The Facts Behind the Fire

Picture: Paul Harris, *"The Age"*
www.theage.com.au

A Scientific and Technical Review of the Circumstances Surrounding the 2003 Victorian Bushfire Crisis

Compiled by Barrie Dexter and Athol Hodgson

A Publication of Forest Fire Victoria

DISCLAIMER

The views expressed in this review are those of Forest Fire Victoria and do not necessarily reflect those of any individuals or organisations with whom individual members of Forest Fire Victoria are associated.

ACKNOWLEDGEMENTS

Donald Macleod for his encouragement and incisive comments; Pat O'Shaughnessy for his contribution on the effects of the fire on water yield; Bernie Evans for helpful background on the fires; Bryan Harper of the Murray Darling Basin Commission and John Cornall-Reilly of the Bureau of Meteorology for data on inflows to Dartmouth Dam and rainfall records for Dartmouth Dam catchment; Lois & Michelle for word-processing/formatting; and last but not least, Anon.

Forest Fire Victoria
36 Evan Street
Parkdale Vic 3195

2nd Edition, June 2005.

PREFACE

The tactical response to the outbreak of fires in the Victorian alpine area in January 2003 committed the first cardinal sin in firefighting, namely, failed to make an initial attack with sufficient force.

The weather during the first 9 days they burned was relatively benign and gave a window of opportunity to control the fires. Time, measured in days rather than hours, passed before ground crews made initial attack on some fires that eventually became uncontrollable.

There was no single reason for the failure, there were many. They include too few local Departmental resources, failure to deploy some resources that were available and failure to use some local knowledge and volunteers. Changes in land management policies and practices on public land that caused closure of access tracks and failed fuel management programs over two decades were other reasons.

One firefighter lost her life on the fire ground.

The cost of extinguishing the fires is estimated in excess of $100 million. That figure pales to insignificant compared with the cost of damage to soil, waterways, stream and river yields, structures, flora and fauna and commercial forest products on public land. To that cost is added the cost of replacing infrastructure, buildings, fences, farm animals and plantations that were destroyed when the fires escaped on to private property. The tourist and agricultural industries also suffered lost income.

The terms of reference of the Victorian Government Inquiry into the fires did not include the significant changes in management practices on public land that occurred as a result of changes in land tenure over the past two decades.

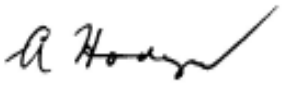
The Inquiry therefore failed to probe issues fundamental to effective forest fire management, namely, the organisational structures, resources, policies and work practices of Parks Victoria the Department of Sustainability and Environment and Department of Primary Industries. The Panel conducting the Inquiry did not include anyone with experience in managing forests or forest fires; it did not hold public hearings and had no power to compel witnesses to give evidence. Evidence given was not tested or privileged for the purpose of the law of defamation and was not available to others until after the Panel submitted its Report to Government.

The Panel's Report, titled "Report of the Inquiry into the 2002-2003 Victorian Bushfires", informed readers *"This Inquiry did not follow a failure".* Dismayed by this opinion and the Victorian Government's apparent acceptance that a flawed process can produce a valid outcome, a group of like-minded and concerned practitioners and scientists formed Forest Fire Victoria in February 2004.

Forest Fire Victoria researched and examined a large amount of historical and contemporaneous records pertaining to forest fire management in Victoria and concluded that Victoria was in regard to effectiveness of preparedness for the Alpine Fires in 2003, less well prepared than at any time in the previous 15 years to control fires caused by lightning in the Alpine area.

Forest Fire Victoria is of the opinion the Panel conducting the Inquiry knew or should have known the response capability of the agency responsible for suppressing the fires had declined, failed to investigate the causes thoroughly and make recommendations to rectify them.

This Review records in some detail, facts that contributed to a number of fires becoming uncontrollable and eventually burning 1.13 million hectares of native forests and grassland and 90,000 hectares of private property. It also identifies the changes in policy the Government must make to ensure the responsible authority discharges its duty to carry out proper and sufficient work to manage fires to protect and sustain the health and biodiversity of forests, regenerate disturbed or degraded forests and to prevent and suppress all unplanned fires on forests.



Athol Hodgson
President
Forest Fire Victoria
April 2005

TABLE OF CONTENTS

APPENDIXES [SEE REAR OF REVIEW]

APPENDIX F1. Terms of Reference for the Esplin Inquiry into the 2002-2003 Victorian Bushfires. – Esplin Report.

APPENDIX F2. *"In a matter of a report of the inquiry of the 2002 – 2003 bushfires."* Comments by Mr. A J Myers QC. 15th July, 2004.

APPENDIX 1.3.1 Fire Threat to Water Supplies by Melissa Marino, Regional Affairs Reporter. *The Age – Tuesday, September 21, 2004.*

APPENDIX 1.3.2 Extract From Interim Report Of The Inquiry Into The 2002 – 2003 Victorian Bushfires. August 2003. 5.5 Protection of Melbourne's Catchments

APPENDIX 1.3.3 Burnt-Out Catchment Poses Threat to Irrigators b*y Peter Hunt. Weekly Times, August 11, 2004.*

APPENDIX 1.3.4 Preliminary Assessment of the Likely Effects on Long Term Streamflows due to the January 2003 Bush fires in the Alpine Areas of Victoria. Pat O'Shaughnessy. January 2005.

APPENDIX 3.1 Extracts from Chapter 3 – Current Legislation and Co-operative Arrangements Esplin Inquiry into the 2002 – 2003 Victorian Bushfires.

APPENDIX 3.2.2 Department of Conservation, Forests and Lands (1985) – Summary of Significant Events – 1984/85 Fire Season. Presented to the Australian Association of Rural Fire Authorities, Perth 6-9 May 1985.

APPENDIX 3.2.3 Assessment of the Number of Persons Concerned with the Practice of Forestry in Victoria's Public Native Forests, August 1982 And February 1995.

APPENDIX 3.2.4 Incident Control System of the Australian Inter-Service Incident Management System (AIIMS).

APPENDIX 3.3.1 Fire Preparedness and Response (agreed 27 July 2004 and expires 1 August 2009), Clause 13 – Summary of Memorandum of Understanding between DSE and VicForests.

APPENDIX 3.3.3 DSE and PV Advertisement, Weekly Times, October 27, 2004 for staff (26) to service the newly launched Public Land Fire Initiative.

APPENDIX 4.3.1 Statewide Overview of Forest Fires, Wednesday 8 January 2003.

APPENDIX 4.3.2 Number and status of lightning-caused fires in seven DSE north east and Gippsland Fire Districts and resources deployed on the fires from 8 January – 16 January 2003.

FIGURES [SEE REAR OF REVIEW]

The text reference for these figures is found at the page indicated.

TABLES

Forest Fire Victoria Inc.

http://home.vicnet.net.au/~frstfire/

ABOUT US

Statement of Purpose

- To provide and promote independent and expert opinion on forest fire management.
- To ensure that Victoria's forest fire management policies and practices are based on science, experience and accountability; and address social, economic and environmental values of natural ecosystems.
- To ensure that the long-term well-being and safety of forest ecosystems and their surrounding rural communities are protected.

Our Method of Operation

Forest Fire Victoria will seek opportunities to pursue its purpose through a range of strategies including:

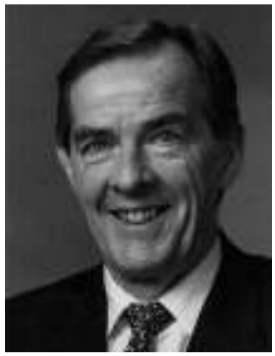
- Making submissions to inquiries.
- Providing experts for seminars, conferences and media opportunities.
- Exposing the consequences and dangers of distorted science and misinformation.
- Bringing problems and solutions to the attention of politicians and decision makers.
- Supporting independent and objective research and education.
- Raising awareness of forest fire issues through the media and community education.
- Publishing articles and research papers.

MEMBERS OF FOREST FIRE VICTORIA

P M (Peter) Attiwill PhD, BScFor, DipFor (Cres), is a principal Fellow in Botany, and Senior Fellow, the Australian Centre, the University of Melbourne. He has researched in eucalypt ecology over 40 years, with a concentration on soils and nutrient cycles, and on bushfires and ecosystem recovery. He is a member of editorial boards of a number of Australian and overseas. He has published extensively in the international journals, and his latest book is E*cology: an Australian Perspective* (co-editor B A Wilson, Oxford University Press 2003). He is a consultant in many environmental issues, and a member of the board of the Westernport Seagrass Partnership.

N P (Phil) Cheney PSM FIFA, BScFor, DipFor, is senior principal research scientist, Division of Forestry, CSIRO. He was head of CSIRO's bushfire research from 1975 to 2001. He has forty years of experience in research into bushfires including bushfire behaviour, prescribed burning, mass fires, fire ecology, aerial and ground suppression, firefighter physiology, firefighter safety, heat transfer, home protection and water catchment hydrology. He was awarded the CSIRO medal for outstanding research achievement in the application of fire science for safer firefighting and safer communities.

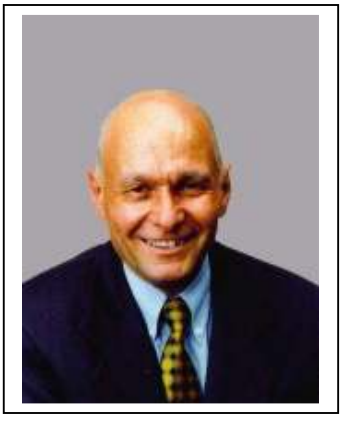
B D (Barrie) Dexter MScFor, BScFor, DipFor(Cres), has 49 years experience in natural resource management including research and development in the silvics and silviculture of native and exotic forests, factors affecting bushfire behaviour, the planned use of fire, and the management of national and other parks. He is a leading expert on the ecology and management of the extensive and vital red gum forests along the Murray River. He is a member of the Board of Management of the Natural Resources Conservation League of Victoria, and a member of Timber Communities of Australia.



B F (Brian) Gibson AM, BScFor, BA, began his career with the Forests Commission Victoria. He then moved to the private forestry sector, and was Managing Director of Australian Newsprint Mills Ltd from 1980-1989, and President of the National Association of Forest Industries from 1987-1991. He was a Liberal Senator for Tasmania from 1993 to 2001. Mr. Gibson is a director of several companies.

R C (Bob) Graham DipFor (Cres), AFSM, has more than 40 years experience of fire prevention, suppression, and prescribed burning. He was a principal (Level 3) Controller and Operations Officer at major fires in Victoria including Ash Wednesday fire, 1983, the North-East fire, 1985 and the disastrous north-east fires, 2003. He has led task forces to South Australia and to the Blue Mountains fire, 1994. He is currently a Managing Director and consultant on wild-fire behaviour and suppression in both native forests and plantations, and in planning and conducting prescribed burns.

A (Athol) Hodgson BScFor, DipFor (Cres), has more than 50 years experience in fire management and forest fire research in Australia, USA, Canada, France and Spain. He was formerly Commissioner for Forests, Forests Commission of Victoria, and then Chief Fire Officer, Department of Conservation, Forests and Lands. He was a Member of the Board of the Country Fire Authority and a Member of the State Disaster Committee. He was awarded a Winston Churchill Fellowship to study fire management in North America, and is a graduate from the National Advanced Fire Behaviour School, Marana, Arizona.



R (Rod) Incoll, BASocSci, GradDipBus, DipFor (Vic), DipFor (Cres), AFSM, developed expertise with the Forests Commission Victoria in the use of prescribed fire and in bushfire management throughout Victoria. He was appointed Divisional Manager, State Electricity Commission in 1984, and Chief Fire Officer, Department of Conservation and Natural Resources, Victoria in 1989. He was a member of the Board of the Country Fire Authority, the State Emergency Services Council, and the Australasian Fire Authorities Council. He worked closely on aviation support for forest fires with North American agencies. He is a consultant with Bushfire Protection Australia.

W G D (Bill) Middleton - OAM, DipFor (Cres) has some 50 years experience in management of forests, of nurseries and of vegetation habitat in rural areas. He is a broadcaster, public speaker, lecturer and adviser on gardening, natural history, forestry and conservation. He has served on many scientific and community-based boards and committees concerned with wildlife research and landscape conservation, and is an Honorary Life Member of Birds Australia. He is a Board Member and Supervisor of the innovative Potter Farmland Plan for ecologically-sustainable agriculture, and a Board Associate and consultant for the Trust for Nature.

D (David) Packham OAM, MAppSci worked for 40 years in bushfire research with CSIRO, Monash University and the Australian Emergency Management Institute. He was responsible for fire-weather services in the Bureau of Meteorology. His extensive research concentrated on the physics of bushfires, and he applied this research to practical issues including the development of aerial prescribed burning, non-evacuation of properties, modelling of fire behaviour, and forensics. He consults extensively on survival of people during bushfires, on fire risk and on coronial inquiries into death during fire-fighting.

S J (Steve) Pyne - Regents Professor, Human Dimensions Faculty, School of Life Sciences, Arizona State University, USA spent 18 seasons with the U.S. National Park Service in fire management. He has authored a dozen books on fire, including 'Burning Bush. A Fire History of Australia', 'Introduction to Wildland Fire', and 'Fire: A Brief History. Among his several awards are a MacArthur Foundation Fellowship and, from the *Los Angeles Times*, the Robert Hirsch Award for lifetime contribution to American letters. He is presently Vice-President and President-Elect of the American Society for Environmental History.
Steve Pyne was not involved in the production of this fire review.

Kevin Wareing, BScFor, DipFor (Cres), is a forestry consultant and co-author of the narrative of the 2003 Alpine fires in Victoria. He was employed for some 40 years in the Forests Commission Victoria and its successors in native forest management, plantation expansion, forest education, timber harvesting and industry development policies. He was manager from 1988-1995 of commercial forestry in Victoria's native forests and plantations. He was awarded a national medal for services to fighting forest fires.

VICTORIA'S BUSHFIRE HISTORY[1]

Victoria is the most seriously affected State in Australia, accounting for some three-quarters of bushfire-related deaths and more than half of economic losses[2].

Serious forest fires are sometimes experienced as early as September, especially in East Gippsland, but the forest fire season normally begins in October and extends until April or even later in very dry seasons.

Lightning causes about 25% of forest fires reported in Victoria each summer and multiple lightning strikes associated with particular weather events are relatively common. In situations where lightning ignites bushfires, a "window of opportunity", usually measured in days rather than hours, exists when the fires can be contained if attacked with sufficient force. If this "window of opportunity" is missed there is a very real risk that the fires will progressively increase in size and become uncontrollable.

Major fires since European settlement include Black Thursday, 6th February 1851 when fires covered about one-quarter of the region which several months later became the colony of Victoria.

From 1896 to 1945 it appears that only about ten out of the 50 seasons were completely free from bushfires. Most destruction occurred from widespread fires in 1898, 1905, 1906, 1914, 1926 (31 deaths, 394,300 ha burnt) and 1932 (20 deaths, 206,000 ha burnt). More recent notable fires include:

1939	Black Friday, 71 deaths, 1,364,410 ha burnt
1942 & 1943/44	700 homes lost, 49 deaths, the total area of forest fires was some 160,000 ha while the total area burnt by grass fires was about 1 million ha
1952	NE Victoria several lives lost, 100,000+ ha burnt
1961/62	167 major fires covering 100,000 ha, 14 deaths and 454 houses lost in the Dandenong Ranges
1965	No lives lost, 378,000 ha burnt
1969	Serious outbreaks, 12 fires reaching major proportions, 23 deaths and 250,000+ ha burnt
1983	Ash Wednesday and other fires, 49 deaths, over 2,200 houses destroyed and 210,000 ha burnt
2003	One firefighter died on the fire ground. 1,067,500 ha of forest and 90,000 ha of private property burnt.

[1] Comprehensive descriptions are provided in: *Ordeal by Fire*, W.S.Noble(1); *Bushfires in Australia*, R.H. Luke and A.G. McArthur(2); *A Fire History of Australia*, Stephen J. Pyne(3); *National Academies Forum*(4) and *Forests of Ash*, Tom Griffiths(5).

[2] MIRA Consultants Ltd, November 1992(6) *Fire Protection Risk Management Study for Department of Conservation and Natural Resources*

THE 2003 ALPINE FIRES

The 2003 alpine fires were ignited by lightning associated with a south-westerly change that crossed eastern Victoria and southern NSW on the evening of 7 January 2003 and the early morning of 8 January 2003. Most of the over 80 fires started in Victoria, and over 40 fires started in NSW and the ACT, were located in National Parks and State Forest.

While most of these fires were contained, a number in both north east Victoria and southern NSW were not contained. These fires developed into large uncontrollable fires that joined together and burnt adjoining area**s**, extending from Canberra in the north to the outskirts of Swifts Creek (North East Victoria) in the south, and from Mt Buffalo in the west to Dellicknora in the east (Figure I.1).

The total area of the fires in Victoria was comparable with the area of Victoria's 1939 fires (Figure I.2). Their sheer size and intensity had a devastating impact on flora, fauna, water catchment, timber and scenic values in National Parks and State forests in Victoria and NSW. Due to the remote location of the fires, damage to the built environment was, in relative terms, limited in Victoria and NSW. However, the fires burnt into urban areas in the ACT resulting in the loss of 5 lives and the destruction of over 400 homes.

The area burnt in Victoria was nine times greater than the area burnt in 1985 when 111 lightning fires started on public land between late afternoon on 14 January and 0900 hrs the next day.

ABOUT THIS REVIEW

The object of this Review is to place on record Forest Fire Victoria opinion that the Victorian Government Inquiry (The Esplin Inquiry[7]) into the 2003 alpine fires, failed to rigorously investigate and address concerns of many knowledgeable individuals, communities and organisations on underlying problems with Victoria's forest fire management policy and practice. These problems have progressively developed under successive State Governments over two decades and culminated in the disastrous outcomes of the 2003 alpine fires. Previous and independent inquiries into Victoria's major bushfires served the State and Nation well. The Esplin Inquiry did not.

Victoria's forests are amongst the most wildfire prone in the world. Consequently, it is fundamental to the State's and indeed the nation's social, economic and environmental wellbeing that Victoria's forest fire management policy and practice is commensurate with the risk. At present it is not. The underlying problems and issues must be addressed if the chances of a similar disaster to that of 2003 are to be reduced.

Forest Fire Victoria has identified serious deficiencies and made recommendations to address the problems. If these matters are not effectively addressed, Victoria will continue to be at an unacceptable risk of widespread and destructive forest wildfires.

INQUIRIES AND REPORTS INTO VICTORIA'S BUSHFIRES OVER THE PAST SIX DECADES

VICTORIAN BUSHFIRE INQUIRIES 1939 - 2003

Year	Known As	Events/Subjects	Principle Outcomes
1939	Judge Stretton[8]	1939 Victorian fires	Foundation for Forest Fire Management (1939)
1945	Judge Stretton[9]	1944 Victorian fires	Creation of the Country Fire Authority (CFA) in 1945.
1977	Sir Esler Barber[10]	Municipal fire prevention arrangements	Revision of municipal fire prevention arrangements.
1982	Taskforce Report to Minister of Forests[13].	Fire protection and fuel reduction burning by the Forests Commission, Victoria	Considered by Government in the formation of the mega Department of Conservation Forests and Lands.
1982	Taskforce Report to Minister of Forests[14].	Examine appropriateness of the organisational structure of the Forests Commission to meet current operational needs and to conform to Government policy	Considered by Government in the formation of the mega Department of Conservation Forests and Lands.
1983	S.I. Miller[11]	Serious problems with fire co-ordination and fire response	Resulted in the Emergency Management Act (1986).
2002	Linton Bushfire Inquest[20]	Coronial Inquiry into the deaths of five volunteer CFA firefighters fighting a fire at Linton, near the City of Ballarat; December 1998.	Recommendations for improved safety of all firefighters. Profound influence on the conduct of fire prevention and fire suppression operations. Annually, DSE and CFA jointly sign and widely promote to their respective workforces a Co-operative Agreement, a document with a strong operational and safety focus. Relevant occupational health and safety legislation recognise the Fire Ground as a 'workplace' and an Incident Controller as 'controlling' the workplace[20].
Oct 2003	Esplin[7]	2002/2003 Victorian Fires	Accepted by Government for formulating Victoria's forest fire management policy and practice.
Oct 2003	Commonwealth Parliament (House of Representatives) "A Nation Charred"[12]	2002/2003 Australian bushfires	The State of Victoria did not contribute to this inquiry.
2004	COAG Council of Australian Governments[22]	Inquiry on Bushfire Mitigation and Management. Reported to the Prime Minister as the Chair of COAG on 2 April 2004 The report and COAG's response were released on 24 January 2005	

REPORTS 1983 – 2003.

Year	Agency	Events/Subjects
1983	Fire Protection Seminar[15]	Review of forest fire protection strategy and techniques following the 1983 bushfires
1984	Department of Conservation, Forests and Lands[16]	Report of the Fire Protection Working Party – to investigate and report on matters relating to Fire Protection within the Department and a proposed structure for the Fire Protection Branch.
1985	Department of Conservation, Forests and Lands[17]	Summary of Significant Events 1984/85 Fire Season. Presented to: Australian Association of Rural fire Authorities. Perth 6-9 May 1985[15].
1992	Auditor-General[18]	Special Report No.16 Fire Protection April 1992 Review to evaluate the economy, efficiency and effectiveness of the Dept. of Conservation and Environment's management of its fire protection activities, embracing both fire prevention and fire suppression.
2001	Department of Natural Resources and Environment[19]	Fire Management – Effectiveness of Broad Scale Fuel Reduction Burning in Assisting with Wildfire Control in Parks and Forests in Victoria
2003	Auditor-General[21]	Fire Report tabled in the Victorian Parliament May 8, 2003[18] This audit commenced prior to the fires of summer 2002-2003, and did not examine suppression operations. The audit focused on the planning, prevention and preparedness measures that can prevent or reduce the severity of Victoria's seasonal wildfires and on whether those essential planning and prevention measures are being effectively implemented.

FOREWORD

This Review examines the Victorian Government's Inquiry into the 2003 fires with particular reference to Victoria's alpine region, from viewpoints of:

1. Why the 2003 alpine fires were a disaster.
2. Factors affecting wildfire suppression.
3. Elements essential to effective forest fire management on public land.
4. Tactical priorities and deployment of resources to detect and bring the alpine fires under control - Day 1, 8th January – Day 9, 16th January 2003.
5. Considers some factors post 2003 impacting on forest fire management.
6. Identifies the key elements of a new forest fire policy.

The Esplin Inquiry(7) (Terms of Reference Appendix F.1.) presented an interim Report(7a) to the Premier of Victoria, The Hon. Steve Bracks, in August 2003. The final Report was released on 14th October 2003.

The Panel conducting the Inquiry informed the Premier and the Victorian public on the nature of the Inquiry, viz:

> *"The issue that differentiates this Inquiry from those of our predecessors is that we were not inquiring into a major disaster in terms of deaths, injuries and homes and properties lost. On the contrary a critical review of recent experience in Australia and overseas points to a high degree of professionalism in emergency response that is assessed as equal to 'world's best practice'. In saying this, however, community expectations of Government and its emergency services have also changed and there is an understandably higher expectation of the quality of fire mitigation/prevention, emergency response and recovery. Lessons have been learnt, fire prevention/mitigation can be enhanced and organisational structures and systems can be further improved. …"*
>
> ***We wish to report to you that, in response to the fires, we found no evidence of major systemic failure****."*[3]

The Inquiry and its Report has been challenged in a pro bono opinion(23) requested of Mr. A J Myers QC by the Stretton Group. Mr A J Myers QC - in the matter of a Report of the Inquiry of the 2002 -2003 Victorian bushfires commented *inter alia*[4]

- "Mr. Esplin was not, and did not appear to be, independent in relation to the matters inquired into.
- The report failed to address important environmental and economic consequences of the fires, including the effect of the fires upon water catchments.

[3] Bold emphasis is that of Forest Fire Victoria.

[4] In the matter of a report of the inquiry of the 2002-2003 Victorian bushfires**(23).** A full copy of Mr. A J Myers QC comments is contained in Appendix F2.

- Matters which the terms of reference ought to have addressed, in addition to the economic and environmental consequences of the fire, include: land use practices of Parks Victoria, forest husbandry practices in Victorian State Forests and specific steps which could have been taken to control and extinguish the fires but which were not taken, or not taken in a timely manner.

- 'Expert input into the Inquiry.' The qualifications of Dr. Gill and Professor Enright are described. What is notably absent in the description of the skills of the members of the Esplin Inquiry and the resources available to them is any reference to skills and experience in relation to forestry management and fire prevention or suppression.

- One must have grave misgivings about the manner in which the report is written. There are few specific findings or recommendations upon the most critical issues about, for example, fuel reduction burning, the organisation of fire and emergency services and the roles of landowners, volunteer firefighters and local communities in fire prevention and control.

- … the tone for the report, which tends to deflect blame from those who are responsible for establishing and administering policies and programmes affecting bushfire mitigation and suppression.

- A major criticism of the efforts to extinguish the fires in north east Victoria in 2003 is that in the first week of the fires there were ample opportunities to completely control or extinguish the fires, but these opportunities were not sufficiently availed of.

- Possibly the most sensitive area of the Esplin inquiry concerns fuel reduction burning. Before the 2002-2003 fires there had been a considerable decline in fuel reduction burning on public land, especially National Parks."

Mr. A J Myers QC in his opinion to the Stretton Group concluded:

> *"*The establishment of the Esplin Inquiry and the procedures followed in the conduct of the Esplin inquiry were seriously flawed. The Esplin Report is correspondingly flawed in its conclusions and recommendations. *It is open to the Coroner to hold a Coronial inquiry into the 2003 north east Victoria fires or for the government to establish a board of inquiry or Royal Commission to undertake an adequate, public examination of the 2003 north east Victorian fires and related issues."* [5]

The Coroner has declined to hold an inquiry and the State Government continues to refute the need for any additional inquiry.

[5] Italics are those of Forest Fire Victoria for emphasis.

Forest Fire Victoria believes that the 2003 alpine fires were a disaster. For Victoria, and the alpine region of south east Australia, these fires were the most disastrous and most contentious forest fire prevention and suppression failure since Black Friday 1939. We do not believe that the "emergency response" should be assessed as equal to 'world's best practice' nor do we accept the claim that there was "no evidence of major systemic failure".

Quite to the contrary, it appears from the Esplin Report[7], The Department of Sustainability and Environment's own narrative of the 2003 Victorian Alpine Fires[24], the Victorian State Auditor-General's report on Victoria's Fire Prevention and Preparedness (May 2003)[21] and Mr. A. J. Myers QC opinion 15 July 2004[23] that there were serious deficiencies in :

- the application of statutory responsibilities;
- the level of preparedness commensurate with the risk;
- fire prevention;
- initial attack;
- allocation and adequacy of resources

We contend that all of these issues had a significant influence on the initial response to these fires and on final outcomes.

CHAPTER 1. WHY THE 2003 ALPINE FIRES WERE A DISASTER

The Victorian Alpine fires in 2003 were different to any lightning caused fire event in the past in that 527,100 ha or 53% of the "treed" forest affected by the fires was burnt by fire intense enough to severely scorch the crowns of all the trees or incinerate their crowns. None of this intense fire behaviour occurred in the first week the fires burned and practically all of it occurred on just 4 days of the 59 days they burned, namely 18, 23, 26 and 30 January 2003. (Figs 26, 27, 28 and 29 DSE fire narrative[24]). It is very doubtful if more than half of such a large area of alpine forest was burnt so severely in the past by fires started by lightning; certainly not since European settlement started and unlikely before then. Nature caused the fires but the 2003 fire event was not natural. Those fires were fed by fuels that accumulated over decades where natural fires had been deliberately extinguished and little or nothing had been done to reduce those accumulating fuels by planned burning or any other means. In those places the fires were feral, and burnt over extensive areas with an intensity and uniformity that was alien to the natural processes that forests require for their health, diversity and sustainability. The result was catastrophic.

Mud and rock slide, Upper Buckland River. ***Photo: Border Morning Mail***

A massive mud and rock slide occurred in the Upper Buckland River during the fires and killed one firefighter on the 26th February 2003. Other graphic examples of environmental damage caused on the 4 days of extreme fire behaviour can be seen in the mixed eucalypt species forests in the Mitta River valley between Omeo and Anglers Rest where tree crowns were severely scorched on an area approximately 20km x 4km. The scorch is remarkable because it is uniform across all aspects (N, S, E and W) and at all elevations from river level to the mountain tops 600m above the river. That does not happen when there is a mosaic of fuels of different ages across a large area. Two years after the fire, thick barked eucalypts are recovering with epicormic shoots along trunks and branches, and thin barked species with basal coppice. Recovery of the understorey is sparse. Sheet erosion is still occurring and deposits of sand and gravel fill the table drains and gullies. An experienced bird observer/photographer recorded fire effects at one site from 3 pm until dark on 19 April 2004, a fine and calm day, and heard one currawong call. He neither heard nor saw any other bird or mammal in that period.

Mixed Eucalypt species, Mitta River Valley. ***Photo: Wallace Bruce***

Also in the Black Cypress and White Box/Black Cypress forests between Suggan Buggan and Willis, tree crowns were severely and uniformly scorched over large areas on slopes in the Snowy river valley. Three years after the fire, White Box is recovering with basal coppice. The Black Cypress trees are dead; there is no regeneration by seed and it is unlikely that any will occur. The soil is 75% exposed, gullies are filled with sand and silt and sheet erosion is occurring. Dr. D H Ashton, an eminent forest botanist with intimate knowledge of the area over some 50 years, saw the effect of the fire and wrote: *"Therefore in this area there has been a major ecological consequence of the fires. A short forest dominated by Cypress pine will be replaced by an open woodland of multi-stemmed White Box until such time as dispersal from unburnt* Callitris *succeeds in re-establishing the original stand. Given the severity of the site conditions this may take a very long time to achieve (if ever)". (Personal communication.)*

Fire-killed Black Cypress Pine, Snowy River Valley. ***Photo: Wallace Bruce***

The pure stands of Snow Gum forests did not escape the high intensity fire.
Snow gums (*Eucalyptus pauciflora*) grow in pure stands up to the limit of the tree-line over much of the alpine region. Snow gums develop large, underground structures called lignotubers from which they regenerate by coppicing after fire. Snow gums are therefore generally regarded as highly resilient to damage by fire.

However, the alpine fire of 2003 burned some of the snow gum forests with such severity that they are not regenerating with vigour. For example, on some of the steep slopes around Mt Saint Bernard, 10% or less of the clumps of snow gums are coppicing two years after the fire; re-establishment of the treeline in these areas may therefore take many decades to centuries.

In January 2003, Premier Bracks established a Ministerial Task Force on Bushfire Recovery whose final report was issued in April 2003. As a result $76m was allocated for a range of specific initiatives focused on water, land and environmental restoration and assistance to farmers, industry and the wider community.

DSE's fire narrative[24] provides a listing of asset losses sustained in the Alpine fires, viz:

- Table 19. P208 – estimate of public infrastructure losses;
- Table 20. P209 – estimate of agricultural losses;
- Table 21. P211 – estimate of impacts on some environmental and cultural values.

It was beyond the scope of the narrative to further investigate the monetary implications of these losses.

This section of the Review briefly reports on just three consequences of the fires which highlight the magnitude of the disaster.

Some social, economic and environmental consequences of not bringing the alpine fires under control in the first week.

Section 1. Socio-economic impact of bushfires on rural communities and local Government in Gippsland and North East Victoria[25]

This was a short term study covering the period from the time of the fires, January – May 2003.
In total, the study estimated that the loss of income and production in the Shires of Alpine East Gippsland, Indigo and Towong was 121.1 million dollars.

The study recognised that there would be flow-on effects both within the Shires examined and outside and that the negative effects would persist into the future.
The study did not include the cost of damage to infrastructure, property, long term loss of primary production including forestry, water yield and quality and the environment.
It is predicted that these run into hundreds of $ millions.

Section 2. Forest industries

Forest industry directly contributes $1.8 billion to Victoria's industry, and underpins a broader industry employing an estimated 250,000 people and contributing over $2.5 billion to the State's economy. The forest industry plays a vital role in providing firefighting equipment and capability, and in constructing and maintaining roads.
The following snapshot has been extracted from the Victorian Association of Forest Industries submissions[26] [27] to The House of Representatives Select Committee on the Recent Australian Bushfires.

> "VAFI is an industry organisation representing the companies employed in the sustainable harvesting and processing of natural timber from Victoria's State Forests. The forest industry directly contributes $1.8 billion to Victoria's economy, and underpins a broader industry of timber merchants, builders and furniture manufactures employing an estimated 250,000 people and contributing over $2.5 billion to the State's economy. Currently the industry is going through a significant downsizing as a result of a 30% statewide reduction in sustainable yield and a decision by State Government to cease timber harvesting in the Otway Ranges Forest.

The industry's future depends upon good management practices in both conservation reserves and multi-use State Forest.

The fires earlier this year (2003) that burnt approximately 1.1 million hectares of forest in the Bogong region of North East Victoria have had an impact on the timber industry, the communities they support and the environment. Timber supplies have been seriously disrupted, valuable resource is at risk, current sustainable yield levels are threatened, and environmental values have been undermined.

Ensuring the ongoing presence of the timber industry in State Forest, and preferably an expansion of that presence is a legitimate and cost-effective means of significantly supplementing vital forest management and emergency fire fighting resources.

As a condition of operating in the forest, the industry is required to supply its bulldozers and transport machinery and operating personnel to fight wild fires, particularly in regard to creating instant access for fire crews and creating fire breaks. These crews provide considerable local knowledge, experience in using heavy equipment in rugged bush terrain, and experience on fire control. They present a valuable resource that is made even more valuable by its ready availability. Further they are an 'on-tap' resource that is only paid for when deployed, and as such its ongoing maintenance and upgrade is not a constant drain on the public purse.

During the fires in January 2003 some 83 bulldozers and crews supported the fire fighting effort. It is anticipated that almost half may exit the industry as a part of the industry downsizing following from the review and subsequent reduction of the sustainable yield. This presents a major problem of resourcing future fire fighting efforts. Additionally, the downsizing of the industry is also likely to impact on the level and type of equipment maintained by DSE full time. Removal of harvesting from the Otways will almost certainly leave little work and little reason for DSE to retain the two bulldozers it currently uses to support its commercial forestry operations.

A reduction in forest access due to the closure or lack of maintenance of roads and tracks, many of which were built by the timber industry at its own cost, is a major concern. This situation has been allowed to develop through both lack of funds for road and track maintenance and "green" pressure to restrict access to areas of (now) park and reserve.

The contribution by the timber industry to forest access is considerable**.** The DSE Vic Forests financial performance report on its website states:

- Roading recoups are collected from the logging industry to establish and maintain access roads to logging areas.

- The recoups are levied on the volume of sawlogs, residual logs and pulpwood sold. Although the volume of residual logs and pulpwood sold during 2001/02 decreased, the roading levy was increased in 2001/02 and largely offset the reduction in volumes.

- The revenue raised for roading was just over $13 million for both 2001/02 and 2000/01.

Removal or downsizing of the industry will inevitably lead to fewer access roads in the forest. It is anticipated that unless new funding sources are found … road funding in the Otway Ranges will drop from $300,000 per year to in the order of $40,000, following the withdrawal of the timber industry.

Fire-damaged mixed species Eucalypt forest. ***Photo: Wallace Bruce***

Commercial impact of the 2003 alpine fires on the industry

An immediate impact of the fires was the reduction, and at some times complete halt to harvesting operations, while crews were dedicated to the firefighting task. In many instances this was for weeks at a time. While the Government paid for equipment and personnel deployed, the remainder of the harvesting and haulage team was idle.

Additionally a number of mills faced critical timber supply issues.
It is estimated that in excess of 20,000 ha of production alpine ash forest has been burnt, although it is understood that some of this forest was burnt at low intensity and that the forest may have survived.

The Land Conservation Council Melbourne Study 2 Final Recommendations 1994 estimated the value of products ex the mill gate from mountain ash forests, a close relative of alpine ash, that had regrown from the 1939 fires was worth $234,000 per ha in mill door products and $500,000 per ha at point of consumption.

This value cannot be directly translated to the burnt alpine ash forests as these forests are much slower in growth, but more valuable in wood quality. Furthermore some of the forests burnt are still young regrowth. However this suggests that the area burnt would have

several billion dollars in potential forest products at the point of consumption.

Some of this will be salvaged but subsequently there will be a significant impact on the sustainable supply of sawlogs until the regrowth from the 2003 fires reaches millable age in around 80 years. The final impact of these fires on timber production is not yet known, but it is possible that the 100,000 m^3/yr of sustainable supplies of D+ sawlogs from the Tambo and North East Forest Management Areas will be reduced substantially - possibly in the order of reducing State-wide supplies by almost 10%.

Long-term impact on sustainable yield
The most recent figures from DSE suggest the annual sustainable Ash yield for Tambo, and North East could drop by over 30,000m^3. These figures are still under review. This could result in the shedding of well over 100 direct jobs, with high value adding mills hit the hardest given Alpine Ash is the prime sawlog for appearance grade products.

Salvaging fire killed trees
The need to quickly salvage the timber has made an already complex situation more difficult. Ash killed by fire must be harvested before it deteriorates, usually within 12 to 18 months after the fire. The salvage operation potentially could be between 450,000 m^3 and 1 million m^3 of D+ sawlogs i.e. equivalent to around 1 to 2 years of statewide supply. Capacity to harvest and process the wood will be an issue as the wood is remote from most processing centres, adequate roads are not in place in some areas and there are major capacity issues associated with a short term increase in harvesting.

Depending on the scale of the salvage, in terms of ex-mill products, the salvageable wood has a value of $160 million to $400 million. The flow-on effect in economic activity will be at least 3 times this amount i.e. $500 million to $1.2 billion. For example, in furniture, the value of sawn wood increases by a factor of ten when converted to furniture."

Section 3. Water quality and water yield

A highly significant aftermath of forest wildfire, particularly in the following 12-18 months, is the vulnerability of the exposed ground to moderate-high intensity rainfall events causing severe soil erosion and excessive run-off. Massive volumes of top soil and ash are eroded off exposed slopes, clogging streams, destroying their aquatic environment, damaging infrastructure (roads, bridges, culverts), silting dams and reservoirs, polluting downstream lake systems with excessive nutrients and rendering domestic water supplies undrinkable.

Stream clogged with soil and debris, Dartmouth Catchment. ***Photo: Wallace Bruce***

Fire damaged riparian vegetation, Nariel Creek, Hume Catchment.

Melissa Marino – The Age, Tuesday, 21st Sept 2004 provides a snapshot of the problem – see Appendix 1.3.1.
It is understood that there are ongoing investigations into these matters.

This section of the Review reports on a preliminary study of the effects of the Victorian component of the alpine fires on water yield in the Upper Murray catchment. This includes the Lake Dartmouth catchment which was 85% burnt. However, it must be remembered that an additional 460,000 ha was burnt in the Kosciuszko National Park affecting the Murray and Murrumbidgee catchments.

DSE alerted the Esplin Panel of Inquiry early in their deliberation of the potential consequences of the fires on water quality and yield.

The Inquiry's Interim Report[7a], August 2003; *Recommendation 6: That the Premier requests that the Minister for Water critically review the fire prevention planning and fire response strategies for Victoria's water catchments.* Appendix 1.3.2.

Peter Hunt – Weekly Times – 11th August 2004 reported:

> "CSIRO Land and Water chief Rob Vertessy said water run-off from the forests would fall significantly, leading to a review of entitlements under the National Water Initiative".
> "It's pretty certain there will be negative impacts in the next 10 to 20 years," Dr Vertessy said.

> "We're talking about large reductions in yields."
>
> The Murray Darling Basin Commission former CEO, Mr. Don Blackmore, also forecast a significant reduction in water yield during the next 20-25 years.
>
> "The Director of Australia's Co-operative Research Centre for Catchment Hydrology, Roger Grayson said run-off from the burnt-out forests could drop by 20 to 40 per cent in the next 10 to 20 years.
> Professor Grayson has been commissioned by the Murray Darling Basin Commission and Victorian Government to determine the impact of the fires."

The full article is included in Appendix 1.3.3.

Forest Fire Victoria is indebted to Mr. Pat O'Shaughnessy, a specialist in catchment management and hydrological issues, for undertaking a preliminary desktop assessment of the ramifications of the Victorian alpine fires on future water yield in north east Victoria (part of the Upper Murray) catchments. The report is contained in Appendix 1.3.4.

It is recognised that a much more detailed study, such as Professor Grayson's, is necessary to establish specific parameters for alpine ash compared with mountain ash catchments and to fully assess the hydrologic ramifications of the alpine fires over the total (Victoria & New South Wales) area burnt.

DSE's fire narrative[24] records:

P195. Table 8(a) Area burnt by the main alpine fires according to land tenure and fire severity class.

P199. Table 8(b) Area burnt according to forest type and fire severity class.

P200. Table 8(c) Area of ash-type forest burnt by the main alpine fire according to land tenure and fire severity class.

Mr. Pat O'Shaughnessy's preliminary estimate of the total area of alpine ash forest destroyed is about 73,700ha.

From data in Figure 1.3.1, the total losses in water yield over 64 years, the comparable time for stands that originated from the 1939 fires would take to develop to their 2003 condition together with younger regrowth that was incinerated to zero age, is about 195 Ml/ha, or 14.4 million megalitres (Ml) for the 73,700 ha of alpine ash killed by wildfire; on average 225,000 Ml/year.

More important is the fact that run-off will increase by some 184,000 Ml in year 1 but drops to a loss of about 313,000 Ml/a by year 17.

In year 64 the loss is still 221,000 Ml/a.

The market value of irrigated agricultural products per megalitre of water is valued at $1100 - $1200[6] which equates to an average loss in the market value of Victoria's key irrigated agricultural products of about $247m - $270m each year over 64 years.

Water in the Murray Darling Basin is significantly overcommitted and such losses in the Murray system cannot be made up from other sources. The losses will mean that Commonwealth and State Government commitments under the National Water Initiative, including the Living Murray Initiative, Victoria's new water initiatives and return of additional water to the Snowy River cannot be met.

CONCLUSION

A preliminary examination of just three examples of not taking the early opportunity to quickly control the alpine fires, show that there are serious, long term social, economic and environmental consequences with economic losses running into several billion dollars.

The cause can be attributed to successive Governments greatly "underinsuring" Victoria's known forest fire risk by progressively downgrading forest fire management from its former top priority in managing Victoria's public native forest resources and values. In allowing this to happen successive Governments ignored the truism heralded by Judge Leonard B Stretton in 1939 and endorsed by Sir Esler Hamilton Barber in 1977 that fire prevention must be the paramount consideration of the forest manager.

[6] Personal communication. Victorian Farmers Federation [VFF].

CHAPTER 2. FACTORS AFFECTING WILDFIRE SUPPRESSION

This section of the Review considers factors relating to the ignition and subsequent behaviour of forest fires; describes typical forest types and fuel types in north east Victoria and sets down the limits of various fire suppression techniques for successful fire control under prevailing fire weather and forest fuels.

Section 1. Ignition and behaviour of forest fires[(2)]

Ignition and behaviour of forest fires[(2)] are influenced by:

(i) The amount and type of accumulated fuel in the forest.
- fuel quantity;
- fuel size;
- fuel arrangement and distribution;
- moisture content and curing of living plant tissue;
- moisture content of dead or cured material; and
- fuel availability.

(ii) Fire weather.
- climate – the prevailing weather over a significant period of time;
- weather – local and regional; the condition of atmospheric elements such as atmospheric pressure, temperature, humidity, wind and stability, vertical motion and turbulence of the atmosphere.

The condition of forest fuels related largely to long, medium and short term rain effects has more influence on the chances of a fire starting whilst subsequent fire behaviour is mainly influenced by the quantity and arrangements of available fuel and the weather.

Cheney[(29)] reports that the drivers of (forest) fire are well understood.

> "They are the moisture content of the fuel, the amount and structure of fuel and the wind speed. The speed and distances that fire can travel under extreme conditions of very dry and abundant fuels and high wind speeds are difficult for many people to appreciate but this basic characteristic must be understood if people are to manage fire and to live with fire. Rates of spread of single fires in forests (both conifer and eucalypt) of 10 km/h have been documented under extreme conditions and rates of spread of grass fires in abundant fuels have exceeded 20 km/h. This means that under extreme conditions a single fire can burn out between 60 000 and 100,000 hectares in eight hours. Multiple fires burning in close proximity may induce even higher rates of spread. …
>
> Likewise the conditions for extinction, reignition and suppression of fire are also well understood. Fire will continue to spread if the fuel is continuous and the moisture content is below the moisture content of extinction (a relatively narrow range between 18 and 28% oven dry weight (ODW) for most vegetation). Even in discontinuous fuel

> headfires will spread above a certain threshold value of wind speed when firebrands are carried ahead of the fire. There is sufficient data and observational experience to show that … forest fire will continue burning overnight for at least extended periods in late spring, summer and autumn under drought conditions. Even in those fine fuels that can adsorb moisture up to the moisture content of extinction, heavy fuel will remain alight and reignite the fine fuel around the perimeter as soon as the humidity drops during the day."

Section 2. Description of typical forest types and fuel types in north east Victoria

Neither the Esplin Report[7] nor DSE's Fire Narrative[24] presented any data on forest fuels characteristic of the forest types burnt in the 2003 alpine fires. Such information is crucial for overall risk assessment, setting the level of preparedness and strategic planning for suppression strategies in the event of wildfire.

DSE's narrative[24], Tables 8(b) and 8(c) on pages 199/200, provide data on the severity of the fires in terms of crown (tree foliage) damage for the main forest types, viz: ash, mixed eucalypt, snow gum and non-eucalypt forest types. The bulk of the non-eucalypt forest type was represented by *Callitris* (Black Cypress Pine) which would have contained relatively low fine fuel loading and described by Tolhurst[30] as not carrying sufficient fuel to warrant a fuel reduction burning program.

The eucalypt forests were a mixture of age classes as a result of past fire and logging history.

Information broadly indicative of typical fine fuel loadings in these eucalypt forest types can be found in the Forest Commission Victoria's narrative of the Mount Buffalo fire 14-26 December 1972[31]. Extracts from this narrative reveal:

Forest and fuel types

Three main forest types were identified in the area burnt by the 1972 fire, viz. the sub-alpine complex, the wet sclerophyll forest, and the dry sclerophyll forest. Within each forest type, definite fuel classes (as defined ahead) were recognised.

Sub-alpine complex

This forest type occurs above 1370 m where snow often forms the major part of winter precipitation. It consists of a mosaic of open tussock grass (*Poa australis*) plains, containing heath, fen and bog communities and forests or woodlands of mainly snow gum (*Eucalyptus pauciflora*), and occasionally mountain gum (*E. dalrympleana*) and stunted alpine ash (*E. delegatensis*) where soils are deeper.

Snow gum is usually found on slightly elevated positions. Scrub species are often suppressed under the canopy and fuel mainly consists of dead litter shed from the trees, although stands have a margin of scrub species up to one metre high. Most of the plains had not been burnt for many years and carried a deep layer of fine fuels though small patches carried less fuel and the reason for this situation is not known. Table 2.2.1 gives the average fuel quantities for the fuel classes in the sub-alpine complex.

Table 2.2.1 Average fine fuel (< 6 mm diameter) quantities measured in unburnt sections of the sub-alpine complex.

Fuel class	*Oven dry weight of elevated fuel (t/ha)*	*Oven dry weight of ground fuel (t/ha)*	*Total fine fuel (t/ha)*
Tussock grass plains	-	*50*	*50*
Scrubby borders of tree stands	*40.4*	*34.7*	*75.1*
Under snow gum stands			
(i) leaf litter and bark	-	*45.7*	*45.7*
(ii) snowgrass and shrubs	*3.0*	*22.6*	*25.6*

Wet sclerophyll forest
This forest type occurs on mountain slopes at altitudes ranging from about 915 m to 1370 m. On the deeper soils of the plateau and upper slopes to 1200 m, alpine ash occurs in pure stands with scrubs such as hickory wattle (*Acacia obliquinervia*), hop bitter-pea (*Daviesia latifolia*), alpine oxylobium (*Oxylobium alpestre*) and elderberry panax (*Tieghemopanax sambucifolius*). Many small even-aged stands of alpine ash regrowth also occur, probably originating from previous fires. This regeneration is mostly pole-sized and the forest canopies very dense. Few shrubs are present and the bulk of fuel consists of dead eucalypt leaves, twigs and bark on the forest floor.

At elevations near 915 m, alpine ash gives way to peppermints (*E. radiata*, *E. dives*) and various gums (*E. rubida*, *E. chapmanianna*, *E. viminalis*, *E. dalrympleana*). The distribution of these species is dependent on aspect, elevation and moisture. A wide variety of wet sclerophyll shrub species are associated with these stands, and in some areas there are large accumulations of fuel, especially of ribbon bark from the gums. Average fuel quantities for the fuel classes in the wet sclerophyll forest are given in Table 2.2.2.

Table 2.2.2 Average fine fuel (< 6 mm diameter) quantities measured in unburnt sections of the wet sclerophyll forest.

Fuel class	*Oven dry weight of elevated fuel (t/ha)*	*Oven dry weight of ground fuel (t/ha)*	*Total fine fuel (t/ha)*
Mature alpine ash stands	*1.3*	*32.1*	*33.4*
Immature alpine ash stands	*3.8*	*45.7*	*49.5*
Mature alpine ash – Mountain gum stands	*4.5*	*38.7*	*43.2*

Dry sclerophyll forest
This forest type occurs below 915 m, mainly on soils overlying sedimentary base rock. The main species are red stringybark (*E. macrorhyncha*), apple box (*E. aromaphloia*), long-leaf box (*E. goniocalyx*) and broad-leaf peppermint (*E. dives*). Black Cypress pine (*Callitris endlicheri*) is sometimes found in association with these eucalypts, and also occurs in pure stands on granite sands at Nug Nug Wa and Sandy Creeks. Gully species, including blue gum (*E. bicosta*), manna gum (*E. viminalis*), candle-bark gum (*E. rubida*) and narrow-leaf peppermint, occasionally overlap from the wet sclerophyll forest. The main understorey species are tussock grass, bracken and hop bitter-pea. Ground cover is predominantly litter on the drier sites, grading to a dense well developed scrub stratum on the wetter sites.

The elevation and aspect of the stands largely determines fuel quantities. Areas at higher elevations on sheltered southerly aspects have higher fuel accumulations than areas on lower,

exposed northerly aspects. Average fuel quantities for the fuel classes in the dry sclerophyll forest are given in Table 2.2.3.

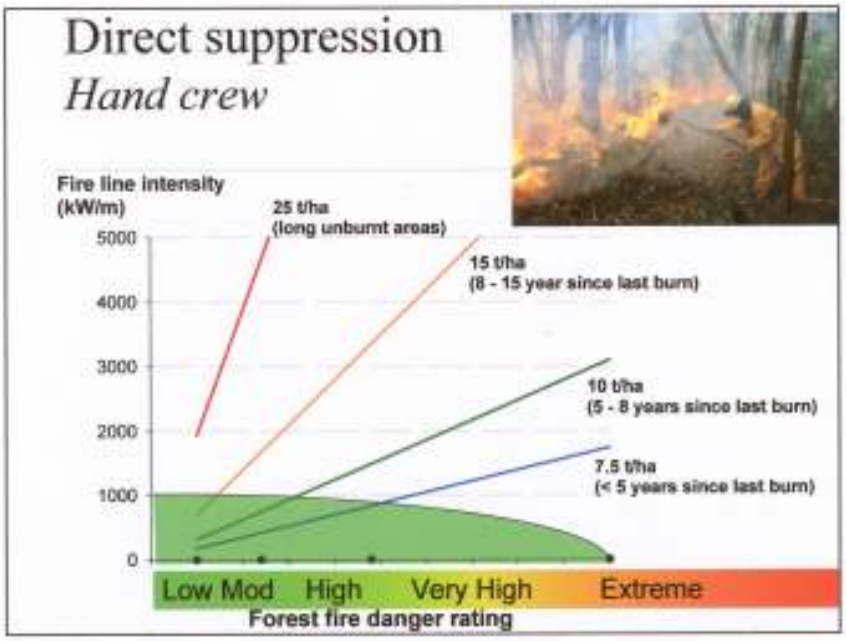
Table 2.2.3 Average fine fuel (< 6 mm diameter) quantities measured in unburnt sections of the dry sclerophyll forest.

Fuel class	*Oven dry weight of elevated fuel (t/ha)*	*Oven dry weight of ground fuel (t/ha)*	*Total fine fuel (t/ha)*
Peppermint-gum forest	*5.3*	*32.0*	*37.3*
Ribbon bark (Accumulation under one large gum)	-	*66.0*	*66.0*
Peppermint – stringybark forest (elevation 305 m)	*5.0*	*15.0*	*20.0*

Section 3. Forest fire suppression techniques – controlling factors for successful fire suppression under various Forest Fire Danger Ratings (FDR) and surface fuel loads

Mr N P Cheney, Senior Principal Research Scientist with CSIRO Division of Forest Products is one of Australia's leading forensic bushfire scientists. Mr Cheney has undertaken detailed studies of the behaviour of bushfires and problems associated with their management in most regions of Australia over 40 years. Cheney provides the following data on the limits of various fire suppression techniques for successful fire control under various forest fire danger ratings and surface fuel loads. This data is applicable to a mixed species eucalypt forest.

Figure 2.3.1 Direct suppression – Hand crew[7]



CSIRO submission to House of Representatives Select Committee on the Recent Australian Bushfires 2003. (Nairn Report)

[7] CSIRO submission to House of Representatives Select Committee on the Recent Australian Bushfires 2003. (Nairn Report)

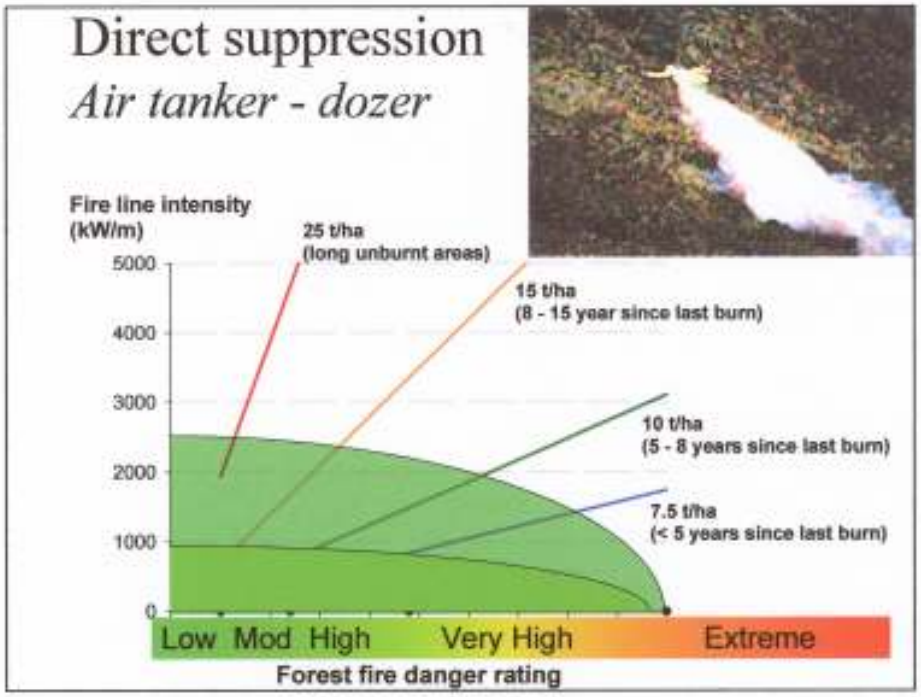
The graph shows the general relationship between fireline intensity and forest fire danger for fuel loads of 7.5, 10, 15, and 25 t/ha of fine surface fuels less than 6mm in diameter in a mixed eucalypt forest.

The green shaded area shows the fire intensities at which direct suppression with hand tools is likely to be successful with an experienced 6 man crew. This is up to 1000 kW/m at moderate to high fire dangers. As the fire danger increases into the Very High range suppression capacity decreases mainly because it is the increase in the number of spot fires that overwhelms the suppression crews. At Extreme fire dangers suppression may be impossible at any intensity because the embers that are produced under high winds will continue to light up the scantiest of fuels.

In heavy fuels of 25 t/ha suppression is effective only at low fire dangers. In fuels of 10 t/ha suppression can be effective when the fire danger is high and at 7.5 t/ha crews can be effective into the low end of the very high fire danger class.

A similar relationship between fire intensity, forest fire danger and the effectiveness of direct suppression with air tankers or bulldozers is shown in Figure 2.3.2.

Figure 2.3.2. Limits of direct suppression with air tankers, bulldozers and hand tools



CSIRO submission to House of Representatives Select Committee on the Recent Australian Bushfires 2003. (Nairn Report)

In this graph both the limits of suppression with air tankers (also bulldozers) and hand tools is shown with the relationship between fire danger and fire intensity in different fuel loads.
The primary role of an air tanker is not to douse the flames directly (although this may happen) but rather to create a break of sufficient width in front of the fire to absorb the spotfires being thrown ahead. Suppression by both air tankers and dozers breaks down when spot fires are thrown beyond the width of the retardant line. Very large air tankers can hold a fire in a mixed stringy bark forest of around 2500 kW/m in 15 t/ha fine surface fuels under high fire danger conditions. Small bucket helicopters are similar in effectiveness as crews with hand tools.

Slightly higher intensities can be suppressed in gum-barked eucalypt forests.
Aircraft alone will rarely hold a fire completely and must be supported by ground crews to be effective.
Prescribed burning reduces fuel load and reduces the rate of spread at all fire dangers so extending the range of fire danger conditions when suppression can be effective.

DISCUSSION

Assessing forest fire risk is fundamental to setting the level of preparedness, development of strategic fire prevention and suppression plans and setting priorities for fire suppression. This requires a detailed understanding of forest types, their attendant fuels and their cyclic interaction with climate and weather.

The amount of fuel available for burning under prevailing weather dictates the likelihood of successful fire suppression. This is why prescribed burning is undertaken to make fire suppression safer and more effective and efficient. (It is also a management necessity for ecological purposes.)

Cheney[32] records:

> "Prescribed burning or hazard reduction burning will reduce the total load of fine fuel and is also effective in reducing the height and flammability of elevated fine fuels such as shrubs and suspended dead material. Burning is the only practical way of reducing the fibrous bark on trees, which is the prime source of firebrands that cause spotting. Hazard reduction reduces fire behaviour by:
>
> - reducing the speed of growth of the fire from its ignition point;
> - reducing the height of flames and rate of spread;
> - reducing the spotting potential by reducing the number of firebrands and the distance they are carried downwind; and,
> - reducing the total heat output or intensity of the fire.
>
> Prescribed burning is not intended to stop forest fires, but it does reduce their intensity and this makes fire suppression safer and more efficient. Prescribed burning is not a panacea nor does it work in isolation. It must be used in conjunction with an efficient fire fighting force.
>
> The benefits of reducing fuel loads by prescribed burning are well understood by any firefighter who is experienced in fighting fires in a range of fuel types and fuel loads. Put simply, the more heat that is released by the fire the more effort is required to suppress it. Higher flames mean that the fire is more responsive to changes in wind direction and thus more dangerous. Heavy fuels require more water to suppress combustion, more work to build fire line, and, because of their long burn-out time, more effort in mopping up to ensure the fire line is secure.

> Heavy fuels and the potential for fires to become uncontrollable at lower fire danger conditions reduce the options that the suppression agency has for controlling fires. Where fuels have been allowed to accumulate to equilibrium levels, the work required to build fire line and the urgency of suppression in a reduced window of fire weather mean that bulldozers or other tracked machinery is the only effective option available.
>
> The high-level of variability inherent in (forest) fire suppression that includes not only fuel, weather and fire behaviour but also operator skill and efficiency mean that aggressive first attack must be undertaken by people who have been trained to acquire the skills and experience for forest fire management, a task that takes 10-15 years to produce a fireline supervisor."

Considerably more training is required for a Senior Fire Boss (Incident Controller) to perform effectively.

CONCLUSION

Given the known very high fuel loadings in the alpine fire area and preceding climate conditions it was imperative that the Government and the responsible authority:

- Were at a state of maximum preparedness;
- Had organisational arrangements in place to facilitate efficient response to the threat;
- Had strategic and operational plans at local, regional and Statewide level to facilitate rapid detection and aggressive initial attack on forest fires;
- Had sufficient skilled and experienced personnel in forest wildfire control;
- Prioritized action that contained and kept controlled initial outbreaks in the shortest possible time by the most effective means.

CHAPTER 3. ELEMENTS ESSENTIAL TO EFFECTIVE FOREST FIRE MANAGEMENT ON PUBLIC LAND

Section 1. Statutory responsibilities for forest fire management in Victoria

The Esplin Report[7] concluded that current legislative arrangements are complex and co-operation, communication and goodwill are essential between agencies. The Report acknowledges that Department of Sustainability and Environment (DSE) has clear legislative accountabilities, 3.19, 3.20, 3.24, 3.26[8].

The Panel made no recommendations in respect of legislative requirements/statutory responsibilities.

Specific responsibility of the Secretary, Department Sustainability and Environment for forest fire management

The legislative/regulatory requirements are set out in the Forests Act 1958 (Vic) ('the Act') with the genesis for forest fire management coming from the 1939 Stretton Report. Section 62(2) of the Act lays down the responsibility of the Secretary, Department of Sustainability and Environment for protection of public land from fire, viz:

> "Notwithstanding anything to the contrary in any other Act or law it shall be the duty of the Secretary to carry out proper and sufficient work for the prevention and suppression of fire in every State forest and national park and on all protected public land but in any national park or protected public land proper and sufficient work for prevention of fire shall be undertaken only by agreement with the person or body having the management and control thereof and in case of failure to reach any such agreement as determined by the Governor in Council whose determination shall be final and conclusive."

Policies and practices for fire prevention and suppression are grounded in duties specified by Sections 20, 22 and 62 of the Forests Act 1958.

Codes of Practice

There are three relevant Codes of Practice:

- The Code of Practice for Fire Management on Public Land 1995[33];
- The Code of Practices for Timber Production Revision 2, November 1996[34] and
- The Code of Practice for Safety in Forest Operations 1990[35].

The Code of Practice for Fire Management on Public Land[33] (CPFMPL) was developed by the Department of Conservation and Natural Resources in accordance with Section 47 of the Conservation, Forests and Lands Act 1987[9]**.** CPFMPL is an explicit statement of policy

[8] Extracts from Chapter 3 of the Esplin report[7] on the 2002-03 bushfires – Current Legislation and Co-operative Arrangements can be found in Appendix 3.1.

[9] At the time of the Alpine Fires, Codes of Practice came under Part 5, sections 31-55 of the CFL Act 1987. The CFL Act 1987 was amended in 2004 including Part 5 Codes of Practice wherein sections 41-55 were repealed, viz matters relating to Codes of Practice relating to their Adoption (41), Lapse (42), Submitted to Minister (43), Notice to be Given (44), Notice of Change (45), Submissions on Changes (46), Approval of a Code of Practice (47), Validity of Codes of Practice (48), Revisions (49), Publication in Government Gazette (50), Availability for

quantifying the Secretary's responsibilities under section 62(2) of the Forests Act 1958 and sets the standards for the management of both prescribed fire and wildfires on public land in Victoria.

Paragraphs 26-32 inclusive state:

> **26.** This code lays down principles, standards and guidelines that apply to fire management on all public land in Victoria to ensure that, in an effective efficient and safe manner
>
> **27.** human life, property, and assets are protected, as far as is practicable, from the deleterious consequences of wildfire;
>
> **28.** environmental values including the vigour and diversity of the State's indigenous flora and fauna are protected, as far as is practicable, from the deleterious effects of wildfire and inappropriate fire regimes;
>
> **29.** water catchment, airshed and landscape values are conserved;
>
> **30.** archaeological, historical and other cultural sites are conserved;
>
> **31.** This Code (CPFMPL) is complementary to those sections of the Code of Forest Practices for Timber Production (CPTP) which also addresses fire-related topics. CPTP deals with fire management as it affects timber production and therefore addresses some topics in more detail than this Code. It should be read in conjunction with this Code to obtain the broad context for fire management planning and practices.
>
> **32.** The Code of Practice for Safety in Forest Operations 1990 (or its successor) is approved under the Occupational Health and Safety Act 1985 and provides practical guidelines concerning measures to be taken to prevent injuries to persons engaged in "forest operations". As fire protection is included in the definition of "forest operations" in that Code it is automatically a "relevant occupational health and safety standard" in the context of this Code.

Tolhurst[30] records that in practice the order of values in paragraphs 27-30 inclusive also represent the order of priority and importance; for example, protection of human life and property will always take precedence over environmental values, and environmental values will usually take priority over cultural values.

The Code of Practices for Timber Production was ratified by both Houses of Parliament, whereas the Code of Practice for Fire Management on Public Land was approved by the then Minister for Natural Resources in 1995. This Code is currently under revision.

Inspection (51). Some provisions are now picked up in the Sustainable Forests (Timber) Act 2004, Part 6 Management of Timber Harvesting, Division 1 Codes of Practice, sections 46-49: - Compliance with Codes of Practice (46), Minister may arrange audits (47), VicForests to respond to Audit (48), Minister to make Findings Available (49).

DISCUSSION

The Esplin Inquiry and Report[7] did not effectively address the issue of changed responsibilities for public forest land management.

The responsibility for forested land management in Victoria has dramatically changed since the legislation was first enacted in 1939. The Report[7] at 2.25 records:

> *Approximately two thirds of the State's land area is privately owned and the remaining third, some 7.7 million hectares is public land, principally parks and forests. Heightened community awareness of conservation issues has led to an increase in the area of National Parks at the expense of State forests. The area of protected parks in Victoria (National and Other protected parks and reserves) has progressively expanded from some four per cent of the State in the early 1970s to approximately 16 per cent or 3.6 million hectares today.*

The Esplin Report[7] failed to put the significance of these statistics in proper perspective of that part of section 62(2) of the Forests Act viz: "… in any national park or protected public land proper and sufficient work for prevention of fire shall be undertaken only by agreement with the person or body having the management and control" (of the land) must come under scrutiny. That part of the Act gives Parks Victoria the power of veto over everything to do with fire prevention on land it manages.

Table 3.1. Area managed under the National Parks Act.

Year	Area Managed under NP Act (ha)
1963/64	149,486
1975/76	276,343
1994/95	2,948,988
1995/96	3,047,347
1996/97	3,073,307
1997/98	3,076,429
1998/99	3,078,102
1999/2000	3,079,902
2000/01	3,093,157
2001/02	3,093,157
2002/03	3,217,225
2003/04	3,217,225

Data in Table 3.1 and illustrated in Figure 3.1, show that the need for agreement for fire prevention work specified under the Forests Act is now more or less evenly balanced between Parks Victoria (PV) and DSE in relation to the 7.7 million ha of forested public land in Victoria.

Furthermore, of the 4 million ha of public forest managed by DSE only about 800,000 ha is available for commercial harvesting with divided responsibilities between DSE and VicForests[10].

Over the last two decades this has progressively led to a number of problems for forest fire management, viz:

[10] See Chapter 5 Post Esplin.

- Whilst DSE is responsible and accountable for fire suppression on all forested public land, agreement must be reached with Parks Victoria on what constitutes proper and sufficient work for prevention of fire in parks and reserves - although Parks Victoria is not accountable for outcomes arising from lack of effective fire prevention.

- Forested land management responsibility is now more or less evenly divided between DSE and PV but PV is not accountable for failed fire suppression resulting from inadequate fire prevention in National and Other Parks and the Fire Protected Area.

- Successive State Governments have failed to adequately fund and resource both land management agencies to the point where 65-75% of public forests are at best under "passive" management. This occurred despite increases in responsibility under the Code of Practices for Timber Production, flora and fauna guarantee legislation and the DSE's timber industry strategy *Our Forests Our Future*; and despite previous significant downsizing in resources.

- The creation of the Victorian Plantations Corporation and the subsequent privatisation to Hancock Victorian Plantations Pty. Ltd. of the State's extensive *Pinus radiata* and limited eucalyptus plantations meant that a significant number of experienced firefighting resources were removed from the Department.

- A significant component of the forest fire prevention and suppression force personnel and resources are not under the Secretary Department of Sustainability and Environment's direct control. They are split between two Government Ministries, Environment (DSE and PV)) and Primary Industries (DPI). The Minister responsible for DPI also has responsibility for VicForests and private forestry activity.

- The much reduced involvement of native forest-based industry in wildfire suppression, and in the preparation of harvested areas in those forest types that require high intensity prescribed burning for forest regeneration, has had serious ramifications for:

  – availability and number of industry resources to assist with control of wildfires;

  – training DSE and DPI staff to become skilled in high intensity prescribed burning and, consequently, suppression of wildfires.

The consequences of these problems for effective forest fire management, and specifically the Government's and DSE's preparedness for the 2002/2003 fire season, are discussed later in this Review.

Forest Fire Victoria has also identified action by the Office of the Emergency Services Commissioner (OESC) that will lead to further and unnecessary complexity in forest fire management. The Auditor-General's Report[21] paras 3.22 to 3.58) notes that

> "The OESC is currently developing a Statewide fire strategy based on risk profiles of different types of fires (Structure fire, wildfire etc.). This strategy is intended to provide fire services with better information on the level of risk in particular areas of the State, which will assist them to make decisions on the appropriate prevention and suppression

> measures. The wildfire part of this strategy will not be developed until the work on structure fires is completed."

DSE's primary statutory responsibility already covers this requirement and importantly, has staff in the forests whose duty it is to constantly monitor parameters related to wildfire risk and put in place measures for the prevention and suppression of wildfire commensurate with that risk.

Forest Fire Victoria believes that responsibility for risk assessment and preparedness for prevention and suppression of wildfires must not be divorced from the authority which is responsible and must be held accountable under the relevant Act.

CONCLUSION

Forest Fire Victoria is of the opinion that:

> The law currently compromises best practice forest fire management. Fire prevention and fire suppression are inextricably linked and whoever is responsible for fire suppression must be responsible and accountable for fire prevention. The idea that a park manager can use strategies that do not conform to best practice forest fire management or refuse to use strategies that do conform with best practice and yet not be accountable when the strategies contribute to poor forest fire management is absurd. It not only leads to the possibility that land use strategies on parks may be developed and applied by people with inadequate knowledge of forest fire, it puts the manager responsible and accountable for fire suppression in an intolerable position.
>
> The forest manager must have the unfettered duty to do the work, it must be adequately resourced and it must report to Parliament annually whether or not it has discharged its duty and if not, why not. Without this imperative, more forested environments in Victoria will be severely impacted upon in the next decade. To minimise that risk the Parliament must assign to the forest manager:
>
> *"The duty, notwithstanding anything to the contrary in any other Act or law, to carry out proper and sufficient work to manage fires to protect and sustain the health and biodiversity of forests, regenerate disturbed or degraded forests and to prevent and suppress unplanned fires on all forests,"*
>
> and that duty must not be compromised by lack of accountability under the law and very complex and inappropriate organisational arrangements that fail to effectively resource the responsible agency.

Furthermore, the Panel investigating the 2003 Alpine Fires was remiss in not evaluating DSE's conduct against The Code of Practice for Fire Management on Public Land.

Section 2. Preparedness, organisational arrangements, resources, guiding principles and strategic priorities for the 2003 alpine fires

This section of the Review is principally concerned with Government's and Department's preparedness for the 2002-2003 fire season and the organisational arrangements, resources and priority accorded to forest fire management in Victoria.

The well documented lessons of the past make it unambiguously clear that forest fire management must be the primary year round activity of the public forest land manager. Notwithstanding that extreme fire seasons are cyclic and usually coincident with drought, Victoria's forest fire record is such that the intervening years of shorter term more moderate fire weather still has periods of extreme fire danger posing a serious threat to the State's social, economic and environmental well being.

Fire is a natural part of the environment and given the typical wide fluctuations in weather, every opportunity must be taken to implement fire prevention measures and prescribed burning for ecological purposes in readiness to combat the inevitable forest wildfire.

It is imperative that resources, commensurate with the risk, are aggressively deployed to detect and control initial outbreaks to this end. Some of the consequences of not doing so in 2003 are summarized in Chapter 1 of this Review.

Preparedness, organisational arrangements and resources are examined against 3 benchmarks:

1. Code of Practice for Fire Management on Public Land[33] [CPFMPL].
2. Summary of Significant Events 1984/1985 Fire Season[17].
3. Changes in resources applied to Fire Management/Forest Management 1982-2003.

1. The first benchmark is laid down in section 2.3.1 of the Code of Practice for Fire Management on Public Land

Preparedness is defined as *All activities undertaken in advance of wildfire occurrence to decrease wildfire area and severity and to ensure more effective fire suppression.*

General principles: CPFMPL paras 121 – 127.

> 121 A level of preparedness for fire suppression will be provided which is appropriate to the existing and forecast fire danger recognise the possibility of extreme fire conditions and aims to minimise wildfire losses of human life and damage to public land assets and values.
>
> 122 The approach to preparedness must be strategic and include:
>
> 123 the evaluation of fire risk;
>
> 124 the identification and appropriate reduction of hazards;
>
> 125 works which provide the infrastructure necessary for fire suppression;
>
> 126 the provision of a strategically located fire fighting force with appropriate training, equipment and readiness;
>
> 127 the provision of a wildfire detection system which is responsive to changes in fire danger.

In an average year over 600 bushfires start in Victoria's National Parks and State Forests of which 25-30% are started by lighting.

The Department's fire narrative[24] describes the situation

> "Victoria has experienced a number of severe bushfire seasons that have resulted in considerable loss of life and extensive property damage, within its relatively brief 160 year history. The State's topography, vegetation and climate make it one of the most bushfire prone areas on earth.
>
> … As Victoria approached the 2002/2003 summer, several years of less than average rainfall had left the State's forests and woodlands particularly vulnerable to bushfires
> … By December 2002 the number of wildfires experienced in Victoria's parks and forests was already considerably higher than the 20 year average."

Consequently, it is beyond dispute that DSE should have been at the highest state of preparedness for the 2002-2003 fire season.

2. Summary of significant events 1984/1985 fire season[11]

The second benchmark for this section of the Review has been described by Hodgson[37] in his submission to the Victorian Bushfire Inquiry 2003:

> "I said in my preamble that land and fire management agencies have achieved better outcomes in the recent past than they did this year. To verify that statement requires a valid benchmark against which the performance of the emergency services in 2003 is compared.
>
> The events of 1939 are not a valid benchmark. At that time many people lived at sawmills deep within forests, there was no planned FRB, firefighters used rudimentary equipment and their efforts were not coordinated. The drought was worse than this year and the fire weather on January 13th, the day most damage occurred, was far worse than on any day during the January 2003 fires. For two months prior to January 13th 1939 there were hundreds of fires burning unchecked on forested and partly cleared private lands near State forests; and as Judge Stretton said, "These fires were lit by the hand of man"[1]. Neither is Ash Wednesday 1983 a valid benchmark for comparison. Lightning did not cause the Ash Wednesday fires. They started when the fire weather was extreme and most of the damage they caused occurred on the day they started.
>
> A better benchmark is the 1984/85-fire season. Both the 84/85 and 02/03 fire seasons were preceded by a long drought and enough rain fell in the winter and spring immediately prior to each fire season to promote the growth of grass on private properties. Lightning caused a similar number of fires in the same areas on both occasions. The events of the 1984/85-fire season are summarised in a Departmental Report[17] that says in part:

[11] Reference No 17 of this Review.

> "In mid-January an unprecedented number of fires started from lightning strikes. One hundred and eleven [111] such fires started on public land between late afternoon on 14 January and 0900 hours the next day.
>
> At the time these fires occurred the Department was heavily involved in assisting the Country Fire Authority with major fires at Anakie, Werribee Gorge, Avoca Broadford and Beechworth.
>
> As well as the fires which started in Victoria, a large fire at Dora Dora in New South Wales entered Victoria on a wide front near Mt.Lawson between Thologolong and Burrowye and burnt 7600 ha before being brought under control on 19 January. Another large fire at Khancoban, NSW, threatened Victoria for several days.
>
> Many of the lightning fires in forest areas started in remote, inaccessible mountain country where firefighting was difficult, hazardous and time-consuming. They burnt more than 150,000 ha and had a perimeter in excess of 1,000 km before they were controlled. About one-third of the perimeter had to be established and held in steep mountain country where there was no conventional access.
>
> An unprecedented effort was made in the Buffalo National Park to minimise environmental damage by the wildfire and firefighting. Ground crews supported by helicopters and fixed-wing firebombers constructed control lines on steep rocky escarpments and successfully held the fire out of sensitive areas and ski slopes. This section was undoubtedly the most costly firefighting per unit length of fireline ever undertaken in Victoria. The effort was justified by the result. Much of the Park is unburnt and that part which was burnt by backfires was burnt by fires of relatively low intensity".

The Report lists the resources used in the firefight, area burnt by individual fires, damage to private and public assets and goes on to say:

> "The fires were brought under control without any help from the weather. The campaign lasted two weeks and cost approx. $7 million (excluding contribution by Armed Services)."
>
> The task faced by emergency services on 14 January 1985 is very similar to the task they faced in January 2003. The time taken to control the fires and the area burnt is strikingly different. (2 weeks v 7 weeks and 150,000 ha v 1.3 million ha.) Only about one third of the total area burnt in January 1985 was in the alpine area."

The full report [(17)] is included in Appendix 3.2.2. It is notable that the Esplin Report[(7)] made no mention of the 1985 report notwithstanding that it was specifically drawn to the Panel's attention.

3. Changes in resources applied to forest management/fire management 1982-2003

The third benchmark for this section is the 1982 Report to the Minister of Forests by Task Force to examine the appropriateness of the organisational structure of the Forests Commission Victoria to meet current operational needs and to conform to Government policy[14].

This Report describes, among other things, the number and disposition of the resources of the then Department to carry out its statutory responsibilities under the Forests Act. Responsibility for fire management of Victoria's public forested land has been previously described in Section 1 of this Chapter.

Organisational arrangements for the Department of State Forests responsible for forest fire management on public land prior to 1983 are shown in Figure 3.2.1.

Whilst the mega-department of Conservation, Forests and Lands had been created by 2nd November 1983, the resources, fire management skills and networks that existed in 1982 were substantially intact at the outbreak of the 1983 fires.

In 1985 accumulated skills over 45 years and the lessons from 1983 were still fresh in the minds of the Executive and throughout the entire organisation. Many fire-experienced senior officers both in central administration and Statewide, including the "Exempt" (from the provisions of the Public Service Act) workforce were available for immediate mobilisation and quick deployment. This is evidenced by the level of competency and numbers of personnel that quickly located and controlled the large number of lightning–caused fires in January 1985[17]. The report on these fires can be found in Appendix 3.2.2**.**

During the next decade government policy dictated that the Department was progressively downsized, including multi-skilling of the professional and technical workforce, to achieve significant gains in productivity.

A new Department of Conservation and Natural Resources was in place by February 1995. The organisational arrangement for the Department of Conservation and Natural Resources is shown in Figure 3.2.2. The area office and work centre map for the North East and Gippsland areas of Victoria are shown in Figure 3.2.3**.**

Given the number of re-organisations (4) including major amalgamations, between 1982 and 1995, rationalisation of functions and duties and the multi-skilling of personnel, it was inevitable that many of the professional and technical skills previously dedicated to the practice of forestry had become at best blurred and substantially diluted over time.

An assessment of the number persons concerned with the science and art of forestry in Victoria's public native forests, August 1982 and February 1995 is given in Appendix 3.2.3.

Data in Table A.3.2.3 of this assessment shows persons employed in central administration according to functional area. Data in Table A.3.2.4 shows field employment according to Divisions/Areas Statewide as at August 1982 and February 1995.

In the course of 13 years to 1995 there was a 37% reduction in the number of personnel in DCNR HO with professional/technical qualifications dedicated to managing Victoria's native forests. A breakdown of the 69 professional/technical positions reveals: Senior Executives (-2), Fire Management (-9), Forest Commerce (+2), Forest Management (-27), Forest Research and Development (-9), and Forest Operations (-24). Between 1982 and 1992 functions in HO Forest Operations were decentralised and nominally transferred to field locations. In fact, during the

course of successive re-organisations and down-sizing since 1992 these and other positions no longer existed in 1995.

Data in Table A.3.2.4 show for the field, State-wide, an overall 44% reduction (273 to 153 positions) in personnel with professional/technical forestry qualifications dedicated to the management of native forests.

It is also significant that the average age of the professional/technical workforce had fallen by about 12 years, reflecting a serious reduction in work experience.

In 1982 the importance with which the Department's forest fire management role was viewed is summed up in the Ministerial Task Force report 27 April 1983, Chapter 10 "Fire Protection and Management"[13].

> "Suppression and prevention of fire take precedence over almost all other Commission activities. Annual expenditure on fire prevention and suppression represents about 25% ($12.4m*) of total expenditure and, on average, approximately 11% of the working time of foresters in district offices." * CPI adjusted 2004 ≡ $35.7m.
>
> A number of deficiencies in fire management were identified by the 1982 Ministerial Task Force[13].
>
> "Additional professional assistance is required in the Division of Forest Protection to undertake fire prevention planning, fire behaviour research and air operations.
> Additional well trained administrative/clerical staff are needed to support services groups to assist at major fires. These areas have not yet attained a satisfactory level and require immediate attention.
>
> There is a need for increased sub-professional staff in all areas; fire prevention, suppression and (general) operations. Their total number is below that required to effectively support professional staff and their physical capability is declining due to ageing of the workforce. 27.5% of overseers presently employed are more than 50 years of age and 62% are more than 40 years of age.
>
> Whilst the current "exempt" workforce of about 850 employees is well trained and is supplemented in the summer season by additional men specifically engaged for fire suppression and prevention works, these employees are unskilled. This places stress on experienced staff and employees who have to train these men as best they can in the short time available and then supervise them in often hazardous situations."

In 1992, ten years on, Victoria's Auditor-General reviewed the economy, efficiency and effectiveness of the Department of Conservation and Environment's management of its fire protection activities, embracing both fire prevention and fire suppression[18].
Key findings include:

FIRE PREVENTION

3.1.6 Only 8 of the Department's 16 regions had finalised long-term plans for fire prevention, even though 7 years had elapsed since commencement of preparation of the plans.

3.1.6 & 3.1.8
Because of deficiencies in the Department's strategic management procedures, it has not been in a position to assess:

- The overall risk to the State's protected areas of destruction or damage by fire; and
- Whether the annual allocation of funds across regions for fire prevention reduces the State's fire risk to the maximum degree.

3.1.14 In 1991-92, a 12 percent across-the-board cut to departmental budget allocations led to a reduction of $750,000 in funds available for fire prevention.

3.1.16 In real terms, the level of expenditure by the Department for fire prevention has fallen by 23 percent over the past five years.

3.1.19 Fire prevention is far too important an issue for funding decisions to be influenced by priorities placed on other activities.

3.1.20 Parliament and the public should be provided with specific information each year on the level of funds allocated within the State for fire prevention in the State's protected areas.

3.1.27 Despite the importance of fire access tracks to effective prevention and control of fires, many critically-placed tracks were;

- In extremely poor condition and would not be effective in the event of fire;
- In such a serious state of disrepair that the Department had been forced to close-off access to its own staff and the bushwalking public for safety reasons; and
- Overgrown with grasses, bushes and other combustible materials which substantially nullified their effectiveness as firebreaks.

3.1.39 The Department is unable to determine the overall fire risk to the State's protected areas in terms of the accumulation of under growth and debris.

3.1.42 Planned levels of controlled burning by the Department have not been achieved during the past 3 years.

3.1.44 The pattern of controlled burning was directly contrary to the Department's priority ranking with those areas warranting the highest level of protection to human life, property and public assets actually receiving the lowest level of protection.

3.1.49 & 3.1.50
In the majority of regions, the levels of forest fuels were higher than target levels set by the Department, with some cases up to 7 times higher.

3.1.63 The Department's firefighting equipment across the State is in poor condition, with approximately 31 percent of equipment in need of replacement at a cost of around $4.5 million.

FIRE SUPPRESSION

4.1.18 In 3 of the 4 regions examined by audit, response times (time elapsed between notification of fire and dispatch of crew) were higher than an internationally-used performance standard of 15 minutes.

4.1.28 Although post-fire debriefings have been a useful method for identifying and documenting problems encountered in combating bushfires, there was little evidence of resultant remedial action taken by the Department.

CHANGES BETWEEN 1995 – 2002/03

Under resourcing in professional technical forestry skills in native forest management was evident in February 1995. Since then definitive figures have not been available. Demarcation between activities has been progressively and substantially blurred since 1982 and forest fire management has been significantly downgraded in Departmental hierarchy.

Organisational arrangements of the Departments involved in the 2003 Alpine fires have been reproduced from DSE's own narrative of the fires[24] (Figures 7 & 8) and are depicted as Figure 3.2.4 in this Review. It should be borne in mind that the Secretary of DSE is responsible under the Forests Act (1958), which overrides all other Acts for fire suppression on all forested public land.

Under these organisational arrangements there are several layers of bureaucracy between the Chief Fire Officer who reports to the Executive Director of Forest Services; three layers in direct reporting relationships remote from the Secretary who reports to two Ministers. This is in stark contrast to the benchmark in 1983 whereby at that time, the Chief of Division of Forest Protection reported directly to the Commission. Furthermore, the three Commissioners each had extensive line fighting experience and a first hand knowledge acquired over several decades of the State's fire risk commensurate with terrain, forest type and seasonal conditions.

The situation in late 2002 was further complicated in that the main workforce to service DSE's statutory fire responsibilities was located in the Department of Primary Industries Regional services unit under a different Permanent Head, remote from the unit and also reporting to two separate Ministers.

This was a recipe for substantially reducing total line fire fighting numbers and skills and delaying the mobilisation and deployment of firefighters statewide to concentrate on bringing the alpine fires under control in the first week.

INCIDENT CONTROL SYSTEM

A description of the overall command and control structure used for the alpines fires, which is in accordance with the Emergency Management Act (1986) is given in Appendix 3.2.4 and depicted in Figure 3.2.5.

The Incident Control System of the Australian Inter-Service Incident Management System (AIIMS) did not, in some instances, function effectively, at least in the first critical stage of bringing the fires under control.

The ramifications of this are discussed in Chapter 4.

The following extracts from the Esplin interim[7a] and final report[7] and the Auditor-General's report[21], provide just a few of the many examples of how DSE was under-prepared to meet the known challenge of a severe 2002-2003 forest fire season.

Forest Fire Victoria disagrees with the Panel's reasoning where on page 127 it states that:

> *"The Inquiry concludes that the specialist fire and emergency services and local Government undertook an appropriate risk assessment and (were) adequately prepared for the 2002-2003 fire season within the parameters of climatic conditions, current legislation, policies and procedures."*

The Panel itself identified at least 10 organisational/management deficiencies, viz:

1. P153/154.
   Agency resources – sustaining long term firefighting and incident management capacity including succession planning 15.43, 15.44.
   The Auditor-General's concerns[21] were borne out by experience in the 2002-2003 summer. Submissions received by the Inquiry and observations made by a number of DSE and CFA personnel in discussions with Inquiry members, indicated the need to develop a longer-term resource management strategy to ensure future availability of:
   - *Trained and experienced fire ground supervisors;*
   - *Personnel experienced in back-burning operations; and*
   - *Fully-qualified personnel to undertake senior roles in Incident Management Teams.*

2. P236 25.91 – 25.92 – 25.95 – 25.96.
   There have been significant changes in the organisational structure and management of the public land estate over the last 50 years.
   There has also been a move to partial or full privatisation for activities that occur on public land such as electricity generation and distribution, water catchment management, plantation management and alpine resort management. Despite suggestions to the contrary

in submissions, DSE advises that the area of public land estate has remained essentially the same over this period. They note, however, that substantial change has occurred in land use and associated management regimes.
Anecdotal evidence suggests that in parallel with, or as a result of these changes, the aggregate number of field staff available for fire prevention and fire suppression has fallen. We have been unable to identify any consolidated data to prove or disprove this trend.
Advice provided suggests that the total number of field staff available has dropped ... employment in forest industries has also declined ... With ageing and reducing population with both CFA and DSE, there is a significant risk of losing not only aggregate numbers of staff but also experienced staff ... these changes are already placing a significant strain on remaining resources.

3. P150 15.8
December 2002 saw machinery-of-government changes to a number of government departments with the former Department of Natural Resources and Environment dividing to form the Departments of Sustainability and Environment, Primary Industries (DPI) and Victorian Communities.

4. 15.9 *These significant changes, occurring as they did during the fire season, could have had a major impact on firefighting arrangements for public land, as many of the frontline firefighters were now in another Department. No formal agreements were in place to access these staff. Fortunately, this did not prove to be an issue for 2002-2003. Discussions have already commenced to ensure appropriate arrangements are in place for next fire season.*

5. P95 10.29
The number of crews available and their resources to do the job is a budget matter not considered here. However, the Inquiry noted reports suggesting that there has been a loss of staff with skills in fire management due to DSE's 'downsizing' and the 'lack of availability of experienced personnel in fire behaviour to oversee ecological burning programs… The Inquiry was informed that numbers of DSE staff had dropped from about 1500 to 2000 in the mid 1980s to about 250 permanent field-based staff in 2003.

6. *That DSE reviews procedures to ensure that all Incident Controllers and incident Management Teams have full access to those Departmental, Parks Victoria or appropriately experienced and qualified community members who can provide local knowledge and expertise in the development of fire suppression strategies and that advice from the fire ground is incorporated into decision making.*

7. P114 11.61/11.65
Prescribed burning by its very nature reduces fuel quantities so, by definition, it reduces potential fire intensity. It also changes fuel arrangement in ways that can only be considered beneficial for

protection purposes" ... "The extent to which prescribed burning should be practised is a vexed and long term problem. Few, is any will commit themselves to an optimal figure for the amount of prescribed burning needed in Victoria.

Note: The Auditor-General's Report(21) Paras 4.13 – 4.35 records:
"There are strong prescriptions in place to ensure that hazard reduction burning on public land is conducted safely and without incident by DSE, and there are systematic planning processes in place to establish targets for optimum levels of fuel reduction burning. **However, there has been a consistent failure to achieve hazard reduction targets**[12]. The significance of the under achievement cannot be easily assessed, because the DSE reports in terms of hectares burned, and does not report on the level of residual risk resulting from failure to achieve hectare targets."

"The necessarily strict conditions governing fuel reduction burning means that considerable advance planning must be conducted for these burns. They can no longer be conducted on an opportunistic basis. The opportunity to conduct fuel reduction burning can be limited by competition for physical resources and limited availability of accredited supervisors as well as meteorological factors … Currently, the DSE employs greater numbers of Project Fire Fighters (PFFs) in seasons of high risk … If PFFs were retained to assist with fuel reduction burning the improvements in target levels may be achieved."

8. P78 7.47
DSE and Parks Victoria recognise that current levels of burning, from whatever source, are inadequate for ecological requirements per year.

9. P80 7.53
Tracks are an important issue in both firefighting and preparedness ... Tracks provide access by ground crews to unplanned fires; they define blocks for prescribed burning; they form the edge against which ignition can take place during firefighting for burning out areas of fuel and for initiating prescribed fires.

10. P91 7.59 – 7.60
The Inquiry is unaware of any form of analysis that sets an appropriate density for a track network even in relation to firefighting alone.

Yet it acknowledges that:
P160 15.92 *Ready ground access for personnel with machinery, equipment and materials is an essential component in a rapid and safe response to bushfires and to minimise spread.*

[12] Emphasis by Forest Fire Victoria

The Panel's reports[7 & 7a] clearly identified the need for rapid response strategies aided by intensive road network and directly linked the importance of roads and access tracks with:

> P160 15.92
> *DSE aims to control 75 per cent of all bushfires at less than 5 ha in size[13]. This response target is designed to provide due regard to the land management objectives on and environmental values in, the public land estate and the economic impacts of fire.*
>
> P13 Esplin Interim Report.
> *Melbourne Water and DSE/PV protect Melbourne's catchments in accordance with a Memorandum of Understanding. The principal mitigation strategies are aimed at preventing fire from entering catchment areas from surrounding land, and putting in place rapid response strategies to ensure fires originating in the catchments can be attacked and controlled while still small. This is done by a combination of well maintained and extensive road network, seasonal or project fire fighting staff required to reside close to the catchment they are protecting ...*

CONCLUSION

Government has yielded to political demands to lock up huge tracts of forests from public access and industry resulting in greatly reduced management inputs particularly in more remote mountain forests.

DSE and its predecessors have undergone significant cultural changes over the past two decades. Concurrently, there has been an erosion in technical expertise in natural resource management at executive level, accompanied by a downsizing in resources, staff and funding devoted to native forest management which is inseparable from forest fire management.

Forest fire management has been relegated from the primary responsibility of the Department and is no longer regarded as a full time core business.

This is reflected in several ways.

- The position of the former Chief of Division of Forest Protection has been substantially downgraded in hierarchy to Chief Fire Officer reporting through two layers rather than directly to the Secretary.

- This has been accompanied by a significant reduction and displacement in skilled resources.

- There has been no strategic recruitment in the forest fire management area for 10-15 years. Furthermore, it must be remembered that there is a lead time of 10-15 years[(21)] to acquire the necessary expertise for senior positions in forest fire management.

- The separation of front line firefighters into another Department adds enormous complexity in lines of communication and reduces operational efficiency.

[13] [Footnote 15] In DSE draft responses to the Panel's questions, August 2003.

- Whilst there has been no diminution in the Department's responsibility for forest fire management the majority (85% +) of the forested estate is now being managed on a passive basis. Only areas set aside for commercial forestry (800,000 ha) are under active management.

The Panel was also confused over the merits of both high intensity and low intensity prescribed burning, viz:

> P96 10.36
> Prescribed Burning Realities.
> Analysis Undertaken for this Report[7].
>
> *(1) A very large number of fires in most districts of the north east and Gippsland Regions are regeneration burns and so do not address fuel reduction issues across broad areas. The requirement to undertake regeneration burns in logging coupes as a priority may limit the time (and remaining suitable weather days) available to complete planned burns for fuel reduction. Such a limitation could be overcome if there were more crews and equipment, or if the requirement for regeneration burns decrease significantly (for example, through a reduction in annual area logged).*
> *(2) The number and area of burns for fuel reduction has declined more markedly through the 1990s than has that for regeneration burns.*
> *This implies either:*
> - *A reduction in resources available for delivery of burn programs (for example, reduction in staff numbers and budget) and/or*
> - *A strategic diversion of resources to other activities deemed to be more important.*
>
> *(3) The seasonal window of time for management burning is narrow …*
> *(4) The inability to regularly use Saturdays and Sundays for management burns.*

It is true that high intensity prescribed burning for regeneration of native forests following harvesting does not cover one contiguous broad area. Relatively small areas are widely dispersed within large forest blocks for sound environmental reasons under the Code of Practices for Timber Production. This adds to the overall fire hazard compared with a single block. However, there has already been a significant reduction in the area logged, due to decreased log allocations which has not translated to increased fuel reduction burning.

High intensity prescribed burns are essential for:

- Ecological purposes – regeneration following harvesting of fire climax eucalypts and maintaining a mosaic of biodiversity dependent on higher fire intensities than those achieved under low intensity prescribed burning;

- Reducing heavy accumulations of fuel on the logging coupes so that wildfires starting in or nearby and entering the coupe do not quickly reach conflagration proportions and spread rapidly particularly by spotting (airborne embers) into surrounding forest;

- Safely training forest firefighters under planned conditions of moderate to severe fire behaviour before they are exposed to wildfire conditions.

Low intensity prescribed burns are essential for:

- Reducing accumulation of fine fuels to levels that moderate fire behaviour/fire intensity and thus extend the range of fire danger conditions when fire suppression can be effective;

- Maintaining a mosaic of ecological succession necessary for sustaining the biodiversity of fire dependent species;

- Safely training forest firefighters under planned conditions.

The Inquiry failed to link cause and effect of these key elements with the failure to bring the alpine fires under control in the first week before severe fire weather conditions inevitably resulted in their massive spread.

CHAPTER 4. TACTICAL PRIORITIES AND DEPLOYMENT OF RESOURCES TO DETECT AND BRING THE ALPINE FIRES UNDER CONTROL - DAY 1, 8TH JANUARY – DAY 9, 16TH JANUARY 2003

Section 1. Guiding principles applied to the 2003 alpine fires

Page 200 of DSE's narrative of the 2003 alpine fires[24] states:

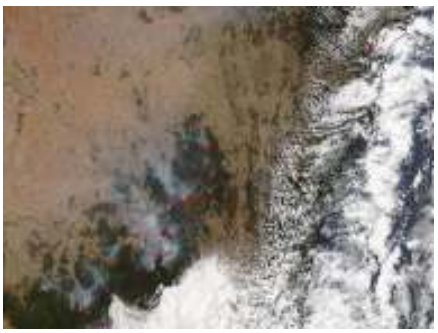
> "It is beyond the scope of this narrative to analyse in any detail all the strategies employed. However, the over-riding strategies in order of priority were generally as follows:
> (1) Firefighter safety;
> (2) Community and asset protection;
> (3) Aggressive first attack on new outbreaks;
> (4) Ecological and environmental value protection; and
> (5) Fire containment and control.
> These priorities were clearly reflected in the daily deployment of resources and in the local and statewide containment strategies.

These guidelines are set out in State Operational Strategic Plans as guiding principles signed off by DSE and CFA and their appropriateness is discussed in Section 5 of this Chapter.

Section 2. Fire weather January 2003 — Opportunity to control the alpine fires

The following passages are extracted from Australian Government, Bureau of Meteorology October 2003 Report; Meteorological Aspects of the Eastern Victorian Fires January — March 2003[38].

> "The Eastern Victorian fires were initiated by lightning strikes from widespread thunderstorms that developed late on 7 January 2003 in association with the passage of an amplifying cold front. Fine conditions prevailed over the next week due to the influence of a persistent high pressure system. On 14 January, a cold front again moved across Victoria, leaving in its passage a surface trough which lingered in the east of the State until 18 January. The remainder of the month was characterised by an alternating sequence of high pressure systems and surface troughs, including a particularly vigorous frontal system that affected the State on 30 January.



Alpine fires burning in benign fire weather.
10 January'03, 1110 hours.

Severe fire weather.
18 January'03, 1430 hours.

Although conditions were hotter than normal in the east of the State during the eastern Victorian fires, there were only a few days during the period when the combination of high temperatures, low humidity and strong winds produced extreme fire danger conditions.

Most of the time Forest Fire Danger was High (FFDI between 12 and 23) or lower.

Figure 2.2[14] shows a time series of the Forest Fire Danger for four selected stations – Gelantipy, Mount Hotham, Hunters Hill and Wangaratta – over the period of the Eastern Victorian Fires. Wangaratta was the only location to regularly experience days on which the Forest Fire Danger achieved an Extreme rating (FFDI of 50 or more). At higher alpine elevations, where temperatures were cooler, the Fire Danger was significantly less."

Data in table 4.2.1 is extracted from DSE's fire narrative(24), Appendix 5, pages 242-247 and the Esplin Report(7) Appendix VI page 275.

Table 4.2.1 Maximum Forest Fire Danger Rating[15] for selected Automatic Weather Stations 7th January to 16th January 2003.

FFDR	Rating
Low	0-5
Moderate	5-12
High	12-24
Very High	24-50
Extreme	50-100
McArthur, A.G. (1966) Forest Fire Danger Meter Mark IV	

Automatic Weather Station (AWS)	DATE & MAXIMUM Forest Fire Danger Rating - January 2003									
	07	08	09	10	11	12	13	14	15	16
Hunters Hill	32	23	15	13	12	17	19	18	18	19
Mount Moornapa	35	9	6	5	8	11	16	11	2	4
Orbost	34	11	6	2	5	8	8	5	3	5
Gelantipy	37	13	4	4	7	16	27	10	1	10
Falls Creek	12	10	6	6	6	12	8	8	4	7
Mt. Hotham[16]										

A description of forest types, their typical fuel loadings in the medium to long term exclusion from fire and limits of various fire suppression techniques for successful wildfire control under various FFDRs and surface fuel loads was given in Chapter 2.

It is Forest Fire Victoria's opinion that under the fuel loadings likely to be encountered in the alpine fire area and the actual maximum daily FFDRs shown in Table 4.2.1, which in the high

[14] Figure 2.2 (Bureau of Meteorology) is shown as Figure 4.2.1 in this Review.
[15] Fire Danger Rating and Fire Danger Index are synonymous.
[16] Fire Danger Index measured at 3pm (1500hrs).

country were mostly in the low (0-5) to moderate (5-12) range there was a 'window of opportunity' lasting up to 9 days for fast, aggressive attack to bring the fires under control.

Section 3. Deployment of resources to detect and bring the alpine fires under control during the Window of Opportunity 8th January – 16th January 2003.

A statewide overview of the Victorian forest fire situation on 8 January 2003 is reproduced from DSE's fire narrative[24] in Appendix 4.3.1.

Table 4.3.1 The location of fires reported to DSE on 8 January 2003.

	Region / Fire District	No of Fires Reported
A	North East Region	
1	Upper Murray	31
2	Ovens	21
3	Mansfield	2
	Sub-total	54
B	Gippsland	
4	Heyfield	12
5	Erica	5
6	Swifts Creek	5
7	Yarram	4
	Sub-total	26
	Total	**80**

Over half of the fires including 25 of the 31 fires in the Upper Murray and all of the fires in the Swifts Creek Fire Districts were not detected and reported until 1200 hours or later on 8th January 2003.

The status of fires in DSE's seven north east and Gippsland fire districts as at 1850hours on 8th January 2003 is shown in Figure 4.3.1.

Resources deployed on the fires from 8 – 16 January 2003 are tabulated in Appendix 4.3.2.

Interpretation of the Data

The following information was extracted from DSE's fire narrative[24].

> "Wherever possible the authors have attempted to identify the resources that have been deployed on a daily basis in each IMT. However, given time constraints and the information that has been readily available, it was not possible to carry out a completely comprehensive analysis of the deployment of resources over the duration of the fires… It was similarly not possible for the authors to undertake a thorough analysis of total resources (human and physical) deployments on a daily basis or less regular basis to the various functions associated with containing this major fire event (planning, logistics, media, on-line fighting etc.). Such an analysis

> however is regarded as important because, inter alia, it provides an indication of the total on line (or Fire Ground) accredited firefighters at the disposal of fire controllers over the prolonged period of the alpine fires.
>
> … The overall resource situation for particular days over the duration of the fires, has not been critically analysed, in part because of some apparent inconsistencies in data entered into the Incident Resources Information System".

Personnel listed against each Fire District is for the day shift only and excludes people resting and/or for the night shift and people manning IMTs and IMACs. It is understood that there was a trend towards (a much) higher deployment on day shifts, although little definitive information is available in the narrative.

This Review has not been able to obtain data by Region and Fire District on DSE/PV/DPI:

- total statewide personnel in each organisation;
- total accredited fireline fighters in each organisation;
- total fireline fighters committed to direct suppression of the alpine fires;
- the forest fire situation in each Region/Fire District during the alpine fires;

nor on resources not committed to the Alpine Fires.

Table 14 Page 203 of the fire narrative[24] shows that the peak numbers of DSE/PV/DPI personnel in all categories including resting totalled 3,350. Parks Victoria personnel employed on all fire categories on days 1, 2, 3 & 4 totalled 175, 219, 267 and 293 respectively. Peak numbers of CFA exceeded 1,700 per rotation.

Timber industries also made a large contribution supplying double the number (70+) of DSE/DPI bulldozers (37) including most of the large bulldozers used for fire suppression as well as other equipment and highly skilled operators with forestry and forest fire experience.

DSE's narrative records that aircraft played a major role in the control of the alpine and associated fires. However, there is scant information on daily deployment of aircraft on specific fires. In total 3,334.80 hours were logged for aircraft engaged on fire ground and associated tasks (DSE narrative Table 17 page 206). The number of aircraft available and deployed on a daily basis from 8th January to 16th January 2003 is shown in Table 4.3.2.

Table 4.3.2 Number of aircraft by category deployed on a daily basis 8 January – 16 January 2003. Source: DSE narrative[24] Appendix 8. Page 278.

Date	8 Jan	9 Jan	10 Jan	11 Jan	12 Jan	13 Jan	14 Jan	15 Jan	16 Jan
Day	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
FW Bombers Available	10	10	10	10	10	9	8	7	8
FW Bombers Deployed	10	10	10	9	8	0	8	1	8
L Helicopters Available	5	7	7	7	7	7	6	7	7
L Helicopters Deployed	5	7	7	7	6	3	6	4	7
IR Scanner Available	1	1	1	1	1	1	1	1	1
IR Scanner Deployed	1	1	1	1	1	0	1	0	1
Heavy Helicopters Available	1	1	1	1	1	1	1	1	1
Heavy Helicopters Deployed	0	1	1	0	0	1	1	0	1
M Helicopters Available	2	5	6	6	6	4	4	4	4
M Helicopters Deployed	0	3	6	5	4	2	0	4	1
FW Recce Available	3	3	7	5	6	8	6	5	5
FW Reece Deployed	1	1	3	1	1	1	1	1	1
Total Aircraft Available	22	27	32	30	31	30	26	25	26
Total Aircraft Deployed	17	23	28	24	20	7	17	10	19
Total Fire Bombers Available	13	16	17	17	17	14	13	12	13
Total Fire Bombers Deployed	10	14	17	15	12	3	9	5	10

Section 4. Some findings of the Esplin Inquiry

The Esplin Report[7] Part D. Term of Reference 2. *"Assess the effectiveness of the response to the 2002/2003 bushfire; including emergency management procedure, cross agency response and co-ordination and resource deployment."*

The following extracts highlight some key statements/conclusions made by the Panel conducting the Inquiry:

Page (xxvii) Chapter 17. Initial Response to Fire records:

> *The Inquiry spent considerable time investigating the effectiveness of the response by the fire agencies to the fires. This was a pivotal issue for many in our community and elicited emotional, but considered, submissions and recommendations.*
> *We fully explored the initial response to the fire outbreaks, the use of aircraft, the control and management of resources and the strategies and tactics employed over the 6 week campaign. We found no evidence of substantial organisational or systemic failure.*
>
> *Aerial resources can play a crucial role in direct attack on small fires in remote and difficult terrain, and in holding fires in the early stages until firefighters are available for direct ground attack…*
>
> *While there have been suggestions that alternative strategies or priorities should have been established including more aircraft deployed to firebombing rather than reconnaissance*

in the initial stages, it is not possible to conclusively quantify what difference additional aircraft, or any other changed strategic response, would have made once the fires started.

Page 172. 17.1. *A critical issue for the inquiry was the question of whether the fires started by lightning on 7 & 8 January 2003 could have been extinguished before severe fire weather developed on Friday 17 January.* (Day 10)

17.9. *The Inquiry has concluded that, given the number, location and accessibility of fires caused by lightning strikes, the fuel load available to support fire, the prevailing weather conditions and the suppression resources available, all reasonable efforts were made by DSE and CFA in the first 10 days to contain the fires as quickly as possible.*

Page 190 Chapter 20. Development and Implementation of Fire Control Strategies

Page 192. 20.19. *The inquiry has concluded there were days when local weather conditions and fire behaviour provided opportunities to safely and more aggressively attack sectors of some fires.*

Page 198. Conclusions on the strategy

20.73 *The Inquiry reviewed both the development of strategy and the execution of strategies through tactical response.*

20.74 *We found that the high-level and local-level strategies developed to control and suppress the fires were overall sound and appropriate. There are some instances where these could be questioned and have been.*

20.75 *The Inquiry is less satisfied that the tactics developed to implement the strategies were both flexible and responsive to the changing conditions on the fire ground and, as such, opportunities were missed to more aggressively attack the fire.*

20.76 *More importantly, however, the Inquiry found that the strategic decisions taken were not effectively communicated to those on the ground and those in intermediate control and supervisory positions. If the front line is not fully informed of the strategy and its planned outcomes then tactical decisions are more open to question (and they were). Such failure to communicate disempowers those on the fire ground to actively participate in tactical decision-making.*

The inconsistencies between the Panel's statement that it found no evidence of substantial organisational or systemic failure and its conclusions that *"opportunities were missed to more aggressively attack the fire"* and *"strategic decisions taken were not effectively communicated to those on the ground and those in immediate control and supervisory positions"* is discussed in Section 5 of this chapter.

Section 5. Examination and discussion of tactics

This section of the Review considers just three of the many critical issues that Forest Fire Victoria believes were not adequately addressed by the Panel conducting the Inquiry.

1. Guiding principles applied to the 2003 alpine fires

The guiding principles that governed the development and execution of strategies throughout the fire campaign, viz in order of priority:

(1) Firefighter safety;

(2) Community and asset protection;

(3) Aggressive first attack on new outbreaks;

(4) Ecological and environmental value protection; and

(5) Fire containment and control.

This widely promulgated order of priority is not appropriate for setting and implementing tactics in the initial stages of forest wildfire control.

There are simple tried and tested rules for controlling forest wildfires equally appropriate when fires occur near settled areas or in remote forest locations.

It is crucial that there is central leadership and over-all coordination with a statewide perspective that going wildfires get priority to be controlled by the most effective means in the shortest possible time. This requires the responsible agency to have organisational arrangements in place and preparedness for rapid deployment of experienced people and resources to aggressively attack the fires in their incipient stage.

Consistent with firefighter safety, the top priority within the window of opportunity that usually follows the passage of a storm front is to quickly bring the fires under control and contain them until they either burn out or are extinguished by rain.

Rapid initial attack on small fires in benign fire weather by ground crews that are well trained, well equipped and led by people who know the fire ground is no more hazardous to firefighters that other "non-fire" forest operations and is not the primary cause of firefighter deaths

Successful initial attack satisfies all other criteria for community and asset protection, catchment (water yield and quality) and environment protection and protection of timber resources. It invariably incurs higher unit area costs for fire suppression, but as demonstrated in Table 4.5.1 it is always by far the least cost and least damaging action over the cycle of fire seasons. This table compares 1985 with 2003 lightning-caused wildfire events.

The Esplin Inquiry[7] reported that during the entire alpine emergency, "the emergency service agencies maintained full service to the rest of Victoria".

At first reading this sounds like a very responsible action. On the other hand for the bushfire agencies to maintain a full service would need a very high to extreme threat of an impending disaster throughout the State plus a number of "active" fires in Regions and Fire Districts, other than Gippsland and north east Victoria, consuming considerable resources. On the premise that the going fire is the fire to control, how does the Panel's statement measure up to NOT providing

sufficient resources to work on the alpine fires (as distinct from falling back to the public land/private land interface for direct asset protection)?

Such a strategy neglects assets such as:

(i) water catchment (water quality and future water yield) protection;
(ii) conservation of biodiversity; and
(iii) timber resources

and often results in an extreme threat to major infrastructure and settled areas.

The Esplin report[7] paid no attention to (iii) and failed to understand the long term ramifications of (i) & (ii).

2. Availability of resources

During the initial 9 days of the fires, data in Appendix 4.3.2 shows that the peak DSE/PV/DPI resources were only about 1400 people (up to 950 (68%) on the day shift), about 400+ CFA volunteers from outside the region supporting their CFA colleagues within the region and 82 industry people and their heavy duty equipment. During the first few days a number of fires were left unattended due to resource constraints and it was not until Day 7 that assistance was sought from NSW for their Erickson Aircrane and action was taken to obtain assistance from Defence Forces and negotiate arrangements for assistance from USA.

The failure to contain some of the fires before the onset of severe fire weather had a profound effect on subsequent options for their control. This is graphically illustrated in Figure 4.5.1 which depicts the rapid spread of the fires between days 8 and 16. (Source: DSE narrative Figure 27.) This is in stark contrast to the fire event in 1985 described in Chapter 3, Section 2.

A comparison of the 1985 event with the 2003 alpine fires is given in Table 4.5.1. In many respects the fire situations in 1985 and 2003 are remarkably similar.

- In both cases there were a large number of geographically dispersed ignitions by lightning with many in remote and inaccessible mountain country where fire fighting is difficult.

- The total area burnt by the 1985 fires was 150,000 ha which is also similar to the 122,600 ha which had been burnt by Day 14 of the 2003 fires.

- 1985
  - Fire season preceded by good rain in late winter and early spring producing excellent crops of grass throughout the State. Summer months were very dry and NE Victoria experienced the same drought that affected SE slopes and southern tablelands of NSW.
  - Some 111 lightning-caused fires started on public land between late afternoon 14 January and 0900hrs 15 January. These fires were brought under control in 14 days without any help from the weather.

- 2003
  - The Bureau of Meteorology reported that "by the end of 2002, much of Victoria had suffered a 6 year period of below average rainfall. Despite this, the area that was to be affected by the Eastern Victorian fires escaped the worst of this, with 6 year totals mostly average to below average (rather than very much below average)."

– Some 80 lightning-caused fires started on public land in eastern/north eastern Victoria following the passage of thunderstorms during the evening of 7 January 2003.

Table 4.5.1 Resources deployed on forest fires 1985 and 2003

DATE	14–28 January 1985	8-16 January 2003	21 January 2003 **
AGENCY	CFL* 1985	DSE/PV/DPI	DSE/PV/DPI
Total Staffing	4500	?	?
Resources on fires CFL DSE/PV/DPI	2000	≈ 1400	≈ 2800 Total** All sources
CFA	500	≈ 300 +	Yes
Armed Services	449	0	90
State Electricity Commission	50	0	0
Forest Industries	120	82	Yes
TOTAL personnel on fires	3119	≈ 2000	≈ 2800
Bulldozers	75	60	61
Fire Tankers	400	200	211
Helicopters	20	9	10
Fixed Wing Aircraft	16	10	11
AREA BURNT	150,000 ha	≈ 34,000 ha @ 9 days	≈ 122,600 ha @ 14 days
TIME TO CONTAIN FIRES	100% 14 days	90% 51 days	100% 59 days
TOTAL AREA BURNT	150,000ha		1.09 MHa
COST of Fire Suppression	$ 7 m*** ($14.8m)		$ 100+ m

Note:
* The Department of Conservation Forests and Lands (CFL) was an amalgamation of the Forests Commission, Lands Department (part), Fisheries and Wildlife (part), National Parks Service, Soil Conservation Authority and Ministry of Conservation (part).
** Numbers exclude personnel and resources working on the Eldorado and Stanley fires reported 1300hrs and 1545hrs respectively on 21st January 2003 with the CFA as the lead agency.
*** Excludes contribution by armed forces. CPI adjusted to 2004 ≡ $14.8m.

Benchmarking the 1985 fire event against the 2003 fire event shows:

- Resources available for fighting the 1985 fires were significantly greater than those immediately available in 2003.
- Fire fighting technologies had not changed significantly between 1985 and 2003 and did not offset the fewer personnel and equipment available in 2003.

The lesson from 1985 and all similar circumstances is that rapid control and containment of forest wildfires on public land consistent with firefighter safety is the best strategy to minimise the subsequent need for direct community and asset protection on private land. This is achieved by the rapid mobilisation and deployment of sufficient numbers of skilled resources mounting a sustained initial attack on wildfires.

It is the only strategy that ensures forest wildfires are kept to a manageable size before the onset of severe fire weather makes control impossible.

3. Allocation of resources

The third issue concerns the number of fires unattended and the apparent failure to reallocate resources quickly to where they were most needed.

Data in Appendix 4.3.2 provides a snapshot of the fires for each Fire District and the aggregate resources, where known, deployed each day on the fires. The data plus a more detailed breakdown of resources extracted from DSE's fire narrative(24), reveals that:

Day 1. There were 17 unattended fires in Upper Murray, 3 in Ovens and one in Swifts Creek Fire Districts.

Day 2. Upper Murray-Tallangatta Group; 6 fires going, CFA handling one fire, 26 persons and 2 bulldozers working on remaining fire with one (1) person attending the Mt Cooper and Razorback fires. All of Swifts Creek's fires were either controlled or contained with 23 DSE/PV/DPI personnel and 2 bulldozers in attendance.

Day 3. Upper Murray-Tallangatta Group; 4 fires going, 10 fires contained, CFA handling one fire, 128 persons and 10 bulldozers working on remaining fires. **No person attending the Mt Cooper fire[17].**
Upper Murray-Corryong group; 8 fires going, 2 contained. Potentially large 3000ha+ fire at Mt Mittamatite being handled by CFA with about 100 persons. **No resources listed for other fires[18].**
Swifts Creek. Five fires under control and resources scaled down to 12 persons in attendance.

Day 4. Upper Murray-Tallangatta Group: 4 fires going, 62 persons working on the Cravensville and Pipers fires and 6 persons and 2 dozers working on the Razorback (area 508 ha) Mt Cooper (area 100+ ha) fires.
Upper Murray-Corryong Group: 5 going fires, Mt Mittamatite fire contained, 128 persons (including 78 persons on the Mt Mittamatite fire) and 5 dozers working on the fires, NO resources allocated to the Stony Creek and Once Only Track fires.
Swifts Creek: no action reported.

Day 5. Upper Murray (Corryong IMT): Going fires under the control of this IMT are:
Cravensville/Pipers (100 persons and 3 dozers working), Mt Tempest (71 persons, 3 dozers and 1 aircraft working), Upper Papes (dozer tracking edge) Mt Cooper/Razorback (control strategy being formulated) and Once Only Track, Stony Creek and Mrs Ceres (not resourced). A further 155 persons 2 dozers and 1 aircraft were working on the Mt Mittamatite fire which is contained.
Data in Table 10, page 201 of DSE's fire narrative(24) provides a snapshot of DSE/PV/DPI Fire Ground personnel for days 5, 20 and 30 of the alpine fires. This reveals that Beechworth, Mt Beauty, Swifts Creek, Dargo and Orbost IMTs were not operating on either the day shift or night shift on Day 5.

[17] Emphasis by Forest Fire Victoria
[18] Emphasis by Forest Fire Victoria

Day 6. Corryong IMT: The fires are now divided into the following Divisions: Pinnibar, Cravensville and Razorback with the Razorback Division being managed by an IMT in Swifts Creek.
Pinnibar Division: Includes the Mt Mittamatite fire which has been re-classified as going and 5 going fires near Mt Pinnibar which will be treated as a single fire and linked to the NSW Yougal fire. 63 persons and 2 dozers working on the Mt Mittamatite fire and 7 persons and 8 bulldozers preparing control lines for the Mt Pinnibar fires.
Cravensville Division: Fires contained, 100 persons and 7 dozers working.
Razorback Division: Razorback fire has now burnt 4,500 ha, 81 DSE/DPI/PV and 5 industry personnel and 9 dozers working on the day shift. The location of the main north east Victorian fires on day 6 (13 January 2003) is shown in Figure 4.5.2 (Source: DSE narrative Figure 11).

Day 7. The rapid build up in resources committed to controlling fires across the 3 divisions that commenced on Day 6 continued with almost 450 persons and 28 dozers working on the fires.
Despite the increased resources DSE was unable to control either the Razorback or the Pinnibar fires.

The foregoing summary of events provides the basis for a number of observations:

1. The 5 fires in the Swifts Creek Fire District were quickly controlled demonstrating that an adequate number of skilled personnel and resources were available for the task.

2. Available resources in the Upper Murray Fire District were inadequate to control the 31 fires reported. Notwithstanding the additional resources provided, only limited control work was carried out in the first 5 days on the 2 fires that merged to become the Razorback fire and the 5 fires that merged to become the Pinnibar fire.

3. Fire fighting resources that were available from the adjoining Swifts Creek Fire District from Day 3 were not redeployed until Day 6.

4. The delays in redeploying the available resources from Swifts Creek reflect the inappropriateness of five over-riding strategies applied to the alpine fires. It warrants a detailed, independent review of the effectiveness of Regional Fire Co-ordinators in ensuring the most efficient use of resources on a statewide basis.

5. The potential of the fires to become uncontrollable was greatly underestimated and the build up of resources on Days 6 and 7, which approximately doubled the number of persons and trebled the number of dozers working in the Upper Murray Fire District, should have occurred earlier.

CONCLUSIONS

1. While the unit cost per hectare of having the capacity to control wildfires in the shortest possible time can be high, it incurs the least cost and least damage to the State's assets over the entire fire season cycle.

2. Two decades of downsizing, budgetary constraints and changed Government/Departmental priorities that significantly downgraded priority given to forest

fire management have greatly reduced DSE's preparedness and ability to meet the challenge of a severe forest fire season.

3. By failing to address, without equivocation, issues the Panel itself found to be unsatisfactory about the way the 2003 fires were fought and failing to benchmark the 2003 fire event against previous comparable events, the Panel was remiss in its investigation. It failed its obligation to make specific recommendations to the Government on actions required to reduce the risk of fires in remote forest locations spreading in benign weather and subsequently becoming uncontrollable on days of severe fire weather.

4. In the absence of specific recommendations from the Esplin Inquiry the Government has, post 2003 made decisions, which jeopardize effective forest fire management. They are:

   - the establishment of VicForests which stripped DSE of many people experienced in forest fire management and with highly qualified and limited obligations to contribute to the protection of commercial forests from wildfire.

   - the re-organisation of fire management in DSE, to provide greater regional autonomy which, based on experience in 2003 (and previous years) have further reduced Victoria's forest fire fighting effectiveness and exposed the community, and vital forest values and uses, to significantly increased risk of destruction from forest wildfires.

These matters are discussed in Chapter 5.

CHAPTER 5. POST 2003

There are three other matters which Forest Fire Victoria believes will have a significant negative impact on DSE's future forest fire management capabilities.

They are:

1. Amendments to the Forests Act 1958.
2. The creation of VicForests
3. New DSE branch functions and activities.

Section 1. Amendments to the Forests Act 1958[19]

In December 2004 the following amendments (amongst others) were made to section 62 of the Forests Act 1958.

Act No. 6254/1958
Forests Act 1958
S. 62A
inserted by
No. 48/2004
s. 112.

62A. Secretary may apply and use fire for land and resource management

(1) Subject to this Act, the Secretary may, in a State forest or national park, or on protected public land, apply and use fire for the following purposes—

(a) as part of silvicultural activities undertaken in the State forest or on protected public land;

(b) to control pest animals and pest plants in the State forest, national park or on protected public land;

(c) to maintain, manage, protect or enhance the ecology of, or land or vegetation in, the State forest, national park or on protected public land.

(2) In applying and using fire in a State forest or national park, or on protected public land, the Secretary must have regard to any relevant Code of Practice.

S. 62B
inserted by
No. 48/2004
s. 112.

62B. Agreement required for Secretary to apply or use fire in national parks or on protected public land

The Secretary must not apply or use fire in a national park or on protected public land for any purpose set out in section 62A(1) unless the person or body that has management and control of the national park or protected public land agrees to its application or use.

S. 62C
inserted by
No. 48/2004
s. 112.

62C. Secretary may enter into agreements and arrangements relating to the prevention and suppression of fires

The Secretary may enter into an agreement or arrangement with any person or body in Victoria or elsewhere—

(a) for assistance in the prevention and suppression of fire;

(b) relating to research into the prevention and suppression of fire;

(c) for training in relation to the prevention and suppression of fire;

[19] At the time of the Alpine fires these amendments had not been made.

(d) for the supply of fire fighting equipment and apparatus and systems used in the prevention and suppression of fire;
(e) for the provision by the Secretary of goods or services relating to the prevention and suppression of fire.

Parts of these amendments have significant ramifications for forest fire management in Victoria. For example, PV's virtual power of veto over sufficient work for prevention of fire in a national park or protected public land.

This power of veto has been significantly reinforced by amendment 62B to the Forests Act 1958. This section precludes the Secretary from the application or use of fire in a national park or protected public land for any purpose, including maintenance, management, protection or enhancement of the ecology or land and vegetation, unless the person or body that has management or control of the national park or protected public land agrees to its application or use. Unlike section 62(2), under this provision there is no avenue for resolving disagreements between land managers.

Section 2. Creation of VicForests

The creation of VicForests, the entity responsible for commercial forestry in Victoria, concurrently with the longer term trend toward passive management of the public forest estate, adds further complexity to organisational arrangements and reduced level of available resources. It is understood that some 96 of the 130 people employed by VicForests transferred from Forestry Victoria in DSE. Many of these people were highly experienced in forest fire management and have not been replaced.

Amendment 62C of the Forests Act 1958 makes provision for: "Secretary may enter into agreements and arrangements relating to the prevention and suppression of fires … with any person or body in Victoria or elsewhere …"

Part 8, Sustainable Forests (Timber) Act 2004 – Fire Prevention and Suppression, sections 78-83 specify that VicForests and the Secretary may enter into agreements and arrangements relating to the prevention and suppression of fire (section 78).

Section 79. The Secretary may direct VicForests or any staff of VicForests to undertake fire suppression works if the Secretary and VicForests have entered into an agreement or arrangements under section 78.

The effectiveness of the Secretary exercising such power lies in the terms and conditions of any agreement entered into by the Secretary and VicForests. Obligations relating to fire preparedness and response (agreed 27 July 2004 and expire 1 August 2009) and spelt out under Clause 13 – Summary of Memorandum of Understanding between DSE and VicForests, are given in Appendix 3.3.1.

Selected paragraphs from the Memorandum of Understanding highlight the complexity of arrangements, fire fighting resources largely at the discretion of VicForests and lack of any compensation funding to DSE for protecting timber resources on State Forest designated for timber production.

SELECTED EXTRACTS FROM MEMORANDUM OF UNDERSTANDING (MOU) BETWEEN DSE AND VICFORESTS

13 Fire preparedness and responses (agreed 27 July 2004 and expires 1 August 2009).

13.1 DSE operating framework

VF recognises the importance of fire suppression and prevention for resource management and is committed to involvement in Fire Prevention and Suppression.

DSE is responsible for ecological burning on its estate, subject to the Code of Practice for Fire Management on Public Land and approved .DSE Burning Prescriptions and Procedures.

DSE has an obligation to deliver fire management programs in accordance with legislation, the Code of Practice for Fire Management on Public Land, approved Fire Protection Plans, Readiness and Response Plans, and Fire Protection Instructions.

DSE will allocate funding to provide prevention works within the Fire Protected Area (FPA), as set out in the annual works programs and detailed in Fire Operations Plans that support DSE's Fire Protection Plans for the State.

DSE is responsible for public land management in the FPA, and will determine fire policy.

13.2 General operating protocols

Both DSE and VF recognise that in creating VF some critical fire skills will be transferred with staff to VF. These skills may be crucial in fire response and in transferring competencies through training and accreditation. In the next five years, VF will use its best endeavours to assist DSE to bridge the skills gaps resulting from the creation of VF.

DSE recognises that over the course of this agreement it is expected that VF's contribution will change commensurate with any reduction or turn-over in its workforce.

VF will, in accord with this agreement, make defined resources available to DSE for fire suppression.

When engaging VF resources, DSE will have regard to VF commercial business remit.

VF will, in entering into commercial arrangements with timber harvesters, ensure appropriate provision is made far[20]

[20] Typo in MOU.

[for] its fire obligations under Part 8 of the Sustainable Forests (Timber) Act 2004.

DSE will reimburse VF's costs according to an agreed cost schedule.

DSE and VF agree that this agreement will be based on the principle that VF will fully recover the actual costs of its participation in fire prevention and suppression activities.

13.3 Fire preparedness and suppression

Day to day management of defined VF staff will include scheduled participation in training and readiness activities for a period of up to 5 days per year to ensure staff are competent to fulfill their fire response roles.

DSE will be responsible for meeting the additional Occupational Health & Safety obligations, workcover premiums and return to work program expenses of VF employees that may arise in preparing for and responding to a fire. The safety of all personnel involved in emergency response activities shall be the responsibility of the managing agency, but nevertheless a primary consideration of both agencies at all times.

13.4 Fire emergencies

VF agrees to provide defined staff and other resources to the Model of Fire Cover in the future, and will consider ways to assist DSE improve the overall level of cover across the State. However, over the course of this agreement, it is expected that VF's contribution will change commensurate with any reduction or turnover in its workforce.

VF resources will be available for initial response for all fires within the FPA, or where requested in support of the Country Fire Authority in the Country Area of Victoria.

13.6 Firefighter skills

Where critical fire skills are not readily available in DSE as a result of the creation of VF and the transfer of staff, VF will make those remaining and identified staff with these critical fire skills available for training and accreditation.

13.7 Personal protective equipment and other equipment

DSE undertakes to provide all firefighters, who may be deployed to any fire prevention or suppression activity which is the subject of this document, with the Personal Protective Equipment required, in excess of normal job requirements, for their role. VF is to ensure that any items of Personal Protective Equipment they issue as part of normal works (e.g.

hard hats), that may have a dual purpose, will be compatible with fire requirements.

13.8 Training/exercising
Frequency of these events will be determined in consultation between senior DSE staff and VF staff.
DSE Regional Manager and VF Director Operations will consult about the involvement of VF staff in fire training programs.

Forest Fire Victoria believes the creation of VicForests as a separate commercial entity responsible for timber production on forested public land has resulted in a further reduction of DSE's experienced fire management personnel.

Forest Fire Victoria is of the opinion that VicForests should have been required to provide specified financial and human resources to protect Victoria's native forest timber assets from wildfire. Furthermore VicForests' obligations towards DSE's ultimate responsibility for fire prevention and suppression should have been an unambiguous statutory requirement.

Section 3. New DSE branch functions

The recent announcement made by DSE's Executive Director of Parks and Forests of new Branch Functions and staff reporting relationships has further downgraded forest fire management in departmental core activities. The position of Chief Fire Officer has been abolished. It is understood that the created position of Director Emergency Management will also fulfill the Chief Fire Officer function until presumed appropriate legislation will be enacted.

The previous dedicated focus provided by DSE's Fire Management Branch on all aspects of forest fire management now requires the involvement of four separate branches and four directors, three of whom have additional significant non-fire responsibilities.

This does not instill confidence that the Government and Senior Departmental Management understand that forest fire management is not just an emergency response task but the most important on-going and primary task of the whole Department.

The State Government has recently signalled that it is committed to providing increased support and resources toward the on-going challenge of managing the State's fire risk on behalf of the Victorian Community:

> "In response to this and as part of the newly launched Public Land Fire Initiative DSE and PV are offering excellent career opportunities with a number of fire roles for individuals with demonstrated experience across regional Victoria; spanning community engagement, operations and planning and strategy."

The positions are listed in Appendix 3.3.3.
Eight of the 26 positions require "experience in fire management in the natural environment".
Three require "experience in fire protection and wildfire control".
Nine require:

- "Experience in preparing fire management strategies for major District parks, State Forests and reserves;

- Proven ability in defining priorities and establishing a consistent approach to the management of ecological fire in parks and State Forests across relevant Districts;
- Proven ability to engage with key stakeholders and land managers in the development and implementation of appropriate ecological fire management criteria, principles and regimes."

While it is encouraging that defining priorities, preparing strategies and engaging with stakeholders concerning fire management will receive some additional attention, these positions do not replace some 96 people in DSE, many with extensive forest fire management experience, recently transferred to VicForests.

It is essential that all these people are accredited line firefighters capable of conducting low and high intensity prescribed burning and in suppressing forest wildfires so that real world experience can be brought to fire management, planning and community engagement processes.

DISCUSSION

There has been a radical change in how successive Governments and the Department see their statutory responsibilities for forest fire management on Public Land.

The whole thrust of these changes is symptomatic of the growing emergence of the Emergency Management "Industry". This "industry" is building to be a classic bureaucratic power base infiltrating and dominating many arms of Government. It is very demanding of resources, heavily involved in process with attendant formal, complex and convoluted organisational hierarchy and procedures.

There can be no question that Victoria needs well resourced Emergency Management Services. From time to time circumstances will require the co-ordination of services to facilitate the particular lead agency in carrying out its responsibilities.

Wildfire control is a good example and the former DISPLAN arrangements were translated and extended into the Emergency Management Act 1986 following the S.I. Miller Inquiry after the 1983 fires. Such arrangements must facilitate action and not be an impediment to the primary task. There must be clear lines of accountability for outcomes. However, there is mounting evidence to the contrary. A specific example of this was displayed in Section 1, whereby the Office of the Emergency Services Commissioner is going to develop a Statewide fire strategy based on risk profiles of different types of fires in order to provide fire services with better information on the level of risk in particular areas of the State. This is to assist the particular fire service to make decisions on appropriate prevention and suppression measures.

Forest Fire Victoria believes that responsibility for risk assessment and preparedness for prevention and suppression of wildfires must not be divorced from the authority who is responsible and must be held accountable under the relevant Act.

Forest fire management is a day to day job throughout the entire year and is the primary responsibility of the forest land manager. It is inseparable from and the key to sustainable native forest management whether it is in parks and reserves or production forests. There must be no organisational impediments and the responsible authority must have unfettered access to resources to carry out its statutory responsibility.

Control of wildfires using the most effective resources in the shortest possible time is paramount to the social, economic and environmental well being of Victoria. When an emergency is declared, procedures must not impede the lead fire agency from taking aggressive action in bringing wildfires under control.

Section 4. Wilsons Promontory Fire March/April 2005

The origin of the Wilsons Promontory fire was a prescribed burn lit on Monday 21st March 2005. At the time of writing the fire has burnt more than 6,000 hectares of the park and is still burning.

The prescribed fire was planned to burn 20 hectares for ecological purposes and to provide protection to amenities and visitors at Tidal River from wildfires.

The weather on 21st March and the forecast for the next few days were generally within acceptable parameters for prescribed burning. The fire escaped the planned perimeter on 24/25 March and the available resources under the prevailing weather were unable to contain outbreaks which continued to spread in rugged terrain in southern sections of the park.

Forest Fire Victoria is of the opinion that the responsible agency did not effectively mop-up and patrol the 20 hectare prescribed burn in the days immediately following its ignition, a fundamental mistake in fire operations.

DSE's Forest Fire Awareness Report No 22 for week ended 30th March shows that (statewide) in the previous week 36 prescribed burns were commenced, 8 ecological burns and 28 fuel reduction burns "as regions maximized opportunities under the current favourable conditions". Inspite of this activity and contrary to recommendations in the Esplin Report (Rec.25.23) the number of Project Fire Fighters (PFFs) was decreased from a peak of 600 in mid-January 2005 to approximately 380 on 25th March, a 40% reduction in front-line firefighting resources.

It is understood that DSE's Regional Services unit, who control funds for day to day management activities, instigated the 40% reduction in PFF numbers although forest fire managers were still expected to continue implementing numerous statewide prescribed burns. With the advent of prolonged dry weather and various escaped burns including at Wilsons Promontory, DSE attempted to re-engage about 120 PFFs to cover the serious shortfall in available fire fighters. This was not successful.

DSE has obviously not heeded the lessons from the 2003 alpine fires by failing to effectively organise and resource its prescribed burning and wildfire control activities. Forest Fire Victoria believes the circumstances of the Wilsons Promontory fire (and other fires with escapes, statewide) warrant an in-depth investigation, independent of Government and DSE, which includes a person(s) with extensive operational experience of forest fire management.

Such an inquiry into the Wilsons Promontory prescribed and escape fires would include investigating:

1. What protocols were in place for conducting the prescribed burn?
2. Were protocols for planning, conducting and controlling the prescribed burn adhered to?
3. What resources were devoted to patrolling and making safe the 20 hectare prescribed burn each day between 22nd March and 24th March 2005?
4. What was the statewide total and statewide availability of regular line firefighting resources, as distinct from PFFs, on 25th March and what was their level of standby for the Easter period?

CHAPTER 6. IT'S TIME FOR A NEW FOREST FIRE POLICY

Why it's time for a new policy

Bushfire history

Victoria's forests are amongst the most fire prone in the world. In Australia, Victoria is the most seriously threatened state, accounting for some three-quarters of bushfire-related deaths and more than half of economic losses. On average, lightning causes about 25% of forest fires reported in Victoria each summer and multiple lightning strikes associated with particular weather events are relatively common.

Most of Victoria's terrestrial ecosystems require fire for their long term health and diversity, but Victoria's bushfire history clearly dictates that it is not an option to have a "let-burn" fire policy. Past events have demonstrated that forest wildfires can and must be controlled by the most effective means in the shortest possible time employing aggressive initial attack. Prescribed high intensity and low intensity fire must be regularly applied as the most practical and effective measure to aid fire suppression and for ecological purposes.

Policy shifts

In 2003 fires started by lightning burnt more than a million hectares of native forests in one conflagration over 59 days. More than half (527,100 hectares) of the "treed" forest affected by those fires was burnt by fire intense enough to severely scorch the crowns of all the trees or burn their crowns right off. This progressively happened after 9 days of relatively benign fire weather following ignition and mostly on just four separate days of bad fire weather of the 59 days the fires burned. The scale of the disaster was the inevitable result of government policies that have resulted in forest fire management being downgraded from the top priority of the responsible agency.

In the 20th Century two policy shifts that impacted most on the way agencies managed fires were:

(1) A shift that followed Royal Commission Reports on fire disasters in 1939 and 1944. The Government of the time responded to the Reports by charging the Forests Commission with the statutory duty to carry out proper and sufficient work for the prevention and suppression of fire in every State forest and national park and protected public land and giving it the resources to do the job. It also established the Country Fire Authority to manage fires in the *"country area of Victoria",* i.e., the rest of the State outside the metropolitan fire district.

Those administrative changes gave to regional Victoria effective programs to reduce hazardous fuels and skilled firefighters to combat fires in forests and grasslands. The programs and skills were equal to any in the world and the Forests Commission and CFA kept them so over four decades.

(2) In the late 1970s and 80s a shift in Government policies towards a "green and clean" environment occurred. It was more subtle but no less effective in changing the way agencies managed forest fires than was the shift three decades earlier. The policy shift resulted in expanded areas of national parks and relegated fire management to a non-core activity of the agency responsible to do the job. These changes occurred despite the law that says;

"Notwithstanding anything to the contrary in any other Act or law it shall be the duty of the Secretary to carry out proper and sufficient work for the prevention and suppression of fire in every State forest and national park and on all protected public land but in any national park or protected public land proper and sufficient work for prevention of fire shall be undertaken only by agreement with the person or body having the management and control thereof and in case of failure to reach any such agreement as determined by the Governor in Council whose determination shall be final and conclusive." (Sec62 (2) Forests Act 1958.)

The significance of the requirements under the Act that "*in any national park or protected public land proper and sufficient work for prevention of fire shall be undertaken only by agreement with the person or body having the management and control"* is that Parks Victoria has the power to amend or veto everything to do with fire prevention on land it manages. Parks Victoria now manages about half the fire prone public land and exercises its power to the detriment of good forest fire management. There is anecdotal evidence Parks Victoria went beyond its statutory role and adversely influenced fire suppression activities during the 2003 Alpine fires(12).

The result of that policy shift is Victoria now has too little of the right and too much of the wrong kind of fire in its forests. And it's not likely to get better. In 2004 another shift in Government policy created VicForests and transferred more than 90 DSE staff to Vic Forests. They have not been replaced, further eroding effective forest fire management. The Department of Sustainability and Environment office of Chief Fire Officer was abolished and the Secretary, DSE now gets advice on fire management from an office designated Manager, Emergency Management via 5 levels of bureaucratic filtering.

Its time for another shift in Government policy.

A new forest fire policy is needed that:

- Re-designates the Department of Sustainability and Environment as a Forest Conservancy with an unfettered charter to keep all public land, rivers and streams clean and running and forests healthy and diverse.
- Amends Section 62 of the Forests Act to provide:
  "Notwithstanding anything to the contrary in any other Act or law it shall be the duty of the Conservator to carry out proper and sufficient work to manage fires to protect water catchments and sustain the health and biodiversity of forests, regenerate disturbed or degraded forests and to prevent and suppress unplanned fires on all public forests"
- Ensures that the Code of Practice for Fire Management on Public Land is an explicit statement of policy quantifying the Conservator's responsibilities, sets standards for the management of both prescribed fire and wildfires on public land and holds the Conservator accountable to the Parliament of Victoria;
- Elevates the office of Chief Fire Officer to the second rung of the Conservancy organisational structure;
- Provides sufficient resources with appropriate organisational arrangements to effectively enable the Conservator to discharge the responsibilities vested in the Forest Conservancy;
- Abolishes Vic Forests;
- Abolishes Parks Victoria; and
- Abolishes the role of DPI in Public Land Management.

REFERENCES

1. Noble, W.S. (1977). Ordeal by Fire – The Week a State Burned Up. The Hawthorn Press, Melbourne.

2. Luke, R.H. and A.G. McArthur 1978. Bushfires in Australia. Australian Government Publishing Service, Canberra 1978.

3. Pyne, Stephen J. (1991). Burning Bush – A Fire History of Australia. Paperback edition published by the University of Washington Press 1998.

4. National Academies Forum (1999). FIRE! The Australian Experience
Proceedings from the National Academies Forum, seminar held at the University of Adelaide, SA 30th September – 1st October 1999.

5. Griffiths, Tom (2001). Forests of Ash – An Environmental History. Cambridge University Press.

6. MIRA Consultants Ltd 1992 – Fire Protection Risk Management Study for Department of Conservation and Natural Resources.

7(a). Esplin, Bruce: Dr. M. Gill and Prof. N. Enright (2003). Interim Report of the Inquiry into the 2002/2003 Victorian Bushfires, August 2003.

7. Esplin, Bruce: Dr. M. Gill and Prof. N. Enright (2003). Report of the Inquiry into the 2002 – 2003 Victorian Bushfires.
ISBN: 0731114884 State Government of Victoria, 2003. http://www.dpc.vic.gov.au

8. Government of Victoria (1939). Report of the Royal Commission to Inquire into The Causes of and Measures Taken to Prevent the Bush Fires of January, 1939, and to Protect Life and Property in the Event of future Bushfires. Judge Leonard Stretton.

9. Victoria. Royal Commission to Inquire into the Place of Origin and the Causes of the Fires which Commenced at Yallourn on the 14th day of February 1944. Judge L E B Stretton.

10. Government of Victoria (1977). Report of the Board of Inquiry into the Occurrence of Bush and Grass Fires in Victoria. The Esler Barber Inquiry (1977).

11. Miller, S.I., Carter, W. & Stevens, R.G. 1984, 'Report of the Bushfire Review Committee on Bushfire Disaster Preparedness and Response in Victoria, Australia, following the Ash Wednesday Fires 16 February 1983', Report to the Hon. C.R.T. Matthews, MLA Minister for Police and Emergency Services, Melbourne.

12. The Parliament of the Commonwealth of Australia (2003). House of Representatives Select Committee into the recent Australian bushfires 23 October 2003.

13. 1982 Report to the Minister of Forests by Task Force appointed to examine fire protection and fuel reduction burning by the Forests Commission Victoria.

14. 1982 Report to the Minister of Forests by Task Force to examine the appropriateness of the organisational structure of the Forests Commission to meet current operational needs and to conform to Government policy.

15. Forests Commission Victoria (1983).
Fire Protection Seminar – Review of forest fire protection strategy and techniques following the 1983 bushfires – July 1983.

16. Department of Conservation, Forests and Lands (1984). Report of the Fire Protection Working Party – to investigate and report on matters relating to Fire Protection within the Department and a proposed structure for the Fire Protection Branch – 1st October 1984.

17. Department of Conservation, Forests and Lands (1985). Summary of Significant Events 1984/85 Fire Season. Presented to Australian Association of Rural Fire Authorities. Perth 6-9 May 1985.

18. Victorian Auditor-General's Office Special Report No. 16. Fire Protection April 1992. The overall objective of the audit review was to evaluate the economy, efficiency and effectiveness of the Department of Conservation and Environment's management of its fire protection activities, embracing both fire prevention and fire suppression.

19. Department of Natural Resources and Environment (2001). Fire-Management – Effectiveness of Broad Scale Fuel Reduction Burning in Assisting with Wild Fire Control in Parks and Forests in Victoria. Research Report No. 51. Gregory J McCarthy and Kevin G Tolhurst, Forest Science Centre Orbost and Creswick, May 2001.

20. Linton Bushfire Inquest. Coronial Inquiry into the deaths of five volunteer CFA firefighters fighting a fire at Linton near the City of Ballarat, December 1998.

21. Auditor-General's Fire Report tabled in the Victorian Parliament May 8, 2003.
This audit commenced prior to the fires of summer 2002-2003, and did not examine suppression operations. The audit focused on the planning, prevention and preparedness measures that can prevent or reduce the severity of Victoria's seasonal wildfires and on whether those essential planning and prevention measures are being effectively implemented.

22. Council of Australian Governments (COAG) (2005). Inquiry on Bushfire Mitigation and Management. COAG reported to the Prime Minister as Chair of COAG, on 2nd April 2004. The Report and COAG's Response were released on 24th January 2005.

23. A. J. Myers QC (15 July, 2004). In the Matter of a Report of the Inquiry of the 2002 – 2003 Victorian Bushfires. A report commissioned by the Stretton Group.

24. Department of Sustainability and Environment (2003). The Victorian Alpine fires January – March 2003. Wareing, K.J and D.W. Flinn.
ISBN 1 74106 624 7 www.dse.vic.gov.au/fires

25. Royal Melbourne Institute of Technology – Centre for Rural and Regional Development and Timber Towns Victoria (July 2003). Socio-Economic Impact of Bushfires in Rural Communities and Local Government in Gippsland and North East Victoria.

26. Victorian Association of Forest Industries. Submission to The House of Representatives Select Committee on the Recent Australian Bushfires (2003).

27. Victorian Association of Forest Industries – Supplementary Submission to The House of Representatives Select Committee on the Recent Australian Bushfires (30 July 2003).

28. Co-operative Research Centre for Catchment Hydrology (1998). Predicting Water Yield From Mountain Ash Forest Catchments. Industry Report 98/4, April 1998. Robert Vertessy, Fred Watson, Sharon O'Sullivan, Sharon Davis, Richard Campbell, Richard Benyon and Shane Haydon.

29. Cheney, N.P. (2004). The Role of Land Management Agencies in Protecting the Community from Bushfire. Paper presented to 11th Annual AFAC Conference and Inaugural Bushfire CRC Conference 7-9 October 2004. Perth, Western Australia.

30. Tolhurst, K.G. (2003). Prescribed Burning in Victoria: Policy and Practice. Forest Science Centre University of Melbourne. Paper presented to "Bushfire Prevention: Are we doing enough?" Conference, Institute of Public Affairs 11 March 2003.

31. Forests Commission Victoria (1973). A History of the Mount Buffalo Fire; B.D. Dexter, A. Heislers and T. Sloan. Fire Research Section, Division of Forest Protection – internal report 1973 published as Bulletin no. 26. 1977.

32. Cheney, N.P. (2004). Fire for What Purpose. Comments on the Discussion Paper – "Review of fire policies and management practices of the Department of Conservation and Land Management." Environmental Protection Authority, Perth, Western Australia.

33. Department of Conservation and Natural Resources (1995), Code of Practice for Fire Management on Public Land – an approved Code of Practice in accordance with Section 47 of the Conservation, Forests and Lands Act 1987.

34. Department of Natural Resources and Environment (1966), Code of Practices for Timber Production, Revision 2, November 1996. Prepared in accordance with the Conservation Forests and Lands Act, 1987.

35. Victorian Workcover Authority. Code of Practice - (No 12) - Safety in Forest Operations. 01 March 1990.

36. Hodgson, Athol (2004). The Feral Fire – Paper presented to Inaugural Eureka Forum – Reclaiming the Environment, Ballarat, 3-4 December 2004.

37. Hodgson, Athol (2003). Submission to the Bushfire Inquiry 2003 – addressing Term of Reference No.1. "Examine the effectiveness of preparedness for the 2002/03 bushfire season, including hazard reduction."

38. Australian Government, Bureau of Meteorology (2003). Meteorological Aspects of the Eastern Victorian Fires January – March 2003.

GLOSSARY

Active management — *Deliberate management actions to achieve stated objectives, in this context, directed to the sustainability of social, economic and environmental uses and values of forests.*

Airshed — *An "Air Quality Region".*

Australian Inter-Service Management System — *An emergency management system which can be applied to the organisation and management of any event (eg. floods, fire, earthquake) where co-ordination and integration of various activities (and agencies) are required. See Appendix 3.3.*

Backburning — *A fire ignited along the inner edge of a control line to consume the fuel in the path of a wildfire.*

Biodiversity — *The range of plants and animals, and the habitat that they live in.*

Biological Diversity/Biodiversity

1. Encompasses the diversity of indigenous species and communities occurring in a given region. Diversity includes genetic (genes/genotypes within each species), species (variety of living species) and ecosystem (different types of communities formed by living organisms and the relations between them).

2. A concept encompassing the diversity of indigenous species and communities occurring in a given region. It includes 'genetic diversity', which reflects the diversity within each species; 'species diversity', which is the variety of species; and 'ecosystem diversity', which is the diversity of different communities formed by living organisms and the relations between them.

Broad area fuel reduction burning

The planned (prescribed) application of fire with the intention of reducing potential fire fuel so as to minimise the intensity of any subsequent wildfire and to ensure that the wildfire is easier and safer to suppress.

Bushfire — *Unplanned fire in bush. A general term that includes grass fires, forest fires and scrub fires.*

Syn. Wildfire. The term usually applied to unplanned fires on forested public land.

Canopy — *The crown of a tree.*

Catchment — *The natural boundary of the area where all surface water drains to a common point. Ridges form the boundaries of catchments.*

CFA — *Country Fire Authority.*

CFL — *The Department of Conservation Forests and Lands was an amalgamation of the Forests Commission, Lands Department (part), Fisheries and Wildlife (part), National Parks Service, Soil Conservation Authority and Ministry of Conservation (part).*

Contained fire — *Indicates that the spread of the fire is halted even though it may still be burning within the perimeter or control lines. Such a fire may still require continuous suppression action to bring it Under Control.* See Under Control.

Control line — *A natural or constructed barrier, or treated fire edge, used in fire suppression and prescribed burning to limit the spread of fire.*

Controlled burn	*The prescribed use of fire to meet management objectives such as fuel reduction and for ecological purposes.*
CPFMPL	*Code of Practice for Fire Management on Public Land. The code provides a framework for fire management procedure and practice.*
CPTP	*Code of Practices for Timber Production. A set of operational principles and, in some cases, minimum performance standards for the conduct of timber harvesting and associated works in forests in Victoria.*
Critical incident	*A fire scenario based largely on previous fire situation(s) in a planning area which would fully utilise local resources (people and other) in meeting the Department's fire suppression performance criteria.*
Crown	*Tree foliage.*
DCNR	*Department of Conservation and Natural Resources.*
DISPLAN	*The Victorian State Disaster Plan authorised by Part 3 of the Emergency Management Act 1986.*
Downsize	*The reduction in human and other resources in an organisation.*
DPI	*Department of Primary Industries.*
Drought stress	*The response of vegetation to deprivation of soil moisture.*
DSE	*Department of Sustainability and Environment.*
Ecological burning	*A form of prescribed burning. Treatment with fire of vegetation in nominated areas to achieve specified ecological objectives.*
Ecosystem	*All the organisms (including plants and animals) present in a particular area together with the physical environment.*
Exempt employee	*Employees of a Government organisation that are 'exempt' from the provisions of the Public Service Act.*
FFDI	*Forest Fire Danger Index. Syn. FFDR Forest Fire Danger Rating.*
Fire access track	A *track constructed and/or maintained for fire management purposes, which is not generally of a standard adequate for all-weather use by two-wheel drive vehicles.*
Fire boss (Incident controller)	*The person having overall management of the fire.*
Fire brands	*A piece of burning material, commonly bark from eucalypts, often windborne and capable of igniting fires downwind. Syn. Ember –see Fire spotting*
Fire containment	*The act of containing a fire.*
Fire control line	*A natural or constructed barrier, or treated fire edge, used in fire suppression and prescribed burning to limit the spread of fire.*
Fire danger	*The resultant of all factors which determine whether fires start, spread and do damage and whether and to what extent they can be controlled.*
Fire danger index	*A related number denoting an evaluation of rate of spread, or suppression difficulty for specific combinations of fuel, fuel moisture and wind speed.*
Fire District	*DSE basic administrative unit for fire management.*

Fire Ground	*The area in the vicinity of the wildfire and fire suppression operations, and the area immediately threatened by the fire. It includes burning and burnt areas; constructed and proposed fire control lines; the area where firefighters, vehicles, machinery and equipment are located when deployed; roads and access points under traffic management control; tracks facilities in the area surrounding the actual fire; and may extend to adjoining area directly threatened by the fire.*
Fire ground firefighters ("On-line" firefighters)	*Personnel working on the Fire Ground.*
Fire intensity	*Syn. Fireline intensity. The ferocity of a fire. Fire intensity is a function of the amount of fuel consumed in a flaming zone of a fire, the calorific value of that fuel, taking into account its moisture content and the rate of spread of the fire. It is expressed as the rate of energy release per unit length of fire front, e.g. Kilowatts per metre. A mild fire produces up to 350kw/m. An intense fire produces about 2,000kw/m and is very difficult to control. Wildfires like those that burned on a few days in 2003 produce 100,000kw/m*
Fire line	*Syn. Fire control line.*
Fire management	*All activities associated with the management of fire dependent and fire-prone public forests, including the use of fire to meet land management goals and objectives and prevention and suppression of wildfire.*
Fire preparedness	*All activities undertaken in advance of wildfire occurrence to decrease wildfire area and severity and to ensure more effective fire suppression*.
Fire prevention	*All activities concerned with minimising the incidence of wildfire, including those of human origin.*
Fire Protected Area	*As defined in Section 3 of the Forests Act 1958, viz: 'any land (not being vested in or under the control of the Melbourne and Metropolitan Board of Works (now Melbourne Water)) which is - within any State forest within any National Park (unless excised...) within 1.5 km of any reserved forest or area of unoccupied Crown land proclaimed as a protected forest...; any national park; any protected public land; within any protected public land.*
Fire protection	*All activities designed to protect an area (including human life, property, assets and values) from damage by wildfire.*
Fire risk	*The probability of a fire starting.*
Fire season	*The time of year, usually September to April when there is a high likelihood of bushfires/wildfires.*
Fire spotting	*Behaviour of a fire producing sparks or embers that are carried by the wind or convective activity and start new fires beyond the zone of direct ignition by the main fire. Hence the term "coming under ember attack". See Fire brands.*
Fire strategy	*Planned management system initiated to control prescribed burns, and to suppress wildfire.*
Fire suppression (Fire control)	*The activities connected with restricting the spread of wildfire following its detection and making it safe.*
Firebombing	*The technique of dropping a fire suppressant or retardant from specialised aircraft to deny the fire fuel and hence reduce fire intensity.*
Firefighter	*Any employee, volunteer or agent from any fire agency who occupies or is designated to undertake a role for the purpose of fire suppression.*

First attack — *The suppression work undertaken in the initial response to a wildfire.*

Flammability — *The ease with which a substance is set on fire.*

FRB — *Fuel reduction burning.*

Frontal system — *When one air mass moves into an area occupied by another, the two do not mix substantially unless their temperature and moisture properties are similar. Instead, a boundary zone known as a front forms between the two air masses and may be described as either a cold front or warm front. When the boundary layer is described as a cold front the colder advances, pushing in as a wedge beneath the warm air. The warm air is lifted bodily and the resulting weather, particularly the incidence of lightning strikes near the frontal surface depends on the stability and moisture content of the warmer air mass and, to some extent, the characteristics of the cold air mass.*

Fuel reduction burning — *The planned use of fire to reduce fuel levels in a specified area.*

Hazard — *A fuel complex defined by type, condition, arrangement, mass/volume and location that determines both the ease of ignition and of fire suppression difficulty.*

Hazard reduction burn (Slash Burn) — *A prescribed burn conducted to consume a proportion of fuel for fire hazard reduction.*

High intensity prescribed burn — *Controlled burning for management purposes (e.g. regeneration of ash-type forest) where the fire intensity exceeds 350 kw/m.*

HO — *Head Office*

IMAC — *Integrated Multi-agency Co-ordination.*

IMT — *Incident Management team.*

Incident Controller (Fire Boss) — *Person responsible for the overall management of all fire activities, including the development and implementation of strategy, and the ordering and release of resources.*

Incident Control System (ICS) — *Incident control system of the Australian Inter-Service Management System.*
AIMS was developed under the auspices of the Australian Fire Authorities Council (AFAC). It is an emergency management system which can be applied to the organisation and management of any event (eg flood, fire) where co-ordination and integration of various activities and agencies are required. It consists of five sub-systems which collectively provide a total systems approach to incident management.
The ICS is the core sub-system which comprises control, operations, planning and logistical functions. From this is derived the Incident Management Team (IMT) which has a planning officer, operations officer and logistics officer who report to Incident Controller (Fire Boss).

Initial attack — *Syn. First attack.*

National Park — *Land declared to be National Park under Schedule 2 of the National Parks Act 1975.*

Native forest — *1. Any local indigenous community the dominant species of which are trees and containing throughout its growth the complement of native species and habitats normally associated with that forest type or having the potential to develop these characteristics. It includes forests with these characteristics that have been regenerated with human assistance following disturbance. It excludes plantations of native species and previously logged native forest*

	that has been regenerated with non-endemic native species. 2. Any locally indigenous forest community containing the complement of native species and habitats normally associated with that community, or having the potential to develop these characteristics.
Passive management	*Minimalist or no management intervention.*
Preparedness	*All activities undertaken at any time in advance of a wildfire occurrence to decrease wildfire area and severity and to ensure more effective suppression.*
Prescribed fire/burn	*Deliberately lighting fires for management purposes e.g. maintaining biodiversity, forest regeneration, and fuel reduction to aid in control of unplanned fire.* *The controlled application of fire under specified environmental conditions to a predetermined area and at the time, intensity and rate of spread required to attain planned resource management objectives. [Includes fuel reduction burning, ecological burning and regeneration burning.]*
Private land	*For the purposes of the Code of Forest Practices for Timber Production, Private land comprises: unalienated land of the Crown managed and controlled by other than the Minister for Conservation and Land Management, the Minister for Agriculture, or the Secretary of Sustainability and Environment or the Secretary of Primary Industries; unalienated land of the Crown occupied under a lease from the Crown; land vested or leased by the Victorian Plantations Corporation or its successor in law; land alienated from the Crown.*
Protected public land	*A legal term. Any lands of the Crown including reserved Crown land, other than a state forest or national park, declared under Section 62 of the Forests Act 1958.*
Public land	*All state forest, national park and protected public land as defined by Section 3 of the Forests Act 1958, except that which is managed by Hancocks Victorian Plantations (or is successor in law).*
PV	*Parks Victoria – Under the Parks Victoria Act 1998, PV's responsibilities are to provide services to the State and its agencies for the management of parks, reserves and other land under the control of the State. For the purpose of the Forests Act 1958, PV is considered part of DSE.*
Reserve(s)	*Areas such as national parks and nature reserves which are subject to an established degree of protection from disturbance.*
Risk assessment	*The overall process of risk analysis and evaluation.*
Run-off	*Rain or water which flows from a catchment into a river, stream, lake or reservoir.*
Salvage logging	*Logging to recover a damaged resource that would otherwise be lost through deterioration following a wildfire, or damage by pests or disease.*
Slip-on unit	*A tank, a live hose, a small capacity pump, and an engine combined into a single assembly that can be slipped on to a truck bed or trailer and used for spraying water and/or foam on wildfires.*
Spotting	*Behaviour of a fire producing sparks or embers that are carried by the wind or convective activity and start new fires beyond the zone of direct ignition by the main fire.*
State forest	*As defines in Section 3 of the Forests Act 1958. State forest comprises publicly owned land which is managed for the conservation of flora and fauna; for the protection of water catchments and water quality; for the*

	provision of timber and other forest products on a sustainable basis; for the protection of landscape, archaeological and historical values; and to provide recreational and educational opportunities.
State Park	*Land declared by the government to be State park through the Land Conservation Council land use decision-making process. Largely because it is a tract of land containing natural environments and features, scenic landscapes, and one or more land types complementing those found in national parks to provide a system representing the major land types of the state.*
Storm front	See *frontal system.*
Sustainable yield	*The sustainable yield of a forest is the maximum level of commercial timber which can be maintained in perpetuity under a given management regime. In Victoria sustainable yield is specified in legislation as the rate of harvest that can be maintained for a defined period (usually 10 years). This figure may increase in the future if the condition of the forest is improved but should not decrease except in the case of a catastrophic event such as fire.*
Tanker (fire tanker)	*A truck specifically designed with a water tank, pumps and hoses used for fire suppression.*
Timber resources	*1. A general term used to describe standing trees or felled logs before their processing into forest produce.* *2. Includes fallen trees felled trees and all wood whether sawn split hewn or otherwise fashioned.*
Topography	*The nature of the land surface in terms of slope, steepness, aspect, elevation and landscape pattern. Terms such as mountainous, hilly, undulating, and flat describe the general topography.*
Turbidity	*A measure of how 'dirty' the water is in a stream or lake. The higher the turbidity the 'dirtier' the water.*
Under Control	*An Under Control fire requires routine patrol including occasional mopping up work.*
VF	*VicForests.*
Water catchment (Catchment)	*The natural boundary of the area where all surface water drains to a common point. Ridges form the boundaries of catchments.* *The area of land drained by a creek or river system, or a place set aside for collecting water which runs off the surface of the land. Catchments provide the source of water for the dams and reservoirs in which our drinking water is collected.*
Water yield	*The volume of water as stream flow off a catchment.*
Wildfire	A*n unplanned grass, scrub or forest fire.*

APPENDIXES

APPENDIX F.1.

TERMS OF REFERENCE FOR THE ESPLIN INQUIRY INTO THE 2002-2003 VICTORIAN BUSHFIES. – ESPLIN REPORT.

A range of significant issues has been raised about these fires, in particular the management of public land to reduce fire risk, as well as the way in which the fire was fought.

It was in this context that, as the Emergency Services Commissioner, I (Mr. Bruce Esplin) was invited to chair an Inquiry into the 2002 – 2003 Victorian bushfires. Under the Emergency Management Act 1986 s21c, the Commissioner is required to monitor the performance of emergency service agencies and to advise, make recommendations and report to government on any issue in relation to emergency management (prevention, response and recovery).

The inquiry is to report at the end of September 2003.
The Terms of Reference for the Inquiry are:

1. Examine the effectiveness of preparedness for the 2002/03 bushfire season, including hazard reduction and mobilization of resources;

2. Assess the effectiveness of the response to the 2002/03 bushfires, including emergency management procedures, cross agency response and co-ordination and resource deployment; and

3. Provide recommendations for future bushfire management strategies, including any required improvements to existing emergency management arrangements including public communications, community advice systems, infrastructure, training and overall resourcing.

Two independent experts were also appointed to the Inquiry. They are:

- Dr. Malcolm Gill, Honorary Research Fellow, CSIRO Centre for Plant Biodiversity Research, Canberra. He has published widely on wildfire and its role in forest ecosystems in Australia and was awarded an Order of Australia Medal in 1999 for his contribution to research on bushfires and the environment; and

- Professor Neal Enright, School of Anthropology, Geography and Environmental Studies, and Executive Director, Office of Environmental Programs at the University of Melbourne. He specialises in the fire ecology of plants, re-vegetation and rehabilitation, has been published widely and conducted extensive research and consultation.

Their appointment brings a breadth of knowledge in bushfire behaviour and environmental science to the Inquiry to complement the expert knowledge of the Emergency Service Commissioner in the planning for, and management of, emergency situations.

APPENDIX F.2.

IN THE MATTER OF A REPORT OF THE INQUIRY OF THE 2002-2003 VICTORIAN BUSHFIRES

MEMORANDUM

Introductory

1. I have been asked by a committee, known as the Stretton Group, to comment upon a report of the inquiry into the 2002-2003 bushfires, which I shall hereinafter refer to as the "Esplin Inquiry" and "Esplin Report". Mr Bruce Esplin, Emergency Services Commissioner of Victoria, was the chairman of the Esplin Inquiry, which he conducted with the assistance of Dr Malcolm Gill and Professor Neal Enright.

2. In addition to a copy of the Esplin Report, I have been provided with the following documents:

   (a) Report of House of Representatives Select Committee on the Recent Australian Bushfires, "A Nation Charred: Enquiry into the Recent Australian Bushfires", published October 2003;

   (b) Report from certain "North Eastern Victorians regarding the 2003 bushfire crisis" entitled, "A Case of Burning Neglect", dated 30 April 2003 and published by The Eureka Project;

   (c) A collection of papers provided to me concerning the 2003 Victorian bushfires, including the following:

      (i) David Packham, "Casual observations on the validity of the Esplin Inquiry", dated 1 February 2004;

      (ii) David Packham, "Submission to Victorian Bushfire Inquiry", dated 9 May 2003;

(iii) David Packham "Supplementary Submission to Victorian Bushfire Inquiry", 1 June 2003;

(iv) Letter from Andrew Chambers, managing director Pinkerton (Australia) Pty Ltd to Messrs Tony Cutcliffe and Simon Paton, dated 6 May 2003;

(v) Letter to Graeme Johnston, State Coroner, from Tony Cutcliffe director The Eureka Project, dated 11 September 2003, together with other correspondence between Mr Cutcliffe and Mr Johnston.

(d) Jim Hoggett and Aled Hoggett, "When Will We Ever Learn", IPA Backgrounder, May 2004.

3. I propose to comment upon two broad matters relating to the Esplin Report. First, I will address certain procedural matters affecting the manner in which the Esplin Inquiry was conducted. Secondly, I will comment upon some of the conclusions and recommendations of the Esplin Report.

Procedures

4. Sound process in the conduct of an inquiry is an assurance as to the reliability of outcome; but if the process is unsound one can have no confidence in the conclusions of the inquiry. Clause 1.17 of the Esplin Report, under the heading "How the Inquiry was conducted", says "the Inquiry members approached the task with no pre-determined view about the eventual finding". Nonetheless, I have been informed that, before the Esplin Inquiry began, the Minister for Emergency Services, Mr Haermeyer, in an interview with Jon

Faine on ABC Radio 774, made a public statement along the lines that the Esplin Inquiry would show that the State Emergency and Firefighting Services did an excellent job controlling and suppressing the 2003 Victorian bushfires. Clause 1.26 asserts the independence of the Esplin Inquiry from Government, but clause 1.17 states that the secretariat for the Esplin Inquiry was located within the Department of Premier and Cabinet, without describing, for example, the role of the secretariat in advising the members of the Esplin Inquiry or in drafting the Esplin Report.

5. Mr Esplin was Emergency Services Commissioner for Victoria during the 2002-2003 fires the subject of the Esplin Inquiry. The Esplin Inquiry dealt explicitly with the Victorian Emergency Services role in fighting the 2003-2003 Victorian fires: see, for example, chapters 16 and 18 of the Esplin Report. Thus, Mr Esplin was not, and did not appear to be, independent in relation to the matters inquired into.

6. The terms of reference for an inquiry are fundamental to the usefulness of the inquiry. The terms of reference for the Esplin Inquiry were to:

> "1. Examine the effectiveness of preparedness for the 2002/03 bushfire season, including hazard reduction and mobilization of resources;
>
> 2. Assess the effectiveness of the response to the 2002/03 bushfires, including emergency management procedures, cross agency response and co-ordination and resource deployment; and

3. Produce recommendations for future bushfire management strategies, including any required improvements to existing emergency management arrangements including public communications, community advice systems, infrastructure, training and overall resourcing."

The terms of reference for the Esplin Inquiry were deficient, being too vague, generalized and unfocussed and, at the same time, too narrow. The report upon those terms of reference was correspondingly vague, generalized and unfocussed and failed to address important environmental and economic consequences of the fires, including the effect of the fires upon water catchments. Matters which the terms of reference ought to have addressed, in addition to the economic and environmental consequences of the fires, include land use practices of Parks Victoria, forest husbandry practices in Victorian State forests and specific steps which could have been taken to control and extinguish the fires but which were not taken, or not taken in a timely manner.

The Esplin Inquiry had no power to compel witnesses to give evidence. Evidence to the Esplin Inquiry was not generally given orally or under oath. Evidence to the Esplin Inquiry was not tested by cross examination. Evidence to the Esplin Inquiry was given secretly, so that one could not generally know what evidence was given by any witness. (All one knows from chapter 5 is that a great deal of evidence was critical of the firefighting services, the response to the 2003 north east Victoria fires and the government policies on fuel reduction burning on public lands. Further, after the publication of the Esplin Report, certain submissions were published on an internet website.)

Evidence given to the Esplin Inquiry was not privileged for the purposes of the law of defamation and any witness who gave evidence may have been inhibited by the knowledge that the witness could be sued for defamation. These aspects of the manner in which the Esplin Inquiry was conducted stand in contrast with the procedures of the House of Representatives Select Committee, whose report is mentioned above, where evidence was given in public, with the benefit of parliamentary privilege and on oath. There was a Hansard report of the oral evidence before the House of Representatives Committee and written submissions were made public. It is also to be contrasted with what would have been the position had there been a coronial enquiry and with the position of the Royal Commissions conducted by Judge Stretton after the 1939 and 1944 bushfires.

8. Under the heading "Expert input into the Inquiry" the qualifications of Dr Gill and Professor Enright are described. What is notably absent in the description of the skills of the members of the Esplin Inquiry and the resources available to them is any reference to skills and experience in relation to forestry management and fire prevention or suppression.

9. One must have grave misgivings about the manner in which the report is written. The language in which the report is written is highly generalized and qualified. There are few specific findings or recommendations upon the most crucial issues about, for example, fuel reduction burning, the organization of fire and emergency services and the roles of landowners, volunteer firefighters and local communities in fire prevention and control. The Esplin Report

contains a great deal of peripheral and irrelevant material: for example, one's attention is attracted immediately upon reading chapter 1 to the highlighted observation that "Victoria is not alone in experiencing fire events such as the fire season. Parts of Europe and Canada have also experienced extreme fire weather over the summer of 2003." That observation is irrelevant to the subject of the Esplin Report and merely distracts from an understanding whether the 2003 bushfires were well-handled by the State bushfire and emergency services organizations and whether correct bushfire prevention and suppression policies are being implemented in Victoria.

Conclusions and Recommendations of Esplin Inquiry

10. In the executive summary of the Esplin Report, after stating in general terms the purpose of the Esplin Inquiry, there is a blow directed against those "who attempt to use this report and its recommendations to apportion blame, and to advance their agendas". That sets the tone for the report, which tends to deflect blame from those who are responsible for establishing and administering policies and programmes affecting bushfire mitigation and suppression. The executive summary also compares the fires of 2002-2003 with Black Friday 1939 and says that the area of land burnt was similar, but in 2002-2003 there were "substantially and starkly different" numbers of deaths and injuries and property loss associated with the fires. In 1939 the means available to control bushfires was very different from the means available today. Furthermore, the losses of private property and deaths and injuries in 1939 were the greater because of the localities where the fires burnt. The 2002-2003 fires in Victoria caused enormous loss of public property and

resources and environmental devastation not properly identified and valued in the Esplin Report . The executive summary concludes with a statement that the authors have "nothing but praise for ... [the] efforts of the many firefighters and support staff". This statement is at odds with many findings of the Esplin Report which identify fire-fighting efforts that deserve condemnation rather than praise: see, for example, the findings in chp. 20 of the Esplin Report. It is also at odds with the preponderance of submissions as, for example, analysed and summarized in chp. 5 of the Esplin Report.

11. A major criticism of the efforts to extinguish the fires in north east Victoria in 2003 is that in the first week of the fire there were ample opportunities to completely control or extinguish the fires, but these opportunities were not sufficiently availed of. Indeed, it is suggested that those responsible for controlling the fire fighting prevented fire fighters completely controlling the fires, when it was possible to do so. There is some intimation of this in paragraph 4.21 of the Esplin Report. On page 171 the authors say "Opportunities to safely attack sectors of the fire were missed .... The authors also reject the suggestion that recommendations of the Linton coronial enquiry about fire-fighter safety meant that decisions were taken not to attack sectors of the fire, especially during the first week, when it was safe to do so". Furthermore, under the heading "Aggressiveness of Firefighting" it is said:

> "20.*14 Many submissions to the inquiry were highly critical of the strategies and tactics employed by DSE and CFA in the management of the fires. These criticisms were made both by fire-affected communities and local CFA volunteers. (Chapter 17 discusses some of these concerns in relation to the initial response to the bushfires.)*

20.15 The issues raised in these submissions were surprisingly consistent across all fires examined by the inquiry, and fall into a number of areas:

- *A perceived reluctances to undertake direct attack on fires due to concerns over fire-fighter safety following the Linton Coronial Inquiry recommendations.*
- *A perceived reluctance to undertake backburning as a method of consolidating control lines – in general, and for fear fires would escape, resulting in litigation;*
- *Staff at Incident Control Centres restricting the tactics that fire ground supervisors could employ;*
- *A perceived failure early in the campaign to deploy aircraft for fire bombing activities; and*
- *Concerns that many resources were not deployed to the fire line but were held in reserve when effective fire suppression could have been undertaken."*

The Esplin Report concludes as follows:

"20.18 The Inquiry believes no one factor is responsible for the concerns raised by both firefighters and the community. The likely explanation is one of interacting factors and events including:

- *Failure to adequately use local knowledge (discussed in detail below);*
- *Incident Control Centres being established (in some cases),a considerable distance from the f ire front;*
- *A failure on the part of the Incident Management Teams to communicate the reasons behind selected strategies to both firefighters and affected communities;*
- *Inexperience on the part of some Incident Controllers; and*
- *AIIMS-ICS being applied too prescriptively or inflexibly by some staff operating from Incident Control Centres.*

12. Nonetheless, the Esplin Report deals with the serious failures identified in submissions and found by the Esplin Inquiry itself, as follows:

"20.25 The Inquiry concludes there were <u>some opportunities</u> where weather conditions, local fire behaviour and available resources <u>could have justified</u> a decision to undertake a more aggressive or direct attack safely on the fires during the campaign. <u>While we can speculate</u> on the difference this decision might have made to property damage and losses, it is

> *not possible to objectively, or conclusively, assess the impact it might have had on the total area burnt by the fires. Nor is it possible to assess whether it would have reduced the impact of the fires on private property."* (Emphasis added.)

Thus, notwithstanding the many critical submissions about the conduct of the firefighting efforts in north east Victoria and the conclusions reached by the members of the Esplin Inquiry quoted above, the Esplin Report states that, in substance, nothing was seriously amiss in the fire fighting efforts and those in command had difficult decisions to make which with the benefit of hindsight one could not say were definitely wrong. No specific recommendations are made concerning the way in which fire fighting strategy should be improved, local knowledge should be used or indeed any other matter which touches upon the widespread criticism of the way in which the 2003 fires were fought. The language of para. 20.25 quoted above is designed to deflect and dilute criticism and stands in contrast with the serious deficiencies in firefighting efforts already identified.

13. The preceding matter is related to the complexity of the relationships between organizations responsible for firefighting and also the relationships between paid employees and volunteers and landowners. The complexity of the relationships between various organizations responsible for fighting the 2003 fires was the subject of a great deal of criticism in the evidence to the Esplin Inquiry. The complexity is demonstrated graphically by figure 15.1 in the Esplin Report, which identifies seven or eight layers of command above the firefighters! Furthermore, the case study in paragraph 15 of the Esplin Report is a powerful instance of a breakdown of communication between permanent (or "professional") fire fighting organizations and landowners and volunteers.

Yet there is not any recommendation which adequately deals with these matters. The only recommendation is as follows:

> *"15.87 That Government supports the immediate development of financial models to analyse and determine the appropriate level of investment in fire management planning, preparedness and suppression on public land."*

This recommendation is so generalized as to be worthless. It completely ignores the evidence of serious deficiencies in the organization of the permanent fire fighting bodies and in the relationship between those bodies and volunteers and owners.

14. Another related issue concerns access roads and tracks. This is dealt with in the Esplin Report in paragraph 15.91 and following. The evidence contained in the submissions, as best one can judge, before the Esplin Inquiry supported a policy of undertaking work on the establishment and maintenance of fire tracks and access roads, many of which had been neglected or closed before the fires as a result of government policy and lack of expenditure in the maintenance of tracks and roads in National Parks and State forests. The Esplin Inquiry recommendations, at paragraphs 15.105 to 15.107, are so generalized as to be worthless, referring to recommendations that bodies "assess" various matters and undertake "community consultation". It was open to the Esplin Inquiry to make specific recommendations concerning access roads and tracks and to comment upon the difficulties that were caused in the fighting of the 2003 fires by decisions to close access tracks and by inadequate maintenance of the remaining access tracks and roads.

15. Possibly the most sensitive area of the Esplin Inquiry concerns fuel reduction burning. Before the 2002-03 fires, there had been a considerable decline in fuel reduction burning on public land, especially National Parks. The submissions received by the Esplin Inquiry identified this as a major source of difficulty in preventing and controlling fires. What did the Esplin Inquiry do? There were five chapters touching upon this matter. One chapter ended with an inconclusive observation about high country grazing. The next chapter appeared to focus on the breeding habits of the mallee fowl. There was a further chapter in which the members were unable to reach any conclusion about aboriginal burning practices as compared with what has happened since European settlement. In chapter 11 there was some ponderings about "philosophical and comparative approaches to determining effectiveness". But, in the end, it was concluded as follows:

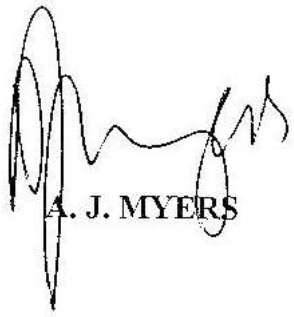
> *"11.61 A prime purpose of fuel modification is to mitigate the effects of unplanned fires. The main technique for doing this in public, forested landscapes is prescribed burning. Prescribed burning by its very nature reduces fuel quantities so, by definition, it reduces potential fire intensity. It also changes fuel arrangement in ways that can only be considered beneficial for protection purposes.*
>
> *11.62 With the mitigation of unplanned fires, the chances of fire control are improved and therefore the risks to life and property are reduced."*

16. Having reached that conclusion, the Esplin Inquiry was in a position to make recommendations for the future about fuel reduction burning policies and observations about what would have been the effectiveness of fuel reduction burning in controlling and mitigating the effects of the 2003 north east Victoria fires. But the Esplin Report did not do so. This is a serious

deficiency in the Esplin Report amounting to an abdication of responsibility to fulfil properly its terms of reference.

Conclusion

17. The establishment of the Esplin Inquiry and the procedures followed in the conduct of the Esplin Inquiry were seriously flawed. The Esplin Report is correspondingly flawed in its conclusions and recommendations. It is open to the coroner to hold a coronial inquiry into the 2003 north east Victoria fires or for the government to establish a board of inquiry or Royal Commission to undertake an adequate, public examination of the 2003 north east Victoria fires and related issues.



A. J. MYERS

15 July 2004

Level 4
71 Collins Street
Melbourne 3000

APPENDIX 1.3.1

THE AGE – TUESDAY, SEPTEMBER 21, 2004.

FIRE THREAT TO WATER SUPPLIES.

Melissa Marino, Regional Affairs Reporter.

Water in catchments and river systems across Victoria's north east face a serious threat from the impact of last year's bushfires. Environment Minister John Thwaites has warned.

Responding to a joint University of Melbourne and Department of Sustainability report, he said catchments were now at greater risk of algal blooms that could smother fish and plant life.

The report, which analysed water at eight catchment sites in Gippsland and the north-east, found a "very significant" increase in sediments and nutrients, including phosphorous and nitrogen, in fore-affected sites.

High nutrient levels increase the prospect of blue-green algal blooms that produce toxins and, in extreme cases, can make water undrinkable.

The report found excess sediment that had run into river systems after the fires could reach the Gippsland Lakes, which needed nutrients to increase by only 1.1 to four times for "significant ramifications in terms of the lakes' nutrient balance and susceptibility to algal blooms".

The lakes have faced a continuing battle with blue-green algae because of reduced river flows and increased nutrients flowing from nearby farms.

Also at risk is the Dartmouth Dam, Victoria's largest capacity dam that, when full, holds 44 per cent of the River Murray system's total storage.

The report found that, unlike the Gippsland Lakes, the Dartmouth Dam was exposed directly to fire with 85 per cent of the catchment burnt, allowing sediment and nutrients to flow more readily into it. It found the concentration of sediment and nutrients higher in areas closer to burnt areas.

Rain also had an impact. One of the highest sediment concentrations, in the Tambo River at Bindi, was found after intense rainfall. A sediment load of 284,700 tonnes a year, more than 1400 times greater than before the fires, was recorded.

The report's authors said the findings were preliminary and could be subject to error. Despite this they said it was clear sediments and nutrients had increased substantially in most fire-affected areas.

Increase in loads were in the order of 100 to 150 times in the Mitta Mitta, Snowy and Tambo rivers, about 20-fold in the Dargo and Ovens rivers and one to three times in the Kiewa and Wonnangatta rivers, it found.

Public meetings are planned in the affected areas of Gippsland to provide information on the report, on catchment research programs and work in hand to improve the situation.

APPENDIX 1.3.2

EXTRACT FROM ESPLIN INTERIM REPORT OF THE INQUIRY INTO THE 2002 – 2003 VICTORIAN BUSHFIRES
AUGUST 2003

5.5 Protection of Melbourne's Catchments

While the fires of 2002-03 burnt a large area of Victoria, significant areas of public and private land remain at risk, and the coming fire season could again be extreme unless Victoria receives substantial and prolonged rain.

A negative outcome of the North East and Gippsland fires has been the degradation of the water quality of many rural communities - caused by silt and ash pollution and damage to catchments.

Because of the importance of Victoria's water catchment areas, the Inquiry believes that Government should be assured that adequate fire mitigation and fire suppression planning is in place for the State's catchments, and in particular the Melbourne catchments.

Approximately 50% of Melbourne's catchment area is Mountain Ash forest and is not prescribed burnt for practical and ecological reasons. Melbourne Water estimates that 80% of the city's water is derived from the Mountain Ash vegetation areas. If there was a significant fire, it is estimated that it would take 20-25 years after the fire for the water yield in these fire affected areas to return to 50% of the pre-disturbance water yields[21]. Actively growing Mountain Ash will intercept and use more water than mature forest. It will then take many more years for full recovery to occur.

An extreme fire in the catchments would have severe impacts on water yield well into the future, and could require development of alternative water storage.

Melbourne Water and DSE/PV protect Melbourne's catchments in accordance with a memorandum of understanding. The principal mitigation strategies are aimed at preventing fire from entering catchment areas from surrounding land, and putting in place rapid response strategies to ensure fires originating in the catchments can be attacked and controlled while still small. This is done by a combination of well maintained and extensive road networks, seasonal or project firefighting staff required to reside close to the catchment they are protecting, mutual aid agreements with DSE and Parks Victoria and other land management strategies.

Recommendation 6

> ***That the Premier requests that the Minister for Water critically review the fire prevention planning and fire response strategies for Victoria's water catchments.***

[21] Kuczera, G.A. (1987) Prediction of water yield reductions following a bushfire in ash-mixed species eucalypt forest. *Journal of Hydrology,* 94:215-236.

APPENDIX 1.3.3

Burnt-out catchment poses threat to irrigators
Weekly Times, August 11, 2004
By PETER HUNT

REGROWTH in fire-ravaged forests is set to Trigger__cutbacks in Murray irrigators' entitlements, according to a leading Australian catchment hydrologist.

CSIRO Land and Water chief Rob Vertessy said water run-off from the forests would fall significantly, leading to a review of entitlements under the National Water Initiative.

"It's pretty certain there will be negative impacts in the next 10 to 20 years,' Dr Vertessy said.
“We’re talking about large reductions in yields."

The fires ripped through 1.5 million hectares of forest during summer last Year. Most of the burnt-out area lies within the nation's best catchments which produce 40 per cent of the Murray-Darling basin's rainfall run-off. Under the NMI brokered by the Federal and State governments, irrigators ' entitlements can be cut without compensation in response to the long-term impacts of climate change for fire.

Two other leading hydrologists also predicted major losses of runoff.

The director of Australia's Co-operative Research Centre for catchment hydrology, Rodger Grayson, said run-off from the burnt-out forests could drop by 20 to 40 per cent in the next 10 to 20 years.
Professor Grayson has been commissioned by the Murray Darling Basin Commission and Victorian Government to determine the impact of the fires.

And the commission's former chief executive, Don Blackmore, forecast a significant reduction in water yield during the next 20 to 25 years.

In his last annual report before retiring, Mr. Blackmore said the fires had done extraordinary damage to the forests above the Hume and Dartmouth dams.

He said as the forests recovered from last year's fires they would draw heavily on rainfall that would usually end up in the two dams.

"In the immediate term, major fire-related problems are to water quality and the deposition of a51] and debris in storages and streams" Mr. Blackmore said.

"In the longer term, as forests regenerate a significant water yield reduction over the next 20 to 25 years can be expected."

Dr Vertessy, who was formerly head of the catchment CRC, said there was a need to distinguish between the reduction in flows caused by the fires and normal climate variability.

He said regrowth modelling in burnt mountain ash forests showed rainfall run-off gradually fell to half the annual average after 25-30 years of regrowth, before entering a recovery phase dial took up to 80 Years.

However for two to three years after a severe fire, water yields rose, he said.

There were no leaves and no transpiration (release of water by plants), which resulted in higher run-off.
It then took three years to get any appreciable leaf area. But by year five or six, water yields fell back to normal as vigorous regrowth absorbed an increasing proportion of the rain that hit the soil, he said.

Each square metre of ground in an old-growth forest was shaded by about three to four square metres of leaf area, but in a regrowth area, that rose to about six square metres.

"About 25-30 per cent of the, water doesn't even reach the ground, but lands and limbs where it then evaporates," Professor Vertessy said.

"Consequently, rainfall runoff is going down as the forest grows before it starts self--thinning. More than 706,000ha were burnt out in north-east catchments, plus another 400,000ha in East Gippsland.
An additional 460,000ha were burnt in the Kosciuszko National Park, affecting the Murray and Murrumbidgee catchments.

APPENDIX 1.3.4

Preliminary Assessment of the Likely Effects on Long Term Streamflows due to the January 2003 Bush fires in the Alpine Areas of Victoria.
Pat O'Shaughnessy. DipFor. Canb. (1959) BscFor. Melb (1967). January 2005.

1. Before commencing the development of any estimates on the long term streamflow implications in the catchment of the 2003 alpine fires there are a number of background statements which need to be made.

   (a) The knowledge of the interaction between stand growth and streamflow for ash type forests is dependent on the long term research undertaken by Melbourne Water and the Cooperative Research Centre for Catchment Hydrology in the mountain ash (Eucalyptus regnans) forests of the Melbourne catchment areas in which there was a minor component of alpine ash (Eucalyptus delegatensis) forest[32].

   (b) The soil type in the Melbourne Water area was generally of a knaznozerm type in nature with depths of up to 18m or more. With shallower soils and less soil storage there is more immediate runoff and less opportunity for the effects of stand age to be prominent. This factor would need to be considered in the detailed development of a regional effect.

   (c) The data which will be given is based on a long term rainfall of 1800mm with the impacts on long term water yields varying according to the actual average annual rainfall in any one locality. For the alpine ash stands in lower rainfall areas the effects on water yield will be reduced.

   (d) The impacts of stand age change for streamflow on a regional basis depend on the degree of tree death and seedling regeneration which have occurred. Therefore it is strongly recommended that the further implications of the 2003 wildfires on streamflow be developed following a detailed assessment of forest in say 2008 when the areas of fully regenerated, part generated or fully recovered stands might be more clearly assessed.

   (e) The long term regional streamflows in the post fire period compared to the streamflows experienced in the pre-fire condition depend on stand age at the time of the fire. This would need to be taken into account in the development of a detailed post fire assessment of streamflow effects.

2. An estimate of likely Stream flow changes.

   2.1 Assumptions made.
   Areas of alpine ash forest burnt and regenerated. (Source DSE fire narrative[24])

   (a) Forest – Crown Burnt – 7,500ha. It can be assumed that the forest has been totally killed and regenerated.
   (b) Forest – Severe Crown Scorch – 61,300ha. It is likewise assumed that the forest has been totally killed and regenerated.
   (c) Forest – Moderate Crown Scorch – 9,800ha. It will be assumed that 50% of the forest has been killed and regenerated.

(d) Forest – Light Crown Scorch – 28,000ha. It will be assumed that the forest will continue to grow without any regeneration occurring.

2.2 Impacts on Water Balance.

A worst case scenario will be assumed based on Table 6 and Figure 24 in industry Report 98/4 entitled "Predicting Water yield form Mountain Ash Catchments" by Vertessy et al published by the Cooperative Research Centre for catchment Hydrology[28].

For mountain ash it was found that streamflow reaches a minimum at age 15 after mass regeneration and then increases with age reaching a maximum at age 240. For the alpine ash stands growing at higher elevations it may take longer for minimum streamflows to occur and for maximum streamflows to be reached.

2.3 Possible impacts on Streamflow from the Alpine Ash Ares.

These results assume that the long term average rainfall over the alpine ash stands is 1,800mm a year. Separate estimates can be made for separate catchments depending on rainfall estimates.

It should be noted that 100mm of streamflow amounts to 1 megalitre per hectare.

2.4 Estimated differences in annual runoff in megalitres per hectare with forest age after a regenerating fire event are shown in **Figure 1.3.1.** Total losses in the first 64 years equate to about 188 Ml/ha over the 73,700ha of fire killed alpine ash.

3. Comments on the effects of the Wild Fire on Streamflows from the other Vegetation types.

3.1 Mixed Species Forest.

A major point is that water yield from these types is generally low being about 1 – 2 Megalitres per hectare.

Forest change in this type is of minor importance to streamflow and the stands generally recover within 5 to 10 years due to epicormic crown recovery. There would be a minor increase in water yield in the first five years.

3.2 Snow Gum Forests.

I am not aware of any Victorian research data on streamflows from snow gum. They may be negatively impacted as the stands recover due to their evapotranspiration characteristics. On the other hand the stands catch wind-blown snow and rhime which may increase streamflows.

3.3 The Treeless Areas.

These are areas of winter snow accumulation which could be less in the years immediately following the fire. Costin and Wimbush have worked in these areas and data may be available. I have no immediate access to their work.

4. The Potential impacts of Wild Fire in the Melbourne Catchment Areas.

The Melbourne catchment area comprises some 156,000ha of which 75,000ha is ash type forest mainly mountain ash, of this ash type some 11,000ha is old growth mainly over 250 years old while the remainder of 64,000ha is mainly 1939 wild fire origin. If a severe and widespread wildfire burnt out all the ash type forests then water yields would decline by age 15 on an annual basis by some 46,200Ml from the old growth area and by

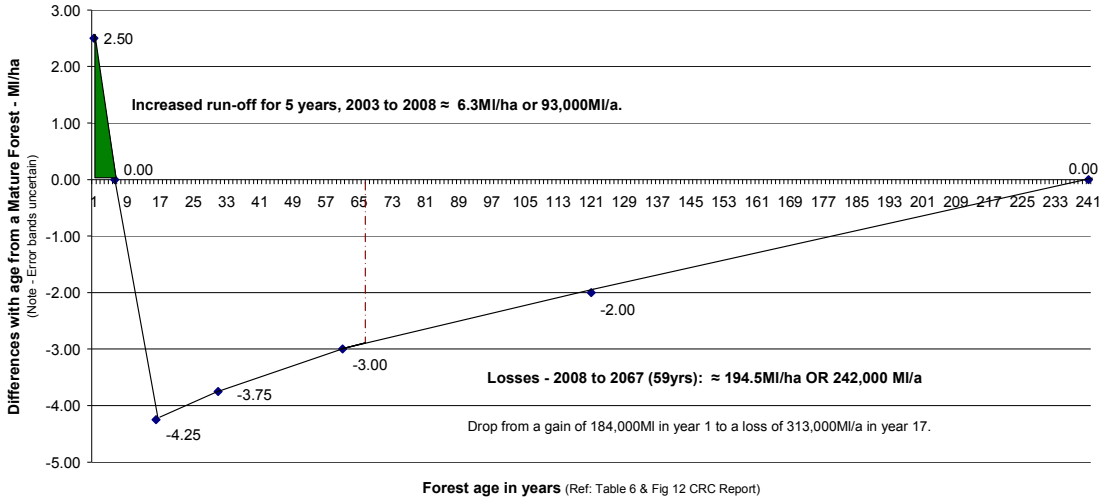
some 76,800 Ml from the area of 1939 fire origin. The total decline would be 123,000 Ml or about 30% of the current annual inflows assuming they amount to some 400,000 Ml. Recovery to the current pre-fire water yields would take some 60 years for the 1939 regrowth area and some 240 years for the old growth area.

These calculations do not take into account minor water yield changes which occur in the mixed species forest where fire caused regeneration might result. They also do not take into account areas recently harvested in the Thomson and Yarra tributary catchments, but these changes would also be minor.

Pat O'Shaughnessy.
January 2005.

Figure 1.3.4 **Differences in Annual Runoff after a Regenerating Fire Event in Ml/ha**

Assume a fully stocked stand with a Rainfall Annual Average of 1,800mm
Based on research by Melbourne Water & others - *E. regnans* forest.
See CRC Forest Catchment Hydrology Industry Report 98/4[28].



APPENDIX 3.1.

Extract from the Report of the Esplin Inquiry[7] into the 2002-2003 Victorian Bushfires [5].

Chapter 3. Current Legislation and Co-operative Arrangements.

Victorian Legislation

3.4. Key legislation includes:

- *Emergency Management Act 1986;*
- *Metropolitan Fire Brigades Act 1858;*
- *Country Fire Authority Act 1958;*
- *Forests Act 1958;*
- *Planning and Environment Act 1987; and*
- *Local Government Act 1989.*

3.5. A number of other Acts impact on agencies charged with protecting Victoria from fire. These include:

- *Electricity Act 1998;*
- *Flora and Fauna Guarantee Act 1988;*
- *Alpine Resorts (Management) Act 1997;*
- *National Parks Act 1975;*
- *Transport Act 1983;*
- *Environment Protection Act 1970;* and
- *Catchment and Land Protection Act 1994.*

3.6. … The Agreement of most interest to the Inquiry is the Co-operative Agreement between the Country Fire Authority (CFA) and the then Department of Natural Resources and Environment, September 2002.

Emergency Management Act 1986

3.7. The *Emergency Management Act 1986* gives the Office of the Emergency Services Commissioner (OESC) a broad role in emergency prevention planning, including the fire services. The OESC can set and monitor performance standards for the Metropolitan Fire and Emergency Services Board (MFESB) and CFA and encourage and facilitate co-operation between the agencies to effectively utilise fire and emergency services.

3.8. The *Emergency Management Act 1986* also addresses:

- Recovery planning and management;
- 'State of Disaster' arrangements; and
- Compensation arrangements of registered emergency workers.

3.9. … Part 5 of the Act outlines the declaration, powers and duties of the Co-ordinator-In-Chief and Part 6 covers compensation arrangements for registered emergency workers.

3.10. Further to these arrangements, the Act outlines specific responsibilities for the development of response planning and co-ordination for emergencies, including fire.

The Fire Agencies

3.11. Three agencies respond directly to fires in Victoria.

- Metropolitan fire and Emergency Services Board;
- Country Fire Authority; and
- Department of Sustainability and Environment (DSE).
- Of these, it is the latter two agencies that deal predominantly with bushfires.

Country Fire Authority.

3.15. The CFA is established under section 6(1) of the *Country fire Authority Act 1958* (CFA Act) and is mandated to provide for the 'more effective' control and prevention and suppression of fires in the country area of Victoria.

3.16. The country area of Victoria is defined in the CFA Act to mean that part of Victoria outside the Metropolitan fire District, not including forest, National Park, or protected public land. …

Department of Sustainability and Environment

3.19. DSE is responsible for fire prevention and suppression for Victoria's 7.7 million hectares of public land including forests, National Parks, and protected public lands. Section 62(1) of the *Forests Act 1958* states that the Secretary's duty is 'to carry out proper and sufficient work for the prevention and suppression of fire in every State forest and national park and on all protected public land …

3.20. Protected public land is defined in section 3 of the *Forests Act 1858* and includes State Forests, National and State Parks, wilderness area and Crown Reserves. This includes areas managed by an Alpine Resort Management Board.

3.24. DSE has the discretionary power to direct the removal of fire hazards on private land with in 1.5 kilometres of any National Park of State Forest. This relates to both control and lighting of fires.

CFA and DSE Suppressing Fire Together

3.26. Depending on whether the fire is located on private or public land, either CFA or DSE respectively will have responsibility over suppression. When the fire traverses public and private land, one agency is deemed the control agency for the fire. This arrangement is outlined in the *Emergency Management Act 1986* which provides that any of the Chief Officers in respect of fire (including the MFESB) may appoint an officer of one of the agencies to have overall control of response activities. This ensures there is a clear line of authority in respect of each fire and ensures the agencies work together in the suppression of fire.

3.27. In addition to the *Emergency Management Act 1986,* further co-operative arrangements between DSE and CFA were put in place following the Linton tragedy with the aim of achieving seamless co-ordination between the two agencies. This arrangement – most recently agreed to in September 2002 and detailed in the Auditor-General's May 2003 report *Fire Prevention and Preparedness* – sets out the extensive incident control and co-operative arrangements in place.

3.28. Most importantly for fires response, a jointly-staffed incident control centre is established to:

- Determine and co-ordinate strategy;

- Co-ordinate communication;
- Co-ordinate the requests for and management of resources;
- Oversee implementation of tactics;
- Provide information to affected communities and the wider community; and
- Liaise with media.

Other Agencies and Organisations in fire Management

3.29 Fire preparedness and prevention involves a myriad of agencies or bodies:

- MFESB, CFA and DSE;
- Office of the Emergency Services Commissioner;
- Other parts of DSE's portfolio through the Office of Planning, the Building Commission and Parks Victoria;
- The 79 Municipal Councils;
- Alpine Resort Management Boards; and
- The electricity industry, the Office of the Chief Electrical Inspector, the forest industry, water Authorities, VicRoads, and VicTrack – to name some of the many agencies involved.

3.30. Current Victorian legislation does not provide specific requirements for the participation of many of these agencies.

Parks Victoria

3.37. Parks Victoria is a Statutory authority within the DSE portfolio. It is the largest land manager in Victoria with responsibility for National Parks, Wilderness, State and regional parks, Melbourne's metropolitan parks and open space network…

3.38. DSE has statutory responsibility for fire prevention and suppression on all National Parks and also has a statutory obligation to seek agreement with Parks Victoria prior to fire prevention works being undertaken.

Alpine Resorts

3.41. Although Alpine Resorts are located on public land and are therefore a DSE responsibility, all resorts except Mount Baw Baw are under CFA's fire prevention responsibilities following an agreement between DSE and CFA. DSE still retains responsibility for managing fuel on public land up to the boundary of the Alpine Board of Management Area.

3.42. Alpine areas are managed by Alpine Resort Management Boards. These Boards are deemed to be Municipal Councils for the purposes of the *Emergency Management Act 1986*. …

Water Authorities and Catchment Management Authorities

3.44. Providing water is the province of five water authorities (wholesalers), three metropolitan retailers (licensees), 15 regional urban authorities, and one irrigation trust. In the Melbourne metropolitan area there is one wholesaler (Melbourne Water) and three retailers. In the rest of Victoria there are four rural water authorities, one water trust and 14 regional urban water authorities.

3.45. Despite this number of entities, DSE and Parks Victoria are primarily responsible for fire prevention and suppression in Victoria's water catchment areas. This is because,

for the most part, Victoria's significant reservoirs and catchment areas are located in national Parks or State forests.

3.46. Some water authorities (for example, Melbourne Water Corporation [MWC] and Goulburn Murray Water) also own freehold land on which balancing storages are located. Because these are located in the country areas of Victoria, CFA has fire prevention and suppression responsibility. …

3.47. MWC and DSE entered into an agreement in December 1995 (Shortly after the Melbourne Metropolitan Board of Works was dismantled and became MWC) that recognises that DSE has the primary legal responsibility for fire prevention and suppression (under the *Forests Act 1858*) but acknowledges MWC's role in this respect (under section 321 of the *National Parks Act 1975*). That agreement states MWC must be consulted about, and agree with, the preparation of Fire Protection Plans for its water catchment areas. MWC has ita own standing fire suppression force of approximately 50 full time staff, which is trained up to DSE standards and which, like DSE's own force, is supplemented during each fire season.

3.48. Interfacing with the Water Authorities and DSE are ten Catchment Management Authorities. Their general responsibilities (outlined in section 4 of the *catchment and Land Protection Act 1994*) are to maintain and enhance long-term land productivity while also conserving the environment. Catchment Management Authorities aim to maintain and enhance the quality of the State's land and water resources (and associated plant and animal life). They have no explicit statutory responsibility for fire prevention. The Fire Protection Plans and fire Operations Plans developed by DSE are required to take into account the special characteristics of the catchment area.

The Forest Industry

3.53. Under amendments to the CFA Act, where a plantation owner has more the 500 hectares of plantation within a 25 kilometre radius, they may be required to establish, equip and staff a forest industry brigade. This requirement is open to interpretation, as it does not cater for owners who might have significant holdings over a more dispersed area.

3.55. There are now over 25 such brigades in operation, controlled by 15 different plantation owners.

Conclusion

3.66. As noted at the start of this Chapter, current legislative arrangements are complex and involve a large number of agencies and organisations. Co-operation, communication and goodwill are essential for such a complex system to work well,

APPENDIX 3.2.2.

DEPARTMENT OF CONSERVATION, FORESTS AND LANDS VICTORIA

Summary of Significant Events – 1984/85 Fire Season.

Presented to the AUSTRALIAN ASSOCIATION OF RURAL FIRE AUTHORITIES. PERTH 6-9 MAY 1985.

New Department

Firefighting in State forest, national parks and protected public land in Victoria is now controlled by the Department of Conservation, Forests and Lands. The Department is an amalgamation of former agencies, viz Forests Commission, Lands Department (part), Fisheries and Wildlife (part), National Parks Service, Soil Conservation Authority and Ministry for Conservation (Part). It exercises its legal responsibilities with respect to fire prevention and suppression through the Forests Act 1958 which, pending review and consideration by Parliament, remains in place.

The total resources of the new Department comprising some 4,500 people and a great deal of equipment and other resources are available for firefighting and close support services. Only some of the people from agencies other than the former Forests Commission had previous firefighting experience. Two hundred (200) training schools were conducted to introduce many of the others to the basics of firefighting prior to the fire season. Now that the fire season is over this training program is being continued and broadened to improve skills at all levels.

Industrial

Amendments to Clause 20 of the AWU Construction and Maintenance Award removed provision of an "emergency period" whereby during the period from when a fire started to midday the following day, long work periods did not generate paid rest periods. This has caused firefighting to be more expensive.

The Fire Season

The 1984/85 fire season was preceded by good rain in late Winter-early Spring which produced excellent crops of grass throughout most of the State. Summer months were very dry and the North-East of Victoria experienced the same drought that affected the south east slopes and southern tablelands of NSW.

In mid-January an unprecedented number of fires started from lightning strikes. One hundred and eleven (111) such fires started on public land between late afternoon on 14 January and 0900 hours the next day.

At the same time these fires occurred the Department was heavily involved in assisting the Country fire Authority with major fires at Anakie, Werribee gorge, Avoca, Broadford and Beechworth.

As well as the fires which started in Victoria, a large fire at Dora Dora in New South Wales entered Victoria on a wide front near Mt Lawson between Thologolong and Burrowye and burnt 7,600 hectares before being brought under control on 19 January. Another large fire at Khancoban, NSW, threatened Victoria for several days.

Many of the lightning strikes in forest areas started in remote, inaccessible mountain country where firefighting was difficult, hazardous and time-consuming. They burnt more than 150,000 ha and had a perimeter in excess of 1,000 km before they were brought under control. About one-third of the perimeter had to be established and held in steep mountain country where there was no conventional access.

An unprecedented effort was made in the Buffalo National Park to minimise environmental damage by the wildfire and firefighting. Ground crews supported by helicopters and fixed-wing firebombers constructed control lines on steep rocky escarpments and successfully held the fire out of sensitive areas and ski slopes. This section was undoubtedly the most costly firefighting per unit length of fireline ever undertaken in Victoria. The effort was justified by the result. Much of the Park is unburnt and that part which was burnt by backfire was burnt by fires of relatively low intensity.

The campaign mounted to fight the fires was the largest ever undertaken against forest fires in Victoria. At the peak of the campaign more than 3,000 people were on the firefronts and in close support including 2,000 from the Department, 500 CFA volunteers, 449 Armed Services personnel, 120 sawmill employees and 50 State Electricity Commission employees. Major equipment used included 75 bulldozers, 400 tankers, 20 helicopters and 16 fixed-wing aircraft.

The fires were brought under control without any help from the weather. The campaign lasted two weeks and cost approx. $7 million (Excluding contribution by Armed Services).

Whilst the fight was going on the potential for damage to life, property and forest values from the fires, was enormous. For a period of two weeks settlements at Harrietville, Freeburg, Bright, Porepunkah and down the Ovens Valley as far as Myrtleford, were directly threatened as were tourist facilities on Mt Buffalo and Mt Hotham. The Mt Lawson fire near Tallangatta was a “half day’s run” from the Department’s pine plantations at Koetong. The fires in the Mallee threatened farmland. The Mt Murray fire was poised to cross the Wongungarra River onto the Dargo High Plains.

The area burnt and losses incurred in the most significant fires are summarised as follows:

Summary of significant Fires, January 1985.

Name of Fire	*Area Burnt in hectares*	*% Private Property*
Mt Buffalo	51 400	
Mt Sugarloaf	4 600	
Mt Murray	800	
Wabonga Plateau	18 500	9
The Bluff	2 300	
The Governors	300	
Mt Lawson	7 600	12
Coleman Creek	2 200	
Werrimull	28 600	
Patchewollock	19 900	30
Wyperfeld	12 700	
Swan Lake	1 300	

NB: CFA fires – Anakie, Werribee Gorge, Beechworth, Broadford and Avoca/Maryborough are excluded from these figures.

Losses.

Houses:	- 1 unoccupied
Fencing:	- Some lost in Mallee and at Wabonga
Vehicles:	- 3 Departmental
	- 1 Hired
	- 1 tanker rolled - $1500 damage.
Dozers	- $250 000 damage to Departmental and hired (incl. two destroyed)
State plantations	- 1100 ha P. radiata Morses Creek }
	- 200 ha P. radiata Rose Valley } cost $1.2 million
Private plantations	- 40 ha P. radiata Rose River
	- 25 ha P. radiata Buckland River

All the commercial sized P. radiata killed in the fires will be salvaged.

Technology

Two developments, previously researched and tested operationally, "came of age" in the 1984/85 season, viz:

(I) Infra-red scanner

The scanner, mounted in a Kingair 200C aircraft was used to monitor the spread of all the major fires and the progress of backburning. Scanning was usually done between midnight and 0200 hours and the imagery made available to the fire controller by 0500 hours. This enabled firefighting tactics to be developed well before the day shifts were due to leave base camps. Victorian forest firefighters have rarely ever had such accurate and detailed information available to them at that time of the day.

Operational costs of the system are high, viz approximately $1500 per day plus $1250/hour flying time. The cost is justified only when the information obtained cannot be gathered by cheaper means and the fire controller is in a position to make effective use of the information.

(II) Helitack

(a) Fire bombing. Three Bell 205s fitted with Canadian built belly-tanks were used for firebombing – often to provide close support for ground crews working the fire edge. Their ability to pick up from small dams, tanks or streams, their short turn-around time and accuracy made them very effective firefighting tools.

(b) Rappelling. Specially equipped and trained crews, usually in multiples of 4 or 6 were lowered from Bell 212 helicopters to attack small fires in remote locations. They were also used to construct helipads at larger fires where there were no vehicle tracks and all fire crews and supplies had to be ferried in and out by helicopter.

APPENDIX 3.2.3

ASSESSMENT OF THE NUMBER OF PERSONS CONCERNED WITH THE PRACTICE OF FORESTRY IN VICTORIA'S PUBLIC NATIVE FORESTS, AUGUST 1982 AND FEBRUARY 1995.

In this assessment, data in Table A.3.2.1 shows persons employed in Central administration according to functional areas and data in Table A.3.2.2 shows field employment according to Divisions/Areas Statewide as at August 1982 and February 1995.

1982 information was extracted from a review of the Organisational Arrangements of the Department of State Forests (Forests Commission, Victoria) prepared for the then Minister of Forests[12], The Honourable Rod McKenzie. Only positions filled at the time (August 1982) were counted. 1995 information was taken from published records of the Department of Conservation and Natural Resources. Data in the tables specifies some exclusions and rationalisation of some personnel between different functional areas for ease of comparison between 1982 and 1995 groupings.

Given the number of re-organisations (4) including major amalgamations, between 1982 and 1995, rationalisation of functions and duties and the so-called "multi-skilling" of personnel, it was inevitable that many of the professional and technical skills previously dedicated to the practice of forestry have become at best blurred and substantially diluted over time.

During the 1980s there was a deliberate policy aimed at destroying the perceived dominance of people with professional and technical forestry qualifications engaged in managing State Forests. To this end the organisational arrangements and culture of the Department of State Forests were dismembered and the personal and professional dignity, skills and experience of many senior, middle level and older staff purposely and very effectively eroded by the new order.

Data in Table A.3.2.1 show that there has been a 37% reduction in the number of personnel in DCNR HO with professional/technical qualifications dedicated to managing Victoria's native forests. A breakdown of the 69 professional/technical positions reveals: Senior Executives (-2), Fire Management (-9), Forest Commerce (+2), Forest Management (-27), Forest Research and Development (-9), and Forest Operations (-24). Between 1982 and 1992 functions in HO Forest Operations were decentralised and nominally transferred to field locations. In fact, during the course of successive re-organisations and severe down-sizing since 1992 these and other positions no longer exist.

Data in Table A.3.2.2 show for the field, State-wide, an overall 44% reduction (273 to 153 positions) in personnel with professional/technical forestry qualifications dedicated to the practice of native forest management.

It is also significant that the average age of the professional/technical workforce has fallen by about 12 years, reflecting a serious reduction in work experience.

CONCLUSION

The human resources; number, experience and skills necessary for the efficient management of Victoria's native forests have been substantially reduced as a direct consequence of government policy.

Severe under-resourcing, including loss of experience, has demonstrably led to the poor management of an important public asset.

If serious deficiencies in the number, skills and, through time, experience of people needed for the efficient practice of forestry are not rectified, then Victoria's native forests as a major economic, social and environmental asset will continue to be downgraded.

Table A.3.2.3. FOREST SERVICE STAFF HEAD OFFICE

		Numbers					Numbers					CHANGE			
FOREST SERVICE -						FORESTS SERVICE 1982 (Positions filled)					FORESTS SERVICE 1995 (Positions filled)				
HEAD OFFICE						DESCRIPTION					DESCRIPTION				
EXECUTIVE		3	3		**6**	3 Commissioners & 3 Secretaries	1	1		**2**	1 DIRECTOR & 1 EXECUTIVE	- 2			
						(excludes: Secretariat (38) Personnel (20)					ASSISTANT				
						Finance (4) Accounts (47) audit (2)									
FIRE MANAGEMENT	Admin		6					5			Includes protection of softwood plantations		-1		
	Prof	7				Includes protection						- 7			
(Div of For Pro)	Tech	17		24			15		15			- 2		-9	
	Exempt		7					5					-2		
					37					**25**					-12
FOREST COMMERCE	Admin		9					2					-7		
	Prof	11				Includes Utilization (1)									
(Div Eco & Marketing)	Tech	0		11		from Forest Operations			13					2	
	Exempt		3					0					-3		
					23					**15**					- 8
FOREST MANAGEMENT	Admin		24			Includes Forest Extension (7) and silviculture (6)		8			Includes Silviculture & Private Forestry.		-16		
	Prof	59				From Forest Operations. Excludes Silviculture (2)					Includes Ballarat-based Forest				
	Tech	14		73		from Forest Operations - softwood and			46		Environment Officer (1)			- 27	
	Exempt		10			hardwood plantations.		0							
					107					**54**					- 53
FOREST RESEARCH &	Admin		7			Includes Biological Survey (12)		5							
DEVELOPMENT	Prof	32				Includes research & development on plantations.	23				Includes R & D on plantations		-2		
	Tech	18		50		Excludes Forestry Education (1) Library (1)	18		41		under contract to VPC.	0		- 9	
	Exempt		4			and VSF Creswick (39)									
					61					**46**					-15
FOREST OPERATIONS	Admin		12					0					-12		
	Prof	9				Excludes Forest Extension (7)	0				Functions transferred to field.	- 9			
	Tech	15		24		Silviculture (8) Utilization (1) Staff Postings(1)	0					- 15		- 24	
	Exempt	0				Special Projects (1)	0								
					36					**0**					-36
TOTAL	Admin		61					12					40		
	Prof	121													
	Tech	64		185					116					- 69	
	Exempt		24					5					-19		
					270					**142**					-128

APPENDIX 3.2.4.

INCIDENT CONTROL SYSTEM OF THE AUSTRALIAN INTER-SERVICE INCIDENT MANAGEMENT SYSTEM (AIIMS)

AIMS was developed under the auspices of the Australasian Fire Authorities Council (AFAC). It is an emergency management system which can be applied to the organisation and management of any event (e.g. floods) where co-ordination and integration of various activities (and agencies) are required. It consists of five sub-systems which collectively provide a total systems approach to incident management.

The Incident Control System is the core sub-system which comprises control, operations, planning and logistical functions. From this is derived the Incident Management Team (IMT) which is a key focus of this narrative. The IMT has a Planning Officer, an Operations Officer and a Logistics Officer, all of who report to an Incident Controller.

As the alpine fires developed, an early decision was taken by the Chief Fire Officers of DSE and CFA to establish an Integrated Multi-Agency Co-ordination (IMAC) centre at Benalla to oversee the North East fires. The main functions of an IMAC were as follows:

* Prioritising the deployment of available resources to fires or fire complexes
* Assisting, as necessary, the flow of information on the situation prevailing at each fire or fire complex
* Co-ordinating the detailed planning being done on individual fires or fire complexes
* Co-ordinating and delivering effective community information programs in those areas affected, or likely to be affected, by the fire or fire complexes
* Liaising with other agencies supporting the fire control operations at the fire or fire complexes Liaising with other agencies, organisations and people with interests that are likely to be affected by the fires or fire complexes
* Co-ordinating local media contact associated with the fire or fire complexes

The overall command and control structure used for the alpine fires, which is in accordance with the Emergency Management Act (1986), is shown in Figure 9.

A further IMAC was established at Traralgon on 20 January 2003 to oversee the Gippsland part of the fires. In this narrative, the two IMACs will be referred to as the North East and Gippsland IMACs.

IMTs reported to the DSE Emergency Co-ordination Centre (ECC) through Regional Fire Co-ordinators (RFCs) or IMACs (once they were functional). IMACs also provided up-to-date information direct to the Melbourne Headquarters of CFA. The ECC of DSE is located at 240 Victoria Parade, East Melbourne and had responsibility for co-ordinating the implementation of the Incident Control System of AIIMS, and for the overall containment strategies. Amongst other things, the ECC had responsibility for Statewide resource co-ordination and movement, logistics support, aviation and other technical services, and support in the collection and provision of fire weather information (at its peak, between 140 and 160 personnel were involved in providing these services).

As noted in the first chapter, the interstate and overseas firefighters were co-ordinated by an ILU located at the ECC complex. The main functions of the ILU were:

- To ensure that the necessary logistical and resourcing requirements associated with the arrival, deployment, welfare, demobilisation and departure of all the various interstate, international and defence taskforces were met as required or requested

- To support those liaison officers from the interstate, defence and international agencies who were located in the ILU by providing information and other assistance
- To provide a contact point for DSE and CFA for various matters relating to interstate, international and defence taskforces

It is important to note that prior to the establishment of IMACs at Benalla and Traralgon, a structured command arrangement was in place from Day 1 of the fires, as part of the normal agency fire season arrangements.

Table A.3.2.4. FOREST SERVICE STAFF FIELD.

FIELD	Numbers				FOREST SERVICE 1982 (Positions filled)	FORESTS SERVICE 1995 (Positions filled)	Numbers	
WESTERN					Excludes:	NORTH WEST (Area HQ + 32 Work Centres)		
(Div HQ + 6 Districts)	Admin		11		Plant Inspectors and Radio Techs (2)	Area manager + Deputy	0.25	
	Prof	19			Softwood Plantations Ad (3) Prof (3) Tech (3)	Catchment & Land Management	0.75	
	Tech	19				Crown Land and Assets	0.25	
				38		Flora, Fauna and Fisheries	1	
						Forests and Fire	8	
NORTHERN	Admin		10		Excludes:	Work Centres (Practice of Forestry)	15	
(DIV HQ + 7 Districts)	Prof	13			Plant Inspector (1)	**Prof/Tech TOTAL**		**25**
	Tech	22			Softwood Plantations Ad (1) Prof (0.5) Tech (0.5)	SOUTH WEST (Area HQ + 39 Work Centres)		
				35		Area manager + Deputy	0.25	
						Catchment & Land Management	1	
SOUTH WESTERN	Admin		13		Excludes:	Crown Land and Assets	0.25	
(Div HQ + 8 Districts)	Prof	14			Plant Inspectors and Radio Techs (2)	Flora, Fauna and Fisheries	1	
	Tech	17			Softwood + Hardwood Plantations Ad (2)	Forests and Fire(excludes Admin(1) & CFP(1))	7	
				31	Prof (5) Tech (5)	Work Centres (Practice of Forestry)	25	
						Prof/Tech TOTAL		**35**
SOUTHERN	Admin		10		Excludes:	PORT PHILLIP (Area HQ + 28 Work Centres)		
(Div HQ + 6 Districts)	Prof	18			Plant Inspectors and Radio Techs (3)	Area manager + Deputy	0.25	
	Tech	13			Softwood + Hardwood Plantations Ad (4)	Catchment & Land Management	1	
				31	Prof (8) Tech (5)	Crown Land and Assets	0.25	
						Flora, Fauna and Fisheries	0.25	
NORTH EASTERN	Admin		12		Excludes:	Forests and Fire	3	
(DIV HQ + 7 Districts)	Prof	20			Plant Inspectors and Radio Techs (5)	Work Centres (Practice of Forestry)	15	
	Tech	18			Softwood Plantations Ad (4) Prof (9) Tech (13)	**Prof/Tech TOTAL**		20
				38		GIPPSLAND (Area HQ + 32 Work Centres)		
						Area manager + Deputy	0.25	
EASTERN	Admin		10		Excludes:	Catchment & Land Management	1.5	
(Div HQ + 5 Districts)	Prof	22			Plant Inspectors and Radio Techs (4)	Crown Land and Assets	0.25	
	Tech	16			Allowance for reduction in timber Production	Flora, Fauna and Fisheries	0.25	
			38		Areas and allocations. Ad(5) Prof(4) Tech(6)	Forests and Fire	4	
						Work Centres (Practice of Forestry)	28	
						Prof/Tech TOTAL		34
						NORTH EAST (Area HQ + 33 work Centres)		
TOTAL (without any exclusions)						Area manager + Deputy	0.25	
102	Admin		77			Catchment & Land Management	1.5	
355 137	Prof	126				Crown Land and Assets	0.25	
188	Tech	123				Flora, Fauna and Fisheries	0.25	
				249		Forests and Fire (Excludes Area Accountant0	6	
						Work Centres (Practice of Forestry)	31	
	Admin		89		Includes positions/functions transferred from	**Prof/Tech TOTAL**		39
	Prof	135			Head Office (Div of For Ops) to			
	Tech	138			locations	**TOTAL Professional/Technical**		**153**
				273		**Reduction in Professional/Technical 1982-1995**		**-120**

Note: the number of Sub-Districts and Work Centres is not shown.	Note: Greatly increased technical requirements due to introduction of Timber Industry Strategy, Code of Forest		
these personnel are included in the Division and District totals	Practice, Flora & Fauna Guarantee and Victoria's obligations to National forest Policy.		

Figure 3.2.5

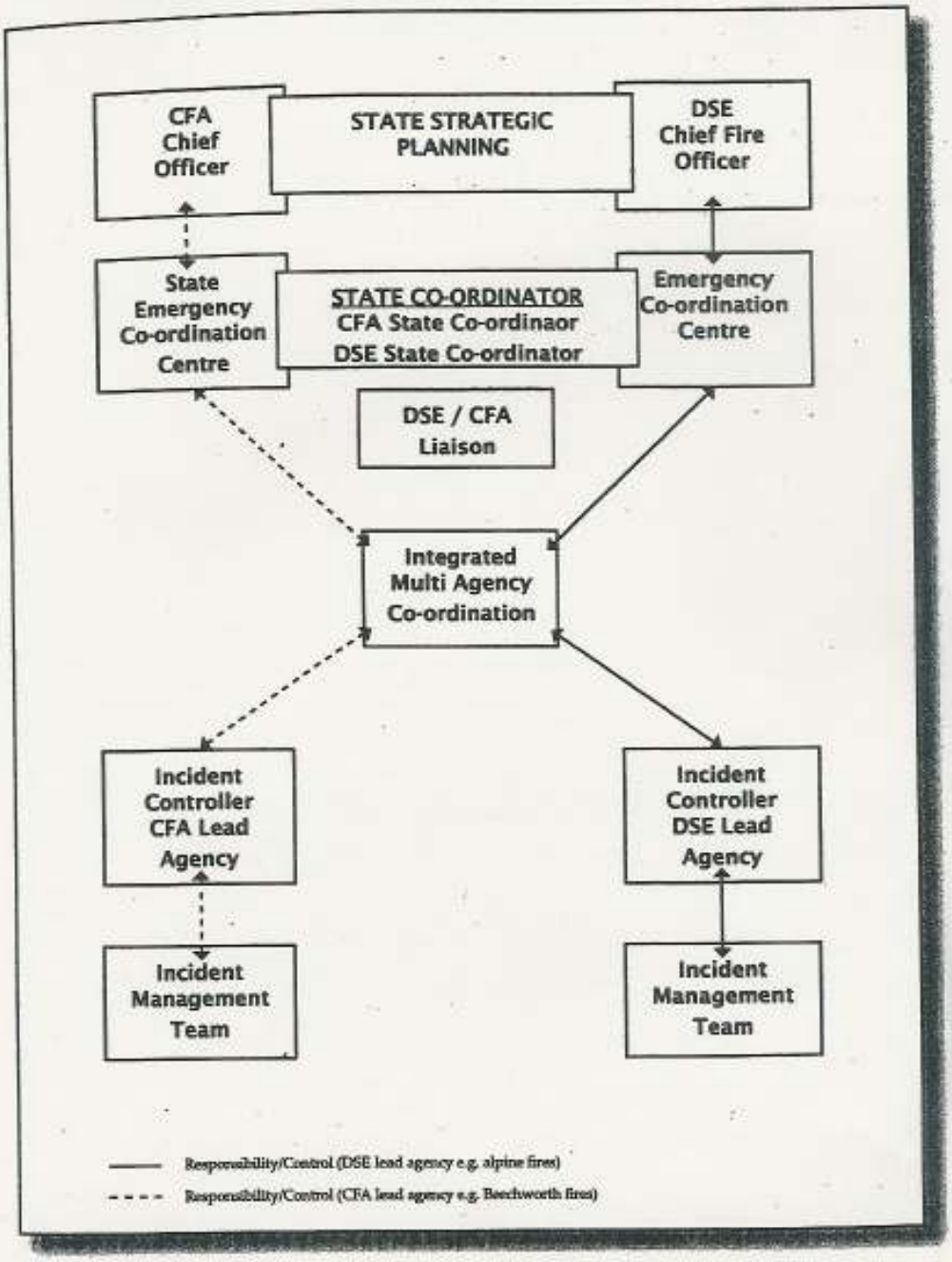


Figure 9 Command and control structure for management of the 2003 alpine fires (Source: DSE, 2003).

21

APPENDIX 3.3.1

SUMMARY OF MEMORANDUM OF UNDERSTANDING BETWEEN DSE AND VICFORESTS *Pages 8 - 12*

VF will charge DSE a fee, to be negotiated before 31 July 2004, for services pertaining to the processing of Log Dockets used prior to 31 July 2004, debt collection and customer management.

All licences proclaimed in Schedule 1 of the Sustainability Forest (Timber) Act 2004 (for the east of the state) will be billed and collected by VF after 1 August 2004.

VF will bill customers for the 20Q4105 licence fee.

VF will pay 1/12th of the 2004/05 annual licence fee to DSE for recognition of DSE's formal management for the month of July 2004. VF will retain the remaining 11/12th.

12 Communications (agreed 25 July 2004)
While the roles of DSE and VF are clearly defined, there are many overlapping areas. It is important that any public communications issued by the parties are consistent with previous communications issued by DSE and VF, singly or jointly, and are agreed, when appropriate, by both parties.

'Communications' includes hard copy documents, electronic documents, web sites, media releases, speeches and other communications concerning State forests.

Communications that concern forest sustainability and regulation may be drafted by DSE; communications that concern commercial forest activities may be drafted by VF; communications that concern sustainability and/or regulation and commercial forest activities may be drafted by either party or both parties together and must be approved by both parties before being publicly released.

Before public release, each party must send to the other a copy of every communication concerning State native forests and give the other party the opportunity to comment before the communication is released. Each party will use its best endeavours to respond as quickly as possible given the circumstances of the situation and urgency of the communication.

Where considered necessary by either party, other agencies or people may be asked to comment on communications before public release. These agencies and people include but are not limited to:

* Department of Primary Industries (DPI)
* Department of Treasury and Finance (DTF)
* Office of the Minister for the Environment
* Office of the Minister for Agriculture
* Office of the Minister for Finance
* Office of the Treasurer.

13 Fire preparedness and response (agreed 27 July 2004 & expires 1 August 2009)

13.1 DSE operating framework
VF recognises the importance of fire suppression and prevention for resource management and is committed to involvement in Fire Prevention and Suppression.

DSE is responsible for ecological burning on its estate, subject to the Code of Practice for Fire Management on Public Land and approved .DSE Burning Prescriptions and Procedures.

DSE has an obligation to deliver fire management programs in accordance with legislation, the Code of Practice for Fire Management on Public Land, approved Fire Protection Plans, Readiness and Response Plans, and Fire Protection Instructions.

DSE will allocate funding to provide prevention works within the Fire Protected Area (FPA), as set out in the annual works programs and detailed in Fire Operations Plans that support DSE's Fire Protection Plans for the State.

DSE is responsible for public land management in the FPA, and will determine fire policy.

DSE is responsible for the procedures and standards of Fire Management (suppression, preparedness, prevention and training), in accordance with fire policy, for all public land within the FPA.
DSE will determine the Model of Fire Cover for Fire Suppression on public land. The Model of Cover shall include personnel and their core competency requirements; plant, vehicles and equipment numbers and specifications far each Fire District, Region and the State. The model will stipulate the contribution of those Departments and Agencies (as agreed with VF) with an obligation to contribute to the Model of Fire Cover.

An appropriately accredited Incident Controller will be appointed for each incident.

Where the incident happens to be a fire within the FPA the Incident Controller will be appointed pursuant to the provisions of the DSE/CFA Cooperative Agreement current at that time.

The Incident Controller will have control of all resources allocated to the incident as per AIIMS - ICS (detailed in Fire Management Manual section (8.1) ‘Fire Suppression').

13.2 General operating protocols

Both DSE and VF recognise that in creating VF same critical fire skills will be transferred with staff to VF. These skills may be crucial in fire response and in transferring competencies through training and accreditation. In the next five years, VF will use its best endeavours to assist DSE to bridge the skills gaps resulting from the creation of VF.

DSE recognises that over the course of this agreement it is expected that VF's contribution will change commensurate with any reduction or turn-aver in its workforce.

VF agrees to make defined staff available to ensure fire fighting skills are maintained and enhanced in accordance with this agreement.

DSE and VF will agree on the contribution of VF to the DSE Model of Fire Cover.

VF will, in accord with this agreement, make defined resources available to DSE for fire suppression.

When engaging VF resources, DSE will have regard to VF commercial business remit.

VF will, in entering into commercial arrangements with timber harvesters, ensure appropriate provision is made far its fire obligations under Part 8 of the Sustainable Forests (Timber) Act 2004.

DSE and VF will ensure that, for defined VF staff, management practices and procedures, training programs and other competency development systems and equipment and infrastructure management fully support an ongoing, sustainable commitment to fire emergency service obligations.

DSE will reimburse VF's costs according to an agreed cost schedule.

DSE and VF agree that this agreement will be based on the principle that VF will fully recover the actual costs of its participation in fire prevention and suppression activities.

This agreement is subject to:

- the endorsement of this principle by Government
- that these VF costs are recognised as a Community Service Obligation (CSO), and
- a commensurate allocation is made to DSE of this amount as a CSO.

If the above principle and conditions are accepted by Government, and the CSO amount is funded, then
this agreement is agreed to by DSE and VF. If the CSO amount is not funded then DSE and VF will renegotiate this agreement.

13.3 Fire preparedness and suppression

The system of work for fire suppression at all incidents controlled by DSE will be the Australasian Inter-service Incident Management System Incident Control System (AIIMS-ICS), as prescribed in the DSE Fire Suppression Manual.

Day to day management of defined VF staff will include scheduled participation in training and readiness activities for a period of up to 5 days per year to ensure staff are competent to fulfill their fire response roles.

Staff from VF will continue to be employed at all times by that agency while they are engaged in fire training, preparedness and response. VF authorises suitably qualified and appointed staff from DSE to command or supervise staff from VF in fire readiness and response. Similarly, DSE authorises suitably qualified and appointed staff from VF to command or supervise staff from DSE in fire readiness and response.

DSE will be responsible for meeting the additional Occupational Health & Safety obligations, workcover premiums and return to work program expenses of VF employees that may arise in preparing for and responding to a fire. The safety of all personnel involved in emergency response activities shall be the responsibility of the managing agency, but nevertheless a primary consideration of both agencies at all times.

DSE will endeavour to ensure that supervisors at incidents are aware of procedures regarding staff management in both organisations. DSE, with support from VF, may initiate an investigation after participating in emergency response or preparedness. Such an investigation may recommend, among other matters, staff disciplinary actions to apply to staff. However, only the employer may initiate disciplinary actions.

Each organisation will ensure that the principles and protocols set out in this document are communicated to the appropriate personnel.

Subject to the Government's agreement on the cost recovery principles and the associated conditions mentioned above, DSE will be responsible for reimbursing VF for any normal time salary, overtime,

standby and associated operating costs (for example vehicles and equipment) for fire training, preparedness and response except for fires declared as a result of VF regeneration burning activities.

DSE's fire prevention planning process involves the identification of forest assets that need to be protected during the conduct of prevention activities (such as fuel reduction burning). DSE will consult with VF during the planning process to ensure commercial forest assets are identified and adequately protected.

13.4 Fire emergencies

By the 31st October each year, DSE and VF shall reach agreement about the defined staff and other resources that VF will have in the Model of Fire Cover for the period November to April next. VF will make defined numbers of staff available for a defined period to undertake appropriate training to meet and maintain agreed levels.

VF agrees to provide defined staff and other resources to the Model of Fire Cover in the future, and will consider ways to assist DSE improve the overall level of cover across the State. However, over the course of this agreement, it is expected that VF's contribution will change commensurate with any reduction or turnover in its workforce.

DSE will own and maintain all specialised fire equipment and infrastructure in relation to the FPA. Where VF have day-to-day management control of DSE fire equipment they shall maintain it to the standard prescribed by DSE. VF will ensure that any equipment which is operated at fires by VF, or any of their contractors, conforms to DSE standards.

DSE will dispatch personnel in accordance with its Readiness and Response Plans, Emergency Management Plans and Departmental Policy. Dispatch and the initial use of resources will be spread between agencies involved in fire suppression. DSE will consult with VF on the Readiness and Response Plans and the order of call-out of VF resources. This and all preparedness will be based on regular local meetings of the agencies to plan preparedness and agree on rosters, VF recognises that need for preparedness may need to extend beyond formal rosters on occasions and VF resources will be available by agreed local arrangements. The VF Operations Manager will he notified as soon as possible after VF resources have been dispatched.

VF resources will be available for initial response for all fires within the FPA, or where requested in support of the Country Fire Authority in the Country Area of Victoria.

13.5 Communications and electronic systems

VF Electronic Resource Data and Systems shall be managed and maintained by VF to ensure that relevant resource information is current and the systems are compatible with Fireweb, IRIS and other relevant DSE systems. Further detail is available on the protocol in the data exchange agreement.

Both DSE and VF will provide appropriate mutual access to relevant electronic data and systems to ensure safe and effective fire resource management capacity.

DSE will provide radios, compatible with the DSE radio network, to VF for use in vehicles and equipment considered by DSE as necessary for effective fire response (refer to separate agreement on radio communications network).

13.6 Firefighter skills

VF firefighters identified in the Model of Fire Cover will attain and retain competencies relevant to fireground operations in accordance with the Australian Fire Competencies Framework and/or fire Management Training System.

DSE will be responsible for developing and conducting training that will ensure that all firefighters deployed to an incident are properly trained and accredited to a level that is appropriate far their particular role at the incident. Participation in managed fire events and exercises is recognised by both DSE and VF as an important part of maintaining fire response accreditations. Defined VF staff will participate in training and readiness activities for a period of up to 5 days per year.

Where critical fire skills are not readily available in DSE as a result of the creation of VF and the transfer of staff, VF will make those remaining and identified staff with these critical fire skills available for training and accreditation.

13.7 Personal protective equipment and other equipment

DSE undertakes to provide all firefighters, who may be deployed to any fire prevention or suppression activity which is the subject of this document, with the Personal Protective Equipment required, in excess of normal job requirements, for their role. VF is to ensure that any items of Personal Protective Equipment they issue as part of normal works (e.g. hard hats), that may have a dual purpose, will be compatible with fire requirements.

Each organisation will work cooperatively to ensure equipment and infrastructure is managed cost effectively. This includes among other matters, agreement on and adherence to equipment standards and joint use of existing infrastructure.

Where VF has a requirement for a heavy duty vehicle it will conform with DSE's Model of Fire Cover requirement for such vehicles to be able to transport slip-on units.

13.8 Training/exercising

Frequency of these events will be determined in consultation between senior DSE staff and VF staff. DSE Regional Manager and VF Director Operations will consult about the involvement of VF staff in fire training programs.

DSE will liaise with VF regarding staff who are experienced and accredited trainers for participation in, and delivery of, DSE fire training and mentoring programs.

DSE will cover the cost of fire training courses far defined VF staff.

APPENDIX 3.3.3 DSE AND PV ADVERTISEMENT, WEEKLY TIMES OCTOBER 27, 2004 FOR STAFF (26) TO SERVICE THE NEWLY LAUNCHED PUBLIC LAND FIRE INITIATIVE.

APPENDIX 3.3.3

Department of Sustainability and Environment

Public Land Fire Initiative Roles

The State Government is committed to providing increased support and resources toward the on-going challenge of managing the state's fire risk on behalf of the Victorian community.

In response to this and as part of the newly launched Public Land Fire Initiative, the Department of Sustainability and Environment (DSE) and Parks Victoria are offering excellent career opportunities with a number of fire roles for individuals with demonstrated experience across regional Victoria; spanning community engagement, operations and planning and strategy.

Community Engagement Coordinator

4 Ongoing Positions

DSE Locations: Bendigo, Colac, Box Hill, Traralgon

The successful applicants must be able to demonstrate:

- experience in community engagement principles and practices;
- proven group facilitation and training skills; with an ability to understand and appreciate different adult learning styles;
- experience in planning and evaluating projects, with a focus on contributing community engagement expertise;
- excellent communicating and networking skills; the ability to build relationships, including skills in negotiation and influencing others;
- the ability to facilitate capacity building in an organisation and to engage in team processes to deliver organisational change; and
- the ability to work with a diverse range of stakeholders.

The salary range for these ongoing positions is $44,580 to $62,618 subject to the grade of the position and skills of the successful candidate.

Community Engagement Officer

1 Ongoing Position

Parks Victoria Location: Alfred Nicholas Gardens - Dandenongs

The successful applicant must be able to demonstrate:

- proven ability to develop and deliver community education and awareness programs;
- the ability to communicate effectively with diverse stakeholders on a range of potentially sensitive issues and to build productive relationships;
- proven ability to plan and manage projects within short timeframes; and
- well developed written communication skills for the preparation of correspondence and reports.

A sound understanding of fire management practices undertaken on public land is required.

The salary for this ongoing position is $41,480.

Fire Operations Officers

8 Ongoing Positions

DSE Locations: Mildura, Edenhope, Daylesford, Horsham, Portland, Powelltown

Parks Victoria Locations: Alfred Nicholas Gardens - Dandenongs, Rosebud

The successful applicants must be able to demonstrate:

- experience in fire management in the natural environment;
- proven capacity to build relationships through excellent interpersonal skills, communication skills (both written and verbal), with strengths in negotiating and problem solving;
- proven ability to lead, mentor and train others;
- experience in developing plans, programs related to fire management; and
- experience in project management, to ensure projects/programs are delivered on time, within budget and to a high standard, particularly in relation to works programs in the natural environment.

The salary range for these ongoing DSE positions is from $33,971 to $54,128 subject to the grade of the position and skills of the successful candidate. The commencing salary for the Parks Victoria roles is $46,027.

Fire Management Officer

3 Ongoing Positions

DSE Locations: Orbost (Senior), Heyfield, Swifts Creek

The successful applicants must be able to demonstrate:

- experience in fire protection and wildfire control strategies and techniques;
- proven resource management skills with an emphasis on fire management;
- experience in issues associated with natural resource management, with an emphasis on fire management; and
- proven ability to effectively develop and implement budgets and work programs related to fire management.

The salary range for these ongoing positions is $55,189 to $77,046 subject to the grade of the position and skills of the successful candidate.

Fire & Environment Program Officer

9 Ongoing Positions

Parks Victoria Locations: Macedon, Halls Gap, Colac, Bendigo, Mildura, Beechworth or Wangaratta, Orbost, Bright, Foster

The successful applicants must be able to demonstrate:

- experience in contributing to the development and interpretation of strategic guidelines and procedures as they apply to the sustainable fire management;
- proven ability in defining priorities and establishing a consistent approach to the management of ecological fire in parks and state forests across relevant Districts;
- experience in preparing fire management strategies for major District parks, state forests and reserves;
- proven ability to engage with key stakeholders and land managers in the development and implementation of appropriate ecological fire management criteria, principles and regimes;
- the ability to develop processes, procedures, protocols and systems that provide for long-term evaluation of the sustainability of fire management programs and activities;
- experience in coordinating the collection of scientific data for fire management purposes, in particular Key Fire Response Species and fuel hazard data; and
- the ability to represent Parks Victoria as a member of Regional Fire Teams (as appropriate).

The salary for these ongoing positions is $50,571.

Strategic Planner

1 Ongoing Position

DSE Location: Bendigo

The successful applicant must be able to demonstrate:

- proven strategic thinking and conceptual skills and the ability to develop options and provide high level advice based on a range of information and possibilities, with a particular emphasis on fire and emergency management and, indigenous programs;
- experience in the management of multidisciplinary teams engaged in projects that are outcome and client focussed, with a particular emphasis on emergency management and indigenous programs;
- excellent written and verbal communication skills and a sound understanding of computer systems relevant to the Fire Program; and
- experience in policy and service delivery issues involved in the delivery of natural resource management services with a particular emphasis on emergency management.

The salary range for this ongoing position is $63,678 to $77,046 subject to the skills of the successful candidate.

Candidates are encouraged to access information and apply on-line through the DPI Recruitment Services website at www.dpi.vic.gov.au access "Hot Jobs" and then access "DSE/PV Public Land Fire Initiative Roles".

Applications close for all positions Friday, 5 November 2004.

Parks

Victoria

APPENDIX 4.3.1

STATEWIDE OVERVIEW OF FOREST FIRES WEDNESDAY 8 JANUARY 2003.
Extract from the DSE Daily narrative – The Victorian Alpine Fires.

The Yambulla fire north-west of Genoa (Cann River Fire 19) is the only going fire recorded by DSE at the start of Day 1. This fire, which was ignited by lightning on 6 January 2003, has the potential to develop into a large fire and is being resourced accordingly. A total of 114 DSE/DPI/PV personnel, 8 bulldozers and 4 aircraft are working on the fire during the day shift on 8 January, with a further 66 DSE/DPI/PV personnel resting.

The resources already committed to Cann River Fire 19 and the progressive detection of over 80 new fires across a broad geographic area, impacted on both the available resources and the allocation of those resources on Day 1.

The new fires caused by lightning strikes in each Fire District in eastern Victoria and the broad time bands in which they were detected and reported are set out in Table A.4.1. This detailed chronological reconstruction of the individual fires progressively reported on the first day is important for many reasons, not the least being that, consistent with long established practice, vital first attack deployment would have presumably been directed to the earliest reported fires. While a number of fires were reported by 0800 hrs, more than half were detected during the afternoon and evening. Lower temperatures, scattered showers and/or increased relative humidity and restricted visibility due to cloud combined to delay the detection of fires.

Table 1 shows that the number of fires reported in the Upper Murray and Ovens Fire Districts exceeds the number reported in other Districts and that many fires were not detected and reported until the afternoon. This pattern was particularly evident in the Upper Murray fire District, where the last fire, Fire 44, Dunstans Road, was reported at 2045 hrs.

The Mt Buffalo fires were reported at 1100 hrs and a decision was made to immediately move to a level 3 Incident Action Plan and establish a base camp at Porepunkah. The Secretary of DSE, the CEO of PV, the Emergency Services Commissioner and the Coroner's Office have been advised of the situation.

By noon, 30 fires resulting from the overnight cold front and associated thunderstorms have been reported, many in remote and rugged terrain. Around 280 DSE/DPI/PV personnel are engaged in fire suppression activities. Further firefighters are in the process of moving from the west of the State to assist with the North East fires (about 140 firefighters) and the Gippsland fires (about 125 firefighters). IMTs have been established at Mansfield, Ovens, Tallangatta, Heyfield/Sale, Swifts Creek, Erica and Yarram to manage fire suppression activities. The high volume capacity Aircrane helicopter has joined other aircraft in Gippsland and is helping to contain the Toms Cap (Mullundung) fire.

Lightning activity associated with the cool change also extends into NSW and 42 fires are reported in the Kosciusko National Park including many close to the Victorian border. Arrangements for the co-ordination of fire suppression activities in the border regions are initiated.

A number of Media Releases are issued during the course of 8 January 2003 as the seriousness of the fire situation unfolds. The first Media Release at 1100 hrs, apart from reporting progress towards containing an already troublesome fire near Genoa that was started by lightning on the evening of 6 January 2003, reports eight new fires resulting from overnight lightning strikes in North East Victoria

and Gippsland. The last Media Release for the day, advising of the increased number of fires and actions being taken to control them, has been issued at 1800 hrs.

The general weather forecast for 8 January 2003 is for cool to mild conditions in the south and warmer conditions inland. Appendix 5 (of the fire narrative[24]) shows that, for the selected Automatic Weather Stations (AWSs) used in this narrative, actual maximum temperatures ranged from 18 to 30^0C, minimum relative humidities were 13 to 36%, and winds were generally moderate in strength. Actual FDIs were low except for Wangaratta and Hunters Hill.

APPENDIX 4.3.1. Table A.4.3.1. **Fires reported to DSE on 8 January 2003.**

Time	DSE Fire District						
	Ovens	**Upper Murray**	**Yarram**	**Heyfield**	**Mansfield**	**Erica**	**Swifts Creek**
0000-1000	32 Catherine River	13 Nicols	9 Toms Cap	17 Gays	6 Lazarini Spur	5 Binns	
	33 Burnt Top			18 Barkly River	7 King Saddle	6 Rojoes	
				19 Cheynes Bridge		7 Fultons Creek	
				20 Mt Margaret			
				21 Berlin Wall			
1000-1200	34 Sandy Creek	14 Dartmouth		22 Kellys Lane		8 Little boys	
	35 Fillinos	15 Mt Granya		24 Lazrini Creek			
	36 Bakers Gully	16 Cravensville					
	37 Bald Hill	17 Rodgers Creek					
	38 Cavalier Spur	19 hills Piggery					
	39 Bogong North						
	40 Buffalo						
	41 Demon Ridge						
	42 Feathertop						
	43 Bogong Village						
	44 Bill Hicks Track						
	45 Not identified						
	46 Black Possum						
	47 Champion Spur						
1200-1800	48 Buffalo Creek	18 Reedy Creek	10 Little Tower	25 Blackfellows		9 Rules Road	15 Tices
	49 Glue pot	20 Mt Brutal	11 Betty's Road	27 Mt Bulldog			16 Dog Track
	50 Lewis Creek	21 Pipers	12 Old R'd'le Road	28 Emu Track			17 Frost
	51 Buff. Creek Sel's	22 Mt Cudgewa		29 Burgoynes			18 Knocker Lake
	52 Mountain Creek	23 Mt Tempest					19 Donnavan Creek
	53 Buff. Creek Track	24 Firebrace					
		25 Top end (Thowgla)					
		26 Mt Mittamatite					
		27 Bunroy Ridge					
	* excludes unidentified	28 Wabba Wild					
	but inc fires reported	29 Nariel/Bennets					
	but not found	30 Elliot Ridge					
		31 Mrs Ceres					
		32 Not identified					
		33 Laurie Col'n			Note:		
		34 Dribbling Creek			Also fires reported in	- Bendigo (3)	
		35 Flaggy Creek				- Ballarat (1)	
	(Razorback) ->	36 Bogong South				- Broadford (2)	
		37 Mt Cooper				- Alexandra (1)	
		38 Pinnibar Creek				Some suspected of	
		39 Upper Papes				being deliberately lit.	
		41 Stony Creek					
1800-2400		40 Once Only		30 N 18 Track			
		42 Knocker					
		43 Mystery Lane					
		44 Dunstans Road					
Totals	**21 ***	**31 ***	**4**	**12**	**2**	**5**	**5**

Table A 4.3.2.

NUMBER & STATUS OF LIGHTNING-CAUSED FIRES IN SEVEN DSE NORTH EAST & GIPPSLAND FIRE DISTRICTS & RESOURCES DEPLOYED ON THE FIRES FROM 8 JANUARY - 16 JANUARY 2003

Note: Daily resources listed are only for day shift.

Day/Date	A 1 G	C	U	2 G	C	U	3 G	C	U	B 4 G	C	U	5 G	C	U	6 G	C	U	7 G	C	U
1/08	28	1	17	20	1	3	3	1	6	7	5	0	2	3	0	4	2	1	4	0	0
2/09	15 (3 not found)	11	?	7 (3 amalgamated)	7	7	1	3	6	1	10	0	0 (1 not found)	4	0	0	5	3	2 (3 amalgamated)	0	0
3/10	13	13	1	7	7	?	-	3	0	1	10	0	0	4	0	0	5	0	0	2	0
4/11	11 (Area burnt G ≈2328ha)	16	2	6 (Area burnt G ≈1700ha)	8	-	-	-	-	1	10	0	-	-	-	- (No action reported)	-	-	0	2	0
5/12	12	16	3	6 (G = 2328ha)	8	-	-	-	-	- / -	- / 11	- / 0	-	-	-	-	-	-	-	-	-
6/13	6	15	?	6	8	-										1	-	-			
7/14	2*	14	-	6	8	-										1 (≈8000ha)	-	-			
8/15	2 (≈6300ha)	-	-	6 (≈6600ha)	-	-										1 (≈9000ha)	-	-			
9/16	2 (7170ha)	-	-	6 (6658ha)	-	-										1 (9200ha)	-	-			

5/12: Resources specifically listed for Upper Murray FID shown in ( ).

7/14: * Down from 7 due to strategic amalgamations

Day/Date	RESOURCES DSE LF	DSE O	PV LF	PV O	DPI LF	DPI O	CFA LF	CFA O	EQUIPMENT GROUND Tankers L	Tankers H	Bulldozers L	Bulldozers H	AIRCRAFT Fixed Wing LS	Fixed Wing RE	Fixed Wing FB	Rotary Wing RP	Rotary Wing RE	Rotary Wing FB
1/08	280	21					70+		6	3	4	3		4 ?				
2/09	438 →	58+					214+		61	7	30	7	1		4			3
3/10	487 →	19					207+		66	49	24					?		←13 / 12
4/11	826 →						200+		168 all categories inc slip-ons		19		2	2	3			8
5/12	824 → (326)						400+		140 (47)	70	49 (8)					35 (2)		
6/13	196 / 170						84		53 / 29	31	15 / 17							1
7/14	427 / 97						48 / 61		58 / 26		22 / 9							
8/15	333* (inc 5 from priv companies) / 77* (inc 6 contractors)						97	60	12	79	8	22						
9/16	320 (inc 8 from priv companies) / 111 + 96 resting for night shift						141 / 72		5	70 / 13	26 / 9							Yes

3/10: Note: poor or no resource information supplied for several fires in Upper Murray (Tallangatta/Corryong) IMT.

Notes:

1. Swifts Creek IMT is now responsible for the Razorback fire (Upper Murray FD [1] fire 36) now burnt out 4,500ha with perimeter of 29kms.

2. The resources allocated to Ovens FD [2] fires reflect conscious decisions to focus on smaller fires & to release resources to larger fires once they are contained. The Andersons Peak (Mt Buffalo fire) is building significantly & the Ericson Aircrane is deployed. Direct attack is considered likely to fail & the very large fallback position which would involve threatening major assets & could cover some 100,000ha. No resources committed to Anderson Peak fire as of 1800 hrs on day 6.

DSE REGION/FIRE DISTRICT

- A. North East
  - 1 Upper Murray
  - 2 Ovens
  - 3 Mansfield
- B. Gippsland
  - 4 Heyfield
  - 5 Erica
  - 6 Swifts Creek
  - 7 Tambo

Fire Status:
- G Going
- C Contained/Controlled
- U Unattended

PERSONNEL
- LF LINE FIREFIGHTER
- O OTHER

Data covers Day shift only.

GROUND EQUIPMENT AND AIRCRAFT

TANKERS	L	Light
	H	Heavy
BULLDOZERS	L	Light
	H	Heavy
FIXED WING	LS	Line scan
	RE	Reconnaissance
	FB	Fire bomber
ROTARY WING	RP	Rappelling
	RE	Reconnaissance
	FB	Fire bomber

Table A 4.3.2 COMMENTS ON NUMBERS & STATUS OF LIGHTNING-CAUSED FIRES IN SEVEN DSE NORTH EAST & GIPPSLAND FIRE DISTRICTS & RESOURCES DEPLOYED ON THE FIRES FROM 8TH JANUARY – 16TH JANUARY 2005.

Day	Date	
1	8	7 IMTs established ≈265 personnel in transit from West Victoria See Appendix 4.1 for Statewide overview.
2	9	26 fires going. 40 fires contained. 8 not found. Majority of going fires in Ovens & Upper Murray FD Benalla IMAC established
3	10	31 going fires, 1600ha burnt. 800 day shift DSE/DPI/PV deployed "onfires". 50 bulldozers, 25HD tankers, 120 LT tankers. 32 aircraft
4	11	Start of day4 going fires reduced to 17. With exception of Heyfield fire no. 24 all are in Ovens & Upper Murray FDs. Approx 900 DSE/PV/DPI deployed on day shift with further 500 pers resting. Approx 400 CFA volunteers deployed. Equipment inc approx: 40 bulldozers, 50 tankers, 160 specialised fire vehicles (slip-ons/light tankers) & 30 spec firefighting aircraft. Ericson Aircrane redeployed from Gippsland to NEVic & 2 IR line scanners (Vic/NSW) deployed to give 24hr cover for fire detection, fire mapping & strategic planning. Containment of 2 large fires in Gippsland enabled firefighting effort to focus on NE fires. NO online resources allocated to 2 fires (Stony Creek & Once Over Track) in the Corryong division of Upper Murray FD on previous evening or on day 4 due to resource constraints & nature & complexity of the fires. No action reported from Swifts Creek FD (6).
5	12	15 going fires following control of 2 fires overnight. Since 8 Jan 16,000ha burnt. All going fires are in Upper Murray & Ovens FD covering area of approx 4,100ha (day4). Resources deployed cont. to increase - approx 950 DSE/PV/DPI fire fighters supported by 400 CFA pers (excluding local brigades & HVP/GRP staff & equipment on day shift. Around 70 tankers, 140 slip-ons & 45 bulldozers are active with approx 30 specialised aircraft. Increasing temperatures & smoky conditions impact on fire suppression effort. Whilst atmospheric conditions, which have remained reasonably stable from Day of the fires are helping to limit spread of some of the fires, erratic fire behaviour due to high local FDIs continue to challenge containing the fires, particularly those in remote locations with rugged terrain. The 2 fires at Mt Cooper & Razorback now being treated as one fire. Direct attack is proving too difficult & dangerous. A decision is made to contain them on a broader scale. Similar situation applies to Cravensville & Pipers fires - also treated as one fire - now burnt a total of around 1,700ha. 3 fires are not resourced, 2 Once OnlyTrack & Stoney Creek are inaccessible.
6	13	The number of fires consolidated to 9 in Upper Murray FD. Total area burnt increased by some 8,000ha over past 24 hours. Location of main fires in NEVic are shown in Figure 4.3. All fires are in the alpine region & managed through Benalla IMAC & Ovens & Corryong IMTs. In the vicinity of 1,400 fire fighters from DSE/PV/DPI & approx 300 CFA are involved in firefighting activities. A Total Fire Ban declared for all fire districts on 13 Jan 2003. Actual max FFDRs for automatic weather stations are shown in Table 4.1. Overall strategy for Kiewa & Ovens Valley fires is to control all fires in shortest possible time because it has not been possible to adequately resources all fires to achieve control during the extended first attack period. Strategy further aims to contain small fires in order to release resources to larger fires. Need for "significant additional resources" is identified, & more efficient use pf resources is recommended by permanently locating resources at Mt Beauty, Bright & Myrtleford. Mt Arthur fire threatens to burn to top of Mt Bogong. PV requests that, where possible, control lines be constructed with hand tools rather than with machines. Bogong NP will be closed to the public at 1200hrs tomorrow. Strategy for Upper Murray is now to manage Pinnibar fire as a joint incident with NSW & to transfer control of Razorback/Mt Cooper fire to an IMT to be established at Swifts Creek. The only other going fire (Cravensville Div) requires about 10 hours of back-burning to complete a perimeter containment line. Fires to the W of the Alpine Way in NSW are threatening to enter Vic and this is addressed in strategies for the control of fires near Mt Pinnibar. Tasmania advises that it is not yet in a position to release fire fighting resources in Vic. Decision is made to establish an IMAC at Traralgon.

Table A 4.3.2 COMMENTS ON NUMBERS & STATUS OF LIGHTNINT-CAUSED FIRES IN SEVEN DSE NORTH EAST & GIPPSLAND FIRE DISTRICTS & RESOURCES DEPLOYED ON THE FIRES FROM 8TH JANUARY – 16TH JANUARY 2005.

(Cont).

Day	Date	
7	14	There are 9 going fires, all in NEVic. NEVic fires have now burnt about 17,000ha. The total area by all fires started by lightning on 7 Jan'03 in eastern Vic is about 27,000ha. Locally strong winds overnight contribute to increased fire size. Around 1,400 personnel from Vic Govt agencies plus about 300 CFA personnel from outside the region (supporting local volunteer brigades); 30 aircraft, 200+ spec vehicles & 60 bulldozers are fighting the fires. Assistance is sought from NSW in relation to availability of its Ericson Aircrane & remote area fire fighting teams. NSW advise that aircraft cannot be released for 48-72hrs due to mechanical failure. Action is also taken to obtain assistance from Defence forces & negotiate arrangements for obtaining assistance from US firefighting agencies Cravensville fire remains within control lines & burning internally. Aerial ignition, mainly on ridge tops undertaken on 14 & 15 Jan to assist internal burnout.
8	15	There remains 9 going fires. Cravensville fire (7,000ha) is contained but Mystery Lane reclassified from contained to going. The NEVic fires have now burnt in excess of 27,000ha. Around 1,400 personnel from Vic Govt agencies, around 300 CFA personnel from outside the region (supp local vol brigades), over 200 spec veh & 60 bulldozers continue to fight the fires. An IMT is to be established at Mt Beauty in coming days to manage fires in the Kiewa Valley. Procedures are being put in place for firefighters from the USA. Special assistance in line scan interpretation will be sought as a first priority. With the exception of Wangaratta & Hunters Hill, max FFDRs at the AWS are low to moderate (Table 4.1). All fires of concern are burning in inaccessible & rugged terrain. The Razorback fire has crossed the Omeo highway which is closed till further notice. Mt Buffalo NP remains closed to all visitors. On the Razorback, low cloud, fog & smoke precludes fire bombing operations. Back burning is slow, due to erratic fire behaviour. Cravensville fire remains within control lines & burning internally. Aerial ignition, mainly on ridge tops undertaken on 14 & 15 Jan to assist internal burnout.
9	16	Overnight containment of a fire near Mt Bogong - now 8 going fires in NEVic as follows: * Pinnibar fire complex south of Corryong; * Mystery Lane fire south of Corryong: * Razorback fire; * Mt Buffalo NP fire; * Four fires in the Mt Beauty, Mt Bogong, Mt Feathertop/Harrietville area. Total area burnt by these & other fires in NEVic now exceed 34,000ha with the largest being the Razorback & Pinnibar complex fires. Razorback fire spot-overs in Mt Wills area & in northern division are causing concern due to intense fire behaviour & the inability to use aircraft because of smoke. It is not safe to directly attack these spot fires with bulldozers under current conditions. Terrain south of Mt Wills area is steep & rocky & not suited to construction of containment lines. Contingency planning towards defending private assets commenced by the CFA. All backburning operations cease for the day. The scenario of falling back to the private property/public land interface NW of Benambra is looking more likely. Around 1,400 personnel from Vic Govt agencies, around 300 CFA personnel from outside region (supp local vol brigades), 200+ spec vehicles & 60 bulldozers remain on the fires. A formal letter of request for USA assistance was transmitted on this day.

FIGURES

Figure I.1 The Final Extent of the 2003 Alpine Fires

Figure 2.3: The 2002 – 2003 Fires (Courtesy DSE fire Narrative).

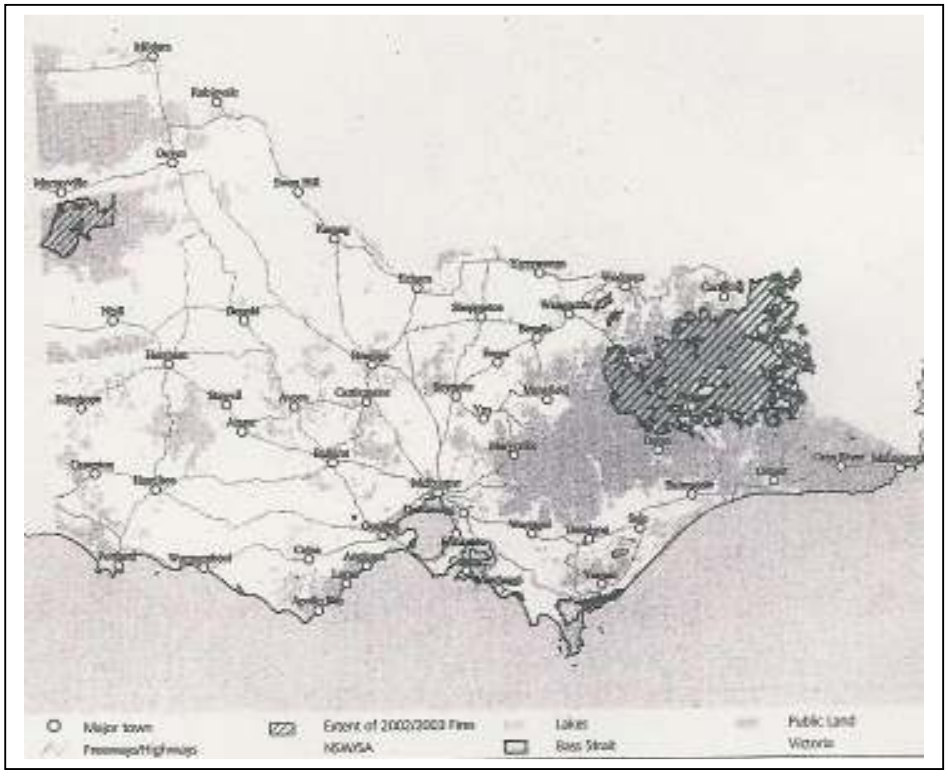


Figure I.2 The Area of Victoria's 1939 Fires

Figure 1.9: Area burnt in the January 1939 bushfires (courtesy of DSE)

Figure 3.1 Area managed under the National Parks Act

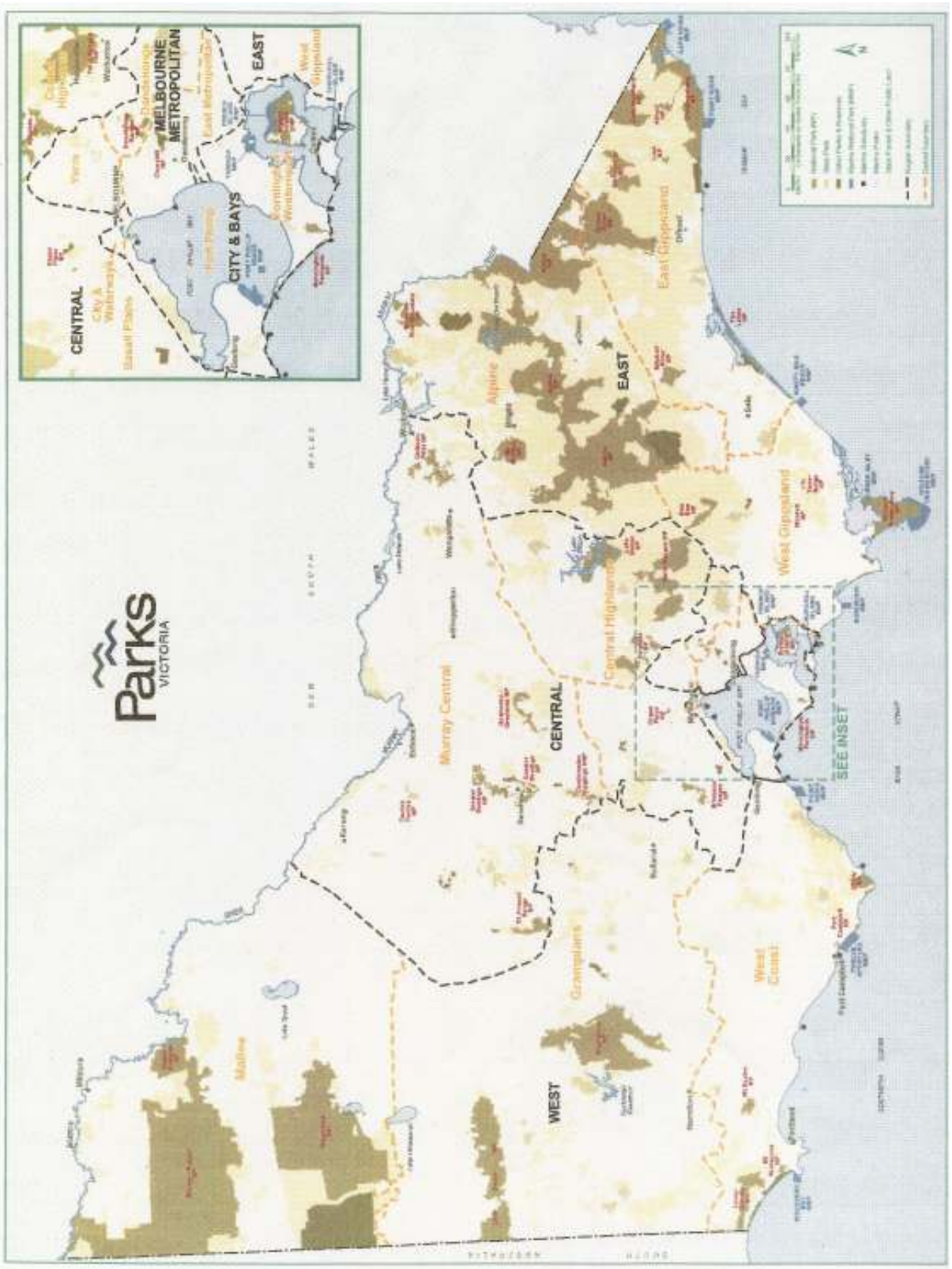


Figure 3.2.1

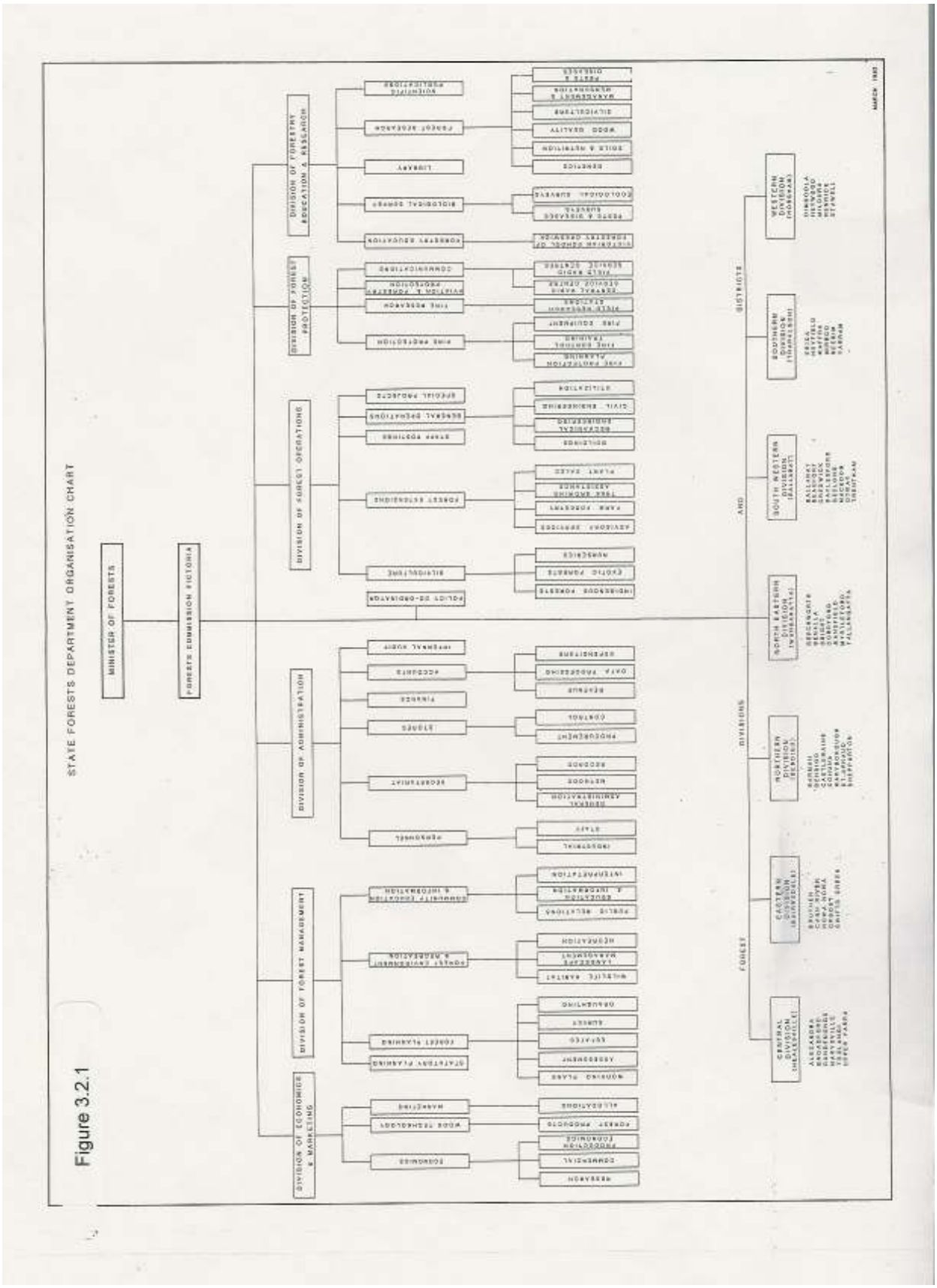


Figure 3.2.2

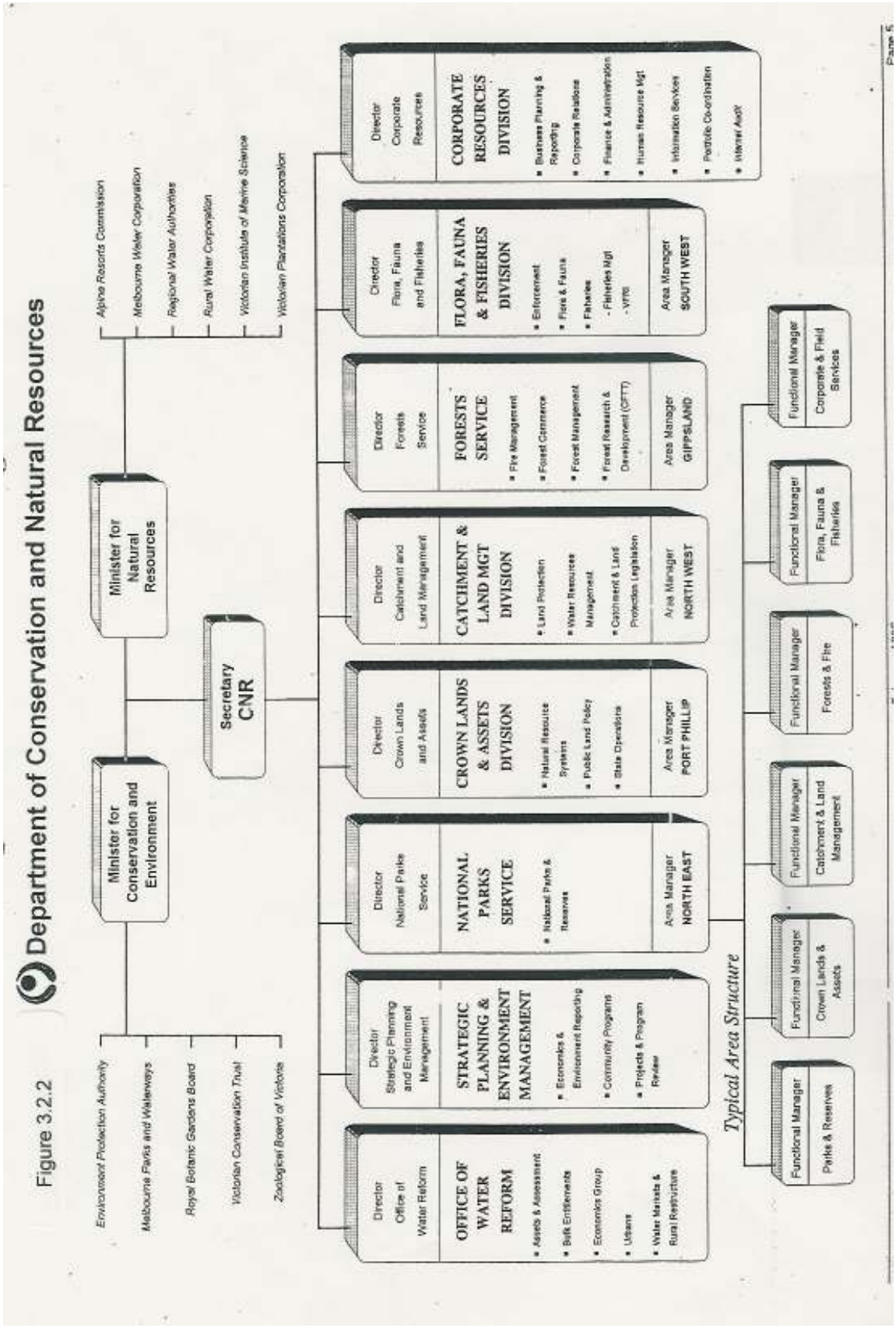


Figure 3.2.3

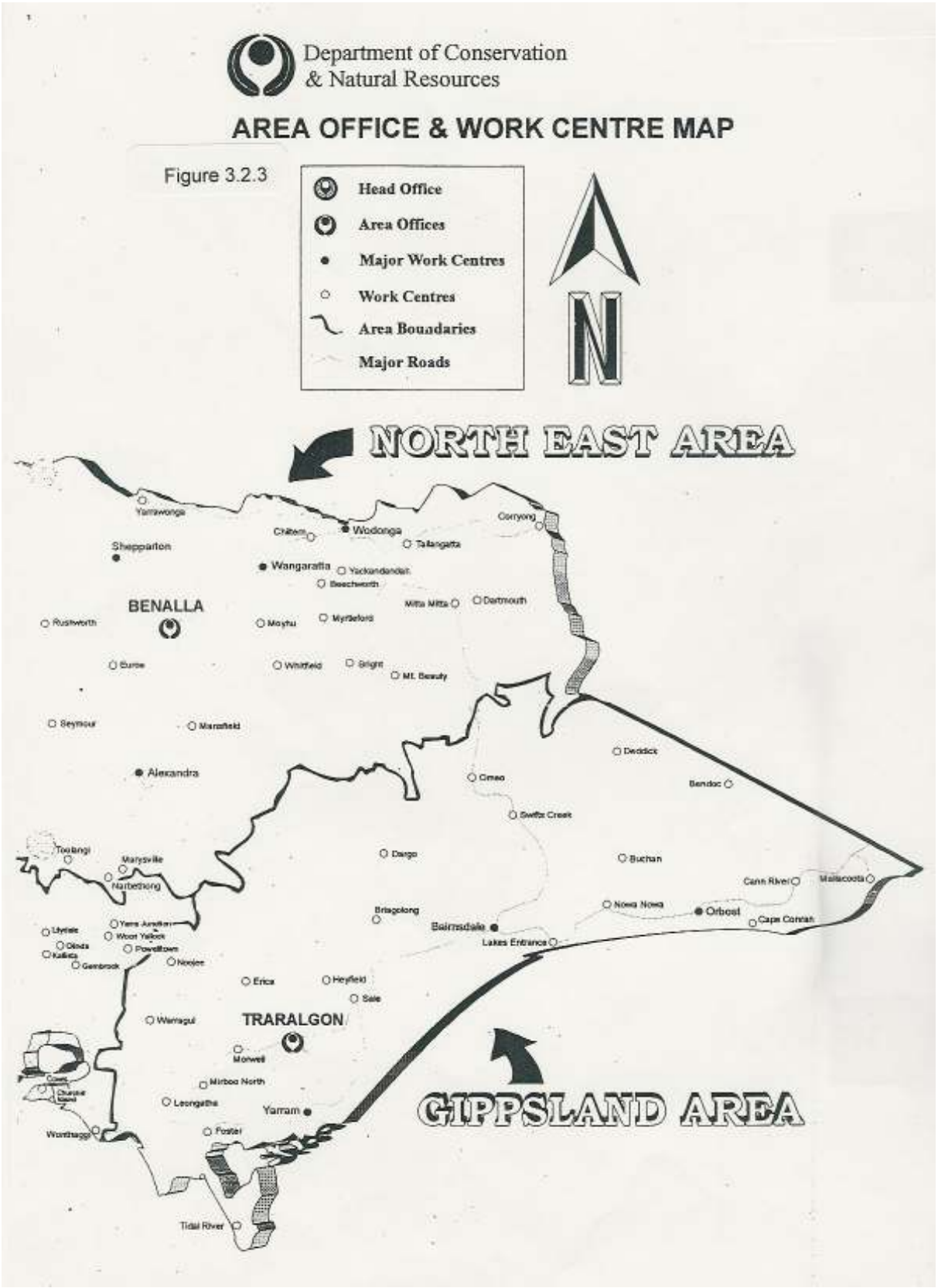


Figure 3.2.4A

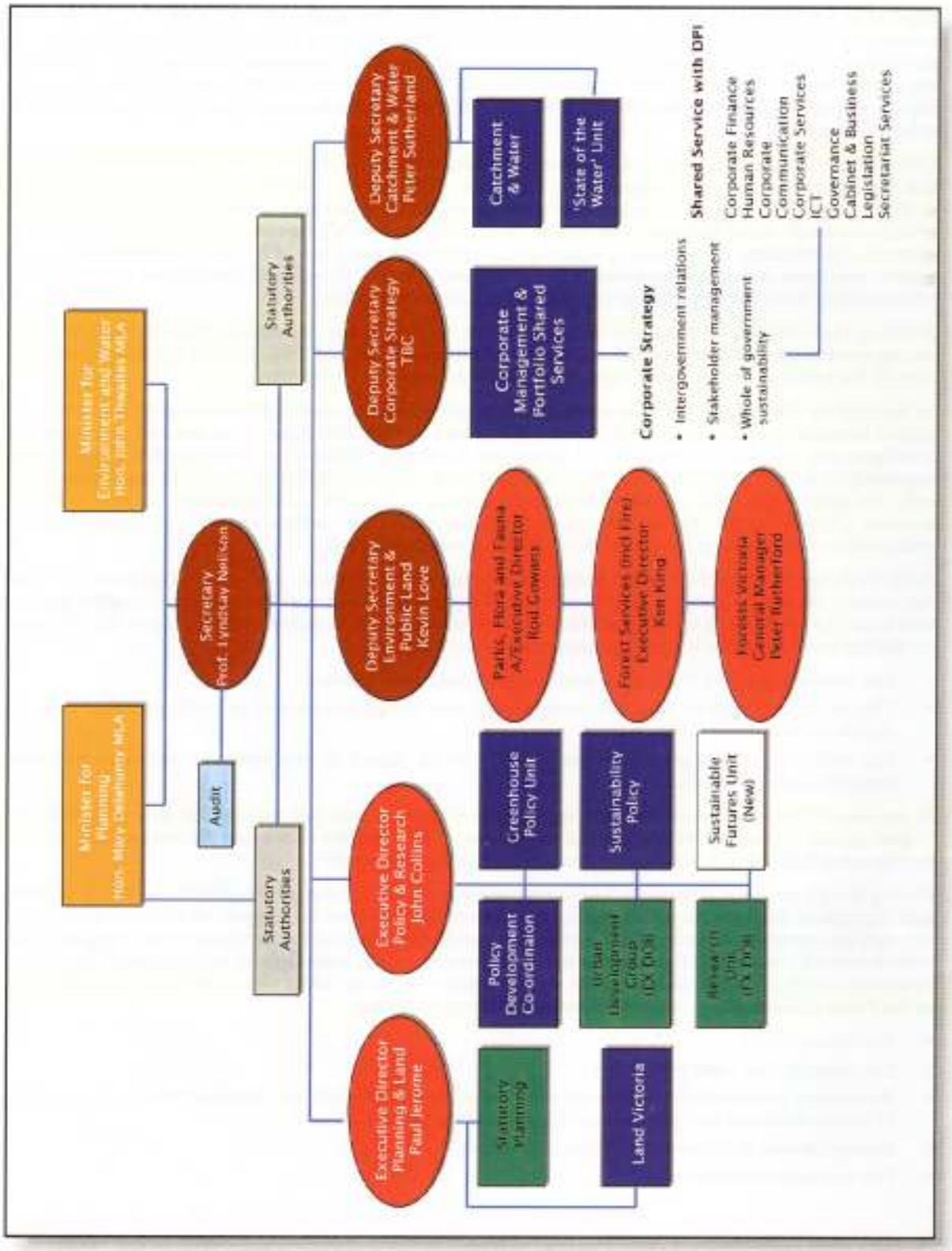


Figure 7 Interim reporting arrangements for DSE as at 8 January 2003 (Source: Victorian Government, 2003).

Figure 3.2.4B

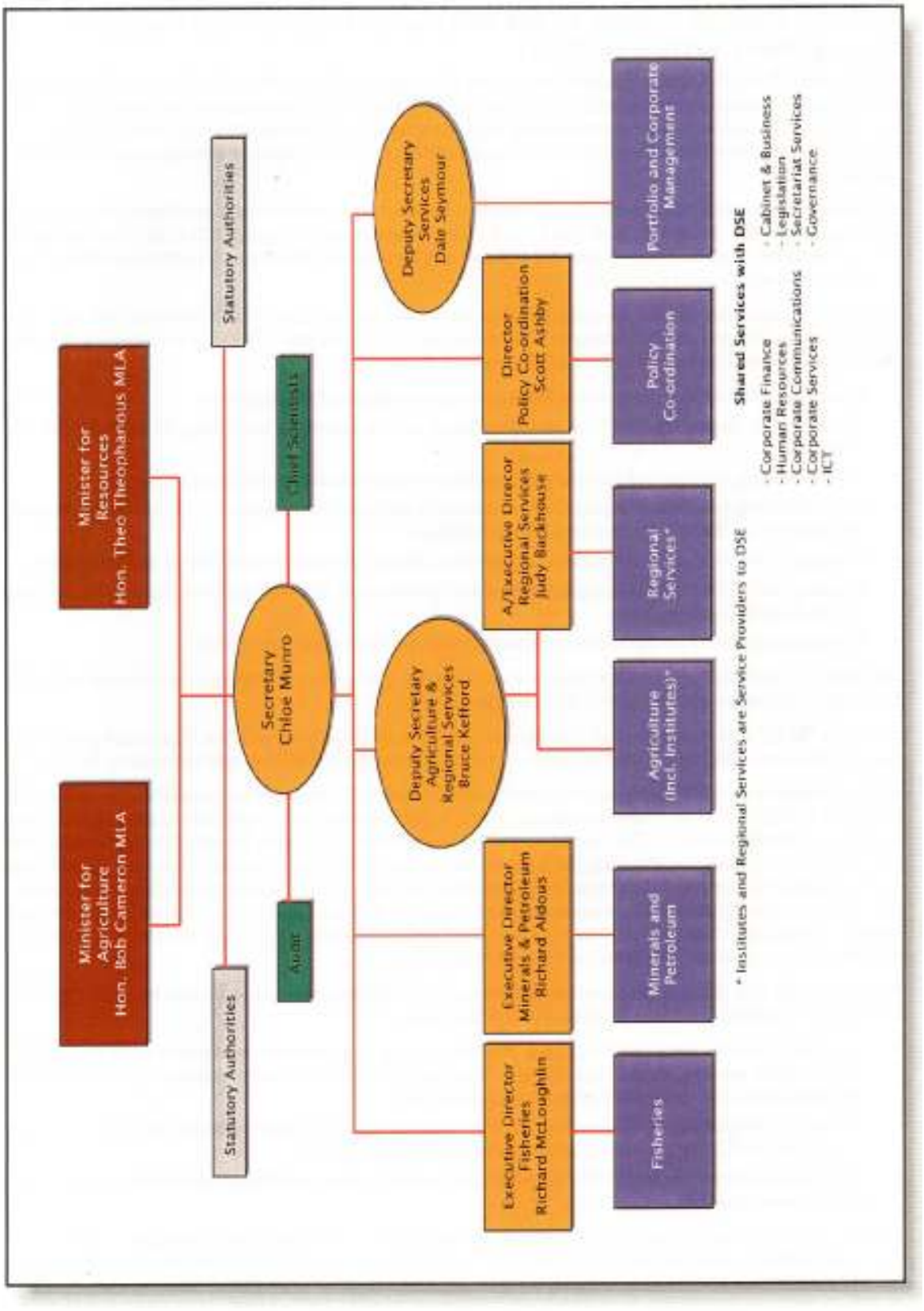


Figure 8 Interim reporting arrangements for DPI as at 8 January 2003 (Source: Victorian Government, 2003).

Figure 3.2.5

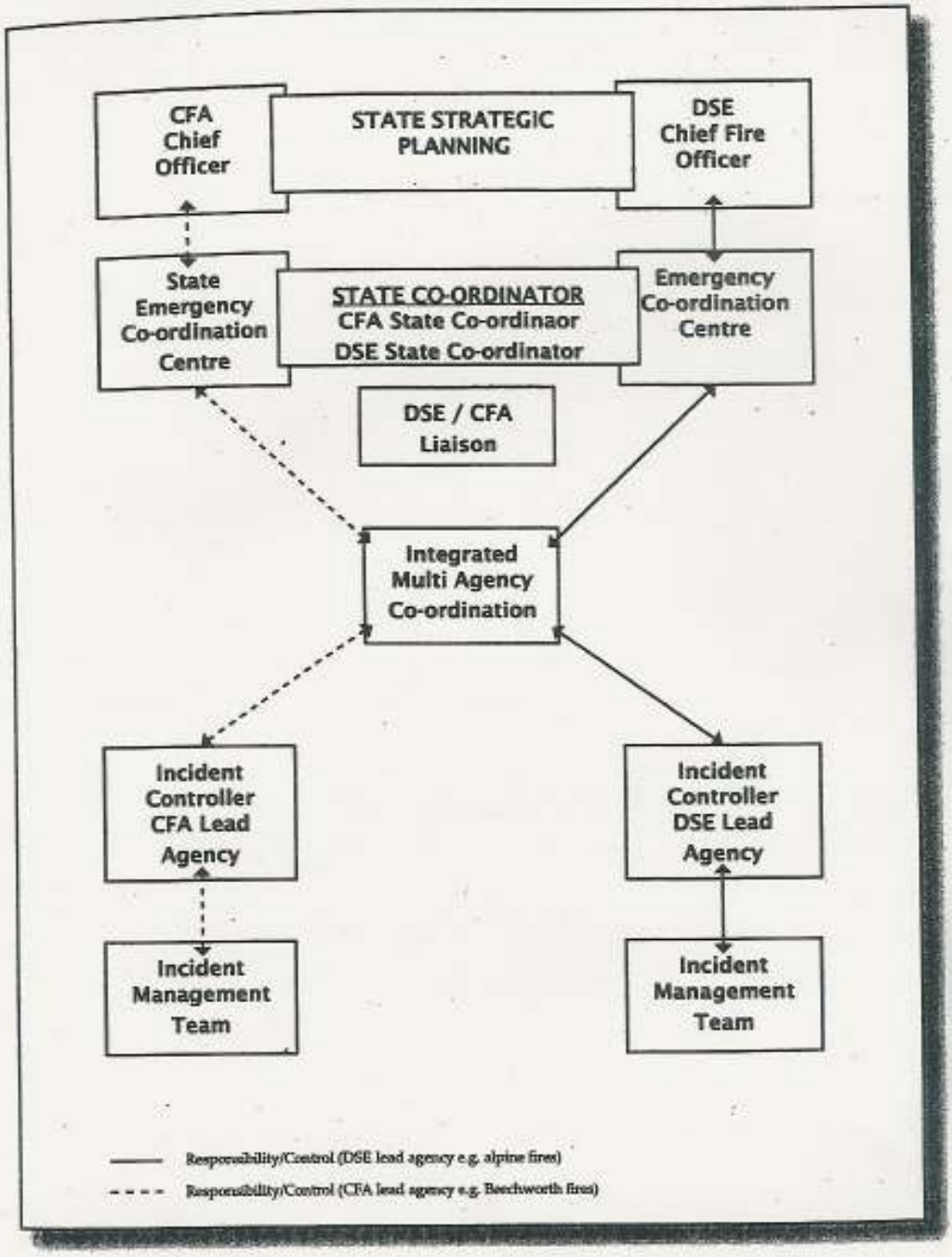
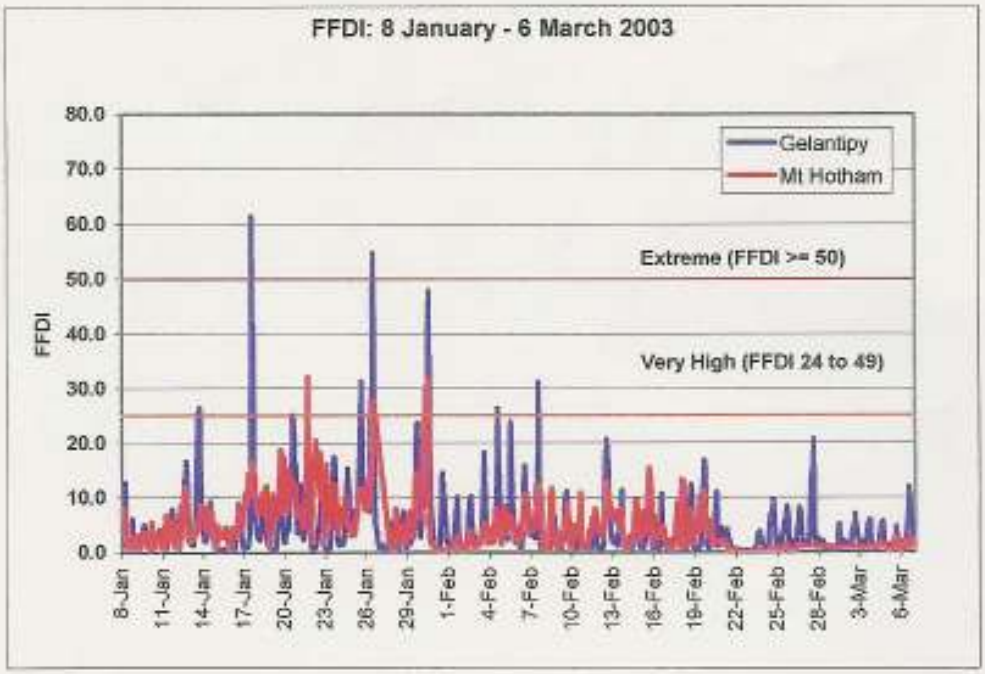


Figure 9 Command and control structure for management of the 2003 alpine fires (Source: DSE, 2003).

21

Figure 4.2.1



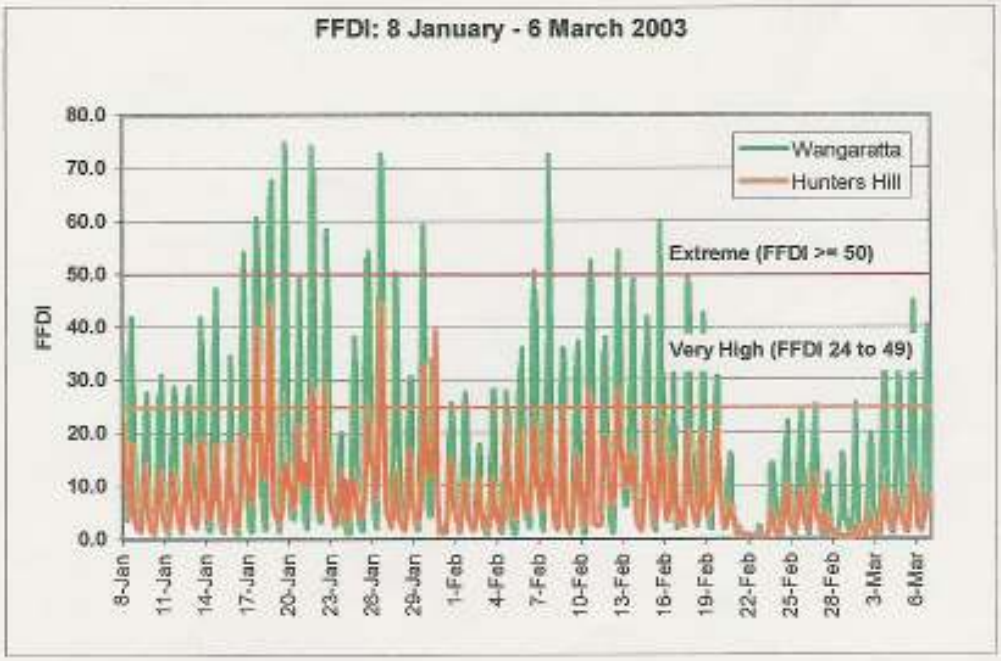
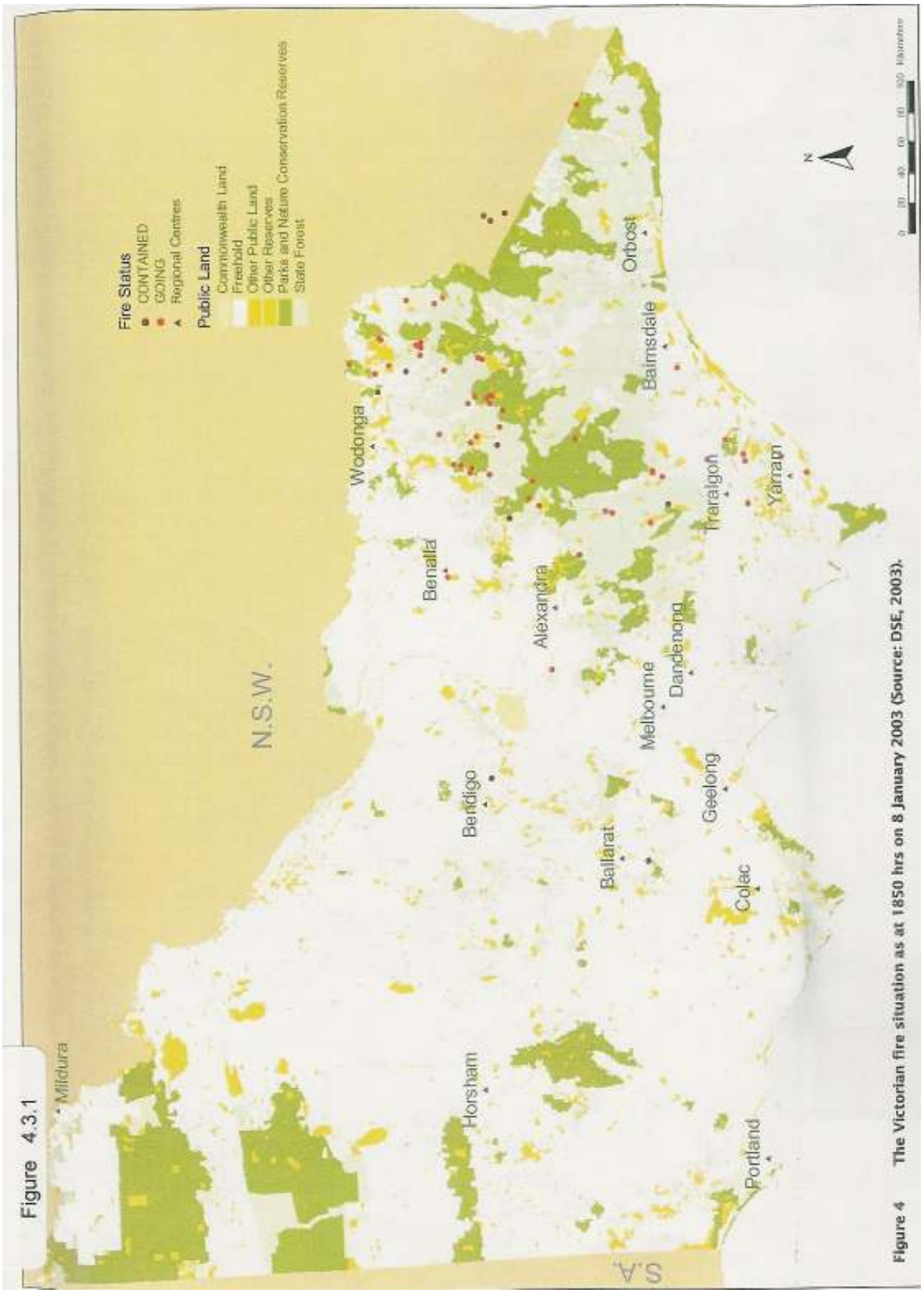


Figure 2.2: Forest Fire Danger Index (FFDI) at Gelantipy, Mount Hotham, Wangaratta and Hunters Hill from 8 January to 6 March 2003. Ranges within which FFDI is rated as Extreme or Very High is indicated by horizintal lines.

19

Australian Government
Bureau of Meteorology

Figure 4.3.1



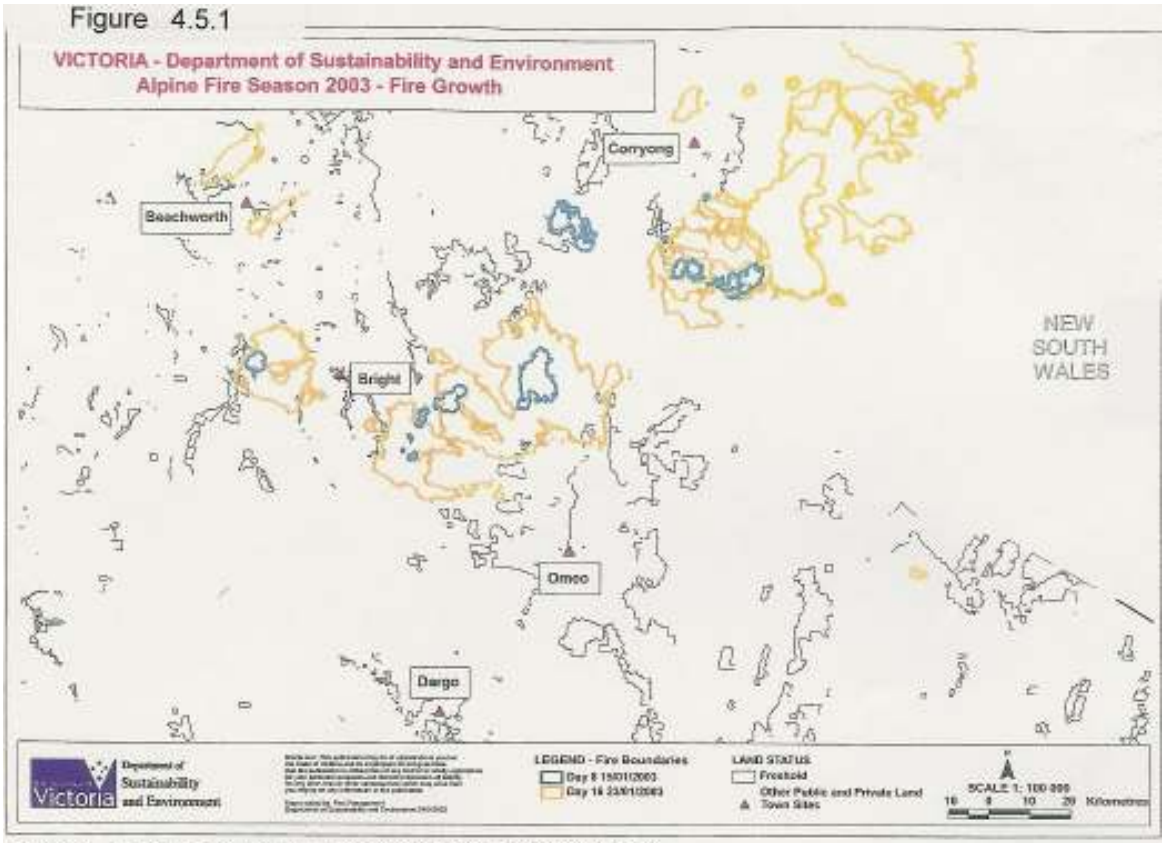


Figure 27 Map of the progressive spread of the fire from Days 5-16 (Source: DSE, 2003).

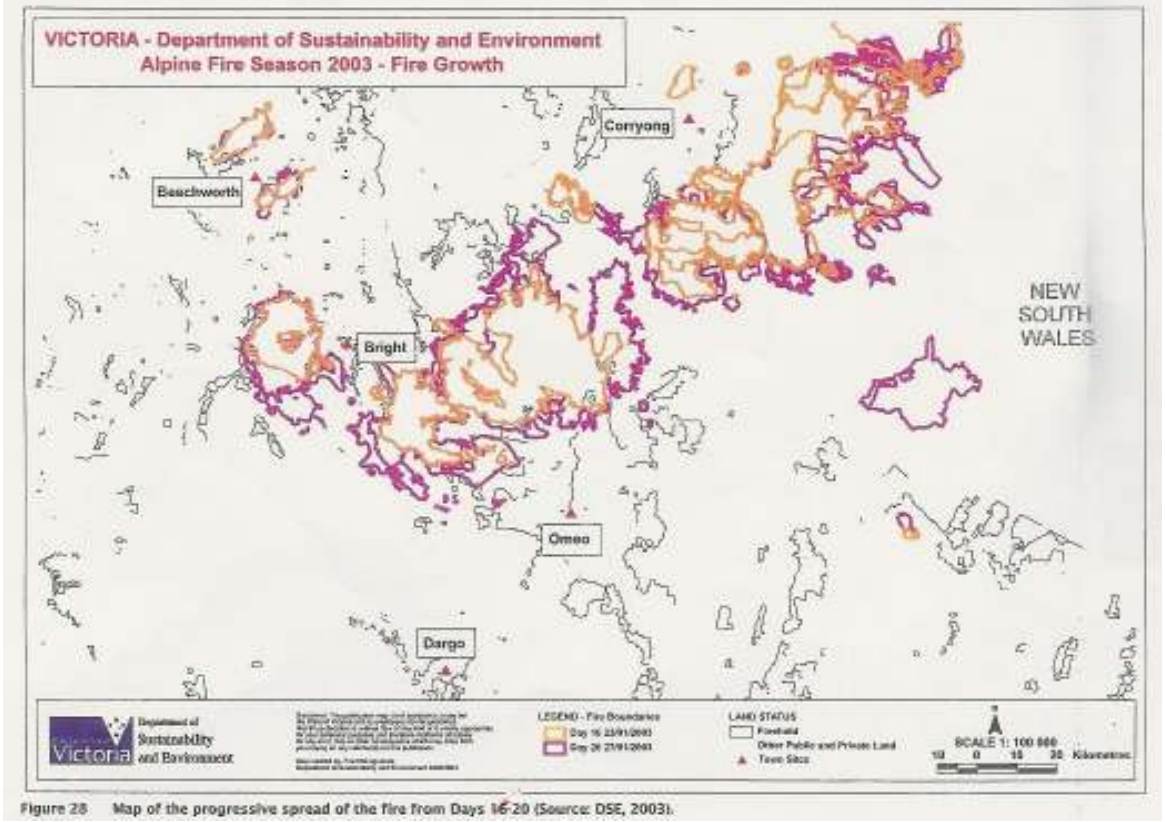


Figure 28 Map of the progressive spread of the fire from Days 16-20 (Source: DSE, 2003).

Figure 4.5.2

Location of main fires in NE Victoria on 13 January 2003 (Source: DSE, 2003).