

Risk & adaptive management

Strategic direction

Develop a more responsive approach to the management of bushfires based on continuous learning and improvement through the development of interagency risk modelling, statewide scenario planning and improved ecological research and monitoring.

Victoria's bushfire agencies successfully extinguish over 80% of lightning strikes and other ignitions before they spread and threaten communities. The paradox of highly effective bushfire control – the icon of success for agencies worldwide – is that it helps build up the fuels that support large fires.

Linkages, causes and effects of bushfire disasters are complex and continue to change. Therefore, bushfire management must be adaptive.

An adaptive management cycle has five critical steps:

1. Identify what we know
2. Identify what's changing
3. Take action
4. Evaluate
5. Adapt and modify

Figure 16: The risk and adaptive management cycle





What we know

Bushfires will continue to take place while fires of disastrous impact need not. Disasters are symptoms of multiple and inter-linked failures to foresee and address risks that grow unnoticed over time leading to events that overwhelm communities and emergency services.

Treating bushfire risks can be counter intuitive. Effective treatment of local risks is often at odds with effective treatment of risk across broader areas and timeframes.

The Council of Australian Governments (COAG) Inquiry on Bushfire Mitigation and Management (2004) identified bushfires as a special case and highlighted the need for enhancement of government approaches to risk management. Effective assessment of bushfire risks will require significant investment to develop the necessary techniques to capture the state of current risks and the mechanisms that drive them.

What's changing

Bushfire risks are changing:

- Threat rises with greater fuel loads, drought and fire dangers;
- Exposure rises as "sea changers/tree changers" populate bushfire-prone areas for amenity and lifestyle, while other rural populations age and decline;
- Expectations of services rise, as does community dependence on them – the services relate to land, fire, emergencies, infrastructure and social well-being; and
- Biodiversity risks rise as fire control excludes fire from vast tracts of bush then fails to prevent large fires, burning large tracts all at once.

Bushfire management must change and adapt to risk. A recurrence of Ash Wednesday-like fire conditions would result in a much greater disaster. Worldwide lessons highlight the need to invest more in prevention, preparedness and in ecosystem management.

Predicting change, including the effects of different courses of action, is critical. So too is comparing predictions with actual change, to improve future action. Necessary approaches include scenario planning and adding the formal rigour of scientific method to the necessary experimentation that daily fire operations require.

Take action

Taking action includes:

- More proactive definition of what the community wants, through initial learnings and ongoing risk assessment;
- Achieving better agreement with communities over necessary actions and any associated trade-offs (e.g. biodiversity versus protection), plus sharing of risk and discomfort (e.g. the need for smoke) and the gaining and use of knowledge;
- Greater use of fire under a wider range of conditions to achieve what the community wants;
- Achieving more integrated and holistic planning of land use and bushfire management;
- Implementing the risk and adaptive management cycle;
- Improved ecosystem monitoring and modelling; and
- Re-allocating and increasing our capacity to achieve these initiatives and to address the existing threats.

Evaluate

Continuous improvement in operational performance alone is insufficient to adapt to the changing bushfire risk environment. Assessing risk and the achievement of real outcomes across the landscape over decades is required.

Evaluation must include feedback from community, through community members undertaking monitoring, identifying learnings and feeding this into the fire planning cycles.

Evaluation and learning requires fire agency staff to have the capacity to observe the way our surroundings react to our actions, review expectations about the future, reflect on what they do and make appropriate adjustments.

Agencies must invest in research, expert opinion, rethinking procedures, challenging strategic wisdom, monitoring, predicting and sharing of local knowledge.

Adapt and modify

Useful learning must result in change and adaptation. Making changes through 'learning' must become routine, not just something that happens after bushfire disasters.

Bushfire agencies and communities must learn together, so that they can respond to changes faster and achieve better outcomes.

Adaptation takes effort and time. Achieving adaptive behaviours will depend on deliberate investment in that activity across the community and agency workforces.



Risk and adaptive management in practice

Effective implementation of the Strategy in a time of climate, social and ecological change, will involve a set of five integrated initiatives.

1. Risk management framework

To best treat bushfire risks, agencies must understand where, when and how the risks apply across Victoria, both locally and strategically.

The interrelated and dynamic nature of bushfire risks, ignition, spread and damage (figure 17) are distinctive and do not fit standard risk management frameworks.

The development of a custom risk management framework, which better incorporates bushfire risk drivers and risk interactions, will enable bushfire agencies to better model, monitor and prioritise risks. The custom framework will be consistent with the broader Victorian Risk Management Frameworks.

A bushfire risk management framework will allow land and fire management decision-making to be transparent, based on needs of environmental, protection and ecosystem services, supported by assessments of risk and possible treatments.

The framework will enable trained staff to undertake planning and allocate resources based on a systematic analysis of risk.

The framework will allow agencies to consider the values and perceptions of the community in determining local strategies, and help in analysing treatment effectiveness.

Cooperative research between fire agencies, the Bushfire CRC and Melbourne University has increased understanding of the relationship between bushfire threat, critical risk and climate change through the Phoenix Fire Spread Model.

2. Performance evaluation

To be effective, agencies must understand and monitor performance in the short, medium and long-term.

In the short-term the agencies must be effective in meeting service delivery objectives such as the annual extent of planned burning. Such measures must, however, measure their intended effect such as reduced levels of fuel hazard.


The measures will be global or purpose-built and involve lead indicators and regular monitoring and assessment.

Medium-term and long-term measures will range from coarse indicators using existing capabilities, to leading indicators of effectiveness at statewide, regional and local level, addressing resilience and supported by systematic monitoring.

Recent fire climatology and climate change modelling has allowed bushfire agencies to better evaluate the changing bushfire risk environment, such as increasing Fire Danger Index trends.

Figure 17: Bushfire risk management





3. Adaptive management and learning

Ideally, management is adaptive, not reactive or disconnected. Effective managers continually assess and learn from their changing operating environment by reviewing the impact and effect their actions (or inactions) are having on this environment. They then match or adapt their responses to this reality.

Uncertainty and change are the major factors that drive the need for adaptation. Managers can tackle uncertainty head-on by being 'actively' adaptive and deliberately taking actions that explore by designing the effects of alternative thinking and actions.

Establishing and promoting a culture of adaptive management requires the investment and support of programs in modelling, prediction-making, monitoring, evaluation, knowledge management and learning. Victoria's fire agencies have a good basis built through a culture of debriefing at operational and community levels. This culture will be strengthened and extended through specialist units, broader staff commitment and inclusion of the community.

4. Enabling Information Technology

State of the art IT systems are essential for making land and fire management agencies more effective and responsive. IT allows for rapid information sharing, facilitates predictive and risk modelling and promotes good adaptive management.

The creation and enhancement of IT systems with the latest modelling, collaborative and interactive technologies will allow strong integration between agencies and effective participation of community in bushfire management.

Delivering an improved IT system requires investment in data sharing, systems modelling, hosting and support.

5. Research

Investing in ongoing research programs is a critical element of adaptive management. To continuously improve, any organisation must review, monitor and research its past, current and future environments to identify gaps, changes and better ways to do business.

An adequate land and fire research program, with strong linkages between staff and research activities is critical to the success of this strategy, especially in a time of climate change.

Development of existing partnerships with research organisations, such as universities, the Bushfire CRC and AFAC will ensure that the latest thinking and broadest levels of expertise are available to support and inform land and fire management activities.