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DEPARTMENT OF CONSERVATION  
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REPORT ON FIRE IN GREYSTONES PLANTATION

MUNDARING DIVISION

29/1/1973

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DIARY OF EVENTS

29/1/1973

- 1040 Simultaneous sighting of smoke by Gungin and Dale towers.
- 1045 F/G Pollock in office, plotted smoke in Greystones Compt. 4. F/A Butts and A/F Selkirk advised red action required, acting O/S C. Heine and H.Q. standby crew instructed to proceed to fire. Pollock left for fire.
- 1050 Butts and Selkirk in office. A.D.F.O. Scambler left for fire. Siren sounded, Mundaring standby crew despatched.
- 1055 Gnangara and Kelmscott advised, message passed to Supt. F.J. Campbell.
- 1056 Scambler at fire, Pollock remained on Allen's Rd. to guide incoming crews. O/S Heine with L/D and two men arrived at fire after unsuccessful attempt to approach fire from east side. Towers plot of fire confirmed.
- At this stage, the fire extended from a few metres to the west of the creek in compartment 3 adjacent to the Weir, to about 90 metres east of the track alongside the creek. The fire had not crossed the track on the southern end of compartment 4, although two spotfires had commenced N of the track and within a few metres of it. Heine's crew successfully held the fire along this track until support arrived.
- 1102 O/S Thompson with 4x4 H/D and one man at fire proceeded to attack headfire on eastern flank.
- 1105 O/S Peet with combination truck and one man at fire and assisted Thompson in headfire attack.
- 1108 Acting O/S B. Rhodes with 3 men in L/D at fire and attacked the western section of the fire burning on both sides of the creek in compt. 3.
- 1120 Running fire stopped and packspray patrols deployed on N and E flanks of fire.
- 1126 Tip truck with slip-on H/D and two men arrived at fire via N and E boundaries of compt. 4.
- 1127 Scambler advised F.C. to call off red action.
- 1140 Michigan front end loader arrived at fire and commenced pushing in.
- 1142 Act. O/S Heine completed patrol of N and E boundaries of compt. 4 without observing any spotfires. Pollock carried out front patrol inside compt. 4.
- 1144 Scambler proceeded back to H.Q.
- 1147 Act. O/S Rhodes, drafting water on edge of Weir to SE of fire reported fire "on other side of river". (The spotfire was in compt. 18, see plan appendix) The following events then occurred in rapid succession.
- Heine and three men with L/D proceeded to a point on the north side of the Weir opposite the spotfire, left the truck and proceeded around the arm of the Weir on foot, carrying rakes.
- Pollock parked his utility alongside Heine's truck and reported that Heine and crew should be able to contain the spotfire, which at this stage was estimated to be less than 10 square metres in size. Pollock despatched the tip truck with slip-on H/D unit to fire and proceeded to assist Heine's crew on foot.
- Act. O/S Rhodes and three men left for the spotfire by road.

1515 Backburning progressing N of Allens Rd. along track E of compt. 27 to Byfield Rd.

1525 D/F Cowcher reported to H.Q. and was requested to hold himself available for night shift.

1555 C.O.D. McNamara arrived at H.Q.  
F/R Newman, O/S Ashcroft and Dwellingup crew with H/D arrived at control point and proceeded to south-west sector.

1615 O/S Warren and Dwellingup crew with L/D arrived at control point and proceeded to southern sector.

1640 Scambler returned to H.Q., briefed McNamara and requested relief forces for night shift. Three sectors now defined.

1738 Fireboss reported Sector 1 is being held and will be secured.  
Sector 2 has running fire within the dozer break, and break will be edged. The edge of compt. 35 held.

1750 Adams reported hopover in compt. 15 being edged in by D4.

1820 DE Fire Control advised relief forces for night shift.

1830 F/R G. Newman and O/S Treasure with Harvey gang in L/D reported to control point and despatched to Sector 1.

1910 Sector 1 reported all running fire stopped, mopping up commenced.

2000 Collie D4 and Jarrahdale Michigan arrived at fire and commenced mopping up Sectors 1 and 2.

2040 Inspector Lejeune arrived at H.Q.

2045 F/R White, F/R Kearns and O/S Osborne with Harvey crew and H/D arrived at control point and proceeded to Sector 1. Adams, Pollock, O/S Thompson and crew relieved. Sector 3 now held from Allens Rd. to aircraft burn.

2050 Scambler returned to H.Q. and briefed Lejeune.

2105 S.F. McEvoy reported to H.Q. for Supply Officer duties.

2145 F/A Butts rested. Situation stable and McEvoy left to return to Bunbury. O/S Heine and Rhodes crews relieved.

2205 F/R G. Black and Collie crew arrived.

2210 Lejeune and Cowcher proceeded to fire to relieve Vince.

2315 Scambler, Vince, Hunt, O/S's Saunders and Peet's crews relieved.

30/1/1973

0530-0700

All external officers and gangs relieved. Forster took over as Fireboss, Adams, Cave and Pollock sector bosses, Selkirk patrol, F/G Mathews and Mersch recce.

Mopping up proceeded through the day with all Mundaring wages personnel, except H.Q. gang.

1020 Hopover occurred on south boundary of compt. 27 adjacent Allens Rd.

1043 Hopover under control.

1700 All officers and men left fire, H/D patrol maintained to 1900 hrs.

2000 Cowcher carried out late patrol.

1202 Scambler viewed the spotfire from compt. 3 and proceeded around the Weir by road, calling for the 4x4 H/D to proceed to the spotfire. This vehicle was drafting and did not receive the transmission.

1204 The rake attack was unable to contain the spotfire, which had spread easterly for a distance of approximately 80 metres and was burning on both sides of the northernmost track in compt. 18. Winds at the spotfire were observed to have increased considerably above levels noticed in compt. 4 and are estimated at this time to have been 20-30 k.p.h. Act. O/S Rhodes with L/D arrived and attacked the headfire with live reel hose. The tip truck H/D backed into the tail of the fire (he could not proceed direct to the fire (head) not having 4 wheel drive) and attempted to attack the S flank of the fire. Both attempts failed due to the rapid development of the headfire, which was crowning in coppice N of the track.

1214 The two units proceeded to the eastern boundary of compt. 18 to re-approach the headfire.

1215 Scambler arrived at spotfire.

1218 Tip truck and L/D arrived back at headfire via compt. 18 eastern boundary track.

1220 Several spotfires observed to N and E of fire at distances ranging from approximately 100-500 metres.

1226 Red Action re-called. F/R Adams at fire, O/S Thompson with 4x4 H/D at fire.

1232 Spotfires observed to be developing rapidly and in turn spotting.

1234 L.F.O. called. Supt. F.J. Campbell and C.O.D. McNamara appraised.

1240 Pollock with Act. O/S Rhodes and L/D despatched to Allens Rd. to recce. Other forces remained to hold fire out of plantation in compt. 18.

1250 Pollock requested to attempt to prepare fireline in E side of fire to cut off headfire into 1978 aircraft burn.

1310 DE Fire Control manned.

1313 DE Fire Control requested to despatch fireboss, D4 and two gangs in addition to red action support en route.

1315 Pollock and Rhodes crew commenced backburning from first track E of Hairpin Bend on Allens Rd., working N-S.

1320 Gnangara crew at fire, deployed to compt. 18.

1330 Forester Hunt with O/S Saunders and Kelmscott crew at fire and deployed to western flank north of Weir.

1350 Control point set up at eastern end of compt. 2 and F/R Forster took over as fireboss.

1400 O/S Peet with 2 men in combination truck left compt. 4 to assist Kelmscott crew on west flank. One man packspray patrol left in compt. 4.

1410 Scambler returned to H.Q.

1415 A/F Selkirk proceeded to fire as Recce Officer.

1445 Forester Vince took over as Fireboss.

1455 Pollock with Rhodes crew and Michigan backburning to west of compt 35, proceeding south.

1505 Gnangara D4 arrived at fire and commenced to clear break through compt 14. Scambler left H.Q. to view fire with Vince. Forster proceeded to western flank to assist Hunt.

31/1/1973

.....  
Mopping up and patrol continued with 2 gangs,  
Michigan and 2 D4's.

L. 2. 5. 6. 7/2

.....  
Salvage operations commenced. Two men with  
jib crane and H/D worked with pieceworkers to  
pull in tops and extinguish those which caught  
alight.

8/2

.....  
Salvage operations continued by piecework  
only - completed 19/2.

WEATHER AND TOPOGRAPHY:

Forecasts for the day were:-

Dwellinup Fine and warm, winds 10-1200 hrs. SE at 13 k.p.h.  
..... 12-1400 SE 13  
14-1600 S 16  
16-1800 S 16

EMT 27° EMRH 30%

Perth Fine and warm, winds 10-1200 hrs. SE at 13 k.p.h.  
..... 12-1400 SSW 19  
14-1600 SW 24  
16-1800 SW 24

EMT 29° EMRH 28%

Tower winds recorded as follows:-

	<u>0900</u>	<u>1000</u>	<u>1200</u>	<u>1400</u>	<u>1600</u>	<u>1800</u>
Dale	NE 8	Nil	W 5.16	W 26.33	WSW 35.36	WSW 35.36
Gungin	E 5.10	Nil	W 5.16	WSW 5.16	SW 5.16	
Sawyers	E 8.16	N 8.12	W 16.24	WSW 8.16	SW 18.24	

H.Q. temperature and RH% readings were as follows:-

	<u>0800</u>	<u>1000</u>	<u>1200</u>	<u>1400</u>	<u>1600</u>
Dry Bulb	16.5°	25°	28°	27°	25°
R.H.	71%	44%	32%	36%	44%

Maximum temperature for the day was 30° C.

Min. R.H. for the day was ..... 24%.

Drought Index = 666

F.D.I.

Basic Hazard was 7.7

Taking wind strength as maximum at nearest tower (Gungin)  
i.e. 16 k.p.h.

F.D.I. = 52.7 Jarrah = 174 Pine

TOPOGRAPHY

The area is deeply dissected by the Helena River and tributary creeks. The terrain varies from moderately steep to very steep, and the ground surface is generally rocky with occasional large outcrops of granite.

LOCAL WIND BEHAVIOUR:

During the attack on the fire in compt. 4, winds were observed to be very light, estimated less than 5 k.p.h., and high smoke travelled slowly in a NE direction. Gungin tower reported an absence of wind at this time.

During development of the compt. 18 spotfire, wind strength was estimated to be 20-50 k.p.h. in a westerly direction. Towers 1200 readings confirm that the westerly was in at this time and Gungin recorded it at 5.-16 k.p.h.

It would appear that the compt. 4 fire may have created its own wind and the NE smoke movement was principally due to the effect of slope. The increase in wind strength in the area of the spotfire above that recorded by towers was probably due to constriction within the arm of the Weir.

FUELS:

Compt. 4

Open grown P. Radiata, approximately 125 stems/hectares (50/acre), planted 1952. Moderately dense undergrowth of A. Cynophilia with grass, wild oats and pine thinning slash on ground.

Needle bed =	12	T.P.H.
Wattle, scrub, grass	10	"
Slash	7.5	"
	<hr/>	
	27.5	"
	<hr/>	

Location of Hopover

Moderately dense wattles with occasional coppiced flooded gum and marri. A high proportion of dead scrub material was present.

Estimated scrub fuel = 15 T.P.H.

Compts. 14, 18

1927/28 P. Radiata, approximately 75 trees/hectare.

Light undergrowth of wattles with heavy thinning slash and grass on ground.

Needle bed =	14.5	T.P.H.
Slash	39.5	"
Scrub and grass	6.0	"
	<hr/>	
	60	"
	<hr/>	

Hardwood coppice

The hardwood areas south consist mainly of failed P. Radiata plantations planted 1929, and subsequently clear felled by 1955 and abandoned to jarrah and marri coppice regrowth. These areas had been included in the plantation protected area and had not come under regular burning. The time of the last burn carried in this regrowth country was after clear falling in 1956.

Average litter weight = 22.0 T.P.H.



## FIRE BEHAVIOUR

### Compt. 4

Estimated R.F.S. = approximately 300 metres/hour. Observed headfire flame height 1.3-3 metres. On the day after the fire, it was noted that a group of pine crowns had burnt to a height of approximately 7 metres, this having occurred before first arrival at the fire. It is assumed that maximum flame height at this time would have been about 15 metres.

### Spotting

Was light near the immediate perimeter of the fire, 5 spots were noted on both the east and north sides of the fire, all within 20 metres of the final perimeter. Distance of the Compt. 18 hopover from the most easterly side of the Compt. 4 fire was 260 metres, slightly S of E. Some time subsequent to the Compt. 18 hopover, 2 stumps were found to be smouldering on the bank of the Weir, at distances of 85 metres and 140 metres, and due east of the fire in Compt. 4.

### Hopover

Estimated R.F.S. = 400 metres/hour.

Headfire flame height 2 metres - 6 metres (in coppice). Spotting distance 100 - 300 metres.

### Compts. 14 & 18

This section consisted of the flank fire.

Estimated rate of spread 150 metres/hour. Flame height 2 - 15 metres, with occasional crowning of pine in compt. 18 gully.

### Regrowth hardwood area

Based on 2½ hours taken for the fire to travel from compt. 18 to Allens Rd. due east, a distance of 1600 metres, average R.F.S. was 640 metres per hour inclusive of spotting.

Headfire flame height varied from 3 - 25 metres. A crown fire was observed to be running ahead of the main headfire on the steepest slopes in wandoo forest.

### Spotting

Development of spotfires thrown by the original hopover in compt. 18 was rapid, and it was observed that the spotfires were in turn spotting by the time they had attained a size of approximately 0.25 hectares. The steep slopes, heavy fuels and strong winds created by the constricting gullies caused by spotting for spectacular distances, fortunately into the 1972 aircraft burn. The longest spotfire noted lit a single marri tree approximately 1400 metres from the fire.

## SUPPRESSION

### Initial Attack

The first L/D unit with Act. O/S Heine and the standby crew held two spotfires to the north of the southern back in compt. 4, and kept the fire south of this track until the H/D's arrived. O/S Thompson with 4x4 H/D attacked the headfire direct and was shortly supported by O/S Peet with combination truck. Act. O/S B. Rhodes with L/D and the Mundaring standby crew then arrived to suppress the western end of the fire burning on both sides of the creek in compt. 3

### Patrol of compt. 4 fire

One man packspray patrols were put on both the east and north flanks of the fire prior to running fire being stopped. F/G Pollock patrolled inside of compt. 4 on foot. The tip-truck with slip-on H/D unit was directed by despatcher A/F Selkirk to approach the fire via the N and E boundaries of compt. 4 and did so. Act. O/S Heine with L/D patrolled the N and E boundaries of compt. 4 after running fire was suppressed, and completed his patrol about 5 minutes before the compt. 18 hopover was observed.

### Hopover attack

Act. O/S Heine and 3 men walked around the arm of the Weir on foot and attacked the hopover with rakes. Act. O/S Rhodes with L/D and tip truck with slip-on H/D and two men proceeded around the Weir by road. It is estimated that the rake attack commenced within 5 minutes of the spotfire being observed, and the two trucks arrived at the fire about 17 minutes after the hopover was observed, having had to travel a distance of 5.9 kilometres.

The spotfire was only about 10 square metres in size when the rake attack commenced, but the attack failed due to the intense heat of the fire and the rocky ground. On arrival of the trucks, only the L/D 4x4 unit was able to proceed direct to the headfire, which was now commencing to crown in coppice stems, and was too hot for the small pumper. The tip truck H/D, arriving just behind the L/D, backed in the rear of the fire and commenced to suppress the south flank.

Progress along the flank was not fast enough, and when the L/D pulled out from the headfire, both units proceeded to the eastern boundary of compt. 18 to regroup at the headfire. However, before an effective attack was commenced on the headfire, at least seven spot fires were observed to the N and E of the fire, on both sides of the creek at distances ranging from 100 - 300 metres. It was at this stage that the red action was recalled, and when spotfires were observed to be in turn spotting a L.F.O. was called.

### L.F.O.

Due to the difficult country and the severity of the headfire, direct attack was not possible. The only tactics available were to attempt to run the fire into the 1972 aircraft burn E of Allens and Byfield Roads. Only one officer and one crew were initially available for this, as other forces were required to hold the fire out

of very valuable plantations in compts. 18 and 14, and one unit had been left to tend to the compt. 4 fire.

#### South flank

The flank fire in compt. 18 and 14 was held by 4x4 H/D (O/S Thompson and 3), tip truck H/D (2 men), one crew with hand tools (Act. O/S Heine and 3) directed by F/R Adams. These were reinforced at 1320 by F/R Law, and Gngangara red action crew with H/D, and at 1600 hours by F/R R. Newman and O/S Ashcroft with Dwellingup crew and H/D.

#### East flank

F/G Pollock with Act. O/S Rhodes and 3 in L/D commenced backburning from Allens Rd. due south along the first track east of the hairpin bend, but had to abandon this line due to heavy spotting east of the track. They subsequently back burned successfully along the west boundary of compt. 35 and due west along the road between compts. 35 and 14. This sector was reinforced by the Michigan front loader and tip truck H/D at about 1400 hours, and by O/S Warren and Dwellingup crew in L/D at 1615 hours.

The Gngangara D4 arrived at the fire at 1500 hours and commenced to clear a break through compt. 14 to link up the back burned fireline with the section held through compt. 18 to 14.

#### West flank

The first attack on this sector was commenced by F. Hunte with O/S Saunders and the Kelmscott crew at 1330 hours. At this stage the fire had spotted heavily into 5 year old fuel north of Allen's Rd., and an attempt was made to rake a fireline from Allens to Byfield Rds. to cut the spotfires off. This was proceeding extremely slowly, due to the rocky country and steep slopes, and when this sector was reinforced by O/S Peet and 2 in combination truck at 1400 hours, backburning was commenced along the track SW of reference tree AR 70 3. This sector was subsequently reinforced by F/R Forster at 1500 hours and the fireline was completed and held between Allens and Byfield Rds. by about 1900 hours, after which the section between the Weir and Allens Rd. was raked in by hand.

All running fire was stopped by around 2000 hours.

#### Mopping Up

Certain problems encountered in mopping up within pine compartments are worthy of note.

1. On the south west section of the compartment 4 fire, a ground fire occurred in peaty soil adjacent to the creek. This was mopped up using a Pacific Marine portable pump, and at least 20,000 gallons of water were required to extinguish a small area of about 0.25 hectares.
2. Old pine stumps burnt for days below ground and even along lateral roots. Careful examination of ground in the vicinity of old stumps is essential close to the fireline, since it is possible for a lateral root to burn ~~into~~ under the firebreak.

2. It is also necessary to create a firebreak well down into mineral soil around plantation fires where old stumps are present.
3. As it is essential to commence salvage recovery of pine logs as early as possible, a H/D unit is required to stand by when the cutters are working on hot ground. Tops and slash should be immediately hauled well into the burnt area.
4. Although "willie willies" were not in evidence after the fire, probably due to cool weather and stable atmospheric conditions, the likelihood of their occurrence after a pine fire is high, and they have been very evident after pine clearing burns.

AREA BURNT AND COST OF FIRE

Area Burnt

Compt. 4 - total area burnt 1.8 hectares, including 0.6 hectares under pine.

Compts 18, 14

2.8 hectares of pine burnt, about 250 trees.

Hardwood Area

Total area burned 194 hectares.

Cost of Fire

<u>Division</u>	<u>Wages</u>	<u>Plant</u>	<u>Total</u>
Wamneroo	240.00	132.23	372.23
Kelmscott	330.00	212.00	542.00
Dwellingup	903.00	189.00	1092.00
Harvey	900.00	106.02	1006.02
Collie	522.00	117.00	639.00
Mundaring	2678.00	1090.63	3768.63
	5573.00	1846.88	7419.88
Food			86.17
Total cost			<u>7506.05</u>

Damage

Scorch height in hardwood area was total with many areas defoliated. However, the stands consist of multiple stem coppice regrowth and C quality wandoo forest and have little production potential.

No loss of pine wood occurred, and salvage of the burnt areas produced :-

36.0	loads	5'7"	casewood
34.9	"	7'9"	"
98.4	"		mill logs
95.3	"		peelers

CAUSE

No firm evidence as to cause of the fire was obtained. However, recent children's footprints were found adjacent to the point of origin of the fire. It is not thought that the fire commenced on the morning of 29th January, since no vehicles were seen in the area at that time. It is quite possible that a family group somehow lit a fire adjacent to the creek in compartment 4 on the 28th January, and the fire smouldered in peaty soil overnight before running on the 29th.

Public entry to the area within one mile of the top water level of Mundaring Weir is prohibited by the Public Works Department, but a large number of persons undoubtedly enter, particularly on weekends.

## COMMENTS

### Red Action & Initial Attack

It is considered that the red action turnout and the initial attack on the fire were fast and effective. The decision to call off the red action was obviously incorrect. However the necessity for fast divisional turnouts is emphasised by the fact that neither Kelmscott or Gnangara crews would have arrived in time to attack the compt. 18 hopover before it got out of control if they had proceeded direct.

Kelmscott combination truck had not left H.Q. when the red action was called off.

Gnangara crew did not receive radio advice that the red action was called off until approximately 11.37 and they were at this stage about 55 minutes travelling time away from the fire in compt. 18.

### Spotting

It was not anticipated that a hopover would occur south of the arm of the Weir for the following reasons:-

1. Winds during suppression of the compt. 4 were light and smoke from the fire travelled NE, up the slope of compt. 4.
2. Spotting observed during and immediately after suppression of the running fire was light, and confined to within 20 metres of the E and N boundaries.

However the following factors were not appreciated during attack.

1. The fire had crowned in several pine trees prior to first arrival. Towers reported a large column of black smoke boiling up vertically shortly after detection, but this information was not passed on to the field. Examination of the fire on 30/1/1973 confirmed that the fire had crowned in about 6 trees.
2. The area between the compt 4. fire and the hopover is largely dead ground fuelwise, consisting of the Weir and its banks. Although two stumps were found, to be smouldering on the north bank some time after the occurrence of the compt. 18 hopover, these were not detected early enough. Had there been continuous fuel east of compt. 4 there would undoubtedly have been a trail of spotfires extending east.

Towers recorded easterly winds at 0900 and these backed to the west with a fixed westerly occurring shortly before 1200 hours. While conditions were generally calm up 1200, it is probable that the crowning which occurred in compt. 4 co-incided with a westerly gust.

Hopover attack

Factors contributory to failure to hold the spotfire were:-

- (a) Confusion due to occurrence of the fire in area not anticipated.
- (b) Fatigue following initial attack.
- (c) More intense fire development of the hopover than anticipated, and thus underestimation of the consequences of the time factor involved in travelling to the hopover by road.
- (d) Failure to get water to the fire early, either by packsprays or by running a hose across the Weir.

L.F.O.

Officers participating in the L.F.O. were as follows for the initial stages:-

Controller/Intelligence	A.D.F.O. Scambler
Recce & Subsequently Supply	A/F Selkirk
Fireboss	For. Vince
Sector Bosses	F/R Adams, F/R Forster F/G Pollock, F/R Law, For. Hunt.
Recorder, Timekeeper, Caterer	F/A Butts

While it is considered that an effective attack was maintained on the fire at all times, the period which elapsed until the L.F.O. was functioning on a properly co-ordinated basis was excessive. It is thought that this was principally due to the lack of an adequately staffed H.Q. control.





CONCLUSIONS:

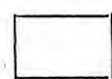
1. The need to anticipate spotting within a wide area ahead of hills plantation fires has been demonstrated, and this must be borne in mind by O.I.C. red action, who should give consideration to instituting a fast roving patrol ahead of plantation fires at the inception of the red action.
2. Towers reports of smoke indicative of crowning are highly significant and must be passed on to O.I.C. red action.
3. Water is essential to contain hopovers in heavy fuel, particularly when even a slight time delay is involved.
4. A properly staffed H.Q. control should be set up as soon as possible at all L.F.O.'s, and it is the responsibility of the O.I.C. of the fire to implement this.

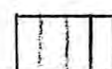
LEGEND

MUNDARING PLANTATION FIRE 20/10/71

 FIRE AREA

 AERIAL C.B. 1972

 Old Coppice Fuel

 5 YR. OLD FUEL

AR

