REALITIES AND CONSTRAINTS, OPPORTUNITIES AND CHALLENGES: FIRE MANAGEMENT IN CONSERVATION LANDS IN WESTERN AUSTRALIA

F. Batini

Department of Conservation and Land Management
PO Box 104
Como WA 6152

SUMMARY

This paper examines some of the many factors which influence fire management programs; for example technical, legal, ecological, economic and social.

INTRODUCTION

In the reality of field operations, there are many factors which may affect the outcome of proposed fire management programs. These may include technical, economic, social, legal and ecological considerations. A number of relevant factors are listed in Table 1. This list is meant to be indicative rather than exhaustive. In addition, the economic, social, legal categories are quite arbitrary and many of these factors may be listed under more than one heading. Because there are many factors to consider, only a few will be discussed in more detail in this paper.

The title of this theme "constraints and considerations" may cause us to concentrate primarily on problems and the negative factors which prevent or constrain certain actions. This is why I have chosen to add "opportunities and challenges" to the title for my paper. In many cases it is the constraints imposed on us which stimulate the opportunity and challenge for change and for the evaluation of alternative techniques.

Technical Factors

The lands vested in the Department of Conservation and Land Management (CALM) cover the full ecological spectrum; from wet sclerophyll tall forest to mallee, from coastal heaths to deserts. Much of the previous practical experience and research into fire behaviour was with the Forests Department, and was therefore restricted to the sclerophyllous tall forests of the south-west of the State, and to pine plantations.

Our current knowledge of fire behaviour in fuels such as heaths, mallees, tropical savannah and desert ecosystems is rudimentary and is based largely on the historical experiences of other organisations; for example the Bush Fire Board, Conservation Commission of the Northern Territory, National Parks, Fisheries and Wildlife, Shires and neighbours. Some research data was also available from Fisheries and Wildlife and National Parks staff, now incorporated in the new Department.

Table 1
Factors which need to be considered and may affect the implementation of proposed Fire Management Plans

FACTORS	IMPLICATIONS				
	TECHNICAL	ECOLOGICAL	LEGAL	SOCIAL	ECONOMIC
Fire behaviour (eg, heaths and mallees)	✔				
Wind driven strips	✔				
Scrub rolling		✔			
Use of natural features	✔				
Helicopter and drip torches	✔				
Access				✔	
Bush Fire Act			✔		
CALM Act			✔		
Necessary Operations			✔		
Wildlife Conservation Act			✔		
Shire			✔	✔	
Friends of Parks				✔	
Neighbours				✔	
Dieback		✔			
Weeds		✔			
Flora - Protected - Declared Rare		✔	 ✔		
Fauna - Protected - Declared Rare		✔	 ✔		
Erosion		✔			
Visual impact			✔		
Chemicals		✔			
Burn Season		✔			
Burn Frequency		✔			
Burn Intensity		✔			
Firebreaks					✔
Staff numbers					✔

These experiences show that the use of fuel-reduced wind-driven buffers, fuel modification by chaining or scrub-rolling, the use of natural features in designing firebreak systems, the use of imagery to identify curing of grasslands, and the use of helicopters fitted with drip torches warrant closer investigation. This has commenced, but only recently. Nevertheless, these concepts offer exciting prospects for innovation, and evaluation of alternative procedures to those traditional for the forest areas.

Some fire research needs for heathland fuels have been proposed by L McCaw (pers comm). These are:

(a) classification, assessment and mapping of fuels;

(b) fire danger rating and fire behaviour predictions; and

(c) response of vegetation to fire regimes.

In addition, the system of fire weather forecasting has to be reviewed and a procedure for the capture of appropriate weather data for remote areas needs to be implemented.

Legal Aspects

The main legal requirements are contained in the Bush Fires Act, the CALM Act and the Wildlife Conservation Act. Of importance also is the approved Departmental Policy on Fire Management. This Policy sets out Departmental Objectives, Policies and Strategies.

Departmental objectives are:

1 To protect community and environmental values on lands managed by the Department from damage or destruction by wildfire.

2 To use fire as a management tool to achieve land management objectives, in accordance with designated land use priorities.

In relation to fire suppression, the Department will assess its response to a fire in the light of potential damage to the following values, in order of priority:

(a) human life;

(b) community assets, property or special values (including environmental values); and

(c) cost of suppression in relation to the values threatened.

Section 34 of the Bush Fires Act relates to Crown Lands other than State Forests and gives a neighbour permission to clear firebreaks and to burn Crown Land. However, if an approved fire management plan is gazetted, these powers no longer apply. In order to retain control of fire management practices on our land, a number of fire management plans for National Parks and Nature Reserves are being developed by CALM. Section 28 requires that fires be suppressed.

Section 33(3) and (4) of the CALM Act deal with Management Plans and Necessary Operations. Necessary Operations are defined as those necessary for the preservation or protection of persons, property, land, flora and fauna, or for the preparation of a management plan. Interpretations of what constitutes a "necessary operation" can differ. Guidelines and checklists need to be developed for Managers. Preparation of Interim Guidelines and Works Programs assist. Doubtful operations are referred to the Protection Branch and to the appropriate Director for a decision.

The Wildlife Conservation Act defines that most flora is protected (Section 23) and that some species are gazetted as rare (Section 23 F). In addition, all fauna is protected (Section 14) and some is given special protection [14 (ba)]. To cater for rare flora the Department has issued an approved Policy for the Conservation of Endangered Flora as well as a set of operational guidelines for field managers.

Ecological Factors

Important ecological considerations relate to dieback (a soil borne disease) and to aspects of prescribed burning such as season, frequency and intensity.

Dieback disease is spread by the movement of infected soil and root material. Its effects on susceptible species (such as heaths) in suitable sites (such as duplex soils) and in high rainfall areas can be devastating. The consequences of dieback on the vegetation, if the disease is spread by errors in planning or operations, can be far greater than the effects of fire itself.

When considering any operation, the disease status, risk, hazard, impact and consequences of disease spread on the vegetation must be evaluated. Various checklists such as the Seven-Way Test and the Pre-burn Checklist are available for field use.

The risk of spreading the disease during an operation can be reduced by:

Season

Operations should proceed only when seasonal conditions are against the fungus. Wet periods of the year must generally be regarded as high risk. *Phytophthora cinnamomi* reproduces rapidly during the warm and moist spring and autumn, but can also survive during the winter. Even in summer, moist gully environments provide suitable conditions for fungal survival.

Therefore any activity which involves the movement of moist soil represents a risk to the spread of dieback. Work should therefore be planned for dry soil conditions.

Obtaining Accurate Dieback Information

Where accurate, up-to-date, dieback-free maps exist for an area in question they should be used for planning a hygienic operation. In the absence of such maps the route must be checked, at least three months in advance. Inspection should be done by trained interpreters using indicator species (eg banksias, blackboys, patersonia) with sampling as required. Laboratory processing may take some time and samples should be despatched as soon as possible.

If possible the proposed works should be redirected to avoid dieback areas.

Hygiene

All dieback categories need to be demarcated. Operations should be confined to a single dieback category, and all equipment cleaned down when passing from suspect or known dieback infections into dieback-free areas.

Where dieback status is uncertain (eg absence of indicator species) activities should be confined to individual sub-catchments and all vehicles and plant cleaned down from one sub-catchment to the next and at the drainage line.

Prescribed Burning

Possibly one of the most controversial ecological questions relates to the season, frequency and intensity of prescribed burning. It is generally accepted that burning is carried out for legal and social reasons as well as for ecological needs. It is also recognised that burning for regeneration may be a requirement for the survival of some species. The preference for a mosaic of smaller burns, of varying season, frequency and intensity, alternating with unburnt areas, is often proposed as an acceptable ecological strategy. While this does create a mosaic of burning patterns and greater "edge" effects, there are also some disadvantages to be considered. These relate to higher cost, safety, access, firebreaks and the possibility for environmental damage through, for example, the greater opportunities for spread of dieback.

Economic Factors

In the current economic climate it is unrealistic to expect significant increases in either staff or money. Desirable changes will be achieved rather by the redirection of existing resources, or by cost-saving innovations. Concurrent with this cost squeeze is a political and public demand for less homogeneity in prescribed burning, greater public involvement and discussion.

To date, conservation lands have not usually been area prescribed burnt. Rather the emphasis has been on double (or triple) systems of firebreaks, with burnt buffers. This maximises the perimeter to area burnt. With the small staff numbers usually present at these fires, hopovers and escapes were frequent. In addition, some of our neighbours are not averse to dropping the odd match over the fence, once they consider that protected areas would and should burn, and the wind is blowing away from their boundary!

The existing system of firebreaks is extensive. In some individual Parks totals exceeding 400 or 500 kilometres are not uncommon. Maintenance is a problem in terms of costs, access and dieback control, weed invasion and erosion. An example of alternative solutions proposed for a Nature Reserve is given in Table 2.

Fuel modification by chaining, ignition by helicopter, alternative methods of constructing and maintaining firebreaks, wind-driven fuel-reduced buffers and area prescribed burning are being investigated as alternative ways of reducing costs and increasing efficiency.

Social Factors

The realities are that fire control and fire management must be implemented in a world where politicians, shire councils, neighbours, friends of Parks and the public have a definite stake and say in our activities.

This is recognised in the CALM Act, particularly in relation to public participation, as well as in the Departmental Fire Policy. This policy recognises the priority of life and property in guiding fire suppression activities. In addition, it stresses effective liaison with neighbours and commitment to improving public awareness through education.

Another aspect of significance is access. Firebreaks and management tracks required for fire control are not usually open to the public. Nevertheless they are often used and may open up access to environmentally sensitive areas, as well as to favoured fishing spots! The closure and subsequent upgrading and re-opening of some management access roads in National Parks along the South Coast Region was recently deemed necessary for the purposes of dieback protection. Though the program was generally well accepted, localised opposition did occur. Interestingly, while some fishing interests opposed the temporary closures, other parties (both fishing and wilderness interests) opposed the upgrading of tracks to a "safe" hygiene standard.

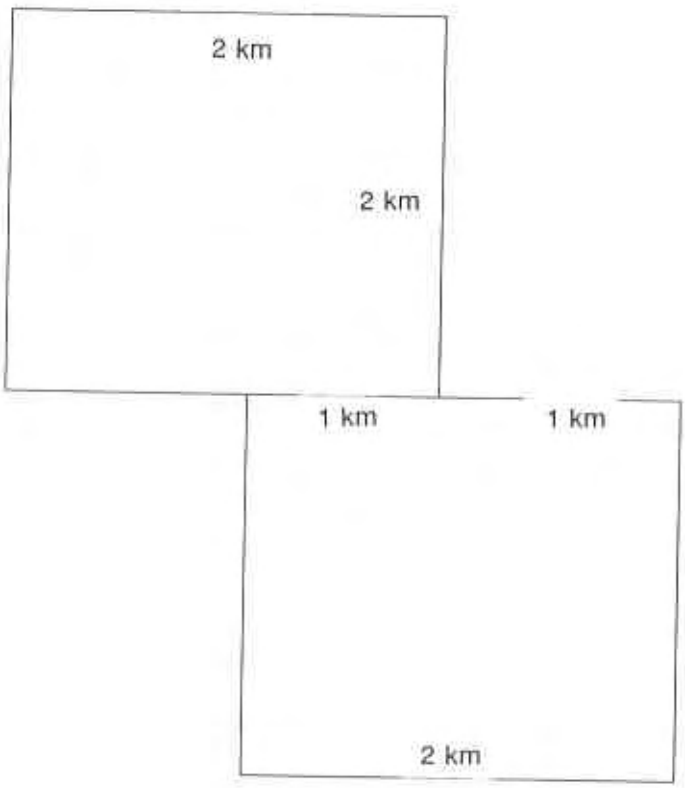
DISCUSSION

It is obvious that operational managers face many constraints and challenges in implementing CALM's fire management policies and plans "on the ground".

The role of the Services Branches (eg Research, Planning, Fire Protection, Environmental Protection), is to assist Operations staff. This can be done by providing data, resources (staff, equipment), suitable training, realistic policies and guidelines for operations.

In addition, these Branches assist in the development of Management Plans for Parks and Reserves. Where Management Plans will not be available for some time, Interim Guidelines and Annual Works Programs are developed by Operations staff in consultation with the Services Branches.

Table 2
Two Alternative Strategies for Protection of a Nature Reserve



		STRATEGY 1 (100m Buffers)	STRATEGY 2 (Blocks)
AREA OF RESERVE	(ha)	800	800
PERIMETER	(km)	14	14
FIREBREAKS	(km)	28	15
FIRELINE	(km)	28	8
AREA BURNT	(ha)	140	400
AREA/FIRELINE		5	50
BURN FREQUENCY	(yr)	0, 8, 16 etc	0, 4, 8, 12 etc