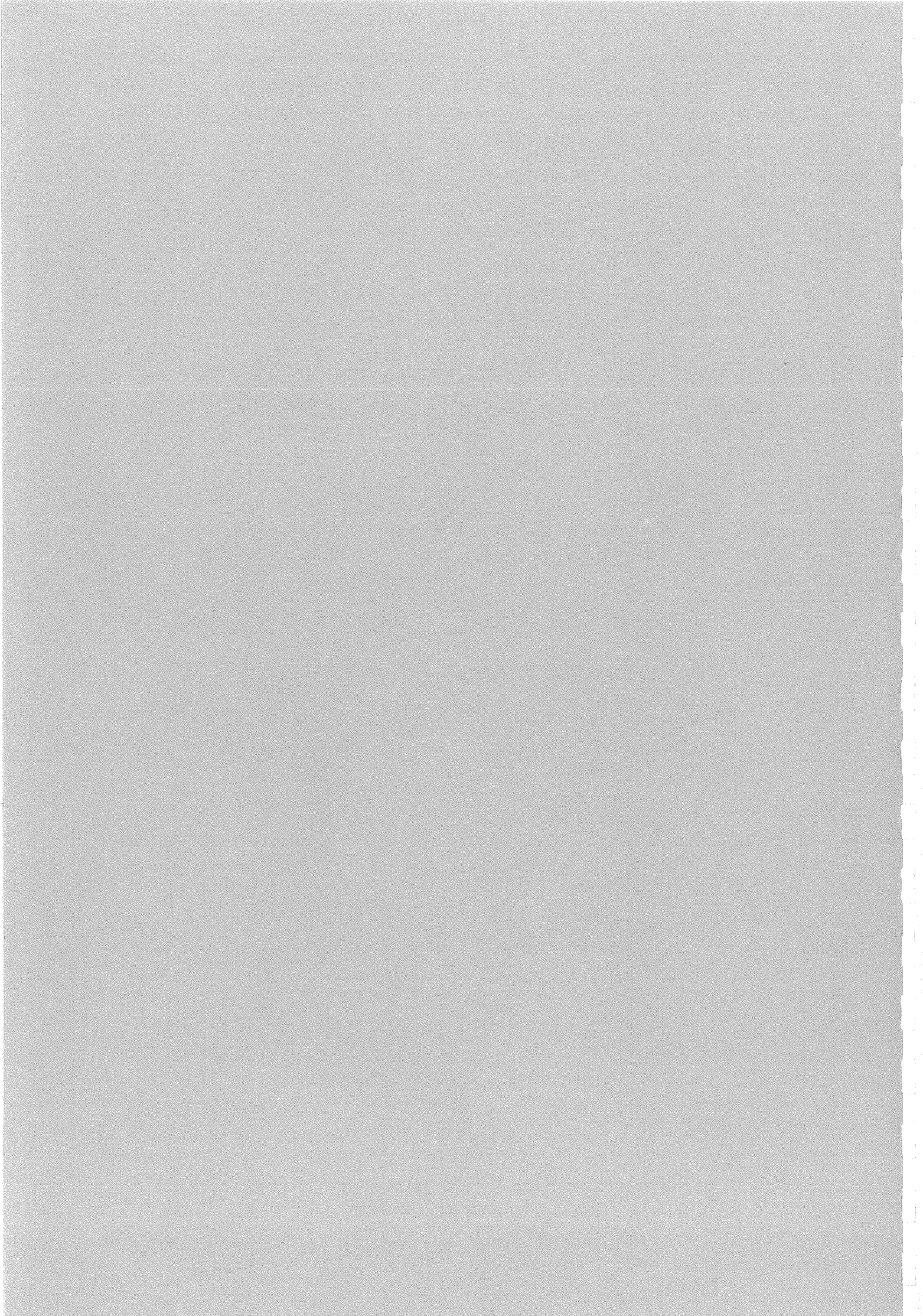


Jim Gould
Bushfire Research

BEERBURRUM WILDFIRES

SEPTEMBER & NOVEMBER 1994





**BEERBURRUM WILDFIRES -
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**REPORT BY THE WILDFIRE INVESTIGATION
COMMITTEE**

*Steve Hunt, Ross Hamwood and Steve Ollerenshaw
June 1995*

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1. INTRODUCTION

Three serious wildfires burnt through 4800 ha of exotic pine plantations at SF 611 Beerburum on 27/28 September 1994 and 6/7 November 1994. Approximately 600 000 m³ of timber was harvested with 400 000 m³ being placed under irrigated storage for later distribution to the sawmilling industry over approximately four years.

As well as Beerburum staff, the suppression of these fires involved Forest Service crews from adjoining Districts and Head Office, as well as members of the Bureau of Emergency Services Volunteer Rural Fire Brigades, Queensland Police, Local Government and members of the general public.

The total suppression cost was approximately \$500 000 and total resource loss will be dependent on the success of the log storage operation. At a minimum, this will be \$10 million.

These fires have demonstrated that even with an exotic pine prescribed burning program, large uncontrolled wild fires can occur in the exotic plantations of South East Queensland if extreme weather conditions prevail.

2. SUMMARY OF RECOMMENDATIONS

3. Seasonal Conditions and States of Fire Emergency

- (i) *The Fire Protection Officer consult with the Queensland Fire Service and the Bureau of Meteorology before June 1995 to improve the current fire weather warning systems, particularly with the imposition and lifting of State of Fire Emergencies. An improved system might incorporate such variables as drought index, rainfall, and seasonal severity index.*

4. Fire Preparedness Levels

- (i) *By August 1995, the Exotic Pine Consultative Committee review fire preparedness levels for exotic centres to include drought index as a further variable in the setting of levels.*
- (ii) *The Committee should also examine the potential for RED ALERT DAYS where drought indices exceed 400 and fire danger ratings are above 30 High. Each Plantation Centre would then nominate specific levels to apply on these days so as to optimise detection, deployment, first attack, additional airspot, etc.*

5. Fire Weather Conditions

- (i) *By August 1995, the Fire Protection Officer arrange a clearly defined protocol whereby the Bureau of Meteorology by the Fire Protection Officer whereby local weather information can be relayed direct to the Bureau from District Offices and spot forecasts given every hour when wildfires occur.*
- (ii) *After interpretation by the Fire Boss or controller, the forecasts should be passed on to field sector bosses so that they are fully aware of any possible weather changes.*

6. Ignition Sources

- (i) *That a working party of QEC and DPI Forest Service staff consisting of the Managers, Plantation Production and Native Forest Production, be formed to review and update the powerline clearing and maintenance guidelines applicable to State Forests and Main Roads by December 1995.*

- (ii) *That investigations into the cause and origin of major wildfires be undertaken immediately after their occurrence by regional staff adequately trained in investigation techniques (refer to further recommendations in Section 2.13 "TRAINING"). The Principal Legislation Officer will be the lead person to ensure adequate staff are available and sufficiently trained.*

7. Detection

- (i) *That a full report be immediately submitted to the District Forester on any fires detected during a State of Fire Emergency or Extreme Fire Conditions within 10 kms of the State Forest boundaries.*

8. Fire Behaviour and Suppression

- (i) *Fire units dispatched from other Districts should be fully equipped units with supervisor and crew who are prepared to stay overnight.*

9. Large Fire Organisation

- (i) *That training programs be instigated to ensure that District and Head Office staff fully understand the role and responsibilities of the key positions of the Queensland Large Fire Organisation. Fire Protection Officer to arrange by June 1996.*
- (ii) *That DPI Forest Service consult with Queensland Police and Queensland Emergency Services with regard to appropriate protocols in the event of major fire emergencies. These protocols would cover such issues as commandeering of people and equipment, road and highway closures, counter disaster arrangements and declaration of Public Safety Preservation Act 1986. Fire Protection Officer to arrange by June 1996.*

10. The Protection System

- (i) *Compartment access tracks should be identified as dead-end or through roads using the standard painting system. To be completed by District staff by June 1996.*
- (ii) *The protection system for exotic centres be reviewed by the Exotic Pine Consultative Committee in light of the losses sustained. This review should include:*
- *firebreak and access road design and maintenance;*
 - *signage and maintenance of water points; and*
 - *prescribed burning policy of exotic plantations and surrounding native forests.*

This review should commence by examining protection unit costs, the losses sustained in 1994 in the Beerburrum plantations, and an appropriate level of expenditure per hectare. Key people involved would be the Senior Economist, Fire Protection Officer, Risk Management Officer, and Regional staff. To be completed by June 1996.

11. The Forest Estate

- (i) The Forest Service notify Queensland Emergency Services of residential complexes adjacent to State Forest not serviced by Rural Brigades, and ask them to encourage the formation of Brigades for these areas.*
- (ii) The Forest Service further develop its relations with Local Government to promote better fire management planning principles in the residential/State Forest interface. There are two ways for the Service to do this:*
 - at the Rezoning Application stage and*
 - via submissions to Local Government Strategic Plan Reviews.*

Further, the Queensland Bush Fire Strategy Report September 1994 has recommended that Local Government prepare Fire Management Plans for their areas and the Queensland Fire Service is to provide a model for all agencies to follow in the joint compilation of these plans. The Forest Service should have input to the planning process.

- (iii) The total Forest Estate of the Beerburrum plantations needs rationalisation. Adjoining rural and residential developments create numerous management problems, especially with regard to wildfire protection. The Service should examine all areas of this type and explore options such as acquisition, land swaps, etc. with a view to rationalising the plantation estate. Beerburrum Staff have previously identified parcels of State Forest that are non-productive hardwood forests, unsuitable for planting, alienated from the protection system or costly and difficult to protect (FRIC Beerburrum memo 15/9/94, Ref. 615-01 held at Beerburrum Office). Areas such as SF 766 Luttons and Bribie LA should also be considered due to their fragmentation. These parcels could be used as a basis to commence land swap actions in the area. A Whole of Government approach would be needed to undertake this action.*

12. Fire Fighting Equipment

- (i) As the present tanker fleet is now 11 years old, it is recommended that the tanker design be reviewed in the light of their performance at the fires and the need to assist with the protection of houses adjoining State Forests in rural residential areas if so required. Engineering Services to draw up plans and specifications by June 1996.*
- (ii) That workshop lighting systems to be upgraded at all major exotic centres and Engineering Services to ensure work is completed by August 1996.*
- (iii) That, by August 1995, a review of the vehicle fleet be undertaken at District level to maximise the number of units that can be used for fire fighting and not purely carriers of personnel.*
- (iv) That District Marketing Officers continually monitor the fire weather data at District Headquarters and keep all contractors informed of their obligations with regard to fire suppression. Training sessions should be held as many new contractors would be unaware of their full obligations. District Foresters to ensure training sessions are carried out.*

13. Communications

- (i) That the Forest Service fully support Recommendation 17 of the Bushfire Strategy Report 1994 to assess the upgrading of Rural Fire Brigade two-way radio communication systems, particularly where Brigades interface with State Forests.*
- (ii) That additional rotary or fixed wing aircraft to be used in fire suppression work be equipped with DPI FS two way radio frequencies. District Foresters to advise Fire Protection Officer of any additions required.*
- (iii) That the Communications Officer has up to 10 additional radios on hand for dispatch to major exotic fires during the annual fire season.*

14. Safety

- (i) All Districts standardise personal protective equipment kept on hand for fire fighting.*
- (ii) Staff dispatched to fires at other centres be fully equipped with personal protective equipment. This particularly applies to Head Office staff. A supply of gloves, goggles, overalls, helmets and respirators be kept on hand at Head Office for this purpose. Fire Protection Officer to organise.*
- (iii) Boots be issued to Head Office staff who volunteer for fire training. Fire Protection Officer to organise.*

- (iv) *Miner's lights on safety helmets for night operations be investigated by the Fire Protection Officer by June 1996.*

15. Training

- (i) *A fire training team made up of the Fire Protection Officer, District Forester Gympie and the Principle of the Training Centre be formed to review training needs. This review should be completed by August 1995. Particular emphasis must be directed to:*

- *Training modules;*
- *Formalising an accreditation system;*
- *Training of Head Office staff;*
- *Fire investigation training, i.e. into the causes and origins of fires;*
and
- *Fire Protection Officer to organise.*

3. SEASONAL CONDITIONS AND STATES OF FIRE EMERGENCY.

A Seasonal Severity Chart for Beerburrum for the period from April to December 1994 shows that seasonal conditions at Beerburrum remained average from April to the end of May then deteriorated (Figure 1). Conditions entered the extreme range at the end of September and remained at this level through to the end of November. Rainfall for September totalled 7.2 mm with the drought index of 326 on 1 September increasing to 430 on the 27 September 1994.

At 4.30 am on 27 September 1994, a severe fire weather warning was issued by the Bureau of Meteorology for the Darling Downs, Granite Belt, Maranoa and South East Coast Districts:

"High temperatures and freshening SW/W winds are expected to cause near extreme fire danger ratings in these districts this afternoon."

Fire Number 25 ignited at about 1.38 pm on this day.

A rainfall total of 38.2 mm was recorded during October. No further rain was recorded before the 6 November when the drought index was 533. Fire Number 48 was first reported by tower at 9.37 am on this day.

The Queensland Fire Service Commissioner declared a State of Fire Emergency at 2.00 pm on the 27 September for 54 shires in South East Queensland in an area from Bundaberg to Goondiwindi and east to the coast. This State of Fire Emergency was revoked at 1500 hrs on 24 October 1994. A second State of Fire Emergency was declared at 9.00 am on 7 November and lifted on the 23 November 1994.

Discussion and Recommendations

For both wildfire periods, the States of Fire Emergency were declared after the wildfires were underway. The Committee considers that sufficient indicators were present to have imposed the States of Fire Emergency before the 27 September. We further contend that the State of Fire Emergency should not have been revoked on the 24 October and should have remained in force up to and after the period 6-8 November 1994.

- (i) *The Fire Protection Officer consult with the Queensland Fire Service and the Bureau of Meteorology before June 1995 to improve the current fire weather warning systems, particularly with the imposition and lifting of State of Fire Emergencies. An improved system might incorporate such variables as drought index, rainfall, and seasonal severity index.*

SEASONAL SEVERITY CHART - BEERBURRRUM 1994

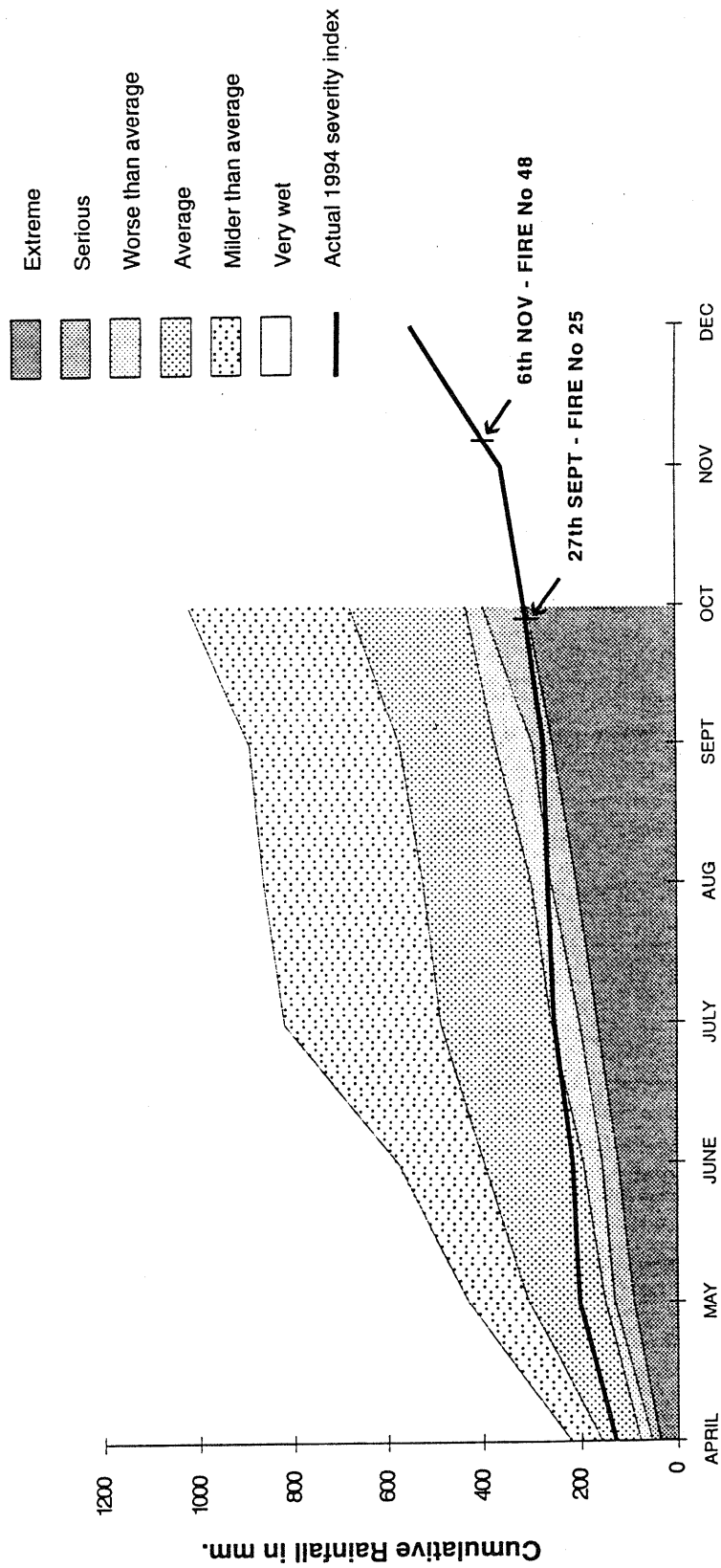


Figure 1 Seasonal Severity Chart for Beerburrrum

4. FIRE PREPAREDNESS LEVELS.

For both wildfire events, staff and equipment levels were actually above the minimum levels required. The September fires occurred on a weekday following a 4.30 am severe fire warning, and preparedness levels were set accordingly. The levels for the weekend of 5-6 November were based on the Bureau's forecast issued at 2.05 pm on Friday 4 November. For this day, the forecast differed markedly for relative humidity, wind speed and direction, and the fire danger rating varied accordingly. Table 1 compares forecast conditions with actual conditions recorded at Beerburum Office on Saturday 5 November.

Table 1 Comparison of Forecast and Actual Weather Conditions at Beerburum for 5 November 1994

	Temp.(° C)	Humidity (%)	Wind Direction and Speed(kph)	Fire Danger Rating
Forecast	29	39	NE 15-25	14 High
Actual	31	14	SW 30	44 Very High

Fortunately, because of the severe fires in September and the plethora of associated reights, Beerburum's preparedness levels for this Saturday were set above the minumum level, and as conditions worsened during the day, staff and equipment levels were increased. Similar levels were set for Sunday 6 November, the day of the fire's outbreak.

Discussion and Recommendations

Recent changes have removed drought index as a variable in the setting of Fire Preparedness Levels for exotic centres. As a measure of soil dryness, drought index provides an estimate of heavy fuel moisture, and in combination with rainfall, an indirect estimate of fine fuel moisture. Because fuel moisture affects the amount of fuel available for combustion and, hence, fire intensity, it is a useful guide for ease of suppression. High drought indices (eg. 400+) also indicate the potential for ready ignition of fine fuels and for spotting potential. That is, fires are more likely to ignite and develop into wildfires, and to spread by spot fires under high drought index conditions.

- (i) *By August 1995, the Exotic Pine Consultative Committee review fire preparedness levels for exotic centres to include drought index as a further variable in the setting of levels.*
- (ii) *The Committee should also examine the potential for RED ALERT DAYS where drought indices exceed 400 and fire danger ratings are above 30 High. Each Plantation Centre would then nominate specific levels to apply on these days so as to optimize detection, deployment, first attack, additional airspot, etc.*

5. FIRE WEATHER CONDITIONS

The synoptic chart for 3.00 pm on the 27 September 1994 [Figure 2 (a)] indicates a common pattern for bad fire weather in southern Queensland, that is, a high over the Great Australian Bight, a low in the Tasman and a ridge preceding a front extending up the east coast from the low. Similar weather patterns occurred during previous wildfires such as the 1982 Missings Fires at Tuan and the 1991 Swampy Fire at Toolara. These weather patterns generally occur at the same time of the year, from late September to early October.

The resulting weather conditions at Beerburum were extreme and fire danger ratings remained high well into the night (Table 2.). As suggested by the synoptic chart, forecast wind directions were south to southwest. However, actual wind directions were westerly (Table 2.) and this has been attributed to the influence of the topography in the vicinity of the fires.

Table 2 Weather Conditions and Fire Danger Ratings Recorded at Beerburum Office on 27 September 1994.

Time (hours)	Temperature (C)	Humidity (%)	Wind Direction and Speed(km/hr)	Fire Danger Rating
900	23.5	21	W 12	16 High
1000	25	17	W 30	30 Very High
1100	27	13	W 35	40 Very High
1200	27	8	W 30	45 Very High
1300	28	7	W 35	46 Very High
1400	24	12	W 40	50 Extreme
1500	24.5	15	W 35	42 Very High
1915	18	11	W 30	30 Very High
2115	16	16	n/a	24 Very High
100	13.5	17	n/a	12-16 High

As the fire situation developed, the Beerburum Fire Control Centre and the Met Bureau set-up a direct forecasting link via fax. Actual weather conditions were faxed through hourly and these were used by the Bureau to produce spot forecasts which were faxed back to Beerburum. This arrangement initiated at the start of the fire.

The synoptic charts for 6 & 7 November 1994 [Figures 2 (b) and 2(c)] again shows the same pattern common for severe fire weather in south Queensland (Refer Appendix 4). However, what is unusual is the late time of year, in November rather than September or October. The following is taken from the Bureau's report on this period:

" The 5th to 8th of November 1994 brought unusual November weather conditions to southeast Queensland. Dry westerly winds are usually a Winter or early Spring phenomenon and by November the air usually has a higher moisture content. The average monthly 3.00 pm relative humidity for November in southeast Queensland is between 40% and 60%.

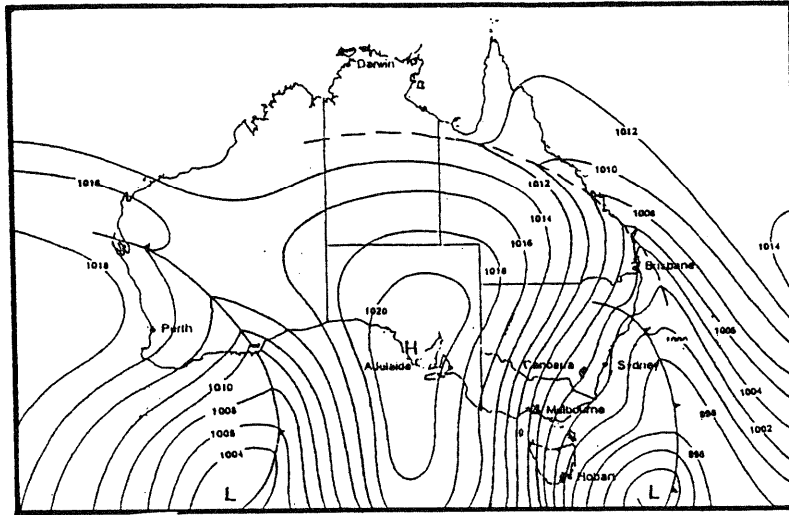


Figure 2 (a) Synoptic Situation at 3 pm, Tuesday 27.9.1994

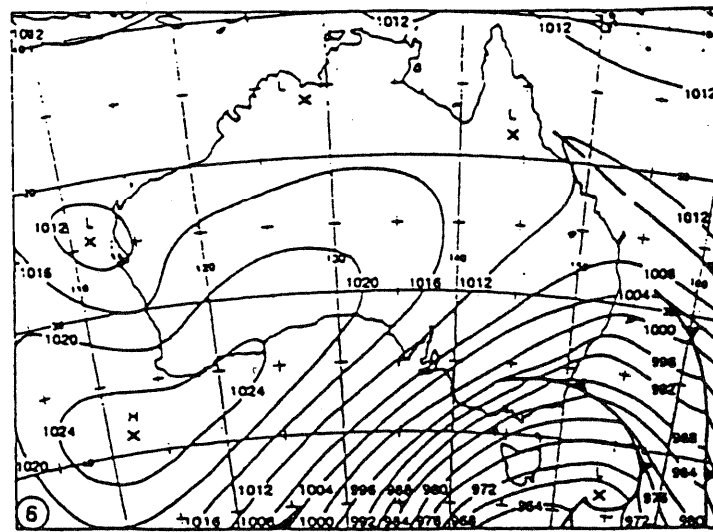


Figure 2 (b) Synoptic Situation at 9 am, Sunday 6.11.1994

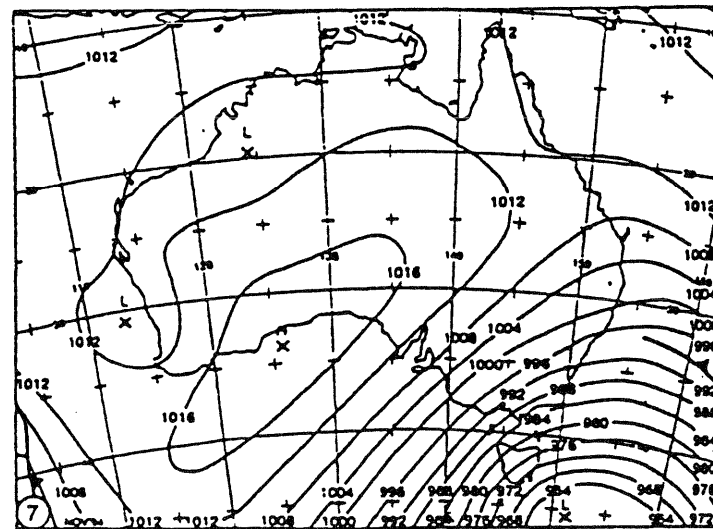


Figure 2 (c) Synoptic Situation at 9 am, Monday 7.11.1994

During the 5th-7th of November the 3.00 pm relative humidity dropped to below 20% in southeast Queensland. In a comparison of these figures and 3.00 pm relative humidity figures for November days over the last 50 years it was found that the event from the 5th-7th of November 1994 produced the lowest November 3.00 pm relative humidity (driest air) in 27 years.

This unusually low humidity and the unseasonally strong westerly winds combined with abundant and dry fuels to produce 'Near Extreme' to 'Extreme' fire dangers through the southeast corner of Queensland on the 6th and 7th of November 1994."

Weather conditions were even worse than during September with higher temperatures, humidities as low as 10%, winds in excess of 50 km/hr and fire danger ratings up to 86 EXTREME recorded (Table 3). As with the September fires, wind directions in the field often differed markedly from forecasts and readings from the Beerburum Office. Conditions also remained adverse well into the nights and were at best marginal for backburning operations.

Table 3 Weather Conditions and Fire Danger Ratings Recorded at Beerburum Office from 6-8 November 1994.

Time (hours)	Temperature (C)	Humidity (%)	Wind Direction & Speed(km/hr)	Fire Danger Rating
6/11/94				
0900	26.6	28	W- 30	28 VERY HIGH
1000	27.4	24	W- 50	42 VERY HIGH
1100	29.0	21	W- 38	40 VERY HIGH
1200	31.0	23	W- 38	40 VERY HIGH
1300	31.0	17	NW-30	38 VERY HIGH
1400	32.3	15	W- 38	44 VERY HIGH
1500	32.6	14	NW-38	52 EXTREME
1600	32.7	12	NW-38	54 EXTREME
1800	30.7	13	SW-11	30 VERY HIGH
1900	30.0	12	SW-50	26 VERY HIGH
2015	30.3	13	W- 44	60 EXTREME
7/11/94				
0548	27.1	12	SW-15	29 VERY HIGH
0600	27.2	12	SW-15	29 VERY HIGH
0700	28.1	8	SW-30	35 VERY HIGH
0800	30.0	20	SW-30	35 VERY HIGH
0900	31.3	19	W- 30	37 VERY HIGH
1000	33.0	17	SW-38	46 VERY HIGH
1100	34.0	17	SW-30	42 VERY HIGH
1200	34.6	15	NW-50	70 EXTREME
1300	35.0	15	NW-50	66 EXTREME
1400	36.6	12	NW-50	86 EXTREME
1500	36.6	13	NW-50	86 EXTREME
1600	35.7	16	NW-50	74 EXTREME
1700	35.0	16	SW-50	74 EXTREME
1800	33.0	18	W- 45	57 EXTREME

Table 3 (cont.)

Time (hours)	Temperature (C)	Humidity (%)	Wind Direction & Speed(km/hr)	Fire Danger Rating
8/11/94				
1000	31.1	20	SW-28	32 VERY HIGH
1111	32.2	18	SW-25	34 VERY HIGH
1200	33.0	20	W- 15	26 VERY HIGH
1310	34.0	13	W- 21	40 VERY HIGH
1415	35.0	9	W- 15	42 VERY HIGH
1500	34.8	10	W- 14	40 VERY HIGH
1600	32.2	19	NE- 18	28 VERY HIGH

Discussion and Recommendations.

- (i) *That a clearly defined protocol be arranged with the Bureau of Meteorology by the Fire Protection Officer whereby local weather information can be relayed direct to the Bureau from District Offices and spot forecasts given every hour when wildfire occur by August 1995.*
- (ii) *After interpretation by the Fire Boss or controller, the forecasts should be passed on to field sector bosses so that they are fully aware of any possible weather changes.*

6. IGNITION SOURCES

- *Bribie Fire Number 26.*

Five separate fires occurred in the vicinity of Bribie and Toorbul LAs on the 27 September. The fire that entered State Forest 611 and its pine plantations is discussed here. This fire started near the boundary of CSR plantation and private property, approximately 3 km west of Bribie LA(see Map 1). Cause of the fire is unknown.

- *Tibrogargan Creek Fire Number 25.*

Evidence suggests this fire started at 1338 hrs from sparks caused by clashing electricity conductors (powerlines) on the western side of the Glass House Mountains Road in a small area under the powerlines just north of the exit road from the Tibrogargan Creek rest area (see Map 2). Sparks appear to have ignited grass and leaf debris under the powerlines, and the resulting fire spotted into scrub on the eastern side of the road on the northern side of Tibrogargan Creek. Material from this fire was blown several hundred metres and started spot fires in the adjacent Compartment 12 Glass House LA in State Forest 611. Although several of these spot fires were controlled, one spread into the buffer strip of native forest along Tibrogargan Creek, rapidly developing into a major wildfire.

- *Beerburum Fire Number 48.*

Beerburum Mountain Fire Tower had reported a fire in CSR Compartment 74 (see Map 3) on the 20, 21, 22 and 25 October 1994. The fire was suspected as being in a large heap of bark and chip remaining from clearing operations in this compartment. As the surrounds of the heap were cleared around for 150-200 m and the fire was 2.8 km west of the State Forest plantations, the fire was not considered a threat under the weather conditions prevailing at the time. However, CSR were notified of this fire on the 20 October. Evidence suggests that as a result a series of dozed lines were cleared around the burning heap.

No further fire activity was reported in the area by Beerburum Fire Tower until 0937 hrs on the 6 November. It appears the heap continued to smoulder for several weeks and became active as weather conditions worsened on this morning. A Forest Officer who arrived at the site at 1000 hrs considers the fire spread from the burning heap, jumped the dozed breaks and burnt across the cleared area before entering the standing pine plantation. Under the prevailing weather conditions, the fire rapidly escalated into a major wildfire.

Discussion and Recommendations.

The origins of Fire Number 26 at Bribie LA were investigated by local staff who consulted Fire Service, Police and CSR Caboolture staff. They concluded that the fires were not deliberately lit and the ignition sources are unknown. No further action is required.

A detailed investigation of the Tibrogargan Creek Fire Number 25 was carried out immediately after the fire. This involved interviews of witnesses and neighbours; and the following consultants were employed to report on various aspects of the fire's origins:

- Mr D Mercer of Uniquet Limited reported on the likely cause of the fire from electricity lines;
- Mr P Ryan, Principal Scientist from the Forest Research Institute, Gympie, reported on the likely age of vegetation under the powerlines and past vegetation clearing; and
- Mr W Drexler, Forester with the DPI Forest Service, reported on fuel loadings under the powerlines, and spotting potential of this vegetation under the prevailing weather conditions on the day of the fire.

This report has been forwarded to Crown Law for advice on whether sufficient evidence exists to proceed with a claim for compensation, and the protocol for such a claim against another Government agency.

It is apparent that existing guidelines for maintenance of vegetation under powerlines on Crown land have not been adhered to by QEC and their agents. Further, the guidelines are inadequate in some aspects.

- (i) ***That a working party of QEC and DPI Forest Service staff consisting of the Managers, Plantation Production and Native Forest Production, be formed to review and update the powerline clearing and maintenance guidelines applicable to State Forests and Main Roads by December 1995.***

Preliminary investigations into the origins of Beerburrum Fire Number 48 were undertaken by local staff. Because of the severity of the fire and the States of Emergency in place during the period, the Queensland Fire Service was requested to jointly assist the Acting District Forester Beerburrum in the formal investigation of this fire's origins. The Queensland Fire Service also requested the assistance of the Police to carry out the investigation because houses and orchards were also lost on freehold land. No further details are available for this aspect until the investigation has been completed.

- (ii) ***That investigations into the cause and origin of major wildfires be undertaken immediately after their occurrence by regional staff adequately trained in investigation techniques (refer to further recommendations in Section 2.13 "TRAINING"). The Principal Legislation Officer will be the lead person to ensure adequate staff are available and sufficiently trained.***

7. DETECTION

- *Tibrogargan Creek Fire No. 25*

Fire No. 25 was first detected from the Beerburrum Mountain Lookout at 1338 hours on 27 September 1994. This lookout is only 2.0 km from where the fires started on the western side of the Glasshouse Mountains Road. The fire was seen to jump this road at 1.42 pm and threaten a private nursery on the eastern side of the road. Even though detection was swift and accurate, early containment of the fire by the forestry tanker was not possible because it assisted to save the house at the private nursery. The fire thus escaped but it would have been extremely doubtful if any fire would have been contained under the weather conditions prevailing at the time.

- *Beerburrum Fire No. 48*

The fire was detected at 0937 hours from the Beerburrum Fire Tower on a bearing of 292° and estimated to be in Cpt 72 CSR at a distance of approximately 13 km from the tower. A cross check bearing 297° on the fire at approximately 0945 hours from the Glasshouse Mountains Lookout confirmed that the fire was in Cpt 74 CSR approximately 7 km from the lookout.

Previous sightings of a fire on the same vicinity had been made on the 20, 21, and 22 October 1994 whilst a State of Fire Emergency existed and also on 25 October 1994 immediately after the revoking of the State of Fire Emergency. No further observations were made until 6 November 1994. Rain had fallen in the area and this would have assisted in quelling the fires.

Recommendation

- (i) *That a full report be immediately submitted to the District Forester on any fires detected during a State of Fire Emergency or Extreme Fire Conditions within 10 kms of the State Forest boundaries.*

8. FIRE BEHAVIOUR AND SUPPRESSION

The three fires are discussed separately and recommendations included where appropriate.

- *Bribie Fire No. 26*

This fire started at 1100 hours on 27 September from an unknown cause at the south west corner of a CSR pine plantation about 3km west of Bribie LA (See Map 1). This fire spread in an east north east direction crossing the Caboolture-Bribie Road at about 1330 hours. It entered Cpt 5 Bribie LA, spreading into Cpts 6, 1A, 2A and later into Cpt 3A. It crossed into CSR and other private property. No units could be spared to attend this fire in its initial stages and there is little documentation of its behaviour.

Control was achieved during the early hours of 28 September by backburning and containment.

- 2. *Tibrogargan Creek Fire No. 25*

Estimates of fire spread are shown in Map 2. This fire started from spot fires landing in Cpt 12 Glasshouse at about 1410 hours on the 27 September, and in particular, the buffer strip along Tibrogargan Creek. This spot rapidly developed and spread along the buffer and adjacent B blocks.

The prevailing weather conditions and cleared compartments resulted in the fire spreading in long narrow fingers in an easterly direction.

Rates of spread between 1410 and 1530 hours is estimated at 1.6km/hr. The head fire did not actually cross the Bruce Highway, but spotted over into Cpt 38B Black Swamp at about 1630 hours. Numerous spots landed into the native forest area of Wild Horse Mountain but none of these developed into fires due to this area being prescribed burnt earlier in the year.

Attempts to control the spot fires in Cpt 38B were not successful and these coalesced and spread east into Cpts 39B and 40B. Backburning was attempted at several lines but these were outflanked by spot and head fires. The fire was eventually controlled by backburning and containment at 0700 hours on the morning of 28 September.

- 3. *Beerburrum Fire No. 48*

Map 3 shows approximate fire spread and suppression actions.

This fire appears to have originated from a large chip heap over 50m in diameter in Cpt 74 CSR. These heaps result from mobile chipping and debarking operations in the clearfall of these pine plantations. This residue is pushed into heaps for burning.

This heap was lit around the 20 October 1994 and continued to smoulder for a number of weeks. As winds increased and conditions deteriorated on the morning of 6 November, it appears this fire burnt from the heap into the cleared strip to the east. It burnt 150m through the light grass cover and into standing pine remaining in Cpt 74 CSR.

The following examines fire behaviour and suppression actions for each time period. Weather details recorded at Beerburum Office are included in the boxes. A detailed transcript is included as Appendix 1.

10.10-12.00 hrs.

Time	Temp.	RH	Wind Speed	Fire Danger Rating
1000 hrs	27.4	24	W- 50	42 VERY HIGH
1200 hrs	31.0	23	W- 38	40 VERY HIGH

A backburn between the northern edges of Cpts 74 and 75 CSR was attempted by CSR but before 50m was lit the fire crossed this road to the south and also jumped the backburn.

CSR units attempted to halt this fire with a dozed line in Cpt 55 CSR but were unable to commence backburning before the fire crossed the line.

12.30-14.00 hrs.

Time	Temp.	RH	Wind Speed	Fire Danger Rating
1300 hrs	31.0	17	NW-30	38 VERY HIGH
1400 hrs	32.3	15	W- 38	44 VERY HIGH

The next strategy was to use the N-S powerline between compartments 56 and 57 CSR as a line but the fire crossed this line before grading started. The fire then developed into two main fronts, one swinging ENE of Beerwah Mountain and the other ESE. Both fires moved along a series of fronts as multiple spot fires developed and coalesced ahead of the main fire front.

A wind change from WSW to NW at 1300 hrs directed the fire towards State Forest and crossed the boundary at about 1320 hrs. Numerous spot fires developed in Cpt 5 Raddatz between 1340 and 1400 hrs

1400-1600 hrs.

Time	Temp.	RH	Wind Speed	Fire Danger Rating
1500 hrs	32.6	14	NW-38	52 EXTREME
1600 hrs	32.7	12	NW-38	54 EXTREME

The southern front travelled ESE through Cpt 5 Raddatz. Several units attempted to control spot fires along the western edge of Cpt 4 Raddatz as the fire approached the powerline clearing. The headfire crowned along swamp vegetation at this edge and spotted over the clearing.

The fire burnt through the remainder of Raddatz LA at about 1.6km/hr in a SE direction. Fire intensity was estimated to be of the order of 12000 kW/m.

The northern front moved through native forest areas and the rural residential developments of Judd's, Woodrow's and Wesley's Roads. Some FS units went to these developments to assist with evacuation and to protect houses and property threatened by the fire.

1600-2400 hrs.

Time	Temp.	RH	Wind Speed	Fire Danger Rating
1800 hrs	30.7	13	SW-11	30 VERY HIGH
2015 hrs	30.3	13	W- 44	60 EXTREME

The southern section spread slowly into Tibrogargan LA and was halted by suppression action along the northern edge of Cpts 208 and 209. This failed and crews dropped back to the northern edge of Cpts 203-207 Tibrogargan and the Beerburrum-Woodford Road. Several spot fires into Cpts 203 and Cpts 204 were controlled.

The northern section spotted onto Mt Tibberoowuccum as early as 1808 hrs and spread up the western side of the mountain. These fires resulted in spot fires falling into Beerburrum and with the impending approach of the main fire, the township was evacuated at about 2330hrs. Further spot fires occurred around the Forestry Office and Barracks and were controlled. This section of fire was contained along the Glasshouse Mountain Road and on its eastern side.

TUESDAY 7 NOVEMBER 1995

0000-0720 hrs.

Time	Temp.	RH	Wind Speed	Fire Danger Rating
0600 hrs	27.2	12	SW-15	29 VERY HIGH
0700 hrs	28.1	8	SW-30	35 VERY HIGH

All efforts were made to secure the line along the Beerburrum-Woodford Road and Cpts 203-207 Tibrogargan with selected backburning, containment and control of spot fires.

0720-1146 hrs.

Time	Temp.	RH	Wind Speed	Fire Danger Rating
0800 hrs	30.0	20	SW-30	35 VERY HIGH
1000 hrs	33.0	17	SW-38	46 VERY HIGH

Several spot fires could not be controlled, and Cpts 203-207 and Cpt 20 were progressively abandoned. Backburns along the southern side of these compartments were attempted but spot fires into Cpt 15, 16 and 17 Twins could not be controlled.

1146-2250 hrs.

Time	Temp.	RH	Wind Speed	Fire Danger Rating
1200 hrs	34.6	15	NW-50	70 EXTREME
1400 hrs	36.6	12	NW-50	86 EXTREME
1800 hrs	33.0	18	W- 45	57 EXTREME

The major run of the fire occurred in a ESE direction, spread by massive spotting in advance of the head fire. Spread rates were in excess of 3.6km/hr.

Strategies to control spot fires on the lee side of major breaks (eg. the Glasshouse Mountain Road and the Bruce Highway) were overwhelmed by the spread and magnitude of these spot fires. The head fire reached Pumicestone Passage by about 1600 hrs, travelling 15kms in about 5 hours.

All units attempted to contain flanks to the north and south and the final perimeter was controlled by backburning and containment at 2250 hrs. Massive mopping up operations involving a fleet of dozers and water units continued for several days.

Discussion and Recommendations.

Under the prevailing weather conditions for both fire periods, these fires rapidly developed out of control. It is difficult to recommend deployment levels that would have prevented these wildfires.

Fire No. 25 Staff and units were in Cpt 12A Glasshouse LA to control spot fires as soon as they started. However, the spot that fell into the buffer strip was out of control within minutes, even though units were present nearby.

Fire No. 48 This wildfire was out of control as soon as it reached the standing pine in Cpt 74 CSR. Rate of spread through the 150m cleared strip between the chip heap and the standing pine would have been less than 15 minutes, considering the open ground and 30 k/hr wind spread.

Weather conditions and fire behaviour prevented any suppression actions other than containment of the flanks until conditions moderated for control attempts on the headfire.

Attempts to halt Fire No. 25 at the Bruce Highway were affected by the commandeering of Forest Service units by the Queensland Fire Service to protect the Moby Vics Service Station. Insufficient units were available to attack spot fires falling into the compartments to the east of the Highway. A State of Fire Emergency existed at the time and this gave the Fire Commissioner the necessary power to requisition plant and equipment to protect houses and fight fires.

Control of this fire was achieved through backburning and containment of the headfires as conditions moderated overnight and early in the morning of the 28 September.

With Fire No. 48, control was almost achieved during the night of the 6 November when attempts were made to contain a line along the northern side of Cpts 203-207 Tibrogargan and the Beerburum-Woodford Road. However, spot fires jumped this line and by midday of the 7 November, the fire was again out of control. In hindsight, if Cpts 203-207 had been sacrificed and the wider Beerburum-Woodford Road used as the control line, it is possible the fire may have been halted at this point. However, with the extreme conditions of the 7 November, it is probable that further spotting and escapes would have occurred along this line.

Once the Beerburum-Woodford Road was crossed the fire spread rapidly eastwards, jumping Rose Creek Road, the North Coast Railway line, Glasshouse Mountain Road and the Bruce Highway with little reduction in speed or intensity.

Spotting in advance of the headfire accelerated its rate of spread and its advance was only halted by the Great Eastern Firebreak, that is, Pumicestone Passage. Even then, the fire spotted 6 km over to Bribie Island causing further widespread damage and control problems. Rate of spread during the main run of the fire on the afternoon of 7 November was about 3.6km/hr.

Beerburum's resources were inadequate to handle a fire of such magnitude and support units and crews from Imbil, Gympie, Maryborough, Yarraman, Dalby, Forest Research Institute and Head Office assisted on suppression and mopping-up operations. These units performed well, although minor problems did arise with incomplete crews especially those lacking supervisors.

- (i) *Fire units dispatched from other Districts should be fully equipped units with supervisor and crew who are prepared to stay overnight.*

9. LARGE FIRE ORGANISATION

The extreme fire weather experienced in 1994 does not occur very regularly in South-east Queensland. There has however, been an increase in the number of exotic plantation fires over the past 10 years because of the now extensive plantation estate, increased visitor usage and deliberate lightings particularly at Beerburum.

With any fire in the September - February period, there is a major potential for resource loss and Queensland Large Fire Organisation has to be enacted as quickly and as efficiently as possible so that all the forces are put into play to ensure early control of the fire.

These 1994 wildfires have allowed a far deeper analysis of the fire boss organisational structure because the fires have been the largest experienced and have drawn together many agencies in the fire suppressional stage both on and off the State Forest.

The Large Fire Organisational System, together with any shortcomings and recommendations is now discussed.

Fire Boss

It is accepted practice in Queensland for the Fire Boss to be a Senior Officer based at the Reserve Headquarters of one of the major exotic plantation areas. This person should be very familiar with the geography and plantation design of the reserve as well as knowing the staff and their capabilities particularly in the role of fire suppression.

Whenever a fire starts, there may be a period of confusion because of staff shortages, equipment mobilisation problems, lack of knowledge of the size of the fire and the fire boss is put under extreme stress until all the players are in place and begin to operate as a team.

Assistant Fire Boss

It is accepted practice that this position is a support role to the fire boss and assists the fire boss to make strategic decisions as a team approach. This position arranges for the supply of material, equipment, food, etc and liaises with other Districts and Agencies, media, etc. The position would be filled by a local Senior Officer familiar with the working of the Reserve.

Sector Boss

These are field positions, are solely responsible to the fire boss and also responsible for the performance safety and welfare of personnel in the sector.

General Comments

The filling of all these positions come into place quickly and worked well given the degree of stress at the commencement of the fire. An excellent situation was in place by the evening of the first day in which all staff on duty had been delegated duties to carry out.

The biggest problem arose when relief had to be provided for a wide range of people from plant operators, fire boss, office staff, etc. when it was realised that the fire would run well in to the second day. It is essential that early planning for relief be undertaken with fires of this size.

With both fires, staff from Head Office were organised to take the night shift and relieve the daytime crews. These people relieved in a wide range of positions depending on their previous experience. Other support fire crews were also drawn from Gympie, Maryborough, Yarraman, Brisbane and Dalby Districts.

The ready availability and willingness of all people was testament to a high degree of successful management within the Forest Service.

Recommendation

- (i) *That training programs be instigated to ensure that District and Head Office staff fully understand the role and responsibilities of the key positions of the Queensland Large Fire Organisation. Fire Protection Officer to arrange by June 1996.*

Liaison with Other Organisations

(1) Bureau of Emergency Services (B.E.S.)

The B.E.S. in Queensland is the controlling body for the following group of departments:

- (1) Queensland Fire Service:
 - (a) Urban Division
 - (b) Rural Division
- (2) Queensland Ambulance
- (3) State Emergency Services

The 1994 fires involved the State Forests as well as surrounding freehold farms, schools, service stations, nurseries, National Parks, major highways, private forestry, etc.

With regard to the major fires, initially the QES Headquarters had been set up at the Glasshouse Bowls Club on 6 November 1994 to co-ordinate the efforts of the fire pertaining to the "other than forestry" activities. That night, the Headquarters were relocated to the Beerburum District Office which meant that all of the above agencies were brought together with the Police, Salvation Army and media also sharing the one site.

This was an excellent arrangement which should be planned and put into effect in the event of any multi-agency fires.

All people involved with fire suppression benefited by being located at one site and using conference rooms, kitchens, offices, etc. on a share basis. If needed, additional tents, caravans, telephones, etc. can be installed to cope with the situation.

The large influx of outsiders had only a minimal impact on the DPI Forest Service fire fighting operations. With good liaison and understanding by all agencies, better utilisation of all equipment can be realised especially if agencies are located at the same headquarters.

The State of Fire Emergency meant that Forest Service equipment was commandeered to save houses, life etc. When this occurred, there was a lack of understanding of how the equipment was to be released back to the Forest Service.

This problem should be solved at the Counter Disaster Committee meeting level discussions and all agencies should be aware of their responsibilities. It should be noted that there was no Counter Disaster declared for these fires because of their swiftness and the fact that it takes 24 hours for the Disaster declaration to be enacted through Parliament.

(2) Queensland Police

The Queensland Police play a very important part in any major wildfire. They have to consider life and property and they are the only agency who can evacuate people from their houses. They also play a very major role in controlling traffic and people at major disturbances.

In the event of an emergency, a police officer of, or above the rank of Inspector can, under the *Public Safety Preservation Act 1986*, declare that an emergency situation exists in respect of an area specified by him. This declaration occurs forthwith as long as the date and time are recorded and forwarded to the Commissioner of Police within 14 days of the revocation of the declaration of the emergency situation.

In the first of the Beerburrum fires, a declaration was made and this gave the Police the power to control all traffic on the Bruce Highway. Whilst this was necessary for safety reasons, Forest Service personnel who had no identification were also stopped and could not get to the fire to assist with the suppression.

Recommendation

- (ii) *It is recommended that DPI Forest Service consult with Queensland Police and Queensland Emergency Services with regard to appropriate protocols in the event of major fire emergencies. These protocols would cover such issues as commandeering of people and equipment, road and highway closures, counter disaster arrangements and declaration of Public Safety Preservation Act 1986. Fire Protection Officer to arrange by June 1996.***

10. THE PROTECTION SYSTEM

The Firebreak System

As expected, external breaks had minimal effect on fire entry and intensity. The Service was criticised in the aftermath of the fires for what were perceived to be inadequacies in the width and maintenance of external breaks adjoining residential development. Although fire intensity and the magnitude of spotting completely overwhelmed the external breaks encountered, some of this criticism may be warranted from other perspectives.

In addition to preventing the entry and reducing the intensity of wildfires, firebreaks also provide a reasonably safe edge for backburning, that is, a strip where spots from backburns can be accessed and easily controlled.

Problems encountered with firebreaks on these fires were due not to their design but to their past maintenance, primarily, the lack of fuel reduction in the interrows. This created problems for crews as it impeded access to control spot fires both within the breaks and inside adjacent plantations. In one instance, it also created havoc as a crown fire crossed the break almost catching a crew in its path. To address these inadequacies, a revised policy for firebreak design and maintenance (Appendix 1) is suggested for use in the reestablishment task of the burnt plantations.

Compartment Access: Design and Maintenance

The current policy for access tracks (Circular No. 2237 Ref: 615-01) aims to achieve a minimum spacing of 150-200 m between tracks. Due to problems with access to spot fires, it is considered there may be merit in reducing to 100-150 m, that is a distance of about twice the standard hose length of a mop-up unit. This should be addressed in the review of protection design.

While it did not create a problem on these fires, several access tracks in Raddatz LA were not identified as either dead-end (double paint bands) or through tracks (single paint band). This should be rectified for all areas.

- (i) *Compartment access tracks should be identified as dead-end or through roads using the standard painting system.*

Prescribed Burning

The objectives of prescribed burning in exotic pine plantations can be summarised as:

1. To reduce the level and arrangement of ground fuels, thereby reducing the intensity of wildfires and increasing their ease of control.
2. To reduce the damage resulting from wildfire.

The application of prescribed burning for these benefits must be tempered by the disadvantages of cost and potential nutrient losses. The current system of commencing at age 8 to 10 years and burning two to three times to reduce fuels to Type I and II aims to achieve a compromise between fuel reduction and nutrient loss.

While many of the areas burnt in these wildfires had been prescribed burnt previously, the benefits of this earlier burning are not readily apparent. For example, prescribed burnt compartments did not halt or allow the control of major headfires, and wildfire damage appears to be unaffected by previous prescribed burning. However, other factors need to be considered:

- Weather and fire conditions were the worst ever encountered for a plantation fire in Queensland;
- These fires were eventually contained along the flanks, and prescribed burnt compartments assisted in this control; and
- Seasonal conditions were extremely dry before and following the fires and this also affects the recovery of fire damaged trees.

In summary, there is no evidence to suggest that prescribed burning should be reduced. However, the overall system of burning needs review and the following are suggested for inclusion:

1. Compartments forming north-south corridors should be selected and burnt on a three to four year cycle through the rotation. These strips should form a fuel reduced buffer to wildfires that burn in an easterly direction (the prevailing direction of all severe wildfires).
2. These corridors should be selected in conjunction with breaks in the plantation estate such as major roads, highways and powerline clearings. These prescribed burnt corridors should be located along the eastern edge of such clearings to provide a fuel reduced buffer for spot fire control as the headfires approach these wide clearings.

Protection Expenditure

Losses from the September and November wildfires at Beerburrum are the worst suffered in Queensland. In 1991, a benchmarking study was conducted of fire weather conditions and protection expenditure of exotic pine plantations. It recommended State wide targets of \$10/ha for exotics. The committee considers that in light of 1994's fire losses at Beerburrum, these targets should again be reviewed.

- (ii) *The protection system for exotic centres be reviewed by the Exotic Pine Consultative Committee in light of the losses sustained. This review should include:*

- *firebreak and access road design and maintenance;*

- *signage and maintenance of water points; and*
- *prescribed burning policy of exotic plantations and surrounding native forests.*

This review should commence by examining protection unit costs, the losses sustained in 1994 in the Beerburum plantations, and an appropriate level of expenditure per hectare. Key people involved would be the Senior Economist, Fire Protection Officer, Risk Management Officer, and Regional staff. To be completed by June 1996.

11. THE FOREST ESTATE

Beerburrum's plantation estate is unique as an exotic centre due to the presence of rural residential developments both within and adjacent to State Forest. A recent estimate suggested there were over 1000 adjacent neighbours to the estate. Their presence affected the overall suppression effort in a number of ways. FS units assisted in numerous cases with evacuation of people and protection of houses and commercial property. In one instance, units were commandeered and the suppression effort in plantations suffered as a result. While FS must always accept responsibility for such assistance with neighbouring developments, there should also be a degree of self help by residents in the form of rural bushfire brigades. The formation of these units must be encouraged in areas where they do not currently exist.

- (i) *The Forest Service notify Queensland Emergency Services of residential complexes adjacent to State Forest not serviced by Rural Brigades, and ask them to encourage the formation of Brigades for these areas.*

A number of these rural residential developments are inadequately designed for fire management, and Forest Service has been wrongly criticised for these inadequacies. The responsibility for fire management planning on these developments rests with the relevant Local Authority. Forest Planning and Environment staff have examined this question in the aftermath of the fires and their report "Beerburrum Fire Report- State Forest/Private Land Interface" is appended (Appendix 2). Their recommendations are summarised below:

- (ii) *The Forest Service further develop its relations with Local Government to promote better fire management planning principles in the residential/State Forest interface. There are two ways for the Service to do this:*
- *at the Rezoning Application stage and*
 - *via submissions to Local Government Strategic Plan Reviews.*

Further, the Queensland Bush Fire Strategy Report September 1994 has recommended that Local Government prepare Fire Management Plans for their areas and the Queensland Fire Service is to provide a model for all agencies to follow in the joint compilation of these plans. The Forest Service should have input to the planning process.

Several of the plantation areas at Beerburrum are fragmented from the overall estate. As relatively small areas, the efficiency of their protection system suffers as a result. For example, the area of external break compared to the area of enclosed plantation is high. In two cases, SF 766 Luttons and Bribie LA, suppression actions were limited due to priorities elsewhere. It is now opportune to examine these areas and consider acquisition of private CSR/Emmanuel plantation adjacent to State Forest plantation. Such rationalisation would markedly improve the boundary protection system at Beerburrum.

- (iii) *The total Forest Estate of the Beerburrum plantations needs rationalisation. Adjoining rural and residential developments create numerous management problems, especially with regard to wildfire protection. The Service should examine all areas of this type and explore options such as acquisition, land swaps, etc. with a view to rationalising the plantation estate.*

Beerburrum Staff have previously identified parcels of State Forest that are non-productive hardwood forests, unsuitable for planting, alienated from the protection system or costly and difficult to protect (FRIC Beerburrum memo 15/9/94, Ref. 615-01 held at Beerburrum Office). Areas such as SF 766 Luttons and Bribie LA should also be considered due to their fragmentation. These parcels could be used as a basis to commence land swap actions in the area. A Whole of Government approach would be needed to undertake this action.

12. FIRE FIGHTING EQUIPMENT

Beerburrum District is one of the major Forestry Districts and as such, it has a wide range of fire fighting equipment adequate to handle the "average" wildfire. Two dedicated fire tankers of 3800 litre capacity with monitors are the first attack units, supported by slip-on units from 400 to 3000 litres. Dozer graders and wheeled tractors are used as necessary in fire line construction and flank control.

In the event of major fires as occurred in 1994, additional equipment and fire fighters have to be acquired from other Districts as well as from the local community. People came from all walks of life to provide assistance - Local Government, Queensland Fire Service - urban and rural divisions, private companies and individuals, Queensland Police Force, Head Office, etc. and their support was greatly appreciated.

Overall, the equipment performed very well with major comments as follows:

- ***Dedicated Tankers with Monitors***

There is no doubt that two dedicated tankers at each of the major centres - Tuan, Toolara and Beerburrum are the absolute minimum requirements when a bad fire season in South east Queensland affects all districts. The release of one tanker from one district to another leaves that district in a very vulnerable state should wildfire occur. The use of the monitors was well demonstrated and it was considered that all future tankers should be so equipped and have a larger water carrying capacity. The monitors were also used to save houses in some residential areas where Rural Fire Brigades failed to arrive in time.

- ***Mechanical Breakdowns - Workshop Back-up***

Because of the need for constant use, breakdowns in all equipment began to occur and these have to be accepted as normal practice. The Beerburrum Workshop was staffed around the clock to repair any item and the advantage of having the workshop under the control of the Forest Service was imperative to the success of the fire fighting operation.

Because much of the work had to be performed at night, it was found necessary to upgrade the lighting system of the Workshop. This had not been allowed for in the original specifications as Forest Service Workshops don't normally operate at night.

- ***4WD Vehicles***

The 4WD fleet of vehicles at Beerburrum consists of utilities, dual cabs and station wagons. In wildfire situations, the station wagons can only carry personnel with no capacity to carry any cargo or fire fighting equipment.

This arrangement is not a very satisfactory one as all vehicles should be able to be used to the maximum of their ability in wildfire suppression.

Use of Purchaser/Contractors Equipment

Annual timber removals from the Beerburum State Forest in 1994 were in the order of 250 000 m³ involving many contractors and their logging equipment.

Under the terms of a Timber Sales Agreement, the purchaser shall promptly, at his own cost and expense, do or cause to be done, everything reasonably within his power to prevent and extinguish any unauthorised fire on or threatening the Supply Zone and shall require his employees, contractors and employees of contractors to do likewise and shall, as soon as practicable, notify or cause to be notified, the nearest Forest Officer or employee of the Forest Service, of any such fire and of the measures taken or being taken by him to extinguish the fire.

With these fires, it was generally agreed that the contractors should have assisted more actively with the fire suppression phase.

Recommendations

- (i) *As the present tanker fleet is now 11 years old, it is recommended that the tanker design be reviewed in the light of their performance at the fires and the need to assist with the protection of houses adjoining State Forests in rural residential areas if so required. Engineering Services to draw up plans and specifications by June 1996.*
- (ii) *That workshop lighting systems to be upgraded at all major exotic centres and Engineering Services to ensure work is completed by August 1996.*
- (iii) *That, by August 1995, a review of the vehicle fleet be undertaken at District level to maximise the number of units that can be used for fire fighting and not purely carriers of personnel.*
- (iv) *That District Marketing Officers continually monitor the fire weather data at District Headquarters and keep all contractors informed of their obligations with regard to fire suppression. Training sessions should be held as many new contractors would be unaware of their full obligations. District Foresters to ensure training sessions are carried out.*

13. COMMUNICATIONS

Two-Way Radio Communications

Both of the 1994 Beerburum Fires were fought with the assistance of the DPI FS two-way radio VHF system which has been developed and strengthened extensively in Queensland over the past 20 years.

The current repeater system had no major failings and performed beyond expectations given the amount of traffic and weather conditions, that prevailed at the time. The Queensland Fire Service, Kawana Headquarters monitored those Rural Fire Brigades not on the DPI FS system and this allowed messages to be passed on to those brigades as necessary from the Beerburum Forest Service Headquarters.

Initially the Queensland Fire Service Rural Division set up at the Glasshouse Mountains Bowls Club, but this was unsatisfactory because of the poor liaison and communication with Beerburum Forestry. The problem was largely solved when the headquarters was relocated to Beerburum Forestry Headquarters and a portable DPI FS radio was used to relay messages between DPI FS and the Rural Division Headquarters.

Because of the size of this fire, a second helicopter was hired to assist with fire fighting duties and was fitted with a portable radio. Unfortunately, this arrangement was not very satisfactory because of the poor communication between helicopter and ground control.

Recommendations

- (i) ***That the Forest Service fully support Recommendation 17 of the Bushfire Strategy Report 1994 to assess the upgrading of Rural Fire Brigade two-way radio communication systems, particularly where Brigades interface with State Forests.***
- (ii) ***That additional rotary or fixed wing aircraft to be used in fire suppression work be equipped with DPI FS two way radio frequencies. District Foresters to advise Fire Protection Officer of any additional required.***
- (iii) ***That the Communications Officer has up to 10 additional radios on hand for dispatch to major exotic fires during the annual fire season.***

14. SAFETY

During both fire periods, suppression activity by numerous staff was intense. Many staff worked in dangerous situations and long hours without relief.

With this intense activity sustained over a four day period, only one serious injury occurred through a heavy fall at night. While several near miss accidents did occur, these were well managed with minimal injuries resulting. This record is exemplary and speaks volumes for the dedication, skill and safety awareness of FS staff.

The Risk Management Coordinator surveyed the performance of personal protective equipment during the fires and the report is appended (Appendix 3). The Committee endorses the recommendations which follow:

- (i) *All Districts standardise personal protective equipment kept on hand for fire fighting.*
- (ii) *Staff dispatched to fires at other centres be fully equipped with personal protective equipment. This particularly applies to Head Office staff. A supply of gloves, goggles, overalls, helmets and respirators be kept on hand at Head Office for this purpose.*
- (iii) *Boots be issued to Head Office staff who volunteer for fire training.*
- (iv) *Miner's lights on safety helmets for night operations be investigated.*

15. TRAINING

In recent years, Beerburrum has reviewed and developed its fire training programmes. These can be broadly described as follows:

- **Internal Training.**

The high incidence of fires has necessitated crew training to a high standard. Over 100 District staff regularly receive some form of fire training, and a high percentage of these have received Level 1 Accredited Fire Fighter training.

- **External Training.**

To cope with decreasing protection resources and the increasing threat of fires, Beerburrum have adopted strategies to involve staff from other agencies in fire training. These include the following:

- Police in forestry map reading skills to improve their response time to forestry areas;
- Private hire contractors in the use of Service radios;
- National Parks and Wildlife Service in joint prescribed burning exercises and equipment use; and
- Rural Fire Brigades who are a potentially valuable resource. In 1994, Beerburrum staff ran 2 day courses for 2 local Brigades. These courses covered all facets of fire suppression. A further 6 brigades are planned for 1995.

In summary, the Committee considers that Beerburrum has developed an excellent programme for internal and external fire training. The success of this programme is reflected by the safety record of staff involved on the wildfires. The same can be said for those Districts who sent support crews to the fires. However, some inadequacies were apparent and these need to be rectified:

- A number of Head Office staff assisting had limited fire fighting experience and training, and most lacked personal protective equipment. This limited their effectiveness and stretched the resources of the Beerburrum Store (see recommendation under Training re issue of ppe to HO staff);
- A detailed investigation of the origin of Fire No. 48 did not commence until 2 weeks after the fire and was limited in extent. Future major wildfires must be investigated immediately by officers trained in fire investigation and interviewing techniques; and

- These fires have highlighted the need for a formalised accreditation system for firefighters. This needs further development and could examine the use of a card system for varying levels.

The Committee makes the following recommendation to encompass the deficiencies in fire training:

(i) *A fire training team made up of the Fire Protection Officer, DF Gympie and the Principle of the Training Centre be formed to review training needs. This review should be completed by August 1995. Particular emphasis must be directed to:*

- ***Training modules;***
- ***Formalising an accreditation system.;***
- ***Training of Head Office staff;***
- ***Fire investigation training, i.e. into the causes and origins of fires.***

FIREBREAK DESIGN- RECOMMENDATIONS FOR RE-ESTABLISHMENT.

Introduction

The following guidelines are recommended for re-establishment of areas damaged by the recent wildfires. They have been compiled by the Wildfire Investigation Committee. These are interim guidelines and should be further ratified by the consultative committee process.

Circular No. 2237 outlines "Standard Roads and Firebreak Design for Coastal Exotic Pine Plantations". The following modifications are recommended for re-establishment of areas at Beerburum.

1. EXTERNAL FIREBREAKS *Replace the table with the following:*

FACTOR	HAZARD RATING	FIREBREAK DESIGN
Forested country, wet sclerophyll, low heath, sugar cane, residential areas.	Moderate to high	60 m break consisting of a 15 m "C" class road adjacent to the external boundary and an effectively drained 5 m access track 40 m in from the plantation edge. This 40 m strip is to be planted along with the rest of the compartment.
Improved pasture, cultivation, riparian rainforest	Low	20 m cleared break, including 15 m "C" class road.

1.2 MAINTENANCE *Replace Section (iii) with the following:*

(iii) The 40 m Strip

This strip is to be planted at the same spacing and row alignment as the rest of the compartment. Unplanted swamp areas within this strip should be cleared and planted with suitable cover crop species, the aim being to replace swamp vegetation with less flammable grass species. Planted areas containing flammable fuels such as bladey grass and heath species occurring within the planted 40 m strip should be sown with cover crops.

The 40 m strip should be fuel reduced by slashing, chopper rolling or herbicide spraying. At pruning age, the strip should be total ground pruned followed immediately by slashing or chopper rolling to break up pruning debris. This operation should be done early in the year to allow breakdown of this material before the advent of the fire season.

When sufficiently developed, the compartment including the 40 m strip can be prescribed burnt. Where the external hazard is assessed as moderate to high, the 40 m strip should be burnt regularly on a 3 year cycle. This should continue until clearfall of the compartment. Low hazard areas should be burnt as per the current guidelines of two to three burns only.

Where previously cleared breaks have been planted, these should be burnt on a 3 year cycle until clearfallen.

APPENDIX 2

THE RURAL RESIDENTIAL INTERFACE

The *Queensland Bushfire Strategy Report 1994* identified as an emerging issue, the problems associated with fire management and planning for rural / residential zones. The report also noted that this problem is especially prevalent throughout the South-east region.

"The desire for a bush life style, especially by residents with little experience of rural living and land management and consequently no experience of bushfires, has often taken precedence over safety. The absence of adequate planning controls on development in such areas has also contributed to the increase in vulnerability."

A number of recommendations were made in the report. The recommendations that apply to the rural / residential interface have been identified and summarised below:

- A risk mapping methodology suitable for use in existing and proposed rural / urban interface zones needs to be developed for planning and training purposes;
- Government Departments that impose land use constraints on land owners should provide fire management assistance where appropriate;
- Communications (two-way radio systems) be upgraded in Local government areas where multi-agency contact is essential for the control of wildfires with particular emphasis on rural / urban interface zones;
- Smoke management plans be developed for rural / urban interface zones; and
- Local Governments (in particular those with considerable rural / urban interface zones) appoint a Fire Management Officer to implement and oversee fire management and planning.

In the Beerburum area, the private land / State Forest interface zone is dominated by smaller rural developments. These developments quite often still carry small hobby type farms on them and represent more of a fire planning dilemma than smaller higher density housing Estates. In general, the high density housing developments are kept in a cleaner state, with mowed lawns and manicured nature strips abutting the State Forest.

The large private blocks carrying small farms and orchards are usually maintained to a lesser degree than housing Estates. They are more heavily vegetated and some management practices employed by the farmers are not in line with wildfire management practices implemented by the Forest Service. For example, good fruit growing practices entail the use of mulches to save on irrigation costs. This practice however encourages wildfire spread.

The Beerburrum Forest Estate

The history of the Beerburrum area has meant a number of private blocks have been developed within the boundary of the Forest Estate. After the Second World War, soldiers were given blocks of land in the Beerburrum area to re-establish themselves, as part of the repatriation process.

Eventually some of the 'Soldier Settlements' were sold to the Government and were subsequently developed as commercial plantations under the management of the then Forestry Department. The parcels of land sold to the Government were owned by retired soldiers who did not necessarily possess the local knowledge or the expertise to succeed in the rural marketplace. Not all of the settlements failed and as a result there are still viable farming communities / blocks within the Beerburrum Forest Estate boundary. The less traditional agricultural pursuits (for the Beerburrum area) such as pineapple and chicken farming, and orchards succeeded whilst grazing and dairy farming did not perform as well. In course some of the settlements have been sold to developers who have established a range of residential developments within or abutting the Beerburrum Forestry District. These residential developments encompass a continuum of housing density from lower densities for rural residential areas through to higher density urban residential developments.

Planning Issues

There are two stages in the planning framework at which the Forest Service can recommend measures be incorporated into the system to promote better fire management planning principles in the residential / State Forest interface zone:

- at the Rezoning Application stage and
- via submissions to Local Government Strategic Plan Reviews.

In addition to functioning within the planning framework there are other processes the Forest Service might incorporate into its operations to enable better fire management and planning at the residential / Forest Estate interface. The listing and prioritising of areas in the Forest Estate according to risks associated with wildfire susceptibility is such an exercise and is in line with the recommendations made in the *Queensland Bushfire Strategy Report*.

The Forest Service needs also to, where feasible, rationalise the Forest Estate boundary. This approach has its limitations due to the area's popularity as a rural retreat and hobby farming community. The area's popularity as a place to live may make land swapping a difficult strategy to implement. People may enjoy residing next to a State Forest and resist any attempts to be relocated. However, the identification of State Forest superfluous to operations and on the fringe of the Forest Estate is an important task. These areas could be noted and utilised in any land swaps that may occur.

Currently, communication (on the subject of fire management) with residents neighbouring State Forest is minimal. Letter drops are done before the start of the fire season indicating approximate times of prescribed burning in the area. A couple of days prior to a prescribed burn, the Forest Service alerts its neighbours that, if conditions suit, prescribed burning will be performed. This may be an area the Forest Service can improve.

An offshoot of increased and more comprehensive communication with neighbours may be an increase in consultation. Neighbours may have queries relating to fire management or other matters under the jurisdiction of the Forest Service and valuable input may be gleaned from these residents. Increased communication lines may also provide more efficient channels within which to negotiate land swaps within.

Traffic increases follow on from population increases. Rises in traffic numbers generally equate to a re-development and / or relocation of original roadways. Relocated roadways leave thin strips of plantation retained alongside the new roadway and quite often adjacent to private property. In the past, this has resulted in plantation and fire management design problems. Increased liaison with the Department of Transport and the local Shires will reduce the occurrence of this situation.

During the assessment of development applications, adjacent to State Forest, the Forest Service should take into account the aspects of these in relation to plantations. During bad fire conditions, winds predominantly come from the West and historically, most wildfires emerge from private property onto Crown land (contrary to popular belief). In assessing a proposed development, the Forest Service should also take into account the position relative to State Forest. State Forest to the East of a proposed development is more susceptible to wildfire damage than one to the West.

- *Rezoning Applications*

The Forest Planning and Environment Unit has adopted a standard approach in the assessment of Rezoning Applications. It is a statutory requirement that every development must maintain a minimal area of 'Green Open Space' (10% of the development site). Regardless of a development's housing density, the Forest Service recommends that Council require the proponents to incorporate a 50 m buffer zone into their design, adjacent to State Forest. The 50 m buffer is negotiable dependent upon practical and economical considerations due to a site's physical characteristics. Public access to the buffer is also incorporated into the request and where feasible, a trafficable firebreak is requested. Once a buffer zone is established, Council should undertake its maintenance as part of their responsibility in maintaining a development's open space.

Local Government authorities are now placing tighter restrictions upon developments in the Beerburum area. The Forest Service should further develop its relations with the Shires so as to better plan for the continued development of the region as a population centre.

- *Strategic Plans*

Periodically, Councils are required to review their Strategic Plans. The Forest Service is an advisory body to the Department of Housing, Local Government and Planning and is involved in the review process. The Forest Service has recommended that Councils include in their Strategic Plan a specific zone for the Forest Estate (State Forests and Timber Reserves) rather than the usual approach of incorporating the Forest Estate into a broad rural or open space designation. The reasoning given for this separate zone is the unique management practices employed by the Forest Service and the importance of the Forest Estate in future planning issues particularly where there is a residential or rural residential interface developing adjacent to the Forest Estate.

Councils within the Beerburum Forestry District include Maroochy, Caloundra, Caboolture and Kilcoy. The District also abuts the Noosa Shire boundary to the North. Attached is an example of the Caboolture Shire's Preferred Dominant Land Use designation (in summary) for State Forest Areas. State Forest areas are delineated as separate zones in the Caboolture Shire Strategic Land Use Plan. To achieve the recognition of State Forest as a separate entity in local Shire Strategic Plans, the Forest Service should increase liaison with relevant Councils.

Fire Management Practices

The management directive to decrease protection costs per hectare of commercial plantation equate to the abandonment of 60 m external firebreaks. Instead of maintaining the firebreaks through slashing, they are to be planted and utilised as productive plantation area. Although the 60 m external firebreaks hardly ever halted the progress of a wildfire they did offer a protection zone for firefighters who may have been trapped by an oncoming fire.

In native forest areas, the practice was to maintain an external firebreak between private land and the State Forest and an internal firebreak / access route approximately 50 m (two chains) in. The narrow strip of buffer left between the external and internal firebreaks was then routinely prescribed burnt. When the management practice was changed to prescribe burning all of the native forest area, this system was abandoned. Currently, only external firebreaks are maintained, the consequence of this management practice is a decrease in access to native forests.

Attached is a summary description of the proposed Bluegum Scientific Area (SA 24). It was identified in the meeting as a possible source of future ignitions due to the exclusion of fires from the area for an extended period. The proposal has not progressed far and is currently only at the start of the gazettal process. If the proposed Scientific Area was to be cancelled a thorough investigation of its value as a Scientific Area would have to be initiated.

STATE FOREST AREAS

State Forest Areas

These areas are shown coloured green with a red border on the Strategic Land Use Plan Map and designate those areas which are under the control of the Department of Primary Industries - Forest Service.

(1) OBJECTIVE

To recognise State Forest Areas in order to protect them from the encroachment of residential and rural residential development which may alienate existing or potential future forestry uses.

Implementation

- (a) State Forests Areas are managed by Queensland Forest Service for a range of uses including timber production, nature conservation, recreation, water catchment protection and grazing.
- (b) In assessing any development proposals within or adjacent to State Forests, council will have regard to the Management Objectives of the *Beerburum - Beerwah State Forest Group Management Plan*.
- (c) Residential and rural residential uses shall not be given favourable consideration should they wish to expand into or towards forestry areas, whereby approving the use, the activities or function of a legitimate forestry use would be prejudiced, or whereby residential amenity would be adversely affected.
- (d) Council shall forward applications which adjoin land designated as State Forest to the Department of Primary Industries - Forest Services for comment, before considering the application.
- (e) Applications in such areas shall take into consideration the need to buffer their development from the State Forest Areas in order to protect the interests of residents and the Department of Primary Industries.

SPECIALISED MANAGEMENT AREA DESCRIPTION SUMMARY

ADMINISTRATION

File Reference:	<input type="text" value="SAP-D2-24"/>	District File Ref.:	<input type="text" value="830-D2-24"/>
Reserve No.:	<input type="text" value="SF 561"/>	Main Parish:	<input type="text" value="Bribie"/>
District:	<input type="text" value="Beerburum"/>	SMA No:	
Name:	<input type="text" value="Bluegum Scientific Area"/>	Area (ha):	<input type="text" value="29"/> MUID or SUIDs: <input type="text" value="NCZB56111"/>
SMA Management Plan (Yes/No)	<input type="checkbox"/> Checked means yes.		
Progress	<input type="text" value="B"/>	Progress of	<input type="text" value="Recommendation from District Forester."/>
Status Code:		Gazettal:	
Update:	<input type="text" value="02-Aug-94"/>		

CRITERIA FOR SELECTION AND ATTRIBUTES OF NOTE

Circular Selection	<input type="text" value="3.0"/>	Justification for the SMA:	<input type="text" value="Represent rare or threatened plant and animal species"/>
Code:			
Attributes of Note:	<input type="text" value="A unique vegetation association has developed as a result of long term fire exclusion."/>		
Biographic Region:	<input type="text" value="South Eastern Queensland"/>	Environmental Province:	<input type="text" value="Southern Coastal Lowlands"/>

DESCRIPTION

Species of Note:	<input type="text" value="E. conglomerata, Leptospermum speciosum, Podocarpus spinulosa"/>	
Vegetation Structure:	<input type="text" value="Shrubland; Open Forest; Heathland."/>	
Major Floristic Component	<input type="text" value="B. Aemula, E. Robusta, E. Resinifera, E. Glomulifera, Epacrids, Rutaceae"/>	
Landform Description:		
Topography:	<input type="text" value="This area lies on the coastal plains and consists of low undulating land between Bellbird and Bluegum Creeks."/>	
Geology/Lithology:	<input type="text" value="Lansborough sandstones."/>	
Soil Type:	<input type="text" value="Lateric podzolics, gleyed podzolics, low humic gleys on the low ridges. Ground water podzols on the lower slopes and drainage area edges."/>	Elevation:

REVIEW OF PERSONAL PROTECTIVE EQUIPMENT PERFORMANCE AT THE BEERBURRUM FIRES

INTRODUCTION

Following the September/October 1994 fires at Beerburum, a survey of all people who attended the fires was conducted to assess the performance of issued personal protective equipment.

Review of the Survey

As a general statement, it was found that sufficient personal protective equipment of a high standard was available to all people attending the fires. Listed below is a summary of the suggestions put forward by the people who returned the survey forms.

Eye Protection

Goggles suitable for protecting the eyes from smoke were not always available. The Beerburum store was issuing UVEX goggles that were of a suitable standard. People arriving from other reserves did not always have the same style of goggles.

It is recommended that all District stores carry a supply of UVEX goggles.

Safety Helmets

Both M.S.A. and Protector Safety Brands were worn. No adverse comments were received but it should be taken into consideration that attachments for the helmets, e.g. ear muffs and visors, are not interchangeable between the two brands.

When purchasing helmets in the future, it should be taken into consideration that M.S.A. helmets have a four point harness and Protector has a six point harness. the additional harness strap in the Protector helmet distributes the weight more evenly over the head and most people find this helmet more comfortable to wear.

It is recommended that District stores carry stocks of attachments for each brand of helmet on issue. It is highly desirable that stores only carry one brand of helmet on stock to avoid confusion.

Overalls

All comments related to the visibility of the overalls. The blue overalls specially designed for forestry fire fighting with orange trim and reflective tape and introduced after the September 1991 Swampy fire were very easy to see both day and night. These overalls were not available to Head Office and Yarraman staff.

It is recommended that all field staff involved in wildfire suppression wear the high visibility overalls that have been specified for DPI Forest Service use.

Safety Boots

There were no injuries as a result of boots failing to protect people's feet. There were several incidents of the tread melting due to people standing on hot coals. All except one case involved dual density polyurethane soles. The other case involved a nitrile rubber sole.

Nitrile rubber sole boots are heat resistant up to 300° C. while polyurethane soles withstand heat up to 140° C. If a person stands on red hot coals, both types of soles may be damaged however nitrile soles do offer a higher level of protection from heat.

A duplex sole consisting of a nitrile rubber tread and a polyurethane inner layer is now available in most of the major brands. This style of sole offers the advantage of heat resistance and light weight flexible soles. Several people wore this style of boot at the fires and recorded no damage to their boots.

It is recommended that the supply of duplex sole boots be phased in over the next 12 months in all Districts.

Gloves

Not all people wore gloves. Those that did had no complaints. The pig skin riggers glove was the most common type worn.

The risk of hand injuries during mopping up operations is high due to the presence of burning timber, steam, hot soil and the tools being used.

It is recommended that during fire training, staff are advised to wear gloves during fire fighting.

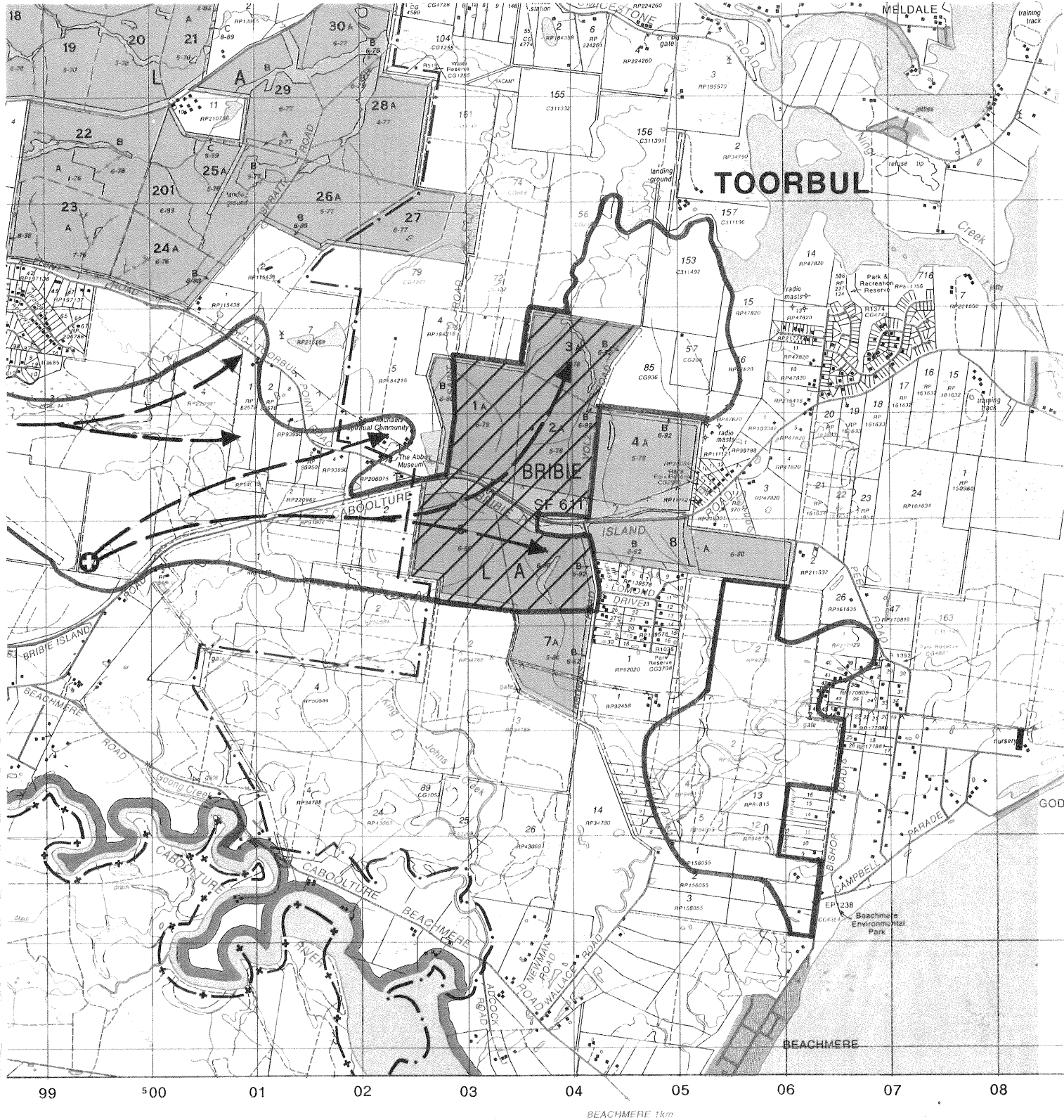
General Comments on Personal Protective Equipment Availability

The Beerburum store was well equipped with personal protective equipment. It is unrealistic to expect the host reserve during a major fire to provide all the equipment. Staff from other centres currently arrive with equipment but the level and type of equipment is not consistent.

Head office staff utilise equipment previously issued to them, their own personal equipment and equipment issued to them from the Beerburum store.

It is recommended that:

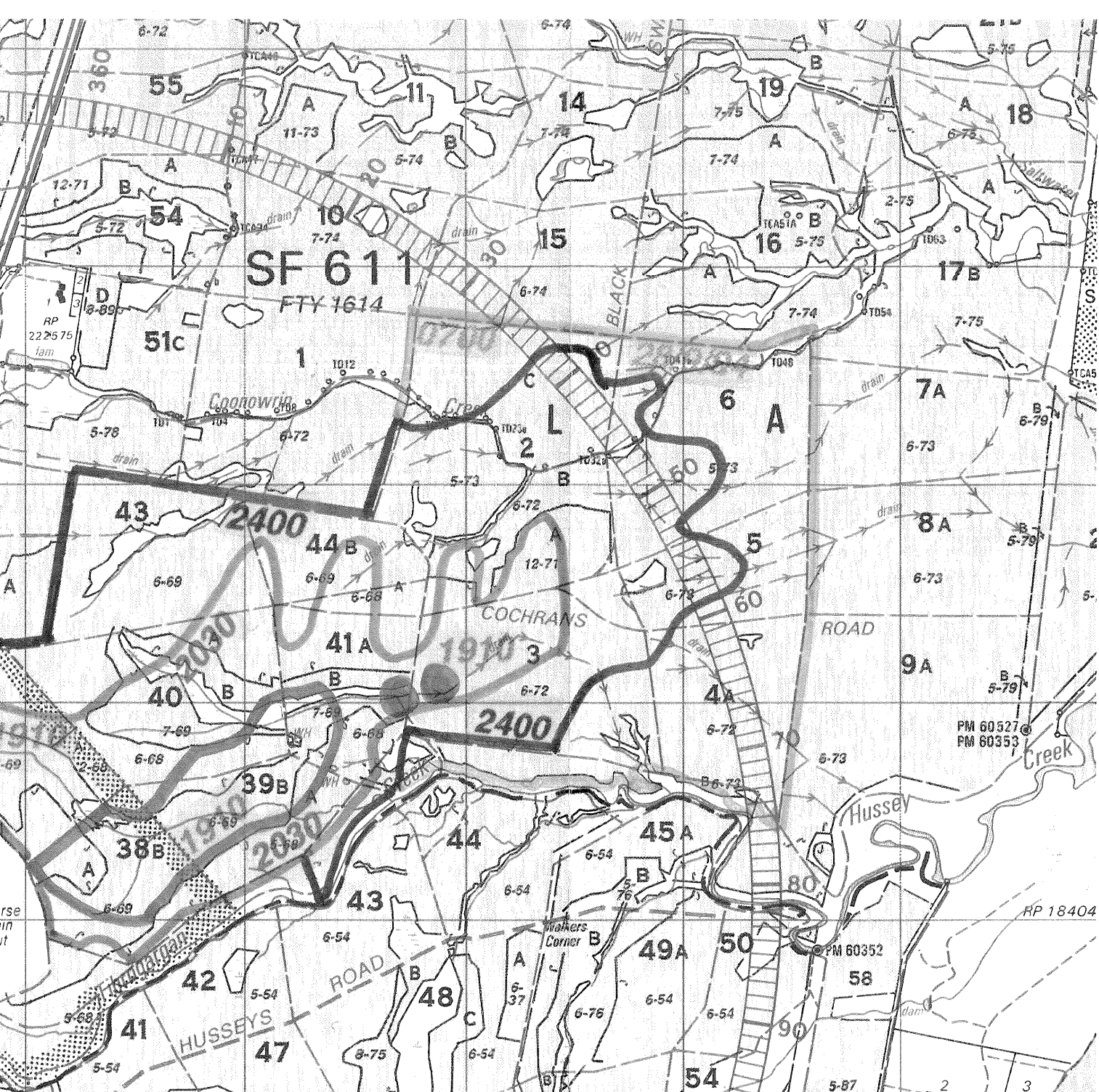
- *all districts standardise the personal protective equipment they keep on hand for fire fighting;*
- *staff are dispatched to fires at other centres fully equipped with personal protective equipment;*
- *head office staff must be equipped with personal protective equipment when they act as support crews for major fires;*
- *a supply of gloves, goggles, overall and helmets be kept on hand at Head Office; and*
- *boots are issued to staff who volunteer their availability for fire fighting.*



BRIBIE FIRE No 26

- State Forest..... 
- Area Burnt within State Forest..... 
- Extent of Fire..... 
- Suspected Source of Fire..... 
- Main Run of Fire..... 

Scale 1 : 50 000



BLACK SWAMP - GLASSHOUSE FIRE No 25

State Forest.....



National Park.....



Fire Chronology.....



Scale 1 : 25 000

Map 2



BEERBURRUM FIRE No 48

- State Forest..... Fire Fronts Monday 7/11/94.....
- National Park..... Spot Fires Monday 7/11/94.....
- Perimeter of Fire..... Back Burns.....
- Perimeter of Fire Sunday 6/11/94. Fire Held.....
- Fire Fronts Sunday 6/11/94..... Black Swamp -Glasshouse
- Fire 27/9/94.....



SF 61
FTY 1614

BEERWAH

CANNING

GLASSHOUSE

SF 611
FTY 1614

BURRUM

ROSE

DONNYBROOK

Glasshouse

1401

Monday 7/11/94.....

Monday 7/11/94.....

1400

● 0130

2134

1810

1401

1401

ROUND MOUNTAIN



Map 3