Victoria's bushfire management strategy

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Victoria's Bushfire Management Strategy: Executive Summary.

Victorians live in one of the most bushfire-prone regions in the world. While fire is a natural part of many Victorian environments, major bushfire events have had devastating impacts and climate change is increasing their severity and frequency.

Our environment and how fire behaves in it continues to change dramatically. For this reason, we cannot simply rely on the way we have done things in the past. We need new thinking, strategies, technologies and behaviours to combat the risks and impacts of bushfires.

Together we can reduce the catastrophic impacts of bushfires on the things we value most. The work we do over the next 10 years will help ensure Victoria's people, land, environment, and resources are made as safe and resilient as possible for when bushfires inevitably occur.

Victoria's Bushfire Management Strategy (the Strategy) replaces the 2015 policy Safer Together: A new approach to reducing the risk of bushfire in Victoria. As with the Safer Together approach, this Strategy continues to drive the sector towards improved outcomes for bushfire management, directing resources and investment to where they will have the greatest impact.

This strategy provides the vision for bushfire management in Victoria that clarifies where we as a state want to be in 10 years' time, and how we can work together to get there.
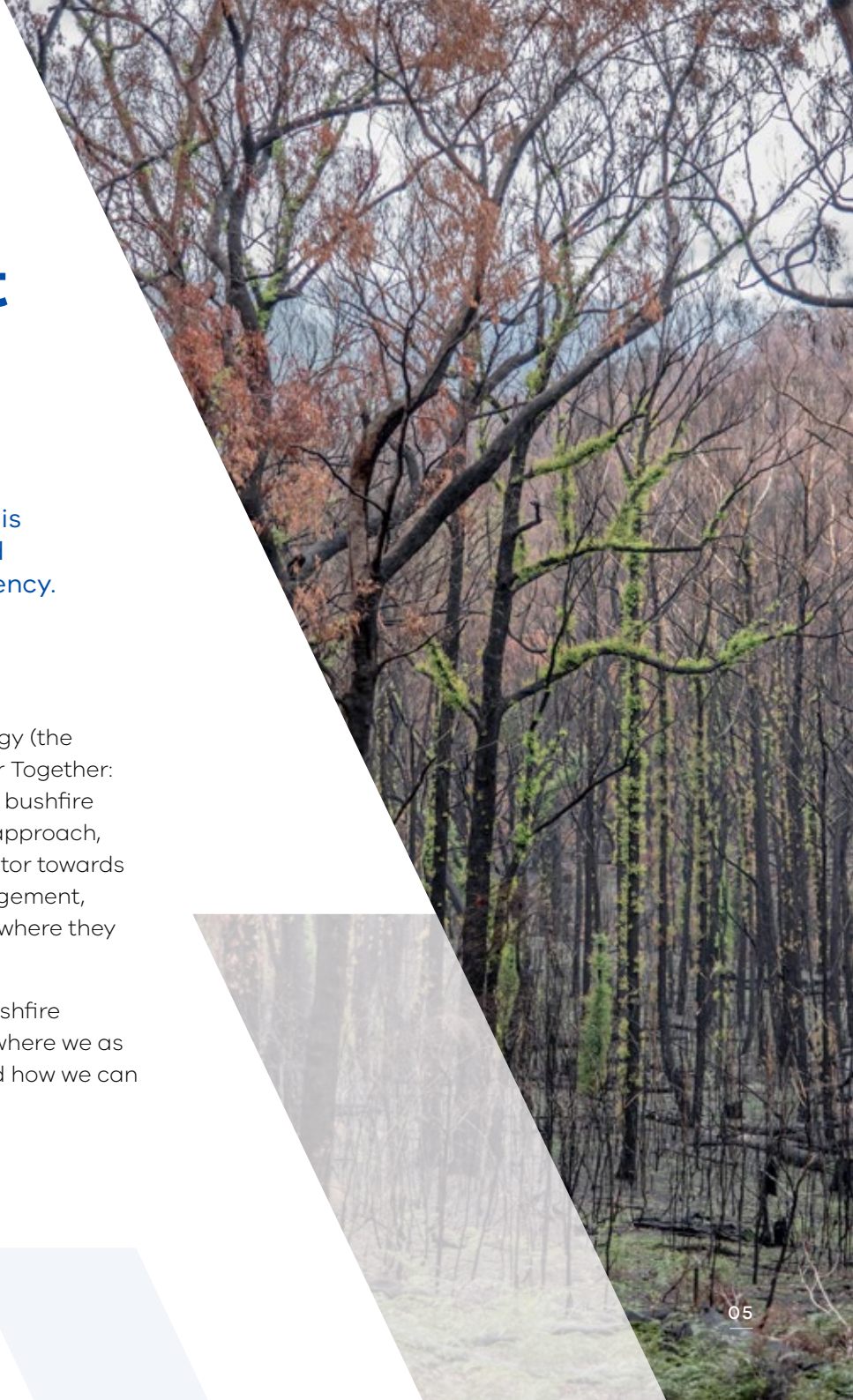
Victoria's Bushfire Management Strategy brings the extensive work we are already doing together with the work we plan to do over the next 10 years. It ensures we all have a shared vision for what a safer and more resilient Victoria looks like and defines the outcomes we will work towards to realise that shared vision.

These bushfire-specific outcomes are nested within the Victorian Government's broader Emergency Management Outcomes Framework. The bushfire management outcomes articulated in this strategy align with and support whole-of-government emergency management outcomes.

This strategy identifies one shared vision and six desired outcomes that the bushfire management sector will work towards over the next 10 years.

Our shared vision: Victorians work together to manage bushfire risk in a changing climate

1: People and Community Safety

Outcome:
Communities are safer from and less impacted by bushfires and bushfire management.

Communities that understand bushfire risks and apply practical solutions to reduce exposure to bushfire hazards and minimise their impacts are more resilient.

To achieve this outcome, the sector must:

1.1. Empower people and communities to manage bushfire risk, response, and recovery more effectively in their local area and on their own land

1.2. Help build strong and resilient communities by working with community service organisations and supporting at-risk groups in a trusted, collaborative and integrated manner to live with fire

1.3. Improve delivery of early warning information and advice on how to respond to bushfire emergencies

1.4. Deliver a fuel management program across public and private land that addresses the challenges associated with a changing climate

1.5. Use a broad range of mitigation strategies to prevent fires from starting and limit their impact on values

1.6. Continuously work to control fires early, limiting their impact on people, communities, industry, the environment and cultural values

1.7. Support people and communities to recover in a timely and safe way, while also supporting community recovery efforts

1.8. Ensure assets, critical infrastructure, community infrastructure and essential services are more resilient to the impact of bushfire.

2: Ecosystem resilience and nature conservation

Outcome:

Fire regimes and land management support healthy and resilient ecosystems and nature conservation.

Supporting better environmental outcomes means continuously updating our understanding of how ecosystems respond to the impacts of fire regimes.

To achieve this outcome, the sector must:

2.1. Continuously improve data, tools, systems and knowledge of the impacts fire regimes have on ecosystem resilience and the environment

2.2. Integrate research and knowledge on climate change into modelling and planning

2.3. Improve monitoring, evaluation and reporting on fire management practices against ecosystem resilience metrics and targets

2.4. Improve the effectiveness, consistency and transparency of environmental value assessments

2.5. Strengthen leadership in fire ecology and environmental sciences

2.6. Work with communities to increase their understanding of fire regimes, ecosystem resilience and nature conservation.

3: Aboriginal self-determination in cultural fire and bushfire management

Outcome:

The sector enables self-determination of Traditional Owners and Aboriginal Victorians in land and bushfire management.

Meaningfully delivering on the government's commitment to advance Aboriginal self-determination includes providing Traditional Owners with access and authority to manage Country using cultural land management tools, including cultural fire.

To achieve this outcome, the sector must partner with Victorian Traditional Owners to achieve the four objectives outlined in the Victorian Traditional Owner Cultural Fire Strategy.

3.1. Develop operational pathways that enable Traditional Owners to lead the planning and to undertake cultural burns across all land tenures and Country types according to their cultural obligations

3.2. Build Traditional Owner governance and capacity in cultural fire knowledge and practice

3.3. Improved management of state forest reserves and private land through the application of collaborative management to heal country and build resilience in people and landscapes

3.4. Facilitate the development and strengthening of institutional frameworks that support cultural fire practice

3.5. Enable Traditional Owners to have a greater role in bushfire management according to their self-determined interests and objectives.

4: Working together, accountability and shared responsibility

Outcome:
The sector, land managers, communities and industry work together effectively and share responsibility for managing and adapting to bushfire risk across public and private land.

As the climate changes and bushfire risk increases across the landscape, shared responsibility becomes more important, and all Victorians have a role to play.

To achieve this outcome, the sector must:

4.1. Collaborate with sector partners, including industry and the community

4.2. Address policy and legislative issues, improving accountability and transparency, and clarifying roles and responsibilities for bushfire management

4.3. Work with communities to share responsibility for managing and making decisions about their bushfire risk

4.4. Use a consistent integrated bushfire management planning framework and addressing risks across public and private land.

5: Informed decision-making, evidence-based approaches and tools

Outcome:
The sector uses science, innovation and knowledge to support evidence-based decisions.

Adapting to and reducing the influence of climate change on bushfire risk requires a strong and continuously improving foundation of knowledge, evidence and tools.

To achieve this outcome, the sector must:

5.1. Make collaborative decisions based on high-quality shared data, science, and research

5.2. Prioritise allocation of resources towards the actions that will most effectively reduce bushfire risk and impacts to values

5.3. Build a culture of evidence-based decision making at all levels of fire management

5.4. Use community and, with consent, Traditional Owner knowledge and values to inform decision making, and clearly communicate the evidence base for these decisions.

6: Enhanced capability and capacity

Outcome:
The sector is supported and equipped with the skills, equipment, capability and systems to safely and effectively manage bushfires.

To ensure the sector is better prepared for current and future bushfire events, it will develop enhanced systems, processes, tools and programs that offer improved training and support to all sector staff.

To achieve this outcome, the sector must:

6.1. Standardise systems, processes and tools to better support interoperability and decision making

6.2. Build capability through learning, training, coaching and mentoring programs

6.3. Embed physical and mental health, wellbeing, and safety

6.4. Increase representation of women and people from diverse backgrounds at all levels of fire management

6.5. Build capacity and capability to mitigate, plan, prepare for, respond to, and recover from bushfires in a changing climate

6.6. Secure the necessary equipment and infrastructure to respond to bushfires in a changing climate

Introduction

A SHARED RESPONSIBILITY

> Victorians live in one of the most bushfire-prone regions in the world. Over the past century, major bushfire events have had devastating impacts on our people, communities, property, regional economies, critical infrastructure, essential services, cultural heritage and the environment—including on wildlife, forests, water supplies and air quality.

While fire is a natural part of many Victorian environments and many native plants need fire for species regeneration, climate change is increasing the severity and frequency of bushfires.[1] It is a key driver of increasing levels of risk and may lead to permanent changes to Victoria's ecosystems, including loss of biodiversity. The public land estate is a critical factor in managing bushfire risk because it constitutes large tracts of land with significant bushfire fuel loads, often close to private land and properties. This highlights the importance of a land and fire management model that integrates public and private land, including forested areas such as road and rail corridors and land managed by local government and private landholders.

Our environment and how fire behaves in it has changed dramatically over the past 20 years. For this reason, we cannot simply rely on the way we have done things in the past. We need new thinking, strategies, technologies and behaviours to combat the risk of bushfires.

If we act now, we can reduce the catastrophic impacts of bushfires on the things we value most. The work we do together over the next 10 years will help ensure Victoria's people, land, environment and resources are made as safe and resilient as possible for when bushfires do occur.

We want Victoria to continue to be a world leader in bushfire management.

You can help make this happen.

> ## ⓘ What is the bushfire management sector?
>
> The bushfire management sector comprises any department or agency with a role or function in bushfire management. The bushfire management sector is a key part of the emergency management sector as defined in the State Emergency Management Plan. Bushfire management sector agencies include Forest Fire Management Victoria (which includes the Department of Energy, Environment and Climate Action), Melbourne Water, VicForests and Parks Victoria), the Office of Bushfire Risk Management, Country Fire Authority (CFA), Emergency Management Victoria (EMV), Emergency Recovery Victoria, Fire Rescue Victoria, Department of Transport and Planning, Department of Government Services (which includes Local Government Victoria), regulators (including the Office of the Conservation Regulator), water authorities and local government.
>
> Although different agencies in the sector play different roles and have different levels of responsibility, each part of the sector is an important contributor to its effectiveness. References to the collective sector do not mean agencies will be responsible for doing things they are not responsible for under relevant legislation or the State Emergency Management Plan.

A 10-year strategy to set a clear direction

Victoria's Bushfire Management Strategy (the Strategy) is the vision for bushfire management in Victoria that defines where we as a state want to be in 10 years' time, and how we can work together to get there.

It brings the extensive work we are already doing together with the work we plan to do over the next 10 years to ensure we all have a **shared vision** for what a safer and more resilient Victoria looks like.

Our shared vision:

Victorians are working together to manage bushfire risk in a changing climate.

Working together requires more than just a shared vision. We must collectively have a clear sense of the **outcomes we want to work towards so we realise our vision.**

> ### ⓘ What is bushfire management?
>
> Bushfire management comprises all of the activities undertaken to mitigate, plan, prepare for, respond to and recover from bushfire. Bushfire and grassfire management are included in the scope of this strategy; however, management of structural fires is not.

This strategy identifies six desired outcomes that the bushfire management sector will work toward over the next 10 years:

- **People and Community Safety**
  - — Outcome: Communities are safer from and less impacted by bushfires and bushfire management

- **Ecosystem resilience and nature conservation**
  - — Outcome: Fire regimes and land management support healthy and resilient ecosystems and nature conservation

- **Aboriginal self-determination in cultural fire and bushfire management**
  - — Outcome: The sector enables self-determination of Traditional Owners and Aboriginal Victorians in land and bushfire management

- **Working together, accountability and shared responsibility**
  - — Outcome: The sector, land managers, communities and industry work together effectively and share responsibility for managing and adapting to bushfire risk across public and private land

- **Informed decision-making, evidence-based approaches and tools**
  - — Outcome: The sector uses science, innovation and knowledge to support evidence-based decisions

- **Enhanced capability and capacity**
  - — Outcome: The sector is supported and equipped with the skills, equipment, capability and systems to safely and effectively manage bushfires

Primary outcomes: The first two outcomes address our social, environmental and cultural aspirations. These are tangible outcomes – the real reasons we work to manage bushfire risk.

Enabling outcomes: The final three outcomes address the systems, processes and capabilities necessary to achieve the primary outcomes.

Aboriginal self-determination in cultural fire and bushfire management is both a primary and enabling outcome, addressing both social, environmental and cultural outcomes and the systems, processes and capabilities needed to achieve them.

These bushfire-specific outcomes are nested within the Victorian Government's broader Emergency Management Outcomes Framework. The bushfire management outcomes articulated in this strategy align with and support whole-of-government emergency management outcomes.

"We" means all Victorians

In this Strategy, "**we**" means all Victorians.

We all need to work together to manage the bushfire risks Victoria faces. This includes the bushfire management sector (the sector), which forms part of the broader emergency management sector (see **Appendix 3**), Traditional Owners and Aboriginal Victorians, the public, landowners and occupiers, the non-government sector, business owners, environmentalists, scientists, educators, and volunteers.

Working together we can reduce the catastrophic impacts of bushfires on the things we value most.

Although reducing bushfire risk is the collective responsibility of all Victorians, some actions require a high level of investment, technical skills and capabilities, and legislative or regulatory changes. This means certain aspects of bushfire management go beyond the responsibility of individuals, communities, and private organisations, and are the responsibility of the Government or local councils.

Victoria is already a world leader in managing bushfire risk, but we need to embrace constant improvement if we are going to protect what we love in a changing climate.

Safer Together: Victoria's risk-based approach to bushfire management

The Safer Together policy was launched in 2015 and revolutionised the way Victoria approached bushfire management on public and private land. This approach saw us move from a hectare target for planned burns to a risk-reduction target for bushfire management. In addition, it focused on combining in-depth local knowledge with the latest science and technology to reduce bushfire risk on both public and private land. Today, the Safer Together approach continues to drive the sector towards improved outcomes for bushfire risk management, directing resources and investment to where they will have the greatest impact in keeping Victorians, and the things they value, safe. The Strategy builds on the existing Safer Together policy to reflect modern bushfire management practice and community values.

LOOKING BACK: VICTORIA'S HISTORY WITH FIRE

Victoria's already turbulent relationship with bushfire is becoming increasingly challenging. Climate change is escalating key bushfire-related risks and may ultimately lead to permanent changes to Victoria's ecosystems, including loss of biodiversity and regeneration failure across some native tree species. Because bushfires do not respect administrative boundaries, we must ensure our land and fire management is integrated and smoothly coordinated across all public and private land.

Fire has shaped Victoria's landscape for hundreds of thousands of years. Prior to European colonisation, First Nations peoples across Australia used fire as a tool for managing Country. This cultural use of fire is a socially and ecologically complex practice, governed by kinship, eldership, spiritual connections to Country and environmental interactions with fire.

Some of the most tragic fire events in Victoria include Black Friday in 1939, which resulted in 71 deaths; Ash Wednesday in 1983, which resulted in 47 deaths in Victoria; and Black Saturday in 2009, which resulted in 173 deaths (see **Figure 1**).

Victoria is characterised by geographic and demographic profiles that further exacerbate the state's vulnerability to bushfires: it is a relatively small, densely populated state with a sizable population living in communities with high to extreme bushfire risk (more than 17 per cent, based on 2019 data)[2]. Relative to other Australian states and territories, Victoria has recorded the largest number of bushfire fatalities: more than 60 per cent of all bushfire deaths in Australia have occurred in Victoria[3].

In addition to the tragedy of lost lives, bushfires can damage the natural environment, biodiversity, water yield and quality, and critical infrastructure, and can impact health and social factors, and the broader Victorian economy.

The past three decades have seen dramatic changes in our environment and the way fire behaves in it. Not only has the total number of fires increased significantly, but also their intensity and the area they burn.

The major contrast between the pre and post-2000 eras demonstrates climate change's impacts on megafire frequency. There have been five megafires in the 20 years since 2000 but only a few in the century before 2000.

In three of the major fire seasons following the year 2000 (see **Figure 1**), the total burnt area was more than 1 million hectares. The 2019–20 Black Summer bushfires alone saw more than 1.5 million hectares of Victoria burnt. The 'Black Summer' bushfires resulted in tragic loss of life, and devastating impacts to homes, property, infrastructure, wildlife, livelihoods, and the environment. There was also a significant impact on Victorian biodiversity, including threatened species and habitats. The bushfires burnt 78 per cent of remaining Warm Temperate Rainforests, and at least 50 per cent of the habitat of 215 rare or endangered plant and animal species[4].

The costs of fires in 2002–03, 2006–07 and 2009 were estimated at about $2.7 billion, $2.1 billion[5] and $4 billion[6]. While the costs of the 2019-20 bushfires are still uncertain, it is estimated that it caused at least $4-5 billion worth of economic losses to the Australian food system alone[7] and overall economic losses of $2.1 billion in Victoria[8].

1939
Black Friday Fires
2m hectares
71 deaths
650 homes lost

Royal Commission into the Causes of and Measures Taken to Prevent the Bushfires of January, 1939

1983
Ash Wednesday
210k hectares
47 deaths
2000 homes lost

Bushfire Review Committee into the bushfire disaster preparedness and response in Victoria

2002-03
Alpine Fires
1.3m hectares
0 deaths
41 homes lost

Inquiry into the 2002-2003 Victorian bushfires

2006-07
Great Divide Fires
1.2m hectares
1 deaths
51 homes lost

• Inquiry into the impact of public land management practices on bushfires in Victoria
• Operational Reviews of Major Fires in Victoria 2006/07

2009
Black Saturday Fires
430k hectares
173 deaths
2000 homes lost

2009 Victorian Bushfires Royal Commission

2013
190k hectares
5 deaths
46 homes lost

Harrietville Inquest

2019-20
Black Summer
1.5m hectares
5 deaths
420 homes lost

• IGEM Inquiry into the 2019-20 bushfire season
• VAGO Reducing bushfire risks audit
• Royal Commission into National Natural Disaster Arrangements

Figure 1:   Impacts of Major Fires in Australia

LOOKING FORWARD

The trends observable in recent decades will only escalate as our climate continues to change. For this reason, we cannot simply continue doing things the way we have done in the past – we need new thinking, strategies, technologies, and behaviours to combat the growing risk of bushfires.

This strategy reflects the step change necessary to bushfires, manage bushfire risk in a world of more frequent, intensive bushfires potentially compounded by other extreme weather events or concurrent emergencies. The strategy complements and supports the delivery of the Strategic Roadmap for Emergency Management in Victoria 2022–28, which sets the strategic directions and priorities for the emergency management sector, of which bushfire management is a critical part.

The strategy also responds to dramatic demographic changes as Victoria's population grows and communities change.

One further, fundamental driver of change is the Victorian Government's commitments to enabling Aboriginal self-determination, through entering formal agreements with Traditional Owners to work in partnership on the path to Treaty.

Climate change will drive increasing challenges to bushfire management practices

Climate change is increasing the frequency, severity and duration of dangerous bushfire weather conditions in Victoria. The fire season starts earlier in spring, is more intense and destructive, and continues longer into autumn[9]. Larger areas may be burnt in a single fire season and fires will occur in places that didn't burn historically. This could have both direct and indirect effects on the natural environment, and cause increasingly damaging consequences for Victorian communities, including towns and urban areas not previously subject to significant bushfire risk. Regional centres such as Bendigo, Ballarat and Shepparton could experience an increase of 60% or more in the projected number of higher fire danger days compared to 1986-2005.[10]

A 2021 CSIRO study found that the area of Australian forest burnt by fire has increased by about 48,000 hectares per year over the past three decades. This increase has been linked to climate change[11]. The same study found that every extra day of severe fire danger equates to a 300 to 500% increase in areas burnt by bushfire, while every extra day of very high fire danger increases potential burnt areas by 21 per cent[12].

Across Victoria, the number of fire seasons starting earlier has doubled in the past 20 years. The number of days with a greater than 'very high' rating greater than 25 on the Forest Fire Danger Index (the previous fire danger rating system – see section 1.1 for description of new fire danger rating system) has increased by 40 per cent in the past 45 years[13]. This pattern is expected to increase further as our climate continues to change.

Bushfire smoke causes substantial health and economic impacts. Between 2021 and 2030, it is predicted that 2,418 lives will be lost to bushfires in Australia, with healthcare costs arising from smoke-related deaths and hospitalisations reaching AUD $110 million[14]. It is also estimated that smoke from the Black Summer bushfires was responsible for 417 excess deaths[15]. These findings highlight the importance of actions to mitigate bushfire risk, including planned burns and other fuel management activities.

Climate change challenges our ability to manage fire because it is likely to:

- lead to other emergency events that need to be managed simultaneously, such as floods and compound events (where two or more extreme events occur simultaneously), placing strain on community and sector coping and response capacity

- change the timing for delivery of safe and effective planned burning and other fuel treatments, requiring a shift in when these bushfire management activities are conducted, and less flexibility to schedule burns around community or stakeholder needs

- result in changes to vegetation types that will affect the fuel load and fire risk in different areas, and present further challenges for planned burning

- lead to longer fire seasons, which puts pressure on firefighting resources (such as, personnel and aircraft), increases firefighter fatigue, reduces the lifespan of firefighting assets, and reduces capacity to share resources nationally and internationally

- increase the occurrence of thunderstorms, which may lead to an increase in the number of bushfires started by lightning strikes[16]

- increase the risk of pyroconvection (where heat and moisture generated by bushfires creates clouds and thunderstorms)[17]

- impact where people can safely live and visit, leading to or avoiding urban development in the most bushfire prone locations

- increase the amount of carbon released into the atmosphere from bushfires and reduce ecosystems' ability to absorb carbon from the atmosphere, likely exacerbating the impacts of climate change

- increase cumulative recovery costs over time for individuals, the community and government.

The timing and extent of these and other impacts of climate change on bushfire in Victoria is likely to vary across the state. In some cases, regional projections of the impacts of climate change are more severe than global, national, or even state-level projections[18].

Figure 2 shows the number of years since the last forest fire has decreased across much of Victoria, meaning that fires have been occurring more frequently.
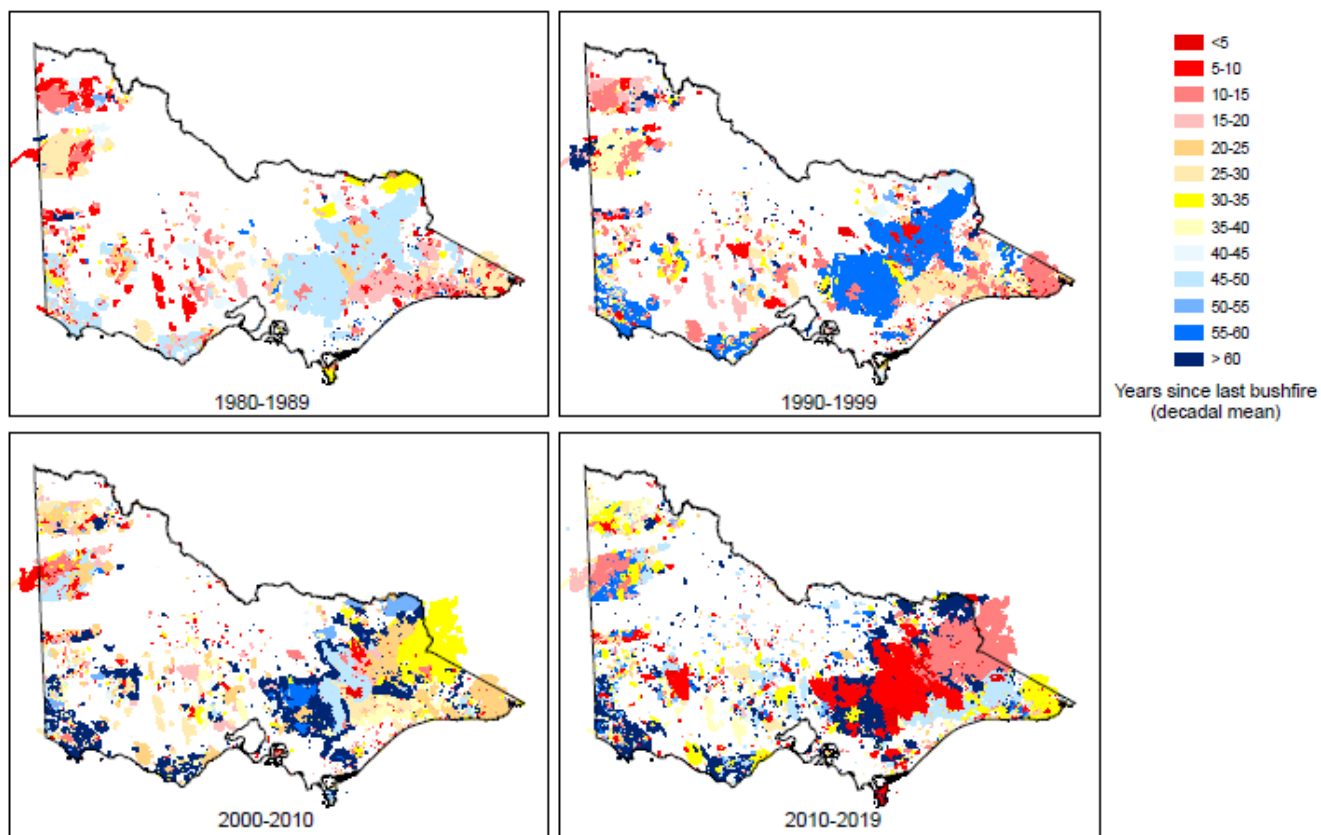
Figure 2: Years since the last forest fire (decadal mean). Data derived from satellite data (NASA-MODIS burned area) and ground/air-based data from states and territories.

Population growth and changing communities require adjustments to bushfire management approaches

Victoria's population is growing, with the most significant growth occurring in peri-urban and regional centres. Since 2006, key growth areas include Melbourne's north-western suburbs and adjacent peri-urban areas, alongside regional centres such as Geelong (and areas south of Geelong), Ballarat, and Bendigo.

By 2056, the Victorian population is projected to grow to 11.2 million, with the strongest growth continuing to occur in outer-urban Local Government Areas[19]. Regional growth is expected to account for 27 per cent of Victoria's population growth to 2056. The regionalisation trend was accelerated by the COVID-19 pandemic, which prompted marked demographic shifts as more Victorians moved into the regions.

These demographic changes have implications for Victoria's bushfire management. With larger regional populations, bushfire risk to life, property, infrastructure and essential services increases.

As Victoria's communities continue to change, our bushfire management practices will need to change with them. To continue to meet the needs of the communities it serves, the bushfire management sector will need to continually learn and adapt.

New communities may differ substantially from the historical profile of a regional community, including different demographics, lifestyles, values, and behaviours. These communities need new connections to and ways of interacting with the bushfire sector. They need tailored information about bushfire risks, and new ways to participate in managing those risks and preparing for fires.

Some groups within our communities are more at risk to the impacts of bushfire, and may require additional or targeted support. These groups may include:[20]

- **Community members likely to experience vulnerability** such as the very young, elderly and people with disability who may be dependent on others for care; those who have serious health issues; those who are less able to manage bushfire risk on their property; those who require greater assistance with fire safety and evacuation.

- **Low-income households** who may need additional support if facing an emergency or financial hardship following bushfire damage to their property or livelihood, which will make it harder for them to recover materially from disasters (for example, due to being underinsured or uninsured).

- **People new to an area**, who may be unfamiliar with local hazards and unaware of preparation and response emergency procedures.

- **People with culturally or linguistically diverse backgrounds,** who may experience difficulty accessing messages and information in their first language

- **Seasonal and mobile populations** that may be unfamiliar with local hazards and emergency procedures and/or cannot undertake full fire preparation on their property.
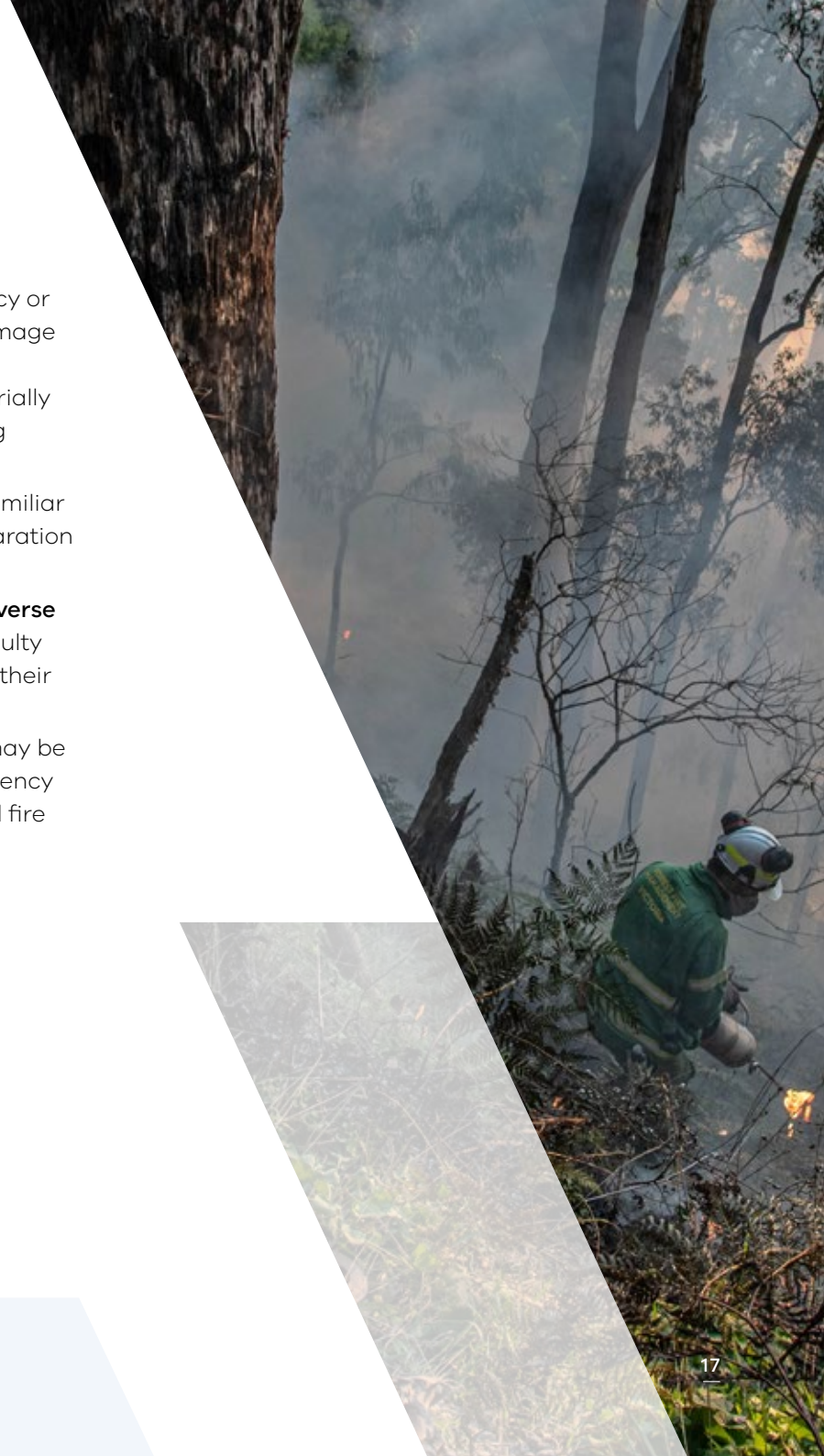
Aboriginal self-determination will change the way we manage fire in Victoria

Cultural fire management is an integral part of Traditional Owners' cultural connections and obligations to Country. For more than 60,000 years, First Nations people managed Country with cultural land management practices including high-frequency, low-intensity burns. These land management practices helped shape the Victorian landscape. One of the many injustices of colonisation was preventing Traditional Owners from fulfilling their cultural obligation to care for Country, including through cultural fire management.

This strategy aims to support the self-determination of Traditional Owners and Aboriginal Victorians in land and bushfire management in recognition of their rights and cultural obligations to care for Country across all types of land. This intent is guided by the objectives of the Victorian Traditional Owner Cultural Fire Strategy.[21] The sector will seek to strengthen partnerships with Traditional Owners and Aboriginal Victorians to enable Traditional Owner-led cultural fire management and to elevate the role of Traditional Owners in decision-making in broader bushfire management.

Victoria's treaty process is occurring in parallel to the development of this strategy. Accordingly, the strategy does not limit or restrict any future recognition of First Peoples' rights. Outcomes from the treaty process will be reflected as the strategy is reviewed and updated.

> (i) **What is Cultural fire management?**
>
> Cultural fire management describes burning practices developed by Aboriginal peoples to enhance the health of the land and its people. Cultural fire management can include burning or prevention of burning on Country for the health of particular plants and animals such as native grasses, emu, black grevillea, potoroo, bushfoods, threatened species or biodiversity in general. It may involve patch burning to create different fire intervals across the landscape or it could be used for fuel and hazard reduction. Fire may be used to gain better access to Country, to clean up important pathways, maintain cultural responsibilities and as part of culture heritage management. It is ceremony to welcome people to Country or it could also be as simple as a campfire around which people gather to share, learn and celebrate.

1: People and Community Safety

Protecting and preserving life is the sector's highest priority.

The most effective way to protect Victorian communities from bushfire is to build the capabilities of those communities. Communities that understand bushfire risks and apply practical solutions to reduce exposure to bushfire hazards and minimise their impacts are more resilient. Communities that understand and are prepared for the risk of bushfires are more resilient.[22] Community-centred approaches, in which the sector helps build the community's bushfire management capacity by involving and consulting with local people, are proven to reduce the impact of fire damage on communities.

These community-centred approaches are informed by behavioural and social science, fuel management strategies and other innovative methods and programs that can positively influence behaviour change and build social capital, not only within communities, but across the sector.

These approaches place community knowledge, expertise and experiences alongside the sector's own expertise, planning and research. This requires communities, agencies and stakeholders to foster relationships based on trust and develop shared learning environments that build a common understanding of evolving fire risk alongside local community values and needs. This in turn develops our capacity to share responsibility for making decisions about local risks, and continuously adapt the way we work together to establish new norms over time.

Outcome:
Communities are safer from and less impacted by bushfires and bushfire management.

To achieve this outcome, the sector must:

1.1 EMPOWER PEOPLE AND COMMUNITIES TO MORE EFFECTIVELY MANAGE BUSHFIRE RISK, RESPONSE, AND RECOVERY IN THEIR LOCAL AREA AND ON THEIR OWN LAND

The bushfire management sector will partner more closely with communities to better understand their needs and improve their knowledge about, and capacity to manage, bushfire risk in places they live, visit, and work.

The sector will concentrate on developing structures, tools, and processes that promote genuine collaboration between all parties involved in managing bushfires: the sector, local government, landowners and land managers, and communities. Collaborative mechanisms are designed to help enhance people's ability to identify, navigate and address bushfire risk, including when and how to seek help. Some examples of this include the use of risk assessment tools to inform community engagement across public and private land based on bushfire risk, and the Australian Fire Danger Rating System (AFDRS) (see box right).

ⓘ What are Bushfire Risk Engagement Areas?

Bushfire Risk Engagement Areas (BREAs) are used by the sector to prioritise areas to work with communities on fuel management options. They refer to parts of the landscape, on either public or private land, where managing bushfire fuels could be most effective in reducing bushfire risk. BREAs are used to guide agencies and communities as they work together to determine the best actions in their local area.

ⓘ What are fire danger ratings and Australia's Fire Danger Rating System (AFDRS)?

Fire danger ratings describe the potential level of danger should a bushfire start. They are important because they provide people the information they need to empower them to take action to protect themselves and others from bushfires.

The AFDRS is an example of national collaboration with emergency services agencies and the Commonwealth government, which is changing how fire danger is forecast in Australia. The system will be the same in all Australian states and territories. It aims to improve public safety and reduce the impacts of bushfires, better supporting Australians to meet the challenges posed by future bushfires.

The sector will use evidence-based engagement methods and science-informed behaviour change practices to create a shared understanding of risk and remove barriers for people to manage and act on their own risk.

The sector will continue to deepen its knowledge of what influences human behaviour, social dynamics and decision making, and will use that knowledge to engage more effectively with communities affected by bushfire. Practice-based learning and strategies to strengthen agency collaboration, leadership and community-centred engagement are already being developed and will be embedded into all bushfire management activities. This will help to ensure that sector can respond to the changing expectations and needs of communities in the context of wider social, environmental, and economic impacts such as climate change.

Communities will increasingly be encouraged and empowered to participate in decision making about bushfire management in their area. Facilitated conversations about living with bushfire will be integrated into all bushfire risk reduction activities, including in schools. Fire agencies will lead work to develop goals and actions to strengthen resilience to bushfire, in partnership with other stakeholders at the local level, to reflect that each landscape and community is different.

Case study

BEHAVIOURAL INSIGHTS

A collaborative project between Safer Together and Monash University's behavioural insights research unit Behaviour Works Australia (BWA) is using behavioural science to encourage Victorians to undertake bushfire risk reduction activities.

The Behavioural Insights project identified factors that influence the success of community risk awareness programs, at both community and individual levels. These factors are influential in helping communities adopt behaviours that reduce bushfire risks, both before and during emergency events.

A 'behaviour' is an 'observable action'. The project analysed many of the behaviours that help reduce impacts of bushfire on communities. Almost 90 bushfire experts were surveyed to estimate the likely risk reduction that would result from particular behaviours, ranging from mowing and cleaning gutters, to leaving homes early on high fire risk days.

The same list of behaviours was used in a survey of almost 3000 Victorians households to understand which of these behaviours were already adopted and how likely households were to action them if they had not already.

Analysis of the survey results through a likelihood/risk matrix (which plots the uptake and impact of a single behaviour in terms of effort to do a behaviour against the likely impact to reduce bushfire impacts) helped identify a suitable example behaviour for use in a behaviour change trial. The behaviour selected for use in the trial was 'attending a bushfire safety planning workshop'.

The results of the trial, and collaboration with the researchers, provided valuable insights for future work using behavioural science to support communities to be better prepared for bushfires. These insights include:

- An apparently simple 'behaviour' actually requires consideration of a range of other factors. For example, leaving early involves access to and understanding of risk information, cost implications, and complexities relating to individual circumstances such as livestock, pets or transportation options

- Personalisation of information is important to encourage participants to respond to and make sense of an invitation and advice.

- The greater the perceived effort required to adopt the behaviour the less likely community members were to adopt it. As a result, it is important to make participation as easy as possible and emphasise this in communications.

- Seasonal and weather conditions also influence the likelihood people will adopt proactive behaviours, so providing appropriate personalised information in context of the annual fire season is valuable.

- The likelihood of particular behaviours being adopted is also affected by situational factors. For example, people may be reluctant to attend in person workshops.

1.2 HELP BUILD STRONG AND RESILIENT COMMUNITIES AND SUPPORT AT-RISK GROUPS TO LIVE WITH FIRE BY WORKING WITH COMMUNITY SERVICE ORGANISATIONS IN A TRUSTED, COLLABORATIVE, AND INTEGRATED MANNER

The impacts of natural disasters, including bushfire, are magnified for some communities and groups (including culturally and linguistically diverse Victorians, newly arrived migrants, women, survivors of family violence, people with disability, younger Victorians and older Victorians).

The sector and community service organisations will work together so that communities can actively include at-risk groups and those communities that are situated in high bushfire risk areas and at urban–rural interfaces in bushfire management activities.

Lack of insurance or under-insurance poses a significant risk to affected individuals and businesses. Low-income earners are particularly vulnerable. This collaborative response to bushfire management will ensure at-risk communities have the opportunity to act as needed to mitigate, plan, prepare for, respond to and recover from bushfire emergencies.

Enhancing community awareness and education on climate change and its effects will build community resilience and support communities to manage their own risk.

This includes building resilience in communities that are most at risk of isolation due to bushfires. Isolated towns may include communities that have one-road-in one-road-out access and egress and populations that have limited access to services and relief. Our ability to do fast first attack is also contingent on maintaining access to these isolated areas. Building resilience in isolated towns may include planning for how communities cope if they get cut off and how the sector may provide relief to these areas in the case they do get cut off.

Case study

COMMUNITY-BASED BUSHFIRE MANAGEMENT

Community Based Bushfire Management (CBBM) is a place-based community approach to reducing the risk of bushfire in Victoria. CBBM ensures that decisions and actions are based on community values and priorities. As a facilitated program, CBBM brings bushfire stakeholders together in respectful, honest conversations to advance risk reduction. CBBM commenced in 2016 and continues as part of the Safer Together Community First program.

To date, 21 communities have participated in CBBM. These communities are connecting with agencies to share learnings and successes, including stories of resilience, centralised hubs, and validating surveys and actions arising from shared fire experiences, such as strategic fuel breaks and informing discussion on the locations of safer places (locations in townships that are considered 'safer' to shelter in during bushfires).

For example, residents of Briagolong have been coming together regularly since 2018 with sector staff to discuss bushfire risk in the area

and design a community-based approach to fuel management. They have established a working group that allows members to share experiences and learn about bushfire behaviour, risk assessment and existing fuel management plans. Together, they are modelling bushfire threat and mapping community assets across built, social, natural and economic environments.

This initiative has been successful at building community resilience, connecting and establishing relationships between community members, agency personnel, and local government, and building an understanding of how to successfully incorporate community values in localised bushfire management.

It has encouraged communities to take the lead in bushfire risk reduction in their locality. All bushfire stakeholders are invited to discuss local values, experiences and strengths, and to find ways to reduce risk at a community level.
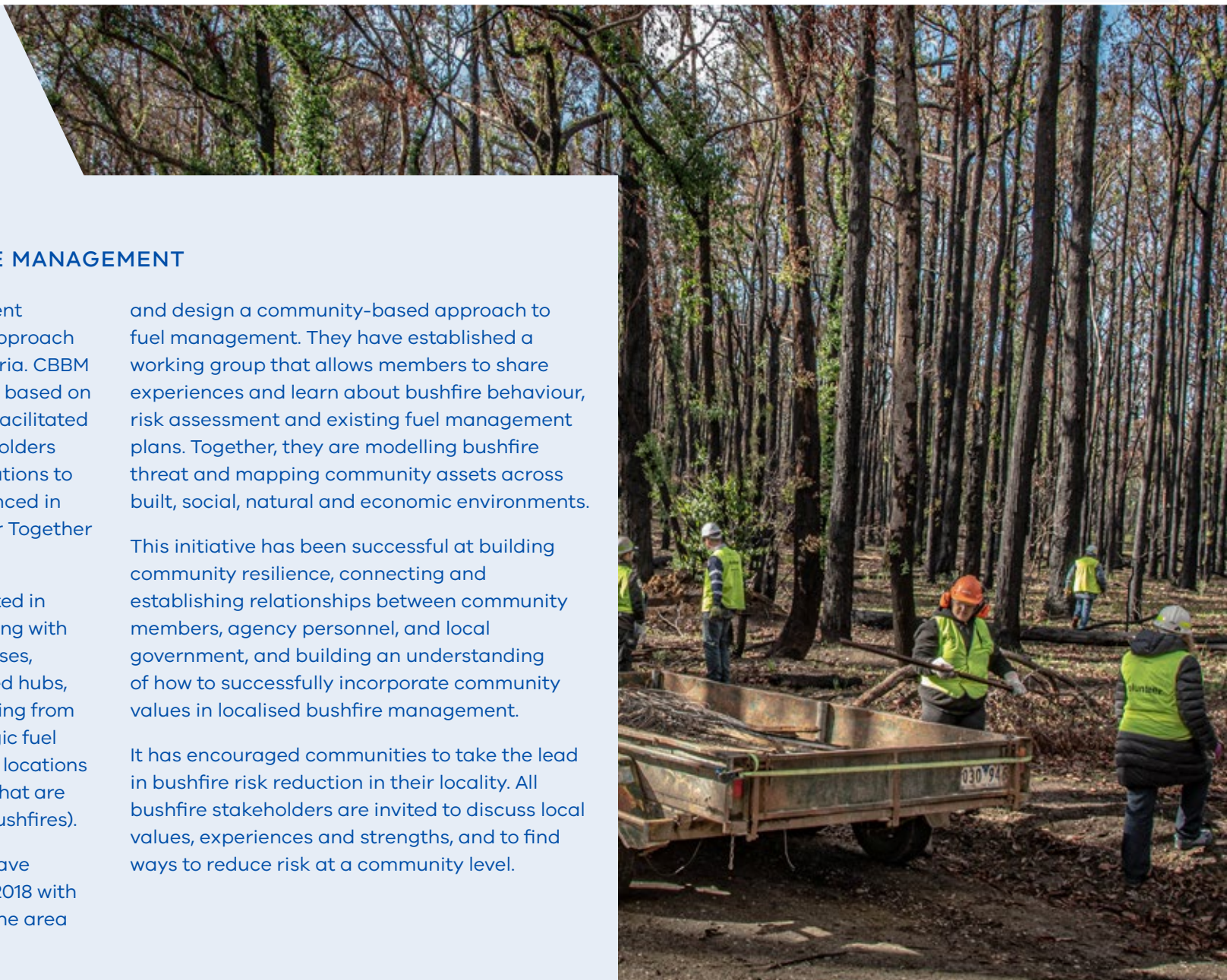
1.3 IMPROVE DELIVERY OF EARLY WARNING INFORMATION AND ADVICE ON HOW TO RESPOND TO BUSHFIRE EMERGENCIES

The sector and communities will work together to ensure early warning information and advice is accurate, up-to-date and communicated in a timely manner to those at risk of bushfire emergencies (including visitors).

The sector will work with communities, especially those living in remote areas, to support volunteers to prepare for the risk of isolation and loss of critical infrastructure. For areas where bushfire risk remains high, this includes planning and investment in shelter in place and places of last resort.

Clear plans for evacuation and relocation processes will be developed and maintained, with particular consideration for factors that may impact high-risk groups.

1.4 DELIVER A FUEL MANAGEMENT PROGRAM ACROSS PUBLIC AND PRIVATE LAND THAT ADDRESSES THE CHALLENGES ASSOCIATED WITH A CHANGING CLIMATE

The sector will partner with communities, industry, and non-government organisations to balance the benefits and impacts of planned burns and other fuel management activities on human health and safety, land and property, ecosystem resilience and industry in a way that is adaptable in a changing climate and consistent with Victoria's Air Quality Strategy.

The fuel management program will continue to deliver precision burning close to assets (such as physical structures, cultural sites and environmentally important locations). This is complemented by burning in larger areas further away from assets. The sector will also consider new approaches, based on the latest information available and practices world-wide, to best achieve Victoria's fuel management goals. The fuel management program will be developed with consideration for the benefits – such as maintaining biodiversity and promoting ecosystem resilience – and impacts of planned burns, such as those caused by smoke.

Treatment types and conservation methods used for fuel management and vegetation control, such as mechanical treatments and low intensity burning, will be carried out on public and private land. These activities will align with and continue to develop established obligations, policies, operating procedures and processes to improve cost-effectiveness and efficiency.

The sector's fuel management program will be informed by an integrated risk-based approach and supported by tools, monitoring, evaluation, reporting and continuous improvement.

Fuel management options will encompass a suite of approaches that will enable work to continue while issues such as unfavourable weather, community concerns, impacts of smoke and operational limitations are appropriately managed. For example, some mechanical treatments can be delivered year-round, including in places where planned burning may not be appropriate.

> ### ⓘ What is fuel management?
>
> Fuel management is the modification of fuels by activities that reduce the likelihood and severity of fire spreading. Some activities include planned burning (lighting and managing planned fires at times of lower bushfire risk to reduce leaf litter, twigs, bark and undergrowth), mechanical treatments (mowing, slashing and mulching) and chemical treatments (herbicides).

1.5 USE A BROAD RANGE OF MITIGATION STRATEGIES TO REDUCE THE CHANCE OF FIRES STARTING AND LIMIT THEIR IMPACT ON VALUES

The sector will use a broad range of interventions and activities to manage bushfire risk. These include land-use planning and building controls, engagement and community capacity building, ignition prevention, compliance and enforcement of illegal campfire, including unattended campfire programs and the Powerline Bushfire Safety Program (see Case Study overpage).

Improving the data and models that underpin Victoria's risk-based decision-making processes will improve understanding of climate change on bushfire risk (see **Chapter 5** for further details). This will support decision making in land-use settlement planning to consider the future impact of climate change on bushfire risk. This includes progressively updating planning, building and infrastructure standards to respond to the current and projected impacts of climate change based on the most current advice from relevant natural resource and emergency management authorities.

This information will support building the capability and capacity of local government to implement the State Bushfire Planning Policy and prioritise the protection of human life in planning decisions. Although protection of human life is the overarching objective, the state policy discourages planning decisions that will result in unacceptable environmental impacts.

Adaptation and maladaptation, including re-settlement planning, will continue to be critical for communities living in increasingly high-risk bushfire areas. Improving our ability to assess the potential impacts of climate change future scenarios on bushfire risk across the state will help design protection and risk reduction measures, including long-term transition planning for settlements facing extreme risks that cannon be mitigated. Using climate change scenarios can also support discussion about long-term risks to settlements and new buildings.

The sector will work with the community to reduce the risk of human-caused bushfires started by illegal or inappropriate use of fire, or inadvertent ignition from activities such as harvesting. This involves agencies, the community, local government, industry and other stakeholders developing and implementing targeted interventions and risk reduction strategies. Interventions will be informed by evidence-based social and behavioural science, including:

- better understanding the drivers of non-compliance, such as a lack of awareness of the rules and risks, structural impediments to following the rules, a desire for adventure and experience, and a perceived lack of enforcement
- targeting patrols, education and regulatory efforts where there is the highest risk of harm based on visitation, proximity to settlements, environmental conditions, and environmental values
- improving coordination and consistency between regulatory agencies.

> ### ⓘ Considering bushfire risk in land-use planning
>
> In 2017, the state planning policy 'Clause 13.02-1S Bushfire planning' was updated to emphasise that the protection of human life is to be prioritised in all planning decisions, including strategic planning matters and permit applications.

Works undertaken through the Powerline Bushfire Safety Program's Powerline Replacement Fund in Wollert

Case study

POWERLINE BUSHFIRE SAFETY PROGRAM

Fire starts on powerlines have caused some of Victoria's most catastrophic and devastating bushfires. The $750 million Powerline Bushfire Safety Program is the biggest powerline safety project to be undertaken anywhere in Australia, implementing critical infrastructure to significantly reduce the risk of bushfires.

This landmark safety program has been implementing a suite of mitigation measures across Victoria since the catastrophic 2009 Black Saturday bushfires, keeping the community safe and bushfire resilient.

The program was established in 2011, and by December 2022 it had achieved a 44.1 per cent relative risk reduction in powerline bushfire risk, protecting approximately 26,000 kilometres of Victoria's high voltage powerlines. Spanning 12 years, the impact of the suite of programs under Powerline Bushfire Safety Program includes achieving:

1. State-wide reduction in powerline bushfire risk since 2009 (progressing to up to 60 per cent in the coming decades)
2. Implementation of Rapid Earth Fault Current Limiters, which switch off a high voltage electricity line within seconds of a fault being detected. During the 2019–2020 summer, rapid earth fault current limiters detected and managed 33 faults of the type that had a high chance of starting bushfires
3. 99% of Victoria's highest-risk bushfire environments protected by 734 kilometres of undergrounding or insulating bare-wire powerlines
4. Victoria's entire 30,000-kilometre single wire earth return network now protected by Automatic Circuit Reclosers to stop fires
5. More than $10 million invested in world-leading research and development programs to support the next generation of powerline bushfire safety technology
6. Fulfilling recommendations 27 and 32 of the Victorian Bushfires Royal Commission
7. Undergrounding eligible private overhead powerlines in high-risk regions across Victoria through the Private Overhead Electric Lines scheme
8. Enhancing government regulations to ensure there is a legacy of continuous improvements to legislation that reduces future state-wide risk of powerline ignited bushfires
9. Installing 343 back-up generators to residential care facilities in high-risk bushfire areas, protecting 16,000 vulnerable Victorians from power outages.

The Powerline Bushfire Safety Program has also paved a pathway for innovation through its research and development grant funding that has led to world-first trials including the introduction of rapid earth fault current limiters. This cutting-edge technology is being deployed at 45 mandated zone substations across the state, with the limiters now at 38 sites – nearly 85% of zone substations to keep communities safe post summer 2022. The third and final tranche of the rollout is underway and by May 2023, more than 30,000 kilometres of high voltage powerlines across rural and regional Victoria will be protected. The completion of the rollout will result in a 48.1 per cent relative risk reduction in powerline bushfire risk.

PBSP has delivered tangible outcomes for regional Victorian communities by significantly reducing the threat of bushfires from powerline ignitions, championing Victorian manufactured technology and creating a legacy of heightened safety measures to continue long into the future.

Case study

PREVENTING HUMAN-CAUSED BUSHFIRE IGNITION

In Gippsland, a pilot program identified priority prevention areas where the highest-consequence fires are most likely to occur due to human activities. These areas were identified using historical patterns of ignitions from escaped burn-offs, deliberate ignition, and campfire escapes.

Identifying these areas is improving the effectiveness of activities such as regulation, enforcement and awareness campaigns that minimise the number of human-caused bushfire ignitions.

The priority prevention areas are implementing actions to reduce human-caused bushfire ignitions through:

- engagement, education and awareness-raising campaigns on campfire safety, burn-offs, and the fire danger period
- targeting regular patrols to ensure compliance
- removing or modifying fuels for prevention purposes
- implementing park closures under certain weather conditions.

1.6 CONTINUOUSLY WORK TO CONTROL FIRES EARLY, LIMITING THEIR IMPACT ON PEOPLE, COMMUNITIES, INDUSTRY, THE ENVIRONMENT, AND CULTURAL VALUES

The sector will continuously advance Victoria's ability to detect fire at the earliest possible point by adopting new technologies, such as satellites, community reports, aerial reconnaissance after lightning storms, and better modelling of potential fire starts. To support decision making around fire suppression strategies, the sector will enhance and expand the tools available to incident controllers.

The sector will improve its processes, procedures, and systems to determine which resources are needed to effectively respond to bushfires on all land tenures. This includes first attack, extended attack, and campaign scenarios.

The sector will build state-wide flexibility, capacity, and capability to provide rapid first-attack and sustained firefighting campaign operations. This includes establishing and maintaining:

- sufficient numbers and coverage of fit, skilled, accredited and experienced firefighters, incident management teams and support staff

- an aircraft fleet that supports on-ground firefighters with detection, suppression and intelligence gathering, as well as providing rapid transport
- fit-for-purpose firefighting equipment, technology and vehicles designed for bushfires
- seamless and integrated incident control and coordination
- modern logistics systems that can be deployed quickly to support ground crews and help manage health, wellbeing, and fatigue
- a detection network that supports early identification of fires across all land tenures and readily adapts to include emerging technology.

The sector will explore and implement opportunities for increased efficiency and effectiveness. Optimising resources and continuously reviewing deployment and utilisation models will help ensure the sector can provide maximum bushfire protection to communities and improved safety for firefighters.

The sector will ensure relief outcomes are considered during response decision-making, and data gathered through initial impact assessments informs relief planning and activities.

1.7 SUPPORT PEOPLE AND COMMUNITIES TO RECOVER IN A TIMELY AND SAFE WAY, WHILE ALSO SUPPORTING COMMUNITY RECOVERY EFFORTS

The sector will develop stronger partnerships with communities and the private sector to enable effective preparation for and recovery from bushfires. This includes supporting community recovery by working with communities in the earlier stages of planning and preparation for a disaster.

The sector will listen and respond to local recovery needs. Effective capacity-building will enable communities to take greater control in leading recovery decisions and processes, including identifying priorities and developing their own plans where communities choose to do this.[23] The sector will also work closely with Traditional Owners and Aboriginal Victorians to embed Aboriginal self-determination in the planning and delivery of recovery efforts.

Approaches will be inclusive, reflecting that communities comprise many groups with different values, cultures, experiences and priorities. Decisions and actions will be actively inclusive. The recognition of complexity is a core principle of disaster recovery, with disasters having a range of different impacts and consequences that require a variety of approaches.[24] Each approach should harness local strengths, leadership, networks, and structures. The use of local approaches can cultivate cohesion and resilience. This is essential for enduring recovery into the future.[25]

Recovery plans at state, regional and local levels will be aligned, will outline clear roles and responsibilities, and will be reviewed regularly. These plans will address recovery needs across the full range of recovery core capabilities. Planning, programs and processes for future recovery efforts will be informed by evidence. The recovery workforce, which makes up part of the bushfire management sector, will continue to build the capabilities and support needed to respond to community needs.

> Core capabilities for recovery include – but are not limited to – impact assessment, relief assistance, environmental response, economic recovery, natural and cultural heritage rehabilitation, built recovery, health emergency response, and social recovery.

When a bushfire impacts a community, we should rebuild with the impact of climate change on bushfire risk levels in mind.

1.8 ENSURE ASSETS, CRITICAL INFRASTRUCTURE, COMMUNITY INFRASTRUCTURE AND ESSENTIAL SERVICES ARE MORE RESILIENT TO THE IMPACT OF BUSHFIRE

Buildings and infrastructure, both private and public, will be designed and located to better withstand bushfires, and existing houses in high-risk areas will be retrofitted or 'hardened' to resist high intensity fires. This includes implementing measures to mitigate house-to-house ignition in existing settlements and consider this risk in future land-use planning decisions. The sector and the communities will enhance infrastructure resilience to mitigate the risk of cascading failures and dependencies in our infrastructure network.

The sector will act to prevent fires starting and spreading from road and rail-sides by undertaking bushfire management activities such as roadside fuel management, hazardous tree removal and early detection. This will minimise impacts on infrastructure and ensure roads are clear and safe for both the community and emergency services.

The bushfire management sector will work with associated sectors, including planning, electricity, and water, to identify and implement initiatives that reduce bushfire risk to elements such assets and reliability.

The bushfire management sector will work with planning agencies to support planning measures that ensure new infrastructure is constructed to standards that allow for escalating climate change impacts. Upgrades to infrastructure construction and maintenance will be encouraged to enhance communities' ability to live with fire and their resilience following fire emergencies. The Built Environment Adaptation Action Plan 2022-2026 details key actions to ensure that Victoria is well placed to consider climate change impacts, including bushfire risk, in decisions about how we plan for and build communities.[26]

Opportunities to enhance the resilience of the electricity network will be assessed and viable, cost-effective measures implemented. Demonstration of and information sharing about new and emerging technologies, such as microgrids and stand-alone power systems, will support informed and transparent decision making on bushfire resilient future energy investments.

Bushfires can have significant impacts on water supply and management. The sector will work with communities and water management authorities to help make the water sector more resilient to bushfires and other climate change impacts. The Water Cycle Climate Change Adaptation Action Plan[27] details key actions to build the resilience of the water sector and minimise service interruptions.

2: Ecosystem resilience and nature conservation

Climate change is resulting in more frequent and longer-lasting bushfires. This increasing intensity is stressing the resilience of Victoria's ecosystems and undermining nature conservation efforts. More frequent fire also impacts ecosystem services and threatens important fire-sensitive species. Climate change will cause large-scale changes to Victorian ecosystems and increase the complexity of managing fire impacts on biodiversity. Multiple large-scale active fires and increasing proportion of areas that have been burnt multiple times since the year 2000 have expanded the context in which mitigation needs to be framed.[28]

ⓘ Ecosystems and ecosystem services

Ecosystems are living and non-living components of the environment and their interactions with each other.

Ecosystem services are the benefits ecosystems provide humans, such as clean water, forest products, biodiversity, soil formation, nutrient cycling, air quality, erosion control and carbon storage.

Protecting Victoria's Environment - Biodiversity 2037 is Victoria's plan to stop the decline of native plants and animals and improve our natural environment. Maintaining and improving the resilience of natural ecosystems is an important goal in its own right and aligns with Biodiversity 2037. It is also essential to continue preserving the ecosystem services we depend on.

Supporting better environmental outcomes means continually updating our understanding of how ecosystems respond to the impacts of fire regimes. Critical to this will be understanding how fire regimes interact with other threatening processes – such as invasive species and drought. The sector will continually identify and adopt ongoing, sector-wide improvements to systems, tools and data to better understand the varying impacts of bushfires and fuel management activities on our ecosystems in a changing climate at a landscape and local level.

To achieve genuine ecosystem resilience and positive nature conservation outcomes, the sector will integrate this improved understanding into decision making. This includes identifying and protecting environmental values and assets during on-ground operations and implementing on-ground programs to manage increased threats to environmental values (such as weeds and pests) resulting from the applied fire regime. This work will be achieved through an adaptive management framework (see box for explanation) alongside skills development and focused training for staff.

Decisions about fire regimes, ecosystem resilience, nature conservation and environmental recovery will be informed by best available biodiversity and fire behaviour science, community priorities and values and, with consent, Traditional Owner knowledge.

(i) Ecosystem resistance, resilience and transition

Ecosystem resistance refers to the measure of an ecosystem's ability to withstand disturbance*.

Ecosystem resilience refers to the measure of an ecosystem's ability to recover from disturbance*. **Ecosystem recovery** occurs when an impacted ecosystem regains its ecological functionality to a reference state or level. Ecosystems may require intervention to recover. This term refers to the immediate recovery of ecosystems following from bushfire impacts rather than general recovery.

Ecosystem transition occurs when ecosystems shift to a new state, either through impacts or managed change; they do not recover to a reference state or level. For example, they could change structure or composition and, in some cases, even become a new ecosystem.

Note in this document 'disturbance' refers specifically to disturbance from fire.

(i) Adaptive management cycle

Adaptive management is the process of 'learning by doing'. This means managing with incomplete knowledge by engaging in a continual cycle of action, using learnings to adjust management actions.

Adaptive management involves a continual and intentional practice of trying new ways of doing things, learning from the outcomes and changing future actions based on learning.[29] The process involves a cycle of seven main steps, illustrated in **Figure 4**.

Applying this process helps drive continuous improvement in bushfire management. **Figure 4** outlines how the adaptive management cycle is applied to the development of the Joint Fuel Management Plan to continually improve how the sector plans its fuel management program.

Outcome:

Fire regimes support healthy and resilient ecosystems and nature conservation.

To achieve this outcome, the sector must:

2.1 CONTINUOUSLY IMPROVE DATA, TOOLS, SYSTEMS, AND KNOWLEDGE OF THE IMPACTS FIRE REGIMES HAVE ON ECOSYSTEM RESILIENCE AND THE ENVIRONMENT

The sector will improve its knowledge of fire regimes and apply this understanding to enhance environmental recovery in fire-affected areas. This knowledge-building will include constantly improving how the sector measures and evaluates the influence of fire regimes on ecosystem resilience and nature conservation including the interaction of fire regimes with other threatening processes. The sector will address critical knowledge gaps through focused research, data gathering and sharing, and integrating information to protect Victoria's ecosystems and ensure continuous improvement[30]. The sector will improve on and integrate the data, tools, systems, and processes used in its fire ecology programs. This work will inform land management, aiding better decision-making, creating more resilient ecosystems, and improving nature conservation. This work connects strongly to the implementation of Biodiversity 2037 – Protecting Victoria's Environment, which includes protecting the health of the natural environment by supporting functioning plant and animal populations and reducing species decline, even under climate change[31].

> (i) **Nature Conservation**
>
> **Nature conservation** is the protection and management of living species, communities and ecosystems. Protection of a site can promote ecosystem function, retain areas of natural or cultural significance (or both), and increase resilience to threatening processes.

Actions to support ecological resilience and nature conservation will be underpinned by research and reinforced by well-defined metrics and targets. This will include establishing baseline data on past fire regimes, as well as data on bushfire risk and its impact on ecosystems. This also includes data collection on integrated threat management that responds to the impact fire regimes have on other threatening processes.

Adaptive bushfire management will incorporate the principles and guidance outlined in the Natural Environment Climate Change Adaptation Action Plan 2022-2026[32]. This will include evaluating outcomes from fire regimes to identify opportunities to maximise ecosystem resilience and minimise impacts on nature conservation.

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ⓘ **Decision support tools**

The sector uses a number of decision support tools to inform and prioritise our decisions.

Fire Analysis Module for Ecological Values is a tool that integrates ecological data and models into a single platform. It provides an indication of the time it takes vegetation to recover following impact by fire and facilitates more effective consideration of ecological values in strategic fire management decisions.

Strategic Management Prospects is a tool designed to protect Victoria's environment, in line with the Biodiversity 2037 Plan's goals and targets by enabling biodiversity managers and decision makers integrate and compare the relative cost-effectiveness of conservation actions across species and locations. Achieving the most positive outcomes for biodiversity requires activities that provide the greatest benefit to the most species at the least cost.

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The sector will use structured on-ground data collection to test and refine ecosystem resilience theory, modelling, and policy. Modelling will increasingly factor in climate change scenarios to better inform planning and decision making. The sector will also integrate data from decision support tools (such as Fire Analysis Module for Ecological Values (FAME) and Strategic Management Prospects (SMP) (see below) to support improved fire and land management decisions and improved ecological resilience and nature conservation outcomes.

Case study

RESEEDING ALPINE ASH AND MOUNTAIN ASH FOREST

Alpine Ash and Mountain Ash are iconic features of the Australian Alps that provide a range of values to their ecosystem and the Victorian community.

Since 1997, successive bushfires (1998, 2003, 2006–07, 2009, 2013 and 2019) have burnt 2.4 million hectares of Victoria's high country, with the 2019–20 fires impacting 24,860 hectares of immature ash forest. This unprecedented fire activity created unfavourable conditions for the persistence of Ash forests and the potential for their permanent loss from significant parts of the landscape.

Responding to this risk, the sector, in partnership with the University of Melbourne and Greening Australia, developed a strategic prioritisation process for re-seeding. This focuses on previously impacted ash forest, biodiversity values and modelled persistence of Alpine Ash under climate change and future fire regimes.

The project successfully used existing specialist skills and equipment from across the sector to increase seed stocks and reseeded priority, fire-affected immature ash forests following the 2019–20 fire season.

The methods developed will be used for re-seeding projects following future significant bushfire events.
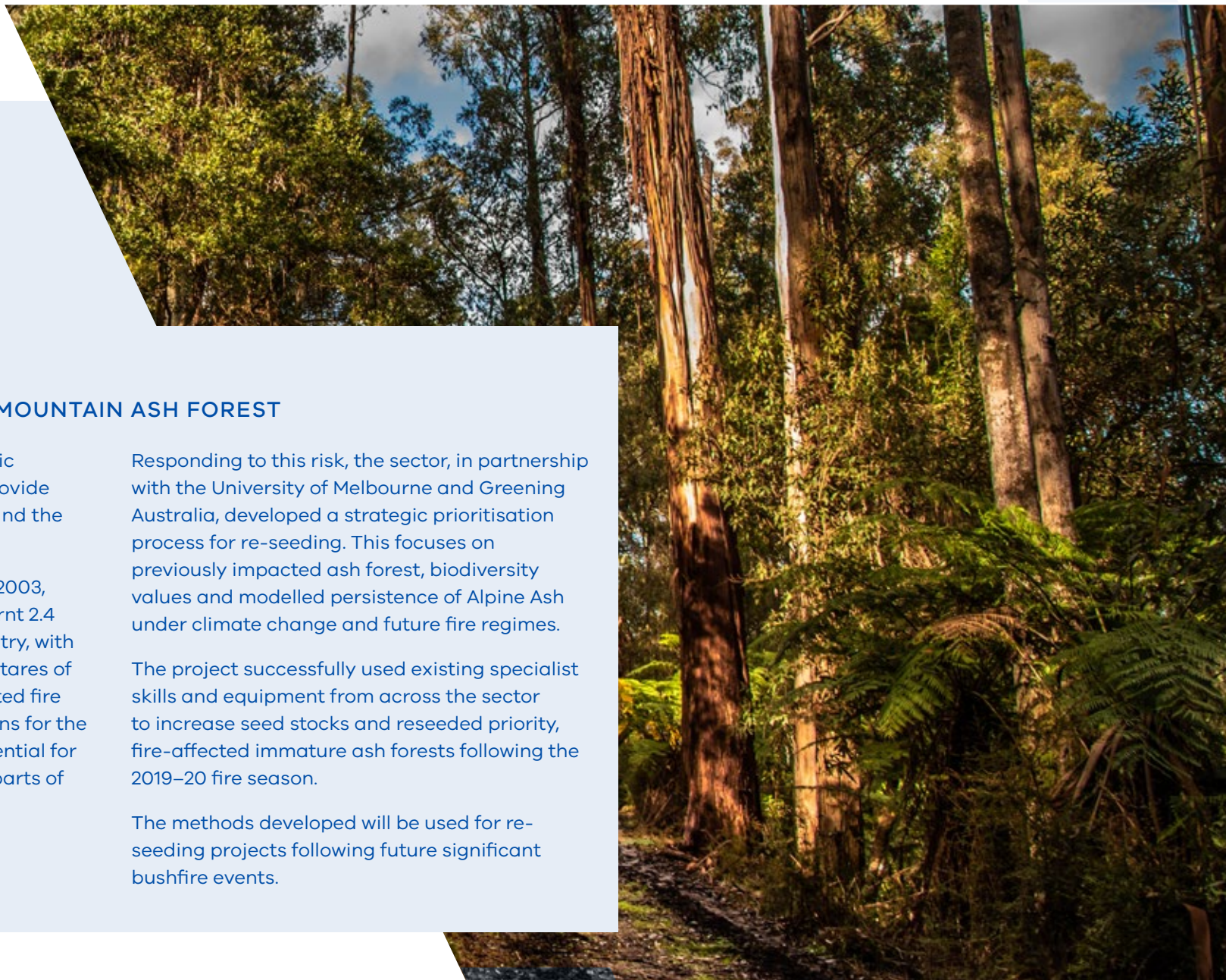
2.2 INTEGRATE RESEARCH AND KNOWLEDGE ON CLIMATE CHANGE INTO MODELLING AND PLANNING FOR ECOSYSTEM RESILIENCE

The sector will plan and implement land management actions aimed at safeguarding environmental values against a changing climate and fire regimes through all aspects of land management, including recovery. These actions will be informed by key elements of climate adaptation such as resilience, retreat, managed change, and transformation.

In determining fire management approaches, the sector will consider the implications of climate change adaptation principles. Climate change is expected to generate significant impacts on Victoria's environment and the conditions in which bushfires occur. To monitor these impacts, the sector will develop trigger points, which will activate escalated ecosystem protection measures.

The sector will strengthen ties with research organisations. This will enable integration of the latest research and knowledge on climate change, bushfire science, fire ecology and nature conservation into modelling and planning for fire regimes and on-ground delivery of bushfire and land management activities. Modelling and planning will include adaptation principles and guidance outlined in the Natural Environment Climate Change Adaptation Action Plan.[33]

Case study

CLIMATE CHANGE AND FIRE WEATHER PROJECT

Fire managers need access to locally relevant projections of future climatic changes, as well as access to more granular interpreted changes to fire weather variables. This increases their understanding of local fire weather conditions and provides guidance on the resources needed to undertake operations.

Fire managers took the projections of 12 global climate models and used sophisticated modelling techniques to create a daily fire weather dataset for Victoria to 2100. Analysis of the projected fire weather data reveals how fire risk is expected to worsen through the century.

This information is essential for informing risk-based decision-making in planning, preparedness, and future research. It provides fire managers with science-based resources for understanding how fire risk is likely to change under different climate change scenarios.

2.3 IMPROVE MONITORING, EVALUATION, AND REPORTING ON FIRE MANAGEMENT PRACTICES AGAINST ECOSYSTEM RESILIENCE METRICS AND TARGETS

The sector will continue to monitor, evaluate and regularly report on the performance of key ecosystem resilience metrics, and will establish targets for ecosystem resilience.

No single metric can capture the complex changes in ecosystem resilience that fire regimes cause. Working with research partners, the sector will determine the most appropriate combination of metrics to best capture the full influence of fire regimes on ecosystem resilience, including markers of healthy ecosystems and those that indicate concerning changes. From this analysis, the sector can use the metrics and targets that are most ecologically valuable for decision-making processes during short and long-term planning and operations.

This includes improving our understanding of the impact of fire regimes on other threatening processes, such as invasive species and drought, which will support decisions about overall management responses. For example, this may help inform decisions about when to control predators

following planned burning to protect at-risk, ground-dwelling mammals from predation following loss of vegetation cover.

Ecosystem resilience and nature conservation metrics are modelled at various scales. The sector will ensure the scale of each target is appropriate and ecologically meaningful across different contexts and decision-making processes. Clear, appropriate and meaningful targets will support more effective connections between bushfire and land management, ecosystem resilience and nature conservation.

2.4 IMPROVE THE EFFECTIVENESS, CONSISTENCY, AND TRANSPARENCY OF ENVIRONMENTAL VALUE ASSESSMENTS

The sector will support communities and staff to use adaptive management to minimise the impact of bushfire management activities on ecosystems.

The sector will work with communities to understand their environmental and ecological priorities and will use this information to inform decisions on fire regimes, ecosystem resilience and nature conservation.

The sector is legally required to protect environmental values.[34] It will continue to improve and maintain a clear and reliable environmental value assessment system that is accessible to all practitioners. The system will optimise and guide decisions to mitigate risk to environmental values. It will include expert support, guidance, and tools to ensure decisions and actions are evidence-based and lead to effective outcomes. It will ensure that the best information on environmental values is applied at the appropriate temporal and spatial scales to inform decision-making and will also ensure that environmental values data is collected to a required standard and entered in the appropriate authoritative database for later use. Communities and staff will be trained in values assessment to ensure decision-making across the sector is consistent and aligned.

Decisions about bushfire management will take into account the increased threats to ecosystems posed by the high-frequency, high-intensity bushfires likely to result from the changing climate. These decisions will align with existing government commitments to enhance how we model the impacts of fuel management on environmental values, including threatened species.

> **ⓘ Values assessment**
>
> **Values assessment** is a process the sector uses to identify potential negative impacts on environmental values, which may arise from activities such as forest or fuel management, and determine mitigation actions to reduce their likelihood and consequences.

2.5 STRENGTHEN LEADERSHIP IN FIRE ECOLOGY AND ENVIRONMENTAL SCIENCES

The sector will establish effective cross-sector governance structures that integrate the protection of environmental values into decision-making. These structures will be underpinned by robust and consistent policies and operational procedures, backed by strong expertise and leadership in fire ecology and environmental science.

The sector will build strong relationships and partnerships with the academic community and stakeholder groups with knowledge of local landscapes.

The sector will work to align strategic, tactical, and operational planning to more effectively protect and enhance ecosystem resilience. Continuous improvement of processes will help ensure research informs on-ground delivery, practice and community engagement.

2.6 WORK WITH COMMUNITIES TO INCREASE THEIR UNDERSTANDING OF FIRE REGIMES, ECOSYSTEM RESILIENCE, AND NATURE CONSERVATION

The sector will build community understanding of the role fire plays in our environment, alongside sharing information about other concepts, such as ecosystem resilience and nature conservation. Improved understanding of fire regimes will enhance community resilience and its ability to interact with ecosystems, and support changing ecosystems.

The sector will work with communities on future scenario mapping to increase community understanding of how fire-prone ecosystems evolve, and how changing fire regimes may alter regrowth patterns and affect the look and feel of locations. This work will be informed by an appreciation that changing demographics in fire-prone areas can lead to situations in which large numbers of people – particularly those new to an area – are unaware of how natural landscapes evolve as they regrow.

Case study

UPPER BEACONSFIELD, GUYS HILL AND DEWHURST STORYMAP PROJECT – A COMMUNITY VALUES-BASED BUSHFIRE RISK MITIGATION PROJECT

In 2020-21, the upper Beaconsfield Association, Southern Ranges Environment Alliance, Cardinia Shire, Monash and Melbourne universities, the Country Fire Authority (CFA) and Forest Fire Management Victoria (FFMVic) delivered a local StoryMap project that was funded by Safer Together.

The project was initiated through a community survey to understand what residents valued most about living in the area, and what they themselves wanted to protect from the risk of bushfire. The survey results fed into the development of an interactive online tool that builds community understanding of bushfire management, clarifies who is responsible for what, and empowers residents to make their own evidence-informed choices and manage their own land.

The project and its interactive online StoryMap platform[35] is helping community members understand more about their local area, its history, bushfire risk and biodiversity values. It supports community members to make decisions about actions that can be taken to protect what they value most from the risk of bushfire, and to see the effects of various actions on biodiversity and bushfire risk. The project demonstrates shared responsibility between the community, local government, and land and fire agencies to understand and reduce bushfire risk on public and private land.

3: Aboriginal self-determination in cultural fire and bushfire management

The Victorian Government is committed to advancing Aboriginal self-determination. Meaningfully delivering on this commitment includes providing Traditional Owners with access and authority to manage Country using cultural land management tools, such as cultural fire.

While ownership of Aboriginal self-determination rests with the Aboriginal community, the Victorian Government can influence many of the systems and structures that support and enable the self-determination agenda.

There is much the sector can do to remove barriers to Traditional Owner-led land and fire management in Victoria. This work needs to be done in partnership with Victoria's Traditional Owners.

Bushfire management and cultural fire management are not the same. Bushfire management refers to how the sector and communities manage the risk of, respond to and recover from bushfires. Improving how the sector delivers bushfire management activities is the primary focus of this strategy.

Cultural fire management refers to practices led by Traditional Owners to fulfil a range of cultural objectives. While the application of cultural fire may reduce bushfire risk, this is rarely its primary objective. Cultural fire management is a socially and ecologically complex practice, governed by kinship, eldership and spiritual connections to Country. Only Traditional Owners have the authority to lead cultural fire management on Country.

Over the past few years, the sector has collaborated with Traditional Owners in cultural fire management in some parts of Victoria. However, much more needs to be done to meet Traditional Owners' expectations of what true partnership looks like.

This chapter outlines the sector's commitment to working towards a partnership approach with Traditional Owners that enables Traditional Owners to undertake cultural land and fire management according to their self-determined pathways.

The commitments made in this chapter have been informed by the Victorian Traditional Owner Cultural Fire Strategy (Cultural Fire Strategy) and conversations with Victorian Traditional Owners.

The Cultural Fire Strategy was authored by Traditional Owners and provides a clear policy and practice framework for effective Traditional Owner-led cultural fire management in Victoria. The

Cultural Fire Strategy is intended to reinvigorate cultural fire through Traditional Owner-led practices across all types of Country and land tenure, enabling Traditional Owners to heal Country and fulfil their rights and obligations to care for Country.

> **ⓘ Vision from the Victorian Traditional Owner Cultural Fire Strategy**
>
> Future generations of Victorian Traditional Owners will grow up observing their Elders leading the use of right fire for Country. They will be trusted to know the special reasons why fire is used and how it brings health to the land and people. Their children and grandchildren will see culturally valuable plants and animals return to Country and know their stories.

The Cultural Fire Strategy articulates a long-term vision for reinvigorating cultural fire on Country, and outlines four specific objectives.

The sector recognises and supports these objectives. This chapter outlines how the sector will contribute to achieving the objectives of the Cultural Fire Strategy.

The sector also recognises that some Traditional Owners not only want to reinvigorate cultural fire practices, but also wish for greater influence in broader bushfire management decision making. In addition to detailing how the sector will contribute to the four objectives of the Cultural Fire Strategy, this chapter includes a fifth objective focused on how the sector can support Traditional Owners to have a greater role in areas of bushfire management that are of interest to them.

Actions outlined in this chapter will be undertaken in close partnership with Victorian Traditional Owners to enact state-level reform, as well as to support each individual Traditional Owner group's objectives for cultural fire and involvement in broader bushfire management.

This strategy does not limit or anticipate the impact and role that a future Treaty or Treaties may have on the Victorian Government's efforts to enable self-determination. Treaty will provide for a new, positive relationship between the State Government and Aboriginal Victorians by determining how each party's priorities, interests and responsibilities can be realised together.

The strategy will be reviewed regularly to ensure alignment with future actions and changes required to facilitate outcomes of a Treaty or Treaties.

Outcome:

The sector enables self-determination of Traditional Owners and Aboriginal Victorians in land and bushfire management.

To achieve this outcome, the sector must partner with Victorian Traditional Owners to achieve the four objectives outlined in the Victorian Traditional Owner Cultural Fire Strategy.

Cultural burning in wetlands on Gunditjmara Country

3.1 DEVELOP OPERATIONAL PATHWAYS THAT ENABLE TRADITIONAL OWNERS TO LEAD THE PLANNING AND TO UNDERTAKE CULTURAL BURNS ACROSS ALL LAND TENURES AND COUNTRY TYPES ACCORDING TO THEIR CULTURAL OBLIGATIONS

As contemporary systems and structures in bushfire management evolve to better meet the expectations and objectives of Traditional Owners (see Objective 4), the sector will work with Traditional Owners to develop operational pathways for Traditional Owners to lead cultural fire practices across land tenures in the short-term, while building new systems that enable Traditional Owners to apply cultural fire knowledge and practice.

Traditional Owners require appropriate and sustainable levels of funding to develop and implement their Country-specific pathways to manage the transition to a healthy Country. Traditional Owners must be empowered to deliver cultural fire management.

The sector will contribute to achieving Objective 1 of the Victorian Traditional Owner Cultural Fire Strategy by:

- working with Traditional Owners to strengthen partnership approaches with the sector
- working with Traditional Owners to create culturally appropriate processes and procedures for cultural fire across land tenures
- reviewing and strengthening government support for Traditional Owners
- support Traditional Owners through targeted programs
- reviewing government procurement strategies, removing barriers and better supporting Traditional Owners' economic resilience
- removing administrative and institutional barriers to Traditional Owner fire practice.

> (i) Land tenure is **the manner in which a party holds or occupies an area of land**. It is a way of identifying who has the right to use and occupy land in accordance with the different types of ownership. Land tenure is the name of the particular legal regime under which land is owned[36].

3.2 BUILD TRADITIONAL OWNER GOVERNANCE AND CAPACITY IN CULTURAL FIRE KNOWLEDGE AND PRACTICE

Restoring and protecting the cultural fire knowledge and practice system around cultural fire is integral to Traditional Owners' ability to heal and manage Country and to their ability to pass this knowledge and practice on to future generations.

The sector will contribute to achieving Objective 2 in the Victorian Traditional Owner Cultural Fire Strategy by:

- supporting the establishment of Traditional Owner-led governance arrangements for cultural fire (e.g. the Cultural Fire Authority)
- developing research partnerships with Traditional Owners and lifting the standards in existing approaches to partnerships

- empowering Traditional Owners to identify their own research needs and to undertake research
- enabling Traditional Owners to heal their systems of cultural fire knowledge and practice
- ensuring relevant existing research in land and fire management, including findings, are made available to Traditional Owners
- providing greater access to and involvement in existing research projects and findings in land and fire management
- enabling Traditional Owners to develop and manage Indigenous Cultural and Intellectual Property.

3.3 IMPROVED MANAGEMENT OF STATE FOREST RESERVES AND PRIVATE LAND THROUGH THE APPLICATION OF COLLABORATIVE MANAGEMENT TO HEAL COUNTRY AND BUILD RESILIENCE IN PEOPLE AND LANDSCAPES

Traditional Owners should be enabled to manage Country holistically. Cultural fire is one of many land management tools that has been used by Traditional Owners to manage Country for thousands of years. Not all agencies within the sector have land management responsibilities, but there are a range of actions the sector can undertake to remove barriers and enable Traditional Owners to manage Country holistically.

The sector will contribute to achieving Objective 3 in the Victorian Traditional Owner Cultural Fire Strategy by:

- removing barriers to the application of fire for cultural objectives
- enabling the establishment of collaborative governance arrangements for the management of private and public land
- removing barriers to enable Traditional Owners to achieve other land management objectives (where relevant)
- breaking down internal silos within the sector to remove barriers to Traditional Owners accessing and managing Country and partnering with government more effectively
- facilitating Traditional Owner-led cultural heritage management services.

3.4 FACILITATE THE DEVELOPMENT AND STRENGTHENING OF INSTITUTIONAL FRAMEWORKS THAT SUPPORT CULTURAL FIRE PRACTICE

As described in the Cultural Fire Strategy, Traditional Owners require their role in managing Country with cultural fire to be embedded in contemporary land and fire management in Victoria. Achieving this objective will require significant reforms to current institutional frameworks related to bushfire management.

The sector will contribute to achieving Objective 4 in the Victorian Traditional Owner Cultural Fire Strategy by:

- identifying and removing legislative, regulatory, and operational barriers to strengthen the authority and capacity of Traditional Owners in cultural land and fire management

- establishing collaborative governance arrangements that enable and embed Traditional Owner knowledge and practice systems in Victorian government policy, legislation, and procedures

- enabling Traditional Owners to participate in decision-making to enable Traditional Owner-led knowledge and practice to be embedded into policy, planning and the management of Country

- support cultural revitalisation programs which promote and remove barriers to the practice of Aboriginal culture and cultural fire

- increasing the cultural competency of sector staff to ensure its agencies have the skills and capacity and also understand the importance of cultural land fire and management.

3.5 ENABLE TRADITIONAL OWNERS TO HAVE A GREATER ROLE IN BUSHFIRE MANAGEMENT ACCORDING TO THEIR SELF-DETERMINED INTERESTS AND OBJECTIVES

The sector undertakes a range of actions in preparation, mitigation, response, and recovery, that impact Country. Traditional Owners have expressed an interest in having greater involvement in decision-making for bushfire management activities.

The sector will work with Traditional Owners to remove barriers to their participation in bushfire management. This includes:

- enabling the application of fire for cultural objectives

- facilitating a greater role for Traditional Owners in providing cultural heritage advice during emergency response and recovery to protect cultural heritage sites

Creating fire using a traditional fire-starting technique. Gundijmara Country

- enabling Traditional Owner-led cultural heritage management services to decrease the impact of fuel reduction activities on bio-cultural values, including Aboriginal heritage (tangible and intangible)

- enabling Traditional Owners to apply cultural knowledge and practice post-fire to heal and restore Country according to cultural land and fire management objectives

- supporting Traditional Owners to establish fire crews to provide operational firefighting services.

4: Working together, accountability and shared responsibility

When it comes to bushfire management, all Victorians have a role to play. As the climate changes, and bushfire risk increases across the landscape, shared responsibility becomes more important.

Over the past five years, the sector has progressively implemented the Safer Together program. This work has set new foundations for improved collaboration between agencies, and with communities. It has guided the development of innovative community engagement programs, joint agency planning activities, and seamless integration plans across public and private land.

How we operate as a sector is constantly evolving and demands ongoing work – particularly for fire agencies. Strengthening communities to live with bushfire risk means continually working to realise the benefits of collaboration and partnership.

As organisations, stakeholders, sector partners, staff and communities change, sustaining effective partnerships requires strong frameworks and ongoing commitment to the principles that guide bushfire management.

Outcome:
The sector, land managers, communities and industry work together effectively and share responsibility for managing bushfire risk across public and private land.

To achieve this outcome, the sector must:

4.1 COLLABORATE WITH STAKEHOLDERS INCLUDING INDUSTRY AND THE COMMUNITY

The sector will work in collaboration with stakeholders to manage fire and its impacts and will support industry and the community to take on enhanced roles in bushfire management. This includes harnessing opportunities through and providing support to work being delivered within and beyond the bushfire management sector, including initiatives related to:

- education and training, to help schools and early childhood services to prepare for and respond to extreme weather and bushfires and comply with bushfire preparedness guidelines[37]

- health, to minimise the impacts of exposure to bushfire smoke and planed burns and agricultural burns on human health[38]

- transport, to ensure the transport system's preparedness for bushfires and to mitigate bushfire impacts on the transport of workers and users, freight, food supply and supply chains, including the health and safety of livestock and the safe transport of perishable goods and medical supplies[39], and

- primary production, to mitigate the impact of bushfires and smoke from planned burns on primary production systems, including ensuring access to key markets and people[40].

Regulation and compliance is another important aspect to preventing bushfires. The Office of the Conservation Regulator provides intelligence-led, risk-based compliance activities around safe campfires on public land to support prevention of bushfires.

All Victorians will collaborate to manage bushfire risk effectively across all public and private land – including land managed by government agencies, local government, industry, the community, and Traditional Owners.

The sector will work with communities to develop a shared understanding of the best approaches to bushfire management, including ways to balance the impact of bushfires and risk mitigation activities with environmental, cultural, social, and economic values.

The sector will identify and pursue opportunities to collaborate more effectively with industry and the community to deliver strong bushfire management outcomes.

The sector will establish and maintain bushfire management governance that enables the sector to work effectively together at state, regional, municipal and local levels to manage bushfires.

4.2 ADDRESS POLICY AND LEGISLATIVE ISSUES, IMPROVE ACCOUNTABILITY AND TRANSPARENCY, AND CLARIFY ROLES AND RESPONSIBILITIES FOR BUSHFIRE MANAGEMENT

The Office of Bushfire Risk Management (OBRM) will develop, maintain and co-ordinate the implementation of the comprehensive end-to-end bushfire management framework that land and fire managers across public and private land will work within to achieve shared risk reduction outcomes.

Updated performance targets will help drive accountability for fuel management across all agencies and land types (see **Figure 3**). Fuel management reporting will expand to provide sector-wide assurance and accountability.

Land managers' responsibilities for fuel management will be considered through the Review of Fuel Management Legislative Frameworks. Ongoing review of fuel management legislative frameworks will inform legislative adjustments, including:

- enabling more effective and efficient planning and delivery of bushfire management across different land tenures

- supporting greater interoperability
- clarifying accountability for fuel management across the sector
- ensuring all firefighters have sufficient legal protections when carrying out fuel management.

The sector will have the powers and protections necessary to manage bushfire risk in a changing climate. It will collaborate effectively with landholders, and communities. All planning, coordination and activities will be consistent with the principles of shared responsibility and accountability.

> ### ⓘ The Office of Bushfire Risk Management
>
> The Office of Bushfire Risk Management (OBRM) will play a key role in leading and coordinating the implementation of evidence-based fuel management policy, practice, assurance, and reporting across all land types, both public and private.

Fuel management roles and responsibilities

PRIVATE LAND – FRV FIRE DISTRICT

Land owners and occupiers are responsible for managing fire risk.

FRV can assist.

Local government can regulate fire prevention.

DEECA can direct land owners and occupiers to manage fire risk on land nearby parks, forests and other public land.

This applies across all of Victoria.

PRIVATE LAND – COUNTRY AREA OF VICTORIA

Land owners and occupiers are responsible for managing fire risk.

CFA can assist.

Local government can regulate fire prevention.

1.5km

1.5km

1.5km

1.5km

PARKS, FORESTS AND OTHER PUBLIC LAND

FFMVic carry out work to reduce the risk and impact of bushfires in Victoria's parks, forests and other public land

OTHER PUBLIC LAND – FRV FIRE DISTRICT

Councils and public authorities take steps to prevent fire and reduce the risk of spread.

FRV can assist.

For example: this includes road reserves (Department of Transport and Planning, local governments), rail reserves (VicTrack), land managed by water corporations, council managed land)

DEECA can direct local governments and public authorities that manage land (for example, the Department of Transport, VicTrack, water corporations) to manage fire risk on land nearby parks, forests and other public land.

This applies across all of Victoria.

OTHER PUBLIC LAND – COUNTRY AREA OF VICTORIA

Councils and public authorities take steps to prevent fire and reduce the risk of spread.

CFA can assist.

For example: this includes road reserves (Department of Transport and Planning, local governments), rail reserves (VicTrack), land managed by water corporations, council managed land)
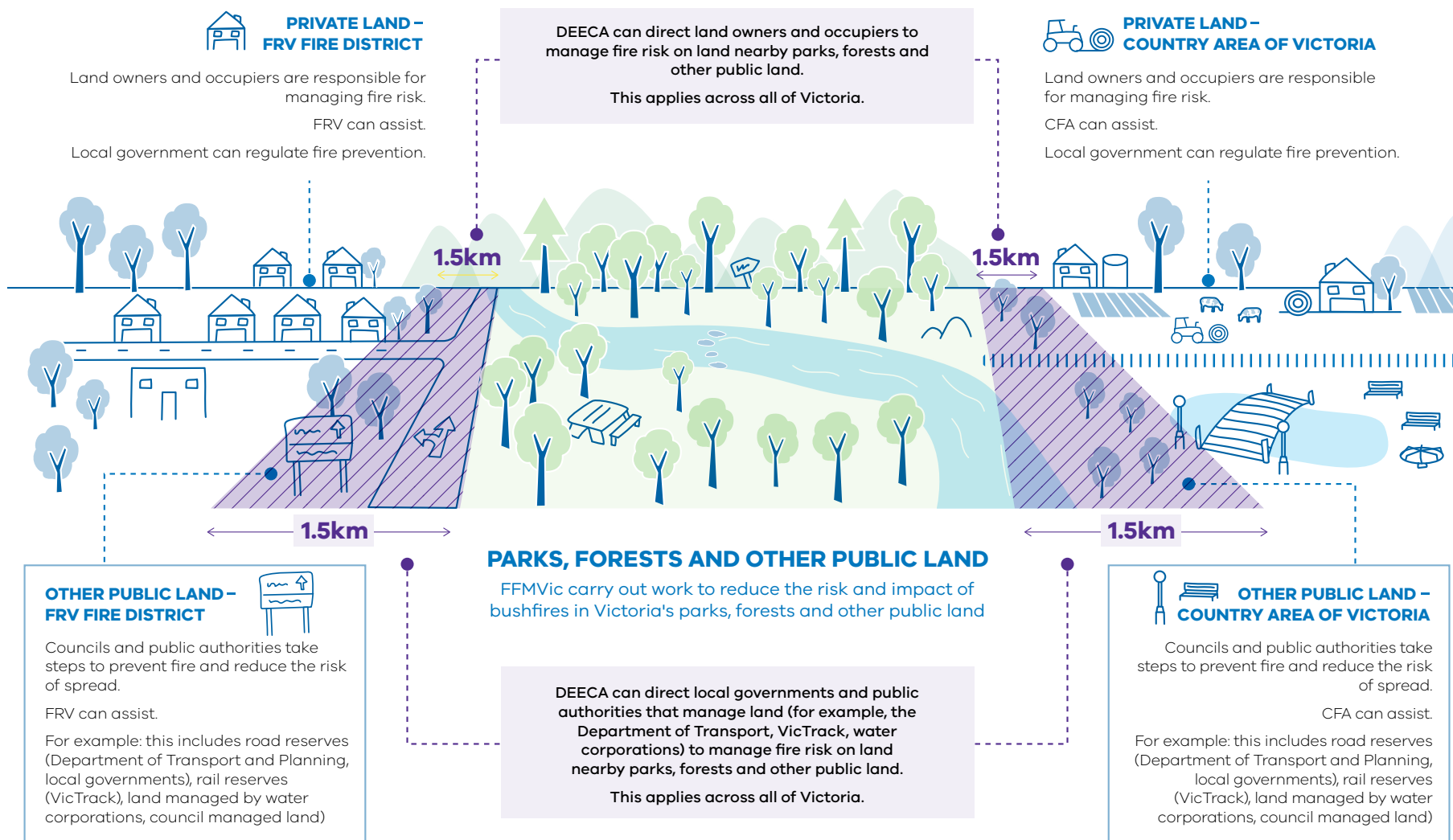
Figure 3: Roles and responsibilities for bushfire management are defined in the State emergency Management Plan.

4.3 WORK WITH COMMUNITIES TO SHARE RESPONSIBILITY FOR MANAGING AND MAKING DECISIONS ABOUT BUSHFIRE RISK

Communities and government organisations will work together to understand bushfire risk, agree on strategies, and meet their individual and shared responsibilities.

The sector will be responsible for actions including:

- delivering education and behaviour change programs
- issuing fire danger warnings and advice
- reducing fuel through planned burning and mechanical treatments
- commissioning bushfire science research and sharing lessons
- recruiting and training firefighters
- compliance and enforcement to prevent bushfires from starting.

The State Emergency Management Plan and its Bushfire Sub-Plan provide more details on each agency's bushfire management roles and responsibilities.

Community members will be responsible for actions including:

- fully extinguishing campfires and other fires
- developing and practising bushfire plans
- preparing themselves and their property for bushfire emergencies
- participating in community bushfire preparedness activities and events.

Everyone, including the sector, communities, land managers and landholders, will be responsible for actions including:

- building an understanding of bushfire risk in their area
- sharing information through community and social channels
- developing, practicing, and implementing plans to protect what matters most to local communities.

The sector, community members, businesses, land managers and landholders will all play their part in the full suite of bushfire management activities – mitigation, planning, preparedness, response, and recovery. Responsibilities will be clearly defined and assigned to those best placed at that time to undertake them.

4.4 USE A CONSISTENT, INTEGRATED BUSHFIRE MANAGEMENT PLANNING FRAMEWORK AND ADDRESS RISKS ACROSS PUBLIC AND PRIVATE LAND

The bushfire management planning framework (the planning framework) will be integrated with broader emergency management planning at municipal, regional and state levels, enabling collaboration and consistency in planning across public and private land.

The planning framework will support the sector and land managers, including government, Traditional Owners, industry, and the community, to:

- make informed, risk-based decisions about how we manage bushfire
- reduce bushfire risk to multiple values in the landscape, including cultural heritage, timber, water, and agricultural assets, with human life as the highest priority.

Drawing on scientific research, community knowledge and, with consent, Traditional Owner knowledge, the planning framework will identify the best interventions available to reduce bushfire risk and will be essential to bushfire risk management in a changing climate.

5: Informed decision-making, evidence-based approaches and tools

Victoria's risk-based approach to bushfire management helps the sector ensure it is achieving key outcomes for people and communities, biodiversity, environmental and social values, cultural heritage, ecosystem services and economic values such as agriculture.

This risk-based approach informs all tiers of planning, from strategic to operational. It assesses the likelihood of fires starting and spreading and also considers the possible impacts of fires and fire response activities on human life, health and wellbeing, communities, cultural heritage, the environment and critical infrastructure.

The risk-based approach relies on many tools to inform decision-making about how best to protect what we value. These tools include accurate data, new science, modelling, decision-support tools, community input and, with consent, Traditional Owner knowledge.

ℹ Risk metrics and targets

A **metric** is a measure of risk to a particular value, whereas a target is a threshold value for a risk metric.

Setting a risk **target** means that we aim to undertake activities that reduce risk to below that threshold. Metrics need to be developed first, which then enables the development of targets.

Climate change is further influencing the dynamic nature of bushfire risk. Adapting to and reducing the influence of climate change on bushfire risk requires a strong and continuously improving knowledge and evidence base.

Outcome:

The sector uses science, innovation and knowledge to support evidence-based decisions.

To achieve this outcome, the sector must:

5.1 MAKE COLLABORATIVE DECISIONS BASED ON HIGH-QUALITY SHARED DATA, SCIENCE, AND RESEARCH

High-quality data will be essential to decision-making. Evidence collection will be strategically determined, and data will be gathered through both short and long-term research and monitoring. Decision makers will thereby be equipped with the most useful data available.

The sector will work with communities to collect high-quality, reliable data, particularly data gathered through long-term studies. It will continue to improve foundation datasets and ensure data regarding fuel load, vegetation characteristics, climate and values of interest are built and maintained. The sector will incorporate the latest science published in peer reviewed literature both locally and internationally.

The sector will establish a data governance framework to ensure data is collected consistently across the sector and made available, where appropriate and required, for all land and fire agencies, emergency management planners, Traditional Owners, and the public, in a manner consistent with intellectual property obligations. This will enable the sector to grow the wealth of existing science and will lead to more coordinated and consistent research approaches.

Ongoing use of scientific methods to obtain, analyse and interpret data will continuously improve sector knowledge about the complex nature of fire behaviour, fire ecology, operations, fuel management, community risk and climate change. The sector will use this data to better identify and respond to bushfire risk.

The sector will consult broadly to target and define research questions and will engage with a range of researchers to continuously develop new knowledge. This engagement will include co-designing research with end-users to increase its uptake and influence on decision-making and behaviour change.

Fire behaviour modelling is critical and underpins our understanding of the potential spread, extent and severity of fire. We then intersect three other things with the fire simulation modelling:

- **values** that might be impacted by a simulated fire and a vulnerability model for each value (essentially, will a particular value be impacted by a fire of that size and intensity)
- **management levers** that reduce the occurrence of fire, the spread of fire, or presence of a particular value in that fire, and
- **a likelihood model** with respect to ignition and weather occurrence.

There are many modelling tools with respect to different management levers. For example, evacuation modelling is a tool that looks at human life value and the ability to safely get that value (human life) out of the path of a fire through evacuation. There are other modelling tools for other values and other levers. The sector will develop, apply, and continually improve fire behaviour modelling tools to support end-to-end, risk-based bushfire management across public and private land. These tools will help identify areas of highest risk in the landscape, the potential for new bushfires (or expansion of established bushfires during summer), and the cost-effectiveness of risk reduction activities.

Investment in next-generation bushfire risk-modelling tools and input datasets will enhance the accuracy of predictive services and the effectiveness of strategic planning. The improved modelling capability will support decision-making to identify the most constructive and cost-effective opportunities for reducing bushfire risk. Climate change scenario modelling and mapping will be integrated into bushfire risk modelling and used to inform decisions. The sector will share risk data and other risk assessments to improve overall understanding of state-wide and localised risks.

The sector and communities will work closely together to share bushfire risk knowledge and information transparently and effectively. This will include knowledge on:

- climate change
- the environment
- available tools and technology
- place-based data
- local knowledge and values.

Decision-making and planning approaches will integrate science-based evidence and, with consent, the knowledge of Traditional Owners and community. The sector will communicate clearly and simply how its programs are being informed and supported by evidence and timely feedback.

(i) Fire behaviour modelling tools

Phoenix RapidFire is the primary modelling tool used by all eastern-Australian fire agencies to model and manage bushfire risk. Phoenix RapidFire uses data (such as vegetation type and condition, terrain and weather) to estimate key fire properties (such as intensity, rate of spread and flame height) and then calculate the number of houses across the state that would be destroyed if that modelled scenario occurred. While house loss is a significant consequence in itself, it can also indicate how many lives may be lost in a bushfire.

Victoria and other states are currently funding CSIRO in the development of a new modelling system called SPARK, which will build upon the success of Phoenix and be more easily updated with the latest research.

5.2 PRIORITISE ALLOCATION OF RESOURCES TOWARDS THE ACTIONS THAT WILL MOST EFFECTIVELY REDUCE BUSHFIRE RISK AND IMPACTS TO VALUES

The sector will use evidence to inform risk-based bushfire and land management and prioritisation strategies – including efficient and effective use of resources – across mitigation, planning, preparedness, response, and recovery on public and private land. Prioritisation will be based on evidence, including data from monitoring, evaluation, research, modelled risk information and place-based knowledge.

The sector will establish and implement monitoring, evaluation, and reporting programs that improve practices and provide transparent reporting to the public on the effectiveness of bushfire risk management activities.

Programs will be informed by data and evidence collected consistently by the sector. Evidence will also be generated through investment in science and research, enabling the sector to identify and prioritise actions that have the biggest impact on reducing bushfire risk.

5.3 BUILD A CULTURE OF EVIDENCE-BASED DECISION MAKING AT ALL LEVELS OF FIRE MANAGEMENT

The sector will continue to build a culture of evidence-based decision making. Knowledge and insights gained from monitoring, evaluation, and research will be used by leaders to inform decisions about managing bushfire risk most effectively.

The sector will implement best practice monitoring, evaluation, and reporting processes as part of the adaptive management cycle (see **Figure 4**) across public and private land for all bushfire management activities.

The sector will embed evidence-based decision making in all aspects of bushfire planning and operations. Systems, tools and processes will work to incorporate lessons from monitoring, evaluation, and research into all levels of decision making.

Sector staff will increase their capability through knowledge sharing, training and mentoring that draws on local, interstate, and international best practices.

Decision makers will be empowered to make decisions that are underpinned by the evidence and science available. Through training, access to tools, and engagement with subject matter experts, they will be able to make informed decisions rapidly.
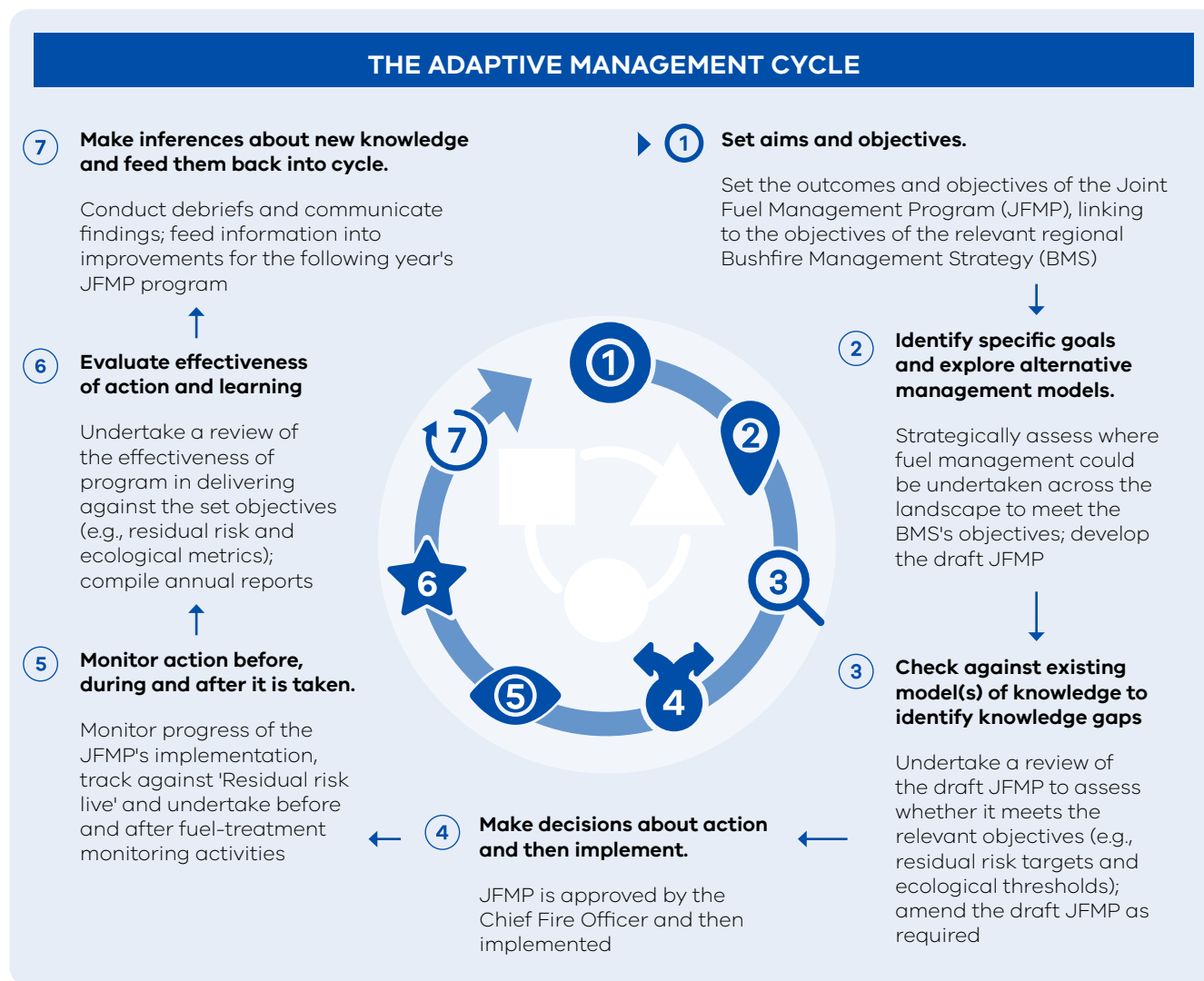
THE ADAPTIVE MANAGEMENT CYCLE

7 Make inferences about new knowledge and feed them back into cycle.

Conduct debriefs and communicate findings; feed information into improvements for the following year's JFMP program

6 Evaluate effectiveness of action and learning

Undertake a review of the effectiveness of program in delivering against the set objectives (e.g., residual risk and ecological metrics); compile annual reports

5 Monitor action before, during and after it is taken.

Monitor progress of the JFMP's implementation, track against 'Residual risk live' and undertake before and after fuel-treatment monitoring activities

1 Set aims and objectives.

Set the outcomes and objectives of the Joint Fuel Management Program (JFMP), linking to the objectives of the relevant regional Bushfire Management Strategy (BMS)

2 Identify specific goals and explore alternative management models.

Strategically assess where fuel management could be undertaken across the landscape to meet the BMS's objectives; develop the draft JFMP

3 Check against existing model(s) of knowledge to identify knowledge gaps

Undertake a review of the draft JFMP to assess whether it meets the relevant objectives (e.g., residual risk targets and ecological thresholds); amend the draft JFMP as required

4 Make decisions about action and then implement.

JFMP is approved by the Chief Fire Officer and then implemented

Figure 4:   The adaptive management cycle

5.4 USE COMMUNITY AND, WITH CONSENT, TRADITIONAL OWNER KNOWLEDGE AND VALUES TO INFORM DECISION MAKING, AND CLEARLY COMMUNICATE THE EVIDENCE BASE FOR THESE DECISIONS

The sector will establish practices that ensure the community and Traditional Owners can participate in the decision-making process. Decisions will be collaborative and will reflect community values and, with consent, Traditional Owner knowledge (see **Chapter 3**).

The sector will improve transparency and accountability to support improved information about the effectiveness of different bushfire management activities in local areas.

The sector will work with the community to:

- understand community values and incorporate them meaningfully into decision-making (this is informing decisions on community safety, the environment, and other values)
- develop community engagement strategies and planning processes that ensure community knowledge and values inform planning decisions.

6: Enhanced capability and capacity

> To manage bushfire risk, Victoria relies on the skills, equipment, capability, and capacity of the sector. Enhancements and improvements to Victoria's workforce capacity and capability will be increasingly critical in our efforts to manage bushfires in a changing climate. The extended duration, frequency and severity of fires will continue to increase strain on the sector, putting pressure on the management of fatigue, safety, and wellbeing among frontline personnel.

To ensure the sector is better prepared for bushfire events now and into the future, it will develop enhanced systems, processes, tools, and programs that offer improved training and support to all sector staff. These improvements will be made with consideration of the sector's increasingly diverse and inclusive workforce and will be consistent with other relevant strategies, such as the Victorian Fire, Emergency and Land Management Aviation Strategic Action Plan.[41]
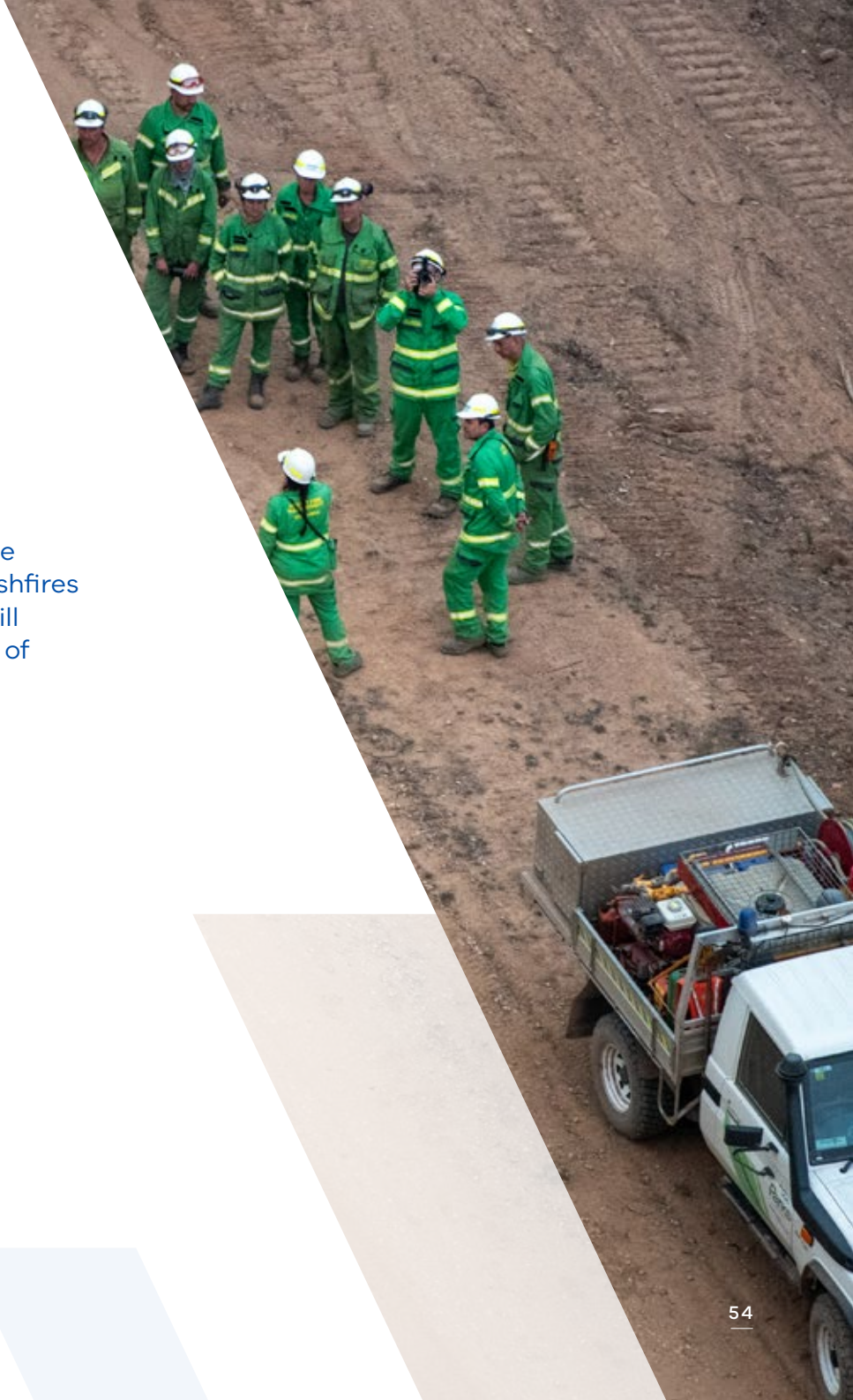
What is capability and capacity?[42]

CAPABILITY FOUNDATIONS

Definitions:

Capability - our collective ability to reduce the likelihood and consequences of an emergency before, during and after.

Capacity - the extent to which the core elements of capability can be sustained before, during and after an emergency.

Capability principles:

- Drive improved public value by working as one
- Maximise use of capability and capacity
- Embrace continuous improvement, innovation and research

Core capacity elements:

- People
- Resources
- Governance
- Systems
- Processes

Enhancing the sector's capability and capacity will better equip workers to respond to bushfire and other emergency events, both nationally and internationally. It will also strengthen the capability and capacity of the broader emergency management sector.

Outcome:

The sector is supported and equipped with the skills, equipment, capability and systems to safely and effectively manage bushfires.

To achieve this outcome, the sector must:

6.1 STANDARDISE SYSTEMS, PROCESSES AND TOOLS TO BETTER SUPPORT INTEROPERABILITY AND DECISION MAKING

The sector will align systems and processes to support common standards across agencies. Systems that share information between agencies will continue to be developed, enhanced and maintained.

Where responsibilities are shared across agencies, the sector will review and consolidate guidelines to better utilise and support incident management staff, with a focus on rostering, shift length, deployment guidelines and fatigue management.

Standardising our systems and processes means we can play our part in national and interstate emergency response.

6.2 BUILD CAPABILITY THROUGH LEARNING, TRAINING, COACHING AND MENTORING PROGRAMS

The sector will invest more in learning and development, including training programs, coaching, mentoring, accreditation systems and state aviation courses. This will ensure there are enough capable incident management and support staff on the ground when it matters. This investment will help to identify opportunities for developing and transitioning to national training standards so skillsets can be transferred interstate and internationally.

The sector will design new learning and development programs that attract and retain skilled and experienced workers who can manage complex, multi-hazard emergencies. These programs will utilise technologies such as artificial intelligence and simulated training systems that replicate bushfire emergencies, so workers can improve their response to real events.

The sector will build a culture of trust and partnership that recognises, values and supports tacit knowledge to be leveraged, exchanged and transferred between staff and across the sector. This includes bridging the gap between research and operational knowledge to drive bushfire management improvements and innovations and exploring opportunities for new approaches to knowledge sharing.

The sector will create opportunities for sharing, learning and developing practical skills between communities and locals, academics, and land and bushfire management agencies to expand our community engagement capabilities and improve our approaches to preparedness. These sector-wide learning systems will facilitate collaboration and increase local communities' capacity and capability to prepare for and recover from bushfires.

The sector will improve the capability of executive leaders to manage emergencies through training that clearly defines expectations. Across senior on-ground and incident management roles, the sector will ensure leaders are well-equipped to support responses to bushfire and other emergency events.

6.3 EMBED PHYSICAL AND MENTAL HEALTH, WELLBEING, AND SAFETY

The sector will provide contemporary mental health and wellbeing programs that better prepare the sector to manage the long-term impacts of bushfire in a changing climate. These programs will increase support for staff going through trauma and recovery as well as help build our resilience in the face of longer and more frequent fire seasons.

The sector will review fatigue management strategies regularly to ensure they reflect current best practices for reducing fatigue and improving survivability during burn-over or entrapment events.

Firefighter safety and welfare has always been a top priority, and will continue to be so. The sector will support firefighter safety by applying a risk-based approach to improving safety systems and processes. This includes firefighter protection systems, updating aviation safety systems, enhancing vehicle ergonomics, and improving vehicle safety, handling and occupant protection systems.

Across the sector, safety management systems – including reporting and investigation processes – will integrate cross-agency safety trends and lessons learnt.

6.4 INCREASE REPRESENTATION OF WOMEN AND PEOPLE FROM DIVERSE BACKGROUNDS AT ALL LEVELS OF FIRE MANAGEMENT

The sector will develop fire and emergency management training programs and recruitment processes that attract and retain women and people with diverse lived experiences, with consideration for gender identity, sexuality, race, culture, disability, socioeconomic factors, and caring responsibilities. To do so, work environments must be safe and inclusive, free of discrimination and harassment.

The sector will establish and maintain workplace cultures that are safe, inclusive, and free from discrimination and harassment. Workplace cultures will be grounded in common principles, with all staff across the sector required to adhere to consistent standards and expectations.

The sector will explore innovative, more flexible ways of working so staff with family or carer responsibilities are not excluded from work opportunities, including leadership roles.

The sector will work to ensure its staff reflect the Victorian community by promoting diversity and inclusion at all levels of the sector, including leadership, through training programs, recruitment processes and mentoring.

(i) **Diversity strengthens communities**

Diversity across the sector is improving service delivery, promoting strong leadership and supporting community partnership and engagement.

6.5 BUILD CAPACITY AND CAPABILITY TO MITIGATE, PLAN, PREPARE FOR, RESPOND TO AND RECOVER FROM BUSHFIRES IN A CHANGING CLIMATE

The sector will enhance its resources and capability to deliver a 365-day 'all-hazards, all-agencies' approach through regional and state-level capacity-building programs to support bushfire management. These programs will be flexible, accessible, and attractive to surge capacity personnel, and will help the sector to engage a regional workforce with local knowledge, bush skills, bushfire management knowledge and experience.

The sector will work collaboratively to develop a more sustainable and reliable resourcing model for state-wide IMT capacity and capability. To support this, the sector will undertake a review of readiness arrangements, facilities, and models of control, coordination and escalation to ensure they appropriately reflect the level of emergency risk and meet the needs of control agencies at state, regional and incident tiers.

Surge capacity requirements will be clear, and appropriate access will be available as required to contractors for firefighting (including forestry contractors) and interstate and international resource sharing arrangements.

The sector will continue to build its understanding of climate change and its implications for workforce capacity. Responding to these implications will require innovative approaches to prepare for and manage more frequent and longer fire seasons. Improved understanding and approaches will help to strengthen responders' first attack.

The sector will invest in recovery capability and capacity to cement mitigation strategies throughout the recovery process and subsequently reduce the financial burden of future emergency events. This will mitigate significant risks to public safety and people's health and wellbeing, the environment and biodiversity, infrastructure and assets, energy security, businesses and the economy, and Aboriginal Culture and Healing.

Case study

AUSTRALIA'S FIREFIGHTING COOPERATION INTERSTATE AND INTERNATIONALLY

In Australia, firefighting efforts are primarily coordinated by state and territory governments, with support from the federal government as needed. During major bushfire events, firefighting resources and personnel are often shared between states and territories through mutual aid agreements.[43] Additionally, Australia has agreements in place for international assistance with countries such as Canada, the United States, and New Zealand, which have provided personnel, equipment, and other resources to assist with bushfire suppression efforts.[44]

The Australasian Fire and Emergency Service Authorities Council (AFAC) represents fire and emergency services across Australia and New Zealand and helps to facilitate resource sharing. Through AFAC, fire and emergency services can share information and resources, such as firefighting equipment and personnel, to better respond to bushfires and other natural disasters.

One example of interstate and international cooperation occurred during the 2019-2020 bushfire season, when fires in New South Wales and Victoria prompted the deployment of firefighting resources from other states. South Australian and Queensland firefighters, as well as aircraft and equipment, were sent to assist with suppression efforts. The federal government also deployed military personnel and equipment to support firefighting efforts.[45]

The Australian government had also requested and received assistance from the United States, Canada, and New Zealand. This assistance also included the deployment of personnel and equipment, such as firefighting aircraft.

Other relevant international agreements include the:

- International Charter "Space and Major Disasters" is an agreement between countries and organisations that provides for the rapid sharing of satellite imagery and other data in the event of a major disaster, such as a bushfire, to support response efforts, and Global Fire Monitoring Cente, which is an international organisation that promotes cooperation and coordination in the monitoring and management of major fires.

- Sharing resources internationally will be increasingly important as we manage bushfire risk in a changing climate but will also be more challenging for the sector to manage as bushfire seasons overlap.

6.6 SECURE THE NECESSARY EQUIPMENT AND INFRASTRUCTURE FOR BUSHFIRE RESPONSE IN A CHANGING CLIMATE

To better manage bushfire emergencies and their aftermath, the sector will seek to acquire and maintain equipment and infrastructure appropriate to current and future needs. This equipment and infrastructure will be versatile, safe and effective for use across the sector at any time of year, for bushfire management.

The sector will seek to invest in a vehicle fleet that meets current and future needs for bushfire management and develop clear expectations and operational activities for vehicle personnel.

The sector will improve its capability to operate effectively in various environments, conditions, and terrains by developing mobile assets that facilitate decision-making closer to areas of operation.

The sector will maintain and supplement infrastructure, such as roads and bridges to better support delivery of fire prevention, preparedness, fuel management, suppression and recovery activities. The sector will continually look for opportunities to improve resilience and adaptability of infrastructure for future bushfire and other emergency events.

The sector will incorporate land-use and settlement planning concepts into precinct structure planning, subdivision design and firefighting infrastructure.

Case Study

SECURING WATER SUPPLIES IN REMOTE AREAS

Remote and mountainous forest areas of Hume and other north-eastern regions of Victoria are prone to bushfire ignition from dry lightning.

During bushfire suppression, helicopters must attend the nearest accessible water sources to reload fire suppressants. A shortage of suitable water sources can lead to longer turnaround times, increasing the risk of bushfires growing in speed and intensity.

The Department of Energy, Environment and Climate Action (DEECA) Hume region started a pilot project to identify the best locations to build waterpoints in high elevation, remote areas for firebombing helicopters and ground crews to access water stores during emergencies.

DEECA selected sites using spatial analysis and modelling, working with technical site and specification specialists with local knowledge of bushfire high-risk areas.

Three 'heli-dip' sites have been established across the Hume, Port Phillip and Gippsland regions. The sites comprise 'heli-dip' water tanks, with capacity to contain 25,000 litres of water, which enable helicopters to re-fill their tanks with water and return to fires quickly.

Timing is essential for containing remote bushfires before they spread and impact people, communities, the environment, and cultural values.

The project is also supporting economic stimulus for regional communities through meaningful employment of local suppliers and contractors.

Appendix 1 – Strategy Summary

DOMAIN	OUTCOME	STRATEGIC DIRECTIONS	OUTCOME INDICATORS
1. People and Community Safety	Communities are safer from and less impacted by bushfires and bushfire management	1.1: Empower people and communities to more effectively manage bushfire risk, response, and recovery in their local area and on their own land 1.2: Help build strong and resilient communities by working with community service organisations and supporting at-risk groups in a trusted, collaborative, and integrated manner to live with fire 1.3: Improve delivery of early warning information and advice on how to respond to bushfire emergencies 1.4: Deliver a fuel management program across public and private land that addresses the challenges associated with a changing climate 1.5: Use a broad range of mitigation strategies to prevent fires from starting and limit their impact on values 1.6: Continuously work to control fires early, limiting their impact on people, communities, industry, the environment, and cultural values 1.7: Support people and communities to recover in a timely and safe way, while also supporting community recovery efforts 1.8: Ensure assets, critical infrastructure, community infrastructure and essential services are more resilient to the impact of bushfire	• Decrease loss of human life from bushfires • Decrease loss of property from bushfires • Decrease health and wellbeing impacts from bushfire and fuel management activities • Decrease economic loss from bushfire and fuel management activities • Decrease impact of bushfires on infrastructure and essential services • Reduce risk to community values • Increase community and individual understanding of risk and management of their bushfire risk • Increase the ability of people and communities to respond to and recover from bushfires • Increase place-based connections and strengthened relationships between the sector and communities • Increase community skills and knowledge to take action to reduce their fire risk and prepare for bushfire • Increase in community resilience to impacts on infrastructure and essential services • Increase the ability of people and communities to recover from bushfires • Increase community understanding of the role of fire as a natural process in the landscape • Increase community understanding of how evidence-based decisions are made • Increase the adoption of effective community engagement approaches based on contemporary social and behavioural science

DOMAIN	OUTCOME	STRATEGIC DIRECTIONS	OUTCOME INDICATORS
2. Ecosystem resilience and nature conservation	Fire regimes support healthy and resilient ecosystems and nature conservation	2.1 Continuously improve data, tools, systems, and knowledge of the impacts fire regimes have on ecosystem resilience and the environment 2.2 Integrate research and knowledge on climate change into modelling and planning for ecosystem resilience 2.3 Improve monitoring, evaluation, and reporting on fire management practices against ecosystem resilience metrics and targets 2.4 Improve the effectiveness, consistency, and transparency of environmental value assessments 2.5 Strengthen leadership in fire ecology and environmental sciences 2.6 Work with communities to increase their understanding of fire regimes, ecosystem resilience, and nature conservation	• Maintain or increase ecosystem resilience • Maintain or increase the ability of ecosystems to provide ecosystem services • Reduce risk to and impacts on environmental values • Increase preparedness for and capacity to undertake wildlife welfare and ecological activities during and after bushfires • Decrease negative impacts of bushfires and fuel reduction activities on wildlife, water, carbon storage and forest products • Increase ability to identify and protect environmentally significant assets and locations during bushfire suppression

DOMAIN	OUTCOME	STRATEGIC DIRECTIONS	OUTCOME INDICATORS
3. Aboriginal self-determination in cultural fire and bushfire management	The sector enables self-determination of Traditional Owners and Aboriginal Victorians in land and bushfire management	3.1 Develop operational pathways that enable Traditional Owners to lead the planning and to undertake cultural burns across all land tenures and Country types according to their cultural obligations 3.2 Build Traditional Owner governance and capacity in cultural fire knowledge and practice 3.3 Improved management of state forest reserves and private land through the application of collaborative management to heal country and build resilience in people and landscapes 3.4 Facilitate the development and strengthening of institutional frameworks that support cultural fire practice 3.5 Enable Traditional Owners to have a greater role in bushfire management according to their self-determined interests and objectives	To be developed in consultation with Traditional Owners.

DOMAIN	OUTCOME	STRATEGIC DIRECTIONS	OUTCOME INDICATORS
4. Working together, accountability, and shared responsibility	The sector, land managers, communities, and industry work together effectively and share responsibility for managing and adapting to bushfire risk across public and private land	4.1 Collaborate with sector partners, including industry and the community 4.2 Address policy and legislative issues, improving accountability and transparency, and clarifying roles and responsibilities for bushfire management 4.3 Work with communities to share responsibility for managing and making decisions about their bushfire risk 4.4 Use a consistent, integrated bushfire management planning framework and addressing risks across public and private land	• Legislation supports cooperative bushfire management • Increase interoperability across the sector • Increase collaboration between sector partners, industries and the community • Increase clarity, accountability and transparency of roles and responsibilities in bushfire management • Increase cost-effectiveness of bushfire management • Increase integration of bushfire management planning with land use, community and infrastructure planning • Increase use of a risk-based approach across bushfire management activities • Increase preparedness of the sector to respond to bushfires

DOMAIN	OUTCOME	STRATEGIC DIRECTIONS	OUTCOME INDICATORS
5. Informed decision-making, evidence-based approaches, and tools	The sector uses science, innovation and knowledge to support evidence-based decisions	5.1 Make collaborative decisions based on high-quality shared data, science, and research 5.2 Prioritise allocation of resources towards the actions that will most effectively reduce bushfire risk and impacts to values. 5.3 Build a culture of evidence-based decision making at all levels of fire management. 5.4 Use community and, with consent, Traditional Owner knowledge and values to inform decision making, and clearly communicate the evidence base for these decisions	• Policies are increasingly informed by evidence • Strategic, operational and tactical planning and delivery is increasingly informed by evidence • Long-term strategies increasingly drive bushfire management, planning and delivery • Increase the transfer of knowledge and outputs from monitoring, evaluation and reporting, research and engagement into BAU • Increase use of a risk-based approach across all bushfire management activities • Increase community participation in planning and decision-making • Increase use of Traditional Owner knowledge, with consent, in planning and decision making. • Increase targeted investment in research • Increase the quality, timely collection and analysis of data • Increase integration of data collection programs across the sector • Increase the accuracy of our models • Improve clarity of approvals processes for incorporating new evidence into BAU • Increase evaluation and reporting to track progressing towards outcomes

DOMAIN	OUTCOME	STRATEGIC DIRECTIONS	OUTCOME INDICATORS
6. Enhanced capability and capacity	The sector is supported and equipped with the skills, equipment, capability and systems to safely and effectively manage bushfires	6.1 Standardise systems, processes and tools to better support interoperability and decision making 6.2 Build capability through learning, training, coaching and mentoring programs 6.3 Embed physical and mental health, wellbeing and safety 6.4 Increase representation of women and people from diverse backgrounds at all levels of fire management 6.5 Build capacity and capability to mitigate, plan, prepare for, respond to, and recover from bushfires in a changing climate 6.6 Secure the necessary equipment and infrastructure for bushfire response in a changing climate	• Increase functionality of systems and tools • Increase operational policies and procedures • Increase staffing and capability • Increase availability of appropriate equipment infrastructure • Increase the integration of bushfire management, training, equipment, systems, doctrine and processes • Reduce the number of workplace injuries, near misses and hazards confronting our frontline responders • Increase diversity of workplace within the workforce • Increase the efficiency by which we contain and control bushfires • Increase the effectiveness of training delivery and knowledge gains • Increase the timely collection, analysis and use of data and other critical information to support decision making • Increase incident management capability and capacity • Increase agency skills and knowledge in engaging with communities about the risk-based approach, risk management, ecosystem resilience and climate change • Increase capability and capacity for place-based and community-centred approaches to engagement and community development

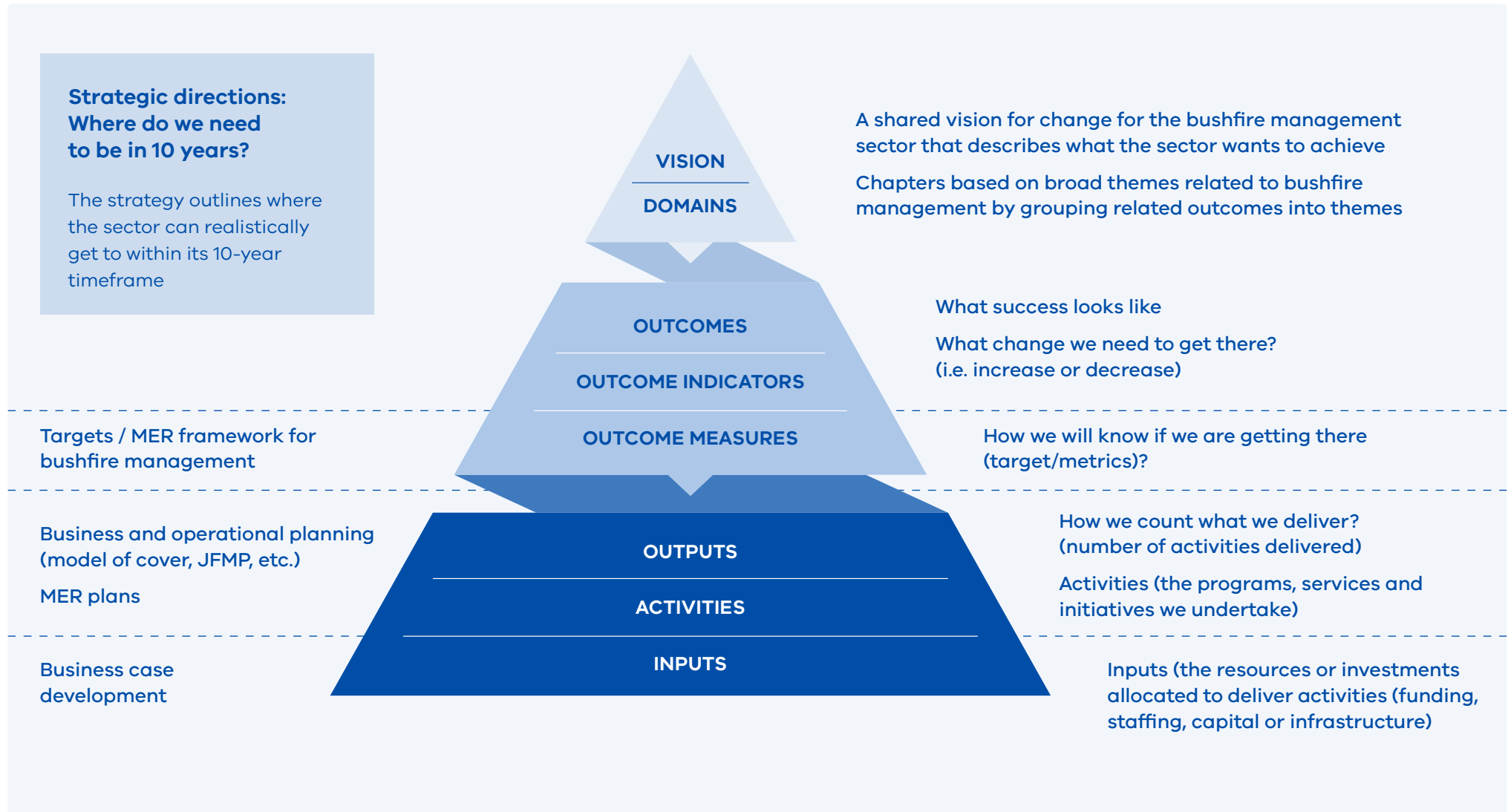# Appendix 2 – Monitoring, Evaluation and Reporting Approach

OUTCOMES FRAMEWORK

The strategy was developed in line with the Victorian Government Outcomes Framework architecture (the framework). The framework ensures that the Government can meet the long-term needs of the community. It has been developed in consultation with the bushfire management sector, community, non-government organisations and Traditional Owners.

Outcomes can be defined at different levels, such as the community level, the system level, the program level or the individual level. This framework focuses on the community-level outcomes, which establish what is most valuable to the community, and the systems level, which establishes the systems that must be in place to achieve good community outcomes.

The strategy is structured around the outcomes framework established in Table 1. Each chapter explores a different domain and the bushfire management activities that contribute to that domain's outcome.

**Strategic directions:
Where do we need
to be in 10 years?**

The strategy outlines where
the sector can realistically
get to within its 10-year
timeframe

VISION

DOMAINS

A shared vision for change for the bushfire management
sector that describes what the sector wants to achieve

Chapters based on broad themes related to bushfire
management by grouping related outcomes into themes

OUTCOMES

What success looks like

What change we need to get there?
(i.e. increase or decrease)

OUTCOME INDICATORS

Targets / MER framework for
bushfire management

OUTCOME MEASURES

How we will know if we are getting there
(target/metrics)?

Business and operational planning
(model of cover, JFMP, etc.)

MER plans

OUTPUTS

How we count what we deliver?
(number of activities delivered)

Activities (the programs, services and
initiatives we undertake)

ACTIVITIES

Business case
development

INPUTS

Inputs (the resources or investments
allocated to deliver activities (funding,
staffing, capital or infrastructure)

WORK AHEAD TO FURTHER REFINE THE BUSHFIRE RISK MANAGEMENT OUTCOMES FRAMEWORK

Bushfire risk management is a complex space involving contributions from dozens of agencies, tens of thousands of Victorians with roles in fire services, community groups and volunteer organisations, and every Victorian living in a community exposed to the risk of bushfire. The development of a whole-of-sector outcomes framework will assist the community to understand how all that work comes together to reduce the risk and impact of bushfires on communities, critical infrastructure, the environment, social and cultural values and local economies.

VICTORIAN BUSHFIRE MONITORING EVALUATION AND REPORTING FRAMEWORK

[Note: this section to be revised and refined as the development of the Victorian Monitoring, Evaluation and Reporting Framework (VB MERF) proceeds]

REVIEW OF THE STRATEGY

The strategy will be reviewed after five years to ensure it continues to reflect the community, sector and Traditional Owners' needs across all domains and is fit for purpose in a rapidly changing climate.

MONITORING, EVALUATION AND REPORTING

The bushfire management sector will develop a Victorian Monitoring, Evaluation and Reporting Framework (VB MERF) which will be released publicly to support the assessment of performance against the Strategy over time, linking through to the Safer Together program.

The Strategy sets domains, outcomes and outcome indicators for bushfire management under which we will develop performance measures to determine how we're delivering on the outcomes set. It will also be important to ensure we adapt to the strategic drivers of this strategy, learning from our progress and the change we are seeing within the sector and communities.

While it will take time to build a comprehensive VB MERF and the associated systems and tools needed to enable the sector to report against the Strategy, there are already a number of performance measures and targets on which the sector will continue to report from Day 1 of implementation.

The performance of the sector against these outcomes and outcome indicators will be monitored, evaluated and reported against according to the parameters of the Victorian Bushfire Monitoring Evaluating and Reporting Framework (*currently in development*).

Appendix 3 – The strategy's role in the current bushfire and emergency management framework

This strategy replaces the 2015 policy Safer Together: A new approach to reducing the risk of bushfire in Victoria. That policy established the current risk-based approach to bushfire management and united the agencies responsible for improving bushfire preparedness and reducing risks across private and public land.

While the strategy will be a key component of the bushfire and emergency management framework, it won't replace or duplicate:

- existing legislative instruments. Instead, it will provide long-term guidance and priorities for bushfire management for the entire sector at a state-wide level
- the 2012 Code of Practice for Bushfire Management on Public Land (the Code), which will continue to provide objectives for bushfire management on public land. The outcomes of the strategy are aligned with the current objectives of the Code as well as considering wider values such as Traditional Owner aspirations

- the State Emergency Management Plan and its Bushfire Sub-Plan, which will continue to detail the roles and responsibilities for bushfire management
- the State Emergency Management Priorities, which underpin and guide all decisions during a response to any emergency, prioritises the protection and preservation of human life over other values
- Strategic Roadmap for Emergency Management in Victoria 2022-28, which will set out the emergency management sector's priorities over the next six years and the supporting State Crisis and Resilience Council Strategic Action Plan for 2022-25

- the regional or municipal fire management sub-plans of the Regional and Municipal Emergency Management Plans
- existing outcomes frameworks developed by the sector, including DEECA, CFA, Fire Rescue Victoria (FRV), Emergency Recovery Victoria (ERV) and the Victorian emergency management Sector Outcomes Framework.
- other agency-specific bushfire management policies, strategies, plans and procedures

- the 2020 regional Bushfire Management Strategies, which are a supplement to the regional fire management sub-plans. They set out the regional approach for risk-based fuel management on public land, as well as identify key areas of risk on private land

- the 2019 Victorian Traditional Owner Cultural Fire Strategy, which articulates Victorian Traditional Owners' long-term goals and aspirations at state-wide and Country (regional) levels to ensure cultural use of fire is re-introduced, adapted and applied wherever possible to allow for healing and caring for Country

- the Regional Forest Agreements (RFAs), which are agreements between State and Commonwealth governments that provide for sustainable management and use of Victoria's forests. They commit Victoria to adaptive forest management for a range of values and include assessing the impacts of major events such as bushfire. The RFAs also commit to partnering with Traditional Owners to support the protection of Country and foster land, water, forest and fire management practices. The roles and responsibilities for bushfire management are defined in the State Emergency Management Plan and the relevant sub-plan for bushfire.

THE BUSHFIRE MANAGEMENT SECTOR

The sector comprises all government agencies and departments with a responsibility, function or other role in bushfire management and makes up a key part of the emergency management sector (as defined in the SEMP).

The sector comprises many departments and agencies, including:

- FFMVic, which includes DEECA, Melbourne Water, VicForests and Parks Victoria
- CFA
- EMV
- ERV
- FRV
- Department of Transport and Planning
- Department of Government Services, which includes Local Government Victoria
- regulators, including the Office of the Conservation Regulator
- OBRM
- water authorities and local government.

Other agencies also play an important role in managing bushfire. A full list of agencies and their roles and responsibilities can be found in the State Emergency Management Plan and the bushfire sub-plan.

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