



SUPPLEMENTARY REPORT

ALPINE AREA

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GOVERNMENT OF VICTORIA

LAND CONSERVATION COUNCIL

464 ST. KILDA ROAD, MELBOURNE, VICTORIA, 3004

REPORT

SPECIAL INVESTIGATION

ALPINE AREA

This supplement and the abridged report are published to allow all who are interested in the use of public land the opportunity to comment by making written submissions to the Land Conservation Council.

All such submissions must reach the Secretary no later than Friday, 10 December, 1982.

These submissions will be considered by the Council before Proposed Recommendations are made on the use of public land in the study area.

Availability of Submissions

Submissions received by the Council will be available for inspection at the Council's offices 10 days after the closing date for submissions.

I. KUNARATNAM
Secretary
Land Conservation Council

ERRATUM

P.17 - 4th para. should read "The table also shows the volume of sawlogs that the mills at the different centres are currently entitled to draw from public land, including the Alpine area, each year."

SUPPLEMENTARY REPORT
for the
ALPINE AREA
SPECIAL INVESTIGATION

Land Conservation Council
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FOREWORD

The *Land Conservation Act 1970* established the Land Conservation Council, whose function is to 'carry out investigations and make recommendations to the Minister with respect to the use of public land in order to provide for the balanced use of land in Victoria'.

This supplementary report and the earlier resources report (now available in reprinted form) describe and assess the natural resources of public land in the Alpine area and provide a factual basis on which members of the community may base their submissions to the Council. It ensures that all those persons and bodies who have an interest in the future use of public land in this area can obtain and study the basic information, which the Council itself will study, and so make informed and constructive suggestions to the Council for its consideration.

In making these reports available, the government hopes that all interested parties will be able to participate in an informed fashion in the process of considering how public lands should be used. It is hoped that, in making submissions, members of the community will use as a basis the information provided by this study. The Council will make its recommendations only after due consideration of those submissions.

Demands for land for various purposes are many and varied, some of which are compatible and some conflicting or competitive. It is therefore important that the decisions made are based on factual evidence, not on subjective criteria.

Submissions are now invited and should reach the Secretary of the Land Conservation Council within 60 days of the publication of this report, as notified in the Victorian *Government Gazette*. All submissions received by the Council will be available for inspection at the Council's offices 10 days after the closure of the submission period.

S.G.McL. DIMMICK
Chairman

Land Conservation Council
464 St. Kilda Road
MELBOURNE 3004

LAND CONSERVATION ACT 1970

EXTRACT

Public Land

Section 2.

(1) "Public land" means -

(a) land which is not within a city town or borough and is -

(i) unalienated land of the Crown including land permanently or temporarily reserved under section 4 of the *Crown Land (Reserves) Act* 1978, State forest and parks within the meaning of the *National Parks Act* 1975;

(ii) vested in any public authority (other than a municipality or a sewerage authority within the meaning of the *Sewerage Districts Act* 1958); or

(iii) vested in the Melbourne and Metropolitan Board of Works; and

(b) any other land which the Governor in Council declares under sub-section (2) to be public land for the purposes of this Act.

"Reserved forest" and "State forest" have the same meanings as in section 3 of the *Forests Act* 1958.

(2) The Governor in Council may on the recommendation of the Minister made after consultation with -

(a) any Minister of the Crown in whom any land is vested; or

(b) the Minister responsible for a public authority in which any land is vested -

by proclamation published in the *Government Gazette* declare any such land to be public land for the purposes of this Act.

Functions of the Council

Section 5.

(1) The Council shall -

(a) carry out investigations and make recommendations to the Minister with respect to the use of public land in order to provide for the balanced use of land in Victoria;

(vi)

- (b) make recommendations to the Governor in Council as to the constitution and definition of water supply catchment areas under the *Soil Conservation and Land Utilization Act* 1958; and
 - (c) advise the Soil Conservation Authority concerning policy on the use of land (whether public land or any other land however vested) in any water supply catchment area.
- (2) In making any recommendation the Council shall have regard to the present and future needs of the people of Victoria in relation to -
- (a) the preservation of areas which are ecologically significant;
 - (b) the conservation of areas of natural interest beauty or of historical interest;
 - (c) the creation and preservation of areas of reserved forest;
 - (d) the creation and preservation of areas for national parks;
 - (e) the creation and preservation of areas for leisure and recreation, and in particular of areas close to cities and towns for bushland recreation reserves;
 - (f) the creation and preservation of reserves for the conservation of fish and wildlife;
 - (g) the preservation of species of native plants; and
 - (h) land required by government departments and public authorities in order to carry out their functions.
- (3) Where the Council recommends the alienation of any land the recommendation shall include the Council's opinion as to the best method of alienating the land to ensure the most satisfactory use and management of the land in the public interest.
- (4) Any person or body may make submissions to the Council as to how any public land can be better used to meet the needs of the people of Victoria and the Council shall consider any such submissions before making any recommendation under paragraph (a) of sub-section (1)

Investigations, notices and reports

Section 9.

- (1) The Council shall not make any recommendation under this *Act* in relation to any district or area without a prior investigation of the district or area.

- (2) Before commencing any investigation under paragraph (a) of sub-section (1) of section 5 the Council shall publish a notice in the *Government Gazette*, in a newspaper circulating throughout the State and in a newspaper circulating particularly in or in the vicinity of the area or district to be investigated stating that an investigation of the district or area described in the notice is to be carried out for the purposes of this Act.
- (3) On completing an investigation of a district or area under paragraph (a) of sub-section (1) of section 5 the Council shall -
- (a) publish a report of the investigation;
 - (b) give notice in the *Government Gazette* of the publication of the report, the address where copies of the report may be obtained or inspected and stating that any submissions to the Council in relation to such report will be considered by the Council if they are made within 60 days of such notice; and
 - (c) publish notice in a newspaper circulating throughout the State and in a newspaper circulating particularly in or in the vicinity of the area or district investigated of the publication of the report, the address where copies of the report may be obtained or inspected and stating that submissions may be made to the Council and the date before which they should be made.
- (4) The Council shall consider any submissions in relation to such report made by any person or body within 60 days of notice being given under paragraph (b) of sub-section (3).

Notice to be given to public departments
and authorities in certain cases

Section 10.

- (1) Not earlier than 60 days after notice being given under paragraph (b) of sub-section (3) of section 9, the Council shall send a copy of its proposed recommendations to -
- (a) the Council of any municipality in the municipal district to which the recommendation relates is situated;
 - (b) any other public authority or government department that in the opinion of the Council has an interest in the area of the proposed recommendation; and
 - (c) any person or body who made a submission under section 9 -

and shall consider any submissions received within 60 days of the sending of such copy to the council, authority, department, person or body or in the case of a public authority or government department within such longer period as may be agreed upon between the Minister and the Minister administering that department or responsible for that authority.

- (2) Where any recommendation is made to the Minister under this *Act* it shall be accompanied by a copy of any submissions received from any person body department authority or council pursuant to the provisions of sub-section (4) of section 9 or sub-section (1) of this section.

Government departments and authorities
to give effect to recommendations

- (3) Where the Council has made a recommendation to the Minister under paragraph (a) of sub-section (1) of section 5 the Minister may, after he has given not less than fourteen days notice of his intention so to do to the Minister administering a government department or responsible for a public authority recommend to the Governor in Council that notice of the recommendation or that part of the recommendation that affects the government department or public authority be given to the government department or public authority concerned and where notice of that recommendation or part is so given by the Governor in Council it shall be the duty of the government department or public authority to use all diligence and dispatch to give effect to such recommendation so far as it affects any land vested in or controlled by it.

Copy of every recommendation and of
proposals to be tabled in Parliament

Section 11.

A copy of every recommendation of the Council made under sub-section (1) of section 5 and of the proposals of the Council submitted to the Minister pursuant to section 7 shall be laid before both Houses of Parliament within fourteen days of the making thereof if Parliament is then sitting and if Parliament is not then sitting within fourteen days after the meeting of Parliament.

A copy of the *Land Conservation Act 1970* can be obtained from the Government Printer Sales Office, 7a Parliament Place, Melbourne, 3002.

INTRODUCTION

In May, 1982, the Council was directed to make an investigation of public land in the Alpine area according to the following Order in Council:

'Whereas it is provided in Section 8 of the *Land Conservation Act* 1970, that where the Governor in Council is of the opinion that an investigation and recommendation of the Land Conservation Council in relation to any particular district or area of Victoria is necessary or expedient, the said Council may be required to make such investigation and recommendation within such time as is fixed by the Governor in Council.

Now therefore, His Excellency, the Governor of the State of Victoria by and with the advice of the Executive Council thereof, hereby requires the Land Conservation Council to carry out an investigation of public land within the area delineated on the plan hereunder and bearing in mind the Government's conservation policy for the Alpine region, to make recommendations by the 1st day of December, 1983 on those areas that might be added to the Alpine park system.'

In conducting this special investigation emphasis will therefore be placed on the attributes of public land and the resources located outside the alpine parks. However, in assessing the significance of this land it will of course be necessary to give consideration to the values associated with the land already included in the parks.

The Land Conservation Council commenced an investigation of the Alpine area in 1973 and published a descriptive report in July 1977. Final recommendations on the use of public land were published in June 1979. In January 1980, the then government of Victoria accepted the boundaries of the various land use recommendations made by the Council, and made some modifications to the provisions for logging and grazing in a number of areas.

This supplementary report updates some of the information contained in that July 1977 report. For a better understanding of the area, however, this supplement should be read in conjunction with the original document, an abridged reprint of which (without photographs) has been prepared by the Land Conservation Council and is available for purchase at the Government Printer Sales Office.

The present volume is divided into three parts. The first describes current land use for the area as approved by government. The second sets out to update information provided in the original report. The third details the values and capabilities of areas outside the parks; for convenience the study area has been divided into five descriptive blocks, each of which incorporates a number of the smaller blocks defined in the original report.

(x)

Information for both this and the original report was obtained from government departments, public authorities, and interested individuals, as well as from published reports. They contain information on which members of the community may base their submissions to Council, and on which land use decisions can eventually be made.

ACKNOWLEDGEMENTS

The rapid preparation of this report would not have been possible without the co-operation and assistance of the following organizations, which prepared basic information for chapters and maps and readily supplied advice;

Departments of Agriculture, Crown Lands and Survey, and Minerals and Energy; Fisheries and Wildlife Division; Forests Commission; Ministry for Conservation; National Herbarium; National Parks Service; State Electricity Commission; and State Rivers and Water Supply Commission.

The Council also wishes to acknowledge the willing assistance of the botany departments of Monash and Latrobe Universities.

PART I
LAND USE

1. PUBLIC LAND USE

Extending into both the north-east of the State and Gippsland, the Alpine area comprises much of the Eastern Highlands. It includes parts of the Shires of Avon, Bairnsdale, Bright, Maffra, Mansfield, Myrtleford, Omeo, Oxley, Tallangatta, Tambo, and Upper Murray.

Most of the public land is in one large contiguous forested area that extends eastwards from Mansfield and Licola to the Snowy River, and contains virtually all the alpine and most of the sub-alpine environments in Victoria. It comprises more than 88% (14,300 sq.km) of the total (public and freehold) land in the study area.

The 1979 final recommendations of the Land Conservation Council included proposals to establish two new national parks (the Wonnangatta-Moroka and Bogong National Parks), to extend the Snowy River and Tingaringy National Parks as well as the Wabonga Plateau State Park, and to create the State's second wilderness (the other being in the Mallee area).

The proposals also set aside land for reference areas, created reserves that incorporated a number of the higher peaks and other natural features, and established reserves for various other special purposes.

Other substantial areas are to be used and reserved for timber production, while the timber resource located on land designated as uncommitted land will also be available for harvesting.

Table 1 shows the various land use categories into which public land in the Alpine area has been placed. The figures have been rounded, but reflect the more accurate area determinations made when preparing plans for the scheduling of the national parks and the amendments made to the Mount Stirling and Mount Buller Alpine Resort boundaries when these were recently declared under the *Forests Act* 1958.

On January 10, 1980, the government announced that it had accepted the boundaries recommended by the Council for parks, reserved forest, and other areas and the special uses within the parks and conservation areas relating to once-only timber production, grazing, and deer stalking (Appendix 1). The government, however, did amend the recommendations, in that it approved further once-only logging areas in some parks and other reserves and standardized the phase-out period for grazing where this had been recommended for parts of parks and the reserve including The Bluff. The phase-out period will end in 1991 rather than 1988 as recommended by the Council. Map A shows the boundaries of the land use categories approved by the government, together with the location of the additional once-only logging areas as determined by the government in 1981.

Table 1
PUBLIC LAND USE

Major land use category	Area (ha)
National parks	326,400
State park	3,600
Wilderness	29,500
Reference areas	9,860
Natural features and scenic reserves	69,130
Hardwood production	455,300
Water production	8,900
Hydro-electricity production	4,000
Historic areas	12,360
Agriculture	1,300
Alpine resorts	9,620
Uncommitted land	499,000
Other reserves	2,270

Notes:

Figures are rounded.

Public land recommended to be uncommitted land in the North-eastern area, Districts 3, 4 and 5, and in the Melbourne area, was recommended for hardwood production (16,000 ha) in the Alpine recommendations. These recommendations also included a further area of uncommitted land (320 ha) in the North-eastern area, District 1, within a Natural Features and Scenic Reserve.

2. CONSERVATION

Following the government's acceptance, in 1980, of the Land Conservation Council's final recommendations for the Alpine area, national and State parks, a wilderness, reference areas, natural features and scenic reserves, historic areas, and education areas either have been or are in the process of being created in the Victorian alps. These reserves, totalling more than 450,000 ha, have been recorded in the register of the National Estate.

Parks

The Bogong National Park (declared in October 1981) is centred on the Bogong High Plains - a remnant of an old erosion surface surrounded by ruggedly dissected terrain. It contains nine of Victoria's ten highest peaks, and includes some of the most extensive and spectacular alpine scenery in the State. The park's vegetation includes large areas of mature and fire-regrowth alpine ash, heathlands, herbfields, and moss beds, and supports a number of significant faunal species - for example, the mountain pigmy possum and alpine water skink - and a distinctive alpine insect fauna.

The Wonnangatta-Moroka National Park (declared in July 1982) includes the spectacular Moroka Gorge in the south, the distinctive peaks of Mount Cobbler and Mount Speculation in the north, the Snowy and Howitt Plains, and the headwaters of the Wonnangatta River. Other outstanding features here include the rocky cliffs and escarpments of the Razor, the Viking, the Crosscut Saw, and Mount Magdala, at Bryces Gorge, and around Snowy Bluff and Mount Reynard. Sub-alpine grasslands, herbfields, snow gum woodlands, and alpine ash and riverine forests constitute much of the park's vegetation.

Those sections of the Cobberas-Tingaringy and the Snowy River National Parks within the Alpine area have not yet been declared. Both parks contain a wide range of important geological formations and vegetation types. Geological features include rocky escarpments, periglacial rock rivers, richly fossiliferous sedimentary rocks, limestone caves, and the Reedy Creek and Stradbroke chasms and the Snowy River gorge. Vegetation associations are very diverse. For instance, the Cobberas-Tingaringy National Park contains associations that range from cypress pine and white box woodlands, through unusual heathland and mallee shrubland, to snow gum woodlands and stands of alpine ash at higher elevations. The vegetation in the Snowy River National Park, although mainly low open forest and woodland, ranges from white box woodland to tall mountain ash open forests and includes areas of lowland closed forest. Both parks support colonies of the rare brush-tailed rock wallaby.

Being adjacent to the Kosciusko National Park in New South Wales, the Cobberas-Tingaringy National Park can be consider-

ed as portion of a large, contiguous alpine conservation area that covers about 775,000 ha, extending as far north as the Australian Capital Territory. The Land Conservation Council is considering a further extension of the Snowy River National Park south into the Gippsland Lakes hinterland area, currently under investigation.

The Alpine area also contains a portion of the Wabonga Plateau State Park, which was declared in July 1982. This section of the park contains a rich flora and several areas of geological interest.

Small areas within each of the five Alpine national parks will be available for logging on a once-only basis. These will be discussed in greater detail in following sections of this report.

Wilderness

A large roadless area in the headwaters of Mount Hump Creek, and portions of the upper catchments of the Avon, Dolodrook, and Turton Rivers are included within the Avon Wilderness. This area, which remains substantially unaltered by man, contains environments ranging from sub-alpine woodlands and open areas, through dense tall forests of mountain ash and shining gum, to stunted dry foothill forests.

The Land Conservation Council is currently considering an extension of this area south into the Gippsland Lakes hinterland area.

Reference areas

Eighteen reference areas, representing the major land systems in the Alpine area, are being reserved to maintain natural ecosystems as standards against which the progress and effects of human intervention can be measured. They will ensure that a gene pool of plant and animal species will be available in the future. Within these areas natural processes should be allowed to continue undisturbed, and all activities that conflict with the purpose of reference areas - such as grazing, mineral exploration and mining, timber extraction, etc. - are prohibited.

The *Reference Areas Act 1978* provides for reference areas to be proclaimed. The Minister for Conservation issues directives for the protection and management of these areas, assisted by an Advisory Committee established under the *Act*.

Natural features and scenic reserves

Thirty such reserves are being created in the Alpine area, principally to maintain outstanding landscapes, geological formations, and significant plant communities. They range in size from the 16,250-ha Trapyard Hill-Tali Karng reserve to the 8-ha Thowgla headwaters reserve, and are distributed widely. Many of the area's highest and most prominent peaks and ridges (outside parks), with their associated alpine

and sub-alpine vegetation communities, are incorporated within these reserves.

Historic areas

Five historic areas are being reserved - four are associated with historic goldfields and the fifth contains remnants of a hydro-electric power station that supplied power to mine and process gold-bearing ores.

Education areas

Four education areas will be set aside, in which students of all ages have the opportunity to study natural land forms and observe, interpret, collect, and monitor biological processes.

Other conservation reserves

An isolated block of public land at Morass Creek is to be designated as a flora and fauna reserve. In the predominantly agricultural regions near Omeo, Gelantipy, and Wulgulmerang, eight small areas of public land carrying remnant native vegetation are to be bushland reserves, the purpose of which is to maintain diversity in the local landscape. On the Kiewa and Victoria Rivers, two small areas are to become streamside reserves, one of the primary uses of which is the conservation of native flora and fauna.

Wildlife conservation

No areas have been specifically set aside as wildlife reserves. Rather, the emphasis will be placed on incorporating provisions, aimed at protecting wildlife and wildlife habitat, into the management plans for the various classes of reserve. The recommendations require the authorities managing public land to co-operate with the Fisheries and Wildlife Division in the development of research and management policies for the conservation of wildlife throughout the Alpine area.

3. TIMBER PRODUCTION

Some 455,300 ha of public land within the Alpine area are currently reserved for hardwood timber production. An additional 16,600 ha in the adjoining study areas had their status changed from uncommitted land to hardwood production as a result of the Alpine area investigation. In addition, the timber resource in the 489,700 ha of uncommitted land may also be harvested.

Not all of the land from which timber harvesting is permitted carries productive forest. The timber resource is dispersed and occurs in pockets, as the highly dissected nature of the topography has produced a complex mosaic with productive and unproductive areas intermixed.

Timber harvesting from hardwood production areas and from uncommitted land is to be conducted in accordance with guidelines that are designed to minimize soil erosion and to protect water production, nature conservation, recreation, and aesthetic values, the environs of walking tracks, and sensitive landscape components as seen from important viewing points. Wildlife values will be protected by the implementation of management prescriptions prepared in consultation with the Fisheries and Wildlife Division.

In addition to the areas reserved for timber production and uncommitted land, certain areas of mature alpine ash forest within the parks and other reserves are available for logging on a once-only basis, with all logging to be completed by 1988. In January 1981, the government announced further areas for once-only logging (see Appendix 1).

These areas are located in:

- * the Delatite valley in the Mount Stirling alpine resort
- * Peters Creek in The Bluff--Mount Clear natural features and scenic reserve
- * the Mount Tamboritha education area
- * the Macalister River headwaters, Dry River basin, and near Mount Kent in the Wonnangatta--Moroka National Park
- * the Diamantina River catchment and near Shannonvale in the Bogong National Park

Locations of all the approved logging areas within the parks and other reserves are shown on Maps A and B.

Logging prescriptions for once-only logging areas have been prepared by a working party set up by the government. This working party - comprising representatives of the Forests

Commission, National Parks Service, and Soil Conservation Authority - also interprets on the ground the boundaries of the approved logging areas.

Council's 1979 recommendations proposed that some areas of public land with high capability for timber production should remain uncommitted because they also possessed special recreational, nature conservation, and scenic values. The recommendations designated these as a special form of uncommitted land. For one area in the Murray River headwaters - U3 on Map A - they stipulated that neither timber harvesting nor the construction of logging access would be permitted until Council reviewed the area.

A similar recommendation was made for an area of land in the East Kiewa Valley (shown as U2 in Map A). However, the government modified that recommendation to allow stream calibration of Slippery Rock Creek and Springs Creek to be followed by experimental logging, and this logging will commence in the Springs Creek Catchment in the 1982/83 logging season. If the results with regard to stream sedimentation are acceptable to the State Electricity Commission, the Soil Conservation Authority, and the Forests Commission, further logging will be permitted, under prescriptions, in the U2 area and in the Little Arthur Creek Catchment within the Bogong National Park (see map A).

The Council's recommendations for the Alpine area did not allocate any public land for the establishment of softwood plantations. In 1981, however, the Forests Commission purchased freehold land in the Shire of Omeo, with the intention of using the property to demonstrate agro-forestry and softwood plantation establishment techniques to the rural community. Although only 14 ha have to date been planted to softwoods, it is intended that ultimately some 150 ha of the 280-ha property will be planted. As well as the agro-forestry trial and demonstration of different site-preparation techniques, a blue variety of *Pinus muricata* will be planted to provide comparison with the more commonly used *P. radiata*.

4. RECREATION

Outdoor recreation is an important use of much public land in the Alpine area, and the various reserves and land use categories cater for many recreational activities. . Not all activities are appropriate in all types of reserve, however, and in some (reference areas and parts of some water production areas) recreation is not a permitted use. The provisions made for particular recreation activities are left to the various land managers.

The Victorian Alps area is one of the most popular bushwalking areas in the State. Many of the areas frequented by bushwalkers are located in parks and natural features and scenic reserves where management will be oriented to the protection of natural environments. However, bushwalkers also make extensive use of the hardwood areas and uncommitted land, and many of the established walking routes traverse these areas. The way in which the hardwood forests are managed will take account of this activity, and management prescriptions will protect the environs of important walking routes such as the Alpine Walking Track and the sensitive component's of distinctive landscapes.

The extensive road network throughout the Alps is of particular value for motorized recreation and many of the other outdoor recreational activities depend on motor vehicles. This road system, mainly of four-wheel-drive standard, will continue to be open for legal recreational use, although some roads may be temporarily or permanently closed when traffic exceeds their physical capacity, for safety reasons, or when the use by vehicles is in unacceptable conflict with the area's primary uses (such as reference areas or the wilderness).

Deer-hunting, using guns or bows and either with or without hounds, is a permitted use throughout much of the public land outside the Avon Wilderness and the parks. Seasonal hunting, by stalking, is permitted in the Wonnangatta--Moroka National Park, while hunting with bows only is permitted in the Avon Wilderness.

Winter recreation is mainly confined to skiing - both downhill and cross-country - with other activities such as bushwalking, hunting, and motor touring being generally confined to the lower elevations.

Cross-country skiing involves few facilities and has relatively little impact on the environment. It embraces day trips from nearby holiday accommodation or from homes, overnight trips to huts or snow camping, langlauf racing, ski-orienteeering, and biathlon events. The Bogong and Wonnangatta--Moroka National Parks and Mount Stirling are important areas for these activities.

Subsequent to its acceptance of the Alpine area final recommendations, the government set up a Ski Industry of Victoria Working Party to prepare a plan for the short-, middle-, and long-term development of Victoria's ski industry - within the general guidelines of the Land Conservation Council's recommendations for the Melbourne and Alpine areas. The Working Party was also asked to review the current system of management committees, the place of local government in the control of resorts, the extent of government financial support of the industry, and the types of franchises granted to developers.

The recommendations of the Working Party were published in November 1980 and were accepted by the government in early 1981. They include the following.

- . A Ski Resorts Council, with statutory powers to co-ordinate the financing, planning, and development of ski resorts in Victoria, should be created
- . The four existing main residential resorts should be developed to optimum capacity by 1985.
- . Private enterprise should be invited to share in the planning and development of a new ski resort at Mount Stirling near Mount Buller - to be operative to at least 25% of ultimate capacity by 1985.
- . A further resort should be provided in the north-eastern section of the Victorian Alps, for development to an early stage of operation by 1985 - particularly for day visitors.
- . The respective committees of management should produce complete development plans for each of Victoria's ski resorts. There should be user and commercial operator input into the control, development, and management of the resorts.
- . The State government should be responsible for the construction of access roads and car parks.

Following acceptance of the Working Party's recommendations planning of the Mount Stirling resort was initiated and a proposal for a new ski village on freehold land east of Mount Hotham - on Dinner Plain - was approved.

Mount Stirling will be developed for both downhill and cross-country skiing. This development will be co-ordinated with the development of Mount Buller to optimum capacity. The Forests Commission is currently supervising a study into the way in which development of Mount Stirling should proceed.

Further details on ski resort usage and development are given in Section 9.

5. CATTLE-GRAZING

At present, 140 public land grazing blocks, which cover most of the Alpine study area, are licensed to about 100 cattlemen, and provide seasonal grazing for some 21,000 head of stock. About half of these cattle graze land above 1,220 m.

The Soil Conservation Authority has had supervisory control over all grazing above the 1,220-m contour since 1960. Prior to the Land Conservation Council's original investigation of the Alpine area, the Authority had excluded grazing from some 13,000 ha of public land, which included the sensitive summit areas of Mounts Bogong, Hotham, Loch, and Feathertop.

As a result of the government's subsequent acceptance of the Land Conservation Council's recommendations, grazing will be withdrawn from further areas on Mounts Bogong and Feathertop as well as other prominent, high-altitude areas such as on The Bluff and Mount Howitt. Cattle will also be excluded from a portion of the Bogong High Plains within the Bogong National Park, from the Snowy River National Park and the Wabonga Plateau State Park, and from reference areas and the Avon Wilderness, where cattle-grazing is incompatible with the primary land use.

While it was intended that in reference areas (other than Hollonds Knob and Whiterock Creek, on the Bogong High Plains), grazing should cease following the adoption of the recommendations, cattle have not yet been excluded. Methods for excluding stock from these areas - while retaining the ability to graze adjacent areas - are still being investigated. For the two reference areas mentioned above, the parks, and the other areas from which grazing is to be removed, the government adopted a phase-out period of 10 years after the proclamation of the *National Parks (Amendment) Act 1981*. Grazing will, therefore, be phased out from these areas by no later than May 19, 1991.

6. MINERAL EXPLORATION AND MINING

In June 1982, the Alpine area included 117 separate mining tenements - issued under the *Mines Act* 1958 or the *Extractive Industries Act* 1966 - either held or under application. Details of these tenements are contained in Appendices 3A-D. The majority of them are held for exploration purposes rather than for actual mining, which is currently on a very small scale. Map C (page 12) shows the mineral exploration licences held in the Alpine area at June 1982.

Mineral exploration

All mineral exploration activity in the area is conducted under either a search licence or an exploration licence. A search licence covers a maximum of 40 ha and expires after 1 year. The most extensive and intensive exploratory activities are being conducted under exploration licences, which are issued on a graticule basis (66 km²). Up to a maximum of 12 graticules can be allocated under one exploration licence, which remains current for 2 years and may be extended for further periods of 1 year at the discretion of the Minister for Minerals and Energy.

Although a substantial portion of the public land in the Alpine area is held under exploration licence, actual works associated with mineral exploration occupy very small areas. Appendix 4 given an indication of the effects of various exploration techniques.

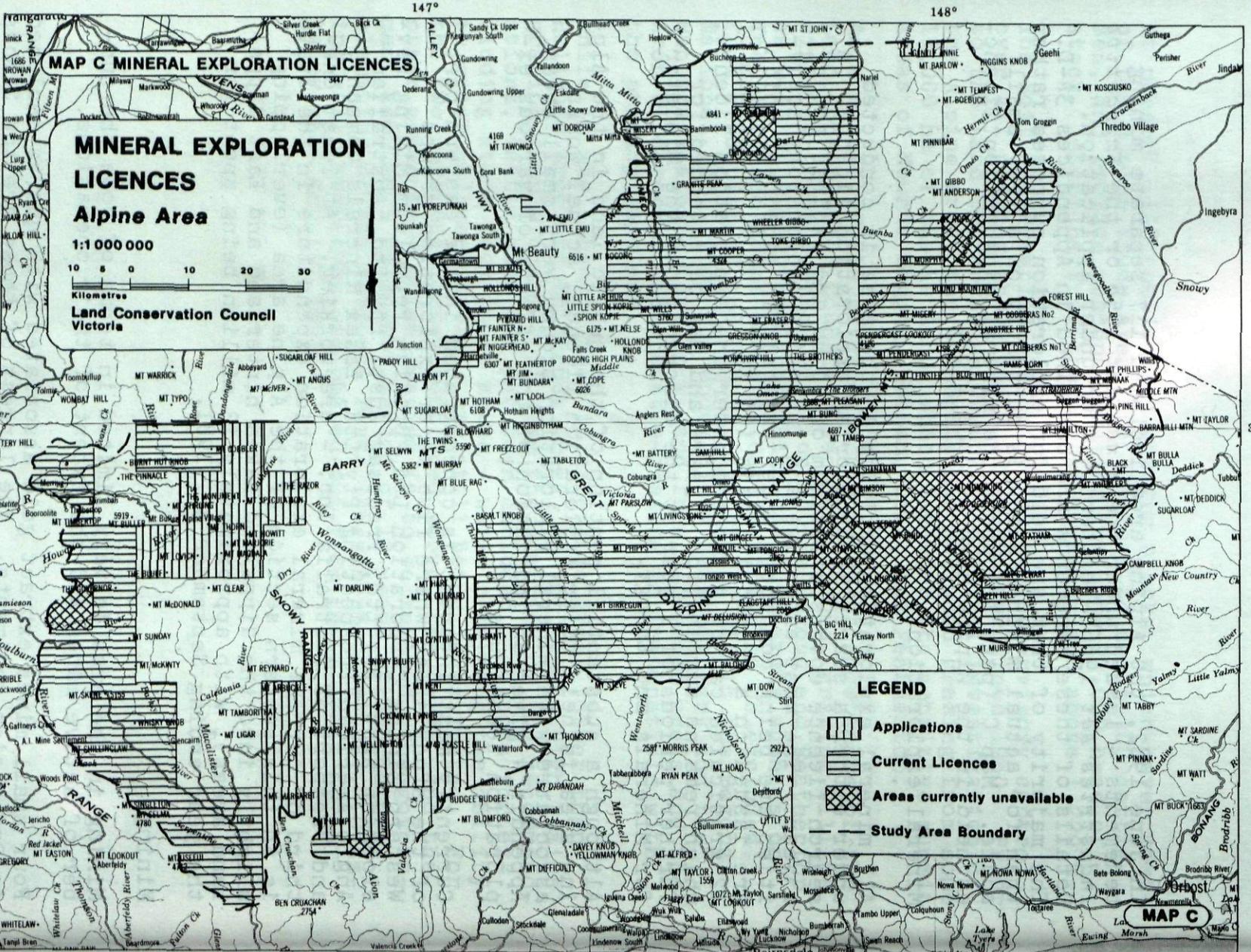
Currently most interest is concentrated in the eastern part of the study area, where five major exploration groups - Western Mining Corporation Ltd - British Petroleum Mining Development Aust. Pty Ltd, Preussag Aust. Pty Ltd, Australian Anglo American Prospecting Pty Ltd, Essex Minerals Company, and Freeport of Australia Inc. - are working. At least one-third of current mineral exploration expenditure in the State is in this eastern section of the Alpine area (overlapping slightly into the Gippsland Lakes hinterland and East Gippsland areas), with approximately \$3 million being spent for the year ending September 30, 1981.

Mining

Mining in the area is very limited in terms of both the number of active mines and the extent of their operations.

Four small mines extract gold associated with quartz enclosed in Ordovician sediments. The largest of these are the Sambas and Red Robin mines, which employ about three persons each and produce about 2-6 and 6 kg of gold respectively each year. In addition, gold is also being extracted from a Miner's Right claim near Swifts Creek.

Slate is quarried under an extractive industry lease from public land in the headwaters of the Jamieson River.

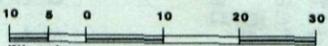


MAP C MINERAL EXPLORATION LICENCES

MINERAL EXPLORATION LICENCES

Alpine Area

1:1 000 000



Land Conservation Council
Victoria

LEGEND

- Applications
- Current Licences
- Areas currently unavailable
- Study Area Boundary

PART II
REVISED INFORMATION

7. ENVIRONMENTAL STUDIES

Since the publication of the Alpine area descriptive report in 1977, a number of environmental studies involving various aspects of alpine ecology have been undertaken.

With the exception of the study by Beauglehole (1981), these investigations are being supervised by the Ministry for Conservation and its agencies.

The following list itemizes these studies (which are generally inter-related) together with a brief description of the work done to date.

1. Two investigations on the distribution and floristic composition of the various alpine and sub-alpine plant communities are being carried out. One of these, carried out by the Soil Conservation Authority in conjunction with the National Herbarium, deals specifically with the Bogong High Plains area. The other covers the remainder of the Alps and is being carried out by the Herbarium. Both studies are due for publication early in 1983. Low-level aerial photography (scale 1:15000) has been carried out to provide a basis for mapping the vegetation units described in them.

The two studies have also identified more than 320 plant species in the alpine and sub-alpine treeless areas, including some 40 introduced species. An analysis of the data provided by these surveys indicates four separate regional plant assemblages:

- Bogong High Plains (including Mounts Fainter, Bogong, and Feathertop)
- Mount Cobbler--Snowy Range--Gable End (including Mounts Stirling and Buller)
- Mount Buffalo--Dargo High Plains--Cobberas--Nunniong Plateau
- Mount Eaw Baw--Lake Mountain

The first three of these occur in the Land Conservation Council's Alpine area while the fourth is located in the Melbourne area. Although many species are common to all of these, the presence of other species has enabled differentiation of the four regions.

A summary of the commonly occurring plants for each region is given in the tables of Appendix 2. The body of each table indicates the recurring combinations of species, and their abundance, which form a vegetation unit.

2. A long-term study being carried out by the Soil Conservation Authority will monitor changes with time to the extent and composition of representative plant communities on the Bogong High Plains. A number of transects have been established, some of which have been fenced to exclude grazing by cattle.
3. The Botany Department at the University of Melbourne is investigating the ecology and dynamics of alpine shrublands and grasslands, including the effects of simulated burning and grazing. The study will also include an investigation of requirements for seed germination and the influence of soil nutrient levels on these communities. A number of unpublished interim reports have been prepared at this stage.
4. Other studies of the mechanisms and effects of various environmental impacts on these alpine and sub-alpine communities will use information from the studies mentioned above, as well as the findings from the investigations listed below.

The School of Agriculture and Forestry, University of Melbourne, is studying the diet and behaviour of free-ranging cattle on the Bogong High Plains. It has already provided information - on the types of vegetation utilized by cattle on the High Plains and their general grazing habits - in two unpublished reports prepared for the Ministry for Conservation.

Ski-slope development trials are being conducted by the Soil Conservation Authority at Falls Creek and Mount Hotham to determine the most efficient methods of re-vegetating areas cleared for downhill skiing. The trials include the use of exotic grasses and clovers; fertilizer and mulch on native grasses already established on the slopes; and other native species. They will also differentiate between the effects of slope grooming and grazing.

The Caulfield Institute of Technology is studying the hydrological effects of land use change. This study will involve an analysis of stream-flow data compiled both before and after the 1939 fires. The final report is due for publication by the end of 1982.

The Soil Conservation Authority also has an on-going investigation of mossbed ecology at Rocky Valley. Some areas have been fenced out and comparisons with other, unfenced, sites will continue to be made.

Experimental plots established in 1945 by Ms S. Carr of the Melbourne University Botany School will continue to be monitored by the Soil Conservation Authority. The publications relating to these plots are listed in the references at the end of this chapter.

5. The Ministry for Conservation has also commissioned reports identifying some sites of zoological, botanical,

and geological significance in the East Gippsland region. These reports include land in the Alpine area, south of the Great Divide. Where appropriate, information from these reports is included in the Block Descriptions (Part III).

6. A special study of the fauna, particularly the mountain pygmy possum (*Burrhamys parvus*), and vegetation of Mount Hotham was carried out by Gullan and Norris (1981) for the Ministry for Conservation.
7. Beaglehole (1981) lists approximately 1,330 species of native vascular plants for the Council's Alpine area, and 287 introductions. These include 96 orchids (family Orchidaceae), 38 wattles (genus *Acacia*), and 43 eucalypts (genus *Eucalyptus*). The aim of the study is essentially to provide a complete and up-to-date inventory of the vascular plants in the area. It also covers the distribution and conservation status of each species.

Although unrelated to the various alpine vegetation studies, it is appropriate to refer to the vegetation map (Map B) accompanying this report. This shows the general distribution of native vegetation on public land relative to the alpine park system. It also shows, broadly, the distribution of natural (fire) regrowth and the location of areas that have been logged. The areas within conservation reserves that are yet to be logged on a once-only basis are also shown on this map.

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- Carr, S.G.M., and Turner, J.S. (1959b). The ecology of the Bogong High Plains. II. Fencing experiments in grassland C. *Australian Journal of Botany*, 7, 34-63.

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- Forbes, S.J., Gullan, P.K., and Walsh, N.G. (1981). 'Sites of Botanical Significance in East Gippsland.'

- Gullan, P.K., and Norris K.C. (1981). 'An Investigation of Environmentally Significant Features (Botanical & Zoological) of Mt Hotham, Victoria.'
- McDougall, K.L. (unpublished). 'The Vegetation of the Bogong High Plains Region.'
- National Herbarium (in press). 'Alpine Vegetation Mapping, Stage 2.'
- Norris, K.C., and Mansergh, I.M. (1981). 'Sites of Zoological Significance in East Gippsland.'
- van Rees, H. (1981). 'Behavior of Free-ranging Cattle on the Bogong High Plains.'
- van Rees, H. (unpublished). 'The Diet of Free-ranging Cattle on the Bogong High Plains, Victoria.'

8. HARDWOOD PRODUCTION

The forests of the Alpine area are the source of nearly one-third of Victoria's hardwood sawlogs, providing direct employment at the peak of the logging season for about 1,150 people in production and associated processing operations at centres located in or adjacent to the area. In addition, hardwood pulpwood is supplied to the Australian Paper Manufacturers Ltd pulp and paper mill at Maryvale under long-term agreement.

The Victorian sawmilling industry, when coupled with other forest products industries (particularly paper and panel products), constitutes the largest decentralized secondary industry in the State. Hardwood sawmills drawing all or part of their intake from the Alpine area form a significant part of this industry and constitute an important source of employment for the communities in their vicinity.

Table 2 provides details of the work force employed by the industry based on the Alpine area. The employment figures exclude employment in secondary processing at plants away from the sawmilling centres - at Seymour, Dandenong, and Melbourne and at the Australian Paper Manufacturers Ltd pulp and paper mill at Maryvale. The figures cannot, however, be related directly to the resource drawn from the Alpine area, as 15 of the 35 sawmills obtain supplies from outside the area as well as from within it.

The table also shows the volume of sawlogs that the mills at the different centres are currently entitled to draw from the Alpine area each year. In recent years the average volume of logs harvested from the area has been less than the total entitlement for some centres.

The sawmilling industry based on the Alpine area has developed substantially in the period following World War II. Structurally it bears little relation to the industry operating in older sawmilling areas of the State, which is based on foothill forests and produces mainly green-sawn construction timbers.

The Alpine area contains two broad classes of productive forest: the ash species forests of principally alpine ash, with some mountain ash, from which seasoning-quality timber is produced; and the mixed-species forests that are the source of sawn timber best suited for construction purposes.

Seasoning-quality ash timber attracts a premium price. It has an attractive appearance, low incidence of defect, and relatively low density. Following seasoning and dressing, select grades may be put to a number of uses including flooring, internal joinery, and cabinet-making, where appearance is important and for which little direct substitution by other timbers is possible.

Table 2

WORK FORCE FOR SAWMILLING CENTRES LOGGING THE ALPINE AREA

Centre	No. of sawmills	Direct employment ¹			Sawlog entitlements ³ (m ³)
		Harvesting ²	Sawmill	Total	
Mansfield	6	37	92	129)	64,710
Benalla	1	-	47	47)	
Jamieson	1	4	10	14	
Whitlands	1	5	12	17	
Ovens and Kiewa Valleys	3	24	131	155	40,500
Mitta Mitta Valley	2	10	17	27	15,750
Wodonga	1	17	20	37	22,500
Corryong	2	6	23	29	8,900
Heyfield	4	64	213	277	86,400
Dargo	1	14	22	36	12,600
Stratford	1	6	12	18	7,800
Mt. Taylor	1	11	23	34	21,000
Bruthen	1	4	11	15	12,000
Bairnsdale	1	4	25	29	10,950
Swifts Creek-Ensay	3	22	79	101	53,000
Benambra	1	9	17	26	18,000
Nowa Nowa	3	16	74	90	49,500
Buchan-Buchan South	2	17	49	66	33,000
Total	35	270	877	1,147	466,360

Notes:

1. Employment figures include workers engaged in further processing of timber only where this is done at the sawmilling centre.
2. Harvesting includes employment on associated pulpwood and veneer log production; the figures are of average employment at the peak of the logging season.
3. Sawlog entitlements are the maximum volumes that may be obtained by the mills at the centres listed.

It is the ash species that have formed the basis for substantial investment by the sawmilling industry in timber-drying and processing facilities in or near sawmilling centres. Although logging operations shift according to the location of the resource, logs are often transported to the processing centres over distances in excess of 100 km. Such structural change of the Alpine area sawmilling industries as has taken place to date has been mainly by way of amalgamation, rather than relocation, of sawmills.

The ash-sawmilling industry is far more capital-intensive and integrated than the small sawmills dependent on the extensive mixed-species foothill forests of the State. It

has, however, almost a craft basis when compared with the predominantly high-technology, high-throughput mills that have been built, based on the State's softwood resource. The craft nature of the alpine-based sawmilling industry derives from the need to ensure maximum recovery of high-value, seasoning-grade material. This can only be achieved by giving a high level of attention to each piece of timber at each stage of sawing.

The strategy underlying the present rate of cutting of the ash forests is a direct consequence of the effects of the 1939 bushfires. These fires destroyed much of the mountain ash forest of the State and, since then, the alpine forests have been required to supply most of the high-quality seasoning timber on the domestic market. The regrowth ash forests that resulted from these fires are only now approaching an age where a substantial proportion of their sawn output is of seasoning quality. It is expected that they will eventually supply much of the seasoning-quality hardwood timber. Wide boards and long lengths (which command a premium in the market) will not, however, be available in any substantial quantity for some further 10--20 years. The continuation of supply from mature alpine ash forests within the study area will be needed if that specialist requirement is to be met.

The role of the Alpine area in supplying sawn timber must also be seen in the context of total timber consumption for the State. Sawn timber consumption in Victoria, although fluctuating from year to year, would seem to be rising at a long-term rate of about 0.5% per annum, calculated on the basis of apparent consumption for the years 1957/58 to 1980/81 - see Appendix 5.

The total availability of hardwood sawlogs from the forests of the State, based on existing tenure, is, however, expected to decline, as is indicated in Table 3 (overleaf).

The whole question of future availability and expected consumption of Victorian-grown softwood and hardwood is currently the subject of review by the Forests Commission, Victoria. The results of this review are not at present available. The predicted availability of hardwood logs (Table 3) is, however, based on the most recent estimates available, which were included in the Forests Commission's submission to the Inquiry by the Senate Standing Committee on Trade and Commerce into All Aspects of Australia's Forestry and Forest Products Industries, in April, 1979.

Pending completion of the review, the broad planning strategy adopted by the Forests Commission has been to increase the rate of establishment of softwood plantations with a view to providing increasing volumes of softwood logs and creating net self-sufficiency in timber products by replacement of imports from interstate and overseas. Table 4 indicates that imports have averaged some 39% of apparent sawn timber consumption over the last 5 years. The rate and extent of any substitution for other timbers by softwood will, however, be limited not only by availability but also by technical capacity and consumer preference.

Table 3
**PREDICTED ANNUAL AVAILABILITY
 OF HARDWOOD LOGS FROM VICTORIAN STATE FORESTS
 1985--2020**

Year	Predicted log availability ^{1,2} (m ³)
1980/81 ³	1,190,000
1985	1,020,000
1990	920,000
2000	820,000
2010	830,000
2020	840,000

Notes:

1. Log includes sawlog, veneer logs and poles; although the specifications of each class overlap to a certain extent, conventional silvicultural practice with sawlog production as the principal objective has been assumed.
2. Volume is underbark in round-wood form, net of defects.
3. Forests Commission Annual Report 1981/82.

There is every expectation of a continued demand for high-quality hardwood timbers of the type that the forests of the Alpine area can supply. In recent years, the annual harvest of sawlogs from the area has been about 345,000 m³, which is about one-third of total hardwood sawlogs supplied from State forest. About 244,000 m³ of this volume is alpine ash, representing some 85% of the select-quality sawn hardwood timber and, averaged over 5 years, some 65% of ash-species sawlogs produced in the State.

Table 4 shows the volumes of sawn timber consumed in the State during the last 5 years.

While the Alpine area has been an important source of timber in the post-war era, the cutting strategy adopted has meant that, for some parts of it the level of harvesting mature ash could not be maintained until logs from the regrowth forests resulting from the 1939 fires became available. This realization, on the part of the sawmilling industry has led to voluntary reductions in the volumes of sawlog removed under licence from certain areas, most notably those areas from which the Mansfield and Heyfield sawmills are supplied.

Table 4

APPARENT SAWN-TIMBER CONSUMPTION - VICTORIA
(m³ sawn volume^{1,2})

Year	Total consumption	Domestic hardwood	Domestic softwood	Net interstate	Net overseas
1976/77	1,287,000	623,000	140,000	232,000	292,000
1977/78	1,112,000	519,000	147,000	232,000	214,000
1978/79	1,099,000	495,000	170,000	231,000	203,000
1979/80	1,168,000	533,000	189,000	233,000	213,000
1980/81	1,196,000	542,000	215,000	229,000	210,000
Average:	1,172,000	542,000	172,000	231,000	226,000

Notes:

1. Volumes rounded to nearest 1,000 m³.
2. The sawlog volume equivalent is about double the sawn volume.

The industry has made these reductions in sawlog intake in an attempt to maintain employment and operating infrastructure for as long as possible - reducing the interval between the time when the mature resource is cut out and the availability of regrowth.

Some readjustment within the industry has taken place since 1979, with a reduction in the number of operating sawmills from 38 to 35. Even so, it is probable that further restructuring of the industry based on this hardwood resource will be necessary and that the number of sawmills drawing logs from the Alpine area will be further reduced by the year 2000.

Recent planning decisions made by the industry have been based on the level of resource availability resulting from the government's adoption of the recommendations of the Land Conservation Council.

The timber resource of the Alpine area

The mature resource presently available for harvesting within the study area is estimated to comprise about 2,500,000 m³ of ash, predominantly alpine ash, and 1,300,000 m³ of mixed species. These sawlog volumes represent about 75% and 90% respectively of the present mature sawlog volume estimated for the forested public land of the study area. These figures do not, however, take any account of location or access, or of regrowth stands.

Two forest types constitute the principal source of sawlog: the mountain forests yield ash, while the moist foothill forests of mixed-species eucalypts yield timber best suited for construction applications. Map B shows the general distribution of forest types in the Alpine area. It also shows

the distribution of ash regrowth resulting from fires and the extent of logging. The Alpine area contains a total of 233,000 ha of ash forests and 995,000 ha of mixed species. Of this area, an estimated 144,000 ha (95,000 ha ash and 49,000 ha mixed species) is able to be harvested. It carries either mature resource or regrowth resulting from fire or following logging. The remaining area is included in parks or other formal reservations, or is unavailable due to prescriptions that prohibit logging near streams and on excessively steep slopes, or is unsuitable for commercial timber production. The forests that can be used for wood production include about 112,000 ha in areas reserved for hardwood production and about 29,000 ha in uncommitted land. A further 2,300 ha within parks or other reserves is available for logging on a once-only basis.

Pulpwood production

At present only parts of the Alpine area are used to provide pulpwood to the Australian Paper Manufacturers Ltd pulp and paper mill at Maryvale. In 1981/82 the forests of the study area contributed some 55,000 m³ of pulpwood obtained from integrated sawlog-pulpwood operations. Some of this is mixed species and some regrowth ash, but the greater part is mature ash. This represented about 8% of the Minimum Annual Supply required to be made available to the company under the *Forests (Wood Pulp Agreements) Act* 1974. Not less than 45% of the Minimum Annual Supply must be derived from mountain forests.

An important additional source of wood for pulping is provided by the sale of residues from sawmills drawing supplies from the Alpine area. In 1981/82 this amounted to some 70,000 m³ produced from logs obtained from that area.

Australian Paper Manufacturers Ltd is currently in the process of expanding its Maryvale mill, involving the expenditure of some \$130,000,000. The expansion will result in the additional production of 80,000 tonnes of softwood kraft pulp per annum, to replace grades of pulp presently imported from overseas, and 60,000 tonnes of bleached eucalypt kraft pulp per annum. The softwood will be drawn from sources outside the Alpine area. The eucalypt pulpwood will largely come from the company's existing area of supply, controlled by the Forests Commission.

Substantially larger supplies of pulpwood will be needed in the future from forests south of the Great Dividing Range, including the Strzeleckis, to fulfill supply commitments under the *Act*.

Reliability of estimates

The area and timber-volume estimates quoted in this report have been supplied by the Forests Commission. They are the most accurate available, but certain qualifications are necessary.

The area data are based on aerial photo interpretation and field mapping, while the volume data are point estimates of

a resource that is constantly changing due to both biological and economic factors. Biological change takes place through increment - growth minus decay and death. The changes are, however, fairly slow and the estimates are based on current data and criteria. Economic factors affect merchantability - that is, the cost of harvesting in relation to quantity, quality, access, and market prices.

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P.A. Management Consultants Pty Ltd (1976). 'Socio-economic Study of the Timber Industry in the Alpine Area.' (Report to the Forest Industries Resources Management Group.)

Timber Supply Review. (Quarterly publication, Australian Government Publishing Service; Canberra.)

Note:

A study of the future of the sawmilling industry in the Mansfield area, conducted by the Shire of Mansfield and funded by the Department of Community Welfare, is currently in progress.

9. RECREATION

The wide variety of recreational opportunities throughout the Victorian Alps attract many thousands of visitors each year. The activities pursued include bushwalking, fishing, camping, motorized touring, horse-riding, downhill and cross-country skiing, and deer-hunting.

Little statistical information is available about the level to which various recreational activities are pursued in the Alpine area. However, estimates of visitor numbers have been supplied by the Forests Commission and National Parks Service and, as a result of recent studies, considerable information is available on the ski industry.

The data from the Forests Commission relate to the use of some of the more popular areas outside parks and are included in the block descriptions.

Two of the national parks in the Alps have recently come under the management of the National Parks Service and only preliminary estimates on the level of usage are available. The Service has estimated that some 20,000 visitor days are spent annually in the Bogong National Park. The figures show a marked summer maximum in visitor use here, most winter activity in the region being in the Falls Creek and Mount Hotham alpine ski resorts.

Ski resorts

Visitor use of Victoria's ski resorts increased at an annual rate of 12% between the 1978 and 1981 snow seasons (see Figure 1). The Ski Industry of Victoria Working Party (1980) estimated that the ski industry and related snow sports contributed about \$143 million annually to the State's economy.

The major residential ski resorts had a maximum daily population of 30,000 in 1980. If the growth rate of the industry is sustained, these residential resorts will need to be developed to their optimum by 1985, giving a total daily capacity of 47,500 visitors (see Table 5). The non-residential resorts (Lake Mountain and Mount Donna Buang) have a total potential daily capacity of 15,000 visitors.

Current works and proposals for each of the existing resorts are described below.

Mount Buller has about 5,500 beds, and redevelopment of the village centre could increase this number to 7,000 by 1985. At present, there are no plans for developing additional bed capacity, and the ultimate maximum number for this resort would probably be less than 8,000.

Falls Creek Committee of Management, in 1981, released plans for the expansion of the village. Although no further action

has been taken at this stage, the planned works would increase bed capacity to between 4,200 and 4,700.

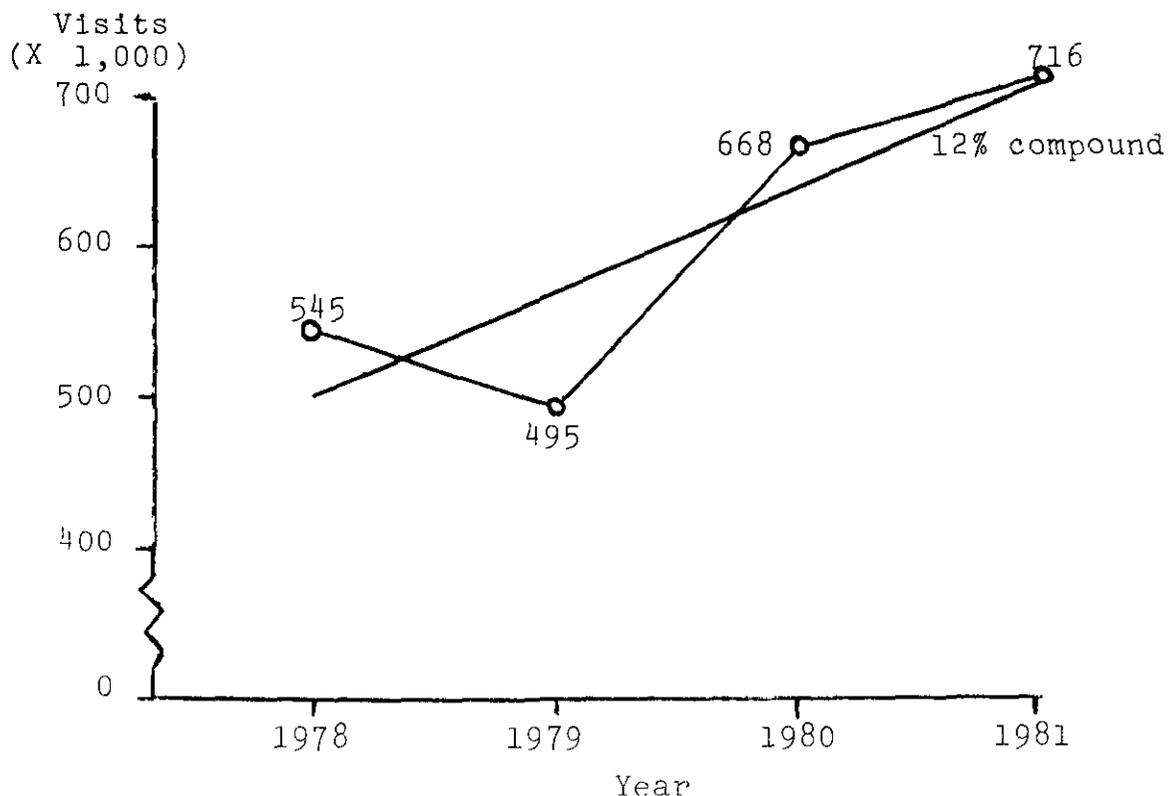
Mount Hotham development works will be subject to a full environmental investigation, which will determine the acceptability of achieving the recommended optimum daily capacity of 7,000 visitors. Current building approvals at Mount Hotham could bring the total bed number to almost 4,000 by 1984, and include a 900-bed complex on the freehold site on the Mount.

Mount Baw Baw (outside the study area) is currently restricted in development by a number of factors - one of which is road access. The Forests Commission is investigating ways of overcoming the limiting factors so that the recommended daily optimum of 7,000 visitors may be achieved.

Mount Buffalo, also outside the study area, has reached its optimum capacity and no new ski-slope or lift-development works are being considered.

Figure 1

VISITOR USE - VICTORIA'S SKI RESORTS



Source: Forests Commission, Victoria.

Table 5

RESORT VISITORS AND OPTIMUM CAPACITY

Resort	Maximum daily population (1980)	Optimum daily population (1985)
Mount Buller	14,000	20,000
Falls Creek	5,500	9,500
Mount Hotham	3,500	7,000
Mount Baw Baw	3,000	7,000
Mount Buffalo	4,000	4,000
Lake Mountain	4,000	8,000
Mount Donna Buang	7,000	7,000
Totals	41,000	62,500

Table 6

SNOWFIELD ACCOMMODATION (1982)

<u>Resort</u>	<u>No. of beds</u>
Mount Buller	5,500
Falls Creek	3,500
Mount Hotham	2,200
Mount Baw Baw	540
Mount Buffalo	260

New and proposed resorts

The development of Mount Stirling as a resort for downhill and cross-country skiing was recommended by the Land Conservation Council. Following the release of the report by the Ski Industry of Victoria Working Party (1980) in which it was stated that the existing resorts would reach optimum capacity by 1985, planning for the new resort commenced, with the Forests Commission as the lead agency.

At this stage, draft working papers have been published and public submissions invited on a number of possible development options for the area. It is expected that the final development plan will be published in August 1983.

The government has recently approved the private development of a 2,000-bed ski village on freehold land at Dinner Plain -

east of Mount Hotham on the Omeo Road. Following appropriate amendment to the Interim Development Orders for the Shire of Omeo, construction should start in November 1982, with substantial work being completed for the 1983 season.

Construction of this village will be subject to a number of safeguards related to the provision of services and the protection of the adjacent Bogong National Park and surrounding public land. The resultant increase in visitors to the Mount Hotham Alpine Resort will place an increased load on the essential services of the resort, and could generate an increased demand for ski tows and runs.

Several other proposals for the development of new resorts have been put forward by private developers, but none has been approved by the government.

Cross-country skiing

The popularity of cross-country skiing is growing at an annual rate of about 10% (Ski Industry of Victoria Working Party - 1980). Although not originally designed to accommodate this form of recreation, the existing resorts now provide some facilities - such as marked trails, instruction, and ski hire. A specific requirement in the development of the new Mount Stirling resort is to provide for cross-country skiing.

In 1976 at Lake Mountain, which is outside the area under investigation, cross-country skiers made up 13% of the 40,000 visitors.

By 1981, the number of visitors had increased to 125,000, of which 26% were cross-country skiers.

During the 1981 snow season, 23,100 visitor-days were recorded for Mount Stirling. Of the 16,955 visitors surveyed during this period, almost 87% listed cross-country skiing as one of their activities. Other activities included:

Snow play	29%
Sight-seeing	27%
Snow camping	16%
Tobogganing	15%

Its relatively reliable snowfalls, spectacular scenery, and the opportunity to ski on extensive areas above the tree line make Bogong National Park one of the most important cross-country skiing areas in the State. The northern section of the Wonnangatta-Moroka National Park contains some of the more remote and difficult ski-touring areas (such as along the Cross-cut Saw), while the southern section is increasing in popularity for the less-experienced skiers.

Other important areas for cross-country skiers include the Dargo and Bennison Plains, The Bluff, Mount Skene, and Mount Wills.

Water sports

At present, there are limited opportunities for recreation along the margins of Dartmouth Lake, although possible uses are being investigated. Boat-launching facilities are available, but houseboat-type craft and water-skiing are not permitted. Camping on the foreshore is also prohibited, except at two campsites where basic facilities are provided, one of which is not accessible by motor vehicle.

Deer-hunting

The Australian Deer Association conducted a survey of its members in 1980 to determine the numbers of deer taken using each of the main methods of hunting. This survey (with 206 respondents) covered the entire range of sambar deer in the State and it was not possible to isolate information for the Alpine area alone. About 48% of the hunters used stalking only and 15% used hounds only, while the balance used both hounds and stalking. The 206 respondents had taken a total of 220 deer. With an estimated total of some 1,500 hunters of varying skills in the State, it is possible that the annual kill of deer could exceed 1,000, about half of which could be taken in the Alpine area.

Deer-hunting is influenced by the density of the animal population and by access. If deer numbers are high and access relatively easy, such as in the Jamieson--Howqua River area, use by hunters will be high.

Each of the block descriptions in Part III includes comments on its importance for deer-hunting, as supplied by the Australian Deer Association.

Reference

Ski Industry in Victoria Working Party (1980). 'Report.'
(Government Printer: Melbourne.)

10. CATTLE-GRAZING

The Soil Conservation Authority applies grazing controls over some 71 licensed areas of land adjacent to, or above, the 1,220-metre contour. Depending on the conditions at the time, up to 11,000 head of cattle may graze these runs during the 1982/83 season.

The Soil Conservation Authority sets up District Advisory Committees (DACs) to consider and report upon all matters relating to land utilization, soil erosion, or conservation within their districts. Currently the Authority is reorganizing the structure of DACs across the State and will shortly form an Alpine District Advisory Committee to cover an area that will approximate the Land Conservation Council's Alpine area. This Committee will make recommendations to the Authority on all matters related to land utilization and, in particular, the matters of earthworks and grazing above 1,220 metres. To assist in these responsibilities, the DAC will appoint local committees comprising cattlemen and representatives of involved government departments to advise on grazing matters such as the entry and exit dates, maximum cattle numbers, and any other items of a soil conservation nature referred to them by the DAC.

The grazing areas covered will be: Mansfield; Snowy-Bennison-Dargo High Plains; Nunniong-Gelantipy-Benambara; and Bogong High Plains.

A number of studies are in progress investigating various aspects of the ecology of alpine areas, including one on the diet and behaviour of cattle on the Bogong High Plains. These are listed in Chapter 7. The short period over which most of these studies have so far been conducted does not at this stage allow firm conclusions to be drawn, but progress reports of some of the studies have been prepared.

The Soil Conservation Authority is currently investigating the areas held under licence in the southern portion of the Bogong High Plains to determine the extent to which the licensing arrangements could be reorganized to provide replacement grazing for cattle affected by the phasing out of grazing from the northern section of the National Park.

11. WATER UTILIZATION

Since publication of the original Alpine area descriptive report, the following three water supply projects have been either undertaken or proposed:

The Dartmouth dam has been completed, and storage at July 1982 was at 73% of its 4-million-megalitre capacity. A 150-megawatt hydro-electric generating station, giving an annual output of 330 million kilowatt-hours, has been constructed near the dam.

A proposal to divert water from the Delatite River - to supply the townships of Mirimbah and Merrijig - has been put forward, although the details of this scheme have yet to be finalized.

The Mount Stirling alpine resort development will require a reticulated water supply and sewerage services. This project is only at an early stage of planning, however, and design details are not yet available.

Also since publication of the original report, further measures have been taken to protect the water supplies from certain catchments within the study area. On the recommendation of the Land Conservation Council, the Governor-in-Council has proclaimed three water supply catchment areas since 1979:

* King River (to Lake William Hovell)	332 sq.km
* Buckland River	322 " "
* Mitchell River	3,900 " "

Investigations for future proclamations are being conducted in the catchments of the Buchan and Tambo Rivers.

Following proclamation of a catchment, the Soil Conservation Authority may make a land use determination, which provides the mechanism for controlling land use activities that may adversely affect water catchment values. Investigations for such land use determinations are in progress for the following:

- * Mitchell River proclaimed water supply catchment
- * Delatite River catchment (part of the Eildon proclaimed water supply catchment)
- * an area of unreserved Crown land in the East Kiewa River catchment (part of the Upper Kiewa River proclaimed water supply catchment)

12. MINERAL EXPLORATION AND MINING

Mineral exploration

Data on metallic minerals used in the original Alpine area report were compiled in 1975. Since that time, mineral exploration has greatly increased, primarily due to the discovery of mineralization in the Benambra area. Hitherto unsuspected types of ore deposits have been identified, and re-evaluation of the ground with different ideas and techniques and new technologies may continue to reveal further new deposits.

Furthermore, mineral deposits currently regarded as uneconomic may become economically viable in the future, and some minerals not used at present may one day become important.

The increase in mineral exploration in the Alpine area is due in large part to the efforts of a joint venture between Western Mining Corporation Ltd and British Petroleum Mining Development Aust. Pty Ltd (WMC-BP) in the Benambra area. Their application of a particular exploration concept and the resultant location of bodies of mineralization has increased WMC-BP efforts as well as encouraging other mineral exploration groups into the area. The rock groups that WMC-BP has proved to have potential for base-metal mineralization occur in the eastern portion of the study area and contiguous parts of Gippsland.

Zones with mineral potential in the Benambra area are located both inside and outside the Cobberas--Tingaringy National Park. Exploratory work initially was concentrated within the park but is now also proceeding in areas to the west. The results of evaluation by drilling of the mineralization, so far announced by WMC-BP, indicate deposits of copper, zinc, and silver. The tonnage of mineralization discovered to date will not support an economic operation at current metal prices. However, exploration is still at an early stage and areas both within and to the west of the park require far more detailed work than they have received to date to test their mineral potential exhaustively. It should be noted that in Australia, during the period 1967-72, the cost of mineral exploration averaged \$12 million per find, with lead times up to 25 years (Lacy 1979; White 1981). To date WMC-BP has committed \$9 million and has been exploring at Benambra for 10 years.

WMC-BP is also exploring near Lake Dartmouth and along the Snowy River. Initial work in the former area indicates promising signs of mineralization in both Silurian volcanic and Ordovician sedimentary series of rocks. Very little work has been done in the latter area, which is within the Snowy River National Park. In recent times WMC-BP has carried out reconnaissance, stream sediment, and - in some cases - soil samp-

ling surveys. The results available to date indicate prospects that will require follow-up exploration.

As previously stated, the efforts of WMC-BP have encouraged other exploration groups to assess the mineral potential of the Palaeozoic volcanic and sedimentary associations in the east of the study area. These groups include the following.

- * Essex Minerals Company is currently mapping and drilling to determine the economic potential of mineralized zones in the South Mammoth--Turnback Creek area, Frazer Tableland area, and Morass Creek gorge. These areas are within unreserved Crown land and reserved forest.
- * Freeport of Australia Inc. has completed initial work and plans follow-up soil and rock-chip sampling on target zones near Gelantipy and Gillingal. The former area contains unreserved Crown land and reserved forest, while the latter incorporates sections of the Snowy River National Park and unreserved Crown land.
- * Australian Anglo American Prospecting Pty Ltd has located anomalous lead and zinc values near 2nd. Emu Flat within the Cobberas--Tingaringy National Park.
- * Preussag Australia Pty Ltd is currently investigating an anomalous zone in the east of licence 552, within reserved forest and the Snowy River National Park.

In addition to the highly prospective rock associations currently being explored by the above companies, other rock types also have mineral potential. The following list summarizes other ore body/rock type associations currently under investigation by mineral exploration companies holding exploration licences in the area:

- * gold or tin associated with quartz veining and stockworks, especially in areas where major fractures or groups of fractures occur
- * porphyry copper--lead--zinc-type deposits associated with granites, their margins, and dykes
- * tin and tantalum associated with greisen-style veins and skarn stratiform bodies
- * molybdenum associated with granites
- * stratiform bodies and lead, zinc, and silver mineralization on Ordovician sediments
- * base metal mineralization and industrial minerals (chromite, corundum) associated with the Cambrian greenstones
- * gold in Lower Carboniferous conglomerates

The renewal of interest in mineral exploration in the Alpine area has, to a certain extent, coincided with government's adoption of the Land Conservation Council's final recommend-

ations for the area and the subsequent introduction of the National Parks Service as a substantial land manager in the Victorian Alps. Most of the area to be managed by the Service has been placed on the Schedule to the *National Parks Act*. Such scheduling affects the issue of licences or leases under the *Mines Act* in two ways. Firstly, a lease or licence application or renewal in such areas requires the consent of the Minister for Conservation, together with any conditions he sees fit to impose. Secondly, such consent shall not come into effect until the application or renewal has lain before both Houses of Parliament for 14 sitting days. These requirements can lead to delays in the issue or renewal of leases or licences.

While the issue of leases or licences for mineral exploration on public land with different forms of tenure are not subject to the same provisions, there are nevertheless requirements that the relevant land managers can impose before exploration proceeds. For instance, on reserved forest and protected forest (uncommitted land) the Forests Commission can specify provisions regarding the clearing of vegetation or the taking of forest produce, and on reserved Crown land permission to enter the land for exploration purposes must be obtained from the land managing authority. Furthermore, where land is in water supply catchments or above 1,220 m the Soil Conservation Authority must be consulted and may specify conditions designed to protect soil stability and water quality.

Mining

While mineral exploration activity has increased recently, no new mines have been opened in the study area. This reflects the State-wide experience that only a very small percentage of prospects reach the stage of an economic ore body. Indeed, since 1965 about 1,200 mineral exploration licences have been issued in Victoria and up to date only two significant ore zones have been located, neither of which has yet proved economic.

References

- Lacy, W.C. (1979). Exploration philosophy and future trends. *Papers, Australian Institute of Mining and Metallurgy. Conference, Western Australia, August 1979*, 17-26.
- White, D.A. (1981). Mineral exploration philosophy in Australia. *Bulletin of Australian Society of Exploration Geophysicists*, 12 (1 and 2), 2.

PART III

BLOCK DESCRIPTIONS

BLOCK DESCRIPTIONS

The original descriptive report divided the study area into 20 blocks to facilitate a detailed description and assessment of natural resources. In this special investigation, the 20 blocks have been amalgamated into five groups. The block names used in the original report have been retained for continuity.

Map D shows the location of the 20 descriptive blocks and the boundaries of the five block groups into which they have been amalgamated.

For such details as the climate, physiography, vegetation and other natural values, and general recreational use in these areas, the reader is referred to the original report. The purpose of the following descriptions is to highlight the recreation, conservation, and timber values outside the existing parks.

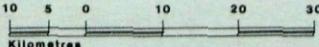
Present levels of use are described, where possible, to give some indication of capability. The figures on annual visitor use have been derived from field observations by Forests Commission staff, visitor-book entries, and in some cases from visitor surveys. Because of their subjectivity, the estimates can be used only as a guide to the level of usage.

For each block group, the figures show the total area of forest, comprising both ash-type and mixed-species forests, and including fire regrowth and areas regenerated following logging as well as mature stands. The most recent estimates of currently available mature log volumes are also listed in each case. Figures used have been rounded, as follows:

- * areas rounded to the nearest 100 hectares
- * volumes rounded to the nearest 10,000 m³
- * relative proportions rounded to the nearest 5%

Alpine Area

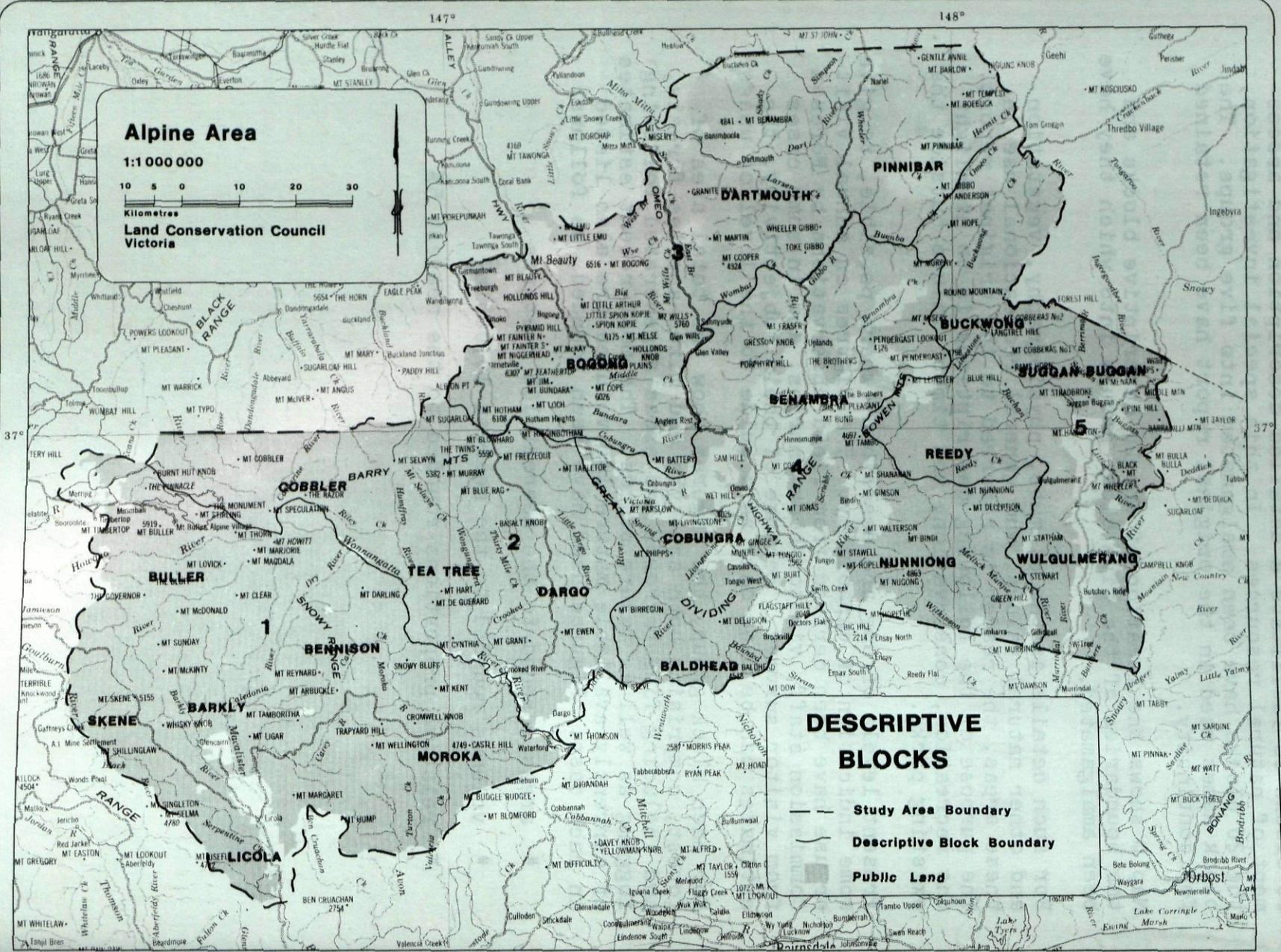
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Land Conservation Council
Victoria

DESCRIPTIVE BLOCKS

- Study Area Boundary
- Descriptive Block Boundary
- Public Land



147°

148°

37°

37°

147°

148°

BLOCK 1
 SKENE, BULLER, LICOLA, BARKLY, BENNISON, MOROKA

Land tenure

<u>Form of reserve</u>	<u>Name</u>	<u>Area (ha)</u>
Park	Wonnangatta--Moroka National Park (greater part of)	81,900
Wilderness	Avon	29,500
Reference	East Caledonia	500
Natural Features and Scenic	Mount Useful, Mount Skene, The Governor, The Bluff--Mount Clear, The Crinoline, Trapyard Hill--Tali Karng, Bennison, Pinnacles--Castle Hill	51,630
Historic	Howqua Hills	1,300
Education	Delatite, Mount Russell, Mount Tamboritha	990
Hardwood Timber Production	Reserved forest	91,000
Alpine Resort	Mount Buller, Mount Stirling	5,060
Stone Production	Warrambat Slate Quarry	9
Other public land	(Uncommitted etc.)	116,000

The Wonnangatta--Moroka National Park dominates the eastern portion of this block. West of the park the spectacular high ridge systems - from Mount McDonald and Mount Clear (on the Great Dividing Range) to Mount Lovick and The Bluff - encompass the north branch of the Jamieson River. Further west again, the prominent peaks of The Governor and Eagle Peaks are isolated in rugged, largely untracked country.

South of the park, high ridges (bearing snow gum woodlands) and snow plains extend to Mount Tamboritha, Gable End, and Castle Hill, and afford extensive views into the headwaters of the Wellington and Avon Rivers and into the Wonnangatta River valley. Lake Tali Karng and the rugged, sparsely--tracked, Avon Wilderness also lie to the south of the Wonnangatta--Moroka park.

Other important landscape features outside the park in this

block are Mounts Buller, Stirling, Timbertop, and Skene, The Crinoline (Mount Ligar), and, to the south, Mount Useful.

North of the Great Divide, the Delatite, Howqua, and Jamieson Rivers drain from this area into the Goulburn River system, while the Macalister and Avon Rivers, and the Wonnangatta River and its western tributaries, drain to the south.

Present Use and Capabilities

Nature conservation

Land within this block but outside the Wonnangatta--Moroka National Park has high nature conservation values.

A number of native plants with very limited distribution within the Alpine area have been identified here. These species, which have not been recorded in Victoria's alpine national parks, include:

- * *Acacia howittii*, a Victorian endemic otherwise known only in the South Gippsland ranges and the upper Macalister River areas
- * *Oxalis magellanica*, a rhizomic herb of wet sub-alpine areas - otherwise known in Tasmania and New Zealand
- * *Pterostylis cucullata*, an uncommon plant that has been recorded along the Victorian coast and on the Howqua and Dolodrook Rivers
- * *Prostanthera rhombea*, a species endemic to the alpine region, which occurs between Licola and Mount Margaret.
- * *Boronia citriodora*, a species found in the Macalister River watershed, which was previously known only in Tasmania.

The area between Trapyard Hill, Lake Tali Karng, and Lamb Hill contains a number of significant native plant species. These include *Botrychium australe*, *Coprosma pumila*, *Eucalyptus kybeanensis*, *Helichrysum rogersianum*, *Plantago glacialis*, *Plantago muelleri*, *Prasophyllum densum*, *Pratia gelida*, *Uncinia compacta*, *Lomandra micrantha* var. *sororia*, and a dwarf form of *Tetratheca pilosa*. While all bar the last two species are already represented in one or more of the alpine parks, the site's unusual concentration of important plant species affords it a high botanical significance. Furthermore, the type locality for *Ranunculus millanii*, *Acacia alpina*, and *Trochocarpa clarkei* is within this area. at Mount Wellington.

Other areas of botanical importance are Mount Skene, the summit of which supports four significant species, and Mount Buller, which is the type locality for nine species.

As well as having botanical interest, the attractive riverine

stands of manna gum along the Castleburn Creek and the Macalister, Caledonia, and Barkly Rivers support diverse bird populations. Other areas of faunal significance occur:

- * on Mount Timbertop, where the broad-toothed rat, a species of limited abundance and distribution, has been recorded
- * at the junction of the Barkly and Macalister Rivers, which is the type locality for the butterfly *Holochila consimilis goodingi*
- * near Breakfast Creek, where the seldom-observed chocolate-wattled bat has been recorded

Public land outside the park contains a number of features of geological and/or geomorphological interest, including Castle Hill, Gable End, The Bluff, The Crinoline, and deposits of Cambrian greenstone at Lickhole Creek and Sheepyard Flat. Two areas of particular significance are:

- * the divide between the Dolodrook and Wellington Rivers, which contains one of the richest Cambrian and Ordovician fossil faunas in the State
- * Lake Tali Karng, which is the only natural, deep, highland lake on continental Australia that is not of glacial or volcanic origin

Recreation

Highly scenic mountainous country, a wide range of recreational opportunities, and the relatively close proximity to Melbourne give this block a very high capability for recreation.

The uses and capabilities of many of the popular recreation areas are set out in the original report. Mount Buller has been extensively developed for downhill skiing, and Mount Stirling is reserved for development for both downhill and cross-country skiing. At present, Mount Stirling is used for snow-related activities (more than 23,000 visitors in the 1981 snow season), as well as for bushwalking and motorized recreation.

Outside the ski resorts and the national park, most recreational activities take place along the major rivers, in the region between the Howqua River and the Great Divide, and in the region between the Wellington River and the Wonnangatta--Moroka Park. These last two regions, and the contiguous areas in the park, are among the most important in the Victorian Alps for bushwalking. During winter, the higher-altitude areas here are also used for cross-country skiing.

Commercial horse-riding safaris from Merrijig and Valencia Creek, canoe streams, important trout streams,

and tourist roads linking with a network of major logging roads suitable for scenic driving, all add to the area's popularity.

Deer-hunters make regular use of this block, especially in the Jamieson--Howqua River (Mitchells) area, and generally rate it highly for hunting, both with hounds and by stalking.

Near the highly popular Sheeppyard Flat, on the Howqua River, are the remnants of a small gold-mining centre. These include a tunnel cut through a spur (to divert the waters of the Howqua River) at Tunnel Bend, a water race, and a brick chimney (remnant of the smelting furnace). This area is also popular for bushwalking, camping, fishing, deer-hunting, horse-riding, and canoeing.

ANNUAL VISITOR USE

Location	Main activity	Estimated use: (visitor days)
Alpine Walking Track	Bushwalking, camping	4,500
The Bluff	Bushwalking, cross-country skiing, horse-riding	2,300
Mount Skene	Picnicking, sight-seeing, pleasure driving, bushwalking, cross-country skiing	2,500
Mount Useful	Sightseeing	1,000
Tali Karng-- Trapyard Hill	Bushwalking, camping	12,000
	Sightseeing, pleasure driving, bushwalking	9,000
Moroka River-- Pinnacle Creek	Bushwalking, four-wheel driving	4,000
Wellington River	Bushwalking, camping, fishing, canoeing, four-wheel driving	17,000
Bennison Plain	Bushwalking, cross-country skiing, fishing (base)	6,000
Caledonia River--	Fishing, four-wheel driving, camping	8,000
Middle Ridge-- Bull Plain	Bushwalking, camping, fishing, four-wheel driving, trail bikes, deer-hunting, canoeing	12,000
Mount Stirling	Snow-oriented activities (also bushwalking and motorized recreation)	23,100

Opportunities for environmental education are provided with the reservation of three education areas in this block, as well as school camp sites at Holmes Plain, at Breakfast Creek, and on the Wellington River.

The table on page 40 indicates the estimated visitor use of some of the popular areas in the block.

Wood production

The block contains 58,200 ha of ash-type forests and 253,800 ha of mixed-species forests. Of those 312,000 ha, a total of 36,900 ha (24,100 ha ash-type and 12,800 ha mixed-species) has been estimated to be suitable for wood production. These estimates represent about 40% of the area carrying ash-type forests and about 5% of the mixed-species present in the block. The remainder is included in parks and other formal reservations, is unavailable due to prescriptions that prevent logging near streams and on excessively steep slopes, or is unsuitable for commercial production. The area that can be logged includes about 28,600 ha in land reserved for hardwood production and 7,400 ha in uncommitted land. A further 900 ha within parks and other reserves will be available for logging on a once-only basis. The above estimates of areas that can be logged include fire regrowth and areas regenerated following logging as well as the mature stands. The mature stands available for logging in the block total 11,200 ha (3,100 ha ash-type and 8,100 ha mixed-species).

The mature sawlog resources that can be harvested from the block are estimated to be 210,000 m³ of ash-type and 260,000 m³ of mixed-species. These volumes represent about 10% and 20% respectively of the estimated available sawlog volumes in the study area.

Approximately 55,000 m³ of logs from this block are converted at sawmills in Mansfield, Jamieson, Benalla, Whitlands, Heyfield, and Stratford. In addition, most of the hardwood pulpwood supplied to Australian Paper Manufacturers Ltd pulpwood paper mill at Maryvale currently comes from this block.

Water production

The State Rivers and Water Supply Commission has assessed the long-term water requirement for the Latrobe valley. As part of this assessment, a dam site has been identified on the Macalister River downstream from Licola. Construction of such a dam, which could impound 350,000 ML, is not expected in the foreseeable future.

Cattle-grazing

Between them 28 graziers hold a total of 45 grazing licences over public land in this block. Of these, 35 licences lie outside parks, 3 licences lie inside parks, and 7 overlap park boundaries. Cattle from home properties located in the Mansfield--Merrijig area graze the northern park of the block, while those from home properties located in Gippsland - at Heyfield, Licola, Glenmaggie, Briagolong, and Valencia Creek, - graze the southern part.

Grazing is usually carried out in the warmer months, November to April, although some areas, mainly in the river valleys, carry stock during winter. The cattle graze the grassy understoreys of alpine ash forests and snow gum woodlands and the alpine open areas that occur along the higher ridges and streams. Such areas occur between Mount Useful and Spring Hill, the Nobs and Mount Skene to Connors Plain, and the Wellington Plateau. Grazing also takes place in the Howqua, Jamieson, Delatite, Wellington, Carey, and Doldrook River valleys - in narrow-leaf peppermint and manna gum forests with grassy understoreys.

Average capability for bush grazing is moderate, although alpine ash forests and snow gum areas have a higher capability. The manna gum and narrow-leaf peppermint forests along the Wellington, Carey, and Doldrook Rivers have value for winter grazing.

Grazing will be withdrawn from the high-altitude areas of The Bluff and Mount Howitt by 1991. The East Caledonia reference area and the Avon Wilderness (from which cattle will also be excluded) are located in this block.

BLOCK 2

COBBLER, TEA TREE, DARGO

Land tenure

<u>Form of reserve</u>	<u>Name</u>	<u>Area (ha)</u>
Parks	Wonnangatta--Moroka National Park (portion of)	23,900
	Bogong National Park (portion of)	7,100
	Wabonga Plateau State Park (extension)	3,100
Reference	Wonnangatta River, Mount McAdam, Thirteen Mile Spur, Blue Rag, Boiler Plain, Lagoon Plateau, Shepherds Creek	4,210
Natural Features and Scenic	Mount Sarah, Barry Mountains, Mount Freezout, Blue Rag Range, Dargo High Plains	6,610
Historic	Grant	7,500
Hardwood Timber Production	Reserved forest	80,600
Alpine Resort	Mount Hotham (part of)	1,400
Other public land	(Uncommitted etc.)	102,900

Located between the Bogong and Wonnangatta--Moroka National Parks, this block's major physiographic features outside the parks are the north--south-trending Tea Tree Range and the Paw Paw and Dargo Tablelands. The portion of the Great Divide here rises from 950 m at Barry Saddle in the west to The Twins (1,701 m) and Mount St Bernard (1,548 m) in the east.

The block contains the upper reaches of a number of north-flowing streams, including the King and Buckland Rivers. South-flowing streams here are the eastern tributaries of the Wonnangatta River, including the Wongungarra and Dargo River systems.

Present Use and Capabilities

Nature conservation

Significant areas of alpine and sub-alpine environments in this block are outside the parks. They include sub-alpine grasslands, wet heathlands, and mosslands, which occur at various places on the Dargo and Paw Paw Tablelands, and alpine heathlands and herbfields on the southern aspect of Mount Murray, The Twins, and Blue Rag Range. Sub-alpine snow gum woodlands occupy the higher elevations on the Tea Tree and Blue Rag Ranges, the Dargo and Paw Paw Tablelands, and the Barry Mountains.

Several significant native plant species not represented in the park system have been identified in this block. These include:

- * *Eucalyptus neglecta*, endemic to the Victorian highlands, which occurs in the headwaters of the Buckland River and Shepherds Creek
- * *Wahlenbergia densifolia* and the extremely rare *Epilobium willisii*, both of which are found at Lankey Plain on the Dargo Tablelands

The Dargo Tablelands support an interesting bat population of great pipistrelle, Gould's wattled bat, and the chocolate wattled bat. They also support the oak skink, which, in alpine areas, is restricted to these tablelands through to Mount Feathertop. Other significant faunal species include the smoky mouse, which has been recorded at Galbraith Saddle on the Tea Tree Range, and broad-toothed rat, which has been recorded near Mount Hotham and The Twins.

Recreation

The Alpine Walking Track traverses this block along the Barry Mountains - between Mount Speculation and Mount Hotham. Some 6,500 bushwalkers are estimated to use this portion of the Track annually. Other popular bushwalking areas include Blue Rag Range, Dargo High Plains, and the historical township and mining sites to the south. The Dargo River valley offers considerable bushwalks in a largely unroaded area.

Access is achieved from the north through this block, to Mount Cobbler and Mount Speculation - in the Wonnangatta--Moroka National Park. Portion of the Mount Hotham Alpine Resort also falls within this area.

The block receives moderate usage by four-wheel-drive vehicles and trail bikes, the Grant historic area being a popular venue. The King River valley - another popular four-wheel-drive destination for both fishing and camping - is also considered valuable as an area in which to hunt deer, using hounds. Elsewhere in the block the use of hounds for

hunting is limited, although it is a popular area for hunting by stalking.

Important fishing waters are found along the Wonnangatta River and its tributaries, and along the north-flowing streams. Gold fossicking is common along the Dargo River.

The accompanying table indicates the estimated visitor use of some of the popular recreation areas in the block.

ANNUAL VISITOR USE

Location	Main activity	Estimated use: (visitor days)
Alpine Walking Track	Bushwalking, camping	6,500
High Plains, Talbotville	Bushwalking, four-wheel-driving, trail bikes, sightseeing, fossicking, fishing, camping, deer-hunting	12,000

Wood production

The block contains 39,000 ha of ash-type forests and 152,200 ha of mixed-species forest. Of those 191,200 ha a total of 30,000 ha (22,000 ha ash-type and 8,000 ha mixed-species) has been estimated to be suitable for wood production. These estimates represent about 55% of the area carrying ash-type forests and about 5% of the mixed-species in the block. The remainder is either unavailable or unsuitable for timber production for the reasons given in the block 1 description. The area that can be logged includes about 19,400 ha in land reserved for hardwood production and 10,300 ha in uncommitted land. A further 200 ha within parks and other reserves will be available for logging on a once-only basis. The above estimates of areas that can be logged include fire regrowth and areas regenerated following logging as well as mature stands. The mature stands total 12,100 ha (5,800 ha ash-type and 6,300 ha mixed-species).

The mature sawlog resources that can be harvested from the block are estimated to be 560,000 m³ of ash-type and 200,000 m³ of mixed-species. These volumes represent about 20% and 15% respectively of the estimated available sawlog volume in the study area.

Approximately 39,000 m³ of logs from the block are converted at sawmills in Mansfield, Benalla, Whitlands, Dargo, and the Ovens River valley.

Some hardwood pulpwood supplied to Australian Paper Manufacturers Ltd Maryvale paper mill comes from this block.

Cattle grazing

Of a total of 34 grazing licences held by 15 graziers over public land in this block, 29 licences cover areas wholly outside parks, while five overlap park boundaries. These graziers have home properties around Mansfield, Merrijig, the Buffalo and Buckland River valleys, and Tawonga in north-eastern Victoria, at Valencia Creek, Crooked River, Dargo, Castleburn, and the Stratford district in Gippsland, and at Cobungra.

About twice as many cows with calves as dry cattle graze here. Most are Herefords, although some Angus graze the river flats along the Dargo, Wongungarra, and Crooked Rivers.

Cattle graze the narrow-leaf peppermint, swamp gum, and manna gum forests of the river valleys and lower slopes all year round, but grazing is restricted to the summer months at higher elevations, where cattle graze on open plains and in snow gum and alpine ash forests. Lower-elevation areas grazed in this block include the valleys of the King, Dandongadale, Catherine, Buffalo (East and West branches), Buckland, Humffray, Dargo, Wongungarra, and Crooked Rivers, and Mount Selwyn Creek. Higher-elevation areas are grazed on the Dargo Tablelands and west of the Cobbler Plateau.

Capability for bush grazing varies. Grassy snow gum woodlands, snow gum--mountain gum forests, open plains, and grassy river valleys have a relatively high capability. Carrying capacity in some valleys have been increased by the removal of small trees, application of superphosphate, and introduction of clovers. The central parts of the block have a low to moderate capability, but their use could be improved by better access. St John's wort and blackberries in some sections of the river valleys reduce their capability.

Cattle are excluded from the Mount Hotham area and between The Twins and Mount Higginbotham, and they will be withdrawn from the Wabonga Plateau State Park by 1991. Seven reference areas, from which cattle will also be excluded, are located in this block.

BLOCK 3

BOGONG, DARTMOUTH, PINNIBAR

Land tenure

<u>Form of reserve</u>	<u>Name</u>	<u>Area (ha)</u>
Parks	Bogong National Park (major part)	72,500
	Cobberas--Tingaringy National Park (portion of)	7,300
Reference	Hollonds Knob, Whiterock Creek, Lightwood	1,120
Natural Features and Scenic	Mount Wills, Granite Peak, Mount Benambra, Mount Cravensville, Mount Barlow, Thowla headwaters, Pinnibar, Wild Boar Range	3,900
Education	Sunnyside	310
Timber Production	Reserved forest	115,600
Water Production	Dartmouth Reservoir	8,700
Electricity Production	East Kiewa	4,300
Alpine Resorts	Hotham (part of) and Falls Creek	3,160
Other public land	(Uncommitted etc.)	126,000

The high tablelands that comprise most of the western part of this block are included in the Bogong National Park. To the east, the moderately dissected mountain and foothill country includes the site of the Dartmouth dam on the Mitta Mitta River. Further east, the physiography becomes deeply dissected and mountainous, and near the Murray River portion of the Cobberas--Tingaringy National Park forms the eastern boundary of the block.

Present Use and Capabilities

Nature conservation

Most of the distinctive alpine vegetation assemblages in this block are contained within the Bogong National Park. However, areas of alpine heathland occur on the summit of Mount Pinnibar and the southern faces of the nearby ridge crests and on Mount Wills. More substantial areas of sub-alpine snow gum woodlands occur at Mounts Wills, Benambra, Sassafras, Gibbo, and Pinnibar.

Significant native plant species identified in this block include:

- * *Acacia dallachiana*, a Victorian endemic found at Mount Wills, at Trappers Gap, and on Zulu Creek (also found in the Mount Buffalo National Park)
- * *Acacia dawsonii*, which has its only known Victorian occurrence at Mitta Mitta
- * *Chiloglottis pescottiana*, an extremely rare species found at Cravensville (also found in the Croajingalong National Park)

The rare and restricted mountain pigmy possum has been recorded in areas within the Mount Hotham Alpine Resort and at Mount McKay. This species was first recorded as a living animal in the alpine resort area, and has its highest population density on Mount Higginbotham, within this area.

Other significant faunal species include the rare sheoak skink, which occurs near Mount Hotham, the seldom-observed great pipistrelle, which has been recorded near Dartmouth Reservoir, and the rare amphibian *Litoria maculata*, which is found in Mount Wills and Lightning Creeks. Murray cod, the rare Macquarie perch, and the very rare trout cod are found in the Mitta Mitta River.

Sites of geological and/or geomorphological interest occur at:

- * Mount Wills, with its large granite tors and east-facing cliffs
- * the junction of the Gibbo and Mitta Mitta Rivers, where excellent exposures of the Silurian Wombat Creek Group of sediments and associated caves occur (much of the rock exposures and at least one of the caves will be flooded by the Dartmouth Reservoir)
- * the Morass Creek gorge, where the youngest-known basalt flows in eastern Victoria are well displayed

Recreation

Following construction of the Dartmouth Dam, the Alpine Walking Track was rerouted to cross the Mitta Mitta River south of Lake Dartmouth. The Track now branches from its original route at Mount Wills, crosses the Omeo Highway near Sunnyside and the Mitta Mitta River north of Mount Fraser, and rejoins the original route along the Eustace Gap Track. The Alpine Walking Track is used, in this block, by bushwalkers, trail bikes, and some four-wheel-drive vehicles.

Outstanding views of the Kosciusko National Park are available from Mounts Sassafras, Gibbo, and Pinnibar - all on the Alpine Walking Track. The last-named mount also has a ski-hut.

Boating on the 6,200-ha Lake Dartmouth is restricted to craft without sleeping or toilet facilities, and water-skiing is prohibited.

The Mitta Mitta River is used for canoeing as far upstream as Glen Valley. Many streams in this block are also popular for fishing.

By far the most heavily used recreational areas in this block are the Bogong National Park and the Mount Hotham and Falls Creek Alpine Resorts; the park receives maximum use during summer, while the resorts are basically for winter sports.

This block receives very little use by deer-hunters using hounds, and only moderate use by deer stalkers.

Estimated visitor use of some of the popular recreation areas are given in the accompanying table.

ANNUAL VISITOR USE

<u>Location</u>	<u>Main activity</u>	<u>Estimated use: (visitor days)</u>
Alpine Walking Track	Bushwalking, trail biking, some four-wheel-driving	5,000
Omeo Highway-- Snowy Creek	Picnicking, camping, fishing	14,000
Mitta Mitta River	Canoeing	1,000
Mount Wills	Sightseeing, bushwalking snow play, cross-country skiing	1,000
Bogong National Park	Bushwalking, camping, cross- country skiing, horse-riding, competitive events (running, orienteering, skiing)	20,000

A number of settlements were established here during the gold-mining era, and some relics may still be found. These include Zulu Creek (the water-wheel from here is now in Omeo), a battery on Green Creek, and the Old Wombat post office.

Wood production

This block contains 78,200 ha of ash-type forests and 186,400 ha of mixed-species forest. Of those 264,600 ha a total of 31,700 ha (24,100 ha ash-type and 7,600 ha mixed-species) has been estimated to be suitable for wood production. These estimates represent about 30% of the area carrying ash-type forests and about 5% of the mixed-species. The remainder is either unavailable or unsuitable for timber production for the reasons given in the block 1 description. The area that is suitable for wood production includes about 22,700 ha in land reserved for hardwood production and 8,500 ha in uncommitted land. A further 500 ha within parks and other reserves will be available for logging on a once-only basis. The above estimates of areas that can be logged include fire regrowth and areas regenerated following logging as well as the mature stands. The mature stands available for logging in the block total 16,600 ha (9,200 ha ash-type and 7,400 ha mixed-species).

The mature sawlog resources that can be harvested from the block are estimated to be 870,000 m³ of ash-type and 180,000 m³ of mixed-species. These volumes represent about 35% and 15% respectively of the estimated available sawlog volumes in the study area.

Logs from the block are converted at sawmills in the Mitta Mitta and Kiewa Valleys and at Wodonga, Corryong, Mount Taylor and Benambra.

Cattle-grazing

There are 23 graziers holding a total of 27 grazing licences over the public land, of which 16 licences occur outside parks, four licences occur inside parks, and seven overlap park boundaries.

Home properties are located in the Ovens and Kiewa River valleys around Harrierville, Bright, Tawonga, Eurobin, Dederang, the Omeo area, Tom Groggin, and the Corryong area.

Grazing is carried out on the Bogong Tablelands, which are predominantly alpine and sub-alpine herbfields, grasslands, heathlands, mossfields, and snow gum woodlands. Elsewhere alpine ash, peppermint-gum forests, and snow gum woodlands are predominantly grazed. Grazing also occurs in the narrow-leaf peppermint forests in the valley of the Mitta

Mitta River and its tributaries and on the Pinnibar Plateau and Buenba Flats.

Cattle - mostly Herefords used for beef production - are usually taken to the high-altitude grazing areas in December and mustered and taken down about mid April.

Capability for bush grazing is generally low to moderate in the east of the block, being highest in the grassy alpine ash forests. The capability in the west of the block around the Bogong Tablelands is high on the alpine and sub-alpine grasslands, tall herbfields, and grassy snow gum woodlands, but lower on the heathlands.

Grazing has been withdrawn from areas on Mounts Bogong and Feathertop south along the Razorback Ridge, and from Mounts Hotham and Loch. Cattle will also be excluded from a portion of the Bogong High Plains, including the Whiterock Creek and Hollonds Knob reference areas and parts of the Bogong National Park, by 1991. They will also be withdrawn from the Lightwood reference area.

BLOCK 4

COBUNGRA, BALDHEAD, BENAMBRA, NUNNIONG

Land tenure

<u>Form of reserve</u>	<u>Name</u>	<u>Area (ha)</u>
Park	Portion of Cobberas--Tingaringy National Park	2,190
Reference	Spring Creek, Burnside, Porphyry Hill, Wombat Creek, Buenba	2,730
Natural Features and Scenic	Livingstone Creek, Benambra, Creek Cascades, Macfarlane Lookout, Mount Tambo, Nunniong Plain, Nunnet Plain, Bentley Plain, Mount Stewart	5,560
Historic	Victoria Falls, Oriental Claims, Cassilis	3,760
Flora and Fauna	Morass Creek	22
Bushland	Various	60
Streamside	Victoria River	4
Lake	Lake Omeo	758
Timber Production	Reserved forest	125,060
Other public land	(Uncommitted, etc.)	122,660

This block is dominated by basin and plateau country between Swifts Creek and Benambra. Its major geological features - a series of metamorphic rocks - occur in a broad north-south-trending band between The Knocker and Swifts Creek. Most of this land is privately owned. The steep public land flanking the basins and plateaux consists of a variety of igneous and sedimentary rocks. The Nunniong Tablelands dominate the landscape to the east.

The major streams in the block are the Tambo and Timbarra Rivers, which flow south from the Great Divide, while the Gibbo and Mitta Mitta Rivers flow north. Lake Omeo is an outstanding example of a lake developed by drainage disruption due to faulting. The lake-shore features provide an insight into contrasting phases of lake evolution, including wave-cut terraces indicative of wetter conditions and more arid phases leading to the development of a large lunette, a unique land form in the highlands of eastern Victoria.

Present Use and Capabilities

Nature conservation

Several features of special conservation significance, a number of which have been incorporated in natural features and scenic reserves, occur in this block. They include alpine and sub-alpine vegetation communities, consisting variously of snow gum woodlands, sub-alpine grasslands and heathlands, and stands of alpine ash, at Mount Tambo and on the Nunniong Tablelands. Significant plant species include *Oreomyrrhis argentea*, *Wahlenbergia densifolia*, and *Hydrocotyle* sp. aff. *sibthorpioides*, which are found on the Nunniong Plain, and an undescribed *Eriostemon* species that occurs on Mount Stewart. Important woodlands of Omeo gum, black sallee, and mountain swamp gum, together with associated grasslands and heathlands, grow along Livingstone Creek. Interesting geological and geomorphological features are the distinctive rocky scarps and cliffs at Macfarlane Lookout, the conglomerate mountain range that forms Mount Tambo, the open plains on the Nunniong Tablelands, and Lake Hill (a basaltic plateau that contains a shallow sub-alpine lake). Cascades on the Benambra Creek and waterfalls on the Mellick Munjie Creek are also of interest.

Significant plant species that do not occur within natural features and scenic reserves are:

- * *Botrychium lunaria*, *Brachycome tenuiscapa*, *Carex capillacea*, *C. raleighii*, and *Turritis gladra*, which are all located near Cobungra
- * *Bertya mitchelli*, *Discaria nitida*, and *Grevillea willisii*, all of which occur near Anglers Rest
- * *Senecio georgianus* and *Thesium australe*, both of which have been recorded at Lake Omeo
- * *Sticherus flabellatus*, which is known only in the upper reaches of Pheasant Creek and far-eastern Gippsland
- * *Cymbonatus lawsonianus* and *Discaria pubescens*, which have been identified west of Omeo
- * *Helicyrsum adnatum* and *Pimelea dichotoma*, which are found above Marble Creek near Bindi

The area around Sunnyside, east of Mount Wills, is significant as it is the only area in east Gippsland where Leadbeater's possum has been recorded.

Recreation

A distinctive recreational feature of this block stems from the historical associations and relics of the gold-mining area, such as at Sunnyside, and especially at Cassilis and oriental claims near Omeo. Many streams in the block are gold-bearing and, therefore, fossicking is a popular activity.

The accompanying table indicates the estimated visitor use of some of the popular recreation areas.

ANNUAL VISITOR USE		
<u>Location</u>	<u>Main activity</u>	<u>Estimated use: (visitor days)</u>
Anglers Rest, Omeo Valley, Gibbo	Camping, fishing, trail- bike riding, canoeing	7,000
Haunted Stream	Camping, fossicking, fishing, trail-bike riding, deer-hunting, four-wheel drive touring	< 3,000
Wentworth River	Fishing, deer-hunting, four-wheel-drive touring, sightseeing	1,500
Mount Nugong, Tambo River, 'Moscow Villa' (hut)	Fishing, camping, sight- seeing, picnicking	1,800

Dinner Plain, near the Bogong National Park, is a popular base for cross-country skiers, and the development of a 2,000-bed ski village on freehold land here has recently been approved by government. This village will be oriented primarily towards day visitors to Mount Hotham ski resort.

The Mitta Mitta River, upstream of Lake Dartmouth, is popular for canoeing and, along with many other streams in this block, is important for fishing.

Generally, this block has little value for deer-hunters, although the south-western portion receives moderate usage.

Wood production

This block contains 34,600 ha of ash-type forests and 189,000 ha of mixed-species forest. Of those 223,600 ha, a total of 30,800 ha (19,500 ha ash-type and 11,300 ha mixed-species) has been estimated to be suitable for wood production. These estimates represent about 55% of the area carrying ash-type

forests and about 5% of the mixed-species. The remainder is either unavailable or unsuitable for timber production for the reasons given in the block 1 description. The area that is suitable for wood production includes about 29,500 ha in land reserved for hardwood production and 1,300 ha in uncommitted land. The above estimates of areas that can be logged include fire regrowth and areas regenerated following logging as well as the mature stands. The mature stands available for logging in the block total 11,330 ha (5,500 ha ash-type and 5,800 ha mixed-species).

The mature sawlog resources that can be harvested from the block are estimated to be 500,000 m³ of ash-type and 430,000 m³ of mixed-species. These volumes represent about 20% and 35% respectively of the estimated available sawlog volumes in the study area.

Logs from this block are converted in sawmills at Benambra, Swifts Creek, Ensay, Mount Taylor, Bruthen, Bairnsdale, Nowa Nowa, Buchan and Buchan South.

Mineral exploration

The mineral potential of the Palaeozoic volcanic and sedimentary associations in the east of the study area are currently being assessed by a number of exploration groups. In this block the Essex Minerals Company is currently mapping and drilling to determine the economic potential of mineralized zones in the South Mammoth--Turnback Creek area, Frazer Tableland area, and Morass Creek gorge.

Cattle-grazing

The 32 licences held by 24 graziers over public land in this block all cover land outside parks. These runs are grazed from home properties situated close by - private property is used in conjunction with the surrounding grazing runs. Additional cattle are brought in from home properties around Iguana Creek, Ensay, Tongio, and Bindi and from runs on the Bogong Tablelands.

The areas grazed are the snow gum woodlands, snow gum--mountain gum forests in the higher altitudes such as the Nunniong Tablelands, the narrow-leaf peppermint and broad-leaf peppermint forests along the Mitta Mitta River, the candlebark woodlands on Deep Creek and Buenba River, and grassland along the flats of the Wentworth River.

Grazing is carried out over the warmer months of summer and autumn. At one area (Low Plain), however, the stock are left more or less throughout the year, with additions or removals made according to range conditions and the market situation.

The capability for bush grazing is generally moderate. The runs, however, are well watered and most lie close to home

properties, which increases their value to graziers.

On the Nunniong Tablelands the capability is generally high to moderate. It is high on the well-watered plains and snow gum black sallee woodlands, but low on the dry scrubby plains and snow gum--mountain gum forests.

Cattle will be excluded from the Buenba, Porphyry Hill, Burnside, Spring Creek, and Wombat Creek reference areas.

BLOCK 5

BUCKWONG, SUGGAN BUGGAN, REEDY, WULGULMERANG

Land tenure

<u>Form of reserve</u>	<u>Name</u>	<u>Area (ha)</u>
Park	Cobberas--Tingaringy National Park (greater portion of)	116,200
	Snowy River National Park	15,700
Reference	Tom Groggin, Forest Hill	1,300
Bushland	Various	76
Timber Production	Reserved forest	42,700
Other public land	(Uncommitted etc.)	65,100

Approximately half of this block lies within the Cobberas--Tingaringy and Snowy River National Parks. The remainder consists mostly of dissected terrain or tablelands composed of Devonian igneous rocks.

Public land in the southern portion of the block forms part of the Wulgulmerang Tablelands, which are bounded in the west by the Buchan River and to the east by the Snowy River.

Landscape evolution in the north has been largely influenced by a series of north-easterly-trending faults. This fault control can be seen in the stream patterns and ridges that have developed in the area.

Present Use and Capabilities

Nature conservation

The great majority of the important nature conservation features contained within this block are included in either the Cobberas--Tingaringy or Snowy River National Parks.

Significant native plant species that have been recorded outside the parks include the Omeo gum, which is endemic in the eastern Victorian highlands, an undescribed pennywort (*Hydrocotyle* sp. aff. *sibthorpioides*) at Buenba, and *Discaria pubescens*, a species with very limited distribution that occurs on unreserved Crown land in the vicinity of Little River west of Suggan Buggan. Both the first- and last-named species also occur within the Cobberas--Tingaringy National Park.

Recreation

The most significant recreational features of this block are located in the Cobberas--Tingaringy and Snowy River National Parks. Public land outside the parks has a moderate capability for bushwalking, four-wheel-drive touring, fishing, and camping, but is of low value for deer-hunting.

The area of uncommitted Crown land adjacent to the headwaters of the Murray River (U3 on Map A) has special values for recreation in a relatively unroaded area.

Wood production

This block contains 23,000 ha of ash-type forests and 213,600 ha of mixed-species forest. Of those 236,600 ha a total of 14,800 ha (5,200 ha ash-type and 9,600 ha mixed-species) has been estimated to be suitable for wood production. These estimates represent about 25% of the area carrying ash-type forests and about 5% of the mixed-species. The remainder is either unavailable or unsuitable for timber production for the reasons given in the block 1 description. The area that is suitable for wood production includes about 12,100 ha in land reserved for hardwood production and 1,800 ha in uncommitted land. A further 700 ha within parks and other reserves will be available for logging on a once-only basis. The above estimates of areas that can be logged include fire regrowth and areas regenerated following logging as well as the mature stands. The mature stands available for logging in the block total 6,400 ha (3,800 ha ash-type and 2,600 ha mixed-species).

The mature sawlog resources that can be harvested in the block are estimated to be 320,000 m³ of ash-type and 180,000 m³ of mixed-species. These volumes represent about 15% each of the present estimated available sawlog volumes in the study area.

Logs from this block are converted at sawmills in Benambra and Buchan.

Mineral exploration

As a result of the discovery by Western Mining Corporation Ltd--British Petroleum Mining Development Aust. Pty Ltd (WMC--BP) of base metal mineralization in the Benambra area, mineral exploration activity in this block has increased considerably. Zones with mineral potential are located both inside and outside the Cobberas-Tingaringy and Snowy River National Parks.

One of the most promising prospects so far located is west of the Cobberas--Tingaringy National Park and east of Mount Tambo. Although, at this stage, the tonnage of mineral-

ization that WMC--BP has discovered at this site will not support an economic mining operation, exploration is still at an early stage and further work is required to test the area's mineral potential exhaustively.

Other areas (outside of parks) that preliminary exploratory work has shown to have mineral potential, and that are being actively investigated by exploration companies, include

- * sites in the Gelantipy and Gillingal area on reserved forest and unreserved Crown land
- * a zone within reserved forest east of the Snowy River National Park.

Cattle-grazing

There are 16 graziers holding 24 licences over public land in this block. Three licences occur outside parks, 13 licences occur inside parks, and eight overlap park boundaries.

Cattle graze in a variety of country, including black sallee or swamp gum woodlands, snow gum woodlands, narrow-leaf peppermint forests, snow gum--mountain gum forests, alpine ash forests, the white box woodlands of the Snowy River, and the red stringybark and manna gum forests of the Buchan River valley.

Home properties are located at Tom Groggin, Benambra, Wulgulmerang, Tubbut, and Buchan. Cattle are run on the higher-altitude areas such as Davies Plain, Forlorn Hope Plain, and the Wulgulmerang Tablelands in summer, while the narrow-leaf peppermint forests, white box--cypress pine woodlands, red stringybark, and manna gum forests are grazed in winter.

The Snowy River forms a natural boundary for cattle movements in the east, but in the north the block adjoins the Kosciusko National Park, and has no distinct physical barrier to stock movement. This reduces the level of use that can be attained on runs bordering that Park, where cattle-grazing is prohibited.

The block is important as summer range at the higher elevations and as winter range at the lower elevations. Average capability for bush grazing is high to moderate.

Grazing will be withdrawn from the Snowy River National Park by 1991. Cattle will also be excluded from the Tom Groggin and Forest Hill reference area.

APPENDICES

Appendix 1

COPY

NEWS RELEASE

10 January, 1980

LAND CONSERVATION COUNCIL - ALPINE AREA

JOINT PRESS STATEMENT BY THE PREMIER (THE HONOURABLE R.J. HAMER), THE MINISTER FOR CONSERVATION (THE HONOURABLE W.V. HOUGHTON), AND THE MINISTER OF FORESTS (THE HONOURABLE F.J. GRANTER)

The Victorian Government announced today that it had approved with only minor modifications the final recommendations of the Land Conservation Council on Victoria's Alpine Area.

In a joint statement, the Premier, Mr. Hamer, the Minister for Conservation, Mr. Houghton, and the Minister of Forests, Mr. Granter, said that the area contains Victoria's most spectacular mountain scenery and alpine vegetation. It is important for tourism, water supply and hydro-electricity production, timber, and minerals.

Two large new National Parks will be created, and substantial additions will be made to existing National Parks, totalling in all nearly 296,000 hectares. This will represent an increase of 45 per cent in the area now managed by Victoria's National Parks Service.

Approvals also include the doubling of Reserved Forests to 455,000 hectares, reference areas, education areas, bushland, and other reserves, a wilderness area, and additions to an existing State Park.

"The Land Conservation Council has had a particularly difficult task in the Alpine Area, because of the widely divergent views and conflicting interests involved", Mr. Hamer said.

"The L.C.C. has been patient and thorough, and has closely reviewed some 14,000 comments and objections to the draft recommendations originally published".

"The Government has given the Final Recommendations of the L.C.C. the most careful consideration".

"It has accepted completely the boundaries recommended for the national parks, reserved forests, and other designated areas".

"The Government has also been concerned to secure the economic stability of local communities dependent to a varying extent on the Alpine Area. In particular, the timber industry has a difficult problem in being assured of sufficient logs to bridge the interim period from now until the ash regrowth from the 1939 fires becomes available in some 10 years' time".

"The L.C.C. recommended certain areas of the proposed National Parks for once-only logging to bridge this gap. Five areas have now been added after further investigation.

"The Forests Commission has assured the Government, on the best revised assessment it can make, that the provisions now made for once-only logging are adequate to ensure a viable timber industry. They are:

- (a) Diamantina River catchment;
- (b) Mt. Reynard;
- (c) Dry River;
- (d) Peters Creek; and
- (e) Shannonvale area.

"In addition, the Government has decided that, subject to stream calibration and experimental logging, demonstrating that logging operations will not cause stream sedimentation at a level unacceptable to the State Electricity Commission, the Soil Conservation Authority and the Forests Commission, further logging be permitted in the areas listed below under prescriptions determined after the results of the experimental logging are known:

- (a) That area of land (1800 ha) classified as U2 in the East Kiewa valley.

On completion of logging, this land shall remain as uncommitted and shall continue in this category until re-investigated by the Land Conservation Council in about 10 years' time.

- (b) Little Arthur Creek.

"The Government has accepted the recommendation of the L.C.C. that cattle-grazing leases in certain sensitive Alpine areas comprising 11(5 completely, 6 in part) out of 140 such leases in all, should be phased out over the next 9 years.

"The effects of the prospective loss of summer pastures on the relevant leaseholders will be reviewed and appropriate assistance will be given to them by the Government as far as possible through adjustment of lease areas and Rural Assistance.

"Mineral exploration in the recommended extensions to the Snowy River and the Cobberas - Tingaringy National Parks will continue.

When they are proclaimed part of the National Parks system, the provisions of the National Parks Act will apply to further exploration and exploitation.

"The recommendations of the L.C.C. on other special uses within parks and conservation reserves were accepted without change.

"I believe that the interests and wishes of the various groups who use and enjoy the Alpine Area for many purposes have been taken into account, as well as the economy of the local communities, and a fair solution has been reached.

"The L.C.C. has recommended a review of the uncommitted areas in 10 years' time. This review will be made and will extend, if necessary, to other aspects of the recommendations, in the light of conditions at the time," Mr. Hamer said.

The Minister for Conservation (Mr. Houghton) said:

"Legislation will be introduced in Parliament this year to incorporate the new parks in the National Parks Act and provide for their proclamation and takeover by the National Parks Service over a period of years, beginning 1981. The Government view at present is that the most likely order will be Bogong National Park, followed by the Wonnangatta-Moroka National Park, and finally the Snowy River and Cobberas-Tingariny National Parks extensions."

The Minister of Forests (Mr. Granter) said that the Forests Commission had assured him that the provision now made for logging in the Alpine Area was adequate and reasonable to ensure the economic stability of the timber industry.

The Forests Commission will remain responsible for fire-fighting on all Crown Lands.

"The Government intends to enlarge and improve the management of the new National Parks and other designated areas and will devote more trained officers and increased finance for this purpose, which will give greater protection against fire, and better control of vermin and noxious weeds.

"These decisions represent a major step forward in the preservation, protection and proper management of Victoria's key Alpine Area," Mr. Hamer said.

10th January, 1980

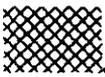
Subsequent to this News Release, and after the passage of the *National Parks (Amendment)* Bill through Parliament (24 March, 1981), the government made further amendments to the provisions for logging within certain conservation areas:

- a. Mount Reynard - mentioned in both the News Release and in the Bill - was withdrawn from logging.
- b. Within the Wonnangatta-Moroka National Park, additional once-only logging areas were made available in the Macalister River headwaters and near Mount Kent - (shown on Map A).
- c. Within the Mount Tamboritha Education Area, one stand near Mount Tamboritha - shown on Map A - was made available.
- d. In the Delatite River valley, in the Mount Stirling alpine resort, additional once-only logging of mature alpine ash was approved with the proviso that it be completed prior to the start of the proposed Mount Stirling ski resort or by 1988, whichever is the sooner. The alpine ash stands that could be affected by this decision are also shown on Map A.

Appendix 2

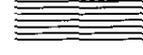
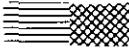
VEGETATION OF ALPINE AND SUB-ALPINE OPEN AREAS

The following tables list the commonly occurring species of each of the four regional assemblages of plants on the alpine and sub-alpine open areas. The body of each table indicates the species characteristic of each vegetation unit. A number of additional species (not listed), many of which are rare, have been identified in each region. For further information, refer to the reports by McDougall and the National Herbarium listed at the end of Chapter 7, Environmental Studies.

- * introduced species
-  species occurring in more than 70% of the sampled sites in each vegetation unit
-  species occurring in 50% to 70% of the sampled sites in each vegetation unit
-  species occurring in less than 50% of the sampled sites in each vegetation unit

Appendix 2A

VEGETATION OF ALPINE AND SUB-ALPINE OPEN AREAS
 CHARACTERISTIC SPECIES OF EACH MAPPING UNIT
 BOGONG HIGH PLAINS

Characteristic species	Mapping unit														
	Dry alpine										Wet alpine			Sub-alpine	
	Heathland				Grassland			Herbfield			Heathland		Sedge land	Grass land	
	1	2	3A	3B	3C	4	5A	5B	5C	6	7	8A	8B	8C	9
<i>Acaena agnipila</i>															
<i>A. anserinifolia</i>															
* <i>Acetosella vulgaris</i>															
<i>Agropyron velutinum</i>															
<i>Ajuga australis</i>															
<i>Aphanes australiana</i>															
<i>Asperula gunnii</i>															
<i>Astelia alpina</i>															
<i>Asterolasia trymalioides</i>															
<i>Baeckea gunniana</i>															
<i>Bossiaea foliosa</i>															
<i>Brachycome decipiens</i>															
<i>B. rigidula</i>															
<i>B. scapigera</i>															
<i>Cardamine</i> sp.															
<i>Carex breviculmis</i>															
<i>C. gaudichaudiana</i>															
<i>C. hebes</i>															
<i>Carppha nivicola</i>															
<i>Celmisia asteliifolia</i>															
* <i>Cerastium fontanum</i>															
<i>Colobanthus affinis</i>															
<i>Cotula alpina</i>															
<i>C. filicula</i>															
<i>Craspedia</i> sp. A															
<i>Danthonia nudiflora</i>															
<i>D. penicillata</i>															
<i>Displaspis hydrocotyle</i>															
<i>Empodisma minus</i>															
<i>Epacris glacialis</i>															
<i>E. paludosa</i>															
<i>Epilobium billardierianum</i>															
<i>E. hintigerum</i>															
<i>Erigeron pappocroma</i> form A															

Appendix 2A (cont.)

Characteristic species	Mapping unit														
	Dry alpine											Wet alpine			Sub-alpine
	Heathland				Grassland			Herbfield		Heathland		Sedge land	Grassland		
	1	2	3A	3B	3C	4	5A	5B	5C	6	7	8A	8B	8C	9
<i>Ranunculus graniticola</i>															
<i>R. gurnianus</i>															
<i>R. millanii</i>															
<i>R. victoriensis</i>															
<i>Richea continentis</i>															
<i>Scleranthus biflorus</i>															
<i>S. singuliflorus</i>															
<i>Senecio lautus</i>															
<i>Sphagnum</i> spp.															
<i>Stackhousia pulvinaris</i>															
* <i>Taraxacum officinale</i>															
* <i>Trifolium repens</i>															
<i>Trisetum spicatum</i>															
<i>Velleia montana</i>															
<i>Viola betonicifolia</i>															

A further 8 plant associations have been identified on the Bogong High Plains. However, these are too small in area to be recorded as individual map units and therefore do not appear on this table.

Characteristic species	Mapping unit														
	Sub-alpine shrubland				Alpine heathland							Alpine wet heathland			
	1	2A	2B	2C	3	4	5A	5B	5C	6	7A	7B	8A	8B	9
<i>Hypericum japonicum</i>													■		
* <i>Hypochoeris radicata</i>					■			■							
<i>Kunzea muelleri</i>							■								
<i>Leucopogon stuartii</i>								■							
<i>L. suaveolens</i>						■	■	■	■	■					
<i>Leptorhynchus squamatus</i>							■	■	■	■	■	■			
<i>Lomandra micrantha</i>									■						
<i>Luzula australasica</i>											■		■		
<i>L. novae-cambriae</i>					■										
<i>Microseris scapigera</i>					■	■	■	■	■	■	■	■			
<i>Olearia phlogopappa</i>	■														
<i>Oreobolus distichus</i>													■		■
<i>Oreomyrrhis ciliata</i>													■		■
<i>O. eriopoda</i>								■							
<i>Oxylobium alpestre</i>		■	■												
<i>Phebalium squamulosum</i>				■											
<i>Pimelea alpina</i>								■							
<i>Plantago euryphylla</i>													■		
<i>Poa citivicola</i>													■		■
<i>P. cocciniana</i>													■		
<i>P. fauconii</i>				■	■	■	■	■	■	■	■	■			
<i>Podocarpus lawrencei</i>	■														
<i>Podolepis jaceoides</i>								■							
<i>Polystichum proliferum</i>	■								■						
<i>Prostanthera curcatis</i>				■											
<i>Pultenaea tenella</i>												■			
<i>Ranunculus graniticola</i>								■	■	■	■	■	■	■	■
<i>R. gunnianus</i>											■	■			
<i>R. pimpinellifolius</i>															■
<i>Richea continentis</i>															■
<i>Scirpus subtilissimus</i>													■		
<i>Scleranthus biflorus</i>											■				
<i>Sphagnum spp.</i>											■				
<i>Stellaria purgens</i>		■			■			■							■
<i>Stipa niveola</i>								■							
<i>Stylidium graminifolium</i>										■					
* <i>Taraxacum officinale</i>													■		

Appendix 2B (cont.)

Characteristic species	Mapping unit														
	Sub-alpine shrubland				Alpine heathland							Alpine wet heathland			
	1	2A	2B	2C	3	4	5A	5B	5C	6	7A	7B	8A	8B	9
<i>Calluna serophila</i>															
<i>Calluna repens</i>															
<i>Calluna spicata</i>															
<i>Calluna serpyllifolia</i>															
<i>Calluna betonicifolia</i>															

Appendix 2C

VEGETATION OF ALPINE AND SUB-ALPINE OPEN AREAS

CHARACTERISTIC SPECIES OF EACH MAPPING UNIT

MOUNT BUFFALO--DARGO HIGH PLAINS--COBBERAS--MUNNIONG TABLELANDS

Characteristic species	Mapping unit						
	1 Alpine herbfield	2 Low dry shrubland	3 Open heath Grassland	4 Damp grassland	5 Wet alpine heath	6 Wet alpine heath Sphagnum bogs	7 Bogs, free water
* <i>Acetosella vulgaris</i>							
<i>Aciphylla glacialis</i>							
<i>Ajuga australis</i>							
<i>Asperula gunnii</i>							
<i>Baeckea gunniana</i>							
<i>Brachycome rigidula</i>							
<i>B. scapigera</i>							
<i>B. spathulata</i>							
<i>Carex blakei</i>							
<i>C. breviculmis</i>							
<i>C. gaudichaudiana</i>							
<i>Celmisia astellifolia</i>							
* <i>Cerastium glomeratum</i>							
<i>Cotula alpina</i>							
<i>Craspedia</i> sp. 5							
<i>Crassula sieberiana</i>							
<i>Danthonia nivicola</i>							
<i>D. pilosa</i>							
<i>Dicksonia repens</i>							
<i>Empodisma minus</i>							
<i>Epaeris breviflora</i>							
<i>E. microphylla</i>							
<i>E. paludosa</i>							
<i>Epilobium cinereum</i>							
<i>E. gunnianum</i>							
<i>Festuca hookeriana</i>							
<i>Gentianella diemensis</i>							
<i>Gnaphalium japonicum</i>							
<i>Gonocarpus micranthus</i>							
<i>Grevillea australis</i>							
<i>Hakea microcarpa</i>							

Appendix 2C (cont.)

Characteristic species	Mapping unit						
	1 Alpine herbfield	2 Low dry shrubland	3 Open heath Grassland	4 Damp Grassland	5 Wet alpine heath	6 Wet alpine heath Sphagnum bogs	7 Bogs, free water
<i>Helipterum albicans</i>							
<i>Herpolirion novae-zealandiae</i>							
<i>Hovea longifolia</i>							
<i>Hydrocotyle algida</i>							
<i>Hypericum japonicum</i>							
* <i>Hypochoeris radicata</i>							
<i>Juncus falcatus</i>							
<i>Leptorhynchos squamatus</i>							
<i>Leucopogon suaveolens</i>							
<i>Luzula australasica</i>							
<i>L. novae-cambriae</i>							
<i>Microseris scapigera</i>							
<i>Myriophyllum pedunculatum</i>							
<i>Oreobolus distichus</i>							
<i>Oreomyrrhis eriopoda</i>							
<i>O. ciliata</i>							
<i>Oxylobium alpestre</i>							
<i>Poa costiniana</i>							
<i>P. fawcettiae</i>							
<i>P. hiemata</i>							
<i>P. hothamensis</i>							
<i>P. phillipsiana</i>							
<i>Pratia surrepens</i>							
<i>Pultenaea tenella</i>							
<i>Ranunculus graniticola</i>							
<i>R. millanii</i>							
<i>R. pimpinellifolius</i>							
<i>Restio australis</i>							
<i>Richea continentis</i>							
<i>Schoenus apogen</i>							
<i>Scleranthus biflorus</i>							
<i>Sphagnum</i> spp.							
<i>Stellaria pungens</i>							

Appendix 20 (cont.)

Characteristic species	Mapping unit						
	1 Alpine herbfield	2 Low dry shrubland	3 Open heath Grassland	4 Damp Grassland	5 Wet alpine heath	6 Wet alpine heath Sphagnum bogs	7 Bogs, free water
<i>*Taraxacum officinale</i>							
<i>*Trifolium repens</i>							
<i>Trisetum spicatum</i>							
<i>Velleia montana</i>							
<i>Wahlenbergia ceracea</i>							

Appendix 2D

VEGETATION OF ALPINE AND SUB-ALPINE OPEN AREAS

CHARACTERISTIC SPECIES OF EACH MAPPING UNIT

BAW BAW--LAKE MOUNTAIN

Characteristic species	Mapping unit					
	1 Dry closed shrubland	2 Grassland Open shrubland	3 Damp shrubland	4 Wet alpine heath	5 Wet alpine heath Sphagnum bogs	6 Bogs, free water
<i>*Acetosella vulgaris</i>	■	■				
<i>Asperula gunnii</i>	■	■	■	■	■	
<i>Astelia alpina</i>				■	■	
<i>Asterolasia trymalioides</i>		■	■			
<i>Baeckea gunniana</i>				■	■	
<i>Blechnum pennamarina</i>					■	■
<i>Callistemon sieberi</i>					■	
<i>Carex breviculmis</i>	■	■				
<i>Carpha nivicola</i>					■	
<i>Celmisia asteliifolia</i>	■	■	■	■	■	■
<i>*Cerastium fontanum</i>	■	■				
<i>Craspedia</i> sp. D		■	■	■	■	
<i>Danthonia nudiflora</i>		■				
<i>Empodisma minus</i>			■	■	■	
<i>Epacris paludosa</i>				■	■	
<i>E. petrophila</i>				■	■	
<i>Epilobium gunnianum</i>					■	■
<i>Euphrasia gibbsiae</i>				■	■	
<i>Gentianella diemensis</i>				■	■	
<i>Gonocarpus micranthus</i>				■	■	
<i>G. montanus</i>	■	■				
<i>Grevillea australis</i>			■			
<i>Helichrysum hookeri</i>		■	■			
<i>H. secundiflorum</i>	■	■				
<i>Herpolirion novae-zealandiae</i>				■		
<i>Hydrocotyle algida</i>	■	■			■	
<i>*Hypochoeris radicata</i>	■	■				
<i>Leptorhynchos squamatus</i>		■	■			
<i>Lusula australasica</i>	■	■				
<i>Lycopodium fastigiatum</i>				■	■	
<i>Nertera depressa</i>				■	■	

Appendix 2) (cont.)

Characteristic species	Mapping Unit					
	1 Dry closed shrubland	2 Grassland Open shrubland	3 Damp shrubland	4 Wet alpine heath	5 Wet alpine heath Sphagnum bogs	6 Bogs, free water
<i>Cleavia algida</i>	▨	▨	▨	▨	▨	▨
<i>G. phlogopappa</i>	▨					
<i>Oreobolus distichus</i>				▨		
<i>Oreomyrrhis eriopoda</i>	▨					
<i>Orites lanifolia</i>	▨		▨			
<i>Pirelea alpina</i>		▨	▨	▨		
<i>Plantago alpestris</i>		▨		▨		
<i>Poa coarctata</i>					▨	
<i>P. himalaica</i>	▨	▨	▨	▨		
<i>Psiloclipsis basia</i>		▨	▨			
<i>Psisyllium</i> sp.		▨				
<i>Psylla pedunculata</i>			▨			
<i>Psittacanthus lanata</i>		▨				
<i>Psittacanthus mulleri</i>	▨					
<i>Ptilotus verticillatus</i>				▨	▨	
<i>Ruscobola hookeri</i>		▨				
<i>Scleranthus biflorus</i>		▨				
<i>Scleranthus gunthii</i>	▨					
<i>S. pinnatus</i>				▨		
<i>Scleranthus xylosteus</i>				▨		
<i>Sphagnum</i> spp.					▨	▨
<i>Styridium graminifolium</i>	▨					
<i>Thelymitra venosa</i>					▨	▨
<i>Trichocarpus alankii</i>		▨				
<i>Viola hederacea</i>	▨					

Appendix 3A

MINING TENEMENTS ON PUBLIC LAND

Mining Leases - June 1982

Mining lease	Parish	Area (ha)	Minerals	Expiry (E) or application (A) Date	L.C.C. recommendation (June 1979)
27-1 *	Harrietville	12	Gold	A.8/9/81 (renewal)	Recreation 02
46 (Sambas)*	Harrietville	54	Gold	E.17/9/87	Uncommitted U1, and National Park A2
425 (King Cassilis)	Tongio-Munjie	2.9	Gold	E.14/12/90	Historic area G5
449 (Warden)	Jirnkee	22	Gold, silver	A.28/4/76	Uncommitted U1
469	Freeburgh	4.3	Gold	E.26/7/82	Uncommitted U1
531	Warrambat	107	Antimony, bismuth, lead, mercury, tungsten, zinc	E.28/8/82	Uncommitted U1
657 (Silver North)	Tongio-Munjie West	14	Gold	A.24/1/80	Historic area G5
714 (Red Robin)* (now 960)	Hotham	28	Gold	A.4/8/80 (renewal)	National Park A2
729	Harrietville	200	Gold	A.23/10/80	Uncommitted U1
768 (prev- ious SL)	Harrietville	80	Diamonds, gold, rubies, silver	A.23/12/80	National Park A2, and Uncommitted U1
769 (prev- ious SL)	Harrietville	100	Diamonds, gold, rubies, silver	A.23/12/80	National Park A2, and Uncommitted U1
784 (One Alone) 784 surr- ounds 714	Hotham	350	Gold	A.26/2/81	National Park A2, and Uncommitted U1
842 (Cass- ilis)	Jirnkee	35.5	Gold	A.6/7/81 (renewal)	Historic area G5

Appendix 3A (cont.)

Mining lease	Parish	Area (ha)	Minerals	Expiry (E) or application (A) Date	L.C.C. recommendation (June 1979)
843 (Queen Cassilis)	Jirnkee	41.4	Gold	A.23/7/81 (renewal)	Historic area G5
850	Kosciusko	48	Cassit- erite, gold	A.7/9/81	Natural feat- ures and scenic reserve D19
910	Wollonaby	331	Gold	A.8/1/82	Agriculture Q7, Uncommitted U1, Natural features D15, Timber production I7

* Current activity

Appendix 3B

MINING TENEMENTS ON PUBLIC LAND

Other Mining Licences - June 1982

Tenement type	Parish	Area (ha)	Minerals	Expiry (E) or application (A) Date	L.C.C. recommendation (June 1979)
<u>Tailings licences</u>					
4748 (for removal)	Wollonaby	-	-	E.14/6/84	Natural features and scenic reserve D15
<u>Mineral Lease</u>					
9204	Kosciusko	5.8	Tin	E.31/9/89	Natural features and scenic reserve D19
<u>Gold Mining Leases</u>					
5654	Tongio-Munjie West	10	Gold	E.16/6/86	Historic area G5
5655	Tongio-Munjie West	10	Gold	E.3/11/86	Historic area G5
8465 (Mons Meg)*	Harrietville	46	Gold	E.24/6/89	National Park A2
<u>Miners Right claims</u>					
813	Jirnkee	1	Gold, lead, silver, zinc	E.12/10/82	Historic area G5
814	Jirnkee	1	Gold, lead, silver, zinc	E.11/10/82	Historic area G5
815	Jirnkee	1	Gold, lead, silver, zinc	E.11/10/82	Historic area G5
816	Jirnkee	1	Gold, lead, silver, zinc	E.11/10/82	Historic area G5
817	Jirnkee	1	Gold, lead, silver, zinc	E.11/10/82	Historic area G5

Appendix 3B (cont.)

Tenement type	Parish	Area (ha)	Minerals	Expiry (E) or application (A) Date	L.C.C. recommendation (June 1979)
<u>Miners Right claims (cont.)</u>					
1015*	Tongio-Munjie West	1	Gold	E.2/2/83	Uncommitted U1
<u>Extractive Industry Lease</u>					
175*	Warrambat	5	Slate	E.26/5/90	Mineral and stone production R3

* Current activity

Appendix 3C

MINING TENEMENTS ON PUBLIC LAND

Search Licences - June 1982

Search licence	Parish	Area (ha)	Minerals	Expiry (E) or application (A) Date	L.C.C. recommendation (June 1979)
1747	Bemboka	32	Gold	E.29/3/83	Historic area G2
1766	Hotham	12.9	Gold	E.1/10/82	National Park A2
1962-3	Wollonaby	40	Gold, silver	E.17/3/83	Uncommitted U1
1964	Wollonaby	45	Gold, silver	E.17/3/83	Uncommitted U1
1965	Wollonaby	47	Gold, silver	E.17/3/83	Uncommitted U1
1981-4	Bogong South	40	Gold, niobium, silver, tantalum, tin	E.28/1/83	Timber production I7
1985-7	Ludrik-Munjie	40	Gold, niobium, tantalum, tin	E.16/9/82	Timber production I7
2030	Harrietville	65	Gold, silver	A.5/12/80	Uncommitted U1
2035	Bogong North	40	Chromite, copper, gold, lead, silver, tin, zinc	E.13/8/82	National Park A2, Uncommitted U1
2076-7	Bingo-Munjie North	40	Chlorite	A.30/1/81	Uncommitted U1
2138-42	Wermatong	40	Gold, lithium, niobium, silver, tantalum, tin, tungsten, zinc	A.25/2/81	National Park A2

Appendix 3C (cont.)

Search licence	Parish	Area (ha)	Minerals	Expiry (E) or application (A) Date	L.C.C. recommendation (June 1979)
2151	Bogong North	40	Gold, niobium, silver, tantalum, tin, tungsten	E.8/10/82	Timber production I7
2284-7	Bogong North	40	Barite, bismuth, gold, lithium, niobium, silver, strontium, tantalum, tin	A.26/5/81	Timber production I7
2292	Bogong North	40	Wolfram	A.29/5/81	Timber production I7
2351-3	Bogong North	40	Cobalt, gold, lead, silver, tantalum, tin, tungsten, zinc	A.29/7/81	Timber production I7
2409	Changue	225	13 minerals	A.11/9/81	Historic area G1
2421 (Brandy Creek Mine)	Hotham	40	Gold	A.6/10/81	National park A2
2455	Changue	224.8	13 minerals	A.17/11/81	Historic area G1
2475	Harrietville	40	Gold	A.25/11/81	National Park A2
2477	Harrietville	40	Gold	A.25/11/81	National Park A2, Uncommitted U1
2492	Harrietville	100	Copper, diamonds, gold, rubies, silver	A.2/12/81	National Park A2, Uncommitted U1

Appendix 3C (cont.)

Search licence	Parish	Area (ha)	Minerals	Expiry (E) or application (A) Date	L.C.C. recommendation (June 1979)
2493	Harrietville	100	Diamonds, gold, rubies, silver	A.2/12/81	National Park A2
2524	Harrietville	200	Copper, gold, silver	A.5/2/82	National Park A2, Uncommitted U1
2525	Harrietville	40	Copper, gold, silver, tin	A.5/2/82	Uncommitted U1
2581-4	Bogong North	40	11 minerals	A.16/4/82	Timber production I7

Appendix 3D

MINERAL EXPLORATION LICENCES - ALPINE AREA

June 1982

E.L. No.	Area sq.km	No. of Minerals	Expiry Date	Applications: New (A) Extensions (E) Date
432	132	*	26/10/82	
456	264	*	26/10/82	
537	132	*	-	E.26/10/82
552	462	*	-	E.6/5/82
564	132	*	-	E.6/5/82
565	462	*	-	E.6/5/82
570	370	*	7/4/83	
596	528	*	23/1/83	
597	726	*	23/1/83	
611	198	*	9/11/82	
640	330	*	-	E.15/3/82
641	301	*	-	E.15/3/82
674	132	*	15/11/82	
675	264	11	25/10/82	
683	264	*	-	E.2/1/82
684	132	9	-	E.23/3/82
695	66	11	4/2/83	
696	66	13	8/8/82	
697	132	9	-	E.20/3/82
726	66	3	4/11/82	
733	264	4	8/11/82	
750	396	13	27/5/83	
752	132	7	28/11/83	
760	198	12	-	E.14/5/82
762	792	12	22/11/83	

Appendix 3D. (cont.)

E.L. No.	Area sq.km	No. of Minerals	Expires Date	Applications: New (A) Extensions (E) Date
764	792	*	3/12/83	
772	198	15	20/11/82	
835	264	15	-	A.6/2/80
841	726	*	20/8/82	
842-3	792	*	14/8/82	
857	66	3	13/10/82	
858	132	14	14/8/82	
893	132	12	4/12/82	
920	660	7	15/2/83	
935	792	7	14/4/83	
958	462	13	-	A.6/11/80
959	198	13	-	A.6/11/80
962	660	13	-	A.6/11/80
965	264	13	-	A.6/11/80
1016	66	13	5/8/83	
1023	396	*	26/8/83	
1138	660	13	8/11/82	
1186	66	17	-	A.16/2/82
1197	132	11	-	A.23/4/82

* Twelve minerals: Antimony, copper, gold, lead, molybdenum, nickel, phosphate, silver, tin, titanium, zinc, zirconium.

Appendix 4

MINERAL EXPLORATION TECHNIQUES

Activity	Frequency/intensity	Techniques
Geological mapping	Regional traverses, local grids	Walking, chipping rocks
Reconnaissance sampling	All rock formations of economic interest	Plastic flagging, 20-cm wood pegs, sampling soils
Grid surveying, sampling	Only over reconnaissance sampling anomalies	Machete clearing, plastic flagging, 90-cm pegs, sampling soils
Geophysical surveys - electromagnetic	Only over anomalous grid samples	Walking, laying out wires on ground
Geophysical surveys - induced polarization	Only over anomalous grid samples	Walking, wires laid, holes with aluminium foil
Drill sites	1--10 per year per licence	50 sq m pad levelled by hand; mature trees generally preserved; drills winched in from nearest track
Primary access tracks	Access to grids	Dead timber, saplings cleared by hand; vehicle over natural surface
Drilling access tracks	10 or less per year, as some drill sites near existing forestry tracks	(i) As for primary tracks, but wider and straighter (ii) Some bulldozing
Temporary camps	1--3 per year	Tents and caravans
Permanent camp	Maximum 1 per licence	Caravan, sheds, water tanks, weather station

Appendix 5

APPARENT CONSUMPTION OF SAWN TIMBER IN VICTORIA
1957/58 to 1980/81

Apparent consumption (m ³ sawn)		Apparent consumption (m ³ sawn)	
Financial year	Volume ^{1,2}	Financial year	Volume ^{1,2}
1957/58	1,115,000	1969/70	1,184,000
1958/59	1,117,000	1970/71	1,154,000
1959/60	1,208,000	1971/72	1,152,000
1960/61	1,107,000	1972/73	1,247,000
1961/62	991,000	1973/74	1,364,000
1962/63	1,037,000	1974/75	1,204,000
1963/64	1,050,000	1975/76	1,234,000
1964/65	1,093,000	1976/77	1,287,000
1965/66	1,009,000	1977/78	1,112,000
1966/67	1,084,000	1978/79	1,099,000
1967/68	1,091,000	1979/80	1,168,000
1968/69	1,153,000	1980/81	1,196,000

Notes:

1. Volumes rounded to nearest 1,000 m³
2. The sawlog volume equivalent is about double the sawn volume.
3. A trend in long-term consumption has been determined from the above data by establishing, statistically, a line of best fit to the plotted data. The trend-line so established indicates a long-term increase in apparent consumption of sawn timber for Victoria of 0.5% per annum.
4. Data compiled by the Forests Commission, Victoria, from tables in the *Timber Supply Review*.