

REPORT ON PLANTATION FIRE AT SOMERVILLE
ON JANUARY 28th 1964.

SUMMARY.

At 1509 hours, on January 28th, Somerville tower reported a fire in Compartment 66, of Somerville plantation. An F.D. gang was working in close proximity, and reached the fire within 10 minutes of the report.

At 1525 hours another fire was reported, in Compartment 14. The gang left the fire in Compartment 66, which was under control, and went to the fire in Compartment 14.

An attack was made on the headfire, supported by additional forces arriving from Collier. The attack was unsuccessful, due to frequent spotting in front of the main fire. The suppression force withdrew to the northern and eastern firebreaks surrounding the Compartment, and supported by units from Wanneroo, and local volunteer assistance, contained the headfire in Compartment 14. The main headfire reached the firebreaks at 1630 hours, and spotted heavily into Compartment 10, 11 and 15. Activities in suppressing these spot fires, prevented the transfer of part of the suppression force, to the flanks of the fire.

The arrival of dozing machines, from local sources, and gangs from Mundaring, and Gleneagle, permitted control of the flanks and back fire. A complete break around the fire had been constructed by 2000 hours, and the running fire stopped.

The approximate area burnt is 20 acres of SQ3 P. Pinaster, (33 years old) in Compartment 14, and $\frac{1}{4}$ of an acre of 14 year old P. Pinaster, in Compartment 66.

Mopping proceeded during the night, and the major work had been completed at 1600 hours, on 29th January, and assisting outside forces were dispatched to their respective headquarters.

Weather conditions were mild when the fire outbreak occurred, and can be described as a Moderate fire hazard, with a moderate S.W. wind.

CAUSE.

Children are the suspected cause of the fire, in Compartment 66. A child's tracks were found near the scene of the fire.

The cause of the fire in Compartment 14 is in doubt. There are two probabilities:

(1) The fire in Compartment 14 is in direct line, with wind direction, from the fire in Compartment 66. This orientation suggests that the fire in Compartment 66 spotted into Compartment 14.

(2) The distance between the fire in Compartment 66, and the origin of the fire in Compartment 14, is 10 chains. From measurements within the area contained by the fire break (constructed in the first attack), the size of the fire in Compartment 66, when spotting into Compartment 14, was approximately 3 chains long and 2 chains wide. The fire has fully browned the crowns, but only 3 to 4 trees show evidence of the crown burning, hence it was not an intense fire.

The fire in Compartment 14 was slightly larger than the fire in Compartment 66, when first attacked. Spotting was frequent within 3 to 4 chains, but at this stage no 10 chain spotting was recorded. There is no evidence of any other spot fires from Compartment 66, other than the one fire in Compartment 14.

Spotting over a 10 chain distance does not appear likely, under these conditions, and if this hypothesis is accepted, the fire in Compartment 14 was deliberately lit.

DETECTION.

At 1509 hours Somerville tower reported two fires, in Compartment 66 of Somerville plantation, to Collier headquarters. It is improbable that one of those fires reported, was the fire in Compartment 14. The tower panorama shows a distinct crown level difference between the two compartments.

At 1525 hours suppression of the fire in Compartment 66 was well advanced, and the tower detected another black smoke, directly in line, but behind, the fire in Compartment 66. This was the fire in Compartment 14. Field observation showed that in fact, the two fires were in direct line, with the line of sight from the tower.

Action to suppress the Running Fire.

This section is divided into two parts.

- (a) Commentary on the course of suppression during the fire.
- (b) Resume of the suppression forces at the fire, during certain periods of its development.

COURSE OF SUPPRESSION.

On the afternoon of January 28th, the Somerville gang was pruning in Compartment 64. The fire in Compartment 66 was reported at 1509 hours, to Collier, and by 1515 hours the Somerville gang had reached this fire.

Suppression action was prompt, and shortly after arrival, the overseer reported the fire under control.

At 1525 hours the smoke in Compartment 14 was detected, and the Somerville gang transferred to this fire, arriving at 1530 hours. The headfire was attacked, and support from Collier i.e. Mr. Ashcroft and 2 pumpers, arrived between 1535 and 1540 hours.

The Somerville gang and pumper, plus the two Collier pumpers attacked the headfire, under the direction of Mr. Ashcroft. At this time the fire had developed in a long narrow tongue, 3 to 4 chains in length, $\frac{1}{2}$ chain wide, and was spotting 3 to 4 chains ahead. Almost immediately the suppression force was depleted by a breakdown in Collier No.1 pumper. This machine was removed from the fire, partially repaired, and transferred to the suppression of the fire in Compartment 66.

The remaining two pumpers, and gang, continued with suppression efforts on the headfire in Compartment 14, but due to continual spotting, were unable to establish control.

At 1610 hours the forces were withdrawn to the northern and eastern firebreaks, surrounding the Compartment, and concentrated on preventing spot fires developing in adjacent areas. The main headfire reached the firebreaks at 1430 hours, and was accompanied by heavy spotting into Compartments 10, 11 and 15.

The suppression force was bolstered by the arrival of a Fire Brigade 4 x 4 at 1630 hours, the Wanneroo gang and pumper at 1440 hours, and a Michigan Scoop from Sol Toghios. The scoop was assigned to cutting a break around the eastern flank, but the remaining force was concentrated on the headfire. The headfire, and spot fires in adjoining Compartments, was contained by this force.

Between 1630 and 1715 hours a D6 bulldozer from the Melville Town Council, and the Mundaring gang, arrived at the fire. The bulldozer commenced cutting a break on western flank, and was followed by the Mundaring gang.

On arrival of the Gleneagle gang at 1830 hours, the Mundaring gang was transferred to the western flank, and their position filled by Gleneagle. At 1945 hours the Somerville gang was transferred from the headfire, to the eastern flank.

At 2000 hours a complete break had been established around the fire, and the running fire was stopped.

(b) Resume of suppression forces.

The following notes refer to the concentration of suppression forces required for the control of the fire in Compartment 14.

(1) 1535 hours.

Fire size was 3 to 4 chains long, and $\frac{1}{2}$ chain wide. Spotting was occurring 3 to 4 chains in front of the headfire.

Suppression forces.

- 1 gang
- 2 effective pumpers
- Fire not contained

(2) 1640 hours.

Headfire held on the eastern and northern breaks. With the exception of Michigan scoop, which had just started work, no attack yet made on flankfire.

Suppression force which held the headfire.

- 3 F.D. gangs
- 4 pumpers
- 4 members of the fire brigade
- 3 local volunteers
- Headfire brought under control.

(3) 1715 to 1830 hours.

Effective suppression of the whole fire commenced. The strength of the force.

- 1 Michigan scoop
- 1 D6 bulldozer
- 1 light grader
- 5 F.D. gangs
- 5 pumpers

MOPPING UP.

Mopping up was designed to fully douse all ignited material, within the fire area, which approximated 20 acres. A cool edge was established first, then the units worked progressively deeper into the fire, until the whole area had been covered.

Mopping up commenced immediately after effective control of the fire in Compartment 14 had been established. The fire in Compartment 66 had been suppressed by Collier No.1 pumper, and was mopped up at the sametime.

Most of the critical mopping up had been completed by 1100 hours on 29th January, and by 1600 hours the objective had been achieved, and outside assistance was dispatched to home headquarters.

On the night of the 28th and 29th the force engaged on mopping up was

- 5 F.D. gangs
- 1 D4 bulldozer
- 4 pumpers

AREA BURNT.

The fire in Compartment 14 burnt a strip approximately 20 chains long and 10 chains wide. The estimated area is 20 acres. The fire in Compartment 66 is estimated at $\frac{1}{2}$ of an acre.

FIRE DAMAGE.

Only isolated trees have burnt crowns, but most are fully scorched. Tree bark has been blackened for a height of 15 to 25 ft. All fuel was burnt, i.e. mineral soil exposed.

FOREST TYPE.

The fire in Compartment 14 burnt through 33 year old SQ 3 P. pinaster. The fire in Compartment 66 involved 14 year old P. pinaster.

FUEL TYPE.

The needle layer in both compartments was 3 to 4" in depth, and approximates 20 tons to the acre of fuel.

Above the needle layer were frequent heaps of thinning slash. These heaps were 3 to 4 ft. in height, and contributed greatly to both fire intensity, and difficulty of suppression. Trees in Compartment 66 carried clusters of needles in branches, fairly close to the ground, but fortunately, in most cases these did not ignite.

All fuel was extremely dry, and fully consumed by the fire.

WEATHER CONDITIONS.

Weather readings for the afternoon of the 28th January, were supplied by the Bureau of Meteorology in Perth, and should approximate the conditions at Sommerville.

Recordings of wind direction, strength in knots, temperature and relative humidity are given in table 1.

Table 1 - 28th January, 1964.

Time	Wind Velocity Knots	Wind Direction	Temperature	Relative Humidity
1200 hours	12	SW	81	55
1400 "	14	SW		
1500 "			77	58
1600 "	13	SW		
1800 "	12	SW	73	67

Using Hatch's tables as a basis of classification, the temperature and relative humidity readings fall within the Moderate fire hazard rating. The wind direction is Moderate, hence fire danger was not high, when compared to usual summer weather.

FIRE BEHAVIOUR.

A rate of spread plan, showing the approximate size of the fires at different times, has been prepared. The rate of forward spread is estimated at 17 chains per hour in Compartment 14. The average headfire flame height, on this fire, was 8 to 10 ft., and average flankfire height 3 to 6 ft.

Spotting developed quickly, once the fire had reached a length of 3 to 4 chains. At this size the distance of spotting, in front of the headfire, was restricted to 3 to 4 chains. At the final fire size three distinct zones of spotting intensity were defined.

(a) Within 3 chains of the headfire.

Spot fires frequent, estimated that one spot fire occurred every 36 sq. ft.

(b) 4 to 6 chains in front of the headfire.

Four major spot fires were found, in Compartment 10.

(c) 6 to 10 chains in front of headfire.

Two major spot fires were found, both in Compartment 10.

Spot fire development was frequent, up to 2400 hours on the 28th January. In the early morning of January 29th, intensity decreased markedly, only two active spot developments being recorded, one at 0230 and one at 0630 hours.

ORGANIZATION OF OUTSIDE ASSISTANCE.

Collier headquarters formed the control centre for this fire.

Wanneroo headquarters was alerted at 1525 hours and Mundaring and Gleneagle at 1535 hours.

Assistance was drawn from all three divisions, and on the 29th January, Dwellingup was requested to assist with mopping up.

A diary showing time of arrival of various units was prepared by D.F.O's van Noort and Hewett. This diary is given in the appendix.

DISCUSSION.

It would be difficult to envisage a more efficient attack on these fires. The initial attack unit arrived within 10 minutes of the report, and supporting forces had arrived within 25 minutes. The initial attack was supported by fast follow up action from three divisions, and it is doubtful whether any major improvement in efficiency, could be achieved.

The fire danger at the time of fire outbreak did not exceed moderate to average, and in no way compared with peak fire danger conditions during the summer months.

The officers attending these fires did not indicate that the concentration of forces was excessive, in fact the force was fully extended to hold the fire.

These observations point to the question of what size of suppression force, would be required, to contain a plantation fire burning in similar fuel type, on a dangerous day. From observation of both the Somerville, and Gnangara fire of January 1963, it is contended that a massive suppression force would be required.

Accepting the real possibility of a plantation fire on a dangerous day, (Gnangara fire occurred on a day of Severe S) it therefore becomes a matter of high priority to reduce the fuel concentrations, within the plantations, to a level which permits fire control on days of severe and dangerous fire danger.

Two methods of fuel reduction are presented, as worthy lines of investigation, for research.

(1) Controlled Burning.

Experimental burning under pines has been conducted in W.A., and in Eastern States by McArthur. The investigations are in a rudimentary stage at present, but this method is presented as one which may have real application. There is an obvious risk involved in this research, but by careful selection of weather conditions, during the winter months, the risk can be minimized. It is suggested that present evidence is insufficient to truly assess the value of controlled burning under pines, but that it presents a worthy line of research.

(2) Fuel reduction by Mechanical Methods.

Hogging, chipping and burying present possibilities as methods of fuel reduction. Current S.A. research should give indication of the value of these methods.

It is suggested that research into fuel quantity reduction, should incorporate an investigation into alternatives to current forest practise. Disposal of slash heaps is of prime importance in reducing both fire intensity, and difficulty of suppression. The various methods of slash disposal, and the economics of the operation, is one aspect of forest practise worthy of further investigation.

G.B. PEET.

A.D.F.O.

For further reference officers attending the Somerville fire were:-
D.F.O.'s van Noort and Hewett, D.For. Ashcroft.



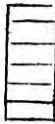

APPENDIX.

DIARY OF SUPPRESSION FORCE ARRIVAL TO SOMERVILLE PLANTATION FIRE

28th JANUARY, 1964.





1509 Hours Two fires in Compt. 66 reported to Collier Headquarters
1515 " Somerville gang arrived in Compt. 66 found one fire
and commenced suppression action.
1525 " Somerville tower reported a fire in Compt. 14.
1530 " Ashcroft arrived.
1535 " Two pumpers from Collier arrived.
1555 " Foot arrived.
1610 " O'Grady arrived.
1615 " Greyhound grader (Pethick) arrived.
1620 " Hewett arrived.
1625 " Fire Brigade 4 x 4 pumper arrived.
1630 " van Noort arrived.
1630 " Michigan scoop (Sol Togios) arrived.
1645 " Gorrindge arrived.
1640 " Wanneroo gang arrived.
1640 " Wanneroo pumper arrived.
1715 " Melville Council D6 bulldozer arrived.
1725 " Mundaring gang arrived.
1730 " Edwards arrived.
1830 " Mundaring pumper arrived.
1830 " Gleneagle gang arrived.
1930 " Pool D4 bulldozer arrived.

Section of Somerville Plantation Plan

Site Quality	I	II	III	IV
				

Scale: 10 chns = 1 inch.

Legend:

	Spot Fires
	Fire size at 1535 hrs on 28 Jan 1932
	" " " 1510 " " "
	" " " 1530 " " "

