Senate Standing Committee on Environment and Communications
Legislation Committee
Answers to questions on notice
Environment portfolio

Question No: 288

Hearing: Additional Estimates

Outcome: Outcome 1

Programme: Environment Standards Division (ESD)

Topic: Planned burns strategic assessment

Hansard Page: 27

Question Date: 04 March 2016

Question Type: Spoken

Senator Rice, Janet asked:

Senator RICE: What is your process for making sure that occurs?

Mr Gaddes: We have regular engagement with states, similar to the engagement Senator O'Sullivan discussed there with landowners, where, if we become aware of a planned burn that we think might have a significant impact, we would then discuss it with the relevant authority and ask them to either refer it or—in most circumstances we would prefer that they do this—alter the activity so that it does not have a significant impact on our nationally protected matters. We have a bushfire fact sheet that I would be happy to provide to you, which sets out our expectations and the way that we engage with states.

Senator RICE: And could you provide to me the strategic assessment that you have with South Australia as well.

Mr Gaddes: Yes, we can provide some details on the strategic assessment.

Answer:

On 10 December 2014 the Minister endorsed, the Policy described in the *Fire Management Environmental Assessment and Management Procedure, November 2014*. The endorsed Policy includes all fire management actions for reducing bushfire risk on all public lands under the care and control of the South Australian Minister for Sustainability, Environment and Conservation.

The South Australian Department for Environment, Water and Natural Resources is responsible for fire management on all public lands under the care and control of the South Australian Minister for Sustainability, Environment and Conservation to protect life, property and environmental assets and to enhance the conservation of natural and cultural heritage values.

Within the endorsed Policy, natural and cultural heritage values include all matters of national environmental significance.

The Fire Management Planning Process requires an information gathering process which consists of a comprehensive literature, data review and field validation (using survey methods) of the planning area to identify issues of concern. This includes all matters of national environmental significance.

The endorsed policy and part 10 approval is attached.

For further information can be found on the departments website at;
http://www.environment.gov.au/protection/assessments/strategic/sa-fire-management

Australian Government
Department of the Environment

Approval

South Australian Fire Management Policy Strategic Assessment

This approval decision is made under section 146B of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Class of actions

person to whom the approval is granted	The Chief Executive of the South Australian Government Department of Environment, Water and Natural Resources
proponent's ABN	36 702 093 234
proposed class of actions	All fire management actions for reducing bushfire risk on all public lands under the care and control of the South Australian Minister for Sustainability, Environment and Conservation taken under the *Fire Management Environmental Assessment and Management Procedure, November 2014*. Further information and explanation is at Annexure 1.

Approval decision

Controlling Provision	Decision
World Heritage properties (sections 12 & 15A)	Approve
National Heritage places (sections 15B & 15C)	Approve
Wetlands of international importance (sections 16 & 17B)	Approve
Listed threatened species and communities (sections 18 & 18A)	Approve
Listed migratory species (sections 20 & 20A)	Approve

conditions of approval

This approval is subject to the conditions specified below.

expiry date of approval

This approval has effect until 30 June 2045.

Decision-maker

name and position	The Hon Greg Hunt MP Minister for the Environment
signature	
date of decision	3:3:2015

Conditions attached to the approval

1. The approval holder must implement the commitments in Sections 4 and 5 of the **endorsed Policy**.
2. Within two years of the endorsement date of the **endorsed Policy**, the approval holder must submit to the **Minister** for approval an Adaptive Management Strategy. The Adaptive Management Strategy must accord with Section 4.4.3 of the **endorsed Policy**. The approved Adaptive Management Strategy must be implemented for the duration of the class of actions approval.
3. The approval holder must maintain accurate records substantiating all activities associated with or relevant to the **endorsed Policy** and the conditions of this approval, including measures taken to implement the **endorsed Policy** and the conditions of this approval. Records must be made available upon request to the **Department** and may be subject to audit by the **Department**, or used to verify compliance.
4. Unless otherwise agreed to in writing by the **Minister**, the approval holder must ensure that an independent audit of compliance with the **endorsed Policy** and conditions of this approval is conducted every five years from the date of this approval. The independent audit must be undertaken in accordance with Section 5.4 of the **endorsed Policy**.
5. If the **Minister** believes that it is necessary or convenient for the better protection of world heritage properties, national heritage places, wetlands of international importance, listed threatened species and communities or listed migratory species to do so, the **Minister** may request that the approval holder make specified revisions to the approved Adaptive Management Strategy specified in Section 4.4.3 of the **endorsed Policy** and submit the revised Adaptive Management Strategy for the **Minister's** written approval. The approval holder must comply with any such request. The revised approved Adaptive Management Strategy must be implemented. Unless the **Minister** has approved the revised Adaptive Management strategy, then the approval holder must continue to implement the Adaptive Management Strategy originally approved, as specified in the **endorsed Policy**.
6. Unless otherwise agreed to in writing by the **Minister**, the approval holder must publish all documents as required by the **endorsed Policy** and conditions of this approval on their website. Each document must be published within one month of being completed or, where relevant, of the **Minister's** approval, and for the duration of the class of actions approval.

Definitions

Department means the Australian Government Department administering the *Environment Protection and Biodiversity Conservation Act 1999*.

Endorsed Policy means the *Fire Management Environmental Assessment and Management Procedure, November 2014*, as endorsed by the **Minister** on 10 December 2014.

Minister means the Minister administering the *Environment Protection and Biodiversity Conservation Act 1999* and includes a delegate of the **Minister**.

EXPLANATORY INFORMATION

Background

This approval decision is made under section 146B of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) which provides for the Minister responsible for administering the Act (the Minister) to approve actions, or classes of actions, undertaken in accordance with an endorsed policy, plan or program. An approval under section 146B of the EPBC Act has the same effect as an approval given under Part 9 of the Act. Actions approved under this decision will not require separate referral, assessment or approval under the EPBC Act in order to be taken.

On 10 December 2014 the Minister endorsed, pursuant to section 146 of the EPBC Act, the Policy described in the *Fire Management Environmental Assessment and Management Procedure, November 2014*. The endorsed Policy includes all fire management actions for reducing bushfire risk on all public lands under the care and control of the South Australian Minister for Sustainability, Environment and Conservation.

Actions covered by this approval must be taken in accordance with the endorsed Policy. Actions not taken in accordance with the endorsed Policy are not covered by the approval provisions of the EPBC Act and therefore may not be compliant with legislative requirements.

In implementing this approval, the endorsed Policy will provide the basis for any necessary interpretation and resolution. The Minister will provide final interpretation and guidance if required.

Actions included in the approval

The class of actions is all fire management actions for reducing bushfire risk on all public lands under the care and control of the South Australian Minister for Sustainability, Environment and Conservation taken under the *Fire Management Environmental Assessment and Management Procedure, November 2014*.

The Policy describes the mechanisms and processes the South Australian Government will implement to reduce the risk of unacceptable impacts to matters of national environmental significance from implementation of the bushfire mitigation program. This includes the fire management of public lands for the purposes of conservation. The Policy dictates that where there is a bushfire risk to life, property or environmental values, it will be managed through strategies set out in a Fire Management Plan.

Examples of activities covered by this approval include:

- prescribed burning
- other fuel reduction methods (e.g. mechanical removal, chemical treatment, slashing)
- construction and maintenance of fire access tracks
- construction and maintenance of fire management infrastructure.

Excluded actions

The approved class of actions excludes actions on Commonwealth land.

The Policy does not apply to any activities associated with the control of bushfires (including a prescribed burn that escapes beyond the capacity of the resources and contingencies in place to manage it).

Government of South Australia
Department of Environment, Water and Natural Resources

Fire Management

Environmental Assessment and Management Procedure

Policy prepared for Strategic Assessment under the EPBC Act

November 2014

PREPARE. ACT. SURVIVE.

BUSHFIRE READY

For further information please contact:

Department of Environment, Water and Natural Resources
Phone Information Line (08) 8204 1910, or
see SA White Pages for your local
Department of Environment, Water and Natural Resources
office.

Online information available at:
http://www.environment.sa.gov.au

Government of South Australia

Department of Environment, Water and Natural Resources

ISBN

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1. Introduction

1.1 Fire Management in South Australian reserves

Fire management in South Australia's reserves is conducted in line with the *National Bushfire Management Policy Statement for Forests and Rangelands*[1] (NRMMC/PIMC 2011). This recognises that bushfires cannot and will not be eliminated from the landscape and a combination of strategies needs to be adopted for the impacts of bushfires to be effectively reduced. Appropriate strategies include fuel hazard reduction, fire management planning, development and building regulations for developments in fire prone areas, and community engagement and education about bushfires. Importantly, this policy recognises that fuel management is the only bushfire mitigation activity that land managers can effectively use across large bushland landscapes.

In response to the National Policy Statement and recent bushfire inquiries and recommendations, the South Australian Government has directed the Department of Environment, Water and Natural Resources (DEWNR[2]) to conduct an increased program of prescribed burning and other bushfire mitigation activities to reduce bushfire impacts to life and property. In particular, DEWNR (and other South Australian Government land managers) have been asked to conduct prescribed burning on five per cent of high risk public land annually.

1.2 Strategic assessment of fire management environmental assessment and management

This strategic assessment was initiated through an agreement between the Commonwealth of Australia and the State of South Australia on 15 January 2010 under Part 10 of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The original agreement was to assess all relevant aspects of DEWNR's fire management in relation to environmental assessment and management. The original scope directly included eight policy/procedure documents along with a large number of supporting documents.

On 27 March 2012, the agreement was amended to strategically assess DEWNR's *Fire Management Environmental Assessment and Management Procedure* (the Policy). This is presented in this document.

The Policy presents a consolidated and concise description of the policies and procedures that DEWNR uses to address impacts on matters of national environmental significance (MNES), as defined by the EPBC Act, in its fire management activities. It draws on all aspects of DEWNR's fire management policies, planning and procedures relating to environmental assessment and management and has been written to facilitate a strategic assessment of DEWNR's fire management practices under Part 10 of the EPBC Act.

The Policy describes the commitments DEWNR is making to protect MNES. A separate Assessment Report (DEWNR 2014) assesses how the measures in the Policy protect MNES and provides relevant case studies to illustrate DEWNR's approach and practices to protect MNES in fire management.

The scope of this strategic assessment includes the impacts from implementation of the Policy for all public lands under the care and control of the South Australian Minister for Sustainability, Environment and Conservation (MSEC) as shown in Appendix 1.

This assessment does not include or apply to any policies, procedures or activities for the suppression of bushfires (including a prescribed burn which escapes beyond the capacity of the resources and contingencies in place to manage it). These are under the control of the South Australian Country Fire Service and not DEWNR.

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[1] This policy was endorsed by all members of the Council of Australian Governments during late 2011 and early 2012.

[2] References to government departments and agencies reflect titles current as of February 2014 and apply to all successors of these departments/agencies.

2. Overview of DEWNR's Fire Management Policy

2.1 Legislative context

A number of Acts and other legislative outcomes drive DEWNR's fire management activities.

2.1.1 Commonwealth legislation

The Commonwealth does not specifically regulate fire management activities undertaken by state and territory governments. The EPBC Act will be triggered if a proposed activity is likely to have a significant impact on a MNES: The relevant MNES that are potentially affected by implementation of the Policy are:

- listed threatened species and ecological communities
- migratory species protected under international agreements
- Ramsar wetlands of international importance
- World Heritage properties
- National Heritage places.

2.1.2 South Australian legislation

The *Fire and Emergency Services Act 2005* requires that all landholders (including MSEC) take reasonable steps to:

- prevent or inhibit the outbreak of fire on the land
- prevent or inhibit the spread of fire through the land
- protect property on the land from fire
- minimise the threat to human life from a fire on the land.

The Act also requires the South Australian Country Fire Service, Bushfire Management Committees (State and Regional) and associated agencies (including DEWNR) to:

- act to protect life, property and the environment
- have due regard to the impact of their actions on the environment
- seek to achieve a proper balance between bushfire prevention and proper land management.

The following South Australian Acts dedicate land to be managed for specific purposes by the MSEC and DEWNR: *National Parks and Wildlife Act 1972*, *Wilderness Protection Act 1992*, *Botanic Gardens and State Herbarium Act 1978*, and the *Crown Land Management Act 2009* (MSEC land[3]).

Requirements for fire management for the protection of life, property and environmental/cultural values on DEWNR-managed land are included in these Acts:

- the *National Parks and Wildlife Act 1972* requires 'the prevention and suppression of bushfires', and provides protection for listed terrestrial flora and fauna

[3] *MSEC land* is all lands under the care and control of the Minister for Sustainability, Environment and Conservation and includes all land managed by DEWNR.

- the *Wilderness Protection Act 1992* requires the preparation of a Wilderness Code of Management. This Code (DEH 2004) establishes principles for fire management and defines essential management operations (including allowable fire management activities) for Wilderness Protection Areas

- both the *National Parks and Wildlife Act 1972* and *Wilderness Protection Act 1992* require the preparation of reserve management plans to provide the overarching strategy for all management activities in reserves. Reserve management plans adopted by the MSEC may provide policy objectives for the management of fire in reserves. Fire management plans will be consistent with the objectives of the reserve management plan for that reserve where adopted.

- the *Botanic Gardens and State Herbarium Act 1978* and the *Crown Lands Management Act 2009* make fire management of botanic gardens and Crown Land dedicated under these Acts the responsibility of DEWNR. Crown Leasehold (i.e. Crown Land under lease or licence to a private individual) or Crown Land not dedicated to the care and control of MSEC is not the responsibility of DEWNR

- the *Native Vegetation Act 1991* controls the clearing of native vegetation across South Australia to prevent further reduction of biological diversity and degradation of the land and its soil. The definition of 'clearance' under this Act includes the burning of native vegetation. The consent of the Native Vegetation Council is required before any burning of native vegetation can occur. The *Native Vegetation Regulations 2003* list the actions that can be undertaken to manage native vegetation for bushfire prevention purposes (i.e. are exempt from control). These include:

    - fire prevention within 20 m of buildings
    - establishing and maintaining fire access tracks
    - actions, if required by approved bushfire management plans.

  DEWNR was granted a delegation in 2004 under this Act to self-assess vegetation clearance associated with prescribed burning for fire prevention

- the *Aboriginal Heritage Act 1988* requires potential impacts to Aboriginal Heritage sites, objects or remains be referred for impact assessment.

2.1.3 DEWNR fire management policy and procedures

The DEWNR fire management policy and procedures are contained in the DEWNR *Fire Management Policy and Procedures Manual* (DEWNR 2013, and as updated from time to time). Fire management activities in DEWNR deliver the objectives set out in DEWNR's Fire Management Policy, while delivery of these activities is guided by the Fire Management Procedures. The manual has been developed to bring together the information, knowledge and skills necessary for DEWNR staff to achieve DEWNR's fire management goals and objectives.

The need to protect life, property and environmental values is core to DEWNR's Fire Management Policy (DEWNR 2013), which states:

> *The Department for Environment, Water and Natural Resources is responsible for fire management on all public lands under the care and control of the Minister for Sustainability, Environment and Conservation to protect life, property and environmental assets and to enhance the conservation of natural and cultural heritage.*

Natural and cultural heritage values include all MNES.

The objectives of the Fire Management Policy are to:

- establish the Department's position in relation to fire management on land managed by DEWNR

- establish that the protection of life has priority over all other fire management and suppression activities

- define the principles for fire management on land managed by DEWNR.

A range of procedures and documents support this Policy. These are not included in the scope of this Strategic Assessment, but are important as benchmarks, standards and for implementation of the Policy. Key supporting documents include:

- DEWNR Fire Management Policy & procedures (DEWNR 2013, or as amended)
- Ecological Fire Management Guidelines (DEWNR 2012, or as amended)
- Ecological Fire Management Strategies (DEWNR various dates)
- South Australian Firebreaks, Fire Access Tracks and Sign Standards Guidelines (GAFM 2013, or as amended)
- Overall Fuel Hazard Guide for South Australia (DENR 2011, or as amended)
- *Australian Standard for Risk Management* AS/NZS ISO 31000:2009 (Standards Australia 2009a, or as amended)
- *Australian Standard for Construction of buildings in bushfire prone areas* AS3959 (Standards Australia 2009b, or as amended)
- *National Emergency Risk Assessment Guidelines* (Emergency Management Australia 2010, or as amended).

2.2 Description of Fire Management Activities

The main focus of DEWNR's fire management activities for reducing bushfire risk is on strategic fuel management in high risk areas, and maintaining appropriate access and infrastructure for fire suppression.

Fire management strategies are delivered using one or a combination of the following activities/treatments.

2.2.1 Prescribed burning

Prescribed burning is the planned application of fire under prescribed environmental conditions and within defined boundaries to achieve a planned management objective. DEWNR uses prescribed burning as the primary tool to effectively and efficiently reduce fuel hazard across the landscape. In South Australia, spring and autumn are generally the optimal seasons for conducting prescribed burning.

The primary objective for a prescribed burn is usually one of the following:

- To reduce fuel hazard immediately adjacent assets
- To create strategic fuel reduced zones across the landscape to impede the spread of large bushfires
- To provide landscape protection (e.g. to prevent fragmented reserve(s) from burning in its/their entirety in a single bushfire event)
- To manage for ecological outcomes (e.g. regeneration of species, maintain specific habitat for fauna, assist to control pest species)
- To conduct research into fire behaviour or ecological responses to fire.

Prescribed burns may be applied in isolation or in conjunction with other fire management activities such as mechanical and/or chemical treatments. For the purposes of this strategic assessment, prescribed burning does not include back-burning or burning out operations used during the control of bushfires.

A prescribed burn that is undertaken to primarily achieve an ecological or biodiversity management objective is called an *ecological burn* by DEWNR. The procedures and methods used to achieve the

ecological objective are the same as for prescribed burns, however the outcome differs. A clear statement of, and justification for, the ecological objectives is required.

2.2.2 Other fuel reduction methods

Other fuel reduction methods are used in areas where prescribed burning may be undesirable (i.e. poses a high risk of impact to life, property or environmental values including MNES) or is operationally not practical. These usually involve physically removing plants contributing to fuel hazard by hand, using machinery (such as a slasher) or chemical means (i.e. herbicides), and are usually confined to relatively small treatment areas due to the intensive nature and higher cost of these methods.

2.2.3 Fire access tracks and fuel breaks

Fire access tracks provide vehicular access for fire suppression and prescribed burning. Fire access tracks are a small, but important strategy for the protection of assets from bushfire, as they facilitate access for faster and safer fire suppression.

Fuel breaks (sometimes referred to as firebreaks) are fuel reduced areas of land that will decrease the intensity and rate of spread of fires, should they burn into them.

Fire Management Plans (FMPs) set out the strategic need for fire access. Individual maintenance requirements for each fire access track are based on the standard listed in the FMP.

2.2.4 Fire management infrastructure

Fire management infrastructure that may be installed by DEWNR include water points (dams), tanks, gates, signs, airstrips and helipads.

Upgrades to infrastructure are identified in FMPs. The annual maintenance requirements are based on the purpose and standards listed in the FMP.

3. Implementation of the Policy

This Policy applies to all MSEC land. Where there is bushfire risk, it will be managed through strategies set out in a FMP.

Environmental assessment and management measures are implemented in DEWNR fire management at two scales:

- regional or landscape scale through the development and delivery of strategies in a FMP for a landscape or group of reserves
- operation or site-specific scale through the development and delivery of a *Prescribed Burn Plan* or *Works Plan*.

The first scale (FMP) of environmental assessment and management develops strategies and programs of bushfire risk mitigation activities which prioritise activities to reduce the risk of impact from bushfires on life, property and environmental values (including MNES). The locations where these activities are planned to occur are selected to minimise any environmental or cultural impacts (from the mitigation activities), including on MNES across the region or landscape.

The second scale (Burn/Works Plan) of environmental assessment and management identifies specific impacts from individual activities and ensures that practical measures are taken during the operation to minimise any specific environmental or cultural impacts, including on MNES, which occur on or adjacent to the site of the burn or other work.

Both scales use risk assessment as the basis for decision-making. An overview of DEWNR's fire management process is shown in Figure 1 and explained below.

3.1 Fire Management Plans

DEWNR applies a landscape-scale approach to fire management planning. Fire Management Plans are prepared for groups of reserves and other DEWNR-managed land in close proximity, with similar geography or sharing similar fire issues.

The primary objectives of an FMP are to provide guidance and direction for fire management decision making, and to create strategies and activities to reduce the impact of bushfires on life, property and the environment (including MNES) at a regional or landscape scale, in line with DEWNR policy.

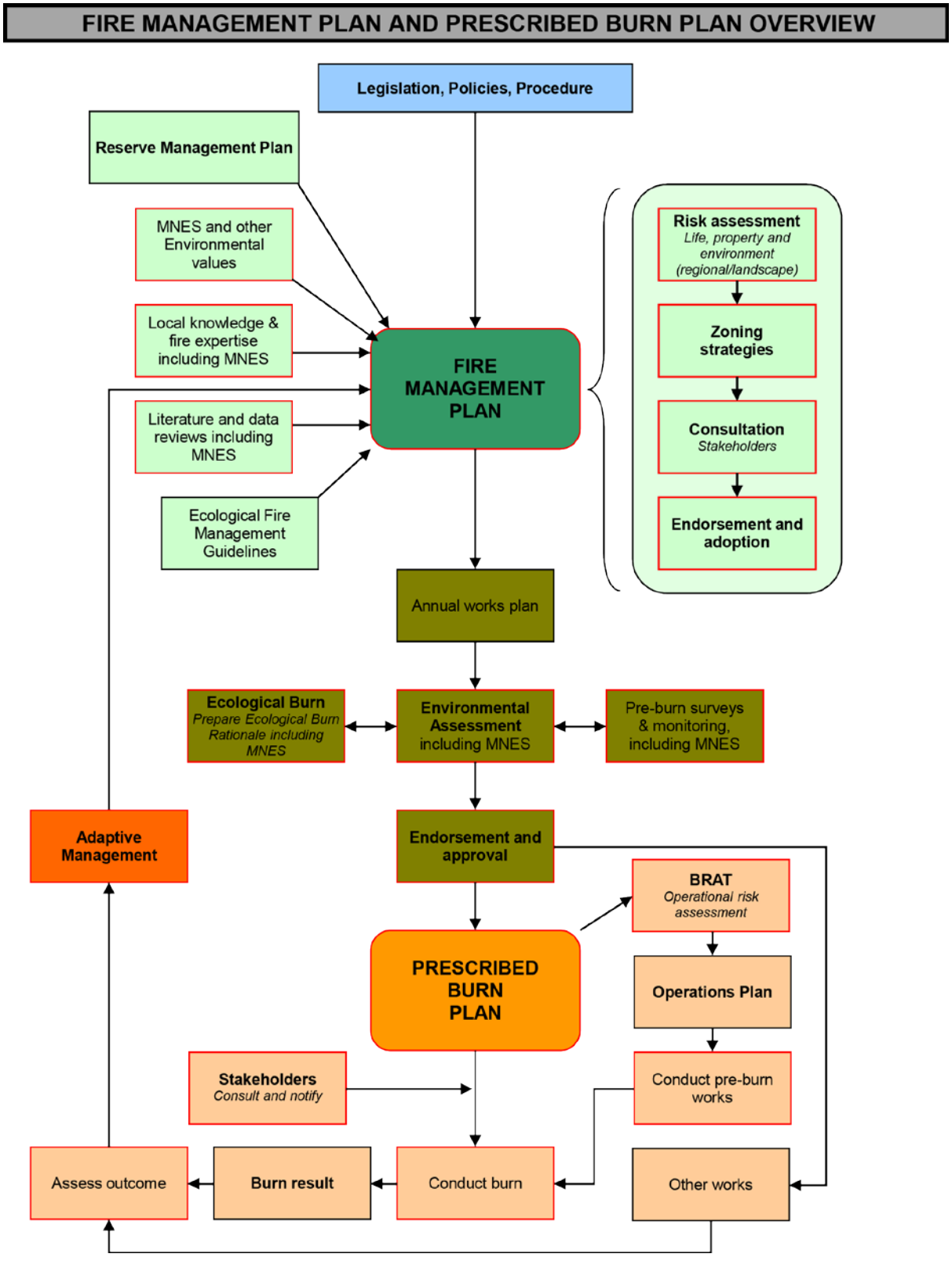
In seeking to achieve this objective, an FMP must:

- identify fire-related risks to life, built assets, and natural and cultural heritage values
- define objectives for fire management in the planning area
- identify strategies to achieve these objectives.

Where adjoining land has shared natural values (including MNES) and/or fire-related risks, DEWNR supports the cooperative or collaborative development of landscape-scale FMPs that integrate fire management regardless of tenure. This ensures a consistent approach to protecting and managing MNES across the broader-scale landscape.

Figure 1 – Fire Management process overview

Boxes outlined in red are where MNES are identified or considered.



DEWNR's landscape-scale approach to fire management planning, through the definition of fire management zones (Section 3.1), is risk-based and follows these five principles:

- a zoning approach is adopted, with the location of zones based on a risk assessment
- clear objectives are outlined for each zone
- zoning is applied at the landscape level
- fire management activities are determined for each zone
- stakeholders and the community are involved.

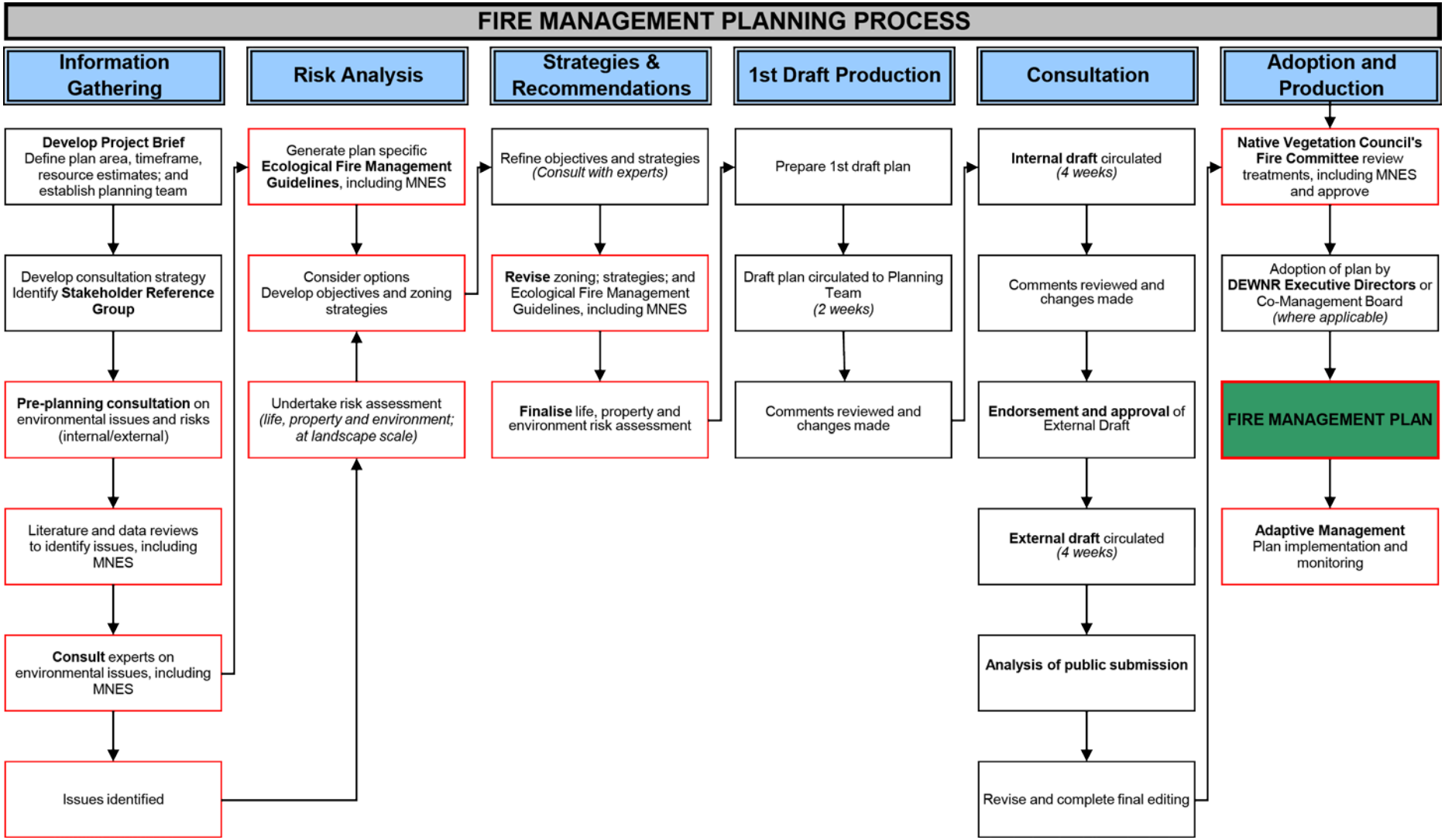
Plans contain the following strategies for influencing and directing fire management decision-making to achieve the desired outcomes:

- *Research, Information & Analysis*: support fire management decision-making through applied research; collection of data (including monitoring); provision of information; and development of relevant tools.
- *Risk Mitigation*: plan for, and undertake, strategic risk mitigation activities (including fuel management) on public land to reduce bushfire risk.
- *Readiness*: Ensure DEWNR is capable of delivering fire management and bushfire suppression activities through the provision of appropriate policies, procedures, standards, equipment, training and staffing.
- *Response*: Respond to bushfires on and adjacent to public land as required/directed.
- *Recovery*: Undertake post-fire rehabilitation and recovery works as necessary and identify lessons learnt.
- *Stakeholder, Community, and Partnership Engagement*: participate in local, state and national fora to influence and promote fire management best practice, and engage DEWNR stakeholders and SA communities to increase the participation in and acceptance of fire management activities.

The planning processes involved in the development of FMPs is summarised in Figure 2 and described below.

Figure 2 - Management planning process – conducted at regional or landscape-scale

Boxes outlined in red are where MNES are identified or considered.



3.1.1 Information gathering

Information is gathered to inform the risk assessment. Information can relate to risks to life and property as well as risks to environmental, cultural and heritage values. For the latter, a comprehensive literature and data review is conducted of the planning area to identify issues of concern, including MNES with a high likelihood of occurring in the planning area. The key data sources include:

- Protected matters search tool (http://www.environment.gov.au/epbc/pmst/index.html)
- DEWNR spatial data – includes the Biological Database of South Australia, which houses known species records in SA, and shared spatial data sets from other Agencies, private companies, etc. (where relevant)
- DEWNR regional datasets
- The Australian Ramsar wetlands database (http://www.environment.gov.au/water/topics/wetlands/database/index.html)
- Recovery plans, conservation advices and species and ecological community specific guidelines
- Relevant technical experts
- Published scientific literature
- Register of Aboriginal Heritage Sites and Objects
- South Australian Heritage Register (http://www.planning.sa.gov.au/go/SAheritagedatabase)
- Interested and known stakeholders (identified through pre-planning public advertising).

Field validation will be undertaken for identified MNES with a high likelihood of occurring in the planning area, using appropriate survey methods (such as duration and appropriate time of year), unless this work has already been undertaken in the previous two years.

The process results in a comprehensive list of issues and values that is the subject of a thorough risk assessment to gauge risks to human life, property and environmental assets posed by bushfire. MNES known or likely to occur in or adjacent to the planning area are included in this list.

3.1.2 Risk analysis

The potential risks to environmental, cultural and heritage values from bushfire are identified and analysed for their likelihood and consequences to determine a resultant risk rating. For MNES, conservation advices, recovery plans, significant impact guidelines (Department of the Environment, various dates) and specific species or ecological community guidelines are applied to determine consequence and resultant risk ratings.

Risk assessment in FMPs considers the likelihood of impacts from a bushfire occurring and the consequence of that impact on human life, property and environmental assets at the broad regional or landscape scale. Conducting risk assessments at the landscape scale during the development of FMPs allows for the consideration of 'whole of population' fire management approaches for the protection of threatened species and for the full extent of known occurrences of ecological communities.

Risk management, particularly when it involves multiple values at risk, uses the following options to address identified risk:

- Avoidance: Use an alternate strategy/method to reduce the risk to the MNES or locate the strategy in an area that does not have the risk to the MNES. This is not always an option, particularly where high risks to conflicting values occurs or where mitigation of high risks to life and property have high impacts to the MNES.

- Control (mitigation): Reduce the risks to the MNES using additional management activities that either protect the MNES at risk or lower the impacts to the MNES.

- Assumption (accept risk): Accepting the risk to the MNES and proceeding with the activities. This must be a decision reserved for situations where mitigation of high risks to life and property may have high impacts to the MNES and there are no other options, given the primacy of protection of life. The assumption or acceptance of risk must be a clear and deliberate decision and not considered as control of a risk.

- Risk Transfer: Causing another party to accept the risk. While bushfire risks can be shared (by co-operative or co-ordinated mitigation activity), transfer is generally not an option available for MNES. Insurance of property against loss from bushfire is risk transfer.

- Knowledge & Research: Activities to gain additional knowledge about risk or mitigation is not an option to address risk. It is a technique for strengthening other options and improving future risk mitigation. As bushfire risks are ongoing (i.e. specific mitigation activities only reduce risk for a specific time period) this option is still important. Knowledge to improve future risk assessment and management, especially when part of an adaptive approach to risk management, will improve the reduction of future risk.

The risk assessment conducted for an FMP guides the designation of fire management zones in the planning area, as either asset protection (A zone), bushfire buffer (B zone), and conservation and land management (C Zone) (Table 1).

Table 1: Fire protection zones

Zone	Purpose
Asset Protection Zone (A-zone)	The aim of this zone is to provide the highest level of protection to human life and highly valued built and environmental assets. This is implemented by undertaking intensive fuel management strategies (burning, slashing, weed removal, etc.) aimed at keeping fire fuel at low to moderate levels at ground level.
Bushfire Buffer Zone (B-zone)	Such areas aim to provide a buffer area in bushland at the urban fringe or close to rural assets (e.g. cropland) to assist in reducing the rate of spread, intensity and spotting potential of a bushfire. It may also be used in larger areas of remnant native vegetation to provide strategic fuel reduction in the landscape. Prescribed burning is aimed at preventing ground fuel levels exceeding high.
Conservation Zone (C-zone)	This is the default zone for all natural areas within a reserve and allows for fire management activities to meet ecological and conservation management objectives. Fire regimes in these areas will be managed to be consistent with the relevant Ecological Fire Management Guideline/s

Areas of high risk to life, property and *fire vulnerable* environmental values (including MNES) have A- and B-zones located in adjacent areas. These areas of reduced fuel will reduce the intensity and likelihood of spread of future bushfires into the vulnerable site, thus reducing the risk. The risks of impacts from the mitigation strategies (e.g. A-zone areas) to MNES are assessed and adjustments to the location of zoning are made where appropriate.

In a fragmented landscape, large bushfires can burn out an entire remnant reserve or block of vegetation, posing a high risk to biodiversity values and particularly to MNES restricted to these areas. Areas of B-zone are located across significant reserves or blocks of remnant vegetation (usually greater than 2000 ha) to provide a strategic fuel reduced zone within these areas. This strategy provides an area where fire suppression could be more safely and effectively conducted should a large bushfire occur. Without such zones, the likelihood of entire reserves or remnant blocks burning is increased.

Where the impact is low or the value limited to a small area, specific mitigation activities (e.g. prescribed burning) can be used in C-zones to address specific risks such as fire vulnerable MNES. Any

prescribed burning in C-zones must be undertaken in keeping with the appropriate Ecological Fire Management Guidelines (EFMG) (see Section 4.1).

Other mitigation strategies for managing identified risks to environmental and cultural values include:

- mechanical and/or chemical treatments (Section 2.2.2)
- application of EFMGs at the regional and/or local scale (Section 4.1)
- application of Ecological Fire Management Strategies (EFMS) at the local scale (Section 4.2)
- post-fire weed and feral animal control
- community education
- research and adaptive management to improve future decision making (Section 4.4).

3.1.3 Consultation

Consultation is undertaken during the preparation of a draft FMP and, more broadly, when the draft FMP is released for public comment. Currently, a Stakeholder Reference Group, comprising individuals, groups or organisations that have a vested interest in the plan or relevant technical expertise, is used as an important conduit for information and feedback during the development of a Fire Management Plan. Consultation methods will continue to be refined under the Policy.

3.1.4 Adoption

All FMPs require approval by the Native Vegetation Council's Fire Committee and adoption by the relevant DEWNR Executive Director.

3.2 Operational planning

Delivery of fire management activities on DEWNR-managed lands is the responsibility of each of the eight DEWNR regions across the state. Each region develops an Annual Works Program (AWP) of activities that implements the strategies outlined in FMPs for the area. Works are delivered on a strategic priority basis (i.e. those burns and works that address the highest risks are prioritised to be completed first) and may include works assessed as high priority in areas not yet covered by FMPs. An individual Prescribed Burn Plan[4] is prepared and approved for all prescribed burns. A Works Plan is prepared and approved for all significant other works.

An AWP for a specific region or area to be managed will include all of the following works and activities proposed for the financial year:

- prescribed burns, including ecological burns
- establishing new fire access tracks
- establishing new fire management infrastructure
- significant upgrade to existing fire access tracks
- significant upgrade to existing fire management infrastructure
- any other new significant activities.

The planning process for the delivery of on-ground fire management activities is shown in Figure 3.

[4] The prescribed Burn Plan includes burn summary information (burn objective, burn prescription, burn approval), environmental assessment, operations plan (lighting patterns, resources, day-of-burn planning & issues), notifications, and burn outcome assessment.

3.2.1 Environmental assessment of activities.

This section describes the environmental assessment of a fire management activity required in a prescribed burn or other fire management works plan. As per the fire management planning process, the environmental assessment of individual fire management activities follows a risk-based assessment approach, but applied at a local scale for a specific management area. Environmental assessments conducted at the local scale for on-ground fire management activities allow for detailed site specific fire management and protection of local populations and sub-populations of threatened species and local extent of occurrence of ecological communities.

All Prescribed Burn Plans and other significant works must undergo an environmental assessment process. This typically takes the form of an Environmental Assessment (EA) using DEWNR's Fire Information Management System. All new road, track or infrastructure works must have an EA conducted prior to planning and commencement (DEH 2006).

Additionally, ecological burns, where the objectives are not listed in the relevant FMP, are required to have an Ecological Burn Rationale prepared as part of the Prescribed Burn Plan. The Ecological Burn Rationale sets out the justification and clear objectives for the burn. See Section 4.3 for more information on Ecological Burning.

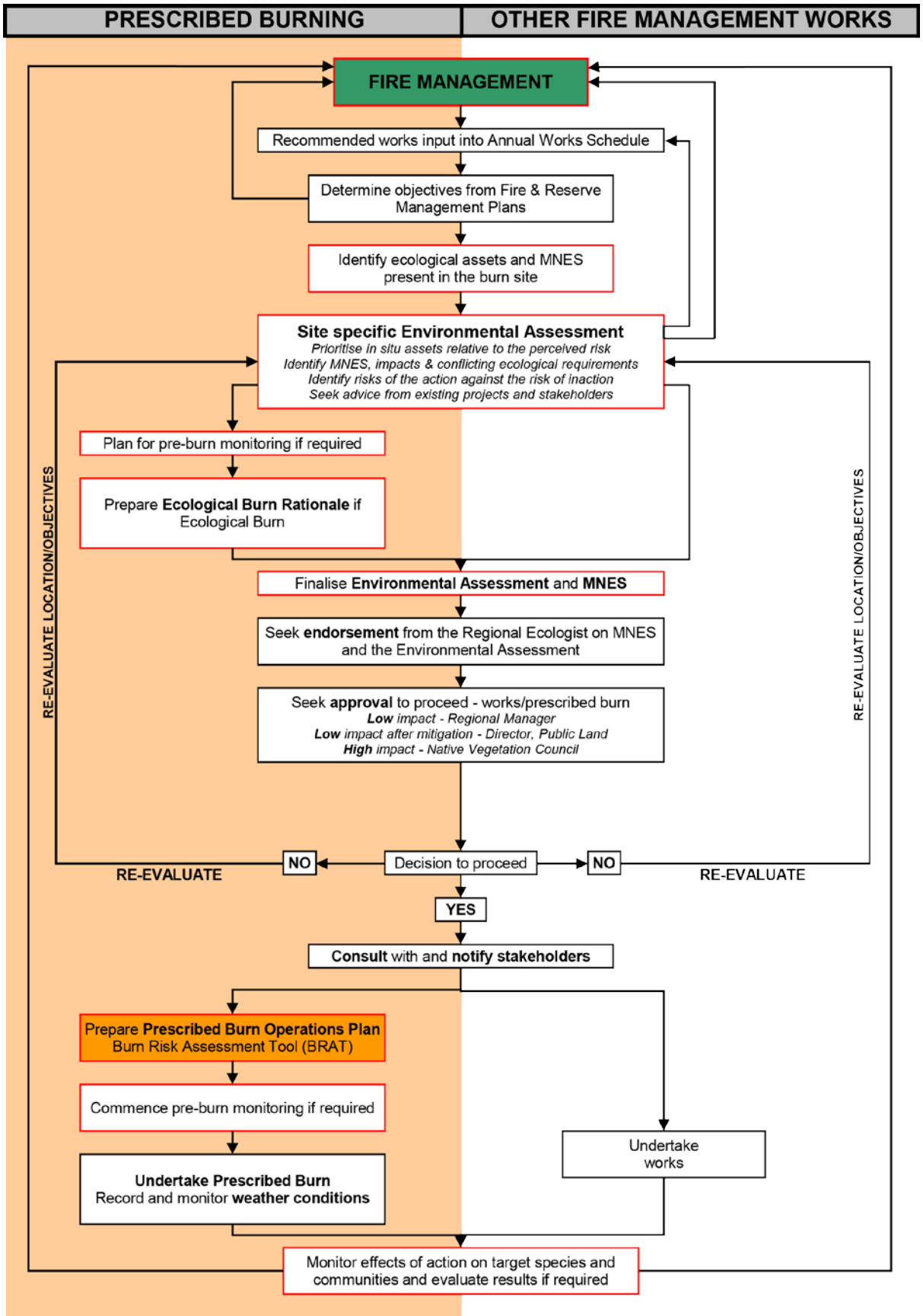
The first step in preparing for a fire management activity follows a similar process to that for FMPs, except the information sourced is more detailed and specific to the area of the proposed activity.

The EA provides guidance on the types of issues that must be assessed, such as the condition and diversity of native vegetation, the presence of threatened species and ecological communities (including MNES), and likely fire responses. A draft EA is generally developed with the issues identified prior to the formal risk assessment, to facilitate risk assessment discussions. Information available through the Fire Information Management System and from the FMP is supplemented by a desktop survey to identify:

- plant diversity and fauna (particularly those listed under the EPBC Act or NPW Act)
- sensitive and threatened vegetation communities (particularly those listed under the EPBC Act and in Neagle (1996) and DEH (2005))
- Aboriginal heritage (under State and Commonwealth legislation)
- European heritage (listed on the SA Heritage Register and on Australian Government heritage lists)
- Other MNES (such as Ramsar wetlands), significant biodiversity and heritage issues.

Figure 3 - Prescribed Burn and Other Fire Management Works planning process

Boxes outlined in red are where MNES are identified or considered.



The EA requires an onsite validation of issues identified in the desktop study. In areas that include native vegetation, a ramble survey (DENR 2010) is undertaken to collect data to inform the EA. Typical details collected in the ramble survey include:

- List of all species detected
- Distribution and abundance of rare or threatened plants
- The current location, distribution and condition of vegetation communities
- Potential habitat for threatened species (e.g. hollows)
- Potential for erosion
- The potential to introduce or increase pest plants and animals, or diseases (e.g. *Phytophthora*)
- On-ground validation of past fire history
- Potential for actions to exacerbate flooding
- Distribution and abundance of significant weeds (especially Weeds of National Significance and weeds declared under the *Natural Resources Management Act 2004* (SA)).

Additional surveys, using appropriate methods, are conducted if significant flora, fauna and/or ecological communities are found to be present (including MNES), or if it is likely for them to be located at the proposed site. These surveys are to confirm the presence (or absence) of the specific threatened species or ecological communities identified. Best practice methods are used as determined by relevant experts.

It is also a requirement that DEWNR obtains details of locations of known heritage sites (including those which are MNES) to ensure the adequate protection of sites in areas that may be disturbed by burning or earthworks.

Risks to identified issues, including MNES, are assessed using the risk framework as outlined for fire management planning (Section 3.1.2). The EA is used to guide DEWNR staff through this assessment. Mitigation measures are then identified and evaluated for their effectiveness in reducing the level of risk to as low as reasonably achievable. The residual risk forms the basis for decision making following the application of the proposed mitigation strategies.

For MNES, recovery plans, significant impact guidelines (Department of the Environment 2013), conservation advices, threat abatement plans, wildlife conservation plans, Ramsar Management Plans, World and National Heritage plans, heritage databases, national wetlands databases and species or ecological community specific guidelines are taken into account in the risk assessment.

The Regional Ecologist (see Glossary) is required to endorse the EA process and outcomes. The Regional Ecologist is the most appropriate staff member in a DEWNR Region to perform this validation, as they have the knowledge and experience to validate the assessment and its outcomes, particularly in relation to threatened species and ecological communities, and have access to appropriate experts for a range of environmental and heritage issues.

Performance measures are developed using information from the risk assessment process.

Environmental Mitigation strategies

Where fire management activities (particularly prescribed burning) are identified as likely to impact on MNES in an EA, appropriate mitigation measures and strategies will be specified to reduce the level of impact to an acceptable level.

The following are examples of possible mitigation strategies:

- the use of alternate mechanical and/or chemical treatments in place of burning (possible in small areas)

- exclusion of parts of the proposed area from the activity or burning operation
- conduct of weed or pest control post-burn
- protection of key habitat elements (such as hollows) from the activity or burning e.g. active suppression, use of fire fighting chemicals (foam, retardant)
- reschedule the activity or burn to a different year/season.

Where mitigation is used, monitoring of the success of the strategies will be conducted so that EFMGs can be developed and applied to future fire management planning and operations (see Adaptive Management section 4.4).

3.2.2 Determination and approval

Decisions on whether to proceed with the fire management activity are based on the residual risk rating, which is the risk remaining following the application of mitigation strategies on the assessed environmental values. Activities with a residual risk rating of Low may proceed, while those with a residual risk rating of Extreme may not.

Categories of impact are:

- Low impact: activity likely to have no significant impact on environmental values (including MNES)
- Low impact after mitigating actions: activity likely to have no significant impact on environmental values (including MNES) after mitigating actions have been applied
- High impact: activity likely to have a significant impact on one or more environmental values (including MNES).

Where the likely impact is assessed as High, approval by the Native Vegetation Council Fire Committee is required (unless exempted under the Native Vegetation Act or the activity is in accordance with an FMP that the Council has already endorsed).

Risk-based decisions for each residual risk rating are shown in Table 2.

Table 2 – Risk assessment rating table

Initial Risk	Residual Risk	Outcome	Endorsement/Approval
Low	Low	Proceed with action as proposed	**Local Manager**
High - risk can be managed through mitigation measures	Low	1) Proceed with action, with exclusions/modifications or 2) Proceed, with mitigation measures	**Director**
High - mitigation to reduce risk not possible	High	1) Plan returned to the planning process for review to see if the action can be redesigned to remove/reduce the risk issues. or 2) Risk considered acceptable to enable proposed action to proceed, with specific monitoring – to specifically provide opportunity for adaptive management (opportunity to learn from long term or cumulative impacts). Generally applies in cases where impacts are locally significant but not widespread/resulting in change in status, or life and property risks are paramount	**Director** **Native Vegetation Council**
Extreme	**Extreme**	**Do not proceed with proposed action**	**n/a**

The EA and proposed action is then approved by the Manager, Public Land (refer to Glossary).

3.2.3 Delivery of activities

Proposed activities are carried out in accordance with the approved burn or works plan. The Incident Controller (for prescribed burns) or Works Supervisor (for other activities) is responsible for briefing all officers involved on the day and ensuring the delivery of activities as described in the prescribed burn or works plan.

There is a level of risk inherent in conducting prescribed burning. Weather cannot be predicted perfectly and, as a result of topography, there are other factors that cannot be changed. Equipment failures and human misjudgements are possible. A Burn Risk Assessment Tool (BRAT) is used prior to each prescribed burn to assess the risks from the burn not being contained as planned. The BRAT is a key input to developing the burn Operations Plan[5] and provides a standardised framework to assess the risk of burn escape, potential for damage to MNES (outside the planned burn area), effect of mitigation strategies in reducing fire escape probability, and the burn's potential to meet fire management objectives. The BRAT is used by the Incident Controller in approving the final decision to implement the burn.

3.2.4 Post-action review and adaptive management

A debrief is held after each burn to identify any issues (including environmental and mitigation issues) arising during or as a result of the conduct of operations, and to determine whether the objectives of the activity have been met.

If the burn objectives are not met or other significant failings identified, an after action review will take place to evaluate the success of the burn planning and execution, identify lessons learned and recommend changes to future activities. These lessons are documented and are used to amend relevant procedures which guide subsequent burn planning and execution.

Post-fire management measures are carried out as identified in the Operations Plan, including activities such as monitoring and weed management.

[5] The burn Operations Plan contains all day-of-burn planning and execution information, including resources required, prescribed fuel & weather conditions to deliver a burn of appropriate intensity and control to meet objectives, fireground communications details, maps and logistics requirements.

4. Fire management tools, guidelines and strategies

A number of tools, guidelines and strategies are employed to ensure DEWNR's fire management practices protect life, property and the environment – including MNES and other matters of biodiversity or cultural significance.

4.1 Ecological Fire Management Guidelines

DEWNR has developed Ecological Fire Management Guidelines (EFMG) to inform prescribed burning in C-zones (DEWNR 2012). This information provides land managers with guidance on fire regimes that are appropriate for the maintenance of broad biodiversity values for all fire-prone vegetation types that occur in South Australia, including MNES.

These guidelines are a recommended approach to developing ecological fire regimes (that is, fire regimes to maintain and enhance biodiversity). Specifically, the guidelines identify five aspects of fire regimes (interval, frequency, spatial, intensity and season) for each major vegetation sub-group (MVS) in a planning area.

The EFMG are not designed to be used as prescriptions; instead they define a window of "acceptable" fire regime suitable for the conservation of the vegetation sub-group.

EFMG development involves the following steps:

- Vital attribute (refer to Glossary) data of flora are gathered and assessed. Data on fauna and ecological communities known to be vulnerable to fire are also gathered and assessed. The species most likely to decline due to changes in each element of the fire regime are identified as the Key Fire Response Species (KFRS) and are typically plant species.

- Based on best available information, the Thresholds of Potential Concern (TPC) or fire regime elements (fire interval, frequency, season, type), where KFRS species will significantly decrease, are identified.

- The TPC inform EFMG, which are then used to guide fire management practices to ensure that adequate habitat is available to maintain biodiversity (i.e. species, populations and ecological communities).

Figure 4 illustrates this process.

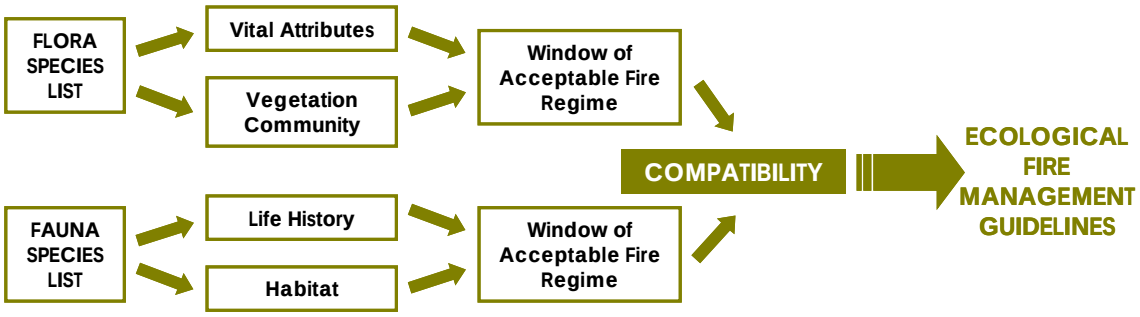


Figure 4 - Approach for determining Ecological Fire Management Guidelines

4.1.1 Thresholds of potential concern

Thresholds of Potential Concern are defined as "the limits of tolerance to a particular fire regime" (Kenny, et al. 2004).

Of particular importance are:

- TPC1, which is the lower threshold for fire interval (in years) for a particular vegetation type. That is, vegetation within this MVS will be represented predominantly by early successional species if the inter-fire interval is less than the time specified, and those species that require longer to flower and set seed can disappear from a community.

- TPC2, which is the upper threshold for fire interval (in years) for a particular MVS. That is, populations of some species (e.g. obligate seeders) are likely to reduce within this vegetation type if fire is absent for more than the time specified.

If either threshold is breached, plant species of sensitive functional types are likely to significantly decline. In particular, fire intervals between the TPC2 and TPC1 are predicted to maintain the species complement, whereas intervals shorter than TPC1 or longer than TPC2 are predicted to lead to the decline of the KFRS (Kenny, et al. 2004).

4.1.2 Other elements of fire regime

The following components are also considered when developing the fire regime for each MVS within the EFMG:

- Fire interval: These values refer to the lower and upper fire interval thresholds in years (TPC1 & TPC2) for each fire-prone MVS

- Spatial Criteria: Spatially, a minimum of 40% (unless otherwise stated) of the area of an MVS in a landscape (or planning area in the case of a fire management plan) should be between TPC1 and TPC2

- Long unburnt habitat: Populations of some species (particularly some fauna) are likely to reduce within this vegetation type if "long unburnt" habitat is not maintained. Spatially, a minimum of 30% (unless otherwise stated) of the area of an MVS in a landscape (or planning area in the case of a fire management plan) should be greater than TPC2

- Frequency: For each MVS, more than two fires within a specified period (years) can severely impact on some species and habitats (significantly more than a single fire) and are to be avoided, if possible

- Intensity: For some MVS there is a need to avoid or maintain successive fires of varying intensity (low, moderate or high) to avoid the decline of some species. Consideration needs to be given to ensuring that appropriate intensity and frequency of fires is applied

- Season: Many flora and fauna are more vulnerable to fire impacts during particular seasons (spring, summer, autumn, winter) or climatic cycles (periods of 'drought' and 'wet years' in arid and semi-arid areas).

TPC, and the other elements of fire regime, inform the development of EFMGs for each vegetation type, based on a combination of current knowledge and expert opinion. It is important to note that there are still large knowledge gaps relating to the vital attributes of many flora species. It is therefore necessary to incorporate both scientific data and available expert knowledge into the KFRS selection process. Monitoring of the pre- and post-fire response of the KFRS is therefore be necessary to assess if the assumptions and data used in deriving the TPC are appropriate.

4.1.3 Fauna

A key issue is the need for an approach to developing fire management guidelines to include critical elements of habitat for fauna as well as flora. Currently there are no widely accepted approaches to managing fire and fauna (e.g. a 'vital attributes' scheme for fauna). Some of the ecological and life-history attributes have been identified (Friend 1993; Keith, et al. 2002; Whelan, et al. 2002) that are important in determining the response of vertebrates to fire, including shelter type, foraging patterns (activity substrate), mobility and breadth of diet. DEWNR is developing a Fauna Fire Response Database that will use these life history attributes in a similar way to the plant-based approach outlined above.

Until this scheme is fully developed, the approach to developing fire regime thresholds using flora, and then testing these against the known needs of significant fauna that occur in the vegetation types, particularly EPBC Act listed threatened species, as illustrated in Figure 4, will continue to be used.

EFMGs will be used to guide the fire management practices and assess the impact of any proposed fire regime on the KFRS and TPC to ensure that adequate habitat is available to maintain and enhance biodiversity (i.e. species, populations and communities).

These thresholds are then assessed for the potential impacts of known faunal requirements, particularly the requirements of MNES and other species of conservation significance. This assessment currently is undertaken at regional/FMP scale based on the compiled fauna species list for the area.

4.1.4 Implementation

The implementation of EFMGs land managed by DEWNR will be through FMPs and prescribed burn planning.

FMPs for reserves and native vegetation will designate C-zones. Natural or cultural heritage features (including MNES), which require special fire regimes, will generally be identified as C-zones.

Fuel hazard management is not the primary focus for the C-zone. Prescribed burning can occur provided the fire regimes applied are consistent with those in the appropriate EFMG unless otherwise specified in the FMP.

4.1.5 Regional Guidelines

EFMG have been prepared for use across South Australia, particularly where regional guidelines have not yet been prepared. DEWNR prepares regionally specific EFMG for each of its FMPs. These may differ slightly from the state-wide guidelines as they are based on a narrower set of species known to occur in the plan area. These regional guidelines are more specific to the area for which they have been prepared, and are used instead of the state-level guidelines in these areas. These will be referred to in the planning of operational activities to guide decision-making on the use of appropriate treatments.

4.2 Ecological Fire Management Strategies

While EFMG outline ecological fire regimes for broad vegetation types (MVS) in a planning area, Ecological Fire Management Strategies (EFMSs) are developed for specific fire-vulnerable issues (e.g. threatened species and ecological communities, significant weed species, heritage items, including MNES) that occur in areas where a significant level of fire management activity is planned to occur. An EFMS briefly outlines the significance and impact of fire to the issue, and the approaches available to managing the risk to this issue within a fire management context. This information will provide land managers with guidance on fire regimes that are appropriate for the maintenance of significant biodiversity values. EFMSs are used to provide consistent strategies for specific MNES where they occur across more than one FMP.

An EFMS is developed as follows:

1. Identify five aspects of fire regime (interval, frequency, spatial, intensity and season) that need to be managed.
2. Identify management strategies and approaches based on a combination of existing data and expert knowledge, including from recovery plans and recovery teams, and species and ecological community specific guidelines.

The EFMS is used as a 'prescription' for best practice management; it defines the range of fire management activities suitable for the conservation of the particular issue. It should be noted that some of the current recommendations contained in these strategies have been based on limited (but best available) data, and all will be reviewed as more information becomes available. EFMSs are used by DEWNR staff to guide burn and works planning, plan ecological burns and are referred to in FMPs when setting strategies for MNES.

The initial impetus for these documents is the need to inform fire managers on current best-practice while research may still be taking place. The development of EFMSs also enables DEWNR to manage adverse impacts to significant values, such as MNES, in a management area.

4.3 Ecological Burning

DEWNR undertakes burning to enhance environmental values. DEWNR's Fire Management Policy (2013) notes:

- 'Land managers with native vegetation have a responsibility to manage that vegetation with clearly defined management objectives and strategies based upon best available information.
- The use of prescribed fire is one of a range of practices available to land managers for the manipulation of vegetation and must be applied within the legislative constraints and ecological considerations outlined in this document.
- Prescribed fire can be used to achieve native vegetation management objectives such as promoting regeneration, creating a mosaic of successional stages or maintaining specific animal habitats.'

Ecological Burning is defined as the treatment of vegetation in nominated areas by the use of fire, primarily to achieve specified ecological objectives.

For ecological burns, the following additional requirements need to be met before approval can be given:

- The ecological burn must deliver actions stated in the relevant FMP
- If no FMP exists or the ecological burn is not delivering actions stated in the relevant FMP, an Ecological Burn Rationale outlining the relevant conservation strategy/plan, ecological objectives, and the fire regime required to achieve them must be developed.

An Ecological Burn Rationale requires the justification of ecological burns in relation to:

- recommendations in existing recovery plans, species and ecological community specific guidelines, reserve management plans and strategic plans
- findings from peer reviewed scientific literature (if this exists)
- specific and measurable ecological and fire management objectives to be achieved
- the fire regime required to achieve these objectives
- environmental impacts on non-target environmental values (e.g. significant species and ecological communities)
- management constraints (e.g. *Phytophthora* infestations)
- planned monitoring, outlining ecological objectives and how the success of these objectives is to be measured, assessed and reported.

Ecological Burns are not to be conducted outside the EFMG stated in the relevant FMP unless accompanied by an endorsed Ecological Burn Rationale. The Prescribed Burn Plan must:

- have specific and measurable ecological and fire management outcomes to be achieved by the Ecological Burn
- have monitoring planned, outlining what and how the success of the ecological objectives are to be measured, assessed and revised.

4.4 Adaptive management

Fire management is a complex discipline, which involves decision-making based around economic, social and environmental elements. Decisions on MNES must sometimes be made in the face of considerable uncertainty, and often in a short planning cycle. Fire managers can respond to this

uncertainty by using risk-based strategies that aim to minimise chances of undesirable outcomes or maximise expected benefits for assessed levels of acceptable risk.

One such strategy is adaptive management. Adaptive management is a structured management process that allows mitigating actions for MNES to proceed while learning about the underlying uncertainty. A defining feature of adaptive management is the feedback between current learning and future decision-making. This is done by placing an explicit value on learning about the effectiveness of management by monitoring its outcomes against specified performance indicators (Figure 5). New knowledge is then used to adjust management if necessary. In essence, the purpose of adaptive management is to acknowledge, deal with and sometimes resolve uncertainty, resulting in improved management based on a better understanding of the resource system (Holling 1978; Walters 1986).

DEWNR currently undertakes adaptive management through post activity review of fire management, and monitoring and reporting on environmental performance. DEWNR is developing a formal adaptive management strategy.

4.4.1 Post Activity Review

Once a fire management activity is completed, compliance is assessed with management measures related to environmental issues carried out on the day of the activity.

The Regional Fire Management Officer is tasked with ensuring that all listed follow-up activities occur, such as weed control and monitoring.

A debrief is held after each fire management activity to identify any issues arising during or as a result of the conduct of operations. This can include environmental matters and mitigation issues.

After a fire management activity, reviews will be conducted where the outcomes of operations need further evaluation. These reviews include reasons why mitigation measures did not occur as planned or outcomes were not achieved, as well as an evaluation of environmental and other issues.

4.4.2 Monitoring and Reporting

The Regional Fire Management Officer will report on identified performance measures for the fire management activity, including delivery of environmental mitigation measures and whether protection of MNES and other matters of significance were achieved. This individual activity reporting is collated and reported annually to DEWNR management and to the Native Vegetation Council.

4.4.3 Adaptive Management Strategy

Fire management is an ever evolving science reliant on a continuous learning process. As such, fire management practices conducted by DEWNR may need to be periodically revised to ensure they are aligned with progresses in the science of fire management.

DEWNR is developing an adaptive management strategy for its fire management program that will include a framework for reducing levels of uncertainty around the Policy's commitments to MNES. This will firstly include improved knowledge through research, monitoring and performance evaluation, and secondly, support a range of fire management options that can provide some resilience to natural variation. By treating the fire management activities as an input to adaptive management, new knowledge of the impact and effectiveness of fire management activities for MNES will allow continuous improvement of fire management towards the stated objectives.

The Adaptive Management Strategy will include:

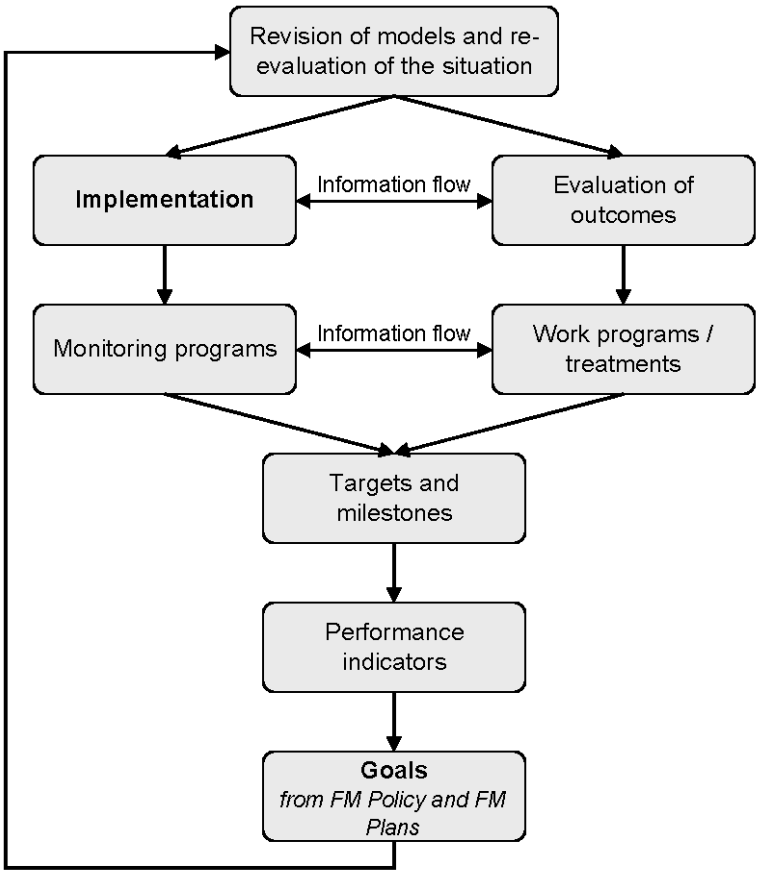
- a breakdown of goals into a series of explicit steps (targets), and the allocation of a due date (milestone) and reporting accountabilities for each
- definition of sensitive, quantifiable, easy-to-interpret, outcome-based performance indicators, to ensure that projects are on track and that targets and goals are being achieved
- determination/validation of threshold (trigger) values for each indicator of management response

- monitoring methods and timeframes, including baseline monitoring for targeted MNES
- review of strategies and guidelines (e.g. EFMS and EFMG) to assess relevance of new information and refine the process for preparing these documents
- a process for inclusion of findings from the latest peer reviewed literature
- re-evaluation of management actions, using new information, especially from monitoring
- a process for review of the Adaptive Management Strategy to take account of experience in applying the strategy and new information.

For the Adaptive Management Strategy to be effective, it is essential that future management plans and actions are informed by the findings from monitoring and of new knowledge gained (both positive and negative). The Adaptive Management Strategy will therefore identify appropriate knowledge transfer processes to ensure closure of the adaptive management loop (Figure 5).

The Adaptive Management Strategy will be submitted for approval to the Commonwealth Minister for the Environment or delegate within an agreed timeframe. Any revision to the Strategy will be submitted for approval to the Commonwealth Minister for the Environment or delegate prior to implementation. The Adaptive Management Strategy will be made publically available.

Figure 5 – The operational phase of the DEWNR Adaptive Fire Management Framework (after Turner 2010)



5. Commitments and governance

5.1 Commitments

The South Australian Government is committed to protecting and conserving biodiversity, heritage and MNES through appropriate fire management on DEWNR-managed lands. DEWNR commits to meeting the following commitments through implementation of the Policy:

1. Fire management will be based on the best available evidence relating to MNES
2. MNES will be protected and enhanced at the landscape level (IBRA sub-region and FMP) through implementation of the Policy
3. Fire management activities that present a high residual risk of significant impact to MNES will not proceed without endorsement of the Native Vegetation Council.
4. Other than in circumstances specified in Outcome 3, fire management activities will not significantly impact on MNES.

5.2 Assurance framework and reporting

To provide confidence DEWNR is achieving the above outcomes through the Policy, DEWNR will implement the actions and report annually to the Department of the Environment as shown below in Table 3.

Table 3: Assurance framework

Commitment		Action	Annual reporting	Responsibility
1	Fire management will be based on the best available evidence relating to MNES	Monitoring undertaken of the effectiveness of all management actions directed to MNES Monitoring of MNES will use appropriate methodology for the targeted species. Adaptive Management Strategy approved by the Commonwealth Minister within an agreed timeframe Implementation of the Adaptive Management Strategy will commence immediately following approval. Priority will be given to MNES identified in FMPs and Environmental Assessments. A progress report on implementation will be completed within two years of approval.	List of fire management activities for which specific management actions for MNES were identified and relevant MNES for each Status of implementation of management actions Summary of key learnings from monitoring, evaluation and research programs relevant to MNES and action taken by DEWNR in response List of regions implementing Adaptive Management Strategy.	DEWNR Executive Director
2	MNES will be protected and enhanced at the landscape (IBRA sub-region and FMP) level through implementation of the Policy	FMP developed for all fire prone regions by 2020. FMPs contain specific measures for MNES Regional EFMG included in each FMP Annual evaluation of landscape fuel management status relative to EFMG undertaken. FMPs and Operational Plans reviewed to ensure they are not inconsistent with: • Australia's obligations under the World Heritage, Ramsar, Biodiversity, Apia, CITES and Bonn conventions, or under	FMPs approved or being prepared List of MNES addressed in each approved FMP Outcome of audits relevant to MNES undertaken by DEWNR Fire Management	DEWNR Group Executive Director

		CAMBA, JAMBA or ROKAMBA • Approved World and National Heritage Management Plans • Approved Ramsar management plans • Relevant recovery and threat abatement plans and approved conservations advices • Relevant Wildlife Conservation Plans.		
3	Fire management activities that present a high residual risk of significant impact to MNES will not proceed without endorsement of the Native Vegetation Council. .	Where a residual risk of significant impact to environmental values, including MNES, from a proposed prescribed burn or fire management activity is high, approval must be sought from the Native Vegetation Council. In A- and B-zones, (where the residual risk to life and property, after considering all practicable mitigation measures, is very high or extreme) the Council may approve activities for the protection of life and property.	Outcome of and rationale for all fire management activities that significantly impacted MNES where approval was sought from the Council.	DEWNR Group Executive Director
4	Other than in circumstances specified in Outcome 3, fire management activities will not significantly impact on MNES	Environmental assessment undertaken of all fire management activities to identify whether specific management measures are needed to ensure impacts on MNES are not significant. Follow up monitoring to determine if management measures were implemented. Ecological burns monitored to determine if burn objectives met.	List of fire management activities for which specific management actions for MNES were identified and relevant MNES for each. Action taken to address any non-compliances with management measures. Outcome of all ecological burns undertaken to specifically address MNES.	DEWNR Group Executive Director

The annual report will be completed within five months of the end of each financial year and made publicly available.

5.3 Compliance

The Annual Report will be the primary mechanism for identifying:

- achievement of the MNES conservation outcomes identified Table 3
- progress in completing the actions listed in Table 3
- any deviation or non-compliance with the actions in Table 3.

Where a fire management activity is undertaken in a way that is not in accordance with the requirements or commitments documented in the Policy, the following procedure will be used:

- Annual Report identifies deviation from or non-compliance with the Policy and progress in achieving objectives/outcomes of any Remediation Plan(s) implemented.
- DEWNR analyses the deviation/non-compliance and considers the importance in terms of significant impacts on MNES.
- DEWNR advises the Department of the Environment, in the Annual Report that either the:

- deviation/non-compliance is minor or trivial and no further action is required; or
- deviation/non-compliance requires corrective action and what is planned.

- In the event that corrective action is required, the Chief Executive of the DEWNR will prepare a Remediation Plan(s) for addressing non-compliance. Remediation Plans will be made publicly available.

5.4 Auditing

The Policy and its associated actions will be audited annually by internal audit processes and periodically by an independent expert (see below), for the life of the Policy.

An audit protocol will be developed with the auditor to ensure that:

- commitments made by DEWNR in the Policy are being adhered to
- conservation outcomes for the MNES are being achieved.

Results of the internal audit will be reported to the Department of the Environment in accordance with the annual reporting requirements of Section 5.2. The internal and independent audit reports will be made publicly available.

Unless otherwise agreed to in writing by the Commonwealth Minister:

- DEWNR will ensure that an independent audit of compliance with the endorsed Policy and any conditions of approval is conducted every 5 years from the date of an approval granted in accordance with the endorsed Policy and a report submitted to the Commonwealth Minister.
- the independent auditor will be approved by the Commonwealth Minister prior to the commencement of the audit.
- audit criteria will be agreed to by the Commonwealth Minister and the audit report must address the criteria to the satisfaction of the Commonwealth Minister prior to publication.

5.5 Life of the Policy and revision

The expected life of this Policy is **30 years**. This Policy will apply to any future listings or changes in status of MNES, when they occur.

Once endorsed by the Commonwealth Environment Minister, the Policy cannot be revised without undertaking a new strategic assessment. The Policy notes, however, that processes specified in the Policy may evolve in response to new information or changed regulatory/policy requirements. DEWNR will not make changes to processes that depart substantially from those described in the Policy or that lessen protection of MNES.

Noting that this Policy will be in place for up to 30 years, references to legislation in this document are provided generally for background information for contextual purposes. Amendments to this legislation over time will not interfere with the applicability and/or requirements of the Policy where those amendments, either partially or wholly are:

- not inconsistent with
- not varying
- not removing

any commitments made in the Policy.

Similarly, references to the names of Commonwealth and South Australian Government Ministers, Departments and portfolio agencies are correct at the time of submission. Changes including, where

the context permits, the officers, delegates, employees and successors of these entities will not, of itself, interfere with the applicability or requirements of the Policy.

5.6 Reasonable Assurance

DEWNR is committed to ensuring positive conservation outcomes for MNES. The legislative, administrative and financial resources to affect this assurance are committed by DEWNR through:

- the Policy;
- statutory requirements under SA's legislative framework
- the establishment of evaluation, reporting and monitoring mechanisms.

The Chief Executive of DEWNR will ensure that the commitments and actions in the Policy are adequately resourced.

Commensurate with the structure of the South Australian Government, the Chief Executive of DEWNR has primary responsibility for this assurance.

6. References

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7. Glossary

Analysis of Submissions: A collation of all public submissions made relating to a DEWNR Fire Management Plan, including the response and agreed recommendations for necessary changes to the plan.

Annual Works Schedule (Operations Plan): The regional plan that includes all works and activities to be implemented by a DEWNR Region over a year.

Asset: An economic, environmental, cultural or social value that is considered important by the community.

Burn Risk Assessment Tool: Used in prior to commencing prescribed burn operations to assess prescribed burning risks versus benefits.

Country Fire Service: Volunteer based fire and emergency service organisation working in South Australia's regional and semi-metropolitan areas. The CFS are the lead combatant agency for fire suppression in these areas.

DEWNR Region: Eight areas of the state divided by DEWNR for management purposes. The regions are: Adelaide-Mount Lofty Ranges (AMLR) Region, South East Region, Eyre Peninsula (EP) Region, SA Arid Lands (SAAL) Region, SA Murray-Darling Basin (MDB) Region, Kangaroo Island (KI) Region, Northern and Yorke (N&Y) Region and Alinytjara Wilurara (AW) Region. Responsibility for regional operations lies with each Regional Manager.

Ecological Burn: Treatment of vegetation in nominated areas using fire, primarily to achieve specified ecological objectives. Ecological burns are a prescribed burn with specific ecological objectives.

Ecological Burn Rationale: Document outlining the relevant conservation strategy/plan, ecological objectives, and the fire regime required to achieve the objectives of an Ecological Burn.

Ecological Fire Management Guidelines Guidelines that identify an appropriate fire regime components (interval, frequency, spatial criteria, intensity and season) that are compatible with the conservation of broad flora and fauna identified within vegetation types in South Australia. Regionally specific Guidelines are also prepared for a Region or Fire Management Plan area.

Ecological Fire Management Strategy: Strategy that identify appropriate fire management for the conservation of specific significant flora, fauna, communities or other identified issue.

Environmental Assessment: Completed for all prescribed burns (as part of the Prescribed Burn Plan) and other fire management works where native vegetation is being cleared and not exempt under the Native Vegetation Act 1991 (SA).

Fire Access Track: A track designed, constructed and maintained for the safe passage of firefighting vehicles.

Fuel Break: An area or strip of land where vegetation has been removed or modified to reduce the risk of fires starting and reduce the intensity and rate of spread of fires that may occur. Sometimes called a 'fire break'.

Incident Controller: Officer in charge of and responsible for all aspects of conducting a prescribed burn. The IC approves the Burn Plan.

Key Fire Response Species: These are the species most susceptible to decline due to inappropriate fire regimes: either too frequent or too infrequent fire, low or very high intensity fire, or fire in a particular season.

Life History : The combination of attributes with respect to growth, shelter, food/nutrients and reproduction which determine species' requirements for existence (FEWG, 2004).

Native Vegetation Council: Established under the provisions of the Native Vegetation Act 1991 responsible for making decisions on a wide range of matters concerning native vegetation management in SA.

Native Vegetation Council Fire Committee: Responsible for making decisions on matters concerning fire management in native vegetation in SA.

Natural Resources Management Boards: Eight regional boards established under the SA Natural Resources Management Act 2004 to provide an integrated and coordinated approach to the management of soil, water, coastal and biodiversity assets.

Overall Fuel Hazard: The sum of the influences of bark fuel, elevated fuel and surface fine fuel (DENR, 20011).

Prescribed Burn Plan: The plan which is approved for the conduct of prescribed burning. It contains a map identifying the area to be burnt and an environmental assessment. It incorporates the specifications and conditions under which the operation is to be conducted.

Protected Areas: Land proclaimed or reserved for conservation purposes pursuant to the National Parks and Wildlife Act 1972 (SA), Crown Lands Management Act 2009 (SA) or the Wilderness Protection Act 1992 (SA) in South Australia.

Publically Available: 'Publication' and/or 'publicly available' means DEWNR, unless otherwise specified in writing by the Commonwealth Minister, will publish the document required by the Policy on their website within 30 business days of completion or where relevant, the department's approval, and for the duration of the class of actions approval.

Ramble Survey: A field survey conducted to compile an annotated inventory of vegetation types and vascular plant taxa for the proposed prescribed burn area.

Ramsar Convention: The Convention on Wetlands of International Importance especially as Waterfowl Habitat done at Ramsar, Iran, on 2 February 1971, as amended and in force for Australia from time to time.

Recovery Plan: Adopted by the Commonwealth Environment Minister for species and ecological communities listed under Section 269A of the Environment Protection and Biodiversity Conservation Act 1999 (Cwth). The plan contains strategies to maximise the long term survival in the wild of threatened species or communities.

Regional Ecologist: DEWNR officer responsible for biodiversity and ecological management matters in a DENR Region. The title of officers performing this role may vary from Region to Region, e.g. Manager Conservation Programs, Manager Biodiversity Programs. In Adelaide Mt Lofty Ranges Region, the Fire Ecologist performs this role for specifically for the fire management program.

Regional Manager: The DEWNR Manager who is responsible for each of the eight DEWNR regions.

Reserve Management Plan: Plan written to identify the vision for the reserve and the objectives and strategies necessary to meet that vision. Adopted by the Minister for Environment and Conservation (SA) under the National Parks and Wildlife Act 1972 (SA) and Wilderness Protection Act 1992 (SA).

Stakeholder Reference Group: Key interest groups or individuals consulted during the development of a fire management plan.

Thresholds of Potential Concern: The limits of tolerance to a particular fire regime.

Vital Attributes: The key life history features which determine how a species lives and reproduces. With respect to fire, these attributes govern how a species responds to fire and/or persists within a particular fire regime (FEWG, 2004).

8. Abbreviations/Acronyms

AWP	Annual Works Program
BMC	Bushfire Management Committee
BRAT	Burn Risk Assessment Tool (SA)
CP	Conservation Park
COAG	Council of Australian Governments
DEH	(former) Department for Environment and Heritage (SA) now Department of Environment and Natural Resources (SA)
DENR	(former) Department of Environment and Natural Resources (SA) now Department of Environment, Water and Natural Resources (SA)
DEWNR	Department of Environment, Water and Natural Resources (SA)
EA	Environmental Assessment
EFMG	Ecological Fire Management Guideline
EFMS	Ecological Fire Management Strategy
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Cwth)
FMP	Fire Management Plan
GAFM	South Australian Government Agencies Fire Management Committee
KFRS	Key Fire Response Species
MNES	Matters of National Environmental Significance
MSEC	Minister for Sustainability, Environment and Conservation (SA)
NPW Act	National Parks and Wildlife Act 1972 (SA)
NRM	Natural Resources Management
MVS	Major Vegetation Sub-Group
SACFS	South Australian Country Fire Service
TPC	Thresholds of Potential Concern