

DISCUSSION

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INTRODUCTION

Workshop syndicates were set the task of establishing a procedure for fire management planning on nature conservation lands. To add a sense of realism to the exercise, each syndicate was provided with a case study involving a National Park or Forest Reserve in Western Australia. Case studies were chosen to reflect the range of circumstances facing conservation land managers in Western Australia. A summary of the important characteristics of each case study is shown in Table 1.

At one extreme is the Hamersley Range National Park of some 617 606 hectares set in the heart of the remote, arid Pilbara region in the state's north-west. Relatively little is known of the ecology and biogeography of the Park and few resources are available for management. Extensive areas of the Park have been burnt by wildfires in recent years. The Park is rapidly becoming a popular destination for organised tourist and expedition groups.

The Walpole-Nornalup National Park represents the other end of the spectrum. This Park of 17 986 hectares is situated on the southern coast of Western Australia in a region experiencing a Mediterranean-type climate. The ecological and biogeographical data bases available for the Park are relatively comprehensive and sufficient resources are available for a range of management activities to be undertaken. The use of prescribed burning to control fuel accumulation within the Park is locally controversial. In recent years arson has been responsible for a number of costly and potentially dangerous fires within the Park.

Syndicates were provided with specially prepared booklets that summarised the available information about a number of factors influencing fire management. These included:

- details of reserve location, size and tenure
- climate
- topography, soil and landform
- legislation affecting management
- current management objectives
- historical and current patterns of useage
- fire history

Table 1
A brief comparison of the major features of the study areas
used for the syndicate planning exercise

	Walpole-Nornalup National Park	Dryandra State Forest	Fitzgerald River National Park	Hamersley Range National Park
Location (latitude/longitude)	35°S 117°30'E	33°S 117°E	34°S 119°30'E	23°S 118°0E
CALM Administrative Region	Southern Forest	Wheatbelt	South Coast	Pilbara
Area of Reserve	17 986 ha	23 500 ha (comprised of multiple blocks of which the largest is 12 200 ha)	242 804 ha (extensions of 51 000 ha planned to the northern section of the park)	617 606 ha
Rainfall amount and seasonality	1400 mm Winter	500 mm Winter	500 mm Winter	300 mm Summer
Phytogeographic context				
Province	South west	South west	South west	Ereman
District	Darling	Avon	Eyre	Fortescue
Sub-district	Warren	Dale	-	-
Dominant physiognomic vegetation type	Tall forest	Woodland	Mallee and scrub heath	Hummock grassland and mulga low woodland
Adequacy of ecological data base relevant to reserve management ranked from best (1) to least (4)	1	2	3	4
Availability of resources to implement management - ranked from best (1) to least (4)	1	2	3	4
Recreational usage - ranked from highest (1) to lowest (4)	1	2	3	4
Notable features	Park contains best stands of mature Red tingle (<i>Eucalyptus jacksoni</i>) tall open forest	Remnant of woodland in an agricultural landscape. Refuge for rare and restricted fauna	Rich, endemic flora. Refuge for rare and restricted fauna. Registered as International Biosphere Reserve with UNESCO	Spectacular gorges and associated vegetation in semi arid environment. Significant aboriginal sites.

- important constraints to management
- resources currently available for management
- known ecology and biogeography of the reserve.

Additional information was made available in the form of posters, maps and slide presentations. Each syndicate was also able to call upon the experience of two mentors with good local knowledge and experience of the case study in question.

Each of the case studies was addressed by two syndicates containing 7-8 members from a variety of backgrounds. Following a day and a half of deliberation, each syndicate was required to give a short presentation describing the procedure that they had adopted and the key features of their plan.

Here we have attempted to summarise the syndicate presentations. Given the abstract nature of planning, this proved to be difficult. The method of presentation varied as did nomenclature and expression syntax. From the syndicate presentations, we identified the major tasks (headings) of the planning process and the components (sub-headings) of each task. These were summarised in table form for the purpose of comparing the various approaches adopted by each syndicate.

RESULTS

The major tasks in the fire management planning process to emerge from the exercise are presented in Table 2. The sequence in which each syndicate undertook the individual tasks is also shown in Table 2. Components of each task are summarised in Table 3. We letter-coded each task (Table 2) in order to show the task-component relationship developed by each syndicate (Table 3).

The planning approach adopted by syndicates was not related to the nature or characteristics of the case studies, but was dominated by the preferences and past experiences of individuals making up the syndicates. Most syndicates started the planning process by examining the reasons for the gazettal of the park (overall goals), legal responsibilities and social and ecological issues in relation to the park. The major departure from this was Syndicate 4, who commenced by specifying planning principles (see Appendix 2).

Data assembly was an important early process. Some syndicates set fire management objectives only after assembling all known information, whereas others set objectives based on legal responsibilities alone. Most syndicates considered that key management issues could be defined on the basis of local knowledge and experience and a brief overview of data rather than through an exhaustive review of the data base. All syndicates agreed that lack of data was no excuse for failure to prepare a management plan. One syndicate made the point that lack of knowledge and information was an important reason for formulating a management plan.

Table 2
Major tasks in the fire management planning process as identified by syndicates.
Numbers indicate the sequence in which each syndicate undertook individual tasks

TASK	SYNDICATE							
	1	2	3	4	5	6	7	8
(A) Review legislative responsibilities and requirements		1					1	
(B) Establish overall goals for management of the reserve				2	1	2	2	1
(C) Identify critical issues (ecological and social) in reserve management on the basis of local knowledge and a brief overview of available resource information		4	1			1		
(D) Set specific, ranked objectives for management of fire in the reserve	1	5	2	4	3	4	3	2
(E) Undertake an objective analysis of the threat posed by wildfire to different resource categories		2						
(F) Specify the underlying principles employed in the planning process				1				
(G) Assemble a data base containing all currently available resource information relevant to fire management in the reserve	2	3	3	3	2	5	4	
(H) Divide reserve into zones within which consistent management strategies can apply						3		3
(I) Formulate strategies to meet objectives, (taking account of specific requirements created by zoning, if employed)	3	6	4	5	4	6	6	4
(J) Identify key constraints affecting fire management objectives							5	5
(K) Establish a monitoring system that can indicate the extent to which management objectives are met	5	7	5	7	5	7	7	7
(L) Initiate further research into areas where management is constrained by inadequate knowledge	4				6	8		
(M) Review fire management objectives and strategies to ensure that they are consistent with each other and with overall goals.				6				6
(N) Prepare works programs and prescriptions to facilitate implementation of the plan						9		8

Table 3
Components of the major tasks in the fire management planning process as identified
by syndicates. Letters refer to major tasks as listed in Table 2

COMPONENTS OF MAJOR TASKS	SYNDICATE							
	1	2	3	4	5	6	7	8
Reasons for proclamation of park	D	AD	BD	BD	BD	BD	BG	BD
Statutory requirements of agency	D	AD	BD	BD	BD	BD	BG	BD
Legislation in relation to the built environment		AD		BD			G	
Legislation in relation the rare flora and fauna		AD	BD	BD	BD	BD	BG	BD
Legislation in relation to bushfires		AD		BD	D	BD	BG	
Management history, past land use	DG	D	BCD	BD	D	D	G	
Fire history (planned and unplanned)	DG	D	BCD	GD	D	D	G	
Regional importance of park	D	D	C	BD		CD	BG	BD
Local community aspirations		C	B	BD	CD		BG	BD
Identify issues and stake holders - liason	D			FB	BD	CD	G	D
Location of settlements, towns, recreation sites	G	D		BD	D	D	G	J
Tenure and use of surrounding lands	G			D	D	G	J	
Wildfire threat analysis/values at risk		D	D		CD		I	
Consistency of fire management objectives	D		D		D	D	D	D
Objectives based on sound ecological principals	D	D		D	D	DI	D	D
Objectives must be achievable, accountable		D	D		D			
Fire management plan must be regionally integrated		DC	D		D	D	DI	
Specify planning principles				F		B		
Specify purpose and life of plan				F	C	B		
Specify methods of public involvement				F	CD	B		
Rank objectives and goals		D	DB	B	BD	BD	B	
Liase with public re management objectives	D			BD	BDI	CHD	H	
Collation of ecological and biogeographical information	DG	D	DI	BGD	GD	CHD	G	DHJ
Topography,landform and soil maps	G	DI		GD	GI	DIH	G	DHJI
Fuel and vegetation maps	G	DI		GD	GI	DIH	G	DHJI
Fuel dynamics and fire behaviour models	G	DI	I	GD	GI	DIH	G	DHJI
Rare flora and fauna location maps	GK	DAI	CD	GDK	GI	DIH	G	DHJI
Location of disease	G	AID	CD	GDK	GI	IH	G	DJI
Fire ecology information	K	D	CD	GD	GI	DIH	G	DHJI
Fire sensitive flora and fauna	GK	D	CD	GD	GI	DIH	G	DHJI
Life cycles of selected taxa	G	D	CD	GDK	GI	DIH	G	DHJI
Identify biological indicators		D	CD	GDK	GI	DIH	G	DHJI
Identify gaps in knowledge, initiate research	G	I	I	BGI	GI	DI	GI	I
Identify special landscape features		D		GD	GI	IH	G	DI
Provide access routes, determine visitor useage patterns	G	D		D	GIK	IH	G	DI
Determine recreation trends, demands, impacts	G	D	BCI	DK	GIK	I	G	
Educate public about fire ecology and park attributes		I	I		DI	D	G	
Assess climate and local weather conditions	G	D			G	D	G	DJ
Human resources, machines and money		D	BCI	I	G	DI	GI	JJ
Assess suppression capability		D	D			G	DI	GI
Safety measures; park visitors and staff		D			I	DI	GI	JJ
Close access to park when fire weather is severe		I			I	I	I	I
Determine management units from ecological boundaries	I	I	I		I	H	I	HI
Zone within management units	I	I		I	I	H		HI
Prepare fire management strategy for each zone	I	I	I		I	HI		HI
Locate firebreaks and low fuel buffers	I	I			I	I	I	I
Implement prescribed burning where necessary	I	I	I		I	I	I	I
Investigate wildfire control options				I	I	I	I	II
Ensure public participation in strategy development				I	I	I	I	II
Monitor changes to park flora and fauna	K	K	I	K	K	K	K	K
Record wildfire details		K	I	K	K	K	K	K
Record all operational details		K	I	K	K	K	K	K
Monitor disease, erosion, feral animals, weeds	K	K	I	K	K	K	K	K
Involve local community in monitoring	K			K		K	K	K
Review and reset objectives and strategies		I	I	IK	D	IK		KI
Develop working prescriptions						N	I	N

Similar concepts were often expressed in different ways and this partially explains the long list of components in Table 3. For example, Syndicate 2 specified wildfire risk analysis as being a major first step, whereas other syndicates considered this to be equivalent to and part of the process of issue identification.

All syndicates considered monitoring to be an essential process to provide feedback on effectiveness of management. However, opinions were divided on how this could be achieved.

All syndicates recognised the importance of public participation and liaison with interest groups throughout the planning process. As with monitoring, opinions varied on how this should be done. Syndicate 6 considered this aspect to be the foundation of a successful management plan. They maintained that stake-holders needed to be identified and involved at the objective setting stage and during the process of developing strategies. Syndicate 6 felt that most conflict concerning fire management was about strategies rather than objectives or goals.

Discussion - Towards A General Planning Framework

A number of common themes for fire management planning emerged during the course of the syndicate planning exercise. This was despite the fact that the four case studies considered by the syndicate groups differed considerably in a number of important respects including reserve tenure and purpose, size, environmental and ecological characteristics, resources available for management and the nature of local community attitudes. The fact that a considerable degree of commonality was evident in the planning procedure adopted indicates that a generalised framework for fire management planning on nature conservation land is achievable and probably desirable. The existence of such a framework could be of considerable assistance to land management agencies throughout Australia.

We propose the following as a general framework for planning fire management in Australia.

General Planning Principles

Planning is an abstract process and it is therefore crucial that concepts and ideas be communicated simply and effectively to avoid confusion. Key words used frequently in planning literature such as goal, policy, objective, aim and strategy are often not defined or consistently applied; this situation may apply between organisations and within different documents produced by the same organisation. Therefore we have adopted the definitions presented by Underwood at this workshop and recommend that they be used in future planning documents.

Briefly, the definitions used are:

goal - a long term desirable situation

objective - a clear statement of a result to be achieved within a stated time frame, and oriented to a goal

strategy - a means by which an objective may be met.

- * Where the planning process identifies gaps in knowledge, the plan should include relevant measures to fill gaps, such as the need for experimental management and monitoring.
- * Planning should be dynamic to reflect the nature of nature. The life of the current plan and timing of reviews should be specified.
- * Decisions can be made on the basis of minimum information but the process of information gathering should follow.
- * The less complete the data set, the more important it is to involve the public at an early stage. How this is to be done must be specified in the plan.
- * Land use planning is an important adjunct to fire management.

Goals

Management goals for the overall management of the park or reserve must be clearly stated at the outset of the fire management process. These will evolve from the legislation and reasons for the gazettal of the park. Normally, goals will be stated in the context of a park or reserve area management plan, or in the absence of such, within a set of interim guidelines that specify the minimum operations considered necessary to maintain and protect existing reserve values. Ranking of goals to reflect the circumstances of the particular land is generally desirable, as is the inclusion of goals that relate directly to the management of fire.

Acceptance of goals by the public and by the agency staff is a necessary pre-requisite in subsequent stages of the planning process. Education and public participation programs may be required to achieve general acceptance.

Fire Management Objectives

Specific objectives for fire management should be consistent with and orientated towards the stated management goals. Objectives should be expressed in a way that allows them to be used to periodically evaluate the effectiveness of management actions via a well designed monitoring process. Formulation of fire management objectives should be preceded by a review of relevant fire-related social and ecological issues. A framework for enquiry and for eliciting necessary information such as identifying values, biotic resources, location of rare flora and fauna, fire ecology, fire history, etc. (see Tables 2 and 3) should be developed. Specific fire management objectives arise from a knowledge of natural processes, values and biotic resources. Selected public involvement is necessary at this stage. Other factors that will influence the formulation of objectives include various pieces of legislation, departmental policy, and the extent and depth of data and knowledge about fire related issues. As objectives must be achievable, management constraints such as resources, weather conditions, access, etc. will also influence objective setting.

Strategies

An important criterion in selecting management strategies is that they are practical, measurable, can be stated clearly and expressed in terms of action plans or prescriptions. A whole array of management options should be generated initially to meet objectives. This array should be reviewed to ensure internal consistency and practicality of strategies. Again, this review provides an opportunity for widespread public participation. After the review, strategies can be finalised. While the strategies may be stated in fairly general terms, action plans and prescriptions must be clear and direct.

Monitoring

It is vital to monitor the effect of strategies to evaluate the success in achieving objectives. Monitoring also provides a valuable source of information necessary to review and re-set (if necessary) objectives and strategies. Monitoring techniques are discussed by Gill and Nicholls, Hopkins and Heislars (this publication).

CONCLUSION

Over the last ten years or so, numerous management plans have been prepared for lands including National Parks, Nature Reserves and State Forests across Australia. Plans vary considerably in content and detail, depending on the purpose. In many States, such plans are statutory requirements under the legislation of land management organisations. Most land management plans ultimately aim to ensure the optimum management of land values over a period of time resulting in the continued availability of these values. However, planning for management of nature conservation land also serves other functions which include:

- (a) the protection of conservation values from land uses which are contradictory to public expectations,
- (b) a means of achieving public involvement in the management of lands and for informing Government and the public as to how and why lands will be managed,
- (c) a process for identifying land management issues and their resolution,
- (d) the provision of guides for day to day operations,
- (e) the collation of known information and data and the identification of further research needs,
- (f) as a basis for national resource allocation and for determining likely future needs.

Fire management on conservation lands continues to be controversial. We hope that this workshop and these proceedings will be a positive contribution to the process of fire management and to the conservation of our biological resources.