FIRE MANAGEMENT FROM THE GENERAL TO THE PARTICULAR

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SUMMARY

Strategy is the setting of objectives and outlining how they are to be achieved. It is based on legislative requirements; policy, both stated and unstated; data, including resource data, scientific data and experience; and the social/political environment. This is transformed into fire management strategies for both wildfires and planned fires.

Fire control strategies for wildfires are basically aimed at the protection of life and property with "let burn" options being contentious.

Fuel management regimes using planned fire are used to reduce fuels and/or modify habitats. Options to be considered are strategic or broad area burns, single or multi-stage burns, as well as variations in timing, frequency and intensity. Treatments vary from specific to general, to either favour a particular plant or animal, or maintain diversity on a broader scale. A "no burn" option must receive the same detailed consideration as other possibilities.

Land managers must develop strategies founded on the best information available, detail the compromises necessary, seek public and institutional input, initiate action, and review the situation constantly in the light of changing circumstances and availability of new data.

All strategies are necessarily compromises as it is impossible to meet all requirements and pressures. Contentious issues are likely to be decided at an emotional/political level rather than being based on scientific evidence.

INTRODUCTION

This paper explores some of the factors influencing the manager of Conservation Lands and how these are translated into fire strategies. On one hand a land manager is faced with vast amounts of conflicting, incomplete information, policies and opinions. On the other side there are constraints of limited resources, time, and money, with often limited data and experience to guide the manager. In addition it is necessary to take positive action, rather than sit on the sideline and see what develops. All this must be turned into strategies for both wildfires and planned fires.

There are many items which provide the basis for determining strategies. These include:

(a) legislative, which are often generalisations and can be interpreted in many ways;

(b) policies of the organisation, which may be stated in policy documents, inherent in the organisation and recognised by all, or may be deliberately unstated but understood;

(c) data, including inventories or assessments of the resource, scientific theories and experience covering cause and effect relationships; and

(d) social/political, which are the perceived demands of the community, both local and at large. These demands are often misguided, insular, and very often polarised.

Wildfires

It is essential that the land manager develop strategies to handle the serious, intense, disastrous fire - the holocaust. If this is done the minor fires, representing ninety-five to ninety-eight per cent of all fires, will cause no great problems. However, if the strategies are based on the majority of fires they will be inadequate for the important fires. There will be no technology available now or in the future to combat an intense wildfire. The only feasible strategy is fuel modification and reduction. If the land manager does not implement this then there is a good chance he will have to answer to a Coroner and his conscience. It is an abrogation of responsibility to accept major intense fires as "natural" or "an integral part of the management of natural areas". The manager must manage his reserve to achieve the desired goals for the area.

Through adequate and proper training and planning the land manager can prevent injuries to firefighters, protect lives and property and minimise damage to conservation values. It is necessary to know the location and importance of various environmental constitutents so that protection strategies can include appropriate priorities.

There is a continuum of strategies for managing wildfires which are illustrated in Table 1. Generally the intention is to establish and consolidate control lines, burning out if necessary as quickly as possible to minimise costs, damage and the chance of breakouts if conditions deteriorate. Following from this is the acceptance, except in some remote areas of low population density, that any strategy that embraces a "let burn" possibility is completely unacceptable. Given the current state of the art of weather forecasting all fires must be considered to have a high potential for causing damage. An unacceptably high proportion of the classic devastating fires in Australia were from "let burn" situations (eg Victoria 1939, Hobart 1964, New South Wales 1968).

Planned Fire

All planned fires reduce fuels and modify habitats regardless of the original reason they were planned. There are a number of factors which influence planned fires and affect the results achieved. Most of these cannot be modified or controlled so all planning and strategies must be based on recognising suitable conditions when they occur and taking advantage of them.

These are:

(a) fire behaviour which is controlled by climatic factors, current weather, fuel characteristics and topography;

(b) timing of the burn in terms of both time of day and season;

(c) frequency, which has several aspects; (The period between burns can be varied but it is impossible to maintain a fixed frequency due to the vagaries of climate and weather. The areas also can be burnt in stages with the more flammable sections being treated under milder conditions.)

(d) area which can vary from restricted small strategic areas to large broad area burns.

To achieve the desired results strategies are developed by integrating all the factors. The basic steps in developing strategies follow:

Aims

The conditions to be achieved by fire management are defined. These are based on the best information available and are specified in terms of fuel remaining (quantity and arrangement), time of year of burn, frequency, acceptable limits for scorch, and proportion of area covered.

Inventory

Detailed, accurate measurements of current conditions are needed as a basis for burning prescriptions and for comparison with the position after burning. Permanent sampling points/plots should be established. Items to be recorded include fuel details (eg quantity, arrangements), flora and fauna, past perturbations (eg fire, clearing, erosion).

Prescription

Based on consideration of all or any guides available (eg McArthur, Rothermel, Peet) and experience, a prescription for the trial treatment is formulated. This will be some form of an index which integrates the various weather and fuel factors which influence fire behaviour. Limits also have to be set on weather factors (eg no burn above 20 per cent or below 30 per cent RH). The method and pattern of ignition is also specified.

Test

When an acceptable balance of conditions occurs light up the test fire. The area treated must be big enough to ensure full development of the burn. Weather conditions during the burn are to be recorded as well as behaviour of the fire. Ensure that the method and pattern of ignition specified is followed closely as many anomalous results (disasters) have been caused by enthusiastic workmen lighting up a bit extra to ensure a "good" burn.

Monitor

The effects of the fire should be carefully monitored for some time after the fire.

Evaluate

The results of the fire and all other fires are considered and used as a basis for setting new prescriptions to be tried.

Repeat

By this process experience and burning guides are developed.

Usually there are numerous combinations of factors which will achieve the desired burn and this needs to be reflected in the guides so that no opportunities are missed. To allow for the vagaries of climate and weather the manager must have sufficient plans prepared to cover three years average treated area to ensure the optimum use of suitable conditions when they occur.

All strategies are essentially compromises and it is the responsibility of the manager to determine the one most suitable for the situation. Although there are a great number of possible strategies they generally fall into a few main groups:

Strategic

Low fuel levels are maintained in an attempt to provide barriers which are difficult for wildfires to cross. They are usually for a specific reason such as the protection of a particular resource. They may also be used to prevent a fire from escaping from an area if, for instance, a high intensity fire was to be applied for some reason.

Specific

These are burns designed to achieve a narrowly defined objective such as favouring a specific animal or plant. They can vary in intensity from no burning to a holocaust. Problems are caused because of unexpected interactions, with possible detrimental effects on other elements of the environment.

Broad area

These are intended to reduce the chance of a holocaust over a relatively large area. Because of variations in vegetation types, fuels and topography, the

intensity of the burn also varies so that diversity is maintained or enhanced. Usually fire intensity is kept low to minimise damage and a second burn under more severe weather conditions may be used to achieve a more complete treatment.

No Burn

For a variety of reasons it will be decided to attempt to exclude fire from an area. This is a conscious planned decision, but managers must accept the possibility that it may be burnt in unforseen circumstances.

GENERAL

Several aspects not covered above include:

Initial Treatment

In many cases the first planned fire in an area presents problems. Fuel levels may be much higher than required or their distribution may be undesirable. Care must be exercised to ensure a safe acceptable result from the initial fire. The managers job is much easier for subsequent burns.

Transition

In most cases where a reserve is created the future land management intended is quite different from that previously practised. The change in emphasis in fire management can be achieved quite smoothly provided it is planned and executed in conjunction with the local community, taking into account their concerns, both real and imagined. However, if the change is imposed abruptly without consultation problems can surface. If the local community perceives, rightly or wrongly, that the changed management may expose it to a dangerous situation, residents may reduce the fuel with illegal fires. If an uncompromising attitude is allowed to continue an isolationist, seige mentality develops. The problem becomes deeply entrenched and increasingly difficult to overcome.

Insufficient Information

Land managers cannot excuse inaction on the ground that there is not enough data/information/evidence on which to base their actions. A manager must act on the information available and build up expertise by experience. The number and complexity of variables involved in fire and land management means that actions will more often be based on developed experience rather than on controlled research. Managers must be encouraged to build up their expertise and not be castigated if results are unexpected or unacceptable. It is most unlikely that "unacceptable" results are irreversable.

The course that a land manager should follow to develop strategies and implement them has been set out in general terms. This course should be pursued vigorously as this is the manager's role.

Table 1
Phases of Forest Fires

	Fire			Strategy			Organisation			
PHASE	BEHAVIOUR	WEATHER FUEL	COSTS DAMAGE	POSITION APPROACH	ATTACK	PRIORITIES	AUTHORITY CREWS	ORGANISATION	CONTROLLER	CO-ORDINATOR
I SMALL	small, slow moving	calm	negligible	offensive	aggressive, direct head-on	immediate suppression	1 + 1	simple	Foreman	Foreman
II MODERATE	developing some high flames	either worse weather or heavier fuel	low cost neg. damage	offensive	aggressive direct/indirect	hold all lines	1 autho. 2-3 crews	simple	Foreman	Forester
III LARGE	free-burning, uncontained	deteriorating, heavy fuel	moderate cost, some damage	offensive defensive	indirect close up flanks	hold main lines	1-2 auth. 5-10 crews	simple	Forester	District Forester
IV VERYLARGE	uncontrolled, complex, some spotting	severe weather, heavy fuel	expensive, major damage	defensive offensive	indirect, remote, complex	hold some lines, protect life and property	2 + auth. 10 + crews	complex	District Forester	Regional Forester
V CATASTROPHIC	very complex, out of control, intense spotting	extreme weather, heavy fuel	extremely costly massive damage	defensive	v. complex, retreat, wait for weather c change	only life or life and property	many/all available	very complex (chaotic)	D/F. + helpers	R/F. + helpers