

THE ORIGIN AND DEVELOPMENT

of Fires in the

PEMBERTON DISTRICT

during

1960 - 1961

by:

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THE PEMBERTON FIRES

I. INTRODUCTION.

During the 1960/61 season fires occurred in the area between Pemberton, Shannon and the southern coast. They cover two main areas:

- (a) The coastal sand plain area to the south;
- (b) The Karri forest area to the north.

Fires on the coastal strip are a regular yearly feature of this region and mostly burn on unalienated crown land. It is difficult to establish the cause of most fires, but it is generally accepted that they may result from stockmen, graziers, campers or fishing parties.

The fires are normally lit during December, and summer and autumn rains are relied upon to extinguish them. Due to the absence of any significant rain this season from December through March the fires continued to burn slowly and eventually threatened either State Forest or developed land. As this coastal country is largely undeveloped, no organised form of fire protection exists in the area.

Fires which occurred in the highly-productive Karri forest area were mainly caused by lightning on the 11th February, and subsequently, by a variety of causes during the first week in March during a period of very high to extreme fire danger.

2. METEOROLOGICAL CONDITIONS.

(a) Seasonal Rainfall.

As in most parts of the South-West, rainfall at Pemberton was below average during winter, spring and summer, with the main deficiency occurring in the Spring.

Monthly rainfall is shown in Table I.

2.

TABLE I. Monthly rainfall received at Pemberton 1960-1961.

Month	Rainfall		Cumulative Rainfall
	Average points	Actual points	Deficiency (points)
June, 1960	879	529	350
July	875	1132	93
August	763	412	444
September	504	454	494
October	415	180	729
November	246	46	929
December	167	86	1010
January, 1961	101	89	1022
February	71	106	987
March	170	356	801

The above average March rainfall occurred after the severe fire danger period in early March and thus had no significant effect on the March fires. Similarly, the rain in February occurred after the severe fire period in that month. The disastrously low spring rainfall must have resulted in a very dry and hazardous bush in the Karri and coastal areas.

(b) Weather Conditions during the February Fire Period.

The daily weather conditions which prevailed during the February fire period are shown in Table II.

TABLE II. Weather Conditions recorded at Pemberton 9th - 18th February, 1961. 1500 hr. readings.

Date	Temperature		Minimum Relative Humidity %	Wind		Rain (points)
	Max. °F.	Min. °F.		Direction	Velocity (mph)	
9/2/61	83	53	27	NNW	14	-
10/2/61	90	59	16	NE	19	-
11/2/61	96	65	26	SW	5	-
12/2/61	84	69	50	SSW	14	-
13/2/61	97	66	15	SE	9	-
14/2/61	96	69	14	NE	14	-
15/2/61	97	65	20	NNW	14	-
16/2/61	77	68	81	SW	19	7
17/2/61	77	59	65	SW	14	3
18/2/61	70	59	75	WSW	14	-

(c) Weather Conditions during the March Fire Period.**TABLE III.** Weather Conditions recorded at Pemberton
27th February - 6th March, 1961. 1500 hour readings

Date	Temperature		Minimum Relative Humidity	Wind		Rain (points)
	Max. °F.	Min. °F.		Direction	Velocity (mph)	
27/2/61	81	67	57	W	9	-
28/2/61	74	66	70	SE	9	-
1/3/61	95	65	15	NE	25	-
2/3/61	91	64	19	NE	31	-
3/3/61	102	78	22	N	14	-
4/3/61	85	68	42	NW	6	-
5/3/61	89	66	44	WSW	2	-
6/3/61	90	68	50	SW	4	-

A comparison of Tables II and III shows that the fire danger was higher on the 1st, 2nd and 3rd March than on the 13th, 14th and 15th February, due mainly to the much stronger winds. The humidity on the night of the 2nd March did not rise above 40%.

(d) Lightning Fires.

A summary of the lightning fires which occurred in the Pemberton-Manjimup-Shannon area is given in Table IV.

TABLE IV. Lightning Fire Occurrence - Pemberton-Manjimup-Shannon area. January-March, 1961.

Storm Period	Number of Fires		Area Burnt - Ac.	
	State Forest	Crown Land and Private Property	State Forest	Crown Land and Private Property
19-20th Jan.	7	4	174	111
11th February	9	2	32558	463
11th March	3	3	11	252
TOTALS	<u>19</u>	<u>9</u>	<u>32743</u>	<u>826</u>

During the last 10 years only nine lightning fires have been recorded in State Forest areas south of Bridgetown, with a maximum of two in any one day. During the 1960/61 fire

season, 28 lightning fires were recorded, with a maximum of 11 occurring on one day. Major suppression difficulty was caused by "sleepers", i.e. lightning fires which remained dormant for several days and then broke away under dangerous conditions. In two cases when this occurred, suppression forces were fully engaged on controlling other fires and so insufficient manpower and equipment were available to mount a heavy initial attack. Over 98 per cent of the burnt area resulted from these two fires.

3. DESCRIPTION OF INDIVIDUAL FIRES.

A brief description of each of the major fires follows.

The fires described and the area burnt are: -

Name	Burning Period	Area Burnt (acres)
(A) Meerup River-Windy Harbour	Dec. - March	56,300
(B) Maringup Lake	January	7,200
(C) Chesapeake	29th Dec. - 4th January	11,300
(D) Shannon River	11th February - 16th February	14,750
(F) Crowea - Dombakup	13th - 16th February	16,900
(F) Brockman	3rd - 4th March	3,800
		110,250

Although only six fires are described in this report, many other fires occurred which were kept to small areas by fast energetic attack. Full credit must be given to both the Rural Bush Fire Brigades and the Forests Department gangs for their very excellent achievements in confining these fires to small areas. During the severe 1960/61 fire season over 50 fires occurred in the Pemberton forest district alone, and only one of these assumed large proportions.

Of the 110,250 acres burnt by the six major fires in this region, approximately 37,000 acres are State Forest and the remaining 73,250 acres are either private property or Crown land held under leasehold.

(a) MBERUP RIVER - WINDY HARBOUR FIRE.

This area was burnt by a series of fires originating on the coastal strip from mid-December onwards and probably the main cause was escapes from graziers' burning off.

On March 1st, 1961, a fire of unknown origin started in State Forest and burnt through 1500 acres. The coastal fires were burning to the south and east of the area and this fire may have originated from a hopover from the extensive coastal fire.

It was decided to unite the two areas in a common front and construct a safe burnt break with the view to eliminating any possible threat to the township of Northcliffe and forest areas lying to the north.

Control of the northern face of the fire was carried out by Forest Department gangs and local farmers working in close co-operation.

A total of 23 separate fires was detected in the coastal area lying between the Warren and Gardner Rivers from December through March, and the total area burnt was approximately 56,300 acres. No reported damage to property or stock occurred. One of these fires severely threatened the holiday camp site at Windy Harbour on the 16th March but was controlled by volunteer firefighters in the area.

6.

(b) MARINGUP LAKE FIRE.

This fire originated from a control burn carried out on leasehold country in locations 10807-10810, and commenced at around 1230 hours on 11th January.

Intention to burn was notified to the Pemberton Forest Office on 21st December. The prohibited burning period in this area commenced on January 1st, and it appears that this was disregarded by the lessee. Under normal seasonal conditions the area would have been considered safe, as the Gardner River lay on the eastern edge of the area to be burnt and a one-year-old protective burn lay to the north.

However, due to the unusually dry seasonal conditions and near heatwave conditions, the fire escaped across the Gardner River and burnt eastwards. It was controlled on a two-year-old burn south of the State Forest area.

There was no recorded damage to property or stock and the burnt area was 7,200 acres.

(c) CHESAPEAKE FIRE.

This fire originated on locations 5602, 5600, 5273, 5605 and 5604 held under various ownerships and on Reserves 9540 and 21712 held under Crown Lease by the owners of the above locations.

The fire commenced as a control burn at about 1245 hours on December 29th, 1960, and escaped northwards on subsequent days under prevailing southerly and easterly winds. The properties concerned in the burn were not securely contained by firebreaks.

The fire was attended by Forests Department gangs from Shannon River and Northcliffe when it commenced to threaten seriously State Forest areas to the north. It was effectively contained by the 4th January.

Damage to State Forest was negligible as the fire was contained on open coastal flats before reaching timbered areas. No damage to property or stock occurred.

The area burnt was approximately 11,300 acres.

(d) SHANNON RIVER FIRE.

Although recorded as one fire for the purpose of this report, the Shannon River fire was actually three separate lightning fires which resulted from a thunderstorm which passed over the area around 3.30 p.m. on Saturday, 11th February. Rain accompanied the storm but was very patchy.

At Shannon River township 40 points of rain were recorded, but in the fire area, seven miles to the south-east, only very light showers occurred.

The first two fires were attended by Shannon River Forests Department gangs and were controlled by Sunday evening, 12th February.

Weather conditions on the day of the lightning storm were fairly severe, with a maximum temperature of 96°F. and a minimum relative humidity of 26%. The following day was hot and humid with a temperature of 84°F. and a minimum relative humidity of 50%. This materially aided the initial control of the two fires.

At about 9 a.m. on Monday, 13th February, weather conditions worsened and several spot fires, which had remained dormant the previous day, started to spread. Bulldozer equipment was thrown in to control these spot fires. At the same time another fire was reported some 40 chains to the south and over 60 chains from the nearest road. This third fire was also a lightning fire which had remained dormant since 3.30 p.m. on Saturday, 11th February. The fire was in very heavy undergrowth and could not be controlled by hand tools.

Under a moderate north-east wind of between 10-15 mph. and severe burning conditions (temperature 97° - relative humidity 15%) the fire was spreading rapidly out of control by 1 p.m. The headfire crossed the Nornalup Road early in the evening and penetrated some 120 chains west of the road. The rate of spread during the afternoon was between 25-30 chains per hour and the fire was spotting heavily.

Although heavy reinforcements of manpower and equipment were directed onto the fire, the headfire could not be contained during the night, although the southern flank was controlled by backburning. As it was evident that the headfire would continue to make progress during Tuesday, 14th February, further manpower reserves were drawn from Kirup and Quininup and additional contract bulldozers hired. Meteorological conditions were very similar to the previous day and the headfire made a further run of approximately 3 miles. Again the headfire could not be controlled during the night, due largely to the number of spot fires which had been thrown some considerable distance ahead.

The uncontrolled perimeter became active by midday on Wednesday, 15th February. Weather conditions had eased slightly but were still severe. The wind had backed to the north north-west by mid-afternoon and the head had travelled a further 190 chains by evening. All available bulldozers and manpower were concentrated on the western face of the fire during Wednesday night and a bulldozed break was completed around the western and southern flanks of the fire by 11 a.m. on Thursday, 16th. Full control of the fire was achieved by 6 p.m. Weather conditions eased considerably on Thursday when a south-west change came through accompanied by some light showers which materially aided suppression efforts.

(e) CROWEA - DOMBAKUP FIRE.

This fire originated in State Forest and was caused by a lightning strike around 1530 hours on Saturday, 11th February, being one of a series of 11 fires which started from lightning in the area between Pemberton and Shannon River.

The fire was not detected at the time the lightning strike occurred, and it did not become active until around 1600 hours on Monday, 13th February, when weather conditions were reasonably severe.

When this fire was detected, all Forests Department gangs and equipment were engaged on mopping-up operations on two fires which had originated from lightning strikes on the 11th February and which had been controlled by Sunday, 12th February.

The Crowea-Dombakup fire occurred in heavily timbered country on steep slopes carrying heavy undergrowth. An initial attack force was detached from mopping-up operations on the above fires and succeeded in containing the fire by hand trailing. The burnt area was held to 2 acres.

On the following day (Tuesday, 14th February) the fire commenced to throw spot fires around 10 a.m. and broke from control. By 1400 hours the fire was making rapid progress and spotting up to 40 chains ahead under moderate south-east winds. By 1800 hours spot fires were reported up to 2½ miles from the point of origin.

The headfire was stopped on the Northcliffe W.A.G.R. line early in the evening and a number of spot fires contained on the west side of the Northcliffe Road.

Late in the evening, a large spot fire was located in Dombakup Block some 4½ miles south and west of the point of origin. Once again the fire was in broken country with heavy fuel types. Attempts to contain the spot fire were

unsuccessful during the early morning hours of Wednesday, 15th February, and by 10 a.m. the fire was moving rapidly before a fresh northerly wind. All other sections were under control and heavy mopping-up was in progress.

The Dombakup headfire was stopped that night and all sections of the fire controlled on Thursday, 16th February. A trafficable trail was constructed around the entire perimeter and intensive mopping-up undertaken.

The area burned was 15,800 acres.

Comments on Suppression Action.

(1) As in most cases where multiple lightning fires have occurred, a "sleeper" which starts up on a day of high fire danger causes serious suppression difficulties.

(2) As all Divisional resources were engaged on mopping-up previously controlled fires, the initial attack was somewhat slow and deficient in manpower and equipment.

(3) The fact that the initial attack gang controlled the fire to an area of 2 acres in difficult terrain and heavy fuel types indicates a high degree of efficiency and fire suppression knowledge.

(4) Lack of efficient radio communication prevented the initial attack gang from advising fire headquarters of the potential of the fire. Consequently, the movement of heavy bulldozer equipment onto the fire to consolidate the hand tool trail was unduly delayed.

(5) When the fire commenced to spot on the morning following initial control, there were insufficient men and equipment on the fire edge to prevent it escaping. This was again dictated by the fact that heavy patrol and mopping up were still proceeding on larger fires. The escape of these fires would have endangered high-quality regeneration areas and private property.

(6) Adequate manpower and contract bulldozer equipment were available for later suppression action. The availability of such equipment and manpower should receive early pre-seasonal attention so that it is readily available in an emergency. Multiple fires resulting from lightning, and the ever-present danger of a "sleeper" showing up some days later, are an ever-present danger to successful fire suppression operations.

(7) Provision of a well-equipped initial attack gang with bulldozer equipment always on ready call, even when the remainder of the suppression forces are fully engaged on other fires, appears to be the only way in which unexpected fires can be quickly suppressed.

(f) BROCKMAN FIRE.

This fire originated on a firebreak south of the State Building Supplies Mill railway line in State Forest area. The cause of the fire appears to have been a spark thrown from the railway locomotive, which ignited a small patch of scrub along the edge of the line. The scrub fire in turn ignited a dry Karri tree south of the break, and this tree spotted freely into dense undergrowth.

The fire was detected at 1055 hours on Friday, 3rd March, and the initial attack crew arrived at 1115 hours. The fire was probably set at 0950 hours or a little later, but the smoke was not readily seen as it was in the deep valley of East Brook.

Once across the firebreak, the fire developed rapidly under a light to moderate northerly wind, and by 1400 hours had entered some tobacco plantations lying to the south. The maximum temperature at Pemberton on this day was 102°F. and the relative humidity 20%. The rate of forward progress of the headfire between 1130 and 1400 hours was between 40-50 chains per hour. At 1600 hours the headfire crossed the Warren River to the south and ran into country burnt by a wildfire two weeks previously. The total distance travelled by the headfire was 3 miles, giving an average rate of forward progress of 53 chains per hour. By around 1700 hours the wind had backed to the south west then south and gangs were engaged on containing numerous spot fires. A big weight of manpower and heavy bulldozer equipment was thrown against the fire during the night, and all sectors were under control by the following morning.

Comments on Suppression Action.

(1) The initial attack force consisted of 3 men who arrived 20 minutes after detection, but probably 75 minutes after the fire started, due to a detection lag of around 1 hour.

(2) Although initial attack by the Forests Department was fast, the attack force was depleted due to the fact that all forestry gangs were committed on two other fires burning in the Pemberton Division.

(3) A fettler gang was patrolling behind the bush loco. but was held up whilst attending to another log ignited by the engine. This gang did not arrive at the main fire until 1245 hours.

(4) Although the fire hazard for the day was "Severe" and not "Dangerous", it is considered doubtful if a bush loco. should be allowed to run on such a day, especially when other fires were already burning in the area.

(5) There is also some evidence to show that the spark arrester on the bush loco. was defective - an even greater reason why it should not have run on such a day of severe fire hazard.

4. DAMAGE CAUSED BY THE FIRES.

No accurate assessment can be made of the monetary damage caused by these fires.

Of the 73,000 acres which were burnt in the undeveloped coastal plain country, a valuation of no more than 1/- per acre could be assessed for this type of country. It is mostly used for cattle grazing, and the area is burnt regularly for the purpose of obtaining a green succulent shoot for autumn grazing. The fires probably achieved this purpose. A short distance of low value fencing may have been destroyed.

Little or no work has been done on assessing the damage resulting to Karri forest from fire. It would be reasonable to assume that some damage has been done to regeneration, and commercial size trees would have suffered some loss of increment.

The damage incurred by these fires is thus estimated at £41,150, comprising: -

	£
(a) 73,000 acres coastal plain country at 1/- per acre	3,650
(b) Loss of fencing, say	500
(c) Damage to 37,000 acres of State Forest, including damage to regeneration, loss of increment and damage to commercial timber—estimated at £1 per acre	37,000
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TOTAL ..	£41,150
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PEMBERTON SHANNON RIVER FIRES

FEB. MARCH 1961

SCALE: 4 MILES TO 1 INCH

