INFORMATION SHEET 11

PRESCRIBED BURNING in Western Australia

Introduction

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During the hot, dry summer months jarrah and karri forests in Western Australia are highly inflammable. Each year the control of fires requires considerable expenditure and effort from Forest Department personnel.

These fires result from fuel build-up as moribund leaves and twigs fall from the trees and accumulate on the forest floor. After many years accumulation, control of fires during severe summer weather can be very difficult. Prescribed burning is used to reduce these fuels and so lessen the summer fire danger. It is carried out under the mild conditions in spring and autumn when damage to the forest is negligible.

Although precautions are taken some fires occur every summer. Lightning strikes from thunderstorms are a natural cause of fire, but most forest fires result from man's carelessness with burning-off, camp fires or are deliberately lit.

Past Fire History

Historical evidence suggests that fire has been common in Western Australian forests for centuries past, and Dutch explorers such as Pelsart and Vlaming saw fires along the west coast. Many of these fires were lit by aborigines for hunting and cooking as they moved continuously over the forest area in search of food.

After British colonisation the incidence of fire increased as exploitation of the forest for sawmilling and clearing for farming produced large quantities of debris. These heavy accumulations of fuel caused severe summer fires damaging large areas of forest.

Some control over these fires followed the passing of the Forests Act by State Parliament in 1918 and the establishment of the Forests Department. Early foresters were alarmed by the extent of fire damage and adopted a policy which almost entirely excluded fire from the cut-over forest. These areas were protected from fire by surrounding them with a burnt firebreak about 100 m wide. Concurrently, fire-fighting units were established to deal with any outbreaks which occurred.

After 15 to 20 years of this policy of "total control" heavy accumulation of fuel had built up and it became impossible to contain fires burning on the worst summer days. It was realised that protection from fire was not a practical objective and a policy of prescribed burning over large areas of forest was introduced in 1952.

Prescribed Burning

Most of the 1,800,000 hectares of State forest is burnt by prescription on a cycle of six or more years, the interval between burns depending on the type of forest. In the burning programme factors such as maturity and composition of tree types, flora and fauna demands are taken into consideration. The substantial contribution from aerial ignition techniques, introduced in 1965, is a highlight of the achievements in prescribed burning from 1951 to 1971, summarised in Table 1.

TABLE 1
Average area covered each year by prescribed burning (hectares)

Period	*Ground method*	*Aircraft method*
1951-56	14,000	
1956-61	180,000	
1961-66	344,000	
1966-71	224,000	180,000

Method

Selection of correct weather is essential for these mild fires which creep over the forest floor with flames one metre high or less. Over the past decade considerable research into fire behaviour has been carried out in both jarrah and karri forest to provide information on the correct conditions for lighting. The analysed information is condensed into fire behaviour guides which relate weather factors such as air temperature, relative humidity, past rainfall and wind to fire behaviour in different fuels. In addition, these guides set out the method to be adopted for lighting the burn. The method commonly used by ground crews is shown in Figure 1.

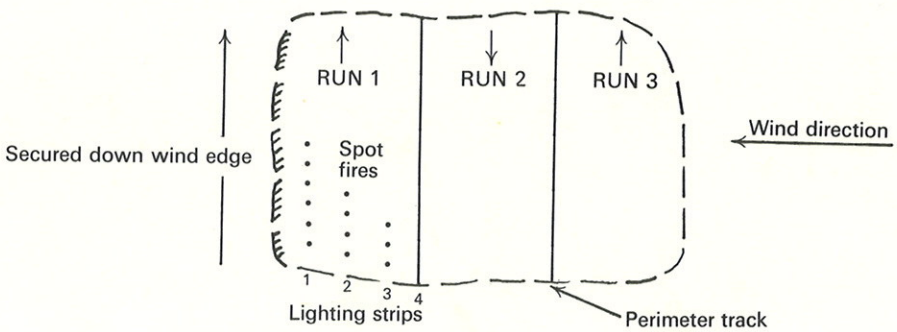
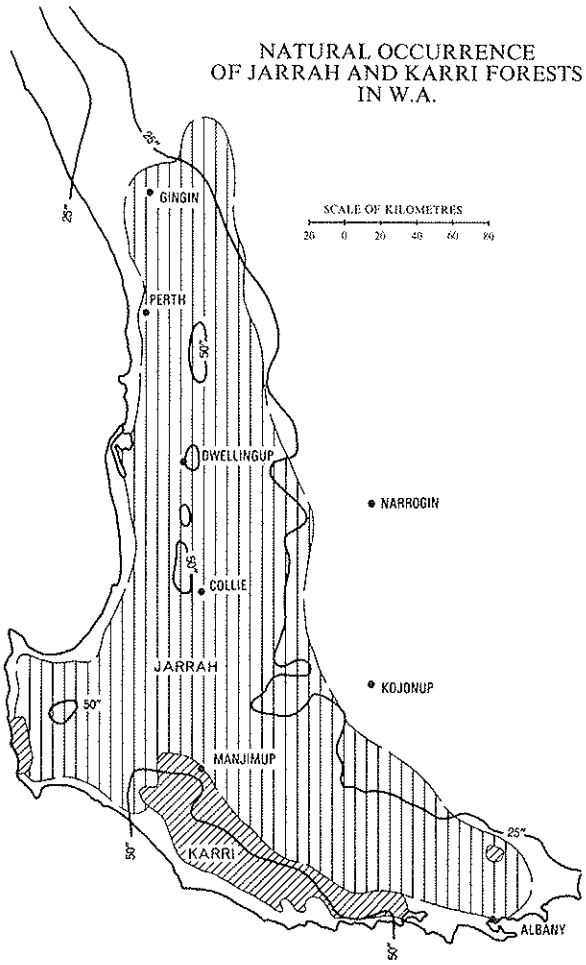


Figure 1. "Across wind" lighting method for ground crews.

The lighting is done by placing spot fires at predetermined distances apart. The men in the crew walk parallel lines across the wind direction when placing these fires. Similarly with aerial ignition, the aircraft flies parallel lines across the forest area dropping incendiaries at intervals worked out from the fire behaviour tables.

Spring versus autumn burning

Research indicates that prescribed burning in spring is considerably less damaging to forest flora and fauna



than burning in autumn. There is also evidence that the many wildflower species suffer if fire is excluded from the forests for a long period.

Damage to flora and fauna can be avoided by burning with mild fires which consumes only the lighter fuels such as litter and dead scrub. This type of burning must be done when heavy fuels such as logs and branchwood are too damp to ignite since they provide refuge from fire for small forest fauna such as insects, reptiles and small animals.

Heavy fuels are damp for many weeks after winter rains giving sufficient time in spring to carry out a major prescribed burning programme. In early autumn logs catch alight easily destroying the faunal refuges and damaging the trees.

New leaves form in the crowns of jarrah and karri trees each summer. If part of the crown is scorched during a spring burn (a limited amount of scorching is inevitable) new leaves will replace the scorched ones within a month or two. After an autumn burn this replacement must wait until the following summer.

Understorey scrub in these forests is easily killed by even the most mild fires. Most of the scrub species will regenerate quickly after a fire from rootstocks, lignotubers, corms or tubers. In this way they are well adapted to a fire environment. Most forest scrub species produce a flush of new foliage in spring. After a spring burn new shoots appear within several weeks. However, after an autumn burn shoot development is delayed until the next spring and the ground rendered quite bare during winter.

New shoots are attractive food for large animals such as kangaroos and wallabies, and surveys have shown these animals congregate during the evening on the recently burnt areas. Spring burning regenerated their food supply in as short a time as possible.

In spring the soil and lower parts of the litter layer are damp. In these moist conditions rarely more than 70 per cent of the forest area is affected by a prescribed burn. The remaining unburnt islands provide shelter for the larger fauna.

While there is considerable research in progress on effects of prescribed burning in the forest, present indications suggest mild burning in spring is the most beneficial.