

THE ORIGIN AND DEVELOPMENT
OF FIRES IN THE
AUGUSTA - MARGARET RIVER SHIRE

by

A.G. McARTHUR

CONTENTS

Introduction	1
Meteorological Conditions	2
(a) Seasonal Rainfall	4
(b) Daily weather conditions during the fire	5
Description of Individual Fires	7
(A) Forest Grove - Rarridale Fire	7
(i) Cause	7
(ii) Development of the fire	7
(iii) Notes on Suppression Action	15
(iv) Fire behaviour	17
(a) Forward Spread	18
(b) Area Spread	19
(B) Treston Fire	20
(C) McLoughlin's Fire	23
(D) Marsh's Fire	26
(E) Cusack's Fire	28
(F) Bell's Fire	30
(G) Courtney Fire	32
(H) Flinders Bay - Augusta Fire	34
(I) Scott River Fire	35
(J) Rosa Brook Fire	36
Fire Control Organisation in the Augusta - Margaret River Area	37
Damage caused by the Fires	40

AUGUSTA-MARGARET RIVER FIRES.

1. INTRODUCTION.

The serious fires which occurred in the Augusta-Margaret River Shire all escaped from burning-off operations by settlers during the first week in March, 1961. Previous to this, two fairly extensive fires had burnt along the coastal strip during February. One of these burnt to the east of Augusta, between Scott River and the coast; the other burnt to the west of Augusta and Flinders Bay and extended northwards along the coastal sand-dune country towards the Deepdene area. This fire had caused considerable concern to the settlements of Augusta and Flinders Bay around 16th February. The cause and origin of these two fires is obscure and no specific investigation of them has been undertaken.

The location of all major fires which occurred in the Augusta-Margaret River Shire district are shown on the map attached to this report. The total area burnt in the Shire is estimated as being 106,910 acres. This represents approximately 21% of the Shire area.

The area burnt by each individual fire is as follows -

<u>Fire</u>	<u>Burning Period</u>	<u>Area</u>
1. Scott River	February	10,300 acres.
2. Flinders Bay-Augusta	"	5,325 "
3. Forest Grove-Karridale	1st-6th March	60,400 "
4. Treeton	2nd-3rd March	1,025 "
5. Rosa Brook	2nd March.	450 "
6. McLoughlin's	27th Feb.-5th March	2,950 "
7. Cusack's	3rd-6th March	2,750 "
8. Courtney	1st-3rd March	8,850 "
9. Bell's	1st-3rd March	13,200 "
10. Marsh's	1st-3rd March	1,660 "

Specific attention has been given to the origin and development of the Forest Grove-Karridale fire, as this fire caused major damage in the Forest Grove, Karridale and Kudardup districts. A large amount of evidence was

given before the Royal Commission on the cause and development of this fire and many allegations were made concerning certain suppression action which was taken. In consequence of this a detailed analysis was made of the development and spread of the fire. This should allow a clearer understanding of the suppression action which was taken at various times and places during the course of the fire.

A brief description is also given of the other nine fires which occurred in the district.

2. METEOROLOGICAL CONDITIONS.

The weather during the fire period in the Augusta-Margaret River area was controlled generally by an intense tropical cyclone moving southwards along the north-west coast. The cyclone passed inland near Roebourne on March 1st then recurved to cross the coast again when South of Carnarvon on March 3rd.

The associated trough on the west coast caused extremely hot and very dry conditions with moderate to strong north-east winds down the west coast to the southern coastal areas. The extreme dryness of the continental air resulted in unusually severe burning conditions in the south-western corner of the State with unusually dry overnight conditions which caused the fires to maintain quite high intensities throughout the night period.

With the southern movement of the pressure system, the winds gradually backed to the north, then north-west.

Dews are a common feature of the coastal strip and fires generally become dormant overnight. A lack of appreciation of the fact that low overnight humidities and high temperatures could occur in this region was probably the main reason why suppression action was not pressed home during the initial burning period.

From all accounts serious fires are not common in the far south-west. However, disastrous ones have occurred in the past and the following are the major fire periods which have been recorded -

- 1890 - March 10th. Numerous bushfires and damage to property around Busselton.
- 1892 - January 31st. Bushfires were very numerous and settlers suffered severe losses.
- 1919 - March 4th. Fires prevalent - a great deal of country burnt.
- 1931 - January 28th. Fierce fires around Margaret River and Yallingup. Margaret River township threatened.
- 1933 - February 10th. Extensive bushfires in South-west districts. Losses by settlers at Karridale.

It has been stated by many farmers in the Augusta-Margaret River district that the conditions this year were the severest ever experienced. It is interesting to compare the meteorological conditions this year with those recorded at Busselton in February, 1933 when serious losses occurred around Karridale. The temperatures recorded at Busselton during the 1933 fire period are as follows :-

<u>Date</u>	<u>Max. Temp.</u>
4.2.33	101
5.2.33	99
6.2.33	97
7.2.33	106
8.2.33	98
9.2.33	100
10.2.33	97

Unfortunately, records of relative humidity and wind velocities are not available. The rainfall recorded at Busselton that season was as follows :-

November	51 points
December	14 points
January	73 points

The meteorological situation giving rise to this extreme heatwave was almost identical to that which existed in March this year with a tropical cyclone off the north-west coast, a pronounced west coast trough and a high pressure system stationary in the Bight for several days.

It appears that the fire weather conditions experienced in February, 1933 were more severe than those experienced this year.

(a) Seasonal Rainfall.

Seasonal rainfall in this area of the South West was not so deficient as in many other districts where serious fires occurred. During the period June through February the following deficiencies were recorded at Busselton, Margaret River and Cape Leeuwin.

Station	Rainfall		
	Actual pts.	Average pts.	Deficiency %
Busselton	1911	2543	24.9
Margaret River	2914	3555	18.1
Cape Leeuwin	2694	3074	12.4

The monthly rainfall at Margaret River is as follows-

Table 1 - Monthly rainfall at Margaret River 1960-61.

Month	Actual pts.	Average pts.	Cumulative Deficiency pts.
June	757	1001	-244
July	994	906	-156
August	495	674	-335
September	293	393	-435
October	110	307	-632
November	59	120	-693
December	78	61	-676
January	24	40	-692
February	104	53	-641

The seasonal curing of the grasslands in the Margaret River area clearly shows the difference between this area and other parts of the South-west.

Table 2 - Seasonal Curing of annual grasslands in the South West and South Coastal areas during the 1960/61 fire season.

<u>Date</u>	Percentage of green grass.			
	Margaret River	Busselton	Dwellingup	Mt. Barker
29.10.60	80	80	80	80
23.11.60	80	50	35	50
8.12.60	50	20	0	20
23.12.60	20	20	0	0
8.1.61	20	0	0	0
23.1.61	10	0	0	0
8.2.61	20	0	0	0
22.2.61	20	0	0	0

It is evident that the above average rainfall received during February had an effect of bringing some green sheet on the pastures. However, this does not reflect the dryness of timbered land to any great extent and these areas must have been in a very dry condition by the end of February.

(b) Daily weather conditions during the fire period.

Temperature, humidity and wind velocity recorded by the Forests Department at Margaret River during the March, 1961 fire period are given in the following tables -

Table 3. Meteorological conditions recorded at Margaret River during the March, 1961 fire period.

Date	Time	Temp. °F.	R.H. %	Wind		Remarks on Fire Behaviour.
				Dirrec- tion	Veloc- ity M.P.H.	
27.2.61	0900	74	82	SW	2	Numerous con- trol burns commenced and burning slowly.
	1200	79	66	SW	2	
	1500	82	60	SSW	4	
	1800	74	72	S	8	

Date	Time	Temp. °F.	R.H. %	Wind		Remarks on Fire Behaviour.
				Dirac- tion	Veloc- ity M.P.H.	
28.2.61	0600	63	88	E	13	All control burns remained under control
	0900	71	74	SSS	18	
	1200	79	68	SE	14	
	1500	74	70	ESE	15	
	1800	73	80	ESE	10	
1.3.61	0600	64	85	E	11	Fires commenced to breakaway around 1500 hrs.
	0900	69	81	E	10	
	1200	82	36	NE	10	
	1500	97	20	NW	20	
	1800	99	18	NE	16	
2.3.61	0600	71	51	NE	15	Fires continued to burn and make rapid progress after 1100 hrs.
	0900	79	40	NE	15	
	1200	92	32	NNE	15	
	1500	100	24	NW	3	
	1800	98	21	E	4	
3.3.61	0600	81	29	N	15	Fires continued to burn through- out the night and commenced rapid progress from daybreak.
	0900	90	25	NNW	18	
	1200	101	26	NW	15	
	1500	99	31	NW	17	
	1800	90	40	W	8	

The trough moved across the fire area shortly after 1800 hours on Wednesday, 3rd and fire danger conditions eased very considerably on subsequent days, although no rain fell. On Saturday, 4th March, the maximum temperature was 84°F. and the minimum relative humidity was 60%. Winds were from the North-west 15-20 m.p.h. early in the afternoon and decreasing to calm by 9 p.m. that evening. A heavy dew was recorded during the night of 4th-5th March which materially aided suppression action on the few fire edges which were still uncontrolled at this time.

As mentioned earlier, overnight conditions were very severe for this area on the nights of 1st-2nd and 2nd-3rd. The minimum temperature on the night of March 1st was 71° and the maximum humidity rose to 51% for 3 hour period.

On the following night conditions were even more severe and the minimum temperature was 81° F. and the maximum humidity only reached 30% for a short period. It was on this night that fires in the timbered areas continued to make fairly rapid progress and backburning operations were unsuccessful due to the fires spotting ahead right throughout the night. The Forest Grove-Karridale fire started to make rapid progress from 6 a.m. onwards and raged out of control throughout the day.

3. DESCRIPTION OF INDIVIDUAL FIRES.

(A) FOREST GROVE-KARRIDALE FIRE.

(i) CAUSE.

This fire resulted from burning-off operations in Sussex location 2760. Burning-off commenced around 9.30 a.m. on Monday, 27th February and, due to insufficient patrol of the area, escaped at around 4 p.m. on Wednesday, 1st March. The direct cause of the breakaway cannot be clearly established. It may have resulted from a standing tree catching alight in the south-west corner of the block or, alternatively, could have escaped from a somewhat ill-advised attempt at backburning along the western side of the block. This backburning attempt was undertaken by the aged owner of the land without any assistance. When either the burning tree or the counterfire threw sparks or burning embers into a forest reserve situated on the western side of this block, the owner was unable to control the numerous spot fires which occurred.

(ii) DEVELOPMENT OF THE FIRE.

(a) Wednesday, 1st March. At 1600 hours when the fire escaped from location 2760, a fresh south-east wind was blowing at around 15 m.p.h. Shortly after commencement, the wind backed to an easterly and later in the evening backed further to a north-easterly. The fire was driven in a generally westerly direction through Timber Reserve 72/25 which had been burnt some 4 to 5 years

previously. By midnight the fire had travelled some 60 chains into the timber reserve. At the time of outbreak, the owner from whose property the fire had escaped notified some property owners along the Bussell Highway that the fire was travelling in their direction. He had also notified the Forests Department at Margaret River. During the evening, some attempt was made to control the northern edge of the fire but no attempt was made to control the southern edge.

(b) Thursday, 2nd March. A reconnaissance of the fire was carried out by the Forestry Officer from Margaret River and a local Bush Fire Brigade Captain at 0400 hours. By this time the fire had progressed 80 chains from the point of origin and the headfire had travelled generally in a west south-west direction. The fire had a face of approximately one half to three quarters of a mile. The rate of forward progress at this stage was about 4 chains per hour. Between 0200 and 0400 hours, fire breaks had been ploughed around various properties to the west of the fire.

Suppression forces were organised by the Forests Department and local land-holders as a result of the reconnaissance. Around 0800 hours an attempt was made to halt the headfire on a forest track north of location 2713. The headfire spotted over this line around 0900 hours and continued spreading in a south-westerly direction. The wind at this stage was a fresh north-easterly, blowing at about 15 m.p.h. The temperature was rising and the humidity was dropping rapidly. At the time of this breakaway, the fire was spreading at about 15 chains per hour and spotting up to 20 chains.

Suppression forces were then re-grouped and a further attempt was made to halt the headfire on Bull Ant Drive. The fire had gained considerable momentum by this time and was spreading at around 35 chains per hour. Once again the headfire spotted over the attempted counterfire and broke into semi-cleared and cleared private property to the south. This breakaway occurred around 1100 hours.

The suppression forces then dropped back to Vigas' property (location 1564). A bulldozed track was commenced through pastureland in this location but the fire went past the break to the east before the head could be cut off. The owner of the property had objected to the construction of this fire line. At around this time (1130 hours) considerable reinforcements of local bush fire brigades arrived and the fire was halted on pasture land. It was, however, still spreading southwards in uncleared locations 3183 and 2714. Bush fire brigades and Forests Department personnel then continued to protect private property which was threatened by the fire to the east of the Highway. The northern head of the fire in the meantime had been burning very slowly through timbered country control burnt during the Spring of 1960.

Around 1600 hours, the wind veered back to an easterly and the fire broke across Bussell Highway westwards into locations 1564 and 2710. An aerial reconnaissance of this and other fires already burning in the Warner Glen, Alexandra Bridge and Courtney areas was undertaken by the Forests Department about this time. Shortly after the fire had jumped the Highway and moved westwards into timbered land, a north-westerly sea breeze came in and considerably slowed the progress of the fire. The fire had a face of approximately one mile and was threatening State forest land lying further to the west.

In view of the wind change which had occurred and the general inaccessibility of the country, the officer in charge of the Forest Department gangs decided to backburn on an existing road some 30 chains south of what is known as "Slabby Ford" and to carry this backburn in a north-westerly and northerly direction to cut across the head of the fire. An adequate departmental force of 14 men, a light duty pumper, a heavy duty pumper, a "Mack" pumper and a D4 and TD6 bulldozer were available for this operation.

The burn commenced at 1800 hours along the track for a distance of about 100 chains, then a trail was cut almost due north in an attempt to cut the headfire. However, at this stage, around 2200 hours, the sea breeze was replaced by a north-easterly gradient wind of about 15 m.p.h. Immediately this caused the headfire to make fairly rapid progress of about 15 chains per hour. Again the fire commenced to spot and broke across the trail. The bulldozers immediately dropped back and attempted another trail to cut the headfire, but the fire passed to the northwards before this could be completed.

It is pertinent to mention here that the weather conditions during this night were unusually severe and especially for this area lying so close to the coast. At midnight the temperature was still 90 deg. and the relative humidity had only risen to 27%. This, combined with a 15 m.p.h. wind, created quite severe burning conditions.

When the attempts to cut the headfire proved unsuccessful, the Forests Department gangs fell back southwards to the existing track and backburned for a distance of approximately 50 chains westwards to the old W.A.G.R. railway line. This burn was completed at around 0530 hours on Friday, 3rd March.

(c) Friday, 3rd March. During the time that the backburning from the Bussell Highway to the W.A.G.R. line was being undertaken, a reserve gang of Forest Department employees had been sent from Margaret River down Caves Road in an endeavour to contain the fire, either on the railway line or on the road. However, the headfire had run through private property (location 316) and had jumped both the railway line and the Caves Road and was then burning in State forest to the westwards. When the backburning had been completed to the railway line at around 0530 hours, the headfire was already some three quarters of a mile to the west end swinging south. Around this time also, the wind was commencing to back from north-east to north north-east and northerly.

Adequate patrol was maintained on the backburn and intensive mopping up had been carried out. The line was holding at 0800 hours, when Forest Department personnel were withdrawn southwards and an inspection by a local fire control officer at around 1100 hours showed it to be still holding. The Forests Department personnel was re-grouped at Antonovich's Mill (location 2704) around 0900 hours. A further attempt was made to cut the headfire on an east-west track through the old plantation. However, at this stage the headfire was developing at around 50 chains per hour and was spotting heavily. Frontal attack under these conditions had little or no hope of success. At the same time as this attempt was being made on the headfire, work commenced on cutting off the tailfire from the north-east corner of location 316, eastwards through location 2708 towards the Highway. The Forests Department men joined local farmers from the Forest Grove area on this operation.

At about 1000 hours the fire reached Antonovich's Mill around which bulldozed trails had been cut. Forest Department men and equipment were then withdrawn to the Bussell Highway and re-grouped at the north-east corner of Buller's location 1353. It was planned to make another attempt on the headfire by backburning from a track running westwards along the northern edge of this location. However, at this stage, the headfire had already moved to the south of this line, some 40 chains west of the railway line. The headfire was now travelling at approximately 80 chains per hour. The temperature had risen to 96 deg. and the humidity was 25%. The wind was continuing to back and, at this stage, was blowing from the north north-west at about 16 m.p.h.

Whilst these operations had been going on in the area west of the Highway, a dangerous situation had developed east of the Highway. During the previous night and early hours of the morning, the main fire had spread southwards through private property and timbered country and had crossed McLeod Creek. At around 0700 to 0800 hours, this fire had burnt into an extensive area of felled and windrowed timber. A very fierce fire developed in these windrows which were lying in a north-south direction and escaped to the southwards around 1000 hours. This formed a separate strongly-burning head which travelled down McLeod Creek in a south-easterly direction. Local bush fire brigades appear to have made little or no attempt to control the southern movement of the main fire or to prevent the fire escaping from this windrowed timber.

At around 1130 hours, Forest Department men and equipment were withdrawn to Margaret River, as the Treton

fire had broken away westwards of the Carburnup river and was thus directly threatening the valuable Keenan pine plantation north of Margaret River. Prior to this, the Forest officer in charge of suppression action on the western head of the Forest Grove-Karridale fire had made an accurate assessment of the potential of this fire by deciding that any attack on the head would be unsuccessful and extremely dangerous.

Any fire which is making a major run and spotting heavily - as the Forest Grove fire was - must unfortunately be allowed to run until weather conditions change and thus allow effective control of the head and flank. A similar assessment was also made around this time by the local Karridale Fire Control Officer who also realised that any organised suppression attempt was doomed to failure, and he had instructed all members of the Bush Fire Brigades attending the fire to return to their homes in an endeavour to save their stock and houses.

By 1200 hours the wind was gusting between north north-west and north-west. By 1300 hours the southern head fire had reached location 1944 and was spotting 80 - 120 chains ahead. A new head had developed along the eastern flank when the wind direction changed to the north west and had crossed Buasell Highway and was entering location 1957 and spotting heavily. The eastern head which had developed from the fire in the bulldozed country near Slabby Ford was also making a major run down McLeod Creek and was also spotting heavily.

Around 1330 to 1345 hours the main headfire burnt through Karridale and was some 60 chains south of the Brockman Highway and heading towards Kudardup. At this stage the fire was travelling at approximately 105 chains per hour and still spotting heavily. The McLeod Creek area was

being severely burnt by the two separate headfires which, a little after 1400 hours, joined together.

From 1400 hours the wind velocity decreased, the temperature fell and the humidity was rising. By 1600 hours, a distinct south-westerly change came in and the wind had backed to the south by 1800 hours. The intensity and rate of spread of the fire dropped considerably from 1500 hours onwards and suppression action on the head and flanks just north of Kudardup became effective from 1900 hours onwards.

Local bush fire brigades successfully held the south-eastern sector of the fire from a little over half a mile north of Kudardup to a mile north of Brockman Highway during the early hours of the evening. The western flank of the fire, which was burning in coastal scrubland, was allowed to spread out to the coast. Forest Grove Brigade members were controlling the north-western sector of the fire and the north-eastern sector from Bussell Highway to the point of origin was brought under control by 2300 hours. The southerly change had driven a head of fire across the Warner Glen Road and this was controlled fairly rapidly. The north-eastern and eastern edges of the fire were burning in timbered private property ~~lands~~ and were uncontrolled.

(2) Saturday, 4th March. A distinct weather change had occurred overnight unl~~th~~ although a strong north-westerly wind was blowing early in the morning, temperatures were moderate at around 80 deg. and the humidity was above 60%. Intensive mopping up and patrol was necessary on all sectors. The extreme north-eastern corner of the fire in the Chapman Brook area was causing some concern and by 1200 hours, the fire had crossed Chapman Brook.

Operations by Forests Department personnel and local brigades controlled this section by 1800 hours on 6th March. The uncontrolled eastern face burnt slowly down into the Blackwood river and burnt itself out in generally light country. The north-western sector was under absolute control by 1800 hours, due to the efforts of local bush fire brigades and Forests Department personnel. Some trouble had been experienced in the southern section west of Kudardup and an early morning breakaway was brought under control by local brigades. By midnight on 4th March, the fire had generally burnt out to the coast. Extensive patrol and mopping up was maintained on the northern, eastern and southern sections for many days.

(iii) NOTES ON SUPPRESSION ACTION.

(a) Initial attack on this fire was extremely slow. This was probably due to a lack of appreciation of the fire danger developing. The local Forestry officer probably overestimated the ability of a spring control burn to stop the spread of the fire in a westward direction and also the fact that occasionally fires will spread during the nighttime in this area. Dews are a common feature of this climate and, on most occasions the fire becomes dormant overnight. Exactly the same reasoning was applied by local landholders and fire control officers and brigade members. One landholder whose property lay immediately to the west of where the fire started did not feel the slightest concern about the fire during the first night as he considered it would burn itself out. The fire escaped at 1600 hours on Wednesday, 1st March and no organised attempt was made to control it until 0800 hours on Thursday, 2nd March - a period of 16 hours. By this time the fire had spread 105 chains from the point of origin and had burnt an area of approximately 500 acres.

(b) Once the full potential of the fire was recognised, the Forests Department and some local brigades undertook very efficient and determined efforts to control the headfire. Their efforts were hampered by lack of prepared firebreaks around many properties, dirty private property bush, lack of equipment to effectively use volunteer labour and, in some instances, opposition by landholders to have firebreaks cut across their properties. A lot of suppression effort was wasted in saving homes and pasture areas from being burnt.

(c) The action of the Forests Department in undertaking a backburn from just south of Slabby Ford north-westwards in an endeavour to stop the headfire during the night of 2nd-3rd March appeared to be the only action possible at this stage of the fire. The operation was carried out efficiently and with ample manpower and heavy equipment necessary for the job. Attempts to cut across the head of the fire and back to the Highway on the north side of the fire were frustrated by the extreme burning conditions experienced during the night and the fact that the fire was spotting ahead some considerable distance. After two determined attempts to cut the head fire, a line was successfully established across to the W.A.G.R. line and the backburn was successfully held and adequately mopped up and patrolled. The fast movement of the headfire during the night had already outflanked the line to the westward. Even when the wind direction changed to northerly and the Forest Grove fire commenced a major, high intensity run southwards towards Karridale, this backburn held and may have materially reduced fire damage in the McLeod Creek and Kudardup area. There was no evidence on the ground to suggest that this backburn had escaped during Friday morning, March 3rd.

(d) The forester-in-Charge of suppression operations on the fire made a correct appraisal of the situation at 11.30 a.m. when he decided that further attempts to control the headfire were useless as it was spotting up to 1 mile ahead and constituted a very serious danger to any persons in the path of the fire. The local fire control officer made the same assessment when he advised local brigade members to return to their individual homes and protect their properties.

(e) A change in weather conditions during the late afternoon of Friday, 3rd allowed the fire perimeter to be attacked safely and efficiently, and from this point onwards suppression action was reasonably well organised and a high degree of co-operation was achieved between all organisations engaged on final control operations.

(iv) FIRE BEHAVIOUR.

Fire behaviour was quite normal for a forest and grassland fire burning under the weather conditions prevailing. To many people the fact that the fire spread reasonably rapidly during the nighttime was quite unusual. This was not so when it is realised that, on the night of 2nd-3rd March the minimum temperature was 80°F. and maximum relative humidity 30% with a moderate to fresh north-east wind. These conditions represent a fire danger rating of 17% and a danger classification of High. The fire behaviour characteristics given for a fire danger classification of High are - Rate of forward spread 7-12 C.P.H., flame height 9-16'; scorch height 35-80'; short distance spotting up to 10-15 chains. These are almost identical to the conditions which were experienced during the night when the backburn northwestwards from Slabby Ford was being undertaken.

(a) FORWARD SPREAD.

The forward spread during various periods of the Forest Grove fire is shown in Table 4.

Table 4 - Forward Spread analysis of the Forest Grove Fire. 1st - 4th March, 1961.

Date	Period (hrs)	Distance travelled by head-fire (chains)	Rate of Spread in chains per hour.
1.3.61	1600 - 2400	60	8
2.3.61	2400 - 0600	34	5½
	0600 - 0900	30	10
	0900 - 1200	90	30 *
	1200 - 1300	35	35 *
	1300 - 1400	35	35 *
	1400 - 1500	8	8
	1500 - 1800	18	6
	1800 - 2400	40	7
3.3.61	2400 - 0300	52	17
	0300 - 0600	62	21
	0600 - 0700	21	21
	0700 - 0800	36	36
	0800 - 0900	51	51
	0900 - 1000	60	60
	1000 - 1100	64	64
	1200 - 1200	76	76
	1200 - 1300	90	90 *
	1300 - 1400	104	104 *
	1400 - 1500	96	96 *
	1500 - 1600	44	44 *
	1600 - 1700	40	40 *
	1700 - 1800	36	36 *
	1800 - 2100	22	7
	2100 - 2400	22	7
4.3.61	2400 - 0600	20	3
	0600 - 1200	54	9

NOTE. Periods marked * do not represent a true rate of spread in forest country as the fire was burning through a mixture of forest and grassland during these periods.

(b) AREA SPREAD.

The area burnt by the Forest Grove fire at various intervals is shown in Table 5.

Table 5. Burnt Area analysis of the Forest Grove Fire.

Date	Time	Hours from commencement	Area. (acs.)
1.3.61	1600	0	0
1.3.61	2400	8	160
2.3.61	0600	14	450
2.3.61	1200	20	1600
2.3.61	1800	26	3300
2.3.61	2400	32	4400
3.3.61	0600	38	6150
3.3.61	0900	41	8000
3.3.61	1200	44	12500
3.3.61	1500	47	24600
3.3.61	1800	50	32000
3.3.61	2400	56	39600
4.3.61	2400	80	60400

Final Area.

Only a very small area remained unburnt in the Chapman Brook area after midnight on 4th March.

Possibly some 5000-6000 acres of this total area were only burnt in patches or remained as unburnt islands within the fire perimeter.

(B) TREETON FIRE.

(1) CAUSE.

This fire resulted from burning-off operations on Sussex location 3057. Burning-off commenced about 6 p.m. on Monday, 27th February. The area to be burnt was only 11 acres and the burn was completed that night. The burn was patrolled on Tuesday and Wednesday and appeared to be well under control. Early on Thursday, 2nd March, the area was again inspected and appeared reasonably safe. However, some standing trees were smoking on the western side of the burn. The fire escaped at about 11 a.m. that morning and was probably caused by sparks being thrown across a surveyed road into location 2229 where bulldozed timber caught alight. The owner of the property from where the fire escaped immediately notified the captain of the Treeton Bush Fire Brigade that the fire was out of control.

(ii) DEVELOPMENT OF THE FIRE.

(a) Thursday, 2nd March. The fire which started in the bulldozed windrows was extremely hot and was burning under a strong north-easterly wind. By 1.30 p.m. the fire had extended through location 2229 and had jumped the North Treeton Road into location 2230 and was then burning in pasture land. The headfire was travelling very rapidly and spotting ahead. Backburns were put in along the east side of locations 2222 and 2224 to stop the western spread of the fire which was also temporarily stopped along the creek in location 2230. The fire eventually escaped from this line around the northern end of the creek into bush country and made another run in a south south-westerly direction. This second run was held on a creek on the south-western corner of location 2230 and the eastern edge was controlled by backburning during the night.

At around 7.30 p.m. the wind freshened and a jump-over occurred along the western face of the fire into location 2224. This third run was held along the Carbunp river on the western flank and by a creek on the southern flank, during the night.

(b) Friday, 3rd March. A strong north north-easterly wind was still blowing during the early morning hours. A further breakaway occurred around 6 a.m. in pasture land and was controlled by backburning from roads on the west and southern flanks. A further breakaway occurred around 10 a.m. when the wind changed to a north north-westerly and the fire burnt into location 2224. This breakaway was controlled along the road on the south side. The fire in timbered country in location 2230, east of the creek, burnt to the edge of pasture land where it was controlled on bulldozed trails. However, at 11 a.m. the north-westerly wind carried the fire across these lines and was finally controlled along the road to the south. This breakaway was still burning in timbered land in location 2231. This run was controlled along the creek on the southern side and a bulldozed line was pushed through from this creek northwards to the North Treeton Road. The fire was controlled by 5 p.m. when it came out onto this break. From 6 p.m. to 10.30 p.m., Forests Department gangs, together with local volunteer bush fire brigade personnel, mopped up and patrolled the southern edge of the fire.

(c) Saturday, 4th March. Extensive mopping up and patrol work was carried out from 8 a.m. onwards by Forests Department gangs and local bush fire brigades. The Forests Department personnel were withdrawn at 7 p.m. and took no further action on the fire. Subsequent mopping up and patrol was handled by the local bush fire brigades.

(111) SUPPRESSION ACTION.

Local bush fire brigades on this fire maintained a very efficient suppression action and are to be congratulated for keeping the burnt area to a figure just over 1,000 acres during the very severe fire weather which was experienced at this time. Backburning operations appear to have been well planned and executed. Each breakaway which occurred was dealt with on its merits and contained to a minimum of burnt area. The brigades did not confine their operations solely to pasture land and did not hesitate to fight the fire in timbered country and, moreover, held their backburning lines in this difficult fuel type.

The Forests Department gangs came on to the fire after all running fire had been stopped, but rendered valuable assistance in mopping up and patrol and allowed the local brigade members a much-needed rest on Friday night. Their heavy-duty pumping equipment proved very valuable in mopping up the back-burning lines in timbered areas.

This fire is a very good example of well co-ordinated action by an efficient group of rural volunteer bush fire brigades and the good co-operation which can be achieved between rural and forestry fire-fighting units.

(C) McLOUGHLIN'S FIRE.

(1) CAUSE.

This fire resulted from an escape from burning-off operations under permit. Burning-off commenced at 11 a.m. on Monday, 27th February, on Sussex location 2408. The area to be burnt consisted of 11 acres of grass country with small areas of scrub. Apparently little attention had been given to the establishment of fire breaks around the area and the fire escaped almost immediately from the permit area and by 2 p.m. was burning in timbered country along the east bank of the Blackwood River.

(ii) DEVELOPMENT OF THE FIRE.

(a) Monday, 27th February. During the afternoon and evening the fire continued to burn very slowly in timbered land along the Blackwood river.

(b) Tuesday, 28th February. During the afternoon the owner ploughed a break along the southern end of location 2408 between his and the adjoining property.

(c) Wednesday, 1st March. The fire continued to burn southwards along the river. The owner backburned from a prepared fire line on the eastern side of location 2408 into the fire along the Blackwood river. By evening, the fire had burnt into location 2410 and the southern movement appeared to be halted by a creek running through this location.

(d) Thursday, 2nd March. According to the owner from whose property the fire escaped, the fire did not make any further progress and was being patrolled by his next-door neighbour. However, an aerial reconnaissance undertaken around 4.30 p.m. on this day definitely showed that the fire had crossed the Blackwood river and was burning on the western side in timbered land in location 83.

(e) Friday, 3rd March. The fire apparently escaped from the creek in location 2410 sometime in the late morning. By 1 p.m. the fire had spread southwards through location 2413 and was then burning rapidly through location 3980. The local fire control officer was notified of the position and assistance was requested. By 2 p.m. the headfire had spread rapidly southwards and was around the south-western corner of location 4027. It had also jumped the Warner Glen Road to the east and was threatening homesteads in location 2412. Suppression action was concentrated on the Warner Glen Road to control the eastern edge of the fire until midnight. The western and southern edges of the fire had been controlled by a local property owner.

(e) Saturday, 4th March. An inspection by the local fire control officer revealed that the headfire had burnt itself out on recently control burnt country in locations 3088 and 2439. It was still burning slowly in location 2434 in light timbered country. No suppression action was taken on this south-eastern front as the fire control officer considered that the fire would burn itself out. Patrols were maintained along the Warner Glen Road during the morning and mopping up continued. During the afternoon patrols were maintained on the east bank of the Blackwood river to protect locations 2989, 2419 and 2436, which were threatened by a fire approaching from the west. (This was the uncontrolled eastern side of the Forest Grove-Karridale fire burning through location 83). A further inspection around 8 p.m. showed that the southern section of the fire in locations 2434 and 2435 was still burning very slowly in a south-easterly direction.

(g) Sunday, 5th March. A bulldozed line was constructed around the south-eastern section and the area burnt out. This area was under control by midday on Monday, 6th March. The perimeter was then patrolled until Wednesday, 8th March, and did not break away on any sections.

(D)

MARSH'S FIRE(i) CAUSE.

This fire resulted from an illegal burning-off operation on Sussex Location 2448. The owner obtained a burning-off permit from his local fire control officer to carry out a burn on the 8th March. However, he decided to burn on Wednesday, March 1st and did not notify the fire control officer to this effect. The owner had ploughed a firebreak half way across the area to be burnt.

Burning off was commenced around 4 p.m. and, by midnight, had escaped around the eastern end of the firebreak and was burning in timbered country in location 2452.

(ii) DEVELOPMENT OF THE FIRE.

(a) Thursday, 2nd March. During the day the fire burnt slowly through locations 2452 and 2453 and through location 3836 south-westwards towards the Alexandra Bridge Hall where it joined with the north-east corner of Bell's fire. By evening it had burnt into timbered country in locations 2454 and 2455 and was approaching the Brockman Highway.

(b) Friday, 3rd March. The fire was controlled along the eastern side north of the Highway early in the morning. The fire reached the Highway at 10 a.m. and jumped southwards into locations 3739, 2480 and 2759. These blocks had been spring burnt and the southern face was halted in this area. The complete area was burnt out by 2 p.m. in the afternoon.

(iii) SUPPRESSION ACTION.

There appears to have been little organised brigade action on this fire as other large fires were already burning in the area. Most work appears to have been done by the owner from whose land the fire escaped and other individual property owners. A large proportion of the perimeter was controlled by running into other recently burnt areas.

The action of the owner in burning off on a relatively bad day, when other fires were already out of control and without notifying the local fire control officer of his intention to burn

27.

in contradiction of the terms of his burning-off permit, shows a complete disregard for the provisions of the Bush Fires Act, the welfare of his neighbours and lack of appreciation of severe burning conditions.

(E) CUSACK'S FIRE(1) CAUSE.

This fire resulted from an escape from burning-off operations under permit on Sussex location 2466. Burning-off commenced about 1 p.m. on Tuesday, 28th February after a 6-chain firebreak had been burned around the permit area on the previous day. The burn was quite successful and was patrolled during the following two days. Odd dead trees were alight on the area and these were not extinguished as the owner desired that they should burn out. At about 11.30 a.m. on Friday, 3rd March, one of these burning trees fell across the firebreak and the fire escaped. No one was on patrol at the time as the owner was helping with the suppression of other fires burning in the area.

(ii) DEVELOPMENT OF THE FIRE.

(a) Friday, 3rd March. Under a moderate north north-westerly wind and severe burning conditions the fire burnt rapidly in a south south-easterly direction and by 1 p.m. the headfire had entered location 4110, having travelled a distance of about 140 chains at a rate of 75 chains per hour. The fire burnt through location 4110 and crossed the Brockman Highway. It penetrated about 40 chains into timbered country where the spread was slowed down considerably in recently control burnt areas.

(b) Saturday, 4th March. Weather conditions had moderated considerably. The eastern and southern edges of the fire were uncontrolled but burning very slowly whilst local brigades had controlled the western edge.

Local landholders and a mill owner showed a serious lack of appreciation of the fire danger on this day and carried out some backburning operations around a sawmill located in State Forest and some 2 miles from the nearest fire edge, without any reference to the Forests Department. The fire lit around the mill and outbuildings was allowed to burn unchecked into the surrounding forest.

(c) Sunday, 5th March. The fire deliberately lit around the sawmill was controlled by Forests Department gangs in the morning. They then proceeded to control the eastern edge of the fire along the Great North Road during the afternoon.

(d) Monday, 6th March. The fire perimeter on the north side of the fire was controlled and mopped up. The southern edge was controlled by heavy bulldozer equipment. No further breakaways from this fire occurred after this date.

(111) SUPPRESSION ACTION.

Local bush fire brigades worked reasonably efficiently in controlling the fire perimeter in pasture land but showed some reluctance to undertake suppression action in timbered areas which were, in the main, left to the Forests Department to control. The backburn undertaken around the sawmill in State Forest was quite unnecessary under the prevailing weather conditions, and emphasises the fact that settlers have little understanding of fire behaviour in forest lands.

The area burnt by this fire was 2750 acres and the damage is estimated at £1,870.

(F)

BELL'S FIRE(1) CAUSE.

This fire resulted from an escape from burning-off operations under permit on the southern portion of Sussex location 4055. The area to be burnt comprised 90 acres of timbered land. The burn was commenced at about 2 p.m. on Monday, 27th February under mild conditions. The burn was put through with the help of two neighbours and patrolled on the following day. A few trees and logs were still burning slowly.

On Wednesday morning the fire escaped from the permit area into Crown Land on the southern boundary. The owner apparently did not have any firebreaks along this section, which lies just north of the Brockman Highway. The owner was in attendance but was without outside help.

(ii) DEVELOPMENT OF THE FIRE.

(a) Wednesday, 1st March. At around 12.30 p.m. the fire jumped the western boundary of location 4055 into a swamp area. The owner could not control this breakaway and called for assistance from local brigade members. An attempt was made to backburn along the Warner Glen Road. Due to a lack of sufficient manpower and equipment, the backburn escaped westwards and continued on to Alexandra Bridge where the Blackwood river halted this headfire. The fire also jumped the Brockman Highway and burnt in a south-westerly direction.

(b) Thursday, 2nd March. The fire was burning in location 3871 during the early hours of the morning and jumped the Blackwood river east of Alexandra Bridge into unoccupied Crown Land towards Glenarty Creek. This head threatened improved holdings along the Kudardup Road and was handled by Karridale and Kudardup Brigades. The Warner Glen Brigade handled the eastern side of the fire and it was controlled around locations 2482 and 2483. This eastern edge eventually joined with Payne's and Marsh's fires.

The western headfire burnt strongly through the timbered Crown Lands and was controlled along the edge of pasture country east of Kudardup Road. By midnight it had reached the vicinity of Glenarty Creek.

(o) Friday, 3rd March. Under a moderate north to north-westerly wind and severe burning conditions, the fire spread rapidly southwards through timbered Crown Land and private property and burnt through to Hardy Inlet at the mouth of the Blackwood river.

(111) SUPPRESSION ACTION.

Local brigade action was slow when this fire broke away and the backburn undertaken along the Warner Glen Road had little hope of success under the weather conditions prevailing.

Subsequent brigade action on the eastern face consisted of saving small areas of improved pasture and was mainly successful.

The work of the Karridale and Kudardup Brigades in controlling the western face was quite efficient. At no time did local brigades attempt to hold the headfire burning in timbered Crown Land.

The presence of this fire fully engaged the main resources of the Karridale Bush Fire Brigade during Thursday and Friday morning and seriously weakened any attempt this brigade may have made to halt the spread of the Forest Grove-Karridale fire burning down from the north. The Forest Grove fire had escaped from control burning operations on Wednesday afternoon and was making steady progress southwards by Thursday. From all accounts, the Karridale Brigades did not realise the potential of the Forest Grove fire and concentrated their efforts on the western edge of Bell's fire. On the Friday morning the Karridale Brigade was split into two sections, one remaining on Bell's fire and one returning to Karridale. By this time the Forest Grove fire was completely out of control.

The area burnt by Bell's fire was 13,200 acres.

(G) COURTNEY FIRE.(1) CAUSE.

This fire resulted from an escape from a control burn lit under permit on Sussex location 2751. The burning-off was commenced at about 5 p.m. on Monday, 27th February, but the burn was not successful due to the damp conditions prevailing. A further attempt to burn was commenced at 5 p.m. on Tuesday, 28th February. During the evening the fire escaped from the permit area and burnt into a swamp area in location 2752. Apparently the owner did not provide any firebreaks around the area to be burnt.

(11) DEVELOPMENT OF THE FIRE.

(a) Wednesday, 1st March. During the night and early morning the fire had burnt in a south-westerly direction and the eastern edge was controlled by the owner of the property from which the fire escaped. The owner notified his local fire control officer of the position at 7 a.m. By 8 a.m. the fire was moving fairly rapidly under a moderate north-easterly wind. This head was controlled on the western edge of location 2755. The southern front was burning uncontrolled in unoccupied Crown land.

(b) Thursday, 2nd March. By midday the southern end of the fire had burnt into location 3972. During the afternoon it burnt southwards into the Courtney area. The fire continued to move southwards on a broad face and attempts were made to halt it along the Courtney Road. At about 5 p.m. it jumped the road and burnt into location 2488 but was controlled about half-way across this location and through location 2494. Later in the evening it broke across this break and swept through into location 2487 and jumped Sunshine Avenue southwards into location 2495. This south-western front was controlled during that night.

(c) Friday, 3rd March. At about 8 a.m. the fire escaped from control on the south end of location 2488 and burnt into locations 2494, 2495 and 2496. This head was again controlled in locations 2740 and 2741. During the latter part of the morning the wind changed direction to the north-west. The eastern edge of the main fire then broke away into location 4074 and made rapid progress into unoccupied timbered Crown land. The main headfire continued to burn in a southerly and south-westerly direction through Crown land and burnt itself out in the Scott River sand plains late in the afternoon. The western edge burnt onto the Blackwood River and joined with the area burnt by Bell's fire. Once the major breakway occurred, all Brigade effort was directed towards saving pasture land in the vicinity of Sunshine Avenue.

(111) SUPPRESSION ACTION.

Suppression action on this fire by brigades in the Courtney area appeared to be well organised and efficient. Well-directed attempts were made to control the headfire and the numerous breakaways which occurred under the extreme weather conditions. It was again unfortunate that the owner of the property from which this fire escaped showed such lack of care in burning off on a block during potentially serious fire danger conditions and without providing adequate measures to prevent the fire escaping.

The area burnt by the Courtney fire was 8,850 acres.

(H) FLINDERS BAY - AUGUSTA FIRE

The cause and point of origin of this fire cannot be determined. The fire apparently started on the coastal sandhill country in the vicinity of Deepdene sometime in February. On the 15th-16th February it seriously threatened the townships of Augusta and Flinders Bay and was controlled by local brigades. The fire burned very fiercely on those two days.

Little or no damage was caused to private property and the area of 5,325 acres estimated to have been burnt is largely wasteland coastal scrub.

(I)

SCOTT RIVER FIRE

The cause and point of origin of this fire cannot be determined. It apparently started on the coastal sandhill country during February and continued to burn slowly westwards and north.

Apparently no action was taken to control the fire, and on the afternoon of Thursday, 2nd March, it jumped the Blackwood River into location 1505 on the north side. This section of the fire was then attended by the Kudardup Bush Fire Brigades which had previously been engaged further north in controlling Bell's fire. The brigades attempted to backburn around the fire during the evening but were unsuccessful due to the severe burning conditions. At this time attempts to control the head of the Forest Grove fire were also proving extremely difficult.

On Friday morning, March 3rd, breaks were cut around the western edge of the fire with Shire bulldozers and it was controlled. The perimeter was patrolled until 2 p.m. when all forces were withdrawn onto the Forest Grove fire.

Eventually, Bell's fire ran into the northern edge sometime that afternoon.

The area burnt by this fire was approximately 10,300 acres, consisting mainly of coastal wasteland.

(J)

ROSA BROOK FIRE.

This fire escaped from burning-off operations under permit on Sussex location 1924. The burning-off was carried out on Monday, 27th February. A considerable number of dead standing trees were on the permit area and some caught alight. The fire escaped at around 1 a.m. on the morning of Thursday, 2nd March, due to sparks blowing from a dead standing tree onto adjoining properties.

The Forests Department controlled the western and northern edges of the fire which burnt into Timber Reserve 60/25, control burnt in the Spring. Local brigades and landholders efficiently controlled the remainder of the fire during the day, so that complete control was achieved by 9 p.m.

The area burnt was 450 acres.

The Rosa Brook fire illustrates the fact that fires in this area can be controlled and the burnt area kept to small proportions during relatively severe fire weather, provided determined suppression action is taken whilst the fire is still small. This fire was controlled whilst the Forest Grove fire was resisting all efforts at control due to slow initial attack.

4. FIRE CONTROL ORGANISATION IN THE AUGUSTA-MARGARET RIVER AREA

(1) Due to generally favourable climatic conditions, serious fires occur very infrequently in the Margaret River-Augusta area. Consequently, many farmers appear to be apathetic towards fire control, fire prevention and the volunteer bush fire brigade organisation.

(2) This general apathy could have more serious consequences in the future. Large areas of land are still undeveloped and land clearing by burning will continue to be commonly practised for many years. However, as land development proceeds and the area of improved pasture increases, greater economic damage will be suffered by farmers if burning-off fires escape.

(3) The majority of burning-off escapes this season were mainly due to the landowner not providing adequate firebreaks around the area to be burnt, and in not adequately patrolling the burn once dangerous fire weather developed. A large part of the blame for these burns escaping must also be borne by the local bushfire brigades and fire control officers in not ensuring that the burns were adequately supervised and patrolled.

(4) Both the Local Authority and landholders failed to appreciate that the season was of above average dryness, and it is very evident that the burning season was allowed to open too early. Obviously, the desire by landholders to obtain a good, economic burn outweighed the dangerous consequences which may arise if such burns escape from control.

(5) Firefighting equipment throughout most of the district is lacking in both quality and quantity and local landholders seem reluctant to purchase heavy pumper equipment. The local Government authority also seems unable to provide adequate finance for the purchase of such equipment. An added impediment to the organisation of an efficient fire control organisation is the lack of communication in some areas. The Courtney area, for example, does not even have a telephone system installed.

(6) There appears to be a lack of co-operation between various sections of the district. This not only exists between the Forests Department and local brigades, but also between individual brigades in the district. Generally there is good co-operation between rural brigades and the Forests Department north of Margaret River, but this does not extend to areas south of the river and is probably caused more by the attitude of the bush fire brigades themselves. Each brigade area seems to be a closely knit group with little concern for happenings or organisation in adjoining brigade areas.

This attitude is probably not significant when only small fires are concerned, but becomes very significant when large-scale fires are burning, and makes for divided control and lack of proper co-ordination of a full-scale fire control effort.

(7) All the criticism which may be levelled at fire control organisation generally in the Augusta-Margaret River area could be largely overcome by a greater degree of co-ordination between individual brigade areas. There is an undoubted need for a chief fire control officer, who would exercise co-ordination powers and take an active interest in the overall district organisation. The work of an active local advisory committee could also greatly assist the chief fire control officer in co-ordination of fire control work generally, especially in the control and supervision of burning-off activities. The Forests Department could also play an important part in such work, both in their advice on seasonal trends and fire weather forecasts, and control of burning-off operations near State Forest areas. The use of their detection system and notification of any suspected fire outbreaks to the chief fire control officer could also improve co-ordination of fire-fighting activities.

(8) Finally, as such a large part of the district consists of forested country under private ownership, and as local brigades have shown a marked reluctance to engage in fire-fighting activities in this type of country, it would appear advisable that private owners should control burn as much of this bush as is practicable during the spring and late autumn.

A control burning plan should be drawn up for the district showing especially hazardous areas and areas burnt each year by all authorities in the district. It would appear desirable that all timbered land should be burnt once every 5 or 6 years. The local Bush Fire Board Warden could render valuable assistance in such work.

5. DAMAGE CAUSED BY THE AUGUSTA-MARGARET RIVER FIRES.

The total area burnt by the series of fires in the Augusta-Margaret River Shire was 106,250 acres. The approximate breakdown of this area into terms of land tenure is as follows: -

	<u>Acres</u>
State Forest	8,400
Timber Reserves under the Forests Act	4,500
Reserves under the Land Act, including Caves Reserves, Recreation Reserves etc.	19,500
Private property, including Leasehold, conditional purchase etc.	73,850
TOTAL ...	<u><u>106,250</u></u>

Of the area of 73,850 acres shown as private property and various leaseholds, approximately 10,000 acres are cleared for pasture.

An estimate of the property losses sustained in the fires was made by the Margaret River Police after inspection of individual farms shortly after the fire passed through.

These itemised losses have been used for the purpose of this report, together with various additional items which give a more complete estimate of the losses sustained in these fires.

The losses and valuation are as follows: -		£
(i) Loss of pasture - 10,000 acres @ £2 per acre		20,000
(ii) Loss of baled hay - 370 tons @ £10 per ton		3,700
(iii) Fences - boundary. 133 miles @ £200/mile		26,600
Fences - internal. 150 miles @ £50/mile		7,500
(iv) Buildings - 5 houses 7 milking sheds 13 hay sheds 16 other sheds	}	18,900
(v) Personal effects		5,000
(vi) Farm implements, plant, farm vehicles, tools and other equipment		10,000
(vii) Loss of stock - 5 pigs, 1 cow		100

41.

(viii) Timber losses -	£
(a) State Forest and Timber Reserves 12,950 acres @ 5/- per acre	3,225
(b) Reserves under the Land Act 19,500 acres @ 2/- per acre	1,950
(c) Private property timbered lands 20,000 acres @ 5/- per acre 43,850 acres @ 2/- per acre	5,000 4,385
TOTAL DAMAGE ..	<u>£106,360</u>

The low valuation given to damage incurred on forested land is due to the fact that the greater portion of commercial timber in this area is of relatively low quality and contains little regeneration. Large areas of Reserves held under the Land Act are sandy wasteland containing timber of little or no commercial value, as is also the case with a large proportion of the privately held timbered land.

The original police valuation of pasture losses was assessed at £7 per acre. This may have been a true valuation at the time, but good early rains late March and April resulted in very good pasture growth and the loss of pasturage would not exceed 5 weeks.

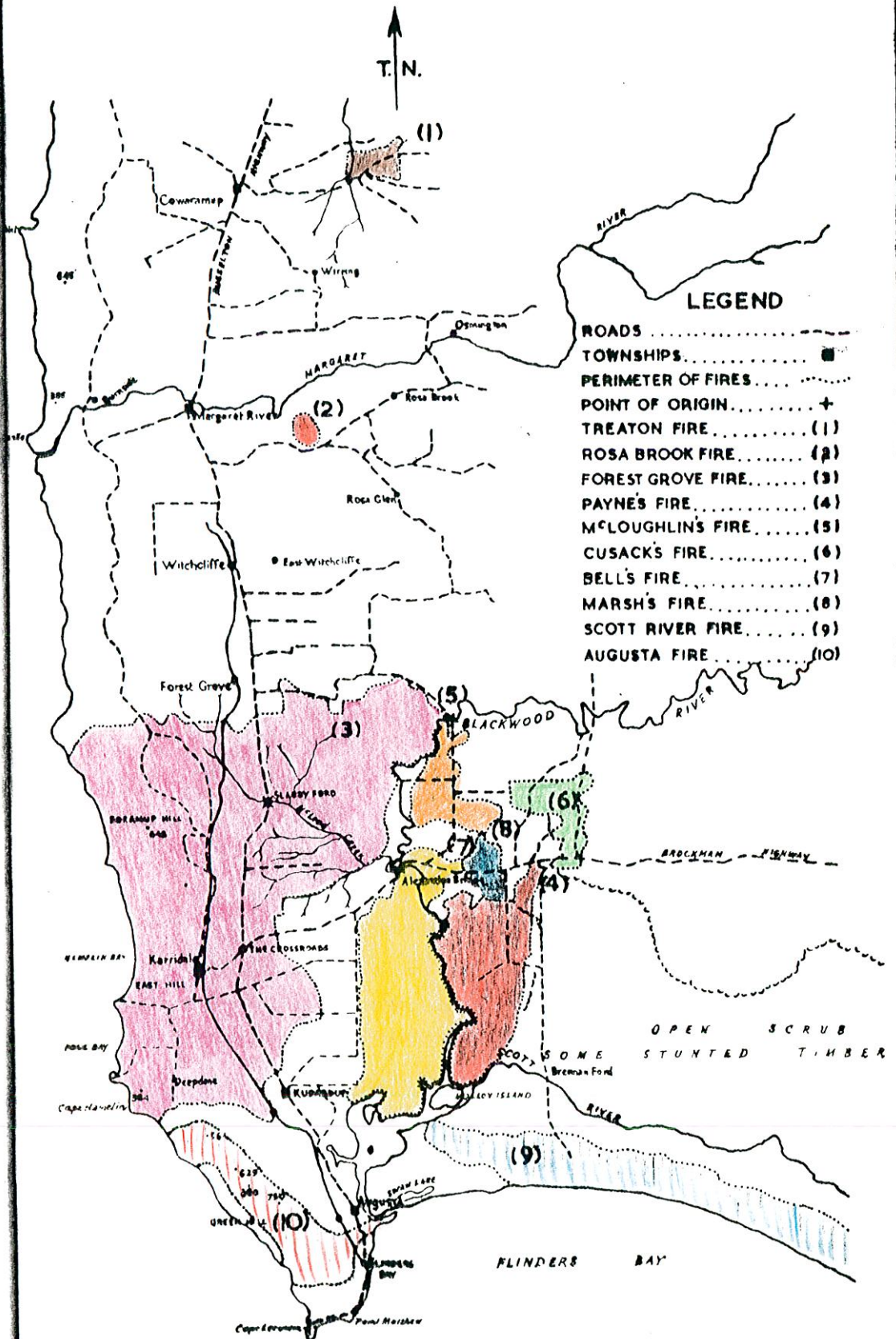
A remarkable feature of this fire was the almost complete absence of stock losses.

LOCALITY PLAN

SHOWING

AUGUSTA-MARGARET RIVER FIRES - 27 FEB-5 MARCH 1961

SCALE: 1 INCH TO 4 MILES

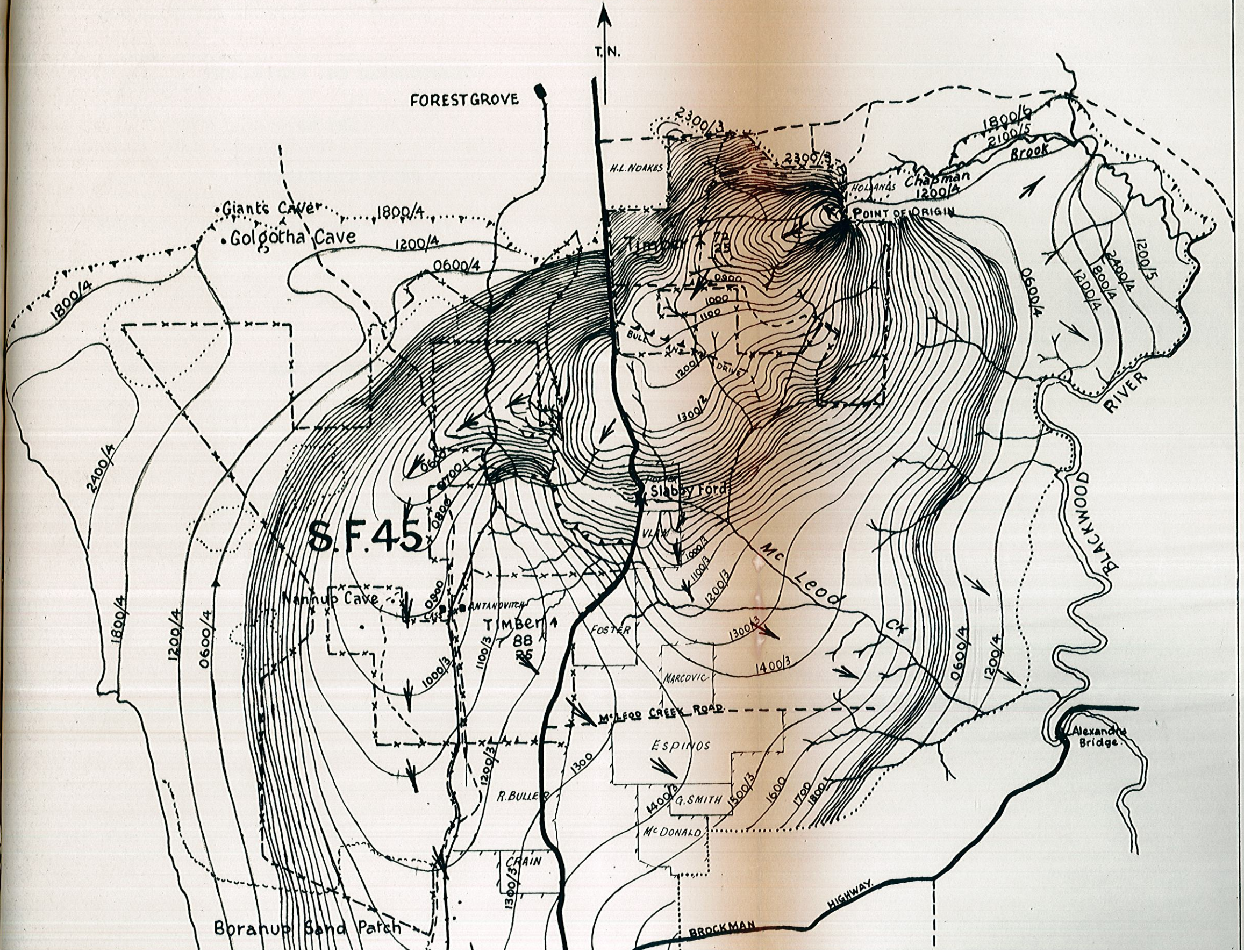


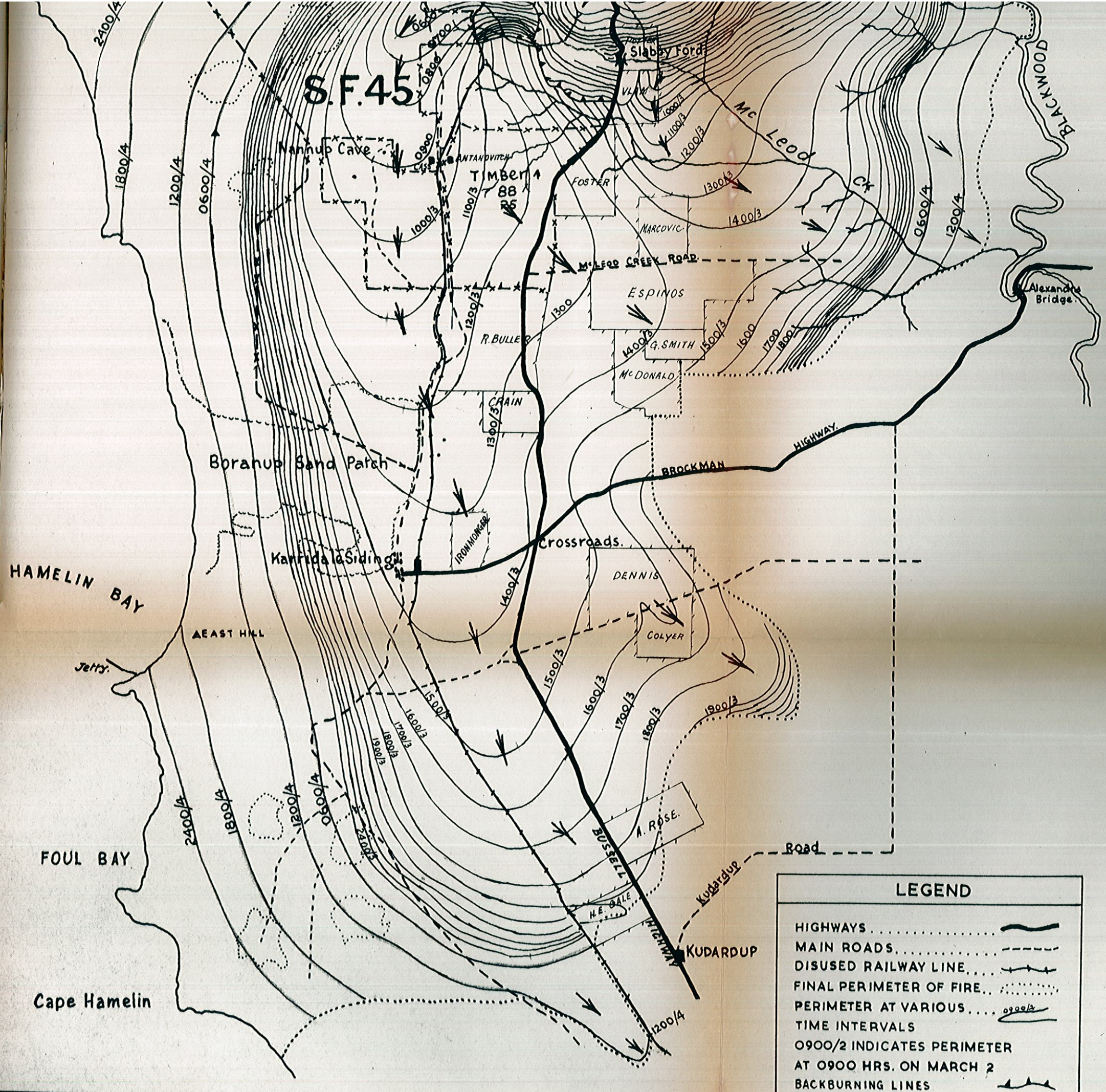
THE FOREST GROVE—KARRIDALE FIRE

27 FEB.—5 MARCH 1961

PERIMETER AT VARIOUS TIME INTERVALS

SCALE: 1 MILE TO 1 INCH





S.F.45

HAMELIN BAY

FOUL BAY

Cape Hamelin

Boranup Sand Patch

Karridale Sidings

AEAST HILL

Slabay Ford

Nannup Cave

ANTANDVITCH

TIMBER 88 85

FOSTER

MARCOVIC

ESPINOS

G. SMITH

MCDONALD

R. BULLER

CRAIN

IRONMONGER

Crossroads

DENNIS

COLYER

A. ROSE

H.E. GALE

KUDARDUP

Alexandra Bridge

BLACKWOOD

LEGEND	
HIGHWAYS	
MAIN ROADS	
DISUSED RAILWAY LINE	
FINAL PERIMETER OF FIRE	
PERIMETER AT VARIOUS TIME INTERVALS	
0900/2 INDICATES PERIMETER AT 0900 HRS. ON MARCH 2	
BACKBURNING LINES	