



KEY PERFORMANCE INDICATORS

AUGUST 2022

TURNING THE GOALS OF THE NATIONAL BUSHFIRE MANAGEMENT POLICY STATEMENT INTO OBJECTIVES AND KEY PERFORMANCE INDICATORS



**PREPARED BY THE FOREST FIRE MANAGEMENT
COMMITTEE OF FORESTRY AUSTRALIA & THE FOREST
FIRE MANAGEMENT GROUP**



Acknowledgements

- The role that Forestry Australia’s Forest Fire Management Committee (FFMC), led by Dr. Kevin Tolhurst (Principal Fellow (Honorary) at the School of Ecosystem and Forest Sciences, University of Melbourne) played in developing this document and the Forest Fire Management Group’s (FFMG) support in producing this document in order to assist the drive towards meeting the National Bushfire Management Policy Statement.
- Earlier drafts were modified following consultation amongst Australia’s leading forest fire management personnel within FFMC and FFMG.
- FFMC and FFMG respect the role of indigenous people in shaping the natural environment. Today’s prescribed burning to achieve land management objectives, encompasses cultural burning and aims to continue Australia’s long history of conserving its unique biodiversity.
- These KPI’s support the United Nations Voluntary Guidelines for Fire Management, Australia’s continued commitment to the Montreal Process, and its production of the State of the Forests report.

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Cover photo credits

Main photo: Ed Hatherley - Early season prescribed burning in West Kimberley, WA
Bottom left: Melanie Anderson
Bottom centre: Matt de Jongh
Bottom right: Ruth Ryan

FOREWORD

In Australia, a Federation of States and Territories, where bushfires / wildfires are ever-present and have caused so much devastation and heartache, where fire has shaped the vegetative environment for many thousands of years, it was eminently sensible that a national position be developed for forest fire management, albeit its implementation remains a legislative role of States and Territories.

The National Bushfire Management Policy Statement has been agreed to by all States and Territories governments and endorsed by the Prime Minister. The policy statement provides an agreed view for good fire management practice across Australia's forests and rangelands. It identifies a set of principles to guide fire management and lists 14 specific goals to deliver on those principles.

This document *Turning the goals of the National Bushfire Management Policy Statement into Objectives and Key Performance Indicators* has been produced by the Forest Fire Management Committee of Forestry Australia, and the Forest Fire Management Group, with the aim of providing a means to systematically analyse Australia's fire management progress towards meeting the national goals.

However, turning this policy into practice has been slow and partial. This is not a unique problem. It is often difficult to turn a vision and goals into a reality, especially in complex environments such as fire management in Australia.

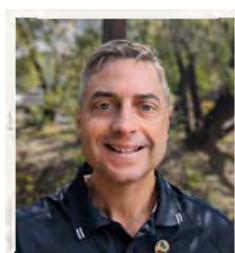
It is understood that organisations and communities will move at different rates towards the national goals in alignment with their own priorities and resources. Also, as new evidence arises from research and operational monitoring, the objectives and key performance indicators shall be enhanced. The set of specific objectives and key performance indicators detailed within this document does provide a manner in which Australia can move further towards its national policy.

This document has been developed to assist organisations address this complex issue as they strive to improve Australia's forest fire management for conservation of our natural environment.

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TURNING THE GOALS OF THE NATIONAL BUSHFIRE MANAGEMENT POLICY STATEMENT INTO OBJECTIVES AND KEY PERFORMANCE INDICATORS

Background

The *National Bushfire Management Policy Statement for Forests and Rangelands* (Forest Fire Management Group 2014) was signed off by all States and Territories in 2014. There is therefore a nationally agreed vision, set of principles and national goals defined for bushfire management in Australia. For these goals to be achieved, a set of specific objectives needs to be formulated and agreed to and the measurable outcomes of these objectives need to be specified as key performance indicators so that progress towards meeting the goals can be assessed, reviewed and reported on. Without measurable outcomes, it will be impossible to systematically improve fire management performance and knowledge as required by the process of adaptive management. Without measurable outcomes, it will also be difficult to attract the level of funding, resources and public support required to work towards the shared vision of fire management.

This document aims to provide a “first cut” at specific objectives and KPIs that will move towards achieving the goals of the policy statement. The objectives and their associated KPIs need to be based on the best available knowledge of fire and its role in the landscape. Over time, the objectives and KPIs are likely to be refined as more becomes known. As far as possible, the measurable performance criteria should be based on the best available evidence from research and operational monitoring. The objectives that are finally used to evaluate bushfire management should also be refined through a public engagement process, especially where the values concerned are social in nature.



TURNING THE GOALS OF THE NATIONAL BUSHFIRE MANAGEMENT POLICY STATEMENT INTO OBJECTIVES AND KEY PERFORMANCE INDICATORS

Background (continued)

Public engagement increases shared understanding of different perspectives on what is important and what is desired (values and vision) by various interest groups; a shared understanding is an important step to shared responsibility and social licence.

The objectives and key performance indicators need to be both meaningful and achievable, however, there is room for them to be aspirational to some extent. Meaningful means that meeting the objectives should contribute materially towards achieving the stated goals.

Achievable means that they should be possible with the level of knowledge and resources currently or potentially available in the timeframe of the plan. It may be necessary to seek additional resources or knowledge to achieve important objectives if they are critically important to reaching the stated goals.

The National Bushfire Management Policy Statement has fourteen national goals in four themes:

- A. Effectively Managing the Land with Fire
- B. Involved and Capable Communities
- C. Strong Land, Fire and Emergency Partnerships and Capability
- D. Actively and Adaptively Managing Risk

Each of these goal themes will be dealt with in turn.



Photo Qld Mild prescribed burn in Bauple State Forest, as part of a Bushfire CRC CO2 balance trial, 2012.
Credit: Peter Leeson

A. EFFECTIVELY MANAGING THE LAND WITH FIRE

A. GOALS

A.1

Maintain Appropriate Fire Regimes in Australia's Forests and Rangelands

"Manage planned and unplanned fire to reduce the risk of severe bushfires impacting on communities, and enhance the health, biodiversity and resilience of Australia's forests and rangelands." (FFMG 2014, p.11). Bushfire is an Australian term synonymous with Wildfire, an international term, for unplanned fires in the landscape

A.2

Balance the Environmental Impacts of Fire

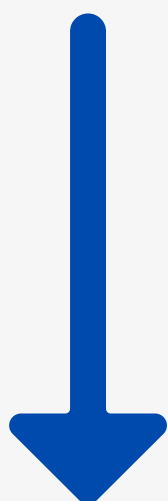
"Maximise the environmental benefits through use of appropriate fire regimes, while minimising the adverse environmental effects of fire on environmental assets or services such as water, timber, carbon and airsheds." (FFMG 2014, p.12)

A.3

Promote Indigenous Australians' Use of Fire

"Where relevant to Indigenous people, and appropriate, further integrate traditional burning practices and fire regimes with current practices and technologies to enhance bushfire mitigation and management of Australian landscapes." (FFMG 2014, p.12)

These goals, taken from the National Bushfire Management Policy Statement need to be converted into specific objectives and key performance indicators. The key performance indicators need to be focused on the desired outcomes, but as some **outcomes** can be difficult to determine in the short-term, **activities** that are expected to assist in reaching the desired outcomes may be used as interim indicators.



- **Goals** (National Bushfire Management Policy Statement, 2014)
- **Objectives**
- **Key Performance Indicators /Metrics** (KPIs from Objectives, both Activities & Outcomes)
 - Monitoring
 - Reporting
 - Review (adaptive management)
 - Comparison between Jurisdictions
 - Continuous improvement
 - Funding and Social License

Note: A glossary of some specific terms is attached at the end of this report. This glossary explains how the terms have been used here even if the terms are used differently elsewhere. You should read the glossary before reading further.

A. OBJECTIVE THEMES

(NATIONAL BUSHFIRE MANAGEMENT POLICY STATEMENT, 2014)

The Goals described in the National Bushfire Management Policy Statement for “Effectively Managing the Land with Fire” can be divided into the following objective themes. These themes then need to be expressed in more specific terms to become landscape-level management objectives. For a management objective to be useful, it must be Specific, Measurable, Achievable, Relevant, and Time-bound (SMART). The themes identified are:

- a) Reduce wildfire severity and extent
- b) Reduce impact of fire on human life and property, social and commercial values, and critical infrastructure.
- c) Maintain viable, resilient and sustainable ecosystems
- d) Maintain or enhance landscape productivity including wood, water, carbon, biodiversity and other ecosystem services
- e) Use adaptive management
- f) Increase or maintain the level of social licence to manage forests and rangelands
- g) Increase or maintain the level of Indigenous cultural and social connection through use of fire

*For brevity, any reference to "forested" areas in this document includes all types of forests, woodlands, shrublands and rangelands. "Forested" is used broadly and inclusively.



Photo: Low intensity prescribed burn in Jarrah forest, W.A.
Credit: Lachie McCaw

A. Landscape-level Objectives & KPIs

Effectively Managing the Land with Fire

a) Reduce wildfire severity and extent

This objective theme can be divided into the following SMART objectives:

A.a.1 - Objective: To limit the extent of any one wildfire in a forested fire catchment to less than 30% of its area through the combined use of planned burning and wildfire suppression.

A.a.2 - Objective: To limit the cumulative extent of areas burnt, at an intensity sufficient to cause full crown scorch or crown fire, to less than 50% of a forested fire catchment over a complete fire cycle. (A fire cycle being the period of time taken to burn a cumulative area equivalent to the total area of the catchment.) (FFMG 2014, p.12)

A.a.3 - Objective: To maintain sufficient fire, both planned and unplanned, in a forested fire catchment to achieve a sustainable fire cycle.

Based on these objectives, the following Key Performance Indicators (KPIs) can be extracted:

- **A.a.** KPI: Outcome: Percentage of forested fire catchments where the area burnt by a wildfire in a single season exceeds 30% of each catchment area.
- **A.a.** KPI: Outcome: Cumulative proportion of forested fire catchment burnt by crown fire or full canopy scorch fire within the period of a fire cycle.

- **A.a.** KPI: Outcome: Current effective fire cycle compared with the sustainable fire cycle based on the range of ecological processes in the forested fire catchment.

b) Reduce impact of fire on human life and property, social and commercial values, and critical infrastructure

This objective theme can be divided into the following SMART objectives:

A.b.1 - Objective: To keep bushfire fatalities to below 1:10,000 people in areas directly affected by fire smoke, heat and embers through public warnings, public education, hazard reduction, evacuation and community response.

A.b.2 - Objective: To keep bushfire house loss to below 10:1000 houses when the AFDR <Extreme, and 100:1000 houses when AFDR >Extreme, in areas affected by fire heat and embers through building design, land-use planning, hazard reduction and fire suppression.

A.b.3 - Objective: To minimize the effect of bushfires on commercial activity by ensuring all major roads (A, B and C) are not closed due to fire-related tree-fall, electrical supply on major distribution lines (22kV and above) is not disrupted by bushfire for more than 12 hours, domestic water supplies to regional and metropolitan centres are not disrupted for more than 4 hours, and telephone, television and radio networks are not disrupted for more than one hour by bushfires.

A. Landscape-level Objectives & KPIs

Effectively Managing the Land with Fire [continued]

A.b.4 – Objective: To minimise the effect of bushfires on regional economies by limiting the impact on agriculture and forestry assets to:

- less than 10% of the regional crop area or livestock numbers in any one year
- less than 10% of the forest plantation area within a National Plantation Inventory Region affected over a 20 year period.

- **A.b.** KPI: Outcome: Bushfire fatality rate is less than 1 in 10,000 people in fire-affected areas.
- **A.b.** KPI: Outcome: Bushfire house loss is less than 10 in 1,000 houses in fire-affected areas.
- **A.b.** KPI: Outcome: Hours of disruption to roads, power, telephone, radio, and television is less than 12 hours
- **A.b.** KPI: Outcome: Cost of providing potable water after fire impact is less than \$100 per head of population serviced by the water supply.
- **A.b.** KPI: Outcome: Percentage of plantation forest impacted within the National Plantation Inventory Region in a rolling 20 year period is less than 10% of the plantation area .
- **A.b.** KPI: Outcome: Percentage of regional agricultural crop area impacted in any year is less than 10% of the annually cropped area.
- **A.b.** KPI: Outcome: Percentage of regional livestock numbers impacted in any year is less than 10% of the number of livestock in the region.

c) Maintain viable, resilient and sustainable ecosystems

This objective theme can be divided into the following SMART objectives:

A.c.1 - Objective: To maintain sufficient planned burning in a landscape and fire suppression ability to ensure wildfires do not exceed 50,000 ha in area or cover more than 30% of a fire catchment, under the most severe drought and fire weather conditions.

A.c.2 - Objective: To maintain viable and resilient ecosystems by managing fire in a way that delivers a mosaic of early-, mid- and late-developmental stages of understorey and overstorey vegetation within the landscape of a fire catchment. The extent of each developmental stage should be at least 20% of the landscape at any one time (McCarthy 2011)

- **A.c.** KPI: Outcome: Percentage of total area burnt in a State or Territory by fires of less than 50,000 ha in area is more than 50%.
- **A.c.** KPI: Outcome: Percentage of a forested fire catchment burnt by a single wildfire never exceeds 30% of the catchment area (Cawson et al. 2012, 2013).
- **A.c.** KPI: Outcome: The proportion of a fire catchment burnt by high severity fire (structure changing), within a defined fire cycle, becomes a reducing proportion in a fire catchment and be less than 50% of the fire catchment.

A. Landscape-level Objectives & KPIs

Effectively Managing the Land with Fire [continued]

- **A.c.** KPI: Outcome: Proportion of landscape in Early-, Mid- and Late-developmental stages approaches 1/3 : 1/3 : 1/3. (Developmental stages defined by habitat values, structure, and regenerative potential)

d) Maintain or enhance landscape productivity including wood, water, carbon, biodiversity and other ecosystem services

This objective theme is already captured in objectives set for theme (a) reduce wildfire severity and extent.

e) Use adaptive management

This objective theme can be described by the following SMART objective:

A.e.1 - Objective: To progressively improve fire management, at a landscape scale, through a process of hypothesis setting, objective setting, planning, implementation, monitoring and review. Where necessary, identify research priorities where hypotheses prove to be incorrect. Objectives must cover all major values and attributes of the forested ecosystem.

- **A.e.** KPI: Outcome: Fire management KPIs are met with increasing frequency over time.
 - **A.e.** KPI: Activity: *Proportion of specific prescribed burning objectives met, by catchment and by jurisdiction.*

- **A.e.** KPI: Activity: *Proportion of specific fire suppression objectives met, by catchment and by jurisdiction.*
- **A.e.** KPI: Activity: *Proportion of specific fire management planning objectives met, by catchment and by jurisdiction.*

f) Increase or maintain the level of social licence to manage forests and rangelands

This objective theme can be captured with the following SMART objective:

A.f.1 - Objective: To increase the level of political support and social licence for prescribed burning in forests and rangelands as reflected in the level of funding for prescribed burning in absolute terms and in comparison with the level of funding for fire suppression.

- **A.f.** KPI: Outcome: The level of funding for fire prevention and preparedness, including broadscale prescribed burning, should be increasing and become an increasingly greater proportion of State-level fire management budgets and the level of funding for fire response and recovery should become a decreasing proportion of the same budget.
 - **A.f.** KPI: Activity: *Annual budget for fire prevention, preparedness and prescribed burning.*
 - **A.f.** KPI: Activity: *Percentage of annual budget spent implementing actual on-ground works*

A. Landscape-level Objectives & KPIs

Effectively Managing the Land with Fire [continued]

- **A.f.** KPI: Activity: Annual budget for wildfire response and recovery

g) Increase and maintain the level of Indigenous cultural and social connection through use of fire

This objective theme can be captured with the following SMART objective:

A.g.1 – Objective: To involve Traditional Custodians in fire planning and operations to enhance Indigenous connection to the land and to avoid impacting on culturally significant Indigenous sites.

- **A.g.** KPI: Outcome: Indigenous groups engaged in fire management process in all regions, including conducting cultural burning and in providing advice for safeguarding culturally significant Indigenous sites during fire suppression, fire preparation and prescribed burning operations.

- **A.g.** KPI: Activity: Proportion of wildfires where Indigenous advisors are part of the Incident Management Team (IMT).
- **A.g.** KPI: Activity: Number of Traditional Owner burns.
- **A.g.** KPI: Activity: Proportion of prescribed burns where Indigenous advisors were part of the planning and implementation process.



Photo: Ngurrara Rangers applying fire, Great Sandy Desert WA
Credit: Darwin Centre for Bushfire Research, Charles Darwin University

B. INVOLVED & CAPABLE COMMUNITIES

B. GOALS

Community Engagement

B.1

"Improve the engagement of communities in fire prone areas in bushfire mitigation and management so that responsibility for bushfire management is acknowledged and appropriately shared through governments, agencies, industries, and individuals taking individual and combined action as part of a comprehensive suite of strategies.." (FFMG 2014, p.12)

Public Awareness and Education

B.2

"Foster community understanding of, and support for, bushfire management in Australia – including the role of planned fire in reducing risk and promoting healthy and resilient ecosystems." (FFMG 2014, p.13)

B. OBJECTIVE THEMES

- a) Engage communities in bushfire mitigation and management
- b) Increase the level of shared responsibility for bushfire management across all sections of the community
- c) Apply a comprehensive suite of bushfire risk mitigation and response strategies with support across the community
- d) Use the level of risk to, and resilience of, key social, political, environmental and economic assets as a communication and negotiation tool in community engagement
- e) Foster community understanding and support for bushfire management



Photo: Fire and Biodiversity field day in Old
Credit: Peter Leeson

B. Landscape-level Objectives & KPIs

Involved & capable Communities

a) Engage communities in bushfire mitigation and management

The first objective theme can be divided into the following SMART objectives:

B.a.1 – Objective: To foster a partnership with the community by establishing a range of public forums where bushfire management issues can be discussed with the aim of developing a set of comprehensive local and regional bushfire management objectives and reviewing annual progress and impediments in achieving the agreed objectives.

- **B.a.** KPI: Outcome: Local and regional fire management objectives have been developed and agreed to by government agencies and a wide-spectrum of community representatives and incorporated into fire management plans.
 - **B.a.** KPI: Activity: *The holding of a public forum to discuss fire management objectives once a year in each major community across the fire management region.*

B.a.2 – Objective: Establish an ongoing bushfire management council with representatives from various government agencies, local interest groups and key local community members with a particular interest in bushfire related matters, which meets at least twice a year to discuss the local bushfire management objectives and strategies.

- **B.a.** KPI: Outcome: A representative bushfire management council with a relatively stable (less than 30% turnover in membership in a year) core membership that meets to discuss fire management issues at least twice a year with at least 60% of members at each meeting.
- **B.a.** KPI: Outcome: The execution and strategies in the fire management plan is reviewed by the council annually and modified as required to meet the publicly agreed local and regional fire management objectives.
- **B.a.** KPI: Outcome: Local and regional fire management objectives have been developed and agreed to by government agencies and community members and incorporated into fire management plans.
 - **B.a.** KPI: Activity: *Establishment and maintenance of a regional bushfire management council.*
 - **B.a.** KPI: Activity: *At least two meetings of the council per year with at least 60% of members at each meeting.*
 - **B.a.** KPI: Activity: *The council run at least one public forum per year to discuss the local and regional fire management plan objectives and the progress towards achieving them.*

b) Increase the level of shared responsibility for bushfire management across all sections of the community

This objective theme can be captured with the following SMART objective:

B. Landscape-level Objectives & KPIs

Involved & capable Communities [continued]

B.b.1 – Objective: To reduce the level of bushfire risk on private land commensurate with the level of risk reduction on public land with a five year fire management program that has objectives developed through broad community engagement, to a level of risk that has been deemed acceptable by the broader community.

- **B.b.** KPI: Outcome: A five year fire management plan incorporating a statement of the level of acceptable risk and fire management objectives for the region.
- **B.b.** KPI: Outcome: The level of bushfire risk to human life and property that is considered acceptable by the community and is achieved by joint fire management across all land tenures.
- **B.b.** KPI: Outcome: The level of action that community members take to reduce their personal risk increases by 20% over a five year period.
 - **B.b.** KPI: Activity: *Development of a five year fire management plan with broad community engagement.*
 - **B.b.** KPI: Activity: *Development of a statement of “acceptable bushfire risk” by government and community representatives.*
 - **B.b.** KPI: Activity: *Joint bushfire mitigation works across all land tenures.*
 - **B.b.** KPI: Activity: *Annual, pre-season, assessment and publication of maps showing the level of bushfire risk for the region.*

- **B.b.** KPI: Activity: *Percentage of households with adequate building and contents insurance to replace losses in the event of loss by bushfire.*
- **B.b.** KPI: Activity: *Percentage of properties with adequate and managed defensible space as defined in AS3959.*
- **B.b.** KPI: Activity: *Percentage of properties built to an appropriate BAL as defined in AS3959.*
- **B.b.** KPI: Activity: *Percentage of properties with documented fire plans.*

c) Apply a comprehensive suite of bushfire risk mitigation and response strategies with support across the community

This objective theme can be captured with the following SMART objective:

B.c.1 – Objective: To work with local communities to develop and document a range of strategies that reduce the level of bushfire risk to human life, property, culture, heritage values, commercial values, aesthetics and community cohesion for that community that include: communication, evacuation, shelter in place, fuel reduction, fuel breaks, firefighting resources and any other strategy that the community can support.

- **B.c.** KPI: Outcome: The bushfire risk mitigation and response strategies will be well known and accepted by each community. At least 20% of a community will be aware of the local fire management strategies being planned and implemented.

B. Landscape-level Objectives & KPIs

Involved & capable Communities [continued]

- **B.c.** KPI: Outcome: The bushfire risk mitigation and response strategies will be effectively implemented. The KPI would be that, in the event of a fire, at least 70% of the community acted as planned.
- **B.c.** KPI: Outcome: The likely impact of a bushfire on assets and values, identified by a community as being important, will be significantly reduced compared with areas where community support is not well integrated into risk mitigation and response. This KPI is the difference in fire related loss in an area with strong community involvement compared with areas with little community involvement in the fire management process.
 - **B.c.** KPI: Activity: *Community fire mitigation and response plans will be prepared and reviewed annually.*
 - **B.c.** KPI: Activity: *There will be community involvement in the implementation of all bushfire risk mitigation and response strategies.*
 - **B.c.** KPI: Activity: *The level of bushfire risk will be assessed and reported to the community before each fire season.*
 - **B.c.** KPI: Activity: *The effectiveness of the planned bushfire risk mitigation and response strategies will be assessed and reported annually after each fire season if fires occur.*

d) Use the level of risk to, and resilience of, key social, political, environmental and economic assets as a communication and negotiation tool in community engagement

Some of the outcomes from this objective theme are already captured in the previous theme. Additional elements of this objective theme can be captured with the following SMART objective:

B.d.1 – Objective: To negotiate the level of acceptable risk given the available resources (including money), based on the level of risk to key community values and assets and capture this in a five year community bushfire management plan, with “acceptability” reviewed annually.

- **B.d.** KPI: Outcome: A fire management plan that incorporates a level of bushfire risk that is understood and accepted by the community. The KPI is a level of acceptable risk that varies little from year to year because it is accepted as being desirable, realistic and achievable.
 - **B.d.** KPI: Activity: *Publish a five year bushfire risk management plan that incorporates the negotiated level of acceptable risk to all important community values and assets.*
 - **B.d.** KPI: Activity: *Perform an annual review of the acceptable level of risk to ensure that community expectations have not changed significantly.*

e) Foster community understanding and support for bushfire management

This objective theme is effectively dealt with if parts a) to d), already described, are achieved.

C. STRONG LAND, FIRE & EMERGENCY PARTNERSHIPS & CAPABILITY

C. GOALS

C.1

Integrated and Coordinated Decision Making and Management

"Improve decision making processes through integrated strategic and operational planning between land, fire and emergency management agencies – including the enhancement of mutual aid and learning and the development of good practice examples." (FFMG 2014, p.13)

C.2

Employment, Workforce Education and Training

"Build employment opportunities and the skill base of people working in land and bushfire management (including indigenous communities) to ensure that Australian agencies continue to have access to graduates, technical and field personnel with appropriate specialised education and training." (FFMG 2014, p.13)

C.3

Bushfire Risk Mitigation

"Improve the efficiency and effectiveness of programs designed to minimise the number, spread and adverse impacts of future bushfires. This includes advocacy about the impact that land use and settlement changes have on bushfire risk and adjacent land and bushfire management practices.

Support and conduct research and share information about fire prevention, preparedness, response and recovery in forest and rangeland environments, for the purpose of increasing the efficiency and effectiveness of land, fire and emergency management." (FFMG 2014, p.13)

C.4

Bushfire Response

"Improve the efficiency and effectiveness of programs designed to minimise the adverse impacts of bushfires through improved capability, knowledge (e.g. resource effectiveness and fire behaviour prediction) and support for the initial and ongoing attack of bushfires." (FFMG 2014, p.13)

C.5

Safety in Fire Operations

"Improve the effectiveness of programs designed to improve the health and safety of all personnel working in on-ground fire management operations and to minimise the related risks to nearby communities." (FFMG 2014, p.13)

C.6

Bushfire Recovery

"Improve the effectiveness of programs designed to minimise the adverse impacts of bushfire suppression operations on human communities, firefighters and on ecological and other environmental values." (FFMG 2014, p.14)

C.7

International Responsibilities

"Ensure that Australia continues to be a leader in the international bushfire community and fulfils its obligations under relevant international agreements ... including exchanges of emergency support and technology." (FFMG 2014, p.14)

C. OBJECTIVE THEMES

- a) Improve decision making processes through integrated strategic and operational planning between land, fire and emergency management agencies.
- b) Increase fire management capacity and capability through strategic recruitment, research, education and training.
- c) Engage with land-use planners, through the sharing of fire management knowledge, to ensure bushfire risk is considered and minimized in land-use changes.
- d) Undertake bushfire control in clearly stated, objective-driven, ways that minimize the overall impact from financial, human-welfare, environmental and cultural perspectives.
- e) Include post-fire recovery programs to further reduce the potential impact of wildfires and fire control operations on human-welfare, environmental and financial impacts.
- f) Collaborate and exchange fire management skills and knowledge with other nations so as to broaden the applicability and effectiveness of fire management and to increase fire emergency response capacity.

C. Landscape-level Objectives & KPIs

Strong Land, Fire & Emergency Partnerships & Capability

a) Improve decision making processes through integrated strategic and operational planning between land, fire and emergency management agencies.

C.a.1 – Objective: To develop, 5 to 10 year, integrated regional and State-level fire management plans with co-ownership by all relevant land, fire and emergency management agencies with fire-related responsibilities within an area.

- **C.a.** KPI: Outcome: Fire management that is well integrated across tenures and agencies as evident by effective and efficient wildfire emergency response, fire prevention, fire preparedness and fire use, supported by the general public and governments.

- **C.a.** KPI: Activity: Multi-agency working groups that meet at least annually to develop, implement and review integrated, cross-tenure, fire management plans.
- **C.a.** KPI: Activity: The development of integrated, cross-tenure, fire management plans covering each regional and State jurisdiction with a 5 to 10 year renewal life.

b) Increase fire management capacity and capability through strategic recruitment, research, education and training.

C.b.1 - Objective: To increase the proportion of fire management staff with formal graduate and post-graduate qualifications in bushfire science and land management up to 70% of the professional staff levels by 2030.

C. Landscape-level Objectives & KPIs

Strong Land, Fire & Emergency Partnerships & Capability [continued]

- **C.b.** KPI: Outcome: Increased technical knowledge about fire and fire management in fire and land management agencies with greater integration with, and adoption of, fire research findings, as evidenced by the level of specific fire management professional and technical qualifications of fire management and fire operations staff.
 - **C.b.** KPI: Activity: *Fire management plans are clearly based on evidence from documented research and operational monitoring. Annual fire management operations are quantitatively evaluated against stated operational objectives and publicly reported on annually.*
 - **C.b.** KPI: Activity: *Numbers of graduates with fire and land management qualifications.*

(c) Engage with land-use planners, through the sharing of fire management knowledge, to ensure bushfire risk is considered and minimized in land-use changes.

C.c.1 - Objective: To formally contribute to, and have acknowledged in planning documents, the input of fire managers into strategic land-use plans in each region and at a State or Territory level.

- **C.c.** KPI: Outcome: The assessed level of bushfire risk for a region will be similar or less after a land-use change than before it.

d) Undertake bushfire control in clearly stated, objective-driven, ways that minimize the overall impact from financial, human-welfare, environmental and cultural perspectives.

C.d.1 - Objective: To have Incident Action Plans with SMART objectives for every wildfire that is uncontrolled for more than 24 hour and for those objectives to be assessed at the end of a fire season to see if they were comprehensive, realistic and achieved, and use this assessment to improve future performances.

- **C.d.** KPI: Outcome: To improve year-on-year fire response effectiveness and efficiency through an adaptive management process so that the relative impact of wildfires is reduced.
 - **C.d.** KPI: Activity: *Conduct after-incident reviews of wildfire management for all fires that burn for more than two consecutive work periods, on an annual basis for each State or Territory and use the results for training and professional development.*

e) Include post-fire recovery programs to further reduce the potential impact of wildfires and fire control operations on human-welfare, environmental and financial impacts.

C.e.1 - Objective: To reduce the potential impact of wildfires by using effective and efficient post-fire recovery programs to complement fire preparedness and response programs.

- **C.e.** KPI: Outcome: The period of time and level of ongoing support for ecosystems, business and communities take to return to independent and fully-functioning systems will be reduced (related to resilience).

C. Landscape-level Objectives & KPIs

Strong Land, Fire & Emergency Partnerships & Capability [continued]

f) Collaborate and exchange fire management skills and knowledge with other nations so as to broaden the applicability and effectiveness of fire management and to increase fire emergency response capacity.

C.f.1 - Objective: To enhance the local capacity and capability in fire management by international collaboration and exchanges on an annual program of study tours, deployments, collaborative research and sabbaticals.

- **C.f. KPI:** Outcome: Increase the capacity and capability of a local agency beyond the financial and physical bounds available locally.
- **C.f. KPI:** Activity: Number of people undertaking international targeted and planned fire management study tours.
- **C.f. KPI:** Activity: Number of people days contributed to fire management by international deployments each year.
- **C.f. KPI:** Activity: Number of fire management research projects in progress each year between international partners.
- **C.f. KPI:** Activity: Number of staff on exchange / sabbatical with an international fire manager each year.



Photo Old: Joint Police, Rural Fire, and National Parks fire investigation team, Brooker State Forest, 2013.
Credit: Peter Leeson

D. ACTIVELY & ADAPTIVELY MANAGING RISK

D. GOALS

Risk Management

D.1

“Ensure that the management of landscape fire is based on ‘best practice’ approaches to managing fire regimes and risk. Develop risk adaptive management systems that support the assessment and report of landscape and local level risks, and identify cost-effective strategies for achieving outcomes (and performance measures) that reduce the impact of severe fires and promote ecosystem resilience.” (FFMG 2014, p.15)

Investing in and Managing Knowledge

D.2

“Bushfire management must be supported by research, graduate development, specialised training, adaptive management, community engagement, professional development, polices, strategies and procedures based on best available knowledge regarding the physical relationships between fire regimes and ecosystem processes, the management of risk, community values and expectations and how these interact.” (FFMG 2014, p.15)

D. OBJECTIVE THEMES

- (a) Develop and implement adaptive management systems that use the level of risk to the gamut of values and assets in the landscape, and the cost to reward ratio, as measures of fire management performance.
- (b) Use an evidence-based approach to underpin fire management plans and performance.

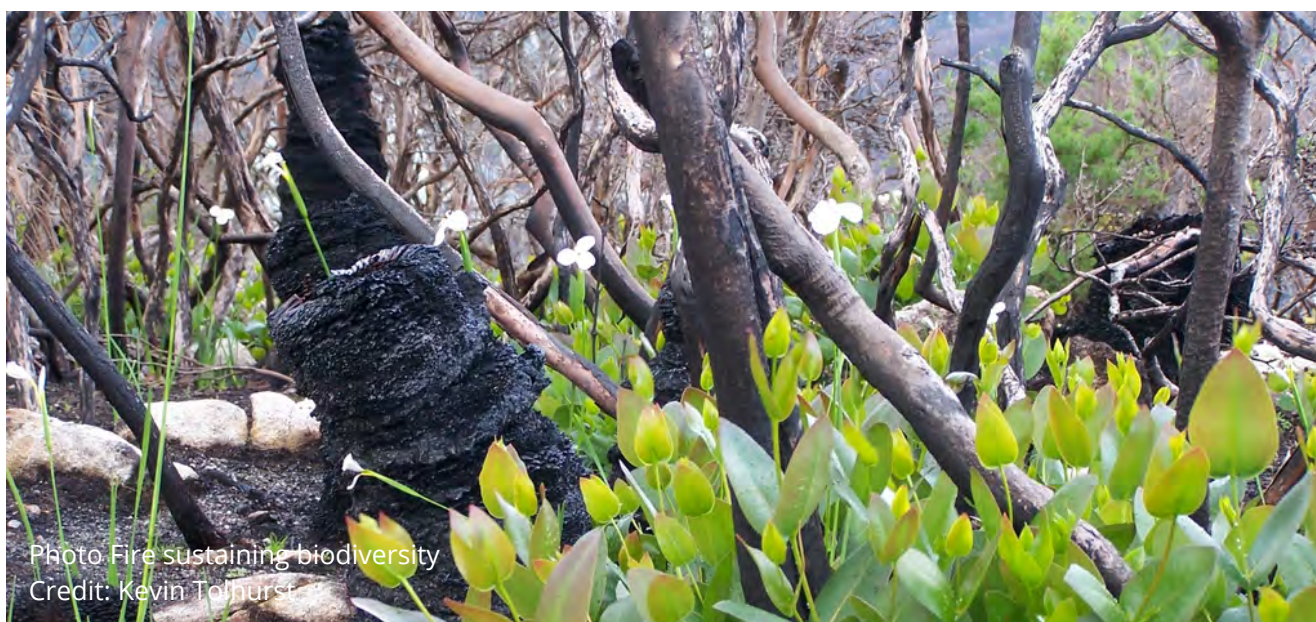


Photo: Fire sustaining biodiversity
Credit: Kevin Tolhurst

D. Landscape-level Objectives & KPIs

Actively & Adaptively Managing Risk

a) Develop and implement adaptive management systems that measure management performance based on the ratio of assessed bushfire risk to values and assets in a landscape relative to the cost of fire management in that area.

D.a.1 – Objective: Use adaptive management to continually improve fire management outcomes and management efficiency so that the proportion of local, regional and national fire management objectives met each year is steady or increases due to sustained or improved performance.

- **D.a. KPI: Outcome:** Fire management objectives, as stated in fire management plans, are increasingly achieved so that more ambitious objectives can be set to move closer to the stated goals and visions of the plan.
 - **D.a. KPI: Activity:** Monitor, evaluate and publicly report the level of activity and outcomes in a fire management area against the KPIs in the fire management plan.

b) Use an evidence-based approach to underpin fire management plans and performance.

D.b.1 – Objective: To increase the level of knowledge and skill of the fire management team in a region, State or Territory as evident by the annual rate of progression toward the stated local, regional and national fire management goals and vision.

- **D.b. KPI: Outcome:** A more consistent achievement of stated local, regional and national objectives and ability to increase the level of difficulty and complexity of fire management objectives with an expectation of being able to achieve them.
 - **D.b. KPI: Activity:** Proportion of stated objectives, in the fire management plan, achieved each year.
 - **D.b. KPI: Activity:** The number/proportion of objectives that are increased each year in order to move closer toward the goals, stated in the fire management plan, as a result of successful and effective achievement of existing objectives.



Photo credit: Hancock Victorian Plantations

SUMMARY

The set of objectives and associated KPIs presented here are similar to the Criteria and Indicators developed as part of the Montreal Process to support sustainable forest management across the world which demonstrates that the proposed system can work (DAFF Australia 2008).

Without a clear statement of objectives, it will be difficult, if not impossible, to demonstrate continual fire management improvement and sustainability and to attract the necessary resources to effectively manage fire and the land.

It is acknowledged that some of the objectives and KPIs will need to be replaced or revised over time, but those presented here are a first step. As a first step, they provide a working platform for ongoing development.

Initially, it might be desirable to work with a subset of the 25 objectives. For example, 13 objectives, A.a.1, A.a.3, A.b.1, A.b.2, A.e.1, A.f.1, A.g.1, B.a.1, B.b.1, B.c.1, B.d.1, C.d.1, and D.a.1, could be selected to be worked on initially with other objectives being incorporated once a formal monitoring and reporting system has been established.



Photo Credit: Andrew Bassau

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Photo: Prescribed Burning in Southern Pine Plantation, Cpt 211 Coochin, Beerburrum State Forest.
Credit: HQPlantations Pty Ltd



GLOSSARY OF SELECTED TERMS

MANAGEMENT FRAMEWORK TERMINOLOGY

Vision:

An aspirational description of what an organization would like to achieve, or accomplish, or be positioned, in the mid-term or long-term future (5-20 years). It is intended to serve as a clear guide for choosing current and future courses of action.

Principles:

A statement of the fundamental understanding of how a system works, based on existing knowledge and available evidence. Principles are based on long-standing experience and are not changed without a major shift in evidence or understanding.

Goals:

A desired outcome. An observable and measurable end result (or outcome) having one or more objectives to be achieved within a more or less specified (fixed) timeframe. Unlikely to be reached within a single planning period (1-10 years). In the process of working towards a Goal, the “goal posts” might change too, but it is unlikely that the new Goal will totally change the planned direction (“Vision”).

Targets:

Something to be reached/achieved. Specific, identifiable, measurable outcomes that contribute to achieving broader management goals. A key performance indicator that confirms that your management strategy is “on track”. Should be achievable within a single planning period.

Objectives:

A specific result that a person or system aims to achieve within a specified timeframe and with available resources (S.M.A.R.T or M.A.D). In general, objectives are more specific and easier to measure than goals. Objectives are basic tools that underlie all planning and strategic activities. They serve as the basis for effectively communicating management intent, and for defining policy and evaluating performance (monitoring).

Key Performance Indicators (KPIs):

A measurable value that demonstrates how effectively a business is achieving key objectives. Organizations use key performance indicators at multiple levels to evaluate their success at reaching targets. High-level KPIs may focus on the overall performance of the enterprise, while low-level KPIs may focus on processes. KPIs are extracted from objectives. A monitoring tool.

Photo credit: Jack
Bassingthwaite, NSW

GLOSSARY OF SELECTED TERMS

MANAGEMENT FRAMEWORK TERMINOLOGY (CONTINUED)

Trigger Point:

A measurable value that has been identified as being a point beyond which the chances of successfully implementing a strategy is unacceptably low so there is a need to change to the next most acceptable strategy given the revised set of circumstances (situation) or to adopt a new objective and strategy that is likely to be successful. A decision support tool.

S.M.A.R.T.:

As it relates to objectives. S = Specific, M = Measurable, A = Achievable, R = Relevant, and T = Time-bound.

M.A.D.:

An alternative acronym to SMART. M = Measurable, A = Achievable, and D = Desirable.

FIRE TERMINOLOGY

Fire Cycle:

The period of time required to burn a cumulative area equivalent to the area of the total extent of a defined landscape. Within a single Fire Cycle, some areas within the defined landscape may remain unburnt and some areas may be burnt more than once. A fire cycle is a landscape-scale metric whereas Fire Frequency is a point metric.

Bushfire:

Any unplanned fire in forest, woodland, shrubland or grassland (Australia).

Wildfire:

A wildfire is any unplanned vegetation fire in the open. Also called Bushfire, Grass Fire, Forest Fire, Scrub Fire, Heath Fire, Landscape Fire, etc.. A wildfire may be of high or low intensity, may be large or small and may be desirable or undesirable from a land management perspective. Many wildfires are "fought" to control or suppress them if there is an expectation that they may cause undesired damage. Some wildfires may be allowed to burn, within defined limits, if they are considered to be achieving desired land management outcomes and the assessed level of threat is less than the potential benefits.





GLOSSARY OF SELECTED TERMS

FIRE TERMINOLOGY (CONTINUED)

Prescribed Fire:

Is the planned application of fire to achieve specific land management objectives. Objectives may include fuel management, wildlife habitat management, vegetation management, soil protection, disease management, cultural burning and a range of other issues. Prescribed fires may be large or small and may be high intensity or low intensity depending on the specific land management objectives being targeted. Prescribed burning requires a significant amount of skill and knowledge to be implemented successfully. (Synonymous with “Planned Burning” and “Controlled Burning”, but broader than “Fuel Reduction Burning”, “Hazard Reduction Burning”, and “Slash Burning”.) “Burning-off” is used to describe fires lit to achieve a particular outcome, but with less formal planning and approval processes.

Fire Catchment:

An area within which most vegetation fires will be naturally confined, limited by natural barriers to fire spread such as bare rocky ridges, cleared farmland, large waterbodies, extensive areas of low-flammability vegetation such as rainforest and alpine bogs, etc.. Major fire catchments will often also be major water catchments or forecast weather districts. (There will be a need for a consistent and systematic mapping of fire catchments across Australia.)

Region:

A geographic area defined by characteristic landform, climate, soil, and natural vegetation. May be one or more fire catchments. An administrative area incorporating communities, towns and settlements with common social or economic characteristics into a geographic region.

Bushfire Risk:

A measure of the likelihood of not achieving fire and land management objectives for a specified area and timeframe. Fire and land management objectives cover social, economic, environmental and political values. Bushfire risk may be expressed in terms of the probability of specified consequences occurring, such as house and human life loss, plant or animal species deaths or local extinctions, social and economic disruption or loss, or political reputation loss. Bushfire risk may be expressed in absolute terms or relative terms, such as the degree of impact for a particular level of severity or scale of fire event.

Bushfire Risk Management:

Is the range of integrated activities taken to deal with bushfire risk. Elements of bushfire risk management include: risk assessment, policy, planning, mitigation, elimination, response, and recovery. The aim of risk management is to increase the likelihood of achieving the stated objectives of fire and land management.

GLOSSARY OF SELECTED TERMS

LIFE STAGES

Populations of plants and animals can be classified according to their stage of development. There are several ways of subdividing life stages, but here we will only consider a simple, three-class classification: early-, mid- and late-stages. The classification is applied to a Fire Catchment. The classification relates to the range of age-classes within the defined Fire Catchment and may be based on a mapping of stands of similar age (stage) across the catchment (e.g. for understorey plants) or be based on the demographics of a species population within the catchment (e.g. for overstorey trees, and animal populations). Mapping life stages of the overstorey will be independent of understorey and independent of fauna populations. Life stage mapping for fauna will only be necessary for long-lived (> 10 years) species. Life stage mapping for flora may only need to be done for floristic communities rather than individual species.

Early-stage: From the time of germination/birth to the time of sexually reproductive maturity. Not yet capable of producing seeds and fruit or young. A period of rapid growth and development. A period of high vulnerability to disturbances and environmental stresses such as predation/grazing, drought and frosts. Plants provide high food value to fauna. A period of high mortality due to death or consumption.

Mid-stage: Sexually reproductive. Plants capable of producing seeds and fruit. A period of ongoing growth and development with competition selectively favouring the more robust and better suited individuals in a population. Ongoing natural attrition within the population. Plants start to develop structural characteristics, such as hollows and accumulations of dead plant material, which provide habitat for some fauna. The most robust and resilient stage of development.

Late-stage: Reproductive potential significantly declining from its peak. A period of declining growth and increased vulnerability to climatic stresses and disease. Declining growth rates tend to lead to lower plant and animal densities. Some specialist fauna require or favour late-stage vegetation due to the relatively high abundance of tree hollows and accumulations of dead plant material such as coarse woody debris and large tussocks.





Photo Credit: Nikki Armstrong



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