

PLANNING TO PLAN, PLANNING TO PRACTISE - A TOOLKIT FOR FIRE MANAGEMENT PLANNING

K. E. Smith^A,

^A Fire Management Branch, Department for Environment and Heritage, South Australia.

Abstract

The fire management planning framework in South Australia has been designed with four priorities in mind - to be easily understood; to address bushfire risk; to incorporate ecological fire management; and to provide direct linkages from objectives and strategies to on-ground works and activities.

Several tools and templates have been developed and are being used in the preparation of fire management plans for National Parks and Wildlife reserves. The toolkit includes risk assessment for life, property and environmental values; ecological tables linked to decision-making; fire management zoning to clarify levels of fuel management required; standards and templates for project management, plan development and consultation; and GIS analysis and mapping to support the plans.

There remains an ongoing challenge, common to all planning, to ensure plans continue to be used over their lifespan, and not relegated to the bookcase. To meet this challenge there are more 'plans to plan' - a 'triage' system for prioritising prescribed burns; development of ecological fire management strategies for significant species; a standard costing model and financial impact statement; and distillation of essential components into response plans and posters. This should add more tools to the toolkit and seal the continuum between plans and practices.

Keywords

Risk assessment; zoning; ecological fire management; consultation; triage; GIS.

Introduction

Background

There are over 300 National Parks and Wildlife reserves in South Australia, covering an area of more than 20 million hectares, or about twenty percent of the State. With South Australia being the driest Australian state, bushfires are commonplace in these reserves (parks), with an annual fire season from late spring to early autumn. The Department for Environment and Heritage (DEH) has the responsibility for managing these parks, including fire management. The South Australian Country Fire Service (CFS) has primary responsibility for fire suppression across all land tenures with DEH fire crews coming under the CFS brigade structure. Local Governments have responsibility for district bushfire prevention fire planning via District Bushfire Prevention Committees. DEH undertakes all aspects of fire management on-park - fire response and suppression, prevention works and activities and planning. DEH fire management plans are the next level down from legislated Management Plans for parks. As such they must not suggest actions contrary to the objectives for park management in the management plans.

History of Fire Planning in DEH

Prior to 2000, fire planning in DEH was largely undertaken by District staff on a park-by-park basis and was largely biased toward response. Fire planning underwent periods of activity, linked to fire events (for example, Ash Wednesday was followed by a peak of planning activity) and resource levels. However, the plans did not consider the ecological aspects of fire management, nor did the plans always provide a clear direction for fire and risk management. Since 2000, the State Government has increased staffing levels and funding for DEH Fire Management, increasing the capacity to undertake and update fire planning for DEH reserves.

The first plan was undertaken in, arguably, a difficult and controversial fire-prone area – Flinders Chase National Park and Ravine des Casoars Wilderness Protection Area at the western end of Kangaroo Island. The plan's format was based on the NSW model used in Tarawi Nature Reserve Fire Management Plan (NSW NPWS 1999) and endeavoured to include ecological considerations. By suggesting prescribed burning to reduce risks in line with contemporary Australian fire management trends, the plan aroused controversy and was not well accepted by some stakeholders.

During the lengthy consultation associated with the draft plan, it became evident that the risks (particularly risks to environmental values from large fires), objectives and strategies for fire management and mitigating actions were not linked closely enough or explained fully. The plan lacked a consistent methodology for evaluating and using fire-related flora and fauna information to guide decision-making at the vegetation community level. Where and when prescribed burning would be conducted was not explicitly outlined in the plan, causing ongoing consternation to some interest groups.

In response, the fire management planning framework has been further developed and expanded with these objectives - to be easily understood; to address bushfire risk; to incorporate ecological fire management; and to provide direct linkages from objectives and strategies to on-ground works and activities. With an influx of new regionally-based fire management staff undertaking planning as part of their roles, standard tools and templates, policies and procedures have been developed to provide guidance, maintain consistency and quality across all DEH fire management plans.

Key Components of a Fire Management Plan

Following the flowchart in Figure 1, the first step is to establish the context for the plan by collating the background information that is helpful and relevant to fire management. Base maps are produced to enable site familiarization and field work to be undertaken. Underlying the plan, starting at plan initiation and continuing through to finalisation are two key aspects - sound project management, critical to a smooth and successful planning process; and community engagement, the key to the public's acceptance of fire management strategies on public lands.

Collating and analysing the information from the office and the field results in the identification of values, suggests possible risks to be assessed, raises issues and highlights gaps in information or knowledge. Risk assessment is undertaken assessing the level of risk to identified life, property and environmental values. Objectives can then be set, and different strategies, particularly zoning, examined to best achieve these objectives. Objectives, strategies, zoning and proposed works and activities are outlined in the plan. Strategies relating to suppression are transferred to the response plan.

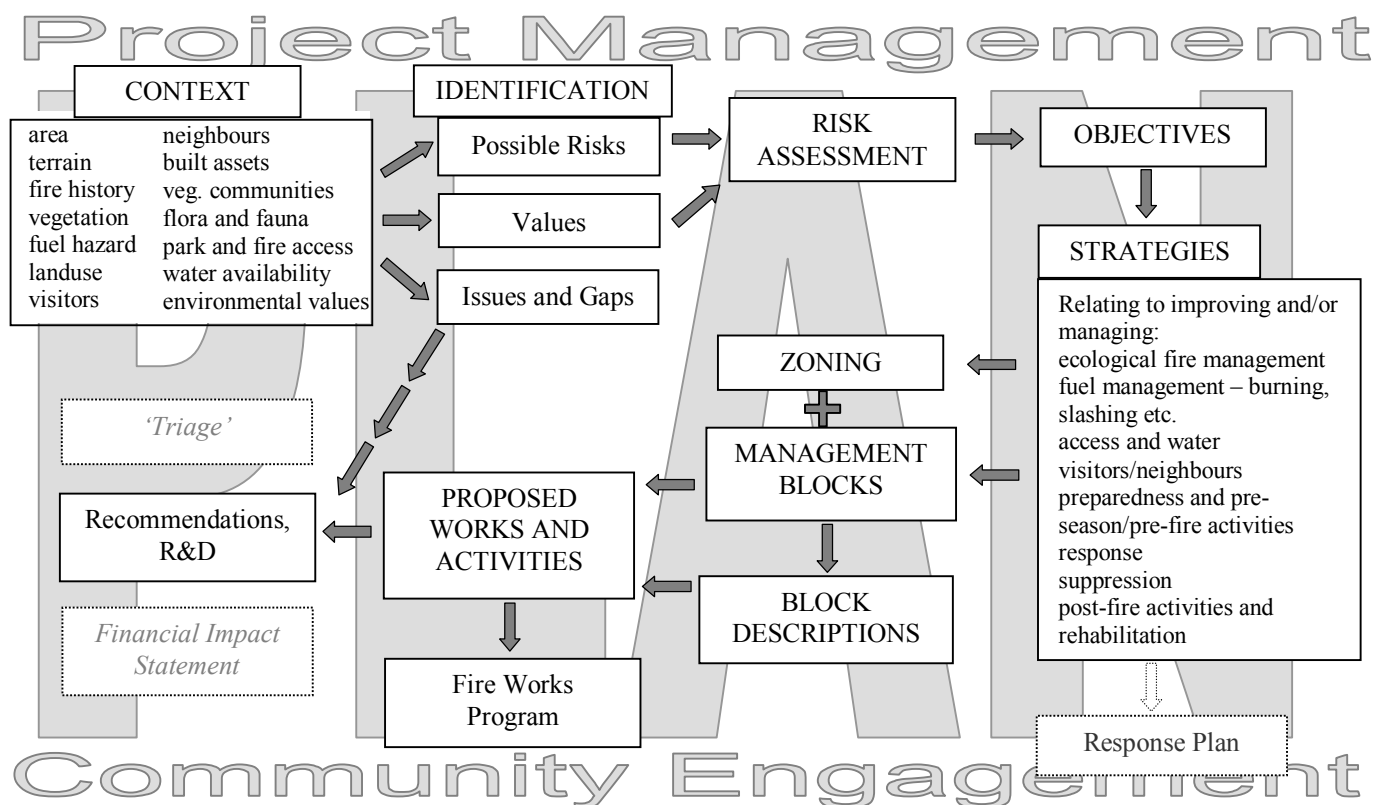


Figure 1. Key Components of DEH Fire Management Plans

The plan should acknowledge gaps and, if further information is needed to assist in future fire management, include recommendations to fill these in the plan. Future developments (Figure 1, grey boxes) include a financial impact and works report and evaluating the use of a 'triage' map to show prescribed burning priorities in the plan.

Fire Planning Toolkit

A toolkit is available to assist in fire management planning. It contains tools in the form of policies and procedures and templates to assist in producing plans. Tools include:

- risk assessment;
- ecological fire management guidelines;
- fire management zoning;
- policies and procedures for project management, plan development and consultation; and
- plan templates, master documents and standard maps.

Risk Assessment Tool

Managing bushfire risk is about taking reasonable steps to decrease risks within current or potential resourcing levels. Fire management plans are used by DEH as the primary instrument to demonstrate the level of bushfire risk and mitigation strategies in reserves.

Risk management is achieved by:

- identifying risks to life and property posed by bushfires;
- identifying risks to core functions of public land management and biodiversity conservation posed by bushfires – environmental risks;
- developing strategies to address the highest risks; and
- implementing works and activities within reasonable resource requirements.

The process for assessing risks in DEH fire management planning is consistent with recognised standards, based on assessing likelihood, consequence with a matrix to assess overall risk. The life and property descriptions for likelihood and consequence have been adapted from CFS Risk Assessment for Structural Fire Risk (unpublished, undated) while the matrix has been aligned with the DEH Agency Risk Matrix.

The results of risk assessment should be seen as a tool to generate discussion, compare risks across the plan area, the regional and state levels, and to explore options to decrease risk.

Likelihood

Likelihood considers the chance that a fire-associated risk will occur in the same way a flood or a storm may be considered. Known fire history in the area may be a starting point, but should not be the only consideration. Anecdotal evidence, incidents in comparable areas, opportunity for the risk to occur should also be taken into account. Evaluating fuels, lightning, previous fire behaviour, fire weather and terrain may also assist in assessing the likelihood. Likelihood is considered in the same way for life, property and environmental values.

Consequence – Life and Property

Consequence considers bushfire risk based on impacts to life, property or environmental values against set criteria. The criteria for assessing risk are used to build a picture of the degree of impact associated with a particular risk. The upper end of the scale considers fire in the context of natural disasters, with the highest rating being for large fires such as the 1983 Ash Wednesday bushfires and the Wangary, Eyre Peninsula bushfire of 2005.

Risks considered to human life include risks to firefighters, neighbours, park visitors and vulnerable user groups (school students, nursing home residents). Built values considered include high density housing, large house blocks, rural living, community assets, forestry, park buildings, horticulture, crops, grazing and industry/commerce.

Consequence - Environmental Values

Assessing the impact on environmental values is multi-faceted and considers a number of criteria:

- the measurable impact on environment including temporal effects;
- the scale of environmental damage;
- loss of flora and fauna populations, species, communities or habitats including displacement and extinction;
- disruption to ecological processes at different scales;
- changes to threatening processes such as weed invasion and feral animal populations; and
- the degree of rehabilitation required.

When assessing bushfire risk to environmental values, the risk from one fire is considered in the context of what has gone before (fire history). For example, while one fire may have only a minor consequence, multiple fires may have a cumulative effect on environmental values resulting in a major or critical impact or consequence. This can be used to look at the risk of repeated burns over a short space of time.

Environmental risks assessed include the whole reserve burning in a single fire event, risks to adjacent native vegetation and private land conservation areas (Heritage Agreements in South Australia), vegetation communities, species, populations or habitats. Other values at risk are considered including catchment values, revegetation, European and Indigenous heritage and wilderness values.

Tool for Fuel Management - Fire Management Zoning

Fire Management Zones have been introduced to ensure that clearly understood fuel management actions are put in place to meet objectives for asset protection and ecological fire management in reserves. DEH fire management zones are largely based on fuel and fire management zones used respectively by the Victorian Department of Sustainability (NRE 1999) and the New South Wales National Parks and Wildlife (NSW NPWS 1999).

The zoning has been simplified to three zones (figure 2): Asset Zone (A-zone), Buffer Zone (B-zone), and Conservation Zone (C-zone).

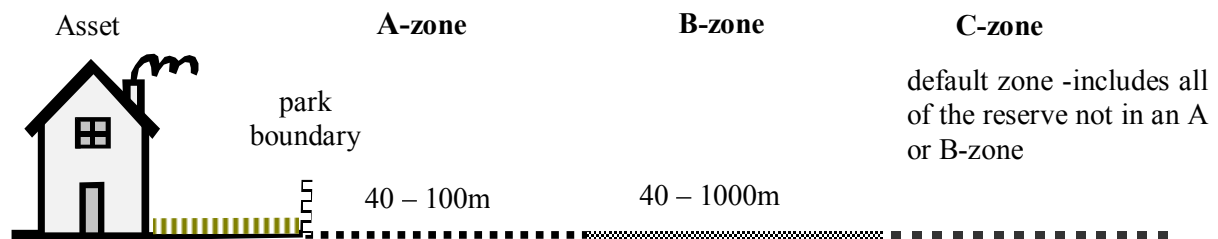


Figure 2. Zoning illustrated.

Asset Zones or A-zones provide the highest level of protection to life and highly valued built assets, applying to park areas immediately adjacent to assets such as residential areas, individual homes, public utilities and visitor areas. They offer a buffer (40 to 100 metres) from radiant heat damage, flame contact and short-distance ember attack and can provide access and a possible control line for use during fire suppression with fuel levels being kept to Moderate or below, as per Draft South Australian Overall Fuel Hazard Guide (Wouters 2005).

Buffer Zones or B-Zones, as the name suggests, provide a buffer area (40 to 1000m) in bushland at the urban fringe or close to rural assets to assist in reducing the speed, intensity and spotting potential of a bushfire with fuel hazard being kept to High or below as per Draft South Australian Overall Fuel Hazard Guide (Wouters 2005). Wider buffers may also be used in larger areas of native vegetation to provide strategic fuel reduction in the landscape.

Conservation Zones or C-Zones are the default zones for all natural areas within a park. The zoning allows for fire management activities to meet ecological and conservation management objectives. Prescribed burning can occur within a C-zone but the burn must meet the ecological fire management guidelines.

Ecological Fire Management

Ecological Fire Management Guidelines (Wouters 2006) have been developed as part of ongoing review and improvement to DEH Fire Policies and Procedures. The guidelines are based on the ecological risks and ecological

fire management requirements of species, populations, habitats, communities, wilderness areas or cultural heritage in the plan area. They provide suggested minimum and maximum inter-fire intervals for vegetation communities in Conservation Zones, C-zones. These intervals are determined for mapped vegetation communities using key fire response species collated for each community. The guidelines also provide information on fire season, intensity and extent, where known and assist in setting objectives and strategies for fire management.

The Ecological Fire Management guidelines have an accompanying database holding information on flora, fauna and community fire response. A summary of the relevant information is provided as appendices in each fire management plan. Information includes life form, preferred habitat, food source (for fauna), reproduction, occurrence and extent, dispersal and home range (for fauna), fire response, fire management guidelines, data source and an indication of the reliability of the information.

Blocks

Blocks are used to subdivide the plan area and present information relating to the specific objectives, strategies, works and activities for an area. Blocks are determined by the scale and practicalities of presenting the mapping, zoning and features; grouping areas of vegetation or landscape features that have similar fire management; and/or logical breaks in the landscape based on tracks, vegetation changes or natural features.

The plan presents descriptions and prescriptions for fire management in each block. This includes background information on land tenure and use, vegetation, fire history and risks, fire access, specific management objectives for each block, strategies for achieving objectives, zoning, actions and works. Actions and works are divided into those already being undertaken and those proposed. Guidelines for suppression are also included.

Planning to Plan

Fire management planning must be a dynamic and adaptive process, otherwise it is in danger of becoming obsolete, irrelevant and impractical. Given a commitment to continual improvement, DEH Fire Planning has more 'plans to plan' with planning innovations to address issues such as transparency in prescribed burning, the cost implications of planning' and practical fire management for key species and species of conservation significance.

Fire Triage

One of the criticisms of DEH fire management planning has been the lack of transparency in where prescribed burning will or will not be undertaken, particularly in C-zones. In response, a 'triage' system is being trialled. It is based on triage in the hospital accident and emergency system where patients are prioritised for treatment by assessing their need, considering the resources available. A fire triage could prioritise areas of a reserve for 'treatment' by prescribed burning, to meet the highest priorities for life and property protection, landscape protection and ecological fire management.

It is proposed to have four triage levels:

1. Critical – these are areas where it is considered critical to undertake prescribed burning during the life of the plan, for life and property protection, landscape protection or ecological management.
2. Likely – these are areas where prescribed burning has been evaluated and considered necessary, and where prescribed burning is likely to be undertaken during the life of the plan.
3. Unlikely – these are areas where no prescribed burning is currently envisaged. However, prescribed burning may be evaluated in this area and may be implemented if circumstances or information changes.
4. No Prescribed Burning – no prescribed burning will be undertaken during the life of the plan. These may include areas recovering from a recent fire, sensitive species or communities requiring protection from fire.

It is anticipated that a fire triage map will be produced as part of the plan and works program. It also may provide the basis of a system for measuring performance or monitoring the implementation of a plan.

Costing Model and Financial Impact Statement

Plans are often criticised for being too ambitious, impractical and costly. Part of the planning process should be an assessment of the cost implications of implementing a plan. Consideration is being given to ways of standardising and costing track upgrades, prescribed burns of varying sizes and other works and activities associated with plan implementation.

Ecological Fire Management Strategy

Many species of conservation significance and key species are at risk from bushfires in many locations, not confined to one reserve or one area. Yet, it is obvious that most of the relevant information available on these species has not been translated into 'fire language' or strategies that are practically useful for fire managers and available for planning. Examples in South Australia include the yellow-footed rock wallaby (*Petrogale xanthopus*), the malleefowl (*Leipoa ocellatus*) and numerous plant species including threatened orchids and Acacias.

A pilot project has been initiated to look at the feasibility of developing ecological fire management strategies for key species in South Australia. The project, using the yellow-footed rock wallaby as a pilot species, will summarise and synthesise available information on a species into a short, stand-alone document to guide decision making. It will set practical objectives for fire management and look at management options for the protection of the species and management of habitat etc. It may include guidelines for fire suppression and post-fire activities (such as post-fire predator control). It is envisaged that this information would then be available to feed back into plans, as required.

Off the Shelf

In the future DEH Fire Planning plans to look at innovative ways of presenting plans and using the information, aside from the planning document itself. This will include assessing alternative presentations of the information to meet different needs and audiences such as examining the linkage between fire management plans and response plans.

Planning to Practise

There has been a push to get fire management planning underway for groups of reserves, particularly in the highest risk areas. There are currently eight large fire management plans in progress across South Australia using the toolkit and planning framework. This includes cross-tenure plans being undertaken in partnership with other land managers. The planning is not without its problems. Given that many of the planners are regionally-based and have other responsibilities, finding blocks of time to 'practise planning' is difficult. However, by 2007 more than one hundred reserves will have updated fire management plans.

Acknowledgements

Fire management planning only succeeds through a team effort. The Fire Management Branch, particularly the GIS Project Officer, Charlotte Morgan, and the Senior Fire Ecologist, Mike Wouters, are to be acknowledged for their respective efforts in progressing standards and quality in GIS and mapping and ecological fire management. Without their assistance, the gains in fire management planning illustrated in this paper would be greatly diminished. The Manager of the Branch, Mike Williams, is to be commended for his ongoing support of fire management planning and his patience in waiting for planning to turn into plans, concepts to reality.

References

New South Wales National Parks and Wildlife Service, 1999, *Fire Management Plan Tarawi Nature Reserve*, New South Wales National Parks and Wildlife Service, Lower Darling District.

Victorian Department of Natural Resources and Environment, 1999, *Fire Protection Plan, North East Region, Alexandra/Broadford Fire Districts*, Fire Management, Department of Natural Resources and Environment.

Wouters, M. 2005, 'Draft South Australian Overall Fuel Hazard Guide', Department for Environment and Heritage, South Australia.

Wouters, M. 2006, 'Ecological Fire Management Guidelines', Department for Environment and Heritage, South Australia.