere in Tasmania, Australia and the world. Many new residents have little knowledge of the landscape's fire history.

Increased residential development, particularly on the urban fringe, means more people than ever now live close to bushfire prone areas. Houses have been built on the edge of steep bushland valleys and ridges at places like Tolmans Hill, Mt Nelson, West Hobart and on the edges and in the foothills of kunanyi/Mt Wellington. Most of these areas were developed at a time when there were few, if any, planning laws requiring houses be built to standards that improve the ability of the building to withstand a bushfire.

The bushland in and around Hobart is extremely important to the health and identity of the city and the people who live here. We are intimately connected with nature and wildness. Whether it is a quiet afternoon spent in one of our many parks, riding or walking to work along the Hobart Rivulet, or a day spent walking on kunanyi/Mt Wellington, these are among our best and most cherished times.

Research^{11, 12} shows that the distance of a house from bushland is the single major factor in determining if a home will be burnt during a bushfire. Research undertaken for the Royal Commission into the 2009 Victorian fires shows that, historically, about 85% or more of the properties lost since the 1967 Hobart bushfires were within 100 metres of bushland.

There are costs and increased risks in building our homes so close to bushland. If we are to live so close to nature we must manage the bushfire risk to minimise the threat as well as accept it will not always be possible to save all houses.

City of Hobart: the bushfire risk

Australia is dominated by fire-adapted vegetation and it is widely accepted that bushfires are an inevitable occurrence¹³. Due to the combination of highly flammable vegetation and climatic systems which bring adverse fire weather to southeast Tasmania¹⁴, Hobart sits within one of the most high-risk areas of Australia.

Quantifying risk

An analysis of bushfire risk considers the following:

- **Likelihood:** Based on factors such as weather, topography, fuels and ignition potential, what is the realistic potential for a bushfire event to occur?
- **Consequences:** Given the bushfire scenario under consideration, what values and assets are at risk?
- **Existing controls:** Given a range of existing controls, how effective will they be at reducing the risk?
- **Confidence level:** How certain are we about the evidence and data used?

Risks from bushfire arise from the interaction between hazard (bushfire), vulnerability (susceptibility to harm) and exposure (people, assets or ecosystems at risk). Hazards include processes that range from brief events, such as small, localised fires in spring or autumn, to slow trends, such as increased severe fire frequencies in summer including the effects of climate change.

Vulnerability and exposure are both sensitive to a wide range of social and economic processes, with possible increases or decreases depending on matters such as location, mobility, knowledge and experience.

Risk is the probability of occurrence (likelihood) of hazardous events or trends multiplied by the magnitude of the outcomes (consequences) if these events occur. There are four possible outcomes for 'likelihood' used in this document: unlikely, possible, likely and almost certain. To determine the likelihood rating we use the following matrix:

Table 2: Risk matrix.

		If a bushfire occurs, is it likely to spread & reach assets?	
		No	Yes
Do bushfires occur frequently?	No	Unlikely	Likely
	Yes	Possible	Almost certain

The answer to the question of 'likelihood' is not always straight forward. It depends on factors such as location, weather, season, fuel levels, terrain, etc. The table below provides a general description of each likelihood rating in relation to bushfires on the urban fringe.

Table 3: Characterisation of likelihood

Likelihood rating	Characterisation of likelihood
Almost certain (sure to happen)	<ul style="list-style-type: none"> is expected to occur in most circumstances high level of recorded incidents and/or strong anecdotal evidence; and/or strong likelihood the event will reoccur; and/or great opportunity, reason or means to occur; and/or may occur more than once in five years.
Likely (probable)	<ul style="list-style-type: none"> regular recorded incidents and strong anecdotal evidence; and/or considerable opportunity, reason or means to occur; and/or may occur at least once in five years.
Possible (feasible but < probable)	<ul style="list-style-type: none"> should/might occur at eventually; and/or few, infrequent, random recorded incidents or little anecdotal evidence; and/or an opportunity, reason or means to occur.
Unlikely (improbable, not likely)	<ul style="list-style-type: none"> would only occur under exceptional circumstances.

Table 4: Characterisation of Consequence

Consequence rating	Characterisation of consequence
Minor	<ul style="list-style-type: none"> no fatalities near misses or minor injuries with first aid treatment only no people displaced little or no physical, mental or emotional support required inconsequential or no damage to assets little or no specific recovery required inconsequential or no disruption to the community inconsequential or short-term failure of infrastructure or services inconsequential or no financial loss.
Moderate	<ul style="list-style-type: none"> isolated serious injuries, no fatalities, possible hospitalisation isolated cases of displaced people physical, mental or emotional support provided locally localised damage, basic repair or routine maintenance little inconvenience to broader community isolated or short-term failure of infrastructure local personal economic impact isolated damage to cultural or environmental assets.
Major	<ul style="list-style-type: none"> isolated cases of fatalities multiple serious injuries leading to hospitalisation local health services stretched large number of people displaced, possibly for greater than 24 hours significant out-of-area resources required for physical, mental or emotional support significant damage to infrastructure, considerable repair needed community functioning significantly disrupted

Consequence rating	Characterisation of consequence
	<ul style="list-style-type: none"> mid to long-term failure of services and infrastructure local or regional economy impacted for considerable time financial assistance required significant damage to cultural or environmental assets localised extinction of native species loss of significant cultural resources and sites.
Catastrophic	<ul style="list-style-type: none"> multiple fatalities extensive severe injuries extended use of hospital resources by a large number of people local health services possibly overwhelmed extensive displacement of people for a considerable time extensive external resources needed for personal support extensive damage to assets community unable to function without significant support long-term failure of significant services and infrastructure regional or state economy impacted extinction of native species extensive loss of significant cultural resources and sites.

Consequence is the outcome of risk x likelihood (Table 5). The consequences will vary for different categories of assets. There are four possible consequences used in this strategy: minor, moderate, major and catastrophic.

Table 5: Risk matrix used to guide this Bushfire Management Strategy.

Consequences	Likelihood			
	Unlikely	Possible	Likely	Almost certain
Minor	Low	Low	Medium	High
Moderate	Low	Medium	High	Very High
Major	Medium	High	Very High	Extreme
Catastrophic	High	Very High	Extreme	Extreme

Heightened risk can result from high probability events as well as low probability events with potentially severe consequences and it is therefore important to assess the full range of possible outcomes.

While risk cannot always be removed or eliminated, it can often be reduced. Risk is most often managed using a wide range of treatments such as annual maintenance e.g. maintenance of fuel breaks, or reducing fuel levels through planned burning.

National Emergency Risk Assessment Guidelines

Understanding and reducing risk, and communicating with and educating the community about risks, are key drivers for action under the National Strategy for Disaster Resilience¹⁵. The nationally consistent approach to risk assessment and prioritisation embodied in the National Emergency Risk Assessment Guidelines support the implementation of the City of Hobart Bushfire Management Strategy 2022.

The national guidelines provide a contextualised, emergency-related risk assessment method consistent with the Australian Standard AS/NZS ISO 31000:2018 Risk Management – Principles and Guidelines¹⁶. They have a focus on risks from emergency events. This includes both actual and imminent events that endanger or threaten to endanger life, property or the environment, and that require a significant and coordinated response.

The guidelines provide a method to assess risks from all hazards and help prioritise risk management and mitigation activities. They consider nationally significant risks and the methodology is localised to Tasmania through the Tasmanian Emergency Risk Assessment Guidelines.

Tasmanian Emergency Risk Assessment Guidelines

The Tasmanian Emergency Risk Assessment Guidelines¹⁷ were developed from the National Emergency Risk Assessment Guidelines as a state-level assessment tool.

The Tasmanian guidelines help maintain controls, identify treatments, and manage existing and emerging risks from natural and human-induced hazards to Tasmania's people, economy, environment, social setting and administration.

Tasmanian State Natural Disaster Risk Assessment

The Tasmanian State Natural Disaster Risk Assessment 2016¹⁸ reassessed the risk of bushfire, earthquake, flood, landslide, severe storms and tsunamis to Tasmania and incorporated the first assessments of coastal inundation, heatwave and pandemic influenza. The relative likelihood of each hazard occurring and the impacts on various sectors of society in a worst-case scenario were assessed. The overall findings were identified across all hazards.

The report warned that:

Bushfire remains the greatest aggregated risk to Tasmania. It is a 'High' or 'Extreme' risk across all sectors of society, often with catastrophic consequences

expected every 30 years (i.e. 'Unlikely' likelihood). This likelihood is expected to become more frequent with climate change, based on anecdotal evidence from experts and the most recent climate projections.

The report concluded that the likelihood of a catastrophic bushfire event is increasing, changing from 'Unlikely' to 'Likely' in future assessments, most likely due to climate change.

Hobart Bushfire Risk Management Plan

In March 2020 the Hobart Fire Management Area Committee prepared the Bushfire Risk Management Planning Guidelines¹⁹. The plan was then endorsed by the State Fire Management Council.

The Hobart Bushfire Risk Management Plan covers the Greater Hobart region, including the local government areas of Hobart, Glenorchy, Clarence, Brighton and parts of Kingborough, Huon Valley and Derwent Valley. The Guidelines aim to coordinate and influence the treatment of bushfire risk across all jurisdictions and tenures by identifying priorities for the treatment of bushfire risk in the Hobart Fire Management Area, but does not identify specific responsibilities.

The plan identifies a number of high bushfire risk areas within the Hobart local government area:

- the Wellington Range, particularly the eastern slopes of kunanyi/Mt Wellington - including Fern Tree, Strickland Avenue & Old Farm Road
- Mt Nelson/Tolmans Hill areas
- Ridgeway and Summerleas Road areas.

City of Hobart Municipal Emergency Management Plan

The City of Hobart has developed its own Municipal Emergency Management Plan 2020²⁰. The plan details arrangements that have been put in place to reduce emergency related risks to the community and the mechanisms needed to mitigate and counter the impacts of an emergency that may arise within the Hobart municipal area.

The plan identifies the following risks, treatments and responsibilities in relation to bushfire:

Table 6: Risks, treatments and responsibilities in relation to bushfire.

Risk statement	Treatment/s	Responsibility for treatment	Status
There is a risk to residential and commercial properties on the urban fringe of Hobart from the effects of bushfire.	Maintain fire management strategy, and specific fire management plans.	City of Hobart, Tasmania Fire Service, Wellington Park Management Trust.	Ongoing
	Ensure adequate water supplies.	TasWater.	Ongoing
	Community education and awareness program to be implemented as required.	Tasmania Fire Service, City of Hobart, Wellington Park Management Trust.	Ongoing
	Maintain planning scheme provisions, including: <ul style="list-style-type: none"> access/egress vegetation clearance defendable space. 	City of Hobart, whole of government.	Ongoing
There is a risk of environmental damage to reserve areas, particularly Wellington Park, from the effects of bushfire.	Maintain fire management plans for Wellington Park, and other large council bushland reserves.	Wellington Park Management Trust, City of Hobart.	Ongoing
	Ensure adequate water supplies.	TasWater, Tasmania Fire Service.	Ongoing
	Community education and awareness program to be implemented as required.	Tasmania Fire Service, City of Hobart, Wellington Park Management Trust.	Ongoing
There is a risk bushfire will damage water and sewage infrastructure.	Develop and implement fire management strategies.	TasWater.	Ongoing

Australian Fire Danger Rating System

In 2022 the McArthur Forest Fire Danger Rating System (FFDI) was replaced with the Australian Fire Danger Rating System (AFDRS). The FFDI was developed in the 1960s and had been modified on a jurisdictional basis overtime. Consequently, variances in the public warning systems between states have emerged. With larger bushfires more frequently crossing state borders, the need for a consistent national system that incorporated updated understandings of fire behaviour was identified.

The Australian Government and all state and territory governments jointly recognised the need for a new national fire danger rating system as a priority in 2014 and a board with

national and state representation was established in late 2016 to oversee development²¹.






The new system aims to:

- provide greater scientific accuracy to support government and emergency services decisions and advice
- increase community awareness of fire risk
- give communities, industry and business clear and timely information in which they can have confidence.

The new system will incorporate two major elements to quantify fire danger:

- A **Fire Behaviour Index** will be a scale of fire danger that produces measures across eight different fuel types (compared to the two fuel types used in the McArthur Fire Danger Index).
- Once the index has been calculated, a **Fire Danger Rating** will be determined for an area. This rating will use four levels to quickly communicate to the public the expected level of danger and to describe actions people should take to ensure their personal safety²².

Table 7: Australian Fire Danger Rating System.

Fire Danger Rating	
Type	Means
<p>No Fire Danger Rating (FBI 0-11)</p> 	<p>No rating. Any fires that start are not likely to threaten the safety of the community.</p>
<p>Moderate Fire Danger Rating (FBI 12-23)</p> 	<p>Plan and prepare. Most fires that start can be controlled. Stay up to date and be ready to act if there is a fire.</p>
<p>High Fire Danger Rating (FBI 24-49)</p> 	<p>Be ready to act. Fires that start can be dangerous. Be alert for fires in your area. Decide what you will do if a fire starts as your life and property may be at risk. The safest option is to avoid bushfire risk areas.</p>
<p>Extreme Fire Danger Rating (FBI 50-99)</p> 	<p>Take action now to protect your life and property. Fires that start will spread quickly and be extremely dangerous. Check bushfire plans and ensure properties are ready. If a fire starts take immediate action. If you and your property are not prepared, leave for a safer location well before the fire impacts. Even prepared homes may not be able to withstand fires in these conditions. Reconsider travel through bushfire risk areas.</p>
<p>Catastrophic Fire Danger Rating (FBI 100+)</p> 	<p>For your survival, leave bushfire risk areas. Fires that start and take hold are likely to lead to loss of property and life. Lives may depend on decisions made, even before there is a fire. For your survival do not be in bushfire risk areas and stay safe by going to a safer location early in the morning or the night before. Homes cannot withstand fires in these conditions. You may not be able to leave, and help may not be available.</p>

City of Hobart – the physical and social context

Managing the urban/bushland interface

The City of Hobart manages 4600 ha of bushland, including 1600 ha outside the local government area boundary.

The City of Hobart bushland reserve system consists of five major blocks:

- Queens Domain
- Knocklofty Reserve and McRobies Gully
- Ridgeway Park and Waterworks Reserve
- Bicentennial Park, Porter Hill and Mt Nelson reserves
- Wellington Park.

The reserve system also includes a number of linear reserves, such as Hobart Rivulet and numerous, small bushland remnants.

Climate

Hobart's climate is typical of the world's temperate zones, with mild to warm summers and cool winters. It is changeable, with sudden showers interspersed with hours of sunshine and alternate warm and cool days, particularly in spring and autumn.

The maximum average summer temperature is 21°C, while the minimum average is 11°C. In winter the maximum average temperature is 11°C, whilst the minimum is 4°C with occasional frosts. Summer conditions can fluctuate wildly, with highs in excess of 40°C being recorded in Hobart and minimums as low as -8°C recorded on kunanyi/Mt Wellington.

The average annual rainfall for Hobart is 627 mm however there is a steep east-west rainfall gradient from the river to the summit of kunanyi/Mt Wellington, where the average annual rainfall is 1400 mm. Within Hobart, the rainfall is distributed throughout the year with a variation in the monthly average of approximately 17 mm. Extreme rainfall events may occur as a result of easterly weather conditions, sometimes bringing several days of rainfall that can become concentrated by the orographic effect of kunanyi/Mt Wellington. Periods of intense rainfall can produce extreme flood flows in the rivulets.

Thunderstorms occur on average five times a year, mainly in the summer months. Historically, lightning has rarely caused major bushfires in Tasmania as lightning has mostly been associated with substantial rainfall. This trend, however, appears to be changing, and lightning has ignited a number of recent bushfires²³.

Westerly driven winds can reach speeds of 150 km/h in Hobart. During summer, strong winds are often associated with hot and dry north-westerly weather, resulting in very high fire danger conditions.

Climate change

The global climate is changing. Findings from the Intergovernmental Panel on Climate Change (IPCC)²⁴ include:

- average temperature of the Earth's surface warmed 0.85°C [range 0.65°C to 1.06°C] over the period 1880 to 2012
- over the period 1901-2010, global mean sea level rose by 0.19 m [range 0.17 m to 0.21 m] and has been rising at three millimetres a year since 1993
- the upper 3000 m of ocean has warmed, as has the lower atmosphere
- the incidence of extremely high temperatures has increased and that of extremely low temperatures has decreased
- water vapour content of the atmosphere has increased since at least 1980, consistent with the theory that warmer air can hold more moisture
- about half of the cumulative anthropogenic CO² emissions between 1750 and 2011 have occurred in the past 40 years to 2014
- the ocean has absorbed about 30% of the emitted anthropogenic CO², causing increased ocean acidification.

A report²⁵ on the climate change impacts on bushfire weather in southeast Australia by the CSIRO and the Bureau of Meteorology modelled likely changes in bushfire weather due to global warming using both high and low rates of global warming as predicted by the IPCC.

The results for Hobart broadly projected very little, if any, change in the average number of days when the Forest Fire Danger Rating (and a slight increase in the average number of days the Grassland Fire Danger Index) is 'Very High' or greater over the next 50 years. This calculation was on the basis that projected increases in temperature will be offset by increases in rainfall and humidity.

On average, there are 3.4 days when the Forest Fire Danger Rating is 'Very High' or greater in Hobart. There are generally 67.5 days when the Grassland Fire Danger Rating is 'Very High' or greater - this could increase to 68.1 – 71.5 days by 2050²⁶. Subsequent modelling has projected the average number of days a year when the FFDI would exceed 25 (Very High) will increase to 5.5 by the end of the century.

One possible effect of climate change that could influence the occurrence rather than the severity of bushfires is the incidence of thunderstorms. Currently, there are no projections available on the effect of climate change on the incidence of thunderstorms around Hobart, although this work has been undertaken for the Tasmanian Wilderness World Heritage Area²⁷ and an increase in the number of large bushfires ignited by lightning has been observed²³.

Topography

The City of Hobart sits below the towering backdrop of kunanyi/Mt Wellington on the Derwent River. The change in elevation from the Derwent foreshore to the summit of kunanyi/Mt Wellington is 1271 metres in just over eight kilometres. Hobart is defined by the river and the mountains and hills behind it.



Figure 5. The City of Hobart with the dramatic kunanyi/Mt Wellington in the background.

Small water courses start in the foothills of kunanyi/Mt Wellington and flow easterly, developing into fast-flowing rivulets as they pass through densely-populated areas before entering the Derwent estuary. Due to the steep slopes of kunanyi/Mt Wellington, stream flows are rapid, roads are seldom cut, and the duration of inundation during floods is mostly short.

Once out of the Hobart CBD the landform changes into incised valleys and slopes with rivulets and gullies. The amount of vegetation in the landscape also increases further out from the CBD, with large tracts of bushland, the edges of which are, in places, heavily interspersed with houses.

Biodiversity

Fire plays an important role in maintaining ecosystems as well as native plant and animal communities in Australia. Changes in fire regimes (frequency, intensity, season and extent) can cause progressive changes to vegetation communities. Frequent fire and long-term fire exclusion have both been shown to lead to progressive changes in plant community structure, and a reduction in biodiversity. Failure to use fire properly as a management tool is a threat to native plants and to animal habitats in and around Hobart.

Inappropriate fire regimes can cause progressive and possibly irreversible changes in indigenous plant communities, including localised species extinctions. On the other hand, identification and implementation of an appropriate fire regime can be used to:

- manage native plants and animal habitats in a sustainable manner
- maintain biodiversity

- control selected weed species and promote natural regeneration in dry forest communities.

The potential risks to native vegetation and animal habitats from bushfire can be managed by minimising the risk of unplanned ignitions, maintaining adequate emergency vehicle access routes and other control lines, and by burning suitable areas of vegetation at different times to create a mosaic-patterned landscape with different stages of recovery from fire. Adoption of a mosaic burning pattern has the following advantages:

- increases floristic diversity
- reduces overall fuel loads
- provides control lines to help in the suppression of bushfires and future prescribed burns
- reduces risk of a single, high-intensity bushfire burning large areas.

Within these mosaics prescribed burns can be used to achieve most or all of the following objectives:

- removal of woody and herbaceous weeds, and weed seeds from mid-storey, leaf litter, and soil surface
- reduction in the levels of plant nutrients, such as phosphorus and nitrogen, which may be contributing to weed invasion
- manipulation of ecological processes such as species composition (via the promotion of selected species or communities), regeneration of senescent vegetation, and the creation of suitable conditions for native seed germination
- protection of animal species of high conservation value by maintaining habitat elements critical to their survival.

Forest litter, such as fallen leaves, twigs and branches, has been found to support larger and more diverse invertebrate fauna than sites where fire has reduced the litter²⁸. If a wide range of invertebrate species, such as native insects, worms and spiders, is to be maintained throughout our bushland areas, it is important to keep small areas of habitat unburnt. These 'habitat island' sites provide essential safe havens from which invertebrate species can recolonise nearby bushland once adjacent areas have been burnt²⁹.

In bushland areas fire can be used to stimulate the germination of native plant seeds. She-oaks, most *Eucalypts*, *Acacias*, members of the pea family (*Fabaceae*) and many species from other plant families frequently germinate prolifically in areas that have been burnt. However, the burnt area will also be open to weed invasion and must be carefully monitored.

Frequent burning of native forests is known to reduce species diversity and make them more vulnerable to weed invasion³⁰. A high fire frequency (less than five years) will usually favour grasses in the understorey at the expense of shrubs, and severely restrict the re-establishment of canopy species.

In rural areas frequent burning is used to control woody weeds. However, in native bushland fire will generally increase an existing weed problem. Many woody weeds re-sprout rapidly from rootstock after fire, often coppicing densely (e.g. hawthorn, gorse). Herbaceous species (including many grasses) respond in a similar way, regenerating from growth buds on a network of robust underground rhizomes (e.g. pampas grass, bracken fern). Seed germination is usually prolific after fire, a response that necessitates prompt weed control measures, ongoing monitoring, and site maintenance (e.g. gorse, boneseed, broom). Where

weeds are already a problem, planned burning should only be carried out after weeds have been treated, and follow-up weed control can be carried out.

Fire - its frequency or its absence - has directly influenced the evolution of the Australian landscape and the native plants and animals it supports. Many native plant species, including eucalypts and wattles, have evolved in fire-prone environments. They are therefore dependent to various degrees on fire events to maintain regenerative cycles. In contrast, ecosystems developed in the absence of fire are highly vulnerable when changed conditions such as prolonged drought increase their susceptibility to fire.

Climate change will alter the nature of fire risk and increase the need to have effective fire management regimes in place to protect people and property in a way that recognises the role of fire in biodiversity management. To address this threat, our understanding of fire regimes will need to increase and be incorporated into land management decisions³¹.

Biodiversity objectives

The City of Hobart's objectives for biodiversity management in relation to fire are:

- Ensure biodiversity information is incorporated into fire management plans to maintain ecological values, recognising the strategy of burning for ecological purposes (as opposed to asset protection) is to mitigate the impact of high-intensity bushfire and maintain fire-dependent vegetation communities.
- Ensure appropriate fire interval thresholds are applied. Fire interval thresholds for Tasmanian vegetation communities can be found in *Tolerable fire intervals for TASVEG communities*³².
- Establish flora monitoring protocol for management units subject to planned burning. The flora monitoring protocols for planned burning developed by the Victorian Government, provide a good basis for a monitoring program.
- Review burning schedule if it is shown that rare and significant species are not persisting under the frequency of burns.

Following the adoption of the City's Biodiversity Action Plan in 2019, the City of Hobart has embarked on a program of assessment, monitoring and review to improve our understanding of the effect fire has on the biodiversity of our bushland areas. To this end, formal Vegetation Condition Assessments (VCAs) have been conducted by qualified practitioners for the significant native vegetation communities around Hobart in order to establish baseline data.

Principles of fire behaviour

Fire and climate

High risk fire weather can be expected in southern Tasmania when strong north-westerly winds that often precede summer cold fronts contain dry air from the interior of the Australian mainland, creating hot, windy and low humidity environments.

Generally a high pressure system sits in the Tasman Sea with an approaching cold front or trough of low pressure pushing a north-westerly wind across Tasmania^{33,34}. These winds pick up surface moisture as they cross Bass Strait, but after the air stream crosses the Central Highlands, dry air at a higher altitude descends to the surface where it is further warmed (Foehn effect), resulting in extremely low humidity³⁵.

The occurrence of the Foehn effect has been linked with increased bushfire risk and is attributed to two main mechanisms.

1. Thermodynamic Foehn: Moist air is lifted over a mountain barrier. The moist air cools as it rises. This results in condensation and precipitation. Precipitation results in the removal of moisture from the air mass. In turn, the latent heat of condensation raises the temperature of the air. This drier air warms as it descends the lee slopes.

2. Blocking Foehn: Moist lower-level air is blocked by a barrier such as a mountain. Upper-level drier air flows over the top of this trapped air mass and down the lee of the mountain barrier. This drier air warms as it descends the lee slopes.

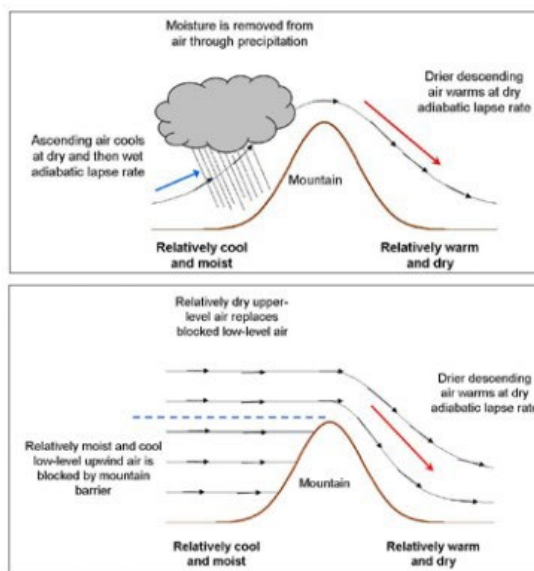


Figure 6. Foehn Effect.

Source: Bushfire CRC Fire Note # 62 June 2010³⁶

Either mechanism results in relatively moist and cool air on the upwind side of the mountain barrier, while in the lee the air will be relatively warm and dry.

This combination of strong winds and low humidity creates ideal meteorological conditions for major bushfires in southeast Tasmania and particularly in and around Hobart.

Fires that start under these conditions can be expected to move quickly downwind, and then move more or less at right angles on a long front when a south-westerly wind change arrives (Figure 7).

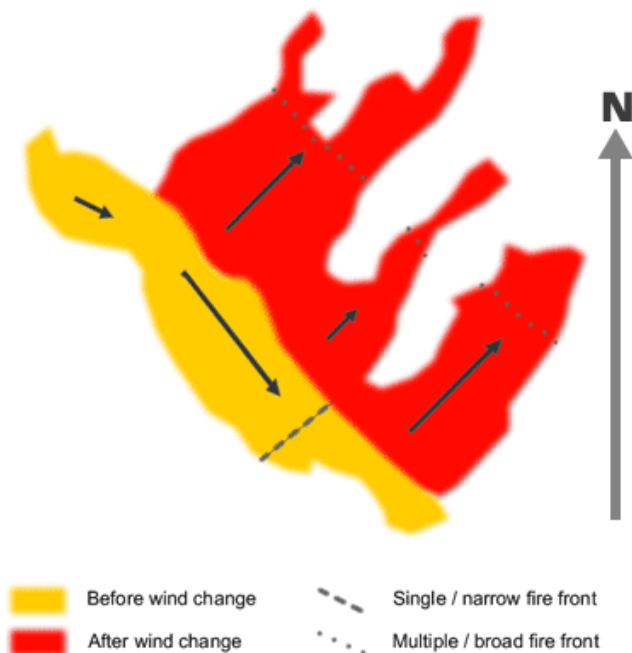


Figure 7. Schematic representation of the effect of wind direction change on a fire front.

If a high pressure system is blocked in the Tasman Sea, strong, dry northerly winds can persist for days. Fires under these conditions can reach very high intensities in a short time, even in areas with relatively low fuel loads, and are very difficult to control until weather conditions abate. These were the conditions that produced the 1967, 1998, 2006 and 2013 bushfires around Hobart.

The Derwent Valley and southeast Tasmania more often experience Extreme to Catastrophic Fire Danger Ratings than the rest of Tasmania. The Hobart region is also one of the driest parts of Tasmania.

Wet winters and springs followed by dry summers produce some of the most hazardous bushfire environments, as the moist conditions encourage vegetation growth which then dries out in summer, creating high levels of flashy fuels.

Weather and prescribed burning

Weather is a key driver of the bushfire risk facing the City of Hobart. Weather is also a key component in the City's planning to mitigate the effects of bushfires on the Hobart community and the environment. High fire danger periods traditionally commence in October and extend through the hotter months to March. Late January and February are traditionally periods of extreme bushfire events in southern Tasmania.

The City of Hobart's bushfire management strategy takes into consideration the more typical weather patterns that occur throughout the year in the management of bushfire risk and mitigation programs in bushland areas. Weather is a critical factor in determining when an area can be burnt by a prescribed burn. The sequencing of prescribed burns is determined by a range of factors, not least of which is the time of year a prescribed burn can be undertaken. Timing in relation to weather, such as the possibility of rain in the day(s) before or after the proposed time of the burn, is also important.

The potential community impact of the smoke generated by a prescribed burn is also considered. For prescribed burns, the preferred weather is when the smoke will climb well into the air column to be dispersed broadly outside of the populated area. This is generally indicated by a 'mixing height' for the day that is calculated by the Bureau of Meteorology for regular three hours periods each day. Mixing height is an indicator of whether smoke will be trapped on a particular day. When there is low mixing height (e.g. closer to or less than 1000 m), smoke will stay closer to the ground. When the mixing height is higher (approaching or greater than 2000 m), smoke will disperse higher into the atmosphere and air quality will improve at ground level.³⁷.

The City voluntarily participates in the Co-ordinated Smoke Management System, which is co-ordinated by the Forest Practices Authority to manage smoke pollution levels in each populated air shed.³⁸.

Considerable planning goes into preparing and then carrying out a prescribed burn. The weather is continually monitored to identify a window when conditions are suitable. This is done ahead of time (within the seven day Bureau of Meteorology prediction cycle) to allow for advice to the community and stakeholders.

Predicted weather is often not reflected in the weather that occurs locally where the burn is to take place, especially for the hills and slopes around Kunanyi/Mt Wellington and the bushland reserves exposed to the influence of the Derwent River. At the very least, the topography in these areas often means wind does not behave as predicted, resulting in localised microclimates.

The weather on and around the time of any proposed prescribed burn needs to assist with achieving the objectives of the burn, especially in terms of the effects of weather on fire intensity, flame height and fire duration. Too little soil and fuel moisture can mean a prescribed burn might be far more intense, burn far more fuel and be harder to manage than proposed in the burn plan. Too much moisture might mean the prescribed burn is not effective, does not reduce the fuel sufficiently or cannot be initiated. Similarly, wind speed and direction can have a range of effects, including drying fuels before a prescribed burn, or making the burn too intense and possibly assisting in carrying fire beyond the proposed burn area (i.e. outside the containment lines).

Topography

The other key factor that effects prescribed burns and bushfires is topography. Factors such as slope angle, slope height, valleys, altitude and the arrangement of these features across the landscape have a major impact on fire behaviour and on fire intensity in particular. Valleys and peaks can direct wind in ways that are quite unpredictable ahead of the event. Slope is a critical factor in fire behaviour, especially the rate at which fire travels (rate of spread) and the intensity and behaviour of the fire. This influences the likelihood of achieving the desired burn intensity and impact on vegetation but also threatens effective control of the burn.

For example, a fire travelling in a straight line across flat land might move at 2 km/h. When it

reaches an upward slope of 10 degrees, the speed at which it is travelling will double almost immediately to 4 km/h, and for each additional 10 degree increase in slope the speed at which the fire travels doubles each time. So if the slope was 20 degrees the fire speed would increase almost immediately to 8 km/h and on a 30 degree slope the fire speed increases to 16 km/h.

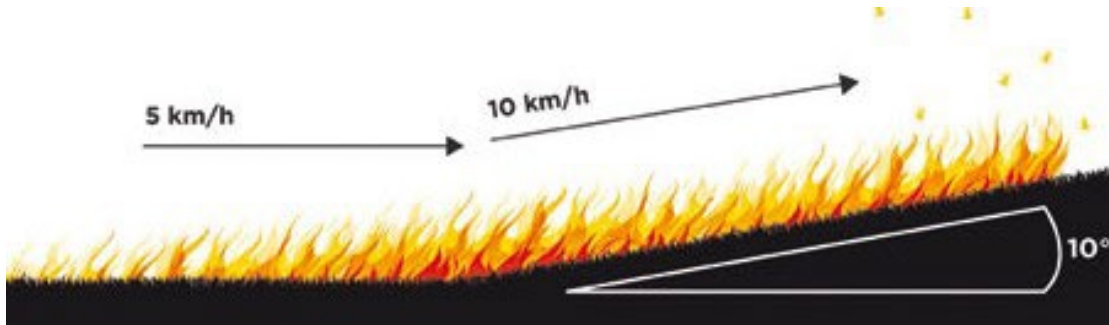


Figure 8. Slope angle effect on rate of fire spread (source: Tasmania Fire Service).

All of these environmental factors – including temperature, dryness, wind speed, slope, the location of hills and valleys – influence the decision to proceed with a burn in bushland reserves on any given day.

Fire ignition and fire behaviour

There are three factors involved in the ignition and persistence of any fire: fuel, oxygen and heat - or source of ignition. When it comes to bushfires, the only one of these three factors fire managers can realistically change is the availability of fuel.

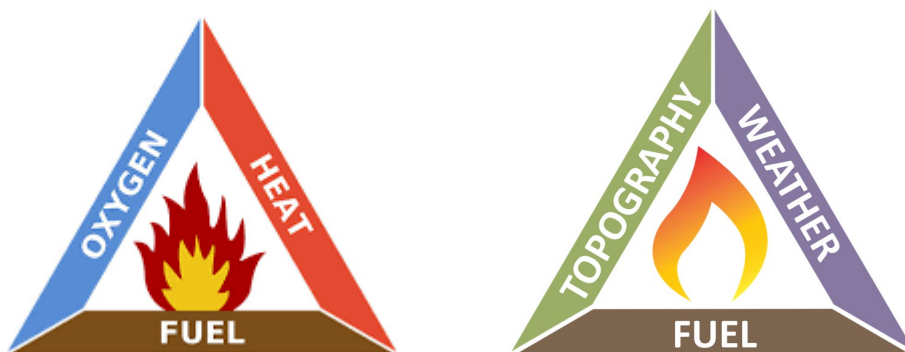


Figure 9. Fire triangles.

Fire behaviour is determined by the amount of fuel, weather and topography. We cannot really change weather or topography, but we can seek to change the fuel component. Regarding fire behaviour, fuel is more about the size and type of fuel and the arrangement of that fuel. The questions this pose are:

- Is there a lot of litter on the ground?
- Are there a lot of shrubs – we call these ladder fuels – that can help the fire reach the tree canopy?
- Is there a lot of dead material?
- Are there lots of trees with fibrous bark?

- Are there lots of ferns and other very flammable shrubs?
- Are the fuels continuous and consistent?

The answers to these questions are considered in each prescribed burn plan.

What can we change?

We cannot remove oxygen from the atmosphere and we cannot stop all ignitions. We cannot remove all topographic features or readily influence the weather. But we can change or alter elements in the landscape that fuel bushfires, and this, to a limited extent, is what the City of Hobart does to try to reduce bushfire risk.

Bushfire risk mitigation actions taken by the City include reducing the build-up of fuel in our forests through prescribed burns and the establishment of fuel breaks in areas adjacent to houses. These actions can help reduce the impacts of vegetation-driven bushfire by reducing on-ground and lower elevated fuels from an area between a dwelling and nearby bushland. How often these areas are maintained depends on annual inspections of site conditions and is driven by the rate of vegetation regrowth or fuel accumulation. Most areas are treated at least annually.

There are also areas that cannot be treated through prescribed burning because of the vegetation type. In these areas the vegetation is often quite dense and usually too wet to burn. These areas are often only susceptible to bushfire under Extreme or Catastrophic fire conditions.

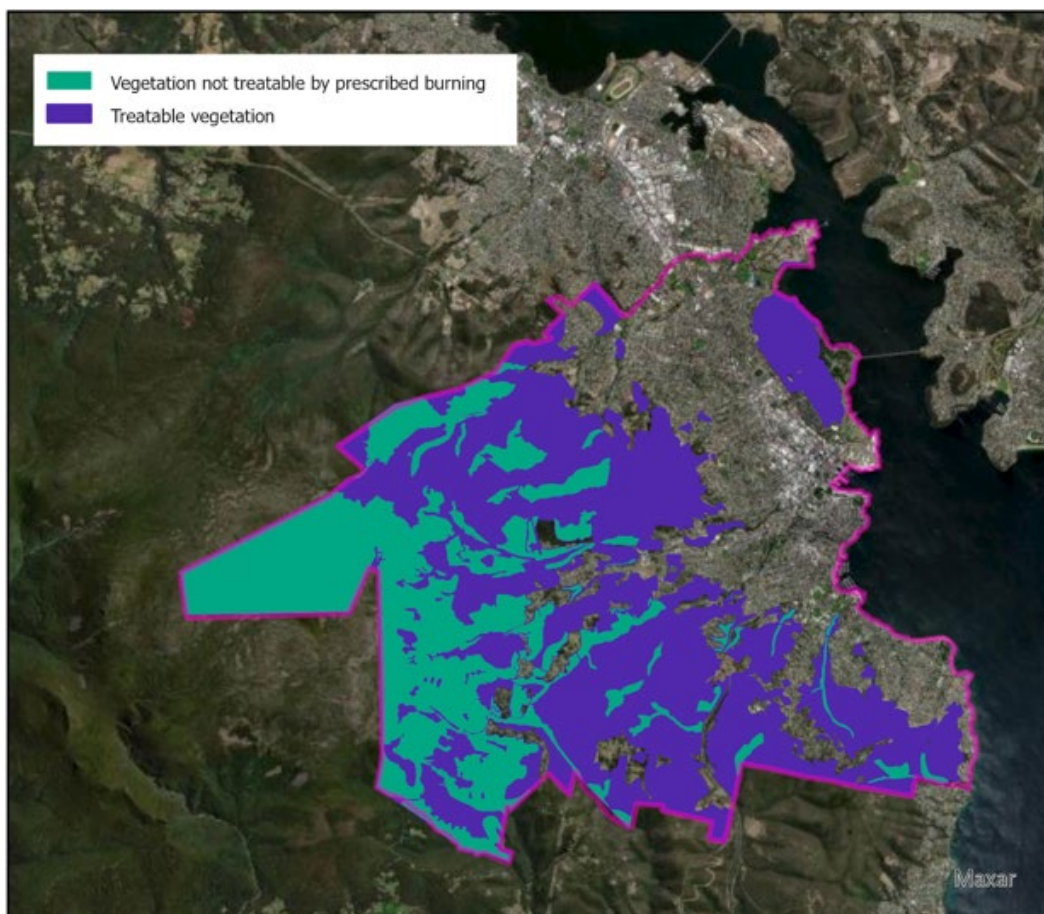


Figure 10. Extent of treatable vegetation in the Hobart municipality.

It is not possible to safely burn all bushland at the same time. This would be undesirable from, at the very least, a conservation management perspective and could result in an uncontrollable bushfire. Instead the City's prescribed burn program aims to create a mix of fuel loads across the landscape from natural fuel levels through to areas with significantly reduced fuel. One outcome of this patchwork of mixed fuel loads is that it can help moderate the development and rate of spread of future bushfires.

The City also maintains a fire trail network that sections bushland areas into more easily managed areas with respect to a prescribed burn or bushfires, and which provide clearly defined and possibly safer access and escape routes for firefighting agencies.

On top of these actions the City employs a well-trained, experienced and equipped firefighting force of more than 30 staff.

These people are trained to at least a Certificate II in Public Safety (Firefighting Operations). This training and experience provides knowledge and skills to respond to bushfire, carry out prescribed burning operations and plan for community safety during times of high bushfire danger. The training is backed up by ongoing and regular field experience.

The exploration of ways in which the City of Hobart can reduce the impact of bushfire on the community while protecting infrastructure and maintaining the high conservation values of our bushland reserves is an ongoing challenge, but one we must persist in if we are to provide ready access to Hobart's wonderful bushland reserves.

By seeking to reduce the risk of bushfire to the community, the City tries to ensure, to the extent possible, that:

- there is increased time and opportunity for residents to leave early when a bushfire threatens
- improved access for response by fire authorities to suppress bushfire ignitions
- moderate fire behaviour and improve success of fire suppression activities
- improve and support asset protection for people living adjacent to our bushland reserves.

It is important to remember that reducing risk does not equate to eliminating risk. Bushfire risk cannot be completely removed but, with careful thought and the cooperation of everyone working together, we can try to reduce the impact but it will most likely remain significant.

Bushfires and house loss

Buildings in areas exposed to higher levels of bushfire risk, such as those closer to bushland, are more exposed to significant consequences once a bushfire starts, including damage to infrastructure and injury or loss of life.

The three elements that damage assets or threaten life in a bushfire are:

- the effect of direct flame on an asset or person
- the effect of radiant heat on a structure, surface or person
- the potential for an ember to ignite material in close contact with (or part of the construction) of an asset or building.

House-to-house ignition is the greatest cause of housing loss in major bushfires. This has

been detailed in reports by the Bushfire and Natural Hazards Cooperative Research Centre and the CSIRO Bushfire Urban Design Unit.³⁹

The preparation of individual houses by landowners is the only way to effectively reduce the potential for property loss in urban areas during a major bushfire.

What is the City of Hobart doing?

The City seeks to reduce these risks by cutting back flammable vegetation in fuel breaks and mechanically thinning vegetation within the Strategic Fire Management Zone immediately adjacent to houses. Prescribed burns are conducted throughout bushland managed by the City of Hobart where physically and environmentally appropriate, and a community education program helps educate people about the importance of taking action to reduce bushfire risks on their property.

Managing fuel loads within bushland reserves is one way the City reduces the likelihood of ember attack in moderate fire danger conditions. But while this work can help reduce the potential for ember attacks it by no means eliminates the risk.

The effects of ember attack on a house or property can be reduced through building design, regular maintenance and appropriate bushfire preparation. Embers landing well away from a fire front can spark new fires that engulf nearby properties if local sources of ignition such as dry timber on the ground, leaves in open gutters or inappropriate vegetation or landscaping material, such as woodchips, are in close proximity.

The chances of a house or property surviving an ember attack is dependent on how well it has been prepared for a bushfire, and is the responsibility of the owner. This is overwhelmingly private householders.

The risk of ember attack

The Tasmania Fire Service has analysed the risk of ember attack on Hobart during a major bushfire under severe fire weather conditions using the Phoenix Rapid Fire model⁴⁰.

The analysis shows embers could reach the city, leaping over the current bushfire risk prone areas. The exact location of any exposure site is completely dependent on the location of the ignition point and prevailing fire weather.

The random nature of where embers could land in Hobart during a bushfire attack makes it impossible to define an exposure area for an ember attack in the Hobart Planning Scheme.

In the event of a bushfire under Extreme or Catastrophic fire conditions, the potential impact of embers is not likely to be significantly moderated by current landscape level fuel treatments such as fuel breaks and prescribed burns.

Fuel management programs are not an effective tool in mitigating the risk to individual properties from ember attack.



Figure 11. Ember attack (Source: CFA)

What can be done?

The current Australian Standard AS3959 2018 provides guidance for the construction of buildings in a bushfire-prone area and can also help guide the retrofitting of existing housing stock to improve resilience to fire and ember attack.

All Australian fire agencies have developed information to help people prepare their properties for ember attack and in doing so reduce the most common cause of house loss during a bushfire – house-to-house ignition.

The Victorian Country Fire Authority has an excellent guide to retrofitting existing houses with bushfire protection modifications⁴¹.

Community engagement and information sharing is the most effective tool in encouraging residents to take action on their own property to protect themselves and their assets from fires generated by ember attack.

Key documents for mitigating the risk to structures in bushfire-prone areas include:

- AS 3959:2018 Construction of buildings in bushfire-prone areas
- AS 5414—2012 Bushfire water spray systems
- Australian Building Codes Board, Private Bushfire Shelters Performance Standard 2014
- NASH Standard Steel Framed Construction in Bushfire Areas 2014.

The current Australian Standard AS 3959 2018 defines the requirements for buildings in bushfire-prone areas. When combined with other standards and research offered by the Bushfire and Natural Hazards CRC and CSIRO, it provides a comprehensive suite of actions for landholders to use when safeguarding their property against bushfire.

Treatment strategies

Fire management planning

The City of Hobart has developed a detailed approach to fire management planning for bushland in the greater Hobart area. The first action has been to zone all of the bushland into one of three Fire Management Zones (FMZs):

1. Asset Protection Zones
2. Strategic Fire Management Zones
3. Land Management Zones

The three FMZs have been identified based on the level of potential risk to life, property and infrastructure from any bushfire coming through adjoining bushland. The identification of these zones also included an analysis of the potential for reduced risk that could be achieved through vegetation management.

Management units

While smaller areas are managed separately, for fire management purposes, the majority of Hobart's bushland reserves are clustered into five major management units:

- Queens Domain
- Ridgeway Park and Waterworks reserves
- Knocklofty and McRobies Gully reserves
- Bicentennial Park, Porter Hill and Mt Nelson reserves
- Wellington Park

These five units are then divided into smaller Vegetation Management Units, which are areas of native vegetation separated by natural boundaries such as roads, trails, creek lines, or different vegetation classes, to allow for detailed and localised fire treatments. These smaller units range in size from less than a hectare to as large as 65 hectares.

Vegetation communities and fire thresholds

Management units also map one or more vegetation communities. Even within the same management unit, different vegetation communities might exist that require different forms of fire management, depending on their ecological needs.

Fire Management Zones

Asset Protection Zones

Asset Protection Zones have been created to help protect houses and other private property in close proximity to bushland from the impacts of bushfire. Asset Protection Zones can take many forms. In Hobart they are predominantly constructed as fuel breaks, which are managed to the [Tasmania Fire Service Fuel Break Guidelines](#).⁴² It must be noted that fuel breaks can be created in any management zone to help interrupt the progression of a fire. The City of Hobart has chosen to locate the majority of fuel breaks in Asset Protection Zones.

Bushfire fuel in these zones is reduced by limiting the amount of vegetation available to a bushfire. The bushfire risk is reduced by removing on-ground and elevated fuels. This does not mean the total removal of all vegetation - trees generally remain spread throughout these areas. An Asset Protection Zone alone may not provide complete protection for a home or property from vegetation-driven bushfire. Individual properties should meet appropriate bushfire building and maintenance standards, and include the maintenance of surrounding private land.

The City of Hobart will largely complete this process by 2023 with ongoing annual maintenance.

It is important to note that Asset Protection Zones can extend across property boundaries. The City reduces the build-up of bushfire fuels within the Asset Protection Zone on council land, but not on private property. It is up to individual property owners to manage the fuel load on their land, especially in relation to protecting their house and associated buildings from bushfire and ember attack.

It is incumbent on all property owners to implement their Property Protection or Bushfire Hazard Management Plan where one exists, and to take notice of fuel break management guidelines provided by the Tasmania Fire Service.

The City of Hobart undertakes actions intended to assist in protecting life and property from bushfire by managing the fire risk within the land it manages, but for this work to have any chance of reducing fire risk to adjacent properties individual property owners must also manage the fire risk on their land.

Strategic Fire Management Zones

Strategic Fire Management Zones are designed to reduce the potential of fire to spread unhindered through bushland areas by:

- providing open space from which firefighters can protect private property during a bushfire, especially in the absence of fuel breaks
- increased fuel management over that provided in Asset Protection Zones
- providing strategically placed open areas to reduce the potential for large bushfires to develop
- creating areas where fire can more easily be suppressed
- providing strategically located open spaces that reduce the vulnerability of assets susceptible to fire.

Strategic Fire Management Zones are not managed as intensively as Asset Protection Zones and are generally areas within which prescribed burns are carried out. Fuel loads in these areas are most often reduced to a moderate level, and provide a mosaic of fuel-managed areas across the landscape.

Any increased accumulation of fuel in Strategic Fire Management Zones can lead to the need for more frequent prescribed burns than recommended under accepted thresholds, however, burn conditions remain very considerate of ecological objectives in these areas.

Land Management Zones

Land Management Zones are managed more for biodiversity and broad-scale fire path management than for specific fire hazard reduction to any given assets.

Prescribed burning in these areas is designed to complement existing fire mosaics within Strategic Fire Management Zones, helping to create varying fuel loads across the landscape. Prescribed burns in these areas generally have a clearer ecological benefit.

Reducing bushfire risk in bushland areas

The City of Hobart uses three bushfire management mechanisms to reduce bushfire risk:

1. Fuel breaks
2. Fuel management
3. Fire trails.

In 2017 a Tasmanian Vegetation Fire Management Policy⁴³ was developed by the State Fire Management Council to provide guidance in the use and control of fire to reduce bushfire risk. The City of Hobart has based its bushfire management plans on this policy, and encourages a shared approach to bushfire management.

The policy reinforces the City's strategy of using prescribed fire to reduce the build-up of fuels in fire-prone areas as a primary means of reducing bushfire risk. The policy also highlights the importance of treating bushfire fuel in zones close to assets such as houses, and the need to take a landscape approach to risk assessment. The City does this through an annual program of prescribed burns, mechanical thinning of bushland, an extensive fuel break program and fire trail management program.

Fuel breaks, prescribed burns and mechanical thinning are all specifically directed at reducing the ferocity and forward momentum of any bushfire threatening Hobart.

The policy also notes that "Bushfire does not recognise tenure. Consequently, all land owners, occupiers and managers have a responsibility to work cooperatively to manage risk".

Fuel breaks

Fuel breaks are usually a cleared or semi-cleared strip of land created between nearby bushland and homes, buildings or infrastructure. They are designed to help protect people and property from fire coming out of a bushland area by substantially reducing bushfire fuels such as tall grasses, shrubs and smaller trees, and by creating an open, clearer and possibly more defensible space.

The City of Hobart creates and manages an extensive network of fuel breaks across its bushland reserve network and uses the Tasmania Fire Service Fuel Break Calculator⁴⁴ to determine the minimum width of each fuel break. The width of every fuel break is measured from each house (generally the rear wall), across the fence and into the bushland beside each property.



It is important that everyone who lives adjacent to bushland in Hobart understands that the City of Hobart only manages that part of the fuel break that is on council land. It is up to residents to manage the component of the fuel break that is on their land – usually the space from your house to your property's boundary with the bushland reserve.

This means householders should minimise bushfire fuel on their property in the same way the City minimises bushfire fuel on its side of the fence. This includes keeping fire-prone vegetation to a minimum and any other flammable material such as wood piles away from houses and other buildings.

Every year, before the bushfire season starts, residents living adjacent to bushland reserves are advised to cut back fire-prone vegetation between their property and reserve boundaries and to check for fire hazards.

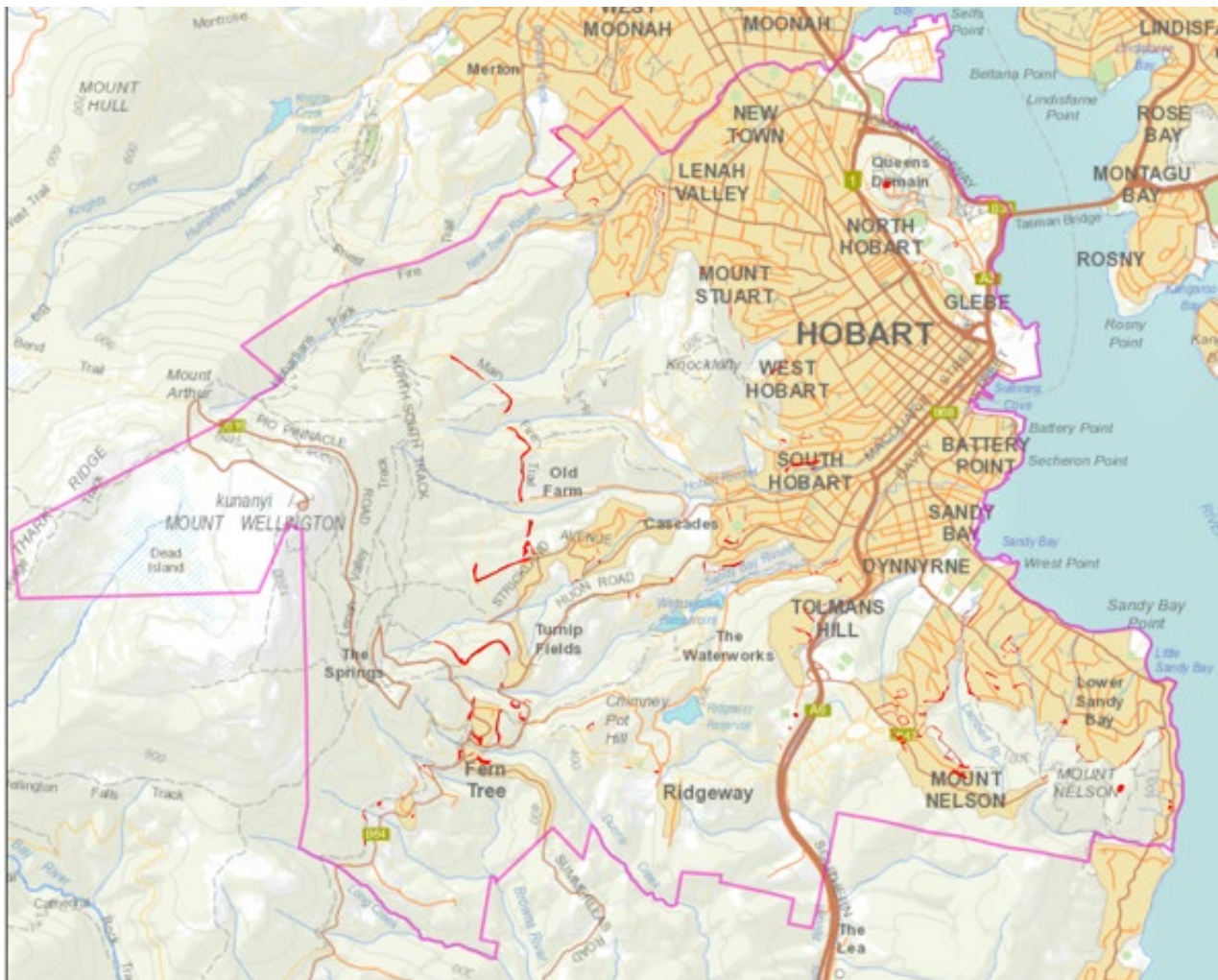


Figure 13. Fuel breaks on City of Hobart managed bushland.

To comply with Tasmania Fire Service guidelines⁴⁵, all residents should:

- reduce bushfire fuel levels around homes and buildings, particularly adjacent to bushland
- not dispose of garden cuttings in nearby bushland – this increases the bushfire risk
- not plant vegetation in, or adjacent to, an existing fuel break - plantings hinder the effectiveness of the fuel break and will be removed.

Fuel breaks can be an effective fire prevention and firefighting tool, but they cannot stop all fires all of the time. During Extreme and Catastrophic fire danger conditions, fuel breaks can help reduce the intensity of bushfire, but once a fire has escalated to an intensity where there are significant ember attacks, spotting well ahead of the fire front and/or crowning through the top of the forest canopy, it is unlikely a fuel break will stop a fire of this magnitude.

During lower intensity fires, fuel breaks provide significant advantages. They can provide safer access for firefighters and create a potential buffer zone between firefighters and the fire front, which can reduce exposure to radiant heat and other fire-related dangers such as falling trees and branches. Similar open space on private properties can potentially (dependant on access and other safety considerations) be used to defend the property from bushfire.

Fuel management

Every year the City of Hobart undertakes a program of prescribed burns across its bushland reserves. These burns are intended to reduce the build-up of bushfire fuel such as dry leaf litter and grass and can be effective for at least three to five years, occasionally longer.

It is not possible or desirable to safely burn all of Hobart's bushland every year. Frequent burning of native forest, woodland and grasslands can have significant adverse impacts on native plants and animals.

Carrying out prescribed burns in different areas over a longer period of time creates a mix of fuel loads across the landscape and leaves habitat strongholds and sanctuaries for animals and for fire sensitive plants.

Reducing the amount of flammable material in Hobart's bushland reserves can lower the severity of future bushfires and the movement of bushfire through the landscape.

Just like fuel breaks, prescribed burns cannot stop all fires all of the time but when combined with fuel breaks they can help reduce the intensity of bushfires. However if conditions are severe enough for a fire to start crowning through the top of the forest canopy, there is very little that will halt its spread.

When fire conditions reach Extreme or Catastrophic FDRs, the amount of fuel on the forest floor makes little to no difference to a fire's intensity. In one study following Victoria's 2009 Black Saturday bushfires,⁴⁶ where the Fire Danger Rating exceeded 100, it was found that even in areas where prescribed burns had been carried out within the last five years, there was no measurable effect on the intensity of the fires. This is the result of conditions that enable a fire to operate at the upper canopy level (crown fire) and not be reliant on surface or elevated fuels to continue to spread.

During the bushfire season the Bureau of Meteorology releases local Fire Danger Ratings. In

Hobart, once this rating enters the Extreme category (50-99) a number of actions are triggered to reduce the impacts on people from any bushfire that could ignite under these conditions.

Many of Hobart's reserves are classified as bushfire-prone areas - an area of bushfire-prone vegetation equal to or greater than one hectare. While they are great places to visit and enjoy, on days of elevated fire danger they may not be safe. The City of Hobart may close selected reserves in the interests of public safety when the Fire Danger Rating is Extreme or higher.

Planning prescribed burns

The City of Hobart takes prescribed burning very seriously and has invested heavily in equipment and the training of staff to undertake prescribed burns, predominantly between autumn and spring.

It would be financially impossible and environmentally catastrophic to burn every patch of bushland in Hobart every year in the hope it would eliminate all bushfire risk. Instead, the City works within a number of parameters - environmental considerations, resource limitations and community needs.

A number of other factors are also considered in determining when and where prescribed burns can safely take place, including:

- vegetation communities
- threatened plant and animal species
- Aboriginal heritage sites
- European heritage sites
- smoke management
- traffic management
- presence of utilities such as power and telephone infrastructure
- tolerable fire intervals and the time since an area was last burnt.

The City has an ongoing program to map flora and to assess the relative condition of vegetation prior to a prescribed burn being conducted. These assessments are considered in all fire management planning. Threatened plants and animals and historic heritage are considered through the Tasmanian Natural Values Atlas⁴⁷. Aboriginal Heritage Tasmania⁴⁸ is consulted with respect to Aboriginal sites and other cultural considerations as part of the prescribed burn planning process.

Every plan takes these matters into account and plans are modified appropriately. Any statutory approvals required for a prescribed burn are obtained prior to the plan being endorsed. 'Dial Before You Dig'⁴⁹ is also checked prior to the burn commencing to ensure that all in-ground services are protected from the preparation works and from the burn.

Tolerable fire intervals

The City of Hobart uses the concept of tolerable fire intervals to determine the fire return frequency for prescribed burns. Tolerable fire intervals represent the fire interval range within which ecosystems are expected to be resilient³⁵. The tolerable fire interval for Tasmanian vegetation communities can be found in *Tolerable Fire Intervals for TASVEG communities*.

Human considerations

When taking into account the needs of the community we look at which bushland areas are close to houses. Will smoke impact the local community? How can we reduce impacts? We also factor in activities planned for the area. The grasslands and woodlands of the Queens Domain are an obvious case. The Domain often plays host to sporting events and people use it every day for walking and jogging, it is close to houses and businesses, bounded by major roads and there are some commercial grape vines nearby.

A safe and successful prescribed burn also requires consideration of a number of other factors. This includes understanding what the wind will do on the day, how well the smoke will rise and disperse high into the atmosphere and knowing that the vegetation is dry enough to take on a cool burn, but not so dry that it becomes a fire hazard in its own right.

Burn prescriptions

All of these conditions, and more, are taken into account for each individual burn, and form what is termed the prescription, hence prescribed burn. Every time we carry out a prescribed burn in Hobart's bushland reserves it has behind it a detailed burn plan setting out weather conditions, any limitations on burn intensity and constraints such as threatened plant or animal species, or Aboriginal and European heritage values that should be protected.

Preparing for each burn can be complex and includes removing fuel from fire trails, around flammable trees and larger habitat trees as well as any threatened assets or sites.

The City of Hobart has developed a decision matrix that looks at all of these factors:

- Fire Management Zoning – meet the management objectives for each zone.
- Management Units – boundaries and options to manage/contain the fire.
- Vegetation Communities management objectives.
- Species management objectives, especially for threatened and vulnerable species.
- Vegetation thresholds and time since last burnt - not wanting to under or over burn any area.
- Seasonal fire conditions – consider the need to change the timetable to suit seasonal conditions.
- Separation of burnt areas to achieve a matrix and create a spread of fuel-reduced areas while having separation in time between when neighbouring management units are burnt.

These factors must be accounted for together with other matters such as access, the need for smoke and traffic management as well as managing conflicting issues like ongoing public access. This is particularly important for sporting and other events that would be significantly disrupted if prescribed burns were scheduled without due consideration.

The best time to conduct prescribed burns in Hobart is generally autumn or spring, although it can be at other times for specific vegetation units or specific desired outcomes.

All of this information is taken into account when planning and scheduling the City of Hobart's annual prescribed burning program. As a result, while every attempt is made to create a clear order of burning, this rarely happens exactly as planned.

Fire management capacity

The City of Hobart generally plans, prepares and conducts all prescribed burns only on City-

managed land. It also manages the biodiversity values of these areas, especially through weed management. The Tasmania Fire Service⁵⁰ may take a lead role in prescribed burns on City-owned land, generally for burns that cross multiple tenures.

The City of Hobart staffs about 30 firefighters trained to industry standards. These staff members all have other responsibilities, but are available, generally at short notice, to assist with any prescribed burns on City-managed land.

The team includes experienced Incident Controllers as defined by the Australian Inter-service Incident Management System (AIIMS) as well as a number of experienced Divisional Commanders. The City's firefighters undertake annual health and fitness assessments as well as additional training as required.

The City maintains a number of 4WD vehicles specifically modified or prepared to support firefighting efforts. This includes vehicles with water tanks and pumps as well as larger tankers and tractors. The City also maintains equipment such as hoses, pumps, etc.

Mechanical thinning

Past management practices have altered Hobart's bushland reserves over time. One of the best examples is on the Queens Domain. Much of the Domain was once grassland interspersed with eucalypts and wattles, however, many of these areas have become dominated by she-oak (*Allocasuarina verticillata*). While she-oak is a native plant, conditions on the Domain allow it to dominate and suppress native grasslands and outcompete other tree species such as eucalypts, especially for water. This can lead to many eucalypts becoming severely stressed or even dying.

She-oak is a species that burns easily and burns hot. Grasslands require regular burning but do not respond well to extremely hot burns. Suppression of native grasses by she-oak also significantly reduces the amount of grass seed in the soil, which in turn has consequences for natural regeneration following any fire.

By thinning out the amount of she-oak on the Queens Domain we can help return the landscape to an open grassy woodland and bring back more of the critically endangered lowland temperate grasslands, a federally listed vegetation community.

Fire trails

The City of Hobart manages more than 120 km of fire trails and in 2016 adopted a fire trail design standard used by the Tasmania Parks and Wildlife Service. These fire trails are predominantly classes three and five in the parks service's fire trail classification system. All of these classifications are suitable for access only by a 4WD vehicle or similar. Most are closed to public vehicle access.

The City's separate, "unclassified fire trail" standard applies to lesser maintained and dormant fire trails, which can be used as containment lines for prescribed burns or for occasional access to specific sites. A comprehensive trail maintenance and repair schedule is in place.

Fire trails serve a number of functions. They can act as a firebreak and play a critical role in providing rapid response and close access to fires, giving firefighters the opportunity to undertake initial attack and early containment of bushfires.

An effective fire trail network increases the number of options available in implementing prescribed burns that protect communities and social, cultural, environmental and economic assets.

Bushfire risk identification and mitigation

Bushfire risk to the Hobart community

Bushfires pose very real risks to the Hobart community, both socially and physically, with at least three high-risk locations:

- the Wellington Range, particularly the eastern slopes of kunanyi/Mt Wellington including Fern Tree, Strickland Avenue and Old Farm road
- Mt Nelson/Tolmans Hill areas
- Ridgeway and Summerleas Road areas.

The City of Hobart identifies that:

- There is a risk to residential and commercial properties on the urban fringe of Hobart from the effects of bushfire.
- There is a risk of environmental damage to bushland reserve areas, particularly Wellington Park, from the effects of bushfire.
- There is a risk bushfire will damage water and sewage infrastructure.

Specifically, the risk is that fire will proceed from or across bushland and directly impinge on people, houses, animals, plants, cultural and historic sites, buildings, services and infrastructure.

The five key elements of a bushfire that impact people and infrastructure are:

- smoke
- fire-induced winds
- direct contact with fire
- radiant heat
- embers and ember attack.

Each element can vary widely in how it impacts individuals, the community and infrastructure.

Smoke might be a nuisance to one person but debilitating for the health of another. Weather conditions on one day might keep bushfire smoke low, on another conditions might disperse smoke higher into the atmosphere.

Fire-induced winds can have catastrophic impacts. However, the level of risk would depend on where the subject at risk is located in the landscape, and with respect to a building the risk would also depend on engineering considerations such as construction materials, building methods and proximity of vegetation and other flammable material.

The impacts of direct contact with fire would depend on the location of the subject at risk in the landscape, its proximity to bushland and how nearby fuel has been managed - for example, have flammable materials been stored next to a house?

Clearly, to assess the level of bushfire risk for every object in Hobart under every conceivable

circumstance would be impossible. Instead, this strategy specifies broad actions the City of Hobart will take to reduce the risks of bushfire impacts on people, infrastructure and services.

It is imperative that every member of the community assess their vulnerability and the vulnerability of where they live and work and take appropriate actions to try to reduce the risk to themselves and those close to them.

Risk analysis

As has already been stated the risks of bushfire impacts on the Hobart community is high and the consequences can and will range from low to catastrophic.

Historically, the most destructive bushfires to hit Greater Hobart have approached from the north and west – a line of approach that traverses much of the area's bushland and urban areas.

A risk analysis often identifies risk levels based on a series of criteria. In the case of bushland this could include proximity of infrastructure to vegetation, slope, aspect, vegetation flammability and position on slope.

Key areas of risk assessed by the City of Hobart are:

- Safe access/egress: Road verges, dangerous trees, verge vegetation management.
- Bushland/urban interface: Fuel breaks.
- Bushland fuel management: Prescribed burning and mechanical treatments.
- Access: Fire trail network.

To ameliorate these areas of risk the City is pursuing one or more corresponding response or treatment options.

Safe access/egress: Road verges, dangerous trees, verge vegetation management

When bushfire threatens a community clear exit routes can mean the difference between life and death.

The provision of information about the location and nature of any fire, where it might impact, and proposed community responses are all managed by the Tasmania Fire Service. Once the public has been warned to evacuate an area due to an oncoming danger, traffic management is managed by Tasmania Police. Under such circumstances the City of Hobart plays an ancillary role.

However, the City is responsible for ensuring that, within its powers, roads are accessible and fit for traffic, and has started work making roads safer during the bushfire season through improved roadside vegetation management.

This work is being guided by Tasmania Fire Service guidelines outlining the extent to which roadside vegetation should be managed to reduce bushfire risk⁵¹.

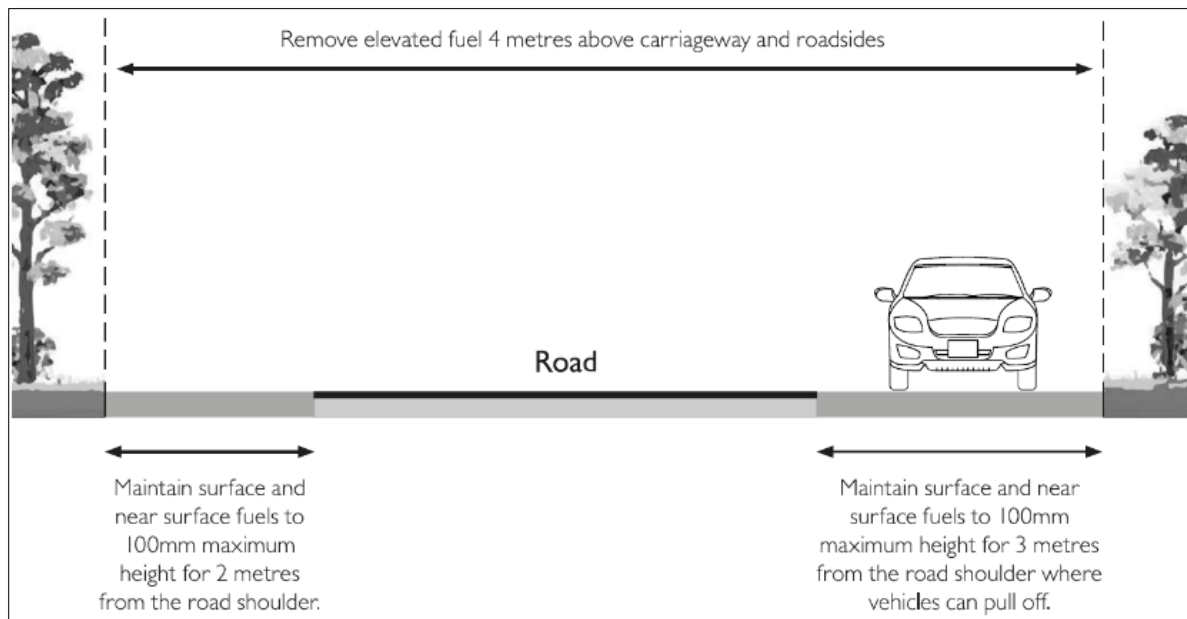


Figure 14. Road verge vegetation management for bushfire mitigation. Source: Tasmania Fire Service.

Vegetation on roads including Huon Road, Summerleas Road, Chimney Pot Hill Road and Waterworks Road has already been assessed. Other roads will be assessed in the future.

A number of roads have also been identified as strategically important access and exit routes during a bushfire emergency. Their strategic importance is based on three main factors: the number of people who will need to access a given road, the complexity of access/egress; the extent and proximity of roadside vegetation.

Two key factors that can impede road access during a bushfire are radiant heat and fallen trees. To mitigate these risks the City now has a program to identify trees near roads at risk of falling because of factors that include tree age and tree health.

Four strategically important roads have been identified as carrying the greatest risk of fallen trees during a bushfire emergency and treated accordingly.

They are:

- Huon Road
- Waterworks Road
- Chimney Pot Hill Road
- Summerleas Road.

Other major access roads will be assessed and roadside vegetation risks removed.

Table 8: Risks, treatments and responsibilities in relation to bushfire.

Road	Management notes
Huon Road	<ul style="list-style-type: none"> Due to historic approaches towards managing Huon Road within the Hobart Local Government Area, ownership and responsibility for managing roadside vegetation is unclear. Road infrastructure includes power and communication cables. Vegetation beneath these cables is managed by TasNetworks. The City of Hobart will work with residents, land owners and TasNetworks to as well as Kingborough Council to manage roadside vegetation in line with Tasmania Fire Service guidelines. Dangerous trees assessed within the Hobart Local Government Area in 2019 have been removed. This work will be repeated approximately every five years. Any trees identified as dangerous in the interim will be removed.
Summerleas Road	<ul style="list-style-type: none"> Summerleas Road is an important route out of the Fern Tree area if Huon Road is cut or becomes congested. The City of Hobart manages the first 1.2 km of this road. The rest is more heavily vegetated and exists within the Kingborough Local Government area. Due to historic approaches towards managing Summerleas Road within the Hobart Local Government Area, ownership and responsibility for managing roadside vegetation is unclear. Roadside vegetation appears to be a mix of native bushland and plants that have probably migrated out of adjoining gardens or have been planted on the verges. The City of Hobart will work with residents, land owners and Kingborough Council to better manage roadside vegetation in line with Tasmania Fire Service guidelines. Dangerous trees assessed within the Hobart Local Government Area in 2019 have been removed. This work will be repeated approximately every five years. Any trees identified as dangerous in the interim will be removed.
Chimney Pot Hill Road	<ul style="list-style-type: none"> Chimney Pot Hill Road is one of two access/egress roads for the Ridgeway community. It also offers an alternative exit route if Huon Road is cut anywhere below the intersection of the two roads. Chimney Pot Hill Road is bounded on both sides by bushland, most of which is managed by the City of Hobart. Roadside vegetation is being actively managed in line with Tasmania Fire Service guidelines. Dangerous trees assessed within the Hobart Local Government Area in 2019 have been removed. This work will be repeated approximately every five years. Any trees identified as dangerous in the interim will be removed.
Ridgeway Road	<ul style="list-style-type: none"> Ridgeway Road is the main access/egress road for the Ridgeway community. Ridgeway Road is bounded on both sides by bushland, most of which is managed by the City of Hobart. Roadside vegetation is being actively managed in line with Tasmania Fire Service guidelines. Dangerous trees assessed within the Hobart Local Government Area in 2019 have been removed. This work will be repeated approximately every five years. Any trees identified as dangerous in the interim will be removed.

There are many other roads within the City of Hobart that are close to bushland and have heavily vegetated verges. Many are quite short, are used by only a small number of people, and are not expected to be heavily trafficked during a bushfire emergency. However, the City is committed to working with residents if they believe roadside verges in their area warrant similar bushfire risk mitigation work.

It should be noted that large sections of road verges within Hobart are not managed by the City of Hobart. As such bushfire risk mitigation, such as the removal of dangerous trees, may not have been undertaken.

Trees and roadside vegetation that could pose a risk during bushfire may also be on private land. The City will continue to encourage and work with other land owners to reduce such risks.

Bushland/urban interface: Fuel breaks

Fuel breaks are employed by the City of Hobart to treat and ameliorate bushfire risks at the bushland/urban interface. As such the creation and maintenance of fuel breaks between bushland and private property is a high priority as part of bushfire risk mitigation works.

The City is also working with other owners of major bushland areas within Greater Hobart to help them establish similar fuel breaks between the bushland they own and manage and houses immediately adjacent to their land. This is also a high priority.

Bushland fuel management: Prescribed burning and mechanical treatments

Approximately 1130 ha of vegetation within the City of Hobart's bushland reserve system can be managed partly through prescribed burning. The aim is to manage the fuel load in these areas on a rotational basis over 10 to 15 years. To achieve this the City will aim to treat approximately 5% of this land every year.

And while a range of factors may make it impossible to meet this target every year, averaged out over a 15 year timespan the target should be obtainable.

There are times when pockets of Hobart's bushland reserve system become high priority prescribed burn areas, but a range of factors make this ecologically and socially unacceptable. In such cases mechanical thinning of understorey vegetation is another option for reducing bushfire risk. Mechanical thinning helps remove and modify vegetation in a way that limits the ability for fire to climb up into the tree canopy. It is not unlike a fuel break but it is less ecologically impactful.

Access: Fire trail network

The City of Hobart has profiled and mapped the strategic importance of each fire trail within its bushland reserve system. These profiles include information about the trail surface, the type of vehicle it can safely carry and its maintenance level. An audit of each fire trail is carried out annually, and in some cases even more regularly.

Ongoing maintenance of fire trails include major realignments, resurfacing or drainage upgrades, environmental and heritage assessments and engineering design reviews. Depending on the level of work required, some of these maintenance tasks can take in excess of three years to achieve.

The strategic importance of a fire trail, its physical condition and level of access all play a role in prioritising its maintenance. If, for example, an essential trail suffers major damage through flooding or tree fall it will generally be moved up the priority works list. Similarly, a trail listed as essential will generally be prioritised over a trail listed as important.

High risk locations

The Hobart Bushfire Risk Assessment Planning Guidelines identify the following areas as high risk locations where bushfires have, and will continue to, impact people and their dwellings and associated infrastructure:

- the Wellington Range, particularly the eastern slopes of kunanyi/Mt Wellington, including Fern Tree, Strickland and Old Farm roads
- Mt Nelson/Tolmans Hill areas
- Ridgeway and Summerleas Road areas.

This risk is recognised by the Tasmania Fire Service, which has prepared the following Community Bushfire Protection Plans for these at risk areas:

- Fern Tree
- Summerleas
- South Hobart
- Mt Nelson - Tolmans Hill
- Ridgeway
- Glenorchy - Lenah Valley area.

These plans can all be found on the Tasmania Fire Service website and the City has prioritised these areas for a range of bushfire mitigation actions.

Fern Tree and Summerleas Road

Wet forests present considerable difficulties in relation to bushfire management. Prescribed burning to reduce fuel is very difficult as the fuel in these forests is too wet to ignite most of the time. However, during summer when the fuel and soil dries out wet forests can burn. This limits our fuel reduction strategies at Fern Tree. Therefore the focus is on establishing fuel breaks, verge management along key roads out of the area and community messaging around the importance of leaving early.

The City is also exploring the option of modifying vegetation structure beyond current fuel breaks. The extent and form of this modification is yet to be determined but will be guided by research, evidence and advice before being implemented. As with the prescribed burns program, the effects of any management actions on fauna and flora will be monitored.

Managing roadside vegetation in Fern Tree can also be difficult. The boundary between private property and the road reserve is often indiscernible or the vegetation is managed by other authorities.

The City of Hobart carries out regular community meetings with the Fern Tree community about ongoing bushfire mitigation works and to help individuals identify and mitigate bushfire risks on their own land.

South Hobart

Much of the bushland in the South Hobart area is privately owned. The City of Hobart is actively working with the largest private bushland owner in the area to extend its fuel break program on to their land.

The Tasmania Fire Service is the key agency facilitating prescribed burning on private land in South Hobart.

Mt Nelson-Tolmans Hill

The Mt Nelson-Tolmans Hill area is surrounded by forest and is most likely to lie in the path of any major fire that approaches Hobart from the northwest.

The City of Hobart maintains a Nearby Safer Place at the Mt Nelson Oval as identified on the Tasmania Fire Service's Community Bushfire Protection Plan for the Mt Nelson/Tolmans Hill area⁵².

It maintains fuel breaks between local bushland and adjacent private dwellings, carries out prescribed burns on City of Hobart-owned bushland and liaises directly with the Tasmania Fire Service and the Parks and Wildlife Service when they carry out prescribed burns on their land.

Roadside vegetation management is also a high priority for this area.

The City of Hobart carries out regular community meetings with the local community about ongoing bushfire mitigation works and to help individuals identify and mitigate bushfire risks on their own land.

Ridgeway

Ridgeway is surrounded by forest and is most likely to be in the direct path of any major fire approaching Hobart from the northwest.

There are limited fuel breaks in this area because of larger property sizes where land management falls completely within private hands.

Prescribed burns are the best way to reduce fuel in Ridgeway's dry eucalypt forests. This area has high ecological values, and so ongoing monitoring of the impacts of fire remains an important component in managing biodiversity.

Chimney Pot Hill and Ridgeway/Waterworks roads are the only routes out of Ridgeway during a bushfire. The City of Hobart manages large sections of these two roads, and is prioritising the management of roadside vegetation in this area.

Glenorchy-Lenah Valley area

The City of Hobart owns a small amount of bushland in the Glenorchy Council area. Any fire bushfire mitigation works need to be coordinated with Glenorchy City Council, the Tasmania Fire Service, Wellington Park Management Trust, other authorities and private land owners.

Knocklofty and McRobies Gully reserves

Knocklofty Reserve is a 122 ha bushland reserve three kilometres west of the Hobart CBD. McRobies Gully is 179 ha and sits between Knocklofty Reserve and Wellington Park. It includes most of the McRobies Gully catchment and one of the Hobart Rivulet's three tributaries. Together the two reserves form a strip of bushland running from Wellington Park to the western urban perimeter of Hobart.

The Knocklofty ridgetop, and the ridges either side of McRobies Gully, are underlain by Jurassic dolerite. The lower slopes are formed on Triassic sandstones and Permian mudstones. Soils include stony black clay loams or clays on dolerite, gravelly grey-brown sandy loams on dolerite, and highly dispersive grey-brown loamy sands on sandstones.

The vegetation ranges from wet forests along the lower, south-facing slopes to dry grassy woodlands and grasslands on the ridge tops.

Average annual rainfall in Knocklofty and McRobies Gully is around 650 mm. Winds are predominantly from the west throughout the year. Elevated fire weather conditions occur when strong, dry, north-westerly winds coincide with summer heatwaves.

The main vehicular access point into Knocklofty is from the carpark off Forest Road. Fire trails and walking tracks extend from Knocklofty and McRobies Gully to the west into Wellington Park.

There is no permanent standing water or streams in either reserve.

Recreation is popular in both areas, with designated walking tracks in addition to walking and mountain bike riding on fire trails. There are limited visitor facilities within the reserves.

Bushfire management of these areas needs to take into account:

- impacts on people living nearby
- natural values including the Ammonite snail and significant stands of pre-european white gum (*Eucalyptus viminalis*)
- recreational activities
- TasWater and TasNetworks infrastructure
- activities that increase the risk of fires starting
- covenanted land at McRobies Gully
- McRobies Gully Waste Management Centre.

Natural values

Knocklofty Reserve is dominated by Tasmanian white peppermint (*Eucalyptus pulchella*), with other large areas of Tasmanian blue gum (*Eucalyptus globulus*) and smaller areas of stringybark (*Eucalyptus obliqua*) and black peppermint (*Eucalyptus amygdalina*).

McRobies Gully Reserve is dominated by Tasmanian blue gum wet forest with other larger areas of stringybark and silver peppermint (*Eucalyptus tenuiramis*).

Knocklofty Reserve and McRobies Gully have the following vegetation communities:

- *Acacia dealbata* forest
- *Eucalyptus amygdalina* forest and woodland on sandstone
- *Eucalyptus amygdalina* forest on mudstone
- *Eucalyptus globulus* dry forest and woodland
- *Eucalyptus globulus* wet forest
- *Eucalyptus obliqua* dry forest
- *Eucalyptus obliqua* forest with broad-leaf shrubs
- *Eucalyptus ovata* forest and woodland
- *Eucalyptus pulchella* forest and woodland

- *Eucalyptus regnans* forest
- *Eucalyptus tenuiramis* forest and woodland on sediments.

Recent bushfire history

Knocklofty Reserve and McRobies Gully were both burnt in the 1967 bushfires. The fires destroyed 23 houses on the perimeter of Knocklofty Reserve and a large number of houses were also lost in the Strickland/Marlyn roads area, south of McRobies Gully. This area was burnt by the main head fire after it had passed through the upper portion of McRobies Gully.

Records indicate that virtually all of Knocklofty Reserve was burnt by a series of prescribed burns between 1977 and 1983. However, the scale of the prescribed burning program declined considerably after that.

A bushfire of moderate intensity burnt approximately 60 per cent of Knocklofty Reserve in January 1983. There was a practice at the time of burning forest strips adjacent to McRobies Gully each year to avoid the risk of bushfires igniting landfill. There have been further fires in Knocklofty Reserve since 1983, including a major fire in February 1993 that burnt approximately half the reserve.

Current program

Specific programs currently undertaken in the Knocklofty Reserve and McRobies Gully are:

- establishment and maintenance of fuel breaks
- prescribed burning
- fire trail management
- weed management (pre- and post-burn).

All available fuel breaks have been completed.

All treatable bushland areas within Knocklofty Reserve and McRobies Gully are part of a rolling fuel reduction burn program to reduce the risk of bushfire.

Kalang Avenue Reserve

The 116 ha Kalang Avenue Reserve is divided into two parts by Kalang Avenue. One side is owned by the City of Hobart, the other by Glenorchy City Council.

The reserve is dominated by dry eucalypt forest that has been severely disturbed by a range of activities over time. The eastern section is currently home to the Riding for the Disabled community group.

The geology of the reserve is dominated by Palaeozoic glaciomarine and marine metasediments. The resulting podzolic soils are poor in structure, skeletal in depth and coverage and are easily eroded.

Access to both sections is generally from Kalang Avenue with other access routes possible with neighbouring land owner consent. The trails into the western section continues into Wellington Park. The entire reserve is fenced with locked gates.

There is no standing water or streams in either reserve. However, there are a number of stand pipe access points throughout both reserves.

Recreational access is limited to walking or mountain bike riding on fire trails. There are no visitor facilities or structures within the reserve. The eastern section does have a building and associated infrastructure for the Riding for the Disabled group as well as the Lenah Valley Tasmania Fire Service brigade shed and a TasWater water tank.

Bushfire management of this area takes the following into account:

- impacts on people living nearby
- natural values including threatened vegetation communities and large old trees
- Riding for the Disabled leasehold
- activities that increase the risk of fires starting.

Natural values

The reserve is dominated by stringybark (*Eucalyptus obliqua*) and black peppermint (*Eucalyptus amygdalina*). Both have fibrous bark that tends to burn easily and can add to embers during a fire.

Kalang Avenue Reserve contains the following vegetation communities:

- *Allocasuarina verticillata* forest
- *Eucalyptus amygdalina* forest on mudstone
- *Eucalyptus obliqua* dry forest
- *Eucalyptus ovata* forest and woodland
- *Eucalyptus pulchella* forest and woodland.

Recent bushfire history

The Kalang Reserve was not burnt in the 1967 Hobart bushfires, although the fire did come very close to the boundary with Wellington Park to the west. Part of the western section of the Kalang Avenue Reserve was burnt in 1977 and the entire reserve was burnt by bushfire in 1984.

Most of the reserve has been burnt under the prescribed burn program since 2015.

Current program

Specific programs are being undertaken in Kalang Avenue Reserve:

- establishment and maintenance of fuel breaks
- prescribed burning
- fire trail management
- weed management (pre and post burn).

All available fuel breaks have been completed.

All treatable bushland areas within the Kalang Avenue Reserve are managed to reduce potential risks from bushfires.

Ridgeway Park and Waterworks Reserve

Together, Ridgeway Park and Waterworks Reserve form Hobart's largest (482 ha) bushland reserve, southwest of the Hobart CBD. The topography is hilly with altitude ranging from 130 m at the Lower Reservoir in Waterworks Reserve to 496 m at Chimney Pot Hill. The area is split between three main catchments: Dunns Creek to the south, Vincents Rivulet to the east, and Sandy Bay Rivulet to the north.

Rainfall is evenly distributed throughout the year and increases with altitude from around 900 mm on the eastern side of the area to 1000 mm in the west. Winds are predominantly from the west and northwest throughout the year. Elevated fire weather conditions occur when strong, dry, north-westerly winds coincide with summer heatwaves.

The geology is predominantly Jurassic dolerite with Permian-Triassic sediments (coarse-grained sandstone and mudstone) in the north-western portion on either side of the upper and lower reservoirs, and on the eastern margin along the Southern Outlet. Soils are generally clay-rich on dolerite and mudstone, but shallow, sandy and erodible on sandstone.

Access to Waterworks Reserve is from Huon, Chimney Pot Hill and Ridgeway roads. Access to Ridgeway Reserve is predominantly from Chimney Pot Hill Road.

There is no standing water or streams in either reserve. However, there are a number of stand pipe access points throughout both areas.

Recreation is popular with designated walking tracks in addition to walking and mountain bike riding on fire trails. Waterworks Reserve has a number of visitor facilities along the southern edge of the upper reservoir and serves as a centralised starting point for the extensive network of tracks and trails that lead to and from Tolmans Hill, Ridgeway, Fern Tree and kunanyi/Mt Wellington.

Bushfire management of these areas needs to take into account:

- impacts on people living nearby
- natural values including very high quality vegetation and significant stands of large old trees
- recreational activities
- TasNetworks and TasWater infrastructure

- Telstra and Optus infrastructure
- Mountain Water Supply System (Heritage)
- activities that increase the risk of fires starting.

Natural values

The area is dominated by Tasmanian white peppermint (*Eucalyptus pulchella*), with sections of stringybark (*Eucalyptus obliqua*) forest, both wet and dry, and smaller sections of silver peppermint (*Eucalyptus tenuiramis*).

Ridgeway Park and Waterworks Reserve contain the following vegetation communities:

- *Eucalyptus amygdalina* forest and woodland on sandstone
- *Eucalyptus amygdalina* forest on mudstone
- *Eucalyptus globulus* dry forest and woodland
- *Eucalyptus globulus* wet forest
- *Eucalyptus obliqua* dry forest
- *Eucalyptus obliqua* forest with broadleaf shrubs
- *Eucalyptus obliqua* forest with broad-leaf shrubs
- *Eucalyptus pulchella* forest and woodland
- *Eucalyptus tenuiramis* forest and woodland on sediments.

Recent bushfire history

It took the bushfires that hit Hobart in 1967 just 30 minutes to burn through Ridgeway Park with high intensity. There was extensive loss of houses in the suburbs surrounding the park and anecdotal evidence indicates the park then remained free of major bushfires until the Ridgeway fire in January 1998, where almost 90 per cent of the park was burnt, either by the bushfire itself or by backburns lit to control the fire.

There are no details of smaller fires in the park until the City of Hobart began maintaining records in the 1980s, when a substantial portion of the park was burnt by either prescribed burns or small bushfires. There were virtually no fires in the park during the 1990s prior to the 1998 Ridgeway fire.

Since 1998 there have been a number of small grass and bushfires within and surrounding the park, but the individual areas burnt have been generally less than a hectare.

There has been no unplanned fire in Ridgeway Park or Waterworks Reserve since 2005. Areas of wet eucalypt forest appear not to have been burnt since 1980.

Prescribed burning has been undertaken since 2003.

Current program

Specific programs are being undertaken in Ridgeway Park and Waterworks Reserve:

- establishment and maintenance of fuel breaks
- prescribed burning
- fire trail management
- road verge vegetation management
- weed management (pre and post burn).

All available fuel breaks have been completed.

All treatable bushland areas within Ridgeway Park and Waterworks Reserve are managed to reduce potential risks from bushfires.

Bicentennial Park and surrounds

The Bicentennial Park area includes a number of smaller, separate reserves in Mt Nelson and Sandy Bay. The total area of these reserves is approximately 230 ha. This includes Bicentennial Park, Porter Hill Reserve, Lambert Park, Pearces Reserve, Cartwright Reserve, the Skyline Reserve and Mt Nelson Oval.

There is no standing water or streams in either reserve. An in-ground tank exists near Dorney House that is accessed during prescribed burns.

Recreation is popular with designated walking tracks in addition to walking and mountain bike riding on fire trails. There is a major heritage complex, Dorney House, on Porter Hill. Dorney House receives limited visitation via a permit system. Bicentennial Park is adjacent to Truganini Reserve and the Mt Nelson Signal Station, a significant heritage and visitor facility. The Tasmania Parks and Wildlife Service manages Truganini Reserve.

Bushfire management of these areas needs to take into account:

- impacts on people living nearby
- natural values including threatened vegetation communities of blue gum (*Eucalyptus globulus*) and black gum (*Eucalyptus ovata*), critical habitat for the swift parrot
- recreational activities
- TasWater infrastructure
- covenanted land at Porter Hill
- Heritage listed Dorney House, Fort Nelson and surrounds
- activities that increase the risk of fires starting.

Natural values

The reserve is dominated by Tasmanian white peppermint (*Eucalyptus pulchella*), with sections of blue gum (*Eucalyptus globulus*), black gum and she-oak (*Allocasuarina verticillata*).

Bicentennial Park and adjacent bushland areas contain the following vegetation communities:

- *Allocasuarina verticillata* forest
- *Bursaria* - Acacia woodland and scrub
- *Eucalyptus globulus* dry forest and woodland
- *Eucalyptus globulus* wet forest
- *Eucalyptus obliqua* dry forest
- *Eucalyptus ovata* forest and woodland
- *Eucalyptus pulchella* forest and woodland
- *Eucalyptus viminalis* grassy forest and woodland
- lowland grassland complex.

Recent bushfire history

The western section of Bicentennial Park near Rialannah Drive was burnt in the 1967 bushfires. In 1982 a fire burnt all but the eastern-most portion of Bicentennial Park. A small bushfire burnt a portion of the slope below bend six in 1995.

The last bushfire in the area was in January 1998. This fire started near Fern Tree and initially travelled in a south-easterly direction towards Kingston, but as the wind shifted with the passage of a cold front it moved first in an easterly direction towards Bonnet Hill and Tarooma and then in a northerly direction approaching Mt Nelson from the south. This is the opposite approach to the 1967 bushfire, which burnt along Mt Nelson ridge from the northwest to the southeast.

Esmond Dorney completed his first circular house on Porter Hill in 1949 and a second more substantial three story circular house in 1966. The first circular house was destroyed by bushfire in 1998 and not rebuilt. The second house was destroyed in the 1978 bushfire and was rebuilt. This house, and a smaller detached flat survived the 1998 bushfire. There are no records of the full extent of the 1978 bushfire.

Current program

Specific programs are being undertaken in Bicentennial Park and surrounding small reserves:

- establishment and maintenance of fuel breaks
- prescribed burning
- mechanical thinning
- fire trail management
- weed management (pre and post burn).

All available fuel breaks have been completed.

All treatable bushland areas within Bicentennial Park and the reserves of Mt Nelson and Sandy Bay are managed to reduce potential risks from bushfires.

Wellington Park

Wellington Park is approximately 18,250 ha and is one of the largest areas of reserved land in Tasmania outside of the Tasmanian Wilderness World Heritage Area. The park has unique natural and cultural significance and includes iconic features such as the columnar face of kunanyi/Mt Wellington.

The Wellington Park Management Trust is the managing authority of Wellington Park under the *Wellington Park Act 1993*. Under the Wellington Park Management Plan 2013 the City of Hobart is responsible for on ground management of its freehold land within the park (1726 ha), land in the Wellington Park that is Crown Land vested in the City of Hobart for the purposes of water supply (1413 ha in the Kingborough Council area) and a small area of land (80 ha in Glenorchy Council area) on the eastern slopes of Mt Arthur.

Wellington Park has many access points used for management purposes and bushwalking.

There is a very extensive network of designated walking and mountain bike tracks throughout the park in addition to the fire trail network. There are significant visitor nodes at The Springs and the Pinnacle.

Wellington Park extends well beyond the Hobart Local Government Area into Glenorchy, Kingborough, Huon Valley and the Derwent Valley LGAs. Large sections of Wellington Park are designated water catchment areas and as such TasWater has a significant role in the management of their infrastructure.

Small streams and standing water are located throughout the park but is mostly seasonal and not readily accessible for bushfire management purposes. Water is generally provided by tankers during the conduct of prescribed burns.

The City of Hobart takes the following into account for the areas it manages with respect to bushfire risk:

- impacts on people living nearby
- natural values including significant stands of wet forest that pose a particular challenge
- recreational activities
- TasWater and TasNetworks infrastructure
- television Infrastructure on the Pinnacle
- Mountain Water Supply System (Heritage)
- significant heritage values
- activities that increase the risk of fires starting.

Natural values

The vegetation in this reserve is largely differentiated by topography and elevation. However, with that elevation and topography comes changes to soil availability, depth and type, soil moisture, rainfall and temperature.

The lower slopes are far more diverse than further upslope. The lower slopes have representation of:

- *Eucalyptus obliqua* dry forest
- *Eucalyptus pulchella* forest and woodland
- *Eucalyptus tenuiramis* forest and woodland on sediments
- *Eucalyptus globulus* wet forest
- *Eucalyptus obliqua* forest with broadleaf shrubs
- *Eucalyptus regnans* forest
- *Eucalyptus ovata* forest and woodland
- *Acacia dealbata* forest

The mid slopes are dominated by:

- *Eucalyptus delegatensis* wet forest (undifferentiated)
- *Eucalyptus obliqua* wet forest
- *Eucalyptus regnans* forest
- *Eucalyptus delegatensis* dry forest and woodland
- Broad-leaf scrub (excluding *Notelaea-Pomaderris-Beyeria* forest)

The upper slopes are dominated by mainly two communities: Tasmanian snowgum (*Eucalyptus coccifera*) forest and woodland and lichen lithosphere.

Recent bushfire history

The fuel moisture conditions of the dry forests and woodlands of Wellington Park dry out to the extent that they are capable of sustaining bushfires over the fire season. In some years, the weather conditions become dry enough that the wet forests and gully vegetation are also capable of sustaining fire. In these years, widespread bushfires can occur. Large bushfires in the vicinity of kunanyi/Mt Wellington were reported in 1806, 1851, 1897, 1914, 1934, 1945 and 1967. The extent and intensity of the pre-1967 bushfires are unknown.

The author of a recent study of newspaper reports stated that:

*Significant fires occurred on the mountain in 1897, 1914, 1920, 1940, and 1967. Of these, the most significant in terms of loss of life and property was undoubtedly the 1967 fire. The fire of 1897, although not as devastating in terms of loss of life and property, may well have rivalled the 1967 fires in terms of its extent. It is not easy to be sure of this, as Hobart was quite small in 1897 and areas which were populated in 1967 were not populated in 1897... Apart from these significant fires, it seems that nearly every year at least one bushfire burned on the mountain, until recent times...*⁵³

Between 1980 and 1990, 27 unplanned fires were recorded in the park. From 1983 to 1999, a large number of vegetation fires occurred on the urban/rural interface within the park with the greatest concentration being in the peri-urban fringes to the west and northwest of Glenorchy, and to a lesser extent, Hobart.

Most of the dry forest along the eastern perimeter of the park was burnt by a series of burns during the 1970s and 1980s.

More recently, there was a major bushfire on the eastern side of kunanyi/Mt Wellington (February 2001) and a smaller fire between Mt Charles and Jefferys Track (November 2003). Both fires were deliberately lit, though the Mt Charles fire originated on private property and moved into the park. There are no reports of assets being damaged.

The Glen Dhu Road fire near Molesworth (northwest of Wellington Park) in 2013 reached approximately 2600 hectares before being contained. It was stopped within about 10 km of Fern Tree to the southeast⁵⁴, before the East West Trail. This fire had the potential to continue to burn into Wellington Park, from where containment would have been very difficult.

A fire ignited by lightning strikes at Tom Thumb on 15 January 2019 to the west of Hobart required significant air and ground resources to contain⁵⁵. The Tom Thumb fire received high level suppression efforts due to the threat it posed to Hobart, and objectives were successfully achieved with that fire being contained.

Current program

Specific programs are being undertaken in the Wellington Park:

- establishment and maintenance of fuel breaks
- prescribed burning (limited)
- fire trail management
- road verge vegetation management
- weed management (pre and post burn).

All available fuel breaks have been completed or are scheduled for completion.

All treatable bushland areas within Wellington Park are managed to reduce potential risks from bushfires.

Mechanical thinning is being considered for the edges of wet forest, which cannot be managed through a prescribed burning program.

Queens Domain

The Queens Domain, on the edge of Hobart's central business district, is approximately 230 hectares and encompasses native grassland and grassy woodland as well as significant European and Aboriginal cultural heritage.

It protects the last of Hobart's original native grasslands, a variety of native birds, including eastern rosellas, grey-breasted silvereys and yellow wattlebirds.

The Queens Domain has a range of sporting venues and grounds – cricket, football, tennis, athletics and swimming – including:

- Doone Kennedy Hobart Aquatic Centre
- Tasmanian Cricket Association Ground
- Domain Athletic Centre
- Domain Tennis Centre
- Soldiers Memorial Oval
- Legacy Park
- Maxs Infinity Loop
- bicycle and walking tracks.

A number of historical, cultural and natural sites are also located within this area:

- Hobart Cenotaph
- Royal Tasmanian Botanical Gardens
- Government House
- remains of the Beaumaris Zoo
- Soldiers Memorial Avenue.

The proximity of this reserve to major infrastructure - highways, houses, Royal Hobart Hospital, Hobart CBD - means smoke is a major consideration both in terms of its impacts on health and visibility, especially on major roads.

Government House is also located on the eastern edge of the Queens Domain and undertakes commercial grape production. These grapes are an important additional consideration with respect to smoke when planning prescribed burns.

Bushfire management on the Domain needs to take into account:

- impacts on people living near the Queens Domain
- smoke entering the Hobart CBD and major transport links
- grassland and grassy woodland ecosystems
- sporting and other recreational activities
- significant infrastructure (listed above)
- TasWater and TasNetworks infrastructure

- significant heritage values
- activities that increase the risk of fires starting.

Natural values

The Queens Domain contains the following vegetation communities:

- *Eucalyptus viminalis* grassy forest and woodland
- *Eucalyptus pulchella* forest and woodland
- *Eucalyptus globulus* dry forest and woodland
- *Bursaria/Acacia* woodland and scrub
- *Allocasuarina verticillata* forest
- Lowland *Themeda triandra* grassland.

Recent bushfire history

In 1971 and 1972 almost the entire Queens Domain was burnt by a series of deliberately-lit fires. In 1974 much of it was burnt again through a number of prescribed burns for grassland management. Since then small areas of the Queens Domain have been burnt, with prescribed burning areas ranging from five to ten hectares.

There are no records of any damage to built assets from fires on the Queens Domain.

Current program

Specific programs are being undertaken in the Queens Domain:

- establishment and maintenance of fuel breaks
- prescribed burning
- mechanical thinning
- fire trail management
- road verge vegetation management
- weed management (pre and post burn).

All available fuel breaks have been completed.

Fuel breaks are used on the Queens Domain to protect habitable dwellings and all bushland areas within the Domain are treated to reduce the potential risk of bushfire. However, the area's isolation from the large continuous extent of bushland that surrounds Hobart means that while prescribed burns and mechanical thinning protect assets within the Queens Domain, the use of these management tools are skewed toward ecological outcomes.

Specifically, prescribed burns and mechanical thinning are being used to reduce the extent of she-oak on the Queens Domain in an effort to return areas to grassland and grassy woodland, which was once extensive across the Domain.

A vegetation management plan was completed in 2018 and approval has been received from the Forest Practices Authority for all mechanical thinning of she-oak on the Queens Domain.

Fire management program

The City of Hobart is responsible for bushfire management, including prescribed burning, within City-owned or managed reserves. The Tasmania Fire Service is responsible for the suppression of any bushfires.

The purpose of this strategy is to ensure the City can meet its bushfire management responsibilities under current legislation, particularly protection of life and property, as well as allowing for the ongoing use of fire as a management tool to assist in reducing fire risk to the community and to help maintain the viability of native ecosystems in Hobart.

There are a number of national, state and regional policies, plans, strategies, regulations and legislation that have a bearing on the management of bushfire risk by the City of Hobart. The intent of this bushfire management strategy is not to examine the existing high-level documents (see Appendix I for list of current, relevant legislation and policies), but rather to connect the requirements and intent of these policy documents to City of Hobart programs and projects that will deliver improved response and management of bushfire risk for the people of Hobart.

The City has five major areas of responsibility that define the scope of its operations to reduce bushfire risk:

- land management – managing bushland to reduce fire risk
- building community resilience – a shared responsibility between the Tasmanian Government (Tasmania Fire Service), the City of Hobart and the Hobart community
- statutory planning – Planning Directive No 5.1 Bushfire-Prone Areas Code 2017
- regulatory responsibilities – legislative compliance and enforcement
- emergency management – the City's roles and responsibilities.

Land management

The City of Hobart is responsible for managing more than 4600 ha of native bushland. Almost 3000 ha of this is within the municipal boundaries of Hobart, and the remaining 1600 ha is owned by or vested in the City of Hobart, to the south and north of the municipal area. Most of this bushland is on the southern side of Wellington Park, urban fringes and the Kalang Avenue Reserve (in the Glenorchy Local Government Area).

The City's Bushfire Management Strategy continues to guide its approach to managing bushfire risk in public bushland for which it is responsible.

The City has the capacity to undertake all aspects of bushfire risk management, from high-level planning to carry out prescribed burns. Time and experience shows that developing and maintaining this capacity is critical to long-term success.

In 2017 the City of Hobart, in line with its statutory obligation, established a policy in relation to the provision and maintenance of managed areas (Bushfire Hazard Management Areas) on City-owned land for private developments in bushfire-prone areas. This followed the

release of AS3959:2018 (Australian Standard for Construction of Buildings in Bushfire-Prone Areas) and the incorporation of that standard into the National Construction Code and Planning Directive 5 (Bushfire-Prone Areas Code).

The purpose of this policy is to ensure that new bushfire Hazard Management Areas for residential dwellings are contained within the property being developed. This reduces the number and extent of any new bushfire Hazard Management Areas (such as fuel breaks) needing to be established in Hobart's bushland and reserves network for the benefit of adjoining dwellings.

Bushfire risk management requires specialised training and equipment, detailed planning, and an ongoing commitment to continue the work once begun. Meeting these needs with finite personnel and resources now and into the future will present a significant challenge to the City of Hobart.

It is becoming increasingly important for the City to better understand weather, especially in relation to fire, and the potential effects of climate change. For example, suitable weather and environmental conditions for conducting prescribed burns is becoming less common due to climate change^{56, 57, 58}.

As the nature of bushfire risk in Hobart is better understood, risk management programs can be adapted to keep pace.

Building community resilience

The intent of building community resilience to bushfire is to improve the awareness, knowledge and self-reliance of property owners in bushfire-prone areas. An informed and aware community is better able to prepare and respond to bushfire risk, and to a bushfire incident when it threatens their area.

The City of Hobart has a supporting role in building community resilience by helping property owners and residents access information, apply the best advice available to their individual situation, and determine how they will respond to the risks involved.

With the growth of communications technologies, it is now well understood that traditional methods of communication between local government and residents is no longer sufficient. Understanding and utilising new media and communications tools is a key part of building community resilience

The elderly, chronically unwell and socially isolated members of the community are often less able to access bushfire information, let alone act on bushfire advice, without extra support. While it is not solely the responsibility of councils to assist this section of the community, it is an area of growing concern given the aging nature of Hobart's population.

Another area that needs attention is people with culturally and linguistically diverse backgrounds, who often lack knowledge of how bushfires behave, and can have difficulty accessing or understanding existing information. Again, this is not the sole responsibility of councils, but the City of Hobart does have a role to play in ensuring all members of society understand the bushfire threat and know how to prepare for bushfire.

Managing the bushfire threat is a shared responsibility

Hobart is one of the most bushfire-prone cities in Australia. To lower the risk, the City of Hobart carries out extensive bushfire mitigation works to protect life, property and the conservation values of its bushland reserves.

The work is intensive and costly. This work is intended to reduce the risk from bushfire to the community, but if individual home owners fail to make their properties bushfire safe by cleaning gutters and minimising the amount of fire-prone vegetation on their property, the effect of the City of Hobart's work is reduced and they remain at increased risk from bushfires.

Since 2019 the City has run an extensive community awareness campaign with three key goals:

1. Raise awareness within the community of the extreme dangers bushfire poses to Hobart and the need for the entire community to work together to mitigate this threat.
2. Raise awareness in the community, and especially among people who live adjacent to bushland reserves, of the need for them to make their properties bushfire safe.
3. Encourage people to reduce the risk of fire in their gardens by cleaning up any flammable material, especially in closer proximity to houses and buildings.

The City's website provides detailed, up-to-date information on how people can prepare their properties ahead of every bushfire season, report potential fire hazards, an explanation of Fire Danger Ratings and important links for what to do in an emergency.

Information about upcoming prescribed burns is widely disseminated on social media.

A strong 'Prepare Now for Bushfire' advertising campaign is run with large format advertising, advertising in local newspapers and through the distribution of a Prepare Now brochure. Public information forums are held in suburbs most at risk from bushfire.

The key message the City conveys to the people of Hobart is that while the City of Hobart does everything it can to protect life, property and our environment from bushfire, we can't do it alone. Preparing for bushfire is everyone's responsibility.

Working with others to assist our community

When it comes to assisting communities to be safer in the peri-urban bushland setting, the City of Hobart is proactively working for and with the Hobart community to make us all safer in the event of a bushfire.

The City spends on average \$1.9 million on bushfire management actions every year, including the commitment of staff and resources. Bushfire risk mitigation strategies carried out elsewhere in Australia and overseas are monitored regularly to identify ways in which the City can continually improve its own strategies.

The City also works closely with other key stakeholders in Tasmania, including the Tasmania Fire Service, the University of Tasmania and other authorities and researchers to identify current and future best practice. Where appropriate the City partners with other organisations and authorities to develop improved bushfire risk management options.

The City has recognised the impacts increasing bushfire risks have on insurance rates and is collaborating with organisations such as the Insurance Council of Australia to have this more widely recognised and understood.

Planning Directive No 5.1 Bushfire-Prone Areas Code 2017

As a planning authority, the City of Hobart is responsible for assessing applications for the use and development of land. Planning schemes are the key instruments that set out the requirements and restrictions that apply to new uses and development. The Hobart Interim Planning Scheme 2015 includes specific provisions relating to the consideration of bushfire risk including a citywide, bushfire-prone area overlay.

Planning Directive No 5.1 Bushfire-Prone Areas Code was issued by the Tasmanian Government in September 2017 and requires the Bushfire-Prone Areas Code to be inserted into interim planning schemes and the future Tasmanian Planning Scheme. The code includes specific use and development provisions for subdivisions, vulnerable uses and hazardous uses in bushfire-prone areas. Bushfire risk mitigation measures set out in the code include:

- the provision of fuel-reduced Hazard Management Areas between buildings and bushfire-prone vegetation
- the provision of safe access arrangements for firefighters and occupants
- the provision of adequate, accessible and reliable water supplies for firefighting
- special provisions for vulnerable and hazardous uses in bushfire-prone areas.

The main pathway for demonstrating compliance with the code is the submission of a Bushfire Hazard Management Plan, certified by a person accredited under the *Fire Service Act 1979*.

An important challenge for the City of Hobart with respect to the code is that it has limited ability to reject certified Bushfire Hazard Management Plans from accredited persons, even if the conclusions appear incorrect.

Regulatory responsibilities

The City of Hobart's three key regulatory responsibilities relating to fire risk are hazard abatement notices, declared weeds notices and compliance with bushfire safety aspects of planning and building approvals (Part V Agreements). Smoke management also falls within the City's responsibilities through the Tasmanian Government's pollution laws.

Hazard abatement notices are one of a group of "nuisance provisions" covered in the *Local Government Act 1993*. Notices can be issued when vegetation and/or other bushfire fuel conditions on a property pose a direct safety risk to assets on an adjoining property, such that it requires prompt removal. In cases where notices are not complied with before the given deadline, the City will conduct the works, and then recovers the cost of these works from the property owner.

Declared weeds notices are issued under the *Weed Management Act 1999*. This legislation is primarily for controlling a wide array of invasive plants, however, several of the weeds listed under this act often form a fire risk. In these cases, weed control also reduces fire risk.

Many subdivisions and new homes approved since 2000 are subject to bushfire risk mitigation requirements as conditions of approval. While primary responsibility for complying with these requirements rests with the property owner, the City has a role in ensuring property owners are aware of their legal responsibilities and are complying with them. However, if they are contained in a Part V Agreement, then while theoretically the City can enforce the conditions, it can only be upheld through the Supreme Court of Tasmania and are therefore ineffective in general practice.

The City of Hobart needs to keep pace with the expanding nature of these regulatory responsibilities over time. One key area is ensuring inspectors and other officers are properly trained and resourced, and have effective administration support to manage the process.

It is important the City develops the capacity to monitor compliance with the bushfire requirements of planning permits, building permits and Part V Agreements. This will require considerable resources into the future.

Emergency management

Emergency management arrangements in Tasmania are established by the *Emergency Management Act 2006*. The Act provides for the protection of life, property and the environment, and establishes emergency management arrangements and emergency powers.

The Act establishes the following governance structure for emergency management in Tasmania:

- State Emergency Management Committee, responsible for the Tasmanian Emergency Management Arrangements (TEMA).
- Three regional emergency management committees (North, North-West and South), each with their own Regional Emergency Management Plan.
- Municipal emergency management committees, one for each council area. The Hobart Emergency Management Committee is responsible for the City of Hobart Emergency Management Plan development and implementation.

At the local government level, the Emergency Management Planning process follows the model of Prevention-Preparedness-Response-Recovery (PPRR). The City of Hobart's emergency management plans and advice, including the Emergency Management Plan, can be found on the City's website: <https://www.hobartcity.com.au/Community/Emergency-management>.

In a bushfire emergency, the Tasmania Fire Service is the lead agency. The City's role is to enact the Municipal Emergency Management Plan. This may involve a number of activities, including:

- establishing an Incident Management Team
- communications to the public and staff

- setting up and operating evacuation centres and other community recovery centres
- provision of resources, equipment and access to City of Hobart information
- road closures
- other assistance as required to emergency services.

Once the recovery phase begins the City will take the lead role, supported by state government agencies and non-government organisations.

Management actions

There are a large number of actions being taken by the City of Hobart to fulfil its statutory responsibilities to the people of Hobart. Table 9 identifies these action.

Table 9: Management Actions

Item	Activity	Leader	Timeframe	Possible Partnering Opportunities
1	Implementation of the Bushfire-Prone Areas Code.	Planning	Current & ongoing	LGAT
2	Provision of advice on the building regulations for bushfire-prone areas to development proponents at the planning stage so that proponents are aware of the full range of bushfire requirements early in the process, and can therefore be addressed with a comprehensive, consistent and complementary approach.	Planning	Current & ongoing	UTAS TFS
3	Provision of advice and guidance to development proponents regarding the use of City of Hobart land for bushfire Hazard Management Areas.	Planning	Current & ongoing	
4	Ongoing response to bushfire hazard and weed enquiries and administering Abatement Notices.	Compliance	Current & ongoing	
5	Continue to pursue the City of Hobart's capacity to administer, monitor and enforce compliance with the bushfire risk mitigation requirements of planning permits, building permits and Part V Agreements, including on-ground inspectorial and Geographic Information Systems resources.	Planning	Current & ongoing	
6	Training staff in the assessment and application of Hazard Abatement notices.	FaB	Current & ongoing	
7	Continuation of bushfire risk management programs for all bushland in the greater Hobart area, including mechanical fuel	FaB		UTAS

Item	Activity	Leader	Timeframe	Possible Partnering Opportunities
	reduction, prescribed burns for fuel reduction and ecological purposes, fuel break management in bushland adjacent to dwellings, and the City of Hobart fire trail network.		Current & ongoing	Cascade
8	All bushland in the greater Hobart area is covered by a detailed Fire Management Plan (this plan, plus associated map-based plans for each of the major bushland reserves).	FaB	Current & ongoing	UTAS Cascade
9	All City of Hobart bushland reserves (other than reserves classed as 'Amenity use') are managed within a bushfire planning process that schedules prescribed burns, fuel break maintenance and fire trail works.	FaB	Current & ongoing	
10	Operational procedures for elevated fire danger weather responses are updated before each bushfire season.	FaB	Current & ongoing	
11	The City of Hobart participates in the Greater Hobart Fire Management Area Committee and is closely involved in the development and future implementation of this committee's Greater Hobart Fire Mitigation Plan.	FaB	Current & ongoing	Hobart FMAC
12	City of Hobart officers remain in regular direct liaison with the Tasmania Fire Service to provide local and regional consistency in bushfire risk management.	FaB	Current & ongoing	TFS
13	Implement TFS Road verge management as per the TFS document <i>Building for Bushfire: Roadside Management for Bushfire Risk Mitigation</i> ⁵⁵ . Priorities in high risk areas particularly where communities have one road in and out. As part the City's bushfire risk management the road verges on Huon Road, Summerleas Road, Chimney Pot Hill Road, Waterworks Road, Strickland Avenue and Woodcutters Road have been assessed in line with the Tasmania Fire Service Road Verge Management Guidelines for safe access.	FaB	Current & ongoing	Other City of Hobart units TFS TasNetworks
14	The Tasmania Fire Service identified Nearby Safer Places on City of Hobart land	FaB	Current &	TFS

Item	Activity	Leader	Timeframe	Possible Partnering Opportunities
	that are being managed to the service's specifications or better. These places are part of the Hobart Emergency Management Plan.		ongoing	UTAS
15	Within the capacity of the City's fire-trained operational staff, assistance is given to the Tasmania Fire Service during post-fire mopping up and associated tasks.	FaB	Current & ongoing	TFS
16	Continue to maintain adequately trained staff to fulfil fire management tasks and respond to bushfires on City of Hobart managed land if requested by the Tasmania Fire Service.	FaB	Current & ongoing	TFS
17	Continue to represent the interests of all Tasmanian councils as the Local Government Association of Tasmania (LGAT) representative on the State Emergency Management Committee's risk and resilience sub-committee.	FaB	Current & ongoing	LGAT FMAC SEMC
18	Continue to build on the City of Hobart's community awareness "Prepare Now" campaign.	FaB	Current & ongoing	
19	Continue to support the Tasmania Fire Service's community protection plans, education programs and other resilience-building projects, and integrate them with City of Hobart programs.	FaB	Current & ongoing	TFS
20	Continue to hold annual public bushfire awareness forums in fire-prone suburbs of Hobart. These forums are held in late spring or early summer on a three-year rotation in Fern Tree, Mt Nelson/Tolmans Hill and Lenah Valley.	FaB	Current & ongoing	
21	Directly support residents' enquiries on bushfire risk management.	FaB	Current & ongoing	
22	Engage with Bushfire Ready Neighbourhood groups in key risk areas of the City of Hobart.	FaB	TFS UTAS	
23	Proactively liaise with the Tasmanian Planning Commission to improve the Bushfire-Prone Areas Code and clarify	Planning	2021-22	LGAT

Item	Activity	Leader	Timeframe	Possible Partnering Opportunities
	areas of ambiguity in interpretation.			
24	Review Part V Agreements in place across the City of Hobart.	Planning	2021-22	
25	Regularly audit a selection of building permit applications to determine the average level of compliance with building regulations for bushfire-prone areas, and ensure the results are conveyed to the City of Hobart and the Tasmania Fire Service.	Planning	Ongoing	
26	Continue to improve the City of Hobart's capacity to plan, manage and conduct all aspects of bushfire risk management safely and effectively.	FaB	Ongoing	TFS
27	Review City of Hobart overall operational response to bushfire management.	FaB	Annually	TFS
28	Continue with the assessment of the bushfire risk component of the road verge management program and implement recommendations.	FaB COH	Ongoing	TasNetworks Residents
29	Open discussions with the Tasmania Fire Service to investigate potential ways to integrate planning, activities and training in bushfire risk management and establish a Memorandum of Understanding between the City of Hobart and the Tasmania Fire Service regarding the manner in which the service can request the involvement of the Council's Firefighting team and resources in any fire which extends outside Council managed bushland areas.	FaB	2021-23	TFS
30	Develop information for residents, especially those who live in or adjacent to bushland, on the importance of fuel reduction including prescribed burning by the City of Hobart as a risk reduction management tool.	FaB	Ongoing	TFS UTAS
31	Improve the Council's knowledge and ability to respond to extreme fire weather events and climate change through staff training and stronger connection with academic and policy institutions working in these areas.	CoH	Ongoing	UTAS
32	Investigate ways to increase the City of Hobart's knowledge and capacity to	CoH	Ongoing	

Item	Activity	Leader	Timeframe	Possible Partnering Opportunities
	understand and adapt to changes in emergency management theory and forecasting, incident control and community recovery.			Monitor AFAC research & information
33	Investigate closer links with academic and operational research agencies to better connect on-ground planning to current and emerging research and to support this research where it shows value to the City of Hobart's management of bushland to reduce fire risk to the community.	FaB	Ongoing	UTAS PWS TFS
34	Develop an information-sharing process with the Tasmania Fire Service & other emergency responders to enable rapid access to City of Hobart assets, such as vehicles, firefighting equipment & other items needed in a fire emergency.	FaB	2021-23	TFS PWS Kingborough & Glenorchy Councils
35	Undertake annual bushfire emergency exercises to plan and prepare for bushfire events.	FaB	Annually	
36	Maintain training levels for all staff involved in fire management duties. This includes ensuring the City of Hobart employs: <ul style="list-style-type: none"> at least one staff member with incident control experience at least one, but preferably two, divisional commanders at least six people with crew leader training all other staff to be trained as crew members to PUA20619 - Certificate II in Public Safety (Firefighting Operations) standard. 	FaB	Ongoing	TFS
37	Ensure sufficient appropriately trained staff are available to respond to a bushfire emergency and undertake prescribed burning.	CoH	Annually	
38	Explore the City of Hobart's role in supporting the Tasmania Fire Service's Community Protection Plans, Bushfire-Ready Neighbourhoods and other resilience-building programs.	FaB	2021-23	TFS UTAS

Item	Activity	Leader	Timeframe	Possible Partnering Opportunities
39	Develop a public document in plain English & other languages to assist all members of the Hobart community better understand the bushfire risk and how to prepare themselves and their homes for every bushfire season.	FaB Communi- cations	Ongoing	
40	Ensure information pamphlets intended for the public are in plain English and other languages that will help all members of the Hobart community better understand the bushfire risk being addressed in that pamphlet	FaB Communi- cations	Ongoing	TFS
41	Investigate the use of new technologies to improve the accessibility of fire risk management information to the community, for both property preparation & emergency responses.	FaB Communica tions	Ongoing	Monitor AFAC research & information
42	Update and expand bushfire-related information on the City of Hobart website, including risk mitigation programs, advice to landowners and emergency response arrangements.	FaB Communi- cations	Ongoing	
43	Be proactive in working with other stakeholders such as the Tasmania Fire Service, University of Tasmania as well as other authorities and researchers to identify current and future best practice in sustainable bushfire risk reduction.	FaB	Ongoing	TFS UTAS Monitor AFAC research & information
44	Work with owners and managers of larger land parcels, such as the University of Tasmania and the Cascade Brewery, to find common ground in our approaches to managing land to reduce the risks from bushfire to the Hobart community and maintain ecological and landscape values.	FaB	Ongoing	UTAS Cascade PWS TFS
45	Where it is appropriate to do so, Council will seek to participate and partner with other parties at a local, State and Commonwealth level to develop improved management options.	FaB	Ongoing	TFS Monitor AFAC research & information
46	Advocate with bodies such as the Insurance	CoH	Ongoing	

Item	Activity	Leader	Timeframe	Possible Partnering Opportunities
	Council of Australia to have mitigation works recognised. It is intended that this recognition might come in various forms including assistance to Council to continue its fire mitigation activities.			Insurance Council of Australia LGAT
47	Continue to promote improved safety as an incentive to review e.g. reduced insurance premiums in the city to benefit the community.	CoH	Ongoing	Insurance Council of Australia LGAT
48	Work with UTAS (Dr Grant Williamson) to implement FireTools Cloud or equivalent for CoH. This tool enhances our capability for prescribed burn planning.	FaB	2021-23	UTAS

Monitoring and evaluation of the Bushfire Management Strategy

This strategy has a life of at least 10 years and will be formally reviewed once every five years to ensure it remains relevant and meets the ongoing needs of managing the bushfire risk to Hobart and its community.

An annual audit measuring the success of implementing the management actions identified in Table 9 will be conducted at the end of each financial year.

In addition, fire management activities undertaken by the Fire and Biodiversity Team will be evaluated at the end of each financial year. This is for all fire related activities including prescribed burning, mechanical thinning and fuel break maintenance. Evaluation will be in the form of a team debrief with a report prepared following discussion. Measures for evaluation are presented in Table 10.

Table 10. Measures for fire program annual evaluation.

Task	Measure	Evaluation method
<i>Fuel breaks</i>	Annual maintenance	Completed/not completed
<i>Prescribed burns</i>	Number scheduled	Number
	Number postponed	Number
	Reason for postponement	Text
	Area burnt	Hectares
	Geographic spread	Name of reserves Firetools Cloud output
	Percentage of burns completed that succeeded in meeting their objective as identified in the burn plan.	Percentage
	Area of bushland reserves within tolerable fire interval.	Percentage
<i>Mechanical thinning</i>	Area treated	Hectares
	Geographic spread	Name of reserves
	Pre and post-burn weed treatment	
<i>Work Health and Safety</i>	Number of incidents	Number
	Number of near misses	Number

Appendix I - Statutory responsibilities

The City of Hobart and other landowners of bushland in the greater Hobart region have a general legal responsibility to take all reasonable steps to minimise the risk of fires originating on their property from causing personal injury, damage to adjoining property, or damage to items of natural or heritage value protected by government legislation.

The City of Hobart has specific responsibilities under various state and federal government legislation covering areas such as fire management, fire hazard abatement and the conservation and management of native flora and fauna. The most important of these are listed below:

Australian Government Legislation

- *Environment Protection and Biodiversity Conservation (EPBC) Act 1999*

Australian Government Policies

- National Bushfire Management Policy Statement for Forests and Rangelands 2012
- National Position on Prescribed Burning 2021.

Tasmanian Government Legislation

- *Aboriginal Heritage Act 1975*
- *Building Act 2016*
- *Climate Change (State Action) Act 2008*
- *Crown Lands Act 1976*
- *Electricity Supply Industry Act 1995*
- *Emergency Management Act 2006*
- *Environmental Management and Pollution Control Act 1994*
- *Fire Service Act 1979*
- *Forest Management Act 2013*
- *Forest Practices Act 1985*
- *Forest Practices Regulations 2007*
- *Historic Cultural Heritage Act*
- *Land Use Planning and Approvals Act 1993*
- *Local Government Act 1993*
- *National Parks and Reserves Management Act 2002*
- *Nature Conservation Act 2002*
- *State Policies and Projects Act 1993*
- *Threatened Species Protection Act 1995*
- *Water Management Act 1999*
- *Weed Management Act 1999*
- *Wellington Park Act 1993*

Tasmanian Government Policies

- Climate Smart Tasmania- 2020 Climate Change Strategy

- Community Bushfire Preparedness in a Changing Climate - Action Plan 2013- 2015 (Community Bushfire Preparedness Plan)
- Environment Protection Policy (Air Quality) 2004
- Planning Directive No 5 Bushfire Prone Areas Code 2017
- Regional Climate Change Adaptation Strategy (Regional Strategy) Southern Tasmania, 2013 – 2020
- Southern Tasmania Regional Land Use Strategy 2010-2035 (revised 2018)
- State Bushfire Safety Policy 2014
- Tasmanian Vegetation Fire Management Policy 2017
- State Policy on Water Quality Management 1997
- Tasmanian Air Quality Strategy 2006
- Tasmanian Emergency Management Plan (reviewed every two years)

City of Hobart Policies and Operational Procedures

- Biodiversity Action Plan
- Capital City Strategic Plan 2019 – 2029
- Municipal Emergency Management Plan 2020
- Climate Change Adaptation Plan
- Climate Change an Issue for Everybody 2008 – 2013 (2009)
- Establishment of Bushfire Hazard Management Areas in Bushland Reserves for New Developments on Adjoining Property 2017.

Appendix II - Characterisation of Fire Management Zones

Asset Protection Zone (APZ)

Description	An area of land surrounding or in very close proximity to an asset or group of assets that is managed in a way that keeps the amount of bushfire fuel – native vegetation and other fire-prone materials – to a minimum. Asset Protection Zones, create a buffer between nearby assets, such as homes, and fire approaching from bushland. They also provide a defensible space for firefighting operations.
Purpose	Protect life (residents, community members and firefighters), property and public assets (human settlement, economic, environmental and cultural items) from direct impact from any bushfire.
Locations	Asset Protection Zones are generally located immediately adjacent to assets considered at risk of direct impact by bushfire emanating from adjoining bushland and to provide an area with a substantially lower amount of bushfire fuel than nearby bushland.
Possible tactics	<ul style="list-style-type: none"> ▪ slashing/mowing/mulching edges ▪ grading ▪ application of herbicide ▪ appropriate frequency of prescribed burning ▪ selective clearing ▪ weed management.
Management intensity	Vegetation within an Asset Protection Zone is managed to a much higher degree than vegetation in other zones. It is fundamentally managed to reduce bushfire risk to neighbouring people and assets. Asset Protection Zones might be treated annually or more regularly if that is required to maintain the desired low fuel load.
Ecological Values	<p>Asset Protection Zones are not managed to achieve improved conservation outcomes and have the potential to negatively impact the conservation and cultural values of a specific area. Where negative impacts are identified they will be minimised as much as possible.</p> <p>Where possible larger trees should be retained within this zones. Smaller trees and shrubs are generally completely removed and ground cover maintained to approximately 100mm in height. All hollow logs on the ground to be retained where possible.</p>

Strategic Fire Management Zone (SFMZ)

Description	An area managed to provide a strategic advantage for the management of fires.
Purpose	<p>To provide areas of reduced fuel in strategic locations, to reduce the:</p> <ul style="list-style-type: none">• speed and intensity of bushfires• potential for spot-fire development• size of bushfires. <p>To help contain bushfires.</p>
Locations	These area are often created to enhance the effectiveness of APZs between bushland and urban areas. They can also be placed at strategic locations within the landscape to reduce the rapid progression of a bushfire across a particular area. Identified fire paths inform the location and delineation of the zone.
Possible tactics	<ul style="list-style-type: none">▪ slashing/mowing/mulching edges▪ grading tracks and trails▪ appropriate frequency of prescribed burning
Management intensity	<p>The City of Hobart considers two key factors in the management of Strategic Fire Management Zones. The first is the extent of fuel build up within an area. The second in the threshold or time interval between burns and how that interval impacts the ecological values of a particular area. Particular forests and grassland areas can be burnt too frequently and for others long intervals between burns can have adverse impacts on ecological values.</p> <p>Management should aim to a achieve mosaic fuel reduction patterns. Fire intervals and intensity should be chosen to not exceed ecological thresholds.</p>
Ecological Values	The City of Hobart puts in a great deal of work to protect the ecological values of an area before it carries out a prescribed burn. Fuel is cleared from around old logs and hollows on the ground, and important habitat trees and trees with highly flammable bark are protected by raking fuel away from their base prior to a burn being conducted.

Land Management Zone (LMZ)

Description	Areas of bushland managed more for biodiversity and broad-scale fire path management than for specific fire hazard reduction to any given assets.
Purpose	Where the area is bushland, the predominant objective will generally be to maintain and where possible improve conservation values.
Locations	In the context of this strategy, areas which are mostly bushland, that are not either an Asset Protection Zone or Strategic Fire Management Zone.
Possible tactics	As appropriate to achieve land management objectives with a greater emphasis, where possible, on maintaining or improving ecological values.
Management intensity	Very low. These areas will only be considered to be burnt when they reach the upper threshold or recommended intervals between burns.
Ecological Values	The strategies implemented in any Land Management Zone should be consistent with maintaining or enhancing ecological values.

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