FIRE - MASTER OR SERVANT

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Without doubt the greatest and foremost problem of Australian forestry is forest fire control. Without fire control the practice of sound forestry is virtually impossible, and to attempt it, futile. Naturally the fire control problem varies considerably in type and intensity according to forest types and climate, but there are few, if any, temperate forests in which fire is not a serious problem at some time or another, and even in the Arctic circle forest fire has played its part (1).

It is not the author's intention to discuss the fire problem technically, but to examine the mental approach of foresters to this formidable problem. This paper sets out to be provocative, and to pave the way for more technical papers to be submitted by others in this session.

Modern forestry science, teaching and practice first developed in Europe where forests had been largely worked over by man more or less intensively for perhaps 1,000 years. The forests were no longer virgin and no longer so vast. The species were often fire tender and needed protection from fire. Much thought was given to effect of fire on soil and much emphasis laid on the need to preserve soil fertility. Thought favoured complete fire prevention. The climate also favoured protection from fire except perhaps in Mediterranean regions.

In new countries, especially those in lower latitudes, European colonists found conditions very different. Fire, both natural and man caused, had played an important part in the development and distribution of indigenous forest types. Native populations made use of fire freely, for various reasons, and a belief in the beneficial effects of fire was wide spread. The colonists were faced with vast virgin forests, on which they made no important demands at the level of primitive use. Fire 'losses' of timber were not of moment to them. European colonising foresters brought their belief in the virtues of complete fire protection with them.

There was at first sight much evidence to support their views. Everywhere the ravages of severe uncontrolled fire were in evidence, though there were large areas of fine virgin forest in spite of it.

They had yet to learn how important fire was for securing regeneration in these new lands; how difficult it might be to control fire in the forests of these climates over long periods; how greatly the outlook of the people generally, both indigenous and colonist, was opposed to fire prevention.

They found that, as a result of consistent past firing, deliberate or natural, the litter and undergrowth level, i.e. the fuel accumulation, had been kept low. Where these conditions prevailed in the main, the frequent fires tended to be relatively docile and creep about apparently without serious consequences. Putting out fires in such circumstances was relatively easy. But it was also obvious that once a new forest crop was being established, a fairly lengthy period of exclusion of fire might be necessary for the young saplings to develop beyond the reach of the 'creeping fire' at least, although during the regeneration period of perhaps ten years, fuels on the forest floor accumulated dangerously.

These considerations led to the belief that virtually complete fire exclusion by suppression of any and all fires which started, could be readily achieved and was the correct approach. Fire exclusion became the orthodox policy of forestry in these new lands also.

However pioneering conditions demanded a fierce 'burn-off' for land clearing, and stopping the spread of such fires was difficult and costly. Graziers (the pioneers) believed in, and wilfully set about, burning the bush whenever they could - to reduce scrub for mustering, improve grazing and in a way reduce fire hazard to their stock and holdings.

Lightning also took a hand at certain times. A general instinctive belief existed in the rural communities in the virtue of firing the country. This led to carelessness with matches and campfires and frequently deliberate firelighting.

The foresters after many bitter experiences found that fire exclusion and fire suppression were not so easy after all. Also it was expensive - and in spite of lookout towers, roads, telephones, special fire fighting trucks and equipment, radio, many men, etc., in certain years and under certain conditions of weather and with a number of simultaneous fire outbreaks, which could not all be tackled simultaneously, large scale fire disasters occurred at regular, if widely spaced, intervals.

When these disasters happened, the successful fire suppression of the previous decade or two had built up a fuel supply, which incinerated the carefully guarded forests and did greater damage than the cumulative effects of frequent, milder fires, while suppression was impossible until vast areas had been burnt over and rain came to the rescue. Furthermore, through

lack of practice, the handling of large fires was outside the experience of a new generation.

The practical forester, of the woodsman type, soon realised this and preached the need for controlled-burning. To professional foresters this was heresy, but as time went on the heretics appeared also in their own ranks. Still for the majority, and for many years, "controlled-burning" was a "dirty word" and in many places still is.

There is a reason. G. K. Chesterton has said that Christianity had not been tried and found wanting - but found difficult and not properly tried. The same can well be said of controlled-burning. In fact debates between foresters on the controlled-burning question tend to develop more heat than light. The way of the controlled-burner, like that of the transgressor, is often hard, for the techniques of controlled-burning are not easy.

However in many parts of the world today controlled-burning is believed in and practised extensively by foresters. There is the classic example of the southern pine regions of the U.S.A., where after years of resistance to the idea, in spite of its advocacy by H. H. Chapman, a leader in U.S.A. forestry, controlled-burning was adopted as a policy - and not only as a fire suppression policy, but for silvicultural reasons as well (e.g. the elimination of a fungus disease and insect problems). Controlled-burning is now being practised in important areas of Pinus ponderosa in Western, U.S.A., though there are still antagonists. A recent visit to these areas in the southern States and Arizona, convinced the author of its effectiveness and desirability there. In India controlled-burning is a recognised practice in some important forest types - and a practical necessity. The Redwood forests (Sequoia) of California are obviously a climax resulting from natural fire. In places where fire is excluded by design, changes in the species composition of the forest are obviously developing

In the Western Australian jarrah forest with its long dry hot summers and wet winters, and with its xerophytic under-growth and slow decomposition of leaf litter, the policy of complete fire protection was eventually found wanting both technically and economically and led ultimately to bigger and better fires. A reversion to wide spread controlled-burning was introduced some seven years ago, as a practical necessity.

Due to long term fuel accumulations, the problems faced in this return to controlled-burning were many and difficult and the forgotten art of wide spread controlled-burning had to be learnt all over again.

It must be appreciated, however, that controlled-burning can not prevent all fires - its role is to provide conditions of reduced hazard under which fires can be fought and stopped. Under extreme weather conditions fire will cross comparatively recent controlled-burns on fallen leaves, but the forest itself escapes serious damage, while areas not control-burnt are damaged with increasing severity according to the time elapsed since the last burn.

In January, 1961, under the worst combination of weather conditions in the memory of any Western Australian forester (prolonged high temperatures, low relative humidity, winds up to hurricane force), a large number of lightning strikes caused many fires to start up simultaneously. Although the majority were contained, a few proved too much for the suppression organisation. Scattered over a forest region of approximately 1 million acres of jarrah forest these outbreaks could not be coped with by the men and equipment available and they coalesced to burn over an area of some 300,000 acres in six days of dangerous fire weather. On 40 per cent of this area, where there were control-burns up to three years old, the damage was negligible. On the rest of the area damage was generally related in severity more or less to the elapsed period of the last controlled-burning. On areas where there had been no burning for eight years or more, the forest was severely damaged.

This fire was eventually brought under control mainly on areas where controlled-burning of comparatively recent date occurred, assisted by some rain. The suppression cost and damage done to both forests and property by these fires was enormous.

Significantly it occurred in the forest division which had, for various reasons, carried out much less controlled-burning over the past seven years than any other jarrah forest division, and after some 35 years of apparently highly successful fire control. Under the onslaught of numerous fire outbreaks and continuous severe weather, culminating in a cyclone, all suppression activity proved in vain, until rain fell. Had these areas been control-burnt every three to five years over the 35 year period, only a fraction of the damage would have resulted.

The history of fire protection and controlled-burning in Western Australia was presented in a joint paper at A.N.Z.A.A.S., Perth in 1959, by Wallace and the present author (2). Since this paper would not have been readily available to many now present at Brisbane, copies of it have been made available now for those interested.

It is the author's belief that many forest types in Australia lend themselves to fire protection by controlled-burning, but every case must be decided on its merits. There is strong

suspicion that many foresters are frightened of controlled-burning and magnify its dangers and difficulties, while the young forester, fresh from the academy, regards controlled-burning as a heresy and it is a blow to his idealism when older foresters support the use of fire. It is the old forester with the bitter memory and experience of years of fire control behind him, who realises, even if reluctantly, the strong case for controlled-burning in many eucalyptus forests.

In Western Australia not even sylvicultural considerations rule out controlled-burning in jarrah (as well as a number of other eucalyptus species). Seedling jarrah becomes fire resistant at an early age. With its early root tubercle development it soon becomes able to shoot again after normal fires. Research in Western Australia has shown that there is no apparent loss of increment with normal controlled-burning (there may even be a gain) nor is there any demonstrable soil deterioration (Hatch) (3) (4). Jarrah is a climax type developed under conditions where fire was inevitable and frequent. Its thick bark protects it, its recuperative powers are enormous.

Psychology plays an important part in fire policy. In one Western Australian forest district, which had over a 30 year period the worst record of deliberate fire lighting, the introduction of controlled-burning policy in 1953 resulted in an immediate drop in incendiarism and the number of fires in the district receded to the normal for other similar districts. There had long been an attitude in that area that complete fire protection was folly and "they would show the Forestry Department that it wouldn't work". When "the Forestry Department had learnt its lesson", the urge to light fires receded suddenly and remarkably.

Quite apart from the technical difficulty of a policy of complete fire protection, the cost of it became so high as to be uneconomic. Under a policy of complete protection fires must still occur and become extremely difficult and costly to control under severe weather conditions, while the damage sustained by the forest is tremendous, far outweighing that caused by any soundly conceived and executed controlled-burning policy.

The decision as to what forest types can or should be control-burnt must rest with the foresters of any specific region. In some forest types it may not be applicable or economic. All that the author wants to emphasise is that the use of fire in forest protection and silviculture in Australia should not be ruled out because of prejudice, preconceived notions, academic teachings or timidity.

Many leading Australian forest administrators and executives started off with such impedimenta and have been forced to modify their views after long experience.

The author wishes to present controlled-burning as a technical challenge to Australian foresters and as a powerful auxiliary in the tremendously difficult problem of effective fire control in our forests.

The practitioner of controlled-burning will need to study how to use, to his own advantage, the basic elements of controlled-burning technique - wind, temperature, relative humidity, forest fuels, slope, aspect, etc. He will have to learn how to use the night hours to control his burning. His main problem may be to train men in the techniques required - but it can be done.

The subject of fire control is too vast, for treatment in a single short paper. Fire control is, however, the sine-qua-non of forestry. The author asks simply that foresters rethink their fire control problems and policies and honestly assess whether a policy of virtually complete fire protection is practicable and economic. Fire disasters may strike only at long intervals, but when they do, the toll is enormous, and the balance sheet is difficult to compile.

There is an economic limit to the expenditure that can be justified on forest fire control, and the author suggests that in the present stage of Australian forestry, at least, foresters ignore, at their peril, the merits of controlled-burning.

References

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