REVIEW OF CURRENT PROBLEMS ASSOCIATED WITH AERIAL BURNING IN SOUTHERN FORESTS

by

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INTRODUCTION

Since the advent of prescribed control burning by the aerial ignition system in 1965, major achievements have resulted in our burning techniques and forest fire protection measures, over the dense mixed forest areas of the lower South West.

The initial control burning from aircraft tests were carried out during spring 1965 over large areas of low quality Jarrah forest and coastal plains with a high degree of success.

This type of operation was extended to areas carrying high quality Jarrah forest in 1966, after successfully refining the techniques for dropping incendiaries and improving the ground marking system. Once again this method proved highly successful.

In 1967 it was clearly evident from the early success that this method of burning would play a very important role in achieving the reduction of the heavy fuels in the large areas of mixed forest, over which because of the wide variety of fuel types and poor access it was almost impracticable to apply a rotational burning system by the hand burning method.

MASTER PLAN

Aim:

It was decided to divide all of the State Forest and some areas of V.C.L. into annual burning strips running east-west or north-south in direction to provide for a 5 year burning rotation. Areas containing young Karri regeneration and recently cut-over forest were excluded from this planning, as complete protection must be maintained over these areas until the saplings and advanced growth are able to withstand the application of fire.

The annual burning strips were divided into daily job areas representing a day's operation for one aircraft and suppression crews. The desirable area for a daily operation is considered to be about 12/15,000 acres.

Having accepted the practical application of a master plan covering the three Southern Divisions, large scale control burning commenced in 1967 in accordance with this plan.

Results:

The progress of the programme over the past five seasons is illustrated in Table I.

Table I

Area burnt by Aircraft

Year	Acreage
1965/66	27,200
1966/67	68,000
1967/68	242,866
1968/69	181,910
1969/70	250,166
TOTAL	770,142

With the completion of the 1970/71 programme it is fairly certain that the total area burnt by the aircraft method in the three Southern Divisions will exceed the 1,000,000 acre mark. This is a notable achievement considering the problems encountered.

Rotational Burning of Karri:

The Karri forest is a much less inflammable fuel complex than Jarrah. For this reason it is unlikely that a five year rotation will be feasible, especially after two cyclic burns when the heavy litter accumulations are removed and scrub density may be reduced.

From observations it is generally considered that after the second burn on the five year rotation basis the likely rotation for subsequent burns may have to be extended to seven years. If this does apply it will tend to increase the problems of burning in mixed forest areas.

PROBLEMS EMERGING FROM PAST BURNING

1. Edging

Early edge burning of dense Karri scrub has proved a problem. Two alternatives seem possible, rolling scrub with a bulldozer and chemical spraying. The former has been the accepted practice, and has been generally successful, but is an expensive operation. The wet gullies and boggy areas cannot be rolled, so consequently weak points occur where these conditions prevail on job perimeters.

Limited use has been made of chemical sprays for scrub control in the Jarrah-Marri scrub type with a great deal of success. This type of scrub control has been extended to the dense Karri scrub types with only minor success, largely because of scrub density and height. These factors prevented the deep penetration of sprays. It is considered that further trials are necessary in this field with a view to reducing the costly operation of bulldozers.

2. Roading

In the past, lack of roading in some areas has prevented regular control burning. In the most highly developed areas the intensity of roading is now a disadvantage in aerial burning. Unfortunately these road networks do not seperate forest types where they would be useful; instead they form buffers against a grid pattern of spot fires. Many of these tracks are unnecessary for current forest management and could be abandoned. Aircraft burning has illustrated the need for good quality perimeter roading as distinct from internal roading.

3. Karri Scrub Types

There are several scrub types in the Karri forest which affect controlled burning, each has a different performance. At one extreme is the grassy forest floor which burns similarly to Marri surrounds; at the other are the Trymalium gullies which rarely burn at a drought index below 600*. These differences introduce major problems when designing a burning prescription.

Karri scrub differences increase the problem when several lightings may already be necessary to burn flats, Jarrah and Karri in that order in one particular job.

4. Heavy Duff Layers

In order to achieve an acceptable fire intensity only part of the heavy Karri litter can be burnt in one lighting. The damp duff remaining after the initial burning dries late in the summer and

* See paper by Van Didden on Byram Drought Index in this issue.

can relight from smouldering logs etc. This burning under uncontrolled conditions poses a problem since the duff layer can weigh as much as 3 to 4 tons per acre. In addition, scrub and understorey species (e.g. casuarina) killed by the first burn cures and adds to the fuel. Where this occurs on a perimeter, suppression problems can develop. Until rotational burning has reduced the duff layer, perhaps after the second cycle, perimeters should be located in Jarrah forest surrounds whenever possible.

5. Incendiaries

It is a well-known fact that a lot of heat is necessary to start a fire in Karri forest under control burning conditions. The present incendiaries seem inadequate and poor ignition may in some instances be due to incendiary limitations. Research should investigate the matter with the object of developing an incendiary that will produce a more intense fire for use on Karri stands.

6. Beacons

Despite modification to the beacons there is still insufficient range for a smooth operation. There seems no doubt some fault lies in the A.D.F. instrument in the aircraft. Research is needed to provide matched equipment which will give the necessary 10-15 miles range.

7. Forecasts and Fire Danger

Since the whole burning operation, including planning before and during the burn, hinges on the weather forecasts, accuracy is essential. There are day to day weaknesses in the present system which will have to be overcome for the long term development of large scale aerial burning.

The existing Karri Fire Danger Tables have obvious errors which are largely due to the variable scrub types, density and the different drying rates of the deep fuels and scrubs. Fire Research Officers are at present investigating this aspect of the problem.

CONCLUSION

The introduction of aerial burning to the southern forest region has greatly improved fire control in this area. However, there are still a number of important problems, and until these are overcome, trouble-free and high quality burns will not always be achieved.