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FOREST FIRES 445/46

Enc. I have prepared a first draft from some notes which I intended should cover our ideas on the subject. Would you please make any corrections you think desirable or extend the ideas and explanations as you may consider necessary.

You will appreciate that in dealing with such a big subject I may have completely omitted some relevant and important matter, which may occur to you.

Any suggestions for change in form would be welcome.

I have not any clear ideas at the moment on how the subject matter can be used, except that it may be explanatory and helpful to our foresters.

CONSERVATOR OF FORESTS.

Perth.
27/8/52
A/EGS.

1 MR. NUNN 29/8/52
2 MR. BROCKWAY
3 MR. PERRY

To note, as for comment if necessary. (From p 36)

Discussed with Conservator of Nunn
Discussed with McStewart. 10/10/52

10/10/52

FOREST FIRES

The forest fire is the greatest single obstacle to the successful practice of forest management in the hardwood forests of Western Australia, and indeed of all Australia.

Considerable areas around the Southern and Eastern coast lines of our Continent are subject to fierce bush fire ravage.

Troublesome fires may occur almost anywhere in Australia in hot and dry periods of weather, but it is the regions receiving a winter rainfall of 20 inches upwards annually, and particularly those regions favoured with 30 inches and more of rain which suffer from the really fierce conflagrations causing so much damage to stock and property, and resulting in such high loss of human life. It is here that the forest fire fuel represented by the woody undergrowth, the litter of tree leaves, branches and limbs has its greatest accumulation. The bark on the trunks and the dead branches in the tree crowns assist in carrying the fire ahead. Trees on roadsides frequently render these roads ineffective as firebreaks even though they may be supplemented by ploughed lines in adjoining cleared fields and pastures.

Paradoxically enough while more intensive development creates a greater risk of a widespread fire in farming areas because there is less burnt "bush" to constitute a barrier to such fires, farm development on the other hand reduces the menace to the forests from the numerous clearing burns. The reason for this is that owners of developed farms do not wish to "burn-off" on hot and dangerous days with frequent escape to the forest.

It may not be generally appreciated that the greater part of the forest burnt each year by fire is burnt by the Forests Department. Apart from the burning of firebreak belts and buffer areas around the boundaries to protect the forest from private property, subdivisional firebreaks, burning along railways and roads, around mills, townships, schools, there is the advance burning carried out on each permit before logging commences and the subsequent burning of the tops and debris.

Foresters always feel somewhat surprised that the people who complain from time to time that the Forests Department does no burning, are so unobservant that they fail to see the smoke rising over the Jarrah forest from the month of August onwards to December. After a short interval burning starts again from March in the Karri forest and April in the Jarrah forest. This has been going on with a gradual extension Southwards for more than 30 years.

It is necessary to state that Foresters carry out light burning of the forest as the lesser of two evils, that is to reduce the chance of a big conflagration, and not because they believe burning is good for the forest.

Fires, while they are present every summer, do not constitute a major problem in the Northern part of the Jarrah forest. Of course the occasional accident must happen such as when, for the first time for 20 years, a large fire developed and burnt over 20,000 acres. For this to take place a combination of factors is required :-

(a) A fire must start on a bad day.

(b) Two dangerous days must follow in succession.

(c) The Departmental organisation must fault.

It is rarely that a fire occurs on a dangerous day before the end of the Prohibited Period. Usually a dangerous day is followed by a weather change and the fire can at least be suppressed the first night. Hundreds of fires are started and dealt with in a few acres each year, some of them on dangerous days; and the Departmental organisation must fault for a large fire to develop. This is a comparatively rare happening.

Hence the chance of the combination of factors required for a big fire in the Northern protected Jarrah forests is a low one.

It is to be expected that with intensification of access reading, and fire-line construction, and improvement in fire equipment and technique, a still better attack will be made on any fire. After all I can remember vividly how at conferences 30 years ago argument revolved around whether a downward blow or a glancing blow should be used with a bush.

More men and more fire gangs would simplify the problem permitting two attacks on fires simultaneously instead of allowing the second outbreak to grow to a larger fire while the first is being suppressed.

It is in the Southern Jarrah and Karri forests that the "bush-fire" or forest fire presents such an acute problem in forestry. The reasons for this are :-

1. The forests are less compact, being more broken by and interspersed with private property, the source of the "burning off" fires.
2. The undergrowth is taller and denser causing more intense fires and at the same time rendering it more difficult to carry out and control Departmental or protective burns.
3. Fires will run for only a few days in the year, other than in the heat of summer.
4. The forests have not as yet been as intensively developed and subdivided, as farther North there are less fire-lines and fewer tracks of access are available to reach a small fire quickly.
5. The prohibited burning period ends earlier in the South, and "burning off" takes place in the dangerous first half of March.

There are numerous causes of forest fires, and those attended by Departmental fire gangs are recorded each year, as in the following case for the year 1948/49 :-

W.A. Government Locomotives	93
Mill Locos.	63
Bush Workers	23
Mill and Bush Navvy Gang.	5
Hunters and fishers	27
Travellers in the forest	45
Stock owners and lease holders	61
Escapes from private property to State Forest	99
C/Fwd.	416

B/Fwd.	416
Firewood cutters	4
Lightning	4
Deliberately lit	4
Escapes from controlled burning	23
Mill surroundings	16
Mine surroundings	7
Other Departments	10
Householders	10
Children	14
Unknown	19
Total	527

In 1949/50 of 579 fires attended 252 were from private property escapes to forest boundaries and threat to the forest, and 93 fires were started by locomotives. Incendiarists in that year even lighted 8 fires in pine plantations.

Of these the escapes from "burning off" on private property constitutes the real problem to forestry. Sporadic outbreaks from the numerous causes, including those deliberately lit, are usually reached quickly by the fire gang and suppressed while still quite small. Contrary to popular opinion, the traveller with his cigarettes and matches and his billy and camp fires has really only a nuisance value. He could, however, pose a problem by tying up the firegang temporarily and thus preventing it from reaching an important fire earlier.

The deliberate incendiarist provokes a feeling of intense exasperation in the fire-gang, chiefly because of the very futility of his crime, and partly because good men are called upon to expend great effort so unnecessarily. Like the traveller he does not cause a major fire. The farmer or settler in "burning off" however, lights not a single or small fire which is quickly attacked by a fire gang, but a long line of fire which he can allow to develop in his own property. When this breaks away on a bad day it may already be a big fire which then increases

in size and gathers in force before it sweeps down on the forest boundary.

Probably the most unfortunate cause of fires, because it is of our own making, is the escape from Departmental controlled burning. Our own burning thus causes fires; inevitably it must. Fire is at all times a dangerous servant. No burning can be undertaken without risk, and it follows that our own burning must sometimes get out of control.

In the Southern forests fires will run on only a very few days of the year, apart from mid-summer. In order to carry out its full programme of burning on firebreak belts around private property, on buffer strips across the forest, along roads and railways, and then in advance of sawmilling operations on the cutting area intended for the current year, the Forests Department is compelled to burn in relatively hot weather immediately prior to and following mid-summer. The Department each year obtains special permission to burn up to the 15th January in these Southern forests and commences burning again in early March.

For the 10 years to 1950 the number of days on which burning could be carried out in the Karri Forest Region below Manjimup was as follows :-

		Sundays not included
Spring		
	October — Nil	-
	November — 2	0
To 22nd	December — 10	0.9
22nd Dec. - 15th Jan.		10.3	0.8
		22.3	1.7
Autumn		
	March	12.1	1.9
	April	4.6	0.55
	May	0.3	0
		17.0	2.45

Days of Severe and Dangerous Hazard were excluded.

It will be seen that in order to obtain even these limited numbers the Department has to secure an extension of the burning period from 22nd December to 15th January.

Although the averages given of 22 for Spring and 17 for Autumn are the theoretical days on which burning was possible, it must be remembered that on many days burning could be carried out for only a short period of 3 or 4 hours in the middle of the day, while on others (High Summer Hazards for example) the weather was so hot that burning had to be done at night.

In order to foster the early burning the Department frequently slashes scrub on the edges of breaks to carry the fire and has tried, though so far without success, flame throwers and spraying with oil. Further developments in these directions may assist.

It will be seen that light controlled burning in the Karri forest can be only limited in extent.

Talk, occasionally heard of the Australian blacks having burnt the forest regularly with light fires, is, Foresters feel, arrant nonsense based upon supposition and conjecture. Foresters' reasons for believing fires did not run commonly before the advent of white man are :-

1. Many Australian Eucalypts are readily killed by light fires and could not have existed if fires had run frequently in the forests. The best known example of this is the Victorian Mountain Ash, the scene of so many appalling fires in our knowledge. Western Australian Brown Mallet which was found scattered over a wide area in the Narrogin District cannot, for example, resist fire
2. The number of days on which fires will run in what might be termed "cooler weather" in the Southern forests is not great enough to allow more than a very small amount of burning.

3. Some fires if lighted early in the season would have carried through into the hot weather resulting in severe forest fires which cause such obvious damage to our forests.

It is significant that the stumps of felled trees do not show old occluded fire scars internally.

The typical Jarrah tree today has a crown consisting of a gaunt framework of limbs containing much dead wood and carrying only a scanty foliage. It cannot be that this is a natural condition of nature. A former Conservator, J. Ednie-Brown, writing in 1897 spoke of the red-flowering gum as a beautiful umbrageous tree with a crown feathering down to the ground. Today the red-flowering gum is as poor a spectacle as the average Jarrah tree.

4. The forest, or the natural vegetation, in any region is the result of the factors of the environment.

It might be that the white man has altered the condition of the forest. Thought given to the possible former condition ~~fundamentally~~ would lead us to expect the normal crowns associated with healthy trees creating a very different condition beneath the trees than would be the case with less emphasis on the taller woody shrubs met with today and encouragement of the more succulent herbaceous types. In some properly managed forests in Europe with trees with proper crowns forming full canopy, purely aquatic plants are sometimes found on the forest floor.

Foresters know that many plants, such as the wattles, which grow quickly after a fire and become quite conspicuous for several years, die out after a very long period giving way to smaller shrubs which constitute a much less serious bush fire hazard.

There would seem to be little reason to doubt that before the present widespread burning of the forest and bush became common, many of the gullies and flats constituted a barrier through and beyond which a fire would not pass.

5. Scientific investigations into the accumulation of litter on the forest floor and its destruction by fire have shown :-

(a) More than two tons of leaves and twigs is dropped per acre from even the poor crowned trees in the jarrah forest.

(b) This represents :-

Phosphorous	lbs.
Potassium	lbs.
Calcium	lbs.
Nitrogen	lbs.

per acre.

(c) Burning at a temperature of degrees centigrade causes

It is of interest that from the big New South Wales bush fires last summer smoke drifted as far as New Zealand, and two years ago smoke from big Canadian fires was recorded over Scotland.

6. The stupendous task represented by systematic early burning of the Southern forest is quite beyond our powers with our present knowledge and methods, and certainly it was beyond the scope of a few Nomadic aborigines.

<u>The Area of Forest Protected.</u>

The Forests Department has not so far afforded any protection to forest South of Pemberton, although this forest is being developed by roads of access, fire-lines, telephone lines, fire towers, etc. Much of this large expanse of forest was relatively inaccessible until the big new mills were built in the South.

It is in this region that perhaps the greatest damage has been done by forest fires. Karri is not resistant to very severe fires, and on some sections Karri trees have been killed in large numbers.

In general
~~For the most part~~ that part of our hardwood forests so far protected is mostly that carrying regrowth which suffers more noticeable damage from fire than the bigger trees.

Departmental Burning.

It has been pointed out that the largest part of the area burnt by fire each year is forest burnt by Departmental gangs. The Forests Department is the only organisation which at certain times of the year gives absolute preference to controlled burning in its work. Some 300 men are engaged on burning in certain seasons.

Records of fires over a long period of years in the protected forests show that in certain regions remote from farms and where man has not operated for that period, fires simply do not occur. It would be a waste of effort and money to burn such forest as a preventive against a bigger fire. Incidentally, it is not yet known whether a big fire once in 20 years is more harmful than repeated burning at short intervals.

There is a tendency among Australians to regard a fire in the native forests as a natural condition of things, but to regard a fire in a pine plantation as something which cannot be tolerated.

In the pine forests of the Mediterranean coast in France fires started in adjoining private property frequently run through the pines and are accepted very much as philosophically as fires in our Jarrah forests. In the South of France pines are planted along the railway lines to protect the hardwood forests because fires are much easier to control in pines.

A private forest owner from French Morocco who visited Australia recently owns more Tuart forest than we have in Western Australia. He was greatly astonished at the Australian Forester who thinking a smoke was in his pine plantation expressed great relief on finding it was only in the native Eucalypt forest.

27/8/32
A/MOS.