

**PROPOSED
RECOMMENDATIONS**

ALPINE AREA

**LAND CONSERVATION COUNCIL, VICTORIA
MELBOURNE, APRIL 1978**

TELEPHONES:
267 1311, 267 1098



GOVERNMENT OF VICTORIA

LAND CONSERVATION COUNCIL

464 ST. KILDA ROAD, MELBOURNE, VICTORIA, 3004

PROPOSED RECOMMENDATIONS

ALPINE AREA

These recommendations are published to allow all who are interested the opportunity to comment by making written submissions to the Land Conservation Council.

All such submissions must reach the Secretary no later than Monday, June 12 1978.

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


I. KUNARATNAM
Secretary
Land Conservation Council

PROPOSED RECOMMENDATIONS

ALPINE AREA

**LAND CONSERVATION COUNCIL, VICTORIA
MELBOURNE, APRIL 1978**

MEMBERS OF THE LAND CONSERVATION COUNCIL

S. G. McL. Dimmick, B.A., B.Comm., Dip.Soc.Stud.; (Chairman)

A. Mitchell, D.D.A., M.Agr.Sc., M.A.I.A.S.; Chairman of the Soil Conservation Authority ;
(Deputy Chairman)

C. N. Austin

J. M. Landy, B.Agr.Sc.

J. S. Turner, O.B.E., M.A. (Cantab), Ph.D. (Cantab), M.Sc., F.A.A., Professor Emeritus

D. S. Wishart, B.V.Sc., F.A.C.V.Sc., Director General of Agriculture

F. R. Moulds, Ph.D., M.F., B.Sc., Dip.For.; Chairman of the Forests Commission

J. S. Rogerson, B.C.E., E.W.S., F.I.E.Aust. ; Deputy Chairman of the State Rivers and Water
Supply Commission

C. E. Middleton, L.S., F.I.S.Aust.; Secretary for Lands

B. W. Court, B.E., B.Sc.; Secretary for Minerals and Energy

J. C. F. Wharton, B.Sc.; Director of Fisheries and Wildlife

J. D. Brookes, M.C., M.Sc.; Director of National Parks

INTRODUCTION

The Land Conservation Council was established by the *Land Conservation Act 1970*. As one of its three functions, it makes recommendations to the Minister for Conservation with respect to the use of public land, in order to provide for the balanced use of land in Victoria. This report contains the Council's proposed recommendations concerning the public land in the Alpine area. Notices showing the boundary of the study area and advising that an investigation was to be carried out were published in the *Victoria Government Gazette* of 5th September 1973 and in local and other Victorian newspapers in September 1973. A descriptive report was published on 18th July 1977. The Council received 1,538 submissions on the future use of public land. Individuals, associations, companies, and local and State government bodies, representing a wide cross-section of the community, made helpful submissions covering most feasible forms of land use for the district. Extracts from the *Land Conservation Act 1970* covering the procedure to be followed in formulating recommendations were included in the descriptive report.

After considering the submissions and visiting the study area, the Council has prepared these proposed recommendations. They will be distributed to all who made submissions and their publication will be followed by another 60-day period for further submissions. After this the Council will prepare final recommendations for presentation to the Minister and Parliament.

Land Use

Table 1 summarizes the proposed recommendations in terms of the major forms of use. In addition to nominating uses for the land, the recommendations indicate what is considered to be the most appropriate form of tenure for the land and the most appropriate management authority.

The Council has proposed that most of the public land in the Alpine area, together with some land previously recommended to be uncommitted in adjacent areas, be included in an Alpine Reserve. The Reserve has been zoned for various forms of land use, and management principles for a number of these uses have been formulated.

It is apparent from submissions that the Alpine area has a particular significance for many people and that the values and resources that the community regard as important are not, in many instances, confined to readily definable portions of the area but rather are dispersed throughout it. In the following recommendations, Council has endeavoured to stress the need for a co-ordinated approach in the broad management of the area. It has proposed that an Alpine Reserve Council be established to assist the authorities responsible for day-to-day management within the Reserve. That Council would have an important monitoring and integrating role in the implementation of the government's land use policies for the Reserve.

The Council has also recommended that some land within the study area be added to two national parks and one State park recommended for East Gippsland and North-east, districts 3, 4, and 5, respectively. Recommendations have also been made for small parcels of public land that, although outside the Alpine Reserve, lie within the gazetted boundary of the Alpine area.

TABLE I
RECOMMENDED PUBLIC LAND USE

Major recommended land use	Area	Percentage of all land covered by these recommendations	Percentage of all public land covered by these recommendations
	(ha)		
Alpine Reserve--			
Wilderness Zone	29 550	2	2
Reference Zone	10 170	<1	<1
Protection and Recreation Zone	290 240	17	19
Natural Features Zone	19 700	1	1
General Use Zone	1 047 680	61	69
Water and Hydroelectricity Zone	13 550	1	1
Historic Zone	10 480	<1	<1
Education Zone	1 300	<1	<1
Additions to Parks	79 870	5	5
Alpine Resorts	7 700	<1	<1
Agriculture	1 290	<1	<1
Uncommitted	13 290	1	1

All other land uses collectively make up the balance. Figures are rounded.

Submissions

As indicated on the previous page, a 60-day period for submissions follows the publication of these recommendations. In the past, submissions have provided the Council with helpful information and an indication of the differing points of view held by those interested or concerned with land use in an area. In these recommendations, Council has proposed a scheme for land use that involves a different approach from that taken in the past. Council would therefore welcome comment on the concept underlying the recommendations to place most of the land in the study area within a single large reserve, as well as comment on the other recommendations, including the boundaries and uses outlined for the various zones.

Layout

The recommendations in the text are grouped under major headings, such as Alpine Reserve and its zones, Agriculture, Recreation, and so on. The text is accompanied by 3 maps. Map A (at a scale of 1 : 250,000) covers the whole study area and gives a broad view of the recommended land uses. Map B (at a scale of 1 : 63,360) and Map C (at a scale of 1 : 30,000) show the recommended land uses in the Mount Hotham-Mount Bogong and the Mount Buller-Mount Stirling areas in more detail. Other detailed plans show areas recommended for agriculture. More detailed information on many of the boundaries is held by the Land Conservation Council.

General Recommendations

The following recommendations qualify those in the body of the text.

The Council wishes to stress the need for adequate management and protection of public land, as it has made its recommendations on the assumption that sufficient manpower and finance will be provided for the appropriate managing authority. Unless these resources are provided, the Council's recommendations cannot be effectively implemented. There is an urgent need to make additional field staff and finance available and the Council therefore recommends :

- I That the authorities responsible for managing and protecting the public land be given the resources necessary for the task.

Council emphasizes that introduced weeds such as blackberry, St. John's wort, sweet briar, and tutsan pose major problems in the management of public land in the Alpine area. Finance and staff are required to research and implement methods for control of these and other noxious weeds. In particular, further research into the biological control of blackberry is important. Continued control of wild-dog populations will be necessary, particularly where public land abuts agricultural districts.

The Council has proposed certain additional arrangements for protecting the public land from fire. These arrangements have now been incorporated into an amendment to the *Forests Act 1958*. The amendment creates the designation "protected public land", which may include public land that is not State forest or national park. The Forests Commission is now required to protect all three of these from fire. In national parks and protected public land, the Commission's fire-prevention works are subject to the agreement of the managing authority or, if agreement is not reached, to determination by the Governor in Council. In State forests, which comprise reserved forest and protected forest as defined in the *Forests Act 1958*, the Forests Commission is also responsible for the control and management of the vegetation. The Council recommends :

- II That, for fire-protection purposes, public land that is not State forest or national park be examined and appropriate areas be declared protected public land under the *Forests Act 1958*.

The Council expects that, as a result of further study, many more areas with special values will be identified. Present planning cannot specifically provide for the conservation of these values. The Council therefore recommends :

- III That, when significant new discoveries are made on land within their administration, government agencies enlist the best advice available on the importance of such features and on any measures that should be taken to conserve them. Advice from organizations other than government authorities and academic institutions should be sought whenever appropriate.

The Council also recognizes that in some cases existing legislation will have to be amended in order to effectively implement these recommendations. The Council is aware that this may result in a delay, in some cases of several years, before some of its recommendations can be implemented. It is concerned that, where implementation of the recommendations would involve a change of management authority, management efficiency could be reduced during the interim period. The Council believes that the government should direct Departments that their responsibilities for management must continue in all areas presently under their control until such time as the recommendations are implemented. The Council therefore recommends :—

- IV That the present legal status and management of public land in each case be retained until the recommended authorities have the capacity to manage each area.

The Council further recommends:

- V That, as many of them have not been precisely surveyed, the boundaries of the areas referred to in the recommendations be subject to minor modification, road excisions, easements, and other adjustments that may be necessary.
- VI That, where areas of public land are not specifically referred to in these recommendations, present legal uses and tenure continue.

A. ALPINE RESERVE

Introduction

The Victorian Alps are an integral part of the Australian Alps, which stretch from southern Victoria to the mountains of the Australian Capital Territory. Although part of the larger geographical unit, the Victorian Alps are more strongly dissected by deep river valleys, contain large volumes of millable timber, and support vegetation associations not represented to the north.

Most of the 14,000 sq km of public land in the Alpine area is continuous and contains a wide range of natural environments, incorporating elevations from 100 m along the Snowy River to 1,986 m on Mount Bogong, the State's highest peak. It includes all of the alpine and most of the subalpine country in Victoria and, perhaps more than any other feature, this "high country" distinguishes the area from any other in the State. Generally snow-covered in the winter and early spring and with extensive ski fields, the high country also attracts many visitors during the summer because of the mild climate and the picturesque high plains with snow gum woodlands and wildflower displays. The high mountains and plateaux, flanked by stands of tall alpine ash (and some mountain ash), receive a high annual precipitation, much of it falling as snow, and contrast markedly with the drier foothills, ridges, and valleys supporting the mixed-species forests of gums, stringybarks, and peppermints. The numerous perennial fast-flowing streams and rivers and the wild and rugged terrain add further to the fascination of the Alpine area.

The range of elevation (1,900 m) helps to create diverse habitats and scenic features and is undoubtedly a major factor contributing to the wide range of land uses in the Alpine area. The water obtained from the catchments contributes about one-quarter of the flow in the State's river systems. Much of the land in the catchments, especially that above 1,200 m and in the drier valleys, is highly sensitive to disturbance and, once damage has occurred, reclamation can be slow and costly.

The ash and mixed-species forests of the area provide one-third of all hardwood sawlogs currently produced in Victoria and the bulk of the Victorian production of select and seasoning-quality timber is produced from the ash-type eucalypts that grow in widely separated locations. The forests and the high plains have traditionally been used for grazing since the early days of settlement. The use of these grazing areas is closely integrated with the home freehold properties and for most graziers is of considerable economic importance. The Alpine area provides important opportunities for a wide range of recreational pursuits. These pursuits include skiing, bushwalking, nature study, rock-climbing, hunting, fishing, canoeing, camping, horse-riding, picnicking, pleasure driving, and other forms of motorized recreation.

A total of 1,538 submissions have been received for the Alpine area. Many of the views expressed regarding future land use and management are widely divergent. People living in or adjacent to the area see it both as a source of income, either directly or indirectly, and as providing a way of life markedly different from urban living. The urban population in general regard it as providing recreational experiences that cannot be found elsewhere in the State.

Despite the diversity of opinions held about land use, it is apparent that many people regard the Alpine area as a clearly identifiable region and the feeling often conveyed was the need to treat the area as a whole for planning and management purposes. This feeling was frequently expressed when referring to the intangible values associated with this mountainous region—its spectacular scenery, sense of spaciousness and isolation, and romantic associations with early exploration and settlement, gold-mining, and cattle grazing. Many others, while acknowledging the non-monetary values, stressed the importance to the State and local centres of utilizing the resources found throughout the area (timber, minerals, grazing, etc.)

Examination of resources and present patterns of use reveals a complex mosaic, with many resources confined to discrete but scattered areas—for example, isolated stands of highly productive alpine ash, ski fields, and areas with wilderness values. For other uses, such as water production, the entire area is of major importance. The complexity of allocating uses to defined areas is further complicated by the extent to which various uses overlap, are compatible, conflict, and because patterns of use vary according to the season.

The Council considers that dividing the Alpine area into land use compartments would not resolve the competing claims of user groups. The special nature of the area requires a different planning approach from that taken by the Council in the past. It has therefore recommended that most of the land—including some land recommended to be uncommitted in the final recommendations for the Melbourne and North-eastern areas, districts 1 and 2, and districts 3, 4, and 5—be included in an Alpine Reserve. It is proposed that land be added to the Snowy River and Tingaringy National Parks and the Wabonga Plateau State Park (recommended in the final recommendations for East Gippsland and North-east, districts 3, 4, and 5) and this land would not be included in the Reserve.

Adoption of this approach, rather than proposing the creation of numerous reserves managed by various government authorities, avoids fragmentation of management based on land tenure boundaries. This arrangement would also assist in reducing the duplication of services and thereby minimize the cost to the community of adopting these land use recommendations. But, more importantly, it recognizes the need for broad planning and management of the area.

The Council is well aware that a portion of the community has long been interested in the creation of a large national park that would include most of the Alpine area. Council considers that a proposal such as this is not feasible, as some uses that should continue in the Alpine area are not compatible with the concept of a national park. In particular, the Council takes the view that hardwood timber is an important renewable resource and that a substantial part of the area should continue to play a role in supplying the State's timber requirements for many years to come. Council also realizes that phasing out the logging industry from virtually all of the Alpine area would have severe social and economic repercussions, not only on the timber industries based on the area but on the community as a whole. But Council also strongly supports the view that there is a need for long-term conservation of some stands of maturing and mature forest for uses other than timber production.

Within the Alpine Reserve, the Council has proposed a system of land use zoning, with general management prescriptions for various uses in specified areas that Council believes require particular attention because of their special attributes, such as erosion hazard or historic, scenic, or nature conservation values. The Council has also recommended the establishment of an Alpine Reserve Council, referred to in more detail below, which would have important monitoring, advisory, and integrating functions with respect to the implementations of the land-use and land-management decisions made by the government for the area. It is not proposed that the Alpine Reserve Council would be involved with the day-to-day management of the zones within the Reserve. This would be the responsibility of the managing authorities as outlined in the following recommendations.

Alpine Reserve Council

The Council proposes that an Alpine Reserve Council be established, with the following composition :

Chairman, Land Conservation Council (who should be Chairman of the Alpine Reserve Council)

Chairman, Soil Conservation Authority

Secretary for Lands

Chairman, Forests Commission of Victoria

Director, National Parks Service

The new Council would not be concerned with the day-to-day management of the zones within the Reserve, but rather would carry out the following functions :

- (i) monitor the implementation of government land-use and land-management decisions made pursuant to section 10 (3) of the *Land Conservation Act 1970*.
- (ii) advise and assist the responsible authorities in carrying out their respective statutory roles.
- (iii) integrate the activities of the various authorities with statutory responsibilities in the Alpine Reserve.
- (iv) report to the Ministers for Lands, Forests, and Conservation.

All authorities with statutory powers and duties with respect to any area of public land within the Alpine Reserve would notify the Alpine Reserve Council each year of their programme of activities for the ensuing year. These plans should be available for inspection by the public at the office of the authority or agency concerned.

Authorities or departments that have statutory powers, duties, or interests with respect to any area of public land within the Alpine Reserve but are not represented on the Alpine Reserve Council would be consulted on policy matters affecting their areas of jurisdiction, be kept informed of the proceedings of the Council, and have the right to attend meetings.

It should be pointed out that the Soil Conservation Authority would continue to make land-use determinations for water supply catchments within the Alpine area. In addition, by Premier's directive, the Soil Conservation Authority has supervisory control of all grazing and earthworks within the Victorian Alpine areas above the elevation of 1,219 m. Under section 5 (1) (c) of the *Land Conservation Act 1970*, the Land Conservation Council advises 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. As virtually all the land in the Reserve is contained within water supply catchments, the Land Conservation Council has a continuing function regarding land use in this area.

Zoning of the Alpine Reserve

The Alpine Reserve has been zoned in order to allow management for various uses depending on the differing capabilities of land, to separate competing land uses where this is practicable, and to attempt to satisfy as far as possible the various demands placed on the many values and resources of the area.

Eight zones have been recognized and the permitted uses in each zone have been specified. Uses in zones vary—from a wide range of activities in the General Use Zone to a single activity such as the study of natural ecosystems in the Reference Zone. In general, where a similar set of uses is permitted in different geographic areas, all such areas have been grouped within a single zone.

The concepts and uses of the Reference, Wilderness, Historic, Water and Hydro-electricity, and Education zones have been outlined in recommendations for other areas already investigated by Council. However, new concepts underly the three major zones that together comprise most of the area—Protection and Recreation Zone, General Use Zone, and Natural Features Zone.

These three zones have a high capability for a wide variety of recreational uses, are of major importance for water production, and include important fauna and flora values, scenic landscapes, and historic sites. The main timber-harvesting areas are found in the General Use Zone. Although widely dispersed throughout the zone, areas suitable for timber production collectively comprise only a small proportion of the total area. It is recommended that logging be excluded from the Protection and Recreation Zone, except for small areas from which timber would be harvested on a once-only basis. The main emphasis in this zone is on providing opportunities for a wide range of recreation activities while at the same time conserving the natural ecosystems, protecting landscapes and other natural features, and retaining roadless areas. Outstanding landscapes, geological formations, or other natural features that warrant special protection are included in the Natural Features Zone.

Recommendations

A1-A70

- (a) That the land shown on the map be reserved under section 14 of the *Land Act 1958* as the Alpine Reserve and be protected public land according to the provisions of the *Forests Act 1958*

- (b) that the land within the Alpine Reserve be zoned for various uses and be managed as indicated in the following recommendations.
- (c) that an Alpine Reserve Council be established with the composition and functions outlined in the previous pages.

Note : Additional land may be added to the Alpine Reserve when the Council prepares recommendations for the Gippsland Lakes Hinterland area.

WILDERNESS ZONE

The concept of wilderness (" an uncultivated and uninhabited tract " —Oxford English Dictionary) has received attention in Australia for many years, particularly since the early 1960s. The need to set aside areas because of their value as wilderness has been recognized by some Australian States.

The wilderness experience involves the perception of being part of nature, of an environment unaltered by human intervention, of isolation, and of being exposed to the challenge of the elements. In a wilderness, Man should function as a part of the natural system, and on equal terms with nature.

The main elements of the appeal of wilderness are :

- * spiritual refreshment and an awareness of solitude arising from close contact with the uninhabited, substantially undisturbed, natural environment.
- * the knowledge that there still exists a large natural area in which plants, animals, and soils can survive and interact with minimal interference by Man.
- * refuge from the pressures, sights, and sounds of modern urban life.
- * the adventure and challenge of putting one's powers of endurance and self-reliance to the test in a substantially undisturbed natural environment.

An ideal wilderness would therefore require a large area of land that still retains its primeval character, and is without human modification or habitation. To preserve these values it would be necessary to protect the natural ecosystems from human interference and maintain the landscape in an undisturbed state. Council recognizes that the Avon Wilderness (see A1) does not meet the criteria for an ideal wilderness because of past human modification and the need for continued modification in order to ensure adequate fire protection and the control of vermin and noxious weeds. The Council believes, however, that by careful management the impact of operations required for fire protection and pest control can be kept to a minimum.

Scenic granduer enhances the value of an area, but is not an essential requirement of the type of experience the Council is endeavouring to provide in reserving land specifically for wilderness use.

To fulfil the uses for which they are intended, wilderness areas should be sufficiently large to enable a walking trip of several days to be undertaken within them. Spaciousness is the essential characteristic distinguishing wilderness areas from the many other smaller undisturbed or primitive areas that may be found as " islands " even in land that has been developed for more intensive uses.

The Council stresses that few large undisturbed areas remain in Victoria, and that these will tend to diminish in size as the road and fire-trail network is extended unless some are specifically reserved to retain their wilderness qualities.

Type of Wilderness Experience

Wilderness experiences of one kind or another will be available in many different places. For some people, a short walk in part of a State park (or even a regional park) may provide it. Others need a much larger expanse of territory, in which they can walk for several days, to fully appreciate the wilderness experience. For the former group, especially those who prefer scenic grandeur and extensive views, zones within areas reserved for other purposes will provide some wilderness experiences. For many people a man-modified component does not detract from the quality of scenery. Such wilderness experiences may be relatively brief, however, as people will come into contact with others because of the intensity of recreational use. Although Council is aware that many people can find all they seek within areas not specifically reserved as wilderness, it considered it necessary to reserve land specifically for wilderness use to provide a more prolonged wilderness experience for people wishing to spend several days in the area, and to ensure protection of an undisturbed area to preserve its wilderness qualities.

Use and Management of Wilderness

Council has proposed that part of the Alpine Reserve be zoned for wilderness use. Activities such as hiking, rock-climbing, caving, fishing, bow-hunting, cross-country skiing, and nature observation would be permitted within this zone. Timber production, grazing, and mining would be excluded as would hunting with dogs and the use of firearms. Motorized vehicles, other than those essential for management, would also be excluded.

In order to maintain the value of the wilderness for solitude and unconfined types of recreation, it may ultimately be necessary to control the number of people using the zone at any one time. Experience in the United States has shown that tourism and the more conventional forms of outdoor recreation commonly associated with parks are among the greatest threats to wilderness, and should not be accommodated in such an area. It may also be necessary to place restrictions on some activities so that conflict between wilderness users is minimized.

Wildfires, however caused, must be prevented from threatening life, property, and natural resources in the State, and the measures necessary to control them must be taken in a wilderness zone as in any other. Some pre-suppression measures such as maintenance of fire-access tracks and protective burning will be required, at least in areas of strategic importance for fire control. A carefully designed and managed fire-prevention programme in the adjacent buffer areas may reduce the requirement for such activities in some areas of the wilderness. Prevention and suppression of fires will remain the responsibility of the Forests Commission.

When tracks are maintained for essential management operations, their use other than for these specific purposes will not be permitted. By careful maintenance, many

tracks can continue to be passable for fire-fighting, rescue, and management vehicles, without clearing all vegetation. Construction of helipads may be an alternative to maintaining all of an extensive track system.

It will be necessary to provide adequate control of vermin and noxious weeds within the wilderness zone and particularly in the buffer area surrounding it, to ensure that the zone itself is protected and that adjoining land is not threatened by pest species from within the area.

Users of wilderness must be prepared to face difficult and challenging conditions, and Council stresses the need to bring to the attention of the public the potential hazards associated with the use of these areas. In general, it is to be expected that the lack of vehicle access, the topography, and the location of this zone will ensure that the users are self-reliant.

Recommendation

A1 Avon

That the area shown on the map (29, 550 ha) be used to :

- (a) provide opportunities for solitude and unconfined forms of recreation in substantially unmodified natural environments.
that
- (b) its value for providing solitude be maintained by controlling the numbers of people using the wilderness at any one time.
- (c) construction of roads or tracks and the entry of vehicles not be permitted other than for management purposes.
- (d) grazing within it be terminated as soon as practicable but not later than 3 years after the acceptance of these recommendations.

and that it be permanently reserved under section 14 of the *Land Act* 1958 as part of the Alpine Reserve, and managed by the Forests Commission.

The zone includes a large roadless "core" area in the headwaters of Mount Hump Creek, where more than 4,000 ha is further than 3 km from any vehicular track. Environments range from subalpine woodlands and open areas to dense tall regrowth forests of mountain ash and shining gum and stunted dry foothill forests.

Part of the watersheds of the Avon, Turton, and Dolodrook Rivers are included in the zone, which provides opportunities for activities such as bushwalking, fishing, and rock-climbing. Climatic conditions vary from hot and dry in summer, particularly at the lower elevations, to very cold, with regular snowfalls, at the higher elevations during winter.

Council is aware of the history of fire in this general area and therefore believes that the wide belt of public land adjoining the proposed wilderness on its eastern, southern, and western borders should be used as a buffer area. Within this substantial area and in the wilderness zone itself all measures necessary for adequate fire protection and control should be taken. Adequate control of pest plants and animals is also essential.

Council is also aware that the Australian Army and the Royal Australian Air Force use air space over the area, and believes such use should be avoided where possible or at least restricted to high-altitude traverses.

Council recognizes that the recommendations for a wilderness zone within the alpine reserve as presently defined does not meet the ideal advocated by many wilderness users. It believes, however, that a considerably larger area will meet most requirements and therefore will consider extending the zone into the Gippsland Lakes Hinterland Area when making recommendations for that area.

REFERENCE ZONE

The areas that comprise the reference zone are tracts of public land containing viable samples of one or more land types that are relatively undisturbed and that are reserved in perpetuity. Those concerned with studying land for particular comparative purposes may then refer to such areas, especially when attempting to solve problems arising from the use of land.

Areas in the reference zone include typical examples of land types that have been modified elsewhere for productive uses such as agriculture, mining, or intensive timber production. The course and effects of human alteration and utilization of the land can be measured against these relatively stable natural areas.

In common with references and standards used in other fields, these must not be tampered with, and natural processes should be allowed to continue undisturbed. Areas in a reference zone should be sufficiently large to be viable and should be surrounded by a buffer, the width of which would vary according to the activity occurring on the adjacent land. The role of the buffer is to protect the zone from damaging or potentially damaging activities on surrounding land. It will also protect important values in the surrounding land from potentially damaging natural processes occurring within the zone.

Access should be restricted, and experimental manipulation should not be permitted. Setting aside such areas will enable continued study of natural features and processes : for example, fauna, flora, hydrology, and nutrition. These studies are important in increasing our knowledge of the ecological laws and processes on which Man's survival may ultimately depend.

The preservation of some species in the long term requires the setting aside of areas free from human interference (in the form of productive or recreational use of the land). These areas preserve a valuable pool of genetic material. Man often uses wild species to genetically strengthen inbred races of domestic plants and animals—and the future use of gene pools will probably expand far beyond this.

In recommending the creation of a reference zone, the Council foresees the need for new legislation to specify their status. An advisory committee has been established to determine the broad policies for the management of these areas and their buffers.

Note that the selection of the areas listed here is based on current knowledge of the land types in the study area, and additional areas may be needed as better information on ecology and land-use problems becomes available.

Recommendations

A2-A19 That the areas listed below and shown on the map

(a) be used to maintain natural ecosystems as a reference to which those concerned with studying land for particular comparative purposes may be permitted to refer, especially when attempting to solve problems arising from the use of land

(b) be surrounded by a buffer, and that the delineation of the buffer be by joint agreement between the managing authorities of the area itself and of the land adjacent to the area and the advisory committee

that

(c) activities, such as grazing, that conflict with the purposes of a reference zone, cease as soon as possible after the recommendations are adopted

and that the areas be permanently reserved under section 14 of the *Land Act* 1958 as part of the Alpine Reserve and managed by the authority indicated in the schedule below.

NOTE : Grazing should be phased out in the two reference zone areas on the Bogong High Plains, A11 and A12, in conjunction with the phasing out of grazing on the surrounding land—see recommendation A20-A26 (h).

A2 East Caledonia (500 ha)

To be managed by the Forests Commission.

Lower Carboniferous—Upper Devonian sediments, flat to mountainous ; elevation 840—1,580 m ; approximate annual rainfall 1,300 mm ; subalpine woodland snow gum, subalpine open area, open-forest IV alpine ash, open-forest III narrow-leaf peppermint.

A3 Wonnangatta River (500 ha)

To be managed by the Forests Commission.

Ordovician sediments, hilly ; elevation 500–1,040 m ; approximate annual rainfall 1,000 mm ; open-forest IV alpine ash, open-forest III narrow-leaf peppermint, open-forest II broad-leaf peppermint.

A4 Mount McAdam (200 ha)

To be managed by the Forests Commission.

Ordovician sediments, hilly ; Quaternary Recent alluvial deposits, river flats ; elevation 320–840 m ; approximate annual rainfall 700–800 mm ; open-forest III manna gum—narrow-leaf peppermint, open-forest II broad-leaf peppermint and red stringybark.

A5 Thirteen Mile Spur (300 ha)

To be managed by the Forests Commission.

Ordovician sediments, mountainous ; elevation 600–1,200 m ; approximate annual rainfall 1,000 mm ; open-forest IV mountain ash and alpine ash, open-forest III messmate stringybark.

A6 Blue Rag (680 ha)

To be managed by the Forests Commission.

Ordovician sediments, mountainous ; elevation 700–1,660 m ; approximate annual rainfall 1,400–1,600 mm ; subalpine woodland snow gum, open-forest IV alpine ash, open-forest III narrow-leaf peppermint, open-forest II broad-leaf peppermint.

A7 Boiler Plain (850 ha)

To be managed by the National Parks Service.

Tertiary Oligocene basalt, Tertiary Eocene gravels, undulating ; Ordovician sediments, mountainous ; elevation 900–1,580 m ; approximate annual rainfall 1,400–1,600 mm ; subalpine woodland snow gum, subalpine open area, open-forest IV alpine ash, open-forest II broad-leaf peppermint.

A8 Lagoon Plateau (970 ha)

To be managed by the National Parks Service.

Tertiary Oligocene basalt, undulating ; Ordovician sediments, mountainous ; elevation 600–1,200 m ; approximate annual rainfall 1,100 mm ; subalpine open-forest mountain gum–snow gum, open-forest III narrow-leaf peppermint, open-forest II broad-leaf peppermint.

A9 Shepherds Creek (590 ha)

To be managed by the National Parks Service.

Ordovician sediments, undulating to mountainous ; elevation 800–1,320 m ; approximate annual rainfall 1,000 mm ; subalpine open-forest mountain gum, open-forest IV alpine ash, open-forest II broad-leaf peppermint.

A10 Spring Creek (650 ha)

To be managed by the Forests Commission.

Upper Ordovician–Lower Silurian gneiss and schist, undulating to low hills ; elevation 1,200–1,480 m ; approximate annual rainfall 1,200 mm ; subalpine open area, subalpine woodland snow gum, subalpine open forest mountain gum–snow gum, open-forest IV alpine ash.

A11 Hollonds Knob (320 ha)

To be managed by the National Parks Service.

Upper Ordovician schists, undulating ; elevation 1,480–1,800 m ; approximate annual rainfall 2,200 mm ; subalpine woodland snow gum, alpine and subalpine open area grassland and mossland.

A12 Whiterock Creek (245 ha)

To be managed by the National Parks Service.

Upper Ordovician gneiss, mountainous ; Tertiary Pliocene alluvial terraces, undulating to mountainous ; elevation 1,420–1,820 m ; approximate annual rainfall 2,400 mm ; alpine open area grassland, herbfield, and mossland, subalpine open-forest snow gum.

A13 Burnside (1,120 ha)

To be managed by the Forests Commission.

Upper Silurian granite, Upper Ordovician–Lower Silurian gneiss, hilly ; elevation 700–1,360 m ; approximate annual rainfall 900–1,200 mm ; subalpine open-forest mountain gum–snow gum, open-forest IV alpine ash, open-forest III narrow-leaf peppermint, open-forest II broad-leaf peppermint.

A14 Porphyry Hill (240 ha)

To be managed by the Forests Commission.

Upper Ordovician–Lower Silurian schist, hilly ; Ordovician–Devonian granite, undulating ; elevation 520–800 m ; approximate annual rainfall 700 mm ; open-forest III narrow-leaf peppermint, open-forest II broad-leaf peppermint, open-forest I snow gum–black sallee.

A15 Wombat Creek (320 ha)

To be managed by the Forests Commission.

Tertiary Pliocene basalt, flat ; Silurian sediments, hilly ; elevation 480–960 m ; approximate annual rainfall 1,100 mm ; open-forest III narrow-leaf peppermint, open-forest II manna gum and broad-leaf peppermint.

A16 Lightwood (550 ha)

To be managed by the Forests Commission.

Silurian rhyodacite, undulating to low hills ; elevation 840–1,170 m ; approximate annual rainfall 1,200 mm ; open-forest IV alpine ash, open-forest III narrow-leaf peppermint.

A17 Buenba (330 ha)

To be managed by the Forests Commission.

Ordovician sediments, low hills to flat ; elevation 860–1,080 m ; approximate annual rainfall 1,100 mm ; open-forest III narrow-leaf peppermint, open-forest II broad-leaf peppermint and candlebark–snow gum–mountain swamp gum.

A18 Tom Groggin (935 ha)

To be managed by the National Parks Service.

Ordovician–Devonian granite, Silurian sediments, mountainous to hilly ; elevation 1,000–1,580 m ; approximate annual rainfall 1,100–1,300 mm ; subalpine woodland snow gum, open-forest IV alpine ash, open-forest III narrow-leaf peppermint.

A19 Blue Hill (870 ha)

To be managed by the National Parks Service.

Silurian sediments, hilly ; elevation 1,000–1,620 m ; approximate annual rainfall 1,000–1,400 mm ; subalpine woodland snow gum, subalpine open-forest mountain gum–snow gum, open-forest IV alpine ash, open-forest III narrow-leaf peppermint.

PROTECTION AND RECREATION ZONE

This zone contains outstanding natural features and diverse land types with high values for water production, for nature conservation, and for various recreation activities. By recommending that large tracts remain unroaded, Council recognizes its value for nature conservation and the opportunity these areas provide for recreation in solitude. The conservation of native flora, fauna, and other features would be an essential aim of management throughout the zone.

A number of features—the Bogong High Plains, Mount Cobbler, Lake Tali Karng, the Razor, the Viking, Mitchell's Homestead, and Reedy Creek Chasm—already attract substantial numbers of visitors, but many other areas throughout the zone are used for bushwalking, camping, fishing, and recreation driving. Hunting and the use of firearms would not be permitted in the Bogong area or in parts of the upper Catherine and Wonnangatta valleys. Deer-stalking would be permitted in the remainder of the zone, but not hunting deer with hounds.

Long-term logging would be excluded. In some small areas (indicated on the map), however, a once-only logging could take place followed by regeneration and a return to their natural state. These areas are close to existing access and are considered to be of vital short-term importance to certain sawmills with limited alternative timber resources. The guidelines for timber harvesting outlined in section C (Hardwood Timber Production) would apply to logging operations in these areas, which would be under the control of the Forests Commission.

Cattle-grazing under close control of the management authority would be allowed, except in certain key areas on the Bogong High Plains and in the Mount Howitt—the Bluff area. Here it is proposed that grazing should be phased out in the interests of soil and nature conservation and tourist values (wildflower displays). The suitability of areas for grazing will be further considered when the Soil Conservation Authority prepares land use determinations for proclaimed catchments. Policies for grazing and various recreation activities are outlined in sections K and I respectively of this report.

Recommendations

A20–A26 That the areas listed below and shown on the map be used to :

- (a) provide opportunities for open-space recreation—such as bushwalking, rock-climbing, ski-touring, fishing, deer-stalking (except in A23 and portions of A21 and A22, where hunting and the use of firearms is not permitted), horse-riding, camping, fossicking, and passive recreation—and for education (see notes 1 to 3 on the following page)
- (b) provide opportunities for motorized recreation (the use of motor vehicles and trail-bikes should be in accordance with legal requirements and regulations, referred to in more detail in the section on Recreation)
- (c) supply water and protect catchments and streams
- (d) conserve native plants and animals
- (e) protect historic sites and scenic values such as natural landscapes, waterfalls, and other beauty spots

that

- (f) logging not be permitted—except for once-only logging in areas indicated on the maps and such areas, after logging in accordance with the principles set down in the section on Hardwood Timber Production, be regenerated and rehabilitated; logging operations to be controlled by the Forests Commission, in consultation with the National Parks Service where it is the authority managing the area
- (g) apiculture be permitted (except in A23—Bogong)
- (h) grazing be permitted in this zone subject to the policies and conditions specified in section K (Agriculture) except in areas referred to in the text and those shown by horizontal stripes on the map, where grazing is to be phased out by 1988 (see note 5 below)
- (i) the Fisheries and Wildlife Division prepare plans for the conservation of wildlife in consultation with the management authority and, after mutual agreement, these be incorporated into the management plan
- (j) no new roads or vehicular tracks be constructed except those essential for protection and management purposes

and that the areas be permanently reserved under section 14 of the *Land Act* 1958 as part of the Alpine Reserve and managed by the Authority indicated in the schedule below.

Notes :

1. Provision should continue to be made for dispersed or bush camping. In areas suitable for more intensive use (such as at Sheepland Flat and adjacent to the township of Harrierville), the management authority should provide camping facilities to cater for larger numbers of people. Along major tourist routes, picnicking facilities in pleasant surroundings away from the road environment should be established to cater for the travelling public.
2. Fossicking should be permitted, using methods approved by the management authority, provided this activity does not conflict with catchment protection, nature conservation, or historic values.
3. The use of dogs associated with hunting would not be permitted in this zone.
4. Mining exploration should be in accordance with the principles set down in section L, Mineral and Stone Production.
5. Council believes that some alteration of grazing licence boundaries will be necessary, together with the re-allocation of current licence areas on the remaining grazing area within this and adjacent zones.

A20 Howqua—Jamieson (16,880 ha)

To be managed by the Forests Commission.

This area includes significant areas of unroaded land on the north fall of the Howqua River and in the catchments of Lickhole and Mitchell Creeks. The Governors and Eagle's Peaks are isolated and prominent peaks. Mitchell's Homestead, Fry's Homestead, and Sheepland Flat have high recreation and historic values.

A21 Cobbler-Viking (23,490 ha)

To be managed by the National Parks Service.

The area includes many outstanding natural features such as Mount Cobbler and the Cobbler Plateau, Mount Speculation, the Crosscut Saw, the Razor, the Viking, and the deep valleys of the upper Catherine and Wonnangatta Rivers.

In addition to the uses listed at the beginning of this section, Council recommends that :

(i) hunting and use of firearms not be permitted in portion of this area as indicated on Map A.

A22 Darling-Moroka (93,210 ha)

To be managed by the Forests Commission.

The area comprises part of the Bennison tablelands and escarpments into several rivers, including the Wonnangatta and Macalister Rivers. Outstanding natural features also include high ridges extending from Mount Howitt to the Bluff, Mount Clear, and Mount McDonald ; Snowy Bluff ; Lake Tali Karng ; and the open woodlands near the Dolodrook River. Large unroaded areas are located between Mounts Dawson and Darling.

In addition to the uses listed at the beginning of this section, Council recommends that :

(i) the road and other earthworks west from Shanty Hollow be revegetated at the completion of logging

(ii) hunting and the use of firearms not be permitted in portion of this area as indicated on Map A.

A23 Bogong (69,800 ha)

To be managed by the National Parks Service.

This area contains Victoria's ten highest peaks, the Bogong High Plains, the most extensive and spectacular alpine scenery in the State, and large areas of mature and fire regrowth alpine ash forest. It provides outstanding opportunities for many forms of outdoor recreation, particularly cross-country skiing, bushwalking, and motor touring. Nature conservation values are very high. The various alpine plant communities, including short herbfield (" snow patch " vegetation), tall herbfield, heathland, and mossland, are well represented here. The High Plains support many botanically significant and showy plants, including the Bogong daisy-bush and silky daisy—both endemic to the study area. Sub-alpine woodlands and open areas, alpine ash forests, and foothill forests are also well represented.

Fauna vary from the numerous and varied invertebrate species characteristic of alpine vegetation to the birds and arboreal mammals of the mountain and foothill forests. The rare mountain pigmy possum inhabits heathy snow gum woodland south-east of Mount McKay. Contrasting geomorphic features show remnants of old erosion surfaces (high tablelands) abutting ruggedly

dissected terrain. Geological features are varied in age and type, and include intensely metamorphosed (altered) rock, massive fault zones, basalt cappings showing columnar jointing, and periglacial rock rivers.

In addition to the uses listed at the beginning of this section, Council recommends that :

- (a) within Area I, associated with the Kiewa hydroelectric scheme, and shown on Map B
 - (i) the management be such that the quantity, quality, and timing of water produced meet the requirements of the State Electricity Commission under its regulations proclaimed to protect the Kiewa hydroelectric scheme
 - (ii) the State Electricity Commission have unrestricted access to its existing works for the purpose of operating and maintaining the hydroelectric scheme and the right to maintain the system of access tracks and control vehicular access
 - (iii) the relevant land management agency and State Electricity Commission consult regarding any proposals involving new earthworks, disposal of waste water, and development for recreation, and that any proposal proceed only with the agreement of the State Electricity Commission
 - (iv) mining operations at the Red Robin mine be permitted, subject to strict control on placement of mine tailings and use of access
- (b) within Area II, associated with the Kiewa hydroelectric scheme, and shown on Map B
 - (i) management be such that the hydroelectric scheme is adequately protected under regulations proclaimed for it
 - (ii) the State Electricity Commission retain the right to carry out all measures necessary to protect its assets in the catchment (these include systematic controlled burning in the northern approaches to the East Kiewa valley, controlling insect infestation, maintaining and augmenting a system of fire-access tracks, restricting vehicular access in certain areas) and the right of access for fire-suppression activities
 - (iii) camping not be permitted without the express approval of the State Electricity Commission
- (c) the leased areas at Wilkinson Lodge (held by the Melbourne Bushwalkers), Howman Gap (held by the National Fitness Council of Victoria), and Rover Scout Chalet (held by the Australian Boy Scouts Association) be added to this zone of the Alpine Reserve on expiration of the leases, but that the facilities on these areas continue to be used for recreation and education
- (d) the Fisheries and Wildlife Division prepare plans for the conservation of wildlife, particularly the rare mountain pigmy possum, in consultation with the management authority and that after mutual agreement these be incorporated into the management plan
- (e) apiculture not be permitted

- (f) hunting and the use of firearms not be permitted
- (g) (i) experimental logging be conducted in the Slippery Rock Creek catchment in accordance with the guidelines outlined in Note 1
- (ii) the logged catchment and adjacent unlogged Springs Creek catchment (control) be monitored to determine the effects of logging on water quality and stream flow
- (iii) subject to the foregoing logging operations not causing 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 area shown on the map under prescriptions determined after the results of the experimental logging are known
- and that
- (iv) logged areas be regenerated and closed to further logging.

Notes :

1. An experimental logging operation will take place in the northern part of the East Kiewa River catchment with the aim of investigating some of the basic hydrological effects of logging in mountain forests in this area.

In a simple comparison model, fundamental hydrological characteristics such as stream flow and sediment load will be monitored in two small adjacent catchments. One catchment will act as a control, and logging, in small dispersed coupes, will be undertaken in the other in accordance with the following guidelines.

- I. Coupes of 20 ha maximum size are to be logged, with approximately equal areas to be cut in each of the first, second, and fourth years.
 - II. Prescriptions for road construction, log extraction, silvicultural treatment, and administration in the West Kiewa catchment, as amended below, are to apply under the general supervision of the Joint Forest Management Committee for West Kiewa :
 - * The main access roads are the Bald Hill–McKay Creek fire track and the Springs–Bogong Village track. No timber traffic is to be permitted via Bogong Village.
 - * Camping is not permitted.
 - * Adequate filter strips are to be retained along streams.
 - * Particular attention is to be given to spreading and filtering run-off from road culverts.
2. An area associated with the Kiewa hydro-electric scheme—part of the Water and Hydroelectricity Production Zone (see recommendation A64)—is excluded from this zone. The State Electricity Commission has indicated a possible need to enlarge this area if the Kiewa hydroelectric scheme is

extended in the future. The Council considers that the boundaries of area A64 as presently defined will allow some flexibility in planning, but until plans for future development are approved by the government it is not possible to determine whether some expansion or contraction will be required. Proposals for further development of the scheme should be better defined when Council next reviews land use in the Alpine area.

A24 Dargo River (22,250 ha)

To be managed by the National Parks Service.

This area forms part of the deeply dissected Dargo River valley, and the only existing vehicular tracks lead to Mayford, the site of a former gold-mining town, and to Boiler Plain.

A25 Reedy-Buchan (33,120 ha)

To be managed by the National Parks Service.

This area contains a wide range of geological formations and vegetation types. Features include the Reedy Creek chasm, Forlorn Hope Plain, unusual vegetation patterns on Silurian sediments, and colonies of brush-tailed rock wallabies.

In addition to the uses listed in the beginning of this section, Council recommends that :

- (i) the Fisheries and Wildlife Division prepare management plans for the protection of the brush-tailed rock wallaby in consultation with the management authority and that after mutual agreement these be incorporated into the management plan

and that

- (ii) the alternating bands of mallee thicket and heathland at Brumby Point and near the Reedy Track be protected.

A26 Davies Plain-Murray (31,490 ha)

To be managed by the National Parks Service.

The area comprises part of the Murray River headwaters, and Davies Plain Ridge. It has a number of affinities with the adjacent Kosciusko National Park, including similar geological formations and the presence of the alpine water skink, which is known in Victoria only in this locality.

Note : A decision on once-only logging of the area marked on Map A has been deferred until land use in the Alpine area is next reviewed by Council.

NATURAL FEATURES ZONE

This zone comprises relatively small isolated areas of land characterized by outstanding landscapes, geological formations, or other natural features that warrant special protection. The maintenance of these features would be the main aim of management. Levels of permitted activities such as recreation and grazing would be closely controlled. Any road construction would be minimal and carefully planned. Logging would not be permitted in this zone.

Recommendations

A27-A49 That the areas listed below and shown on the map be used to :

- (a) maintain natural landscapes and features
 - (b) provide opportunities for recreation and education
 - (c) supply water and protect catchments and streams
 - (d) conserve native plants and animals
- that
- (e) the Fisheries and Wildlife Division prepare plans for the conservation of wildlife in consultation with the management authority and, after mutual agreement, these be incorporated into the management plan
 - (f) grazing be permitted in this zone subject to the policies and conditions specified in section K, Agriculture
 - (g) apiculture be permitted
 - (h) any new roading be constructed only where essential for management and protection purposes and be designed to minimize effects on scenic and nature conservation values

and that the areas be permanently reserved under Section 14 of the *Land Act* 1958 as part of the Alpine Reserve and managed by the Forests Commission.

NOTE : Most of these areas are high ridges of snow gum woodland flanked by forests of alpine ash. Where this situation occurs the natural features zone is intended to include a strip of alpine ash, with a minimum width of 40 m where possible. The small quantities of timber these areas include would not be harvested, as they are extremely important for nature conservation and landscape amenity.

A27 Mount Useful (860 ha)

The rounded summit of the mountain supports subalpine heathlands and herb-fields, which are surrounded by woodlands and thickets of snow gum and ash-mallee. The old mining track known as McEvoy's Track passes through the area. A fire look-out tower is situated at the summit.

A28 Mount Skene (1,420 ha)

This high ridge of subalpine woodland is traversed by the Jamieson-Licola tourist road. It contains the most westerly occurrence of ash-mallee. A fire look-out is situated on the main ridge south of Mount Skene.

A29 The Crinoline or Mount Ligar (1,070 ha)

The mountain derives its popular name from the horizontal bands of sandstone protruding from its slopes. This distinctive landscape feature and the adjacent plateau just to the north lie on a popular walking route.

A30 Mount Kent–Castle Hill (1,360 ha)

The rim of the Moroka Basin affords extensive views of the Wonnangatta valley, particularly from prominences such as Mount Kent, the Pinnacles (site of a fire look-out) and Castle Hill ; conversely, it forms an impressive landscape feature viewed from the valley itself.

A31 Mount Sarah (400 ha)

This high point is viewed from various surrounding areas and the spring near Guys Hut, which is surrounded by grassy snow gum woodland, is strategically placed for visitors travelling along the Tea Tree Range.

A32 Mount Murray–the Twins (2,050 ha)

Mount Murray—a high peak—overlooks the Wongungarra valley. The remainder of the area forms part of the Barry Mountains—a section of the Alpine Walking Track—and consists of high mountain peaks and ridges covered for the most part with snow gum woodlands but also, on some southern aspects, alpine herbfields and heathlands.

A33 Blue Rag Range (1,040 ha)

This high prominent ridge rivals the Mount Murray–Twins section of the Barry Mountains as a landscape feature. Southern aspects below the ridge-top support alpine herbfields and heathlands.

A34 Dargo High Plains (1,510 ha)

This area is perhaps the best-known of the Dargo Tablelands. Its main features are Lankey Plain, site of the highly significant plants *Epilobium willisii* and *Wahlenbergia densifolia* ; Devils Hollow and the King Spur ; and cliffs of columnar basalt overlooking the Dargo River headwaters.

A35 Livingstone Creek (340 ha)

Woodlands of Omeo gum, black sallee, and mountain swamp gum, together with associated grasslands and heathlands, grow along the environs of Livingstone Creek.

A36 Victoria Falls (50 ha)

The Victoria Falls comprise a series of waterfalls and cascades on the Victoria River. This river descends about 90 m vertically within a distance of about 400 m through a gorge cut into gneissic rocks of Upper Ordovician to Lower Silurian age.

A37 Mount Wills (640 ha)

Although isolated, the mountain is readily accessible from the Omeo Highway and from the Alpine Walking Track, which passes through part of the area. Its snow gum-covered upper slopes and large granite tors along the summit ridge are distinctive. A fire look-out is situated at the summit.

A38 Granite Peak (170 ha)

The messmate stringybark stands here lie at the northern edge of this species' distribution in Victoria. These grade into alpine ash forests at their upper limit, and snow gum woodlands replace alpine ash near the summit. The distinctive landscape feature of this peak is its almost conical slope.

A39 Mount Benambra (200 ha)

This prominent mountain overlooks Dartmouth Reservoir, and carries a fire look-out on its summit. Snow gum woodlands cover the upper slopes.

A40 Mount Cravensville (540 ha)

Like nearby Mount Benambra, this mountain is composed of Silurian volcanic rocks. The summit area forms a small basin rimmed by snow gum woodlands.

A41 Wild Boar Range (560 ha)

The range includes Mount Sassafras, which overlooks the valleys of the Gibbo River and Zulu and Wheeler Creeks. The snow gum-covered ridge lies on the Alpine Walking Track and is viewed from Mounts Pinnibar and Gibbo.

A42 Mount Gibbo (1,290 ha)

This high mountain ridge covered by snow gum woodland lies along the Alpine Walking Track. Like Mount Pinnibar nearby, it affords extensive views of the Kosciusko National Park.

A43 Mount Pinnibar (1,340 ha)

Mount Pinnibar, a distinctive landscape feature, overlooks the Pinnibar plateau and Murray River valley at Tom Groggin. The Alpine Walking Track reaches the summit area, which supports stunted snow gum shrubland.

A44 Benambra Creek Cascades (200 ha)

Snow gum woodlands cover a hill formed of Triassic igneous rocks, and Benambra Creek forms cascades where it crosses resistant Ordovician bedrock.

A45 Macfarlane Lookout (320 ha)

The rocky scarps and cliffs of this distinctive mountain are formed from Triassic igneous rocks.

A46 Mount Tambo (2,800 ha)

The rocky mountain range, composed largely of red to purple conglomerates of Upper Devonian age, forms a spectacular landscape feature visible from both the Benambra and Bindi districts. The vegetation varies from dry foothill forests of red stringybark and brittle gum, through moist foothill forests of messmate stringybark and narrow-leaf peppermint, to pockets of alpine ash forests and summit areas of snow gum woodland.

A47 Nunniong Plain-Lake Hill (1,040 ha)

Perhaps the most notable feature of the Nunniong tablelands is the Big Nunniong Plain, composed of grasslands formed on basalt-derived soils and surrounded by snow gum woodlands.

The highly significant plant species *Oreomyrrhis argentea*, *Wahlenbergia densifolia*, and *Hydrocotyle* sp. aff. *sibthorpioides* are found here. Also included within the area is Lake Hill, which is essentially a plateau on basalt, carrying a small shallow lake surrounded by subalpine grassland and snow gum woodland.

A48 Bentley Plain (200 ha)

This area comprises subalpine grasslands and heathlands surrounded by attractive snow gum-mountain gum forest. "Moscow Villa", a picturesque hut located beside Bentley Plain, also attracts visitors.

A49 Mount Stewart (300 ha)

Mount Stewart, a granite hill overlooking the clearing at Glenmore in the Buchan River valley, is the site of heathlands growing on shallow rocky soils. Showy plants include an undescribed *Eriostemon* species considered to be of high botanical interest. The nearby waterfalls on an attractive section of Mellick Munjie Creek are also included in the area.

GENERAL USE ZONE

This covers the largest area of any of the zones and is to be managed for multiple use, including water production, hardwood logging, forest grazing, and apiculture. It has a high capability for a wide variety of recreational use and also has great importance for fauna and flora, scenic landscapes, and historic sites. It differs primarily from the Protection and Recreation Zone in catering for long-term hardwood production.

Although widely spread throughout the zone, the areas suitable for hardwood timber production comprise only a small percentage of the total area. The major ones include the Upper Goulburn and Howqua River catchments, the Tea Tree Range, Pinnibar plateau, and Nunniong Tablelands. Particular sites or features in each area have been singled out for special protection measures. As logging and access to logging will nevertheless make a significant impact on landscape, a set of principles based on current Forests Commission prescriptions have been included in these recommendations to provide guidelines for timber harvesting (see section C, Hardwood Timber Production). Policies for grazing and various recreation activities outlined elsewhere in these recommendations would also apply here.

Recommendations

A50–A59 That the areas listed below and shown on the map be used to :

- (a) provide opportunities for open-space recreation and education, where recreation would include activities such as bushwalking, camping, fishing, canoeing, fossicking, deer-hunting, horse-riding, four-wheel-drive touring, trail-bike riding, and the various forms of passive recreation (see notes 1, 2, 3, and 4)
- (b) supply water and protect catchments and streams
- (c) produce hardwood timber in accordance with the principles outlined in section C, Hardwood Timber Production, which aim at protecting other values and uses in and around logging areas
- (d) provide forage for grazing in accordance with the policies and conditions specified in section K, Agriculture
- (e) produce honey, gravel, sand, and other forest produce as defined under the *Forests Act 1958* (see note 5)
- (f) conserve native plants and animals
- (g) protect sensitive components of distinctive landscapes that are a matter of public concern and may be seen from popular viewing points
- (h) protect the environs of popular walking tracks, driving routes, look-out points, waterfalls, or other beauty spots
- (i) protect historic sites and relics that are the property of the Crown
- (j) protect particular values as listed below in the 10 divisions of the zone according to the principles and guidelines outlined for various uses dealt with in sections on Hardwood Timber Production, Agriculture, Mineral and Stone, and Recreation (in listing viewing points it should be noted that some logging areas and roads will be visible from them, but protection of sensitive landscape components will reduce the visual effects)

that

- (k) the Fisheries and Wildlife Division prepare plans for the conservation of wildlife in consultation with the management authority and, after mutual agreement, these be incorporated into the management plan

and that the areas be permanently reserved under Section 14 of the *Land Act 1958*, as part of the Alpine Reserve, and managed by the Forests Commission.

NOTES :

1. The use of four-wheel-drive vehicles and trail-bikes should be in accordance with legal requirements and regulations as referred to in more detail in section I, Recreation.
2. In addition to allowing dispersed or bush camping throughout most of the zone, in areas suitable for more intensive use (such as at Wrens Flat, Eagle Vale, Anglers

Rest, Staleyville, Harrierville, and Nariel, and along the Wellington and Gibbo Rivers) the management authority should provide camping facilities to cater for larger numbers of people. Along major tourist routes (such as adjacent to the Omeo Highway at the Mitta Mitta River crossing and the Alpine Way near the Victoria River crossing), picnicking facilities in pleasant surroundings away from the road environment should be established to cater for the travelling public.

3. Fossicking should be permitted, using methods approved by the management authority, in areas where this activity does not conflict with water catchment, nature conservation, and historic values.
4. The use of hounds for deer-hunting should be permitted in this zone.
5. The use of areas within this zone for mining exploration and for extraction for sand and gravel should be in accordance with the principles and guidelines set out in section L, Mineral and Stone Production.

A50 Goulburn (167,240 ha)

In accordance with (j) above, the following values should be protected :

- (a) sensitive components of distinctive landscapes seen from important viewing points such as Mounts McDonald, Clear, Buller, Howitt, and Speculation, and from the Bluff
- (b) timber tramlines at Bakers Creek and Plain Creek, the Cinnibar mine site, mining relics in the Upper Goulburn catchment, and environs of old cattlemen's huts
- (c) waterfalls on Falls and Currajung Creeks, the Jamieson Gorge, and an alpine ash stand of 15 ha immediately south-east of Lovicks Hut
- (d) several rare species of frogs recorded in the upper Goulburn River and its tributaries
- (e) sites containing important fossils located at Enoch's Point (Silurian fossils), upper Howqua River (Upper Devonian fish fauna), and the Matlock area (Lower Devonian, Silurian, and Ordovician fossils).

NOTE : The use of an area of 5 ha in the Parish of Warrambat for the production of slate should continue. The quarry workings, equipment, and building should be masked from view from Mount Buller, Mount McDonald and the Governors. Mining debris should be used to surface the extraction road and not dumped on undisturbed sites.

A51 Macalister (134,170 ha)

In accordance with (j) above, the following values should be protected :

- (a) sensitive components of distinctive landscapes seen from important viewing points such as Mounts McDonald, Clear, Magdala, Dawson, Wellington, and from the Sentinels

- (b) the lake situated near Caledonia River—east branch (Warburton 1:250,000 GR. 4725 3955)
- (c) environs of McMillans Track, McEvoy's Track, relics that are the property of the Crown, and sites associated with early mining on the Aberfeldy goldfield
- (d) manna gum forests along river flats and silvertop open forest I in Grimme and Coleman Creek catchments
- (e) *Koeleria australiensis*—Butchers Spur; *Boronia citriodora*—near Mount Margaret and S.O.B. Spur; *Astrotricha parvifolia* and *Prostanthera* sp. aff. *rhombea*—near Mount Margaret; *Goodenia grandiflora* var. *macmillanii* and *G. heterophylla*—Macalister River south of Burgoyne's Gap; two undescribed *Hibbertia* spp., *Prostanthera decussata*, *P. rhombea*, *P.* sp. aff. *howelliae*—near Licola; *Dampiera scottiana*—headwaters of Warrigal Creek.

A52 Buffalo–Ovens–Kiewa (52,360 ha)

In addition to the uses listed for the zone at the beginning of this section, Council recommends that :

- (a) within area I, associated with the Kiewa hydroelectric scheme, and shown on map B
 - (i) the management should be such that the quantity, quality, and timing of water produced meets the requirements of the State Electricity Commission under its regulations proclaimed to protect the scheme
 - (ii) the State Electricity Commission have unrestricted access to its existing works for the purpose of operating and maintaining the hydroelectric scheme and the right to maintain the system of access tracks and control vehicular access
 - (iii) the relevant land management agency and State Electricity Commission consult regarding any proposals involving new earthworks, disposal of waste water, and development for recreation, and that any proposal proceed only with the agreement of the State Electricity Commission
- (b) within Area II associated with the Kiewa hydroelectric scheme, and shown on map B
 - (i) management should be such that the hydroelectric scheme is adequately protected under regulations proclaimed for it
 - (ii) the State Electricity Commission retain the right to carry out all measures necessary to protect its assets in the catchment (these include systematic controlled burning in the northern approaches to the East Kiewa valley, controlling insect infestation, maintaining and augmenting a system of fire-access tracks, restricting vehicular access in certain areas) and the right of access for fire-suppression activities
 - (iii) camping not be permitted without the express approval of the State Electricity Commission

In accordance with (j) above, the following values should be protected :

- (a) sensitive components of distinctive landscapes seen from important viewing points such as the Twins, Tawonga Gap, and Mounts Feathertop, Fainter, McKay, Spion Kopje, and Bogong
- (b) relics that are the property of the Crown and sites associated with early mining on the Harrietville goldfield, and environs of Dungeys Track
- (c) Omeo gum stands in the headwaters of the Buckland River, manna gum and swamp gum forests along river flats, and fern gullies in the Mountain Creek catchment.

A53 Mitchell (163,260 ha)

In accordance with (j) above, the following values should be protected :

- (a) sensitive components of distinctive landscapes seen from important viewing points such as Mounts Darling, Sarah, Murray, and Tabletop, Devils Hollow, and the Blue Rag Range
- (b) McMillans Track, relics that are the property of the Crown, and sites associated with early mining on the Dargo, Crooked River, and Cobbannah goldfields, including Gows Hotel site, Patty mine site, and the township sites of Mayford, Brockett, and Louisville ; Moroka Hut ; Moroka Pack Track
- (c) manna gum forests along river flats
- (d) *Eucalyptus neglecta*—south-east of Treasures Homestead ; *Astrotriche parvifolia* and *Prostanthera* sp. aff. *rhombea*—Valencia Creek area ; *Tetratheca* sp. aff. *procumbens*—near Moroka Hut
- (e) the smoky mouse, recorded in the Galbraith Saddle area of the Tea Tree Range.

A54 Wentworth (44,660 ha)

In accordance with (j) above, the following values should be protected :

- (a) Dargo-Omeo mining track, Jirnkee water race, relics that are the property of the Crown, and sites associated with early mining at the old township of Brookville and in the Haunted Stream ; old sawmill site and tramway near Mount Baldhead
- (b) herbfield and adjacent alpine ash environs at Mount Baldhead ; herbfields, heathland, black sallee woodland, and adjacent alpine ash environs at Mount Delusion ; manna gum forests along river flats
- (c) *Sticherus flabellatus*—Pheasant Creek headwaters.

A55 Livingstone-Bundara (69,750 ha)

In accordance with (j) above, the following values should be protected :

- (a) Jirnkee water race, Dargo-Omeo mining track, relics that are the property of the Crown, and sites associated with early mining around Mount Gingeer, Munjie, Glen Valley, and Glen Wills
- (b) *Grevillea willisii* near Anglers Rest and *Eucalyptus neglecta* on Spring Creek.

A56 Snowy Creek (73,810 ha)

In accordance with (j) above, the following values should be protected :

- (a) sensitive components of distinctive landscapes seen from important viewing points such as Mounts Nelse, Bogong, and Wills, and Granite Peak
- (b) Lightning Creek–Mitta Mitta, Trappers Creek, Wombat Creek, Scrubby Creek, and Sunnyside water races ; relics that are the property of the Crown, and sites associated with early mining around Sunnyside, Wombat Creek, Lightning Creek, and Mitta Mitta ; old sawmill site at Mount Wills
- (c) waterfalls on Wye Creek
- (d) fern gullies in the headwaters of Trappers Creek and Snowy Creek (west branch).

A57 Gibbo–Dart (129,560 ha)

In accordance with (j) above, the following values should be protected :

- (a) sensitive components of distinctive landscapes seen from important viewing points such as Mounts Sassafras, Gibbo, and Benambra
- (b) relics that are the property of the Crown, and sites associated with early mining at Green Creek, Glen Dart, Saltpetre Creek, and Pheasant Creek ; Gibb sawmill site, Buenba Hut area
- (c) forests and woodlands along the Gibbo River and Buenba Creek flats
- (d) *Hydrocotyle* sp. aff. *sibthorpioides* at Buenba.

A58 Wheeler–Murray (71,520 ha)

In accordance with (j) above, the following values should be protected :

- (a) sensitive components of distinctive landscapes seen from important viewing points such as Mounts Sassafras, and Gibbo, and Davies Plain Ridge
- (b) relics that are the property of the Crown, and sites associated with early mining at Mount Murphy, Zulu Creek, and Surveyors Creek
- (c) *Acacia dallachiana* at Dinner Creek, and riverine forests along Omeo Creek flats.

A59 Tambo–Buchan (141,350 ha)

In accordance with (j) above, the following values should be protected :

- (a) early settlement site at Glenmore ; relics of early logging near Mount Nugong
- (b) waterfalls and gorges on the Timbarra and Tambo Rivers
- (c) *Deyeuxia microseta*—upper Frying Pan Creek ; *Deyeuxia parviseta*—upper Blue Shirt Creek ; *Helichrysum adnatum* and *Pimelea dichotoma*—Marble Creek near Bindi ; *Leucopogon pilifer*—headwaters of Timbarra River and Blue Shirt Creek ; *Pterostylis aestiva* near Ensay ; *Dillwynia prostrata*—Seldom Seen and Boundary Creeks ; *Thesium australe*—upper reaches of Little River and at Gillingall

- (d) Mossbed Lake and numerous subalpine plains such as Joe, Mundy, Hill, Low, Nunnett, Pig, Paddy, Timbarra, Blue Shirt, and Emu Plains ; gullies containing montane closed forest beside the main Bindi-Mount Nugong and Ensay North-Mount Nugong roads.

WATER AND HYDROELECTRICITY PRODUCTION ZONE

The catchments of the study area are extremely important for water production. High rainfalls are received over much of the area, particularly at the higher elevations, where winter precipitation is stored in the form of snow. Snow melt in spring and early summer helps maintain summer stream flow. Water quality in most streams is of a high standard. The highest elevations produce the greatest amounts of water per unit area of any part of the State.

Current Management and Use

The Alpine area contributes about one-quarter of the State's water. Water from part of this area enters the Murray above Albury and is shared between Victoria, New South Wales, and South Australia under the control of the River Murray Commission. The area supplies major storages including Lakes Hume, Eildon, and Glenmaggie and the smaller Lake William Hovell and Lake Buffalo, all of which lie outside its boundary, and the Dartmouth reservoir, which lies within it. Large irrigation districts in northern Victoria and in Gippsland draw water from these storages. Storages and streams in this area also provide water for hydroelectric power, for domestic consumption in large centres such as Albury-Wodonga, Wangaratta, and Bairnsdale and in numerous smaller towns and individual houses, for privately operated irrigation of crops and pastures, and for stock water. Planning is well advanced for a storage on the Mitchell River, which has a large part of its catchment in the study area.

Four catchments that lie partly within the study area (those of Lakes Hume, Eildon, and Glenmaggie, and the Nicholson River) and one (the Upper Kiewa catchment) completely within it, are Proclaimed Water Supply Catchments. The use of all land in proclaimed catchments may be subject to specification by notice issued by the Soil Conservation Authority, or by determination made by the Authority after consultation with the Land Conservation Council.

Land above 1,200 m has the highest water yield in the State and is very sensitive to disturbance of soils and vegetation. Most of it is already included in those five proclaimed catchments. To protect the other catchments and ensure common standards of land use, the remaining catchments with land above 1,200 m will need to be proclaimed.

No catchment in the area is closed to the public and used solely for water production, although the State Electricity Commission exercises restrictions on vehicular use, camping, and lighting of fires in the upper Kiewa catchment. This area of 10,400 ha of public land along the Kiewa River East Branch and extending south to Mounts Jim, Bundara, and Cope on the Bogong Tablelands, is administered by the Commission under regulations designed to protect the Kiewa hydroelectric scheme.

The Kiewa hydroelectric scheme supplies, from three power stations, about 2.7 per cent. of total State electricity output. The system is valuable for meeting peak-load requirements and will assume increasing importance until the expected shortfall in generating capacity is overcome sometime in the late 1980s.

The Soil Conservation Authority has been given a specific responsibility by the State government to exercise supervisory control over all grazing and earthworks on land above 1,219 m elevation.

Multiple Use

Recognizing that the prime water-producing areas of the State coincide with the principal mountain and forested areas, and that these areas together with inland water bodies are a major attraction for recreation, the Council believes that whenever possible there should be multiple use of catchments. Where recreational use of storages is permitted, it must be carefully controlled to ensure adequate protection of water quality, and responsibility for this must remain with the water supply authority.

The Council realizes that the optimum combination of land uses for catchments will vary from one land type to another, depending on the interaction between the environmental variables of climate, parent material, topography, soils, and organisms. The Council is aware that a particular use may not impair the quantity, frequency, or quality of water yield in one instance, but may have a profound effect in another.

Where a multiple use is required of a catchment supplying water used for power generation or for domestic, industrial, or irrigation purposes, the catchment should be proclaimed under section 22 (1) of the *Soil Conservation and Land Utilization Act* 1958 and section 5 (1) of the *Land Conservation Act* 1970. This will require the proclamation of additional catchments.

Council believes that in most situations it is not necessary for a water or electricity supply authority to control and manage all land in its water catchment. Public authorities managing land within a proclaimed catchment must, however, consult, co-operate, and reach agreement with that authority and with the Soil Conservation Authority regarding the type, location, and timing of its management activities. This is the current practice in most areas.

On the other hand, the water or electricity supply authority should control and manage the buffer strip (defined in the land use determination) around storages and diversion works in addition to the storages and the areas on which capital works are situated. Although the primary object of management in the buffer must always be to protect water quality, there are situations where secondary uses (such as recreation and timber production) can be permitted. In such circumstances, the water or electricity supply authority and any other authorities concerned must agree upon the principles of management.

Water Quality, Yield, and Regulation

It is possible to improve the quality of water by treatment—at a cost. It must, however, be recognized that the higher the quality of raw water, the cheaper and more efficient is the treatment and, in most cases, the more acceptable the end product. It is also vital to safeguard the quantity and timing of yield. Catchments must be protected from loss of infiltration capacity and damage to other hydrologic properties, soil erosion, and contamination from chemical or biological sources.

The implementation of proper management of land uses within catchments is extremely important and recognition must be given to the greater-than-normal need for high levels of protection, particularly in the ecologically sensitive areas such as those above 1,200 m. Implementation of any recommendations for public land within catchments will require that values such as water yield, quality, and flow regime are of major concern. The Council recognizes the need for research to provide guidelines for such management.

Additional Water and Electricity Needs

The Dartmouth dam project began impounding water in November 1977 and will hold 3.77 million Ml at full supply level. The storage will be operated by the State Rivers and Water Supply Commission on behalf of the River Murray Commission and used primarily for irrigation. It will also generate hydroelectricity. The power station will have a generating capacity of 150 MW and will be sited just below the dam and upstream of a regulating dam and pondage. The regulating dam will be sited some 8 km downstream from Dartmouth dam and will impound 5,000 Ml.

Electricity generated by the scheme will be transmitted by a 220-kV transmission line, which will be constructed to join the Mount Beauty terminal station. The route for this transmission line has been authorized by the government on the recommendation of a Parliamentary Public Works Committee. It will pass through Granite Flat and along Rodda Creek, cross the Eskdale Spur east of Mount Emu, and descend to Mountain Creek and Mount Beauty.

The State Electricity Commission has investigated a number of areas with regard to possible future development. These include :

1. An expansion of the Kiewa hydroelectric scheme by utilization of the 400-m head difference between McKay Creek power station and Junction Dam (Lake Guy). (This proposal would require a new power station, conduits, and aqueducts, and storage and diversion dams in both the Kiewa catchment and the headwaters of the Mitta Mitta and Cobungra Rivers.)
2. A pumped storage development located on the western escarpment of the Bogong High Plains between Pretty Valley and the West Kiewa River. (The lower-level storage would be located at the confluence of the Diamantina and West Kiewa Rivers and the upper-level storage in the headwaters of the Tawonga Hut Creek. The transmission line would be located along the West Kiewa River.)

3. A pumped storage development located on Cullen Creek, north of Licola. (The upper storage would be situated in the headwaters of Cullen Creek and the lower storage at the junction of Cullen Creek and Mount Skene Creek. The transmission line from the scheme would probably follow the Barkly River to Licola and then to the Latrobe Valley.)

Future water needs for the production of electricity, for domestic purposes, and for stock and irrigation may require the construction of additional water storages and associated facilities. In planning these the possible effects of the storages and their water releases on the ecosystems in the vicinity (in particular the effects on fish and wildlife habitat downstream) should be determined.

The Council appreciates that it will probably be necessary to develop additional facilities associated with such schemes, but no specific provision for those developments can be made until definite proposals are made. The environmental effect of any future developments should be assessed before proceeding.

Recommendations

A60-A63 That in the case of the locations listed below and shown on the map (all these locations being within catchments for which no land use determinations have been made), the present tenure and management of public land continue for the time being

that, once a land use determination has been made, the following areas :

- (i) the storage areas
- (ii) diversion works
- (iii) aqueducts
- (iv) associated facilities
- (v) the buffer strips around diversion works and storages, as defined in the land use determination

be used for

- (a) water supply purposes
- (b) other activities permitted by the water supply authority after consultation with the Soil Conservation Authority and the Environment Protection Authority

and that these areas be permanently reserved under section 14 of the *Land Act* 1958 as part of the Alpine Reserve for water supply purposes, and be managed by the water supply authority named.

Notes :

1. The buffer should be wide enough to prevent direct pollution, to filter overland flow of water, and to control access. Its width will vary to suit differences in ground slope, soil type, vegetative cover, adjoining land use, and type of facilities available for treating the water. This will be established by the Soil Conservation Authority when the land use determinations for the catchments are made.

2. The primary object of management of the buffer must be to protect water quality. Subject to this principle, the water supply authority may permit other secondary uses on the buffer. In such cases, the principles of management must be agreed upon by that authority and any other authorities concerned.

A60 Livingstone Creek diversion ; Omeo Waterworks Trust.

A61 West Kiewa and Simmonds Creek diversions ; Mount Beauty Waterworks Trust.

A62 Dartmouth Reservoir, State Rivers and Water Supply Commission.

A63 Dartmouth hydroelectric scheme ; State Electricity Commission and State Rivers and Water Supply Commission.

In addition to the uses described above, the area indicated on the map should be used to :

- (i) provide for the generation of electricity and its transmission to Mount Beauty terminal station
- (ii) regulate water used in the generation of electricity.

This area includes a buffer zone, which the Soil Conservation Authority will define in a land use determination.

Note : A diversion on the Tambo River lies outside the Alpine Reserve but is within the study area. It should continue to be managed by the Swifts Creek Waterworks Trust.

Kiewa Hydroelectric Scheme

The Kiewa hydroelectric scheme at present consists of three power stations, located in the East and West Kiewa valleys, which generate electricity from water derived from the upper Kiewa and upper Mitta Mitta catchments.

The State Electricity Commission has indicated that there may be a need to extend the scheme in the future. Council considers that the boundaries of this area, A64, as presently defined, will allow some flexibility in planning, but until plans for future development are approved by the government it is not possible to determine whether some expansion or contraction will be required. Proposals for further development of the scheme should be better defined when Council next reviews land use in the alpine area.

Recommendation

A64 That the area of 4,880 ha indicated on the map be used to :

- (a) transport, store, and regulate water for the generation of electricity
- (b) operate, maintain, and protect hydroelectric installations (including power stations, pipelines, conduits, transmission lines, communication facilities, and works buildings)

- (c) produce stone from the existing quarry at Basalt Hill and gravel from the Pretty Valley gravel pit for essential works as required by the State Electricity Commission and other government authorities

and that it be permanently reserved under section 14 of the *Land Act 1958* as part of the Alpine Reserve for the purpose of generating electricity and managed by the State Electricity Commission.

Note : The area includes a buffer zone around storages and installations, the precise boundaries of which will be determined by the Soil Conservation Authority. Areas within the buffer may be used for activities associated with the Falls Creek Alpine Resort, but only after agreement is reached between the State Electricity Commission, the Soil Conservation Authority, and the Falls Creek Tourist Area Management Committee.

Area A64 does not include the Falls Creek Alpine Resort, which is indicated on the map and described in more detail in section I, recreation.

Portions of the area have considerable conservation value and are also currently used for low-intensity recreation in conjunction with areas recommended for inclusion in the Protection and Recreation Zone. There should, therefore, be consultation between the National Parks Service and the State Electricity Commission, to allow continued use of parts of area A64 for low-intensity recreation and to ensure that its nature conservation values are adequately protected consistent with the use for State Electricity Commission purposes.

Two areas of special significance in the operation, maintenance and protection of the Kiewa hydroelectric scheme are outside the area covered by recommendation A64. Principles for management of these areas are set out below and also referred to in recommendations A23 and A52.

- (i) Within the area I shown on Map B :
 - (a) the management should be such that the quantity, quality, and timing of water produced meets the requirements of the State Electricity Commission under its regulations proclaimed to protect the Kiewa hydroelectric scheme
 - (b) the State Electricity Commission should have unrestricted access to its existing works for the purposes of operating and maintaining the hydroelectric scheme and the right to maintain the system of access tracks and control vehicular access
 - (c) the relevant land management agency and State Electricity Commission should consult regarding any proposals involving new earthworks, disposal of waste water, and development for recreation, and any proposal should proceed only with the agreement of the State Electricity Commission
 - (d) mining operations at the Red Robin mine should be permitted subject to strict control on placement of mine tailings and use of access.
- (ii) Within area II shown on Map B :
 - (a) management should be such that the hydroelectric scheme is adequately protected under regulations proclaimed for it

- (b) the State Electricity Commission should retain the right to carry out all measures necessary to protect its assets in the catchment (these include systematic controlled burning in the northern approaches to the East Kiewa valley, controlling insect infestation, maintaining and augmenting a system of fire-access tracks, restricting vehicular access in certain areas) and the right of access for fire-suppression activities
- (c) camping should not be permitted without the express approval of the State Electricity Commission.

HISTORIC ZONE

Sites of historical importance, associated with the mining boom of the late 1800s and early 1900s are found throughout the alpine area. Two areas in differing gold-bearing regions have been recommended for inclusion in the Historic Zone. Each contains features that are important in illustrating the techniques for mining and processing gold-bearing ore and showing the life styles associated with early mining. They include remnants of dwellings, mining tracks, water races, shafts, tunnels, and processing equipment.

Council believes that these areas should be managed to provide for public education associated with the history of gold-mining. The Council points out that other significant historical features are known to exist elsewhere in the Alpine Reserve, and these should be catalogued, researched, and protected from further damage.

Recommendations

A65-A66

That the areas listed below be used to :

- (a) protect the sites and the remnants of buildings, mining equipment, water races, and artifacts associated with the mining history of the locality

that

- (b) mineral exploration and mining be permitted where it does not conflict with (a) above and in accordance with the policy set out in section L, Mineral and Stone Production.
- (c) fossicking be permitted using methods approved by the managing authority where this does not conflict with (a) above
- (d) the land be available for educational and recreational activities where this does not conflict with (a) above
- (e) harvesting of forest products not be permitted
- (f) apiculture and grazing be permitted

and that the areas be permanently reserved under section 14 of the *Land Act* 1958 as part of the Alpine Reserve, with A65 managed by the Forests Commission and A66 managed by the National Parks Service.

Note : Management of both areas should be in consultation with the Department of Minerals and Energy.

A65 Grant (6,860 ha)

Gold was first discovered at Crooked River in 1860 by Alfred Howitt and his party of government prospectors. Resulting from these alluvial discoveries, the area was rushed and by the early 1860s the townships of Bulltown and Hogtown had developed and most creeks in the area were being prospected. By 1864 the Crooked River field was languishing ; but the discovery of a large number of exceedingly rich quartz reefs—the first discovery is accorded to Angus Macmillan—caused renewed interest and the establishment of townships of Grant, Talbotville, and Howittville followed.

Exploitation of the Grant and Crooked River reefs was initially rapid and gold yields were high, but after 1869 returns were small and the townships slowly declined. Grant, a typical “boom and bust” township with a population large enough to support 18 hotels had only 2 hotels in 1890 and by 1914 had ceased to exist.

A66 Cassilis (3,620 ha)

This area adjoins the existing townships of Cassilis and Tongio West and includes the site of the first quartz reef discovered in Gippsland. The gold-bearing ore was found to be highly mineralized and required a series of treatments including crushing, reduction, and roasting to ensure high yields.

One of the larger companies carted ore along a gravity activated tramway from mines on top of the range to a battery and treatment plant situated in Powers Gully. The plant, fuelled initially by timber and then by oil, was converted to electricity in 1909. Power was supplied by a hydroelectric generating plant—the first in Victoria—constructed at the Victoria Falls.

A gold-slucing company constructed the Jirnkee water race, which brought water 90 km from the head of the Wentworth River to the slucing works at Tongio West.

Two of the richest mines, the Cassilis and the King Cassilis, are covered by current mining leases and are worked intermittently.

EDUCATION ZONE

Environmental education is a fundamental step in the conservation of natural resources ; it has become an important part of school curricula, and forms the basis of courses for tertiary and adult students.

Environmental education is indispensibly linked with field studies. It is concerned with studying and appreciating all sorts of environments—natural ones undisturbed by Man’s activities, natural ones manipulated to produce particular products such as hardwood timber, or drastically altered ones such as are found in urban and agricultural areas. One of its basic requirements is access to land.

Council, realizing that public land provides excellent opportunities for studies of a wide range of environments, has recommended that almost all public land be available for educational uses. Council believes that in most situations educational studies

can take place without conflicting with the primary use for which an area is set aside. Indeed in some cases it is the manipulation of the land for primary use that makes the area of value for environmental education. Council believes, however, that it is necessary for some relatively undisturbed land to be set aside specifically for education uses as, unless this is consciously done, such environments will tend to be changed by other uses. In these areas education would be the primary use and other uses would only be permitted when not in conflict with the educational use. Activities permitted in the education zone that may not be appropriate elsewhere would include long-term studies, collection of biological material, biomass studies, and the establishment of growth plots.

In selecting land for inclusion in the education zone, the Council has sought to provide areas :

- * giving examples of major land types
- * with maximum diversity of vegetation type, soils, etc., and with natural boundaries
- * located with consideration of ready access by users
- * located so as to minimize the danger that wildfires present to users
- * located in proximity to other land types and to a variety of other land uses
- * large enough to prevent over-use and to allow for zoning to protect areas of special value
- * selected so as to minimize erosion and pollution hazard.

No one organization should have the exclusive right to use any area within the education zone, as it is important that students have the opportunity to visit a number of areas in various land types throughout the State rather than visiting the one site several times. Minimum facilities such as toilets and shelters would be required for each separate area in the zone, and it would be desirable to have accommodation either on the area or at some nearby locality. Whether or not accommodation facilities are located on the area will depend on its proximity to other areas of educational value in the region and also on the availability and location of existing accommodation. In forested areas accommodation and other permanent facilities should only be provided where adequate safeguards against fire can be made.

Council believes that the land management of each separate area in the education zone should be the responsibility of the authority managing the adjacent or surrounding public land, while the Ministry for Conservation (in consultation with representatives of the Education Department, other user organizations, and the land manager) should be responsible for implementing educational aspects, and for co-ordinating use of the areas.

Recommendations

A67-A70 That the areas of public land listed below and shown on the map be used to provide opportunities for students of all ages to :

- (a) study the nature and functioning of reasonably natural ecosystems in a manner such that the integrity of these ecosystems is maintained as far as is practicable

- (b) compare the ecosystems within the education zone with other nearby natural and modified systems
- (c) observe and practise methods of environmental analysis, and the field techniques of the natural sciences
- (d) conduct simple long-term experiments aimed at giving an understanding of the changes occurring in an area with time

and that they be permanently reserved under section 14 of the *Land Act* 1958 as part of the Alpine Reserve and managed by the Forests Commission.

A67 Delatite (450 ha)

Middle to Upper Devonian hornblende granodiorite and metamorphics, Upper Devonian conglomerate and rhyolite ; hilly ; Elevation 510–1,000 m ; average annual rainfall 1,000–1,400 mm ; open-forest II broad-leaf peppermint, open forest III narrow-leaf peppermint, open forest IV alpine ash.

A68 Mount Russell (220 ha)

Middle to Upper Devonian hornblende granodiorite, mountainous ; elevation 600–1,200 m ; average annual rainfall 1,200–1,400 mm ; open forest IV alpine ash, open forest III messmate stringybark and narrow-leaf peppermint.

A69 Mount Tamboritha (320 ha)

Upper Devonian–Lower Carboniferous sediments, Upper Devonian rhyolite ; mountainous, moderate slopes ; elevation 1,000–1,500 m ; approximate annual rainfall 1,000–1,200 mm ; subalpine woodland snow gum, open forest IV alpine ash, open forest III messmate stringybark.

A70 Sunnyside (310 ha)

Ordovician–Devonian granite, Ordovician schist ; mountainous, steep to moderate slopes ; elevation 1,000–1,720 m ; approximate annual rainfall 1,400 mm ; subalpine woodland snow gum, open forest IV alpine ash.

B. ADDITIONS TO PARKS PREVIOUSLY RECOMMENDED

In its final recommendations for East Gippsland, Council recommended the creation of two national parks adjacent to the Snowy River. Council now proposes additions to these two parks. The total area of the Tingaringy National Park would increase to 78,000 ha, while the Snowy River National Park would cover 40,700 ha. Council points out that 1,450 ha within the Gippsland Lakes Hinterland area, indicated by hatching on Map A, could be considered for addition to the Snowy River National Park when recommendations are made for this area.

The final recommendations for the North-eastern Area, districts 3, 4 and 5 included a recommendation for a State park of 18,600 ha adjacent to the Alpine area. At that time Council indicated that it would consider extending the Park when making recommendations for the Alpine area. The addition of 3,500 ha to the State park as recommended below will bring the total area to 22,100 ha.

Recommendations

B1 Tingaringy National Park

That the area of 61,000 ha shown on Map A be used to :

- (a) provide opportunities for recreation and education associated with the enjoyment and understanding of natural environments
- (b) conserve and protect natural ecosystems
- (c) supply water and protect catchments and streams

that

- (d) the Fisheries and Wildlife Division prepare plans for the conservation of wildlife in consultation with the management authority and, after agreement these be incorporated into the management plan (particular attention should be given to the protection of the brush-tailed rock wallaby)
- (e) low-intensity grazing of cattle be permitted subject to adequate protection of the park, the Kosciusko National Park in New South Wales, and the proposed Blue Hill reference area

and that it be reserved under section 14 of the *Land Act* 1958 pending reservation under the *National Parks Act* 1975, and managed by the National Parks Service.

This area adjoins one of 17,000 ha east of the Snowy River, which was recommended as a national park in the final recommendations for East Gippsland. It also adjoins the Kosciusko National Park (in New South Wales) along the Victoria–New South Wales border.

The park is important for nature conservation. The geology is varied and includes important features such as periglacial rock rivers, richly fossiliferous sediments, and limestone caves. Elevations range from 160 to 1,838 m, contributing to a variety of vegetation and habitat types. Cypress pine and white box woodlands containing

birds and reptiles typical of warm dry environments contrast markedly with snow gum woodland and alpine ash forest at the higher elevations. The rare brush-tailed rock wallaby, smoky mouse, and broad-toothed rat occur here.

The park is also valuable for recreation. Its most important recreational features are the Snowy River, Suggan Buggan valley, Mount Stradbroke, Cobberas Range, Limestone Creek valley, and the many small subalpine open areas.

Note : The Black Mountain–Benambra, Wulgulmerang–Jindabyne, and Wulgulmerang–Tubbut roads pass through or adjoin the proposed national park. These roads and their reserves should be excluded from the park. Minor changes to them may be necessary in the event of future up-grading and realignment requirements. Access should continue to be provided through the park to private property.

B2 Snowy River National Park

That the area of 15,730 ha shown on Map A be used to :

- (a) provide opportunities for recreation and education associated with the enjoyment and understanding of natural environments
 - (b) conserve and protect natural ecosystems
 - (c) supply water and protect catchments and streams
- that
- (d) the Fisheries and Wildlife Division prepare plans for the conservation of wildlife in consultation with the management authority and, after agreement these be incorporated into the management plan (particular attention should be given to the protection of the brush-tailed rock wallaby)
 - (e) grazing be phased out

and that it be reserved under section 14 of the *Land Act* 1958 pending reservation under the *National Parks Act* 1975 and managed by the National Parks Service.

This park adjoins an area of 25,000 ha east of the Snowy River, which was recommended as a national park in the final recommendations for East Gippsland.

The section within the Alpine area, in common with the section in East Gippsland, comprises part of the Snowy River valley and has outstanding attributes of scenic grandeur. It provides opportunities for activities that include white-water canoeing, bushwalking, and rock climbing.

Nature conservation values are high. Most vegetation types are of low open forest and woodland, but range from white box woodland to mountain ash open forest IV and lowland closed forest II.

Features include several colonies of the brush-tailed rock wallaby, occurrences of mountain ash, "jungle" gullies, several rare or endemic plants, and also attractive limestone formations.

Notes :

1. The southern part of this area presently supports timber production and is a vital source for local industry. Supplies here will be exhausted before 1983 at the current

rate of logging. Council considers that logging in this section of the park could continue until that date, under the close supervision of the Forests Commission, provided features of special significance to the park are adequately protected. These include the "jungle" gullies, some examples of undisturbed mountain ash stands, and the scenic quality of the escarpments into the Snowy River. Logged areas should be regenerated and rehabilitated following the completion of logging.

2. The Wulgulmerang-Tubbut road reserve is excluded from the proposed park. Adjustments to the road reserve may be necessary if upgrading and realignment of this road is required in the future. Access should continue to be provided through the park to private property.
3. An area of approximately 20 ha south of McKillops Bridge, excluded from the park, has been recommended to be temporarily reserved for possible development associated with this park and the Tingaringy National Park. Any such development would be undertaken only after receiving the prior approval of the National Parks Service (see recommendation N5).
4. The Council notes suggestions to build dams on the Snowy and Rodger Rivers for flood mitigation and for irrigation.

B3 Wabonga Plateau State Park

That the area of 3,140 ha shown on Map A be used to :

- (a) provide opportunities for recreation and education associated with the enjoyment and understanding of natural environments
 - (b) conserve and protect the natural ecosystems
 - (c) supply water and protect catchments and streams
- that
- (d) emphasis be placed on conserving the park's rich flora
 - (e) grazing continue at a level that is compatible with (d) above but be phased out within a period of 10 years after the park is approved by Order in Council
 - (f) low-intensity timber production be permitted within the areas indicated on Map A for a period of up to 3 years after the park is approved by Order in Council

and that it be permanently reserved under section 14 of the *Land Act* 1958, and managed by the National Parks Service.

The main feature of this section of the park is the dissected topography on Devonian-Carboniferous volcanic and sedimentary rocks. The extensive areas of rock outcrops are of particular geological interest.

The park supports a rich flora, in which open forest II and III of broad-leaf and narrow-leaf peppermint and their associated species predominate ; small pockets of alpine ash forest add diversity.

Timber production operations should be carried out by the Forests Commission in consultation with the National Parks Service.

C. HARDWOOD TIMBER PRODUCTION

The Alpine area is an important source of hardwood sawlogs ; it produces nearly one-third of Victoria's output from public land.

Sawn timber from ash-type eucalypts (alpine ash and mountain ash) constitutes about 67 per cent. of output and other species contribute about 33 per cent. Alpine ash is the major timber species. Mountain ash forests cover only relatively small areas at several scattered locations in the southern part of the area and mixed-species forests are generally less productive.

The study area produces about 22 per cent. of Victoria's production of green scantling for house framing—sawn from both ash-type and other species. More importantly, the area produces about 85 per cent. of Victoria's production of seasoning-quality hardwood timber, which is extensively used for various joinery items, lining, and furniture.

Ash-type eucalypts are virtually the only Victorian source of seasoning-quality hardwood timber and continued output will depend largely on the supply of good-quality logs from mature ash forests, and from regrowth ash forests where trees have reached a suitable size. More than 93 per cent. of all ash regrowth forests, occur in the Alpine and Melbourne areas, in the proportions of one-third and two-thirds respectively.

Advanced fire-regrowth forests of alpine ash, most of which originated from the 1939 fires, comprise trees that could begin to yield a proportion of seasoning-quality timber at about 50 years of age. It is envisaged that logging of these regrowth stands would begin at about this age and continue over the next 80 years in roughly equal annual felling areas. The age of these forests at the time of felling would therefore range from 50 to 130 years. The succeeding forest would have an 80-year range in age classes, with each class occupying about the same area.

The ability of sawmills, which are presently based on supplies of mature ash, to continue producing seasoning-quality timber will depend upon their success in securing rights to regrowth forests as the supply of good-quality logs from mature forests decreases.

At present a total of 38 sawmills, employing directly about 1,000 persons, draw the whole or part of their timber supplies from the study area. Associated with some mills are processing and manufacturing works located nearby or at centres such as Benalla, Bairnsdale, Seymour, Wodonga and Melbourne.

Because of the distribution of mature and regrowth forests in relation to mill location and their present level of log intake it appears inevitable, irrespective of any recommendations made by the Council, that some mills will not be able to continue to produce seasoning-quality timber at their present levels indefinitely. It is also apparent, however, that some mills have good prospects for a continuous life based on production of seasoning-quality hardwood.

In making its recommendations, the Council has been mindful of the varying situations and has endeavoured to make available sufficient resources for the continuous operation of existing mills where this is possible. Some restructuring of the industry appears

inevitable where supplies of mature ash are limited. A number of options exist. Some sawmillers may decide to accept reduced allocations, or to produce a higher proportion of scantling-grade timber, or to saw softwood timber where softwood plantations lie within an economic distance. The use of alternative resources in the adjoining Melbourne and East Gippsland areas that are within economic distance of existing sawmill centres is a possible option.

General Use Zone

The recommendations delineate a large area as a General Use Zone within which logging would continue in the long term. This zone contains about 77 per cent. of the total volume of mature ash in the Alpine area. In addition, 5 per cent. would be available in the Protection and Recreation Zone for a once-only logging operation. Thus approximately 82 per cent. of the estimated volume of mature alpine ash would be available for use by the timber industry. A decision regarding the use of an area in the headwaters of the Murray containing a further 3 per cent. is to be deferred until Council next reviews land use in the Alpine area. As well as mature forests, the General Use Zone contains large areas of fire and logging regrowth that would be available for timber production in the future.

It should be pointed out that timber resource data are estimates only, based, in many instances, on aerial photo interpretation and field reconnaissance.

The General Use Zone, while containing the bulk of commercial forests, also contains large areas of snow gum woodland and other non-commercial forests. Therefore, only a small percentage of it would be logged.

For this zone, which covers the bulk of the area and is the only one in which logging in the long term can take place, a set of principles has been formulated (see below) to provide guidelines for forest operations. The principles are based on more-detailed logging prescriptions used by the Forests Commission.

Other Zones

Council considers that long-term logging is not compatible with the main uses proposed for some zones or appropriate in additions to previously recommended parks. Many of the stands of mature timber contained in these areas are remote, inaccessible, and located on very steep slopes with a high soil erosion hazard. Logging them would seriously impair their high scenic and nature conservation values, and the total cost of providing access, felling and transporting logs, and subsequently regenerating and rehabilitating the sites would be very high.

However, in order to cause minimum disruption to the industry, Council has recommended that once-only logging take place in certain localities in these zones where, although in the long term it is considered desirable to exclude logging, they contain timber resources that are essential to maintain supplies in the short term until alternative supplies become available.

In the East Kiewa Valley it is proposed that a small experimental logging operation be permitted with further logging to proceed subject to the experimental logging

operation not causing a level of stream sedimentation unacceptable to the State Electricity Commission, the Forests Commission, and the Soil Conservation Authority (for details see A23 (g)).

At a locality in the headwaters of the Murray River adjacent to the Kosciusko National Park, where both timber values and values incompatible with timber harvesting are high, the Council has recommended that no logging take place or logging roads be constructed pending its review of land use in the study area. In this case Council believes that sufficient alternative supplies exist to sustain the present level of logging in the general area for the 10-year review period envisaged.

Pulpwood

Council recognizes the great importance of the alpine area as a source of timber. It considers that production of hardwood sawlogs should continue to be the primary goal in harvesting operations and that pulpwood should be obtained only as a by-product from sawlog operations, except for pulpwood cut in the course of salvage operations or silvicultural treatments such as thinning.

This means that, in most cases, pulpwood would be obtained from the same site as sawlogs. As forest operations such as roading, felling, snigging, and regeneration treatment are common to both sawlog and pulpwood procurement, the main difference between sawlog and integrated harvesting is the removal from the site of sawlog residues (which otherwise would have been burnt or left to decay) and some additional trees unsuitable for sawlogs. The Council considers that the principles for forest operations outlined below should apply to integrated operations as well as to areas from which sawlogs only are harvested.

At present, parts of the alpine area are used to provide Australian Paper Manufacturers (A.P.M.) with wood for its pulp and paper mill at Maryvale. In 1976-77 the forests of the study area contributed 33,000 m³ of pulpwood obtained from integrated sawlog-pulpwood operations. This represents 9 per cent. of the minimum annual supply required to be made available to the company under the *Forests (Wood Pulp) Agreements Act 1974*. An important additional source of supply is chipped residues from sawmills drawing supplies from the area. In 1976-77 this amounted to 81,000 m³.

Substantially larger supplies of pulpwood would be needed in the future from forests south of the Great Dividing Range to fulfil supply commitments under the Act.

Principles for Forest Operations

Most public land in the alpine area is already included in the proclaimed catchments of Lakes Hume, Eildon, and Glenmaggie and of the upper Kiewa and Nicholson Rivers. Council intends to proclaim the remaining catchments in order to protect them. The Soil Conservation Authority will then, after consultation with the Council, prepare land use determinations for implementation.

The land use determination will have special regard for high-altitude catchments. It is considered that these determinations in combination with the prescriptions agreed

upon by the Soil Conservation Authority and the Forests Commission, and the principles set out below, should adequately protect soils and water catchments as well as specific scenic, recreation, and nature conservation values.

1. Soil Conservation and Catchment Protection

- (i) Strips along major and minor streams should, as far as is practicable, be reserved from logging and other operations involving soil disturbance and be protected from fire.
- (ii) Spur roads and snig tracks, log landings, and dumps should be designed and constructed to minimize potential erosion. These should be drained, breached, and barred when not required, and revegetation should be encouraged.
- (iii) Intensive utilization operations should be subject to specific constraints on areas of high erosion hazard, especially on slopes greater than 30°.
- (iv) Logging roads should be designed, constructed, and maintained so as to minimize erosion potential ; there should be an adequate number of culverts, and drainage water should be dispersed ; batters should be sloped so as to prevent land slips.
- (v) *Except in some mixed-species forests at lower elevations, logging operations should be restricted during winter and periods of heavy rainfall ; consideration should be given to closing unsurfaced logging roads during these periods.*
- (vi) Fuel dumps and logging camps should not be sited immediately adjacent to streams ; adequate provision should be made for the disposal of wastes from these sites.

2. Recreation and Aesthetics

- (i) Special consideration should be given to road location, size and shape of logging coupes, and other forest operations in areas of high landscape value.
- (ii) Specific prescriptions should be applied to logging near major tourist roads and walking tracks.
- (iii) All refuse associated with logging operations (such as tyres, drums, and disused huts) should be removed at the end of the operations.
- (iv) Logging roads, if not required for management, protection, recreation, or other use, should be encouraged to revegetate after utilization ceases.
- (v) Buffer areas around popular recreation sites and beauty spots should be reserved from logging.

3. Nature Conservation

- (i) Prescriptions for logging (including size and scheduling of coupes) should provide for the protection of plant or animal species that have special scientific values and have been located in a logging area.
- (ii) All logged areas should be regenerated with forest tree species native to the area.

- (iii) Some mature and veteran trees in logging areas should be retained for fauna habitat.
- (iv) Aerially applied pesticides and fertilizers should be used with caution ; compounds that may significantly affect native animals should not be used ; compounds should be carefully applied so as to avoid damage to retained vegetation.

4. Historic Sites

- (i) Sites of historical significance or interest (such as cattlemen's huts or relics of mining or early settlement) should be identified, and the sites and their environs should be protected by special prescriptions.
- (ii) When historical sites are identified, the desirability or otherwise of providing or upgrading vehicular access to each one should be considered when logging roads are being designed.

D. WILDLIFE

Wildlife conservation—a land use in its own right—cannot always be separated from other land uses such as timber production, forest grazing, water production, and recreation. These types of use often require large areas of land, much of which can be managed to retain its value as wildlife habitat. In the long term wildlife conservation depends upon conservation of habitat covering areas that are sufficiently large and diverse to support genetically viable populations of species.

Animal habitats are generally described in terms of vegetation communities, although other parameters—such as vegetation structure, ground cover, water depth, salinity, rock outcrops, and hollow trees—are also important. In the Alpine area, the vegetation communities adopted for habitat types range from alpine herbfields, grasslands, heathlands, and mosslands to snow gum woodlands and montane, foothill, and riverine forests. Aquatic habitats, particularly those associated with mountain streams and rivers, are a feature of the area, which, however, contains few lakes and swamplands. Rocky Valley Dam and the huge Dartmouth Reservoir are the only large artificial lakes in the area.

The vegetation map of the Alpine area illustrates the diversity of habitats and shows that no single community covers an extensive uninterrupted area, but rather that each community or habitat tends to be repeated over a wide area as parts of a complex mosaic. This pattern is largely determined by the diversity of climate, soils, physiography, and aspect.

The distribution of an animal species depends on its behavioural and physical requirements for food, shelter, and breeding sites. Many species can utilize a range of habitats and consequently are widely distributed throughout the area. Some occupy their environmental range as residents, being relatively sedentary. Others, such as birds, are more mobile. Some bird species, for instance, are not year-round residents but migrate in and out of the area at regular intervals. Others visit the area infrequently in nomadic movements, while yet other species move between high and low altitudes with the seasons. It is obvious therefore that the conservation of fauna presents many difficulties, even for those relatively few species whose life history and behaviour is understood.

Because Council has recommended that virtually all the land in the study area (as well as some adjacent land outside it) be included in an Alpine Reserve, no areas have been specifically set aside as wildlife reserves. Rather, Council considers that the Fisheries and Wildlife Division has an important role in the management of the entire area and, by working in close co-operation with the managing authority in the formulation of management plans, should ensure that provision is made for the conservation of wildlife.

This is especially important for animals that are closely restricted to a particular habitat for feeding and breeding. The mountain pigmy possum found in alpine heathlands and subalpine woodlands and the brush-tailed rock wallaby found among rocky outcrops in dry open forest are two such examples, and have been mentioned specifically in the recommendations relating to the area in which they are known to occur.

The activities of Man in modifying the natural environment have resulted in changes in the distribution and abundance of many species and some species have become extinct. These effects have depended upon the nature and severity of the modification, the particular habitat requirements of the species, and its adaptability to change.

The precise effects on many species, however, are not well documented. The Council has recommended elsewhere in this report that principles relating to the conservation of fauna be adopted for land uses that could significantly affect wildlife values, and considers that further research into the ecological requirements of species is necessary to determine the effects of various land management practices. In some zones, particularly those where management is oriented towards more competitive uses such as timber production, forest grazing, and intensive recreation, the results of such research may mean the modification of management practices if wildlife values are to be adequately considered.

Recommendations

- D1** That the authorities managing public land co-operate with the Fisheries and Wildlife Division in the development of research and management policies for the conservation of wildlife values.
- D2** That the Fisheries and Wildlife Division prepare management plans in consultation with the managing authority to ensure that wildlife values are fully considered when management policies and prescriptions are formulated and implemented.

Note : There are specific recommendations and references to wildlife values in other sections such as General Use Zone, Natural Features Zone, Hardwood Timber Production, Water and Hydroelectricity Production, Recreation, and additions to Parks.

E. FLORA AND FAUNA RESERVE

The isolated block of public land described below and located outside the Alpine Reserve contains flora and fauna communities in a near-natural state.

Recommendation

E1 Morass Creek

That the area of 22 ha adjoining allotments 4c and 15 of section 11, Parish of Hinno-Munjie, indicated on the map be used to conserve native plants and animals

and that it be permanently reserved under section 14 of the *Land Act* 1958 and managed by the Department of Crown Lands and Survey.

F. BUSHLAND RESERVES

Throughout the predominantly agricultural regions of the area and outside the Alpine Reserve, a number of relatively small areas of public land carry remnants of native vegetation. This vegetation, particularly the ground flora, has often been modified from the original by grazing and invasion of weeds. The native tree species still remain, however, and these areas provide landscape diversity, particularly where more intensive agriculture is resulting in a gradual reduction in the numbers of trees on freehold land.

The Council recommends that a number of these small remnants of the native vegetation should become bushland reserves. Their major use is to maintain the distinctive Australian character of the countryside, and to provide diversity in the landscape. They may also provide some opportunities for passive recreation in relatively natural surroundings. The areas are generally too small to be significant for fauna conservation, although some may be important for migratory birds.

Management should aim at the maintenance of the native flora, particularly the tree species. Low-intensity grazing, timber production, and gravel extraction are not necessarily incompatible with this primary aim, provided they are carefully planned and controlled and do not spoil the appearance of the reserves, particularly as viewed from roads, and lookout points. These uses may not be appropriate to all reserves, however, and the management authority may have to exclude them from some, at least temporarily, in order to permit regeneration of tree species.

Recommendations

F1-F8 That the areas indicated on the map and described below be used to :

- (a) maintain the local character and quality of the landscape
- (b) provide opportunities for passive recreation such as picnicking and walking that
- (c) expansion of any existing facilities or new development be permitted only where this does not conflict with the primary aim

and that they be permanently reserved under section 14 of the *Land Act* 1958, and be managed as indicated in the schedule below.

- F1** 7 ha, adjacent to allotment 22, Parish of Bingo-Munjie—to be managed by the Department of Crown lands and Survey.
- F2** 23 ha, being the camping and watering reserve north of allotment 108 and the gravel reserve adjacent to allotment 100, Parish of Cobungra—to be managed by the Department of Crown Lands and Survey.
- F3** 15 ha, being allotment 6 of section 1, Parish of Terlite-Munjie—to be managed by the Department of Crown Lands and Survey.

- F4** 10 ha, being allotments 22E and 22B of section 8, Parish of Tongio-Munjie West—to be managed by the Department of Crown Lands and Survey.
- F5** 8 ha, being allotment 19A of section B, Parish of Chilpin—to be managed by the Forests Commission.
- F6** 36 ha, adjacent to allotment 20 of section B, Parish of Chilpin—to be managed by the Forests Commission.
- F7** 20 ha, North of allotment 6B, Parish of Gelantipy West—to be managed by the Forests Commission.
- F8** 12 ha, adjacent to allotment 32, Parish of Detarka—to be managed by the Forests Commission.

G. RIVERS AND STREAMS

PUBLIC-LAND WATER FRONTAGES

Along a number of rivers and streams in the study area, a strip of public land has been reserved between the water and adjacent public or alienated land. No public land strip adjoins land alienated before 1881, and some properties in the study area have titles that extend to the banks or even incorporate the bed and banks of a stream.

Thus some streams and rivers have either no public-land water frontage or a discontinuous one. The recommendations that follow do not apply to privately owned frontages.

The locations of public-land water frontages are shown on parish plans, which are available to the public from the Central Plan Office in the Department of Crown Lands and Survey. These frontages may have a surveyed boundary of short irregular lines or be of a specified width (varying in particular instances from 20 m to 60 m) along each bank. In some cases this land has been reserved for public purposes under the *Land Act* 1958 and in others it is unreserved. The land usually comes under the control of the Department of Crown Lands and Survey, while in all cases the State Rivers and Water Supply Commission controls the water.

Each of these authorities may delegate some of its responsibility to local bodies. The Department of Crown Lands and Survey may form committees of management for public purposes, while river improvement or drainage trusts under the guidance of the State Rivers and Water Supply Commission may be formed in certain areas.

The Forests Commission controls forest produce on public-land water frontages, except where a committee of management has been formed. Public-land frontages alongside artificial water storages and aqueducts are often controlled by the management authority that controls the water.

Adjoining occupiers often hold public-land water frontages under licence for grazing purposes. Special conditions may apply to the licences—for example, to permit cultivation. The licence system has advantages in that licence-holders are required to control noxious weeds and vermin on the frontage.

This control would be extremely difficult and expensive to achieve in any other way. When a frontage is held under licence, boundary fences are normally extended to the water's edge, and legal public use is limited to through travel. The licensee often discourages public access because of an understandable fear of damage, intentional or otherwise, to his property. Vandalism and littering are problems in many areas open to the public, and firm action by management authorities is often required. Control is obtained through the normal exercise of fire, litter, firearms, and other regulations, although it is evident that more effective policing is required, particularly at weekends. Education of the public to understand the rural environment is perhaps the best solution in the long run.

These licensed river frontages are, however, public land ; they are often valuable for low-intensity forms of recreation such as walking, fishing, and observing nature, and provide access to extensive lengths of streams and lake shores. As mentioned above, members of the public are legally entitled to walk through a licensed frontage. Licences for previously unlicensed public water frontages, now being issued by the Department of Crown Lands and Survey, require the licensee to erect a stile or gate in any fence erected across the frontage, where appropriate, to facilitate public access. This condition has not been applied to the majority of existing licences and Council believes that in some situations—for example, along popular fishing streams—the provision of stiles would facilitate pedestrian access along public-land water frontages and would reduce damage to fences and avoid gates being left open.

Public-land frontages that are unlicensed have no restriction on public access, although use of vehicles is controlled by the *Land Conservation (Vehicle Control) Act* 1973. They are, however, normally fenced off from adjacent freehold land. The landholder has no obligation to provide access through freehold land to the frontage, and nothing in these recommendations suggest that this situation should change.

The maintenance of a vegetation cover along stream banks is important in preventing soil erosion and in preserving the local landscape. Public-land water frontages are sometimes valuable for nature conservation as well, as they may provide corridors for movement of nomadic and migratory species, or support native plants and animals that are no longer found in surrounding areas. In too many cases, however, the provisions of the relevant Acts have not been enforced effectively, and such public-land water frontages have been progressively cleared of native vegetation.

Public-land Water Frontage Reserves

Water frontage reserves are defined for the purposes of these recommendations as being all existing water frontage reserves and other reserved or unreserved public land adjoining streams, except for those areas not currently reserved as a water frontage, that have been set aside elsewhere in these recommendations, either as part of the Alpine Reserve or for some special purpose such as a streamside reserve.

Recommendation

G1 That the public land defined above

(a) be used to :

- (i) protect adjoining land from erosion by the maintenance of an adequate vegetation cover
- (ii) maintain the local character and quality of the landscape
- (iii) conserve native flora and fauna
- (iv) provide opportunities for low-intensity recreation
- (v) allow access to water and for grazing of stock by adjoining landholders under licence where appropriate

that

- (b) (i) where a licence has been issued for a public-land water frontage as in (a) (v) above, restricted recreation use by the public be permitted (non-damaging activities such as walking, nature observation, fishing, or just relaxing should be allowed, while potentially damaging activities such as camping, lighting fires, or using motor or motorized recreation vehicles should be prohibited)
- (ii) licensees be required to provide stiles in any fences erected across their licence area if requested to do so by the management authority
- (iii) cultivation not be permitted, except with the approval of the Department of Crown Lands and Survey, and that, in proclaimed water supply catchments, the Soil Conservation Authority be consulted to ensure that approval to cultivate is in accordance with land-use determinations affecting the water frontage made under the *Soil Conservation and Land Utilization Act 1958*
- (iv) in particular cases, licensees may be required to fence off and exclude stock temporarily from some parts of the licence area where, in the opinion of the management authority, special measures are necessary to protect water supplies, to rehabilitate eroding areas, or to permit regeneration of native plants that have particular value for nature conservation

that

- (c) the Department of Crown Lands and Survey be consulted prior to the proclamation of roads, the construction of roadways, or the erection of buildings on public-land water frontages

and that

- (d) (i) public-land water frontages be permanently reserved under section 14 of the *Land Act 1958*
- (ii) where an area currently reserved as a water frontage is adjacent to or within the Alpine Reserve, national or State park, bushland, streamside, or flora and fauna reserve, it be managed by the authority responsible for the adjoining or surrounding land
- (iii) where it is not within or adjacent to a reserve or park as described in (d) (ii) above, it be managed by the Department of Crown Lands and Survey or by a committee of management where one is appointed.

RIVER IMPROVEMENT

River Improvement Trusts have been constituted under the *River Improvement Act 1958* for sections of the following rivers in the study area :

Kiewa River

Ovens River

Improvement works in these rivers are designed to maintain the carrying capacity (for water supply or drainage purposes), to protect adjoining land from flooding and

erosion, to maintain the security of structures such as bridges on the flood plain, and to prevent siltation of the lower reaches by control of upstream erosion.

The works carried out include :

- * erosion-preventing works on the banks—for example, construction of wire-mesh fencing, planting of trees, the use of various materials for bank protection, and the felling of trees that may be undermined (to prevent loss of bank material)
- * clearing of waterways by removal of snags within the bed of the channel to maintain or improve discharge capacity
- * realigning and altering a stream by the use of wire-mesh fencing and log or concrete barriers.

Such work is often made necessary by the changes that Man has made to land use in the river catchments and on the flood plain. The following changes have generally reduced the value of the rivers for nature conservation.

- * Clearing of vegetation has increased run-off and reduced time of concentration of storm flows. The situation is sometimes aggravated by overgrazing and unwise cultivation in the catchment and along the river banks, permitting soil erosion and transport of sediment to the stream. Increases in urban development—with disposal of storm water directly to streams—have also altered flow regimes.
- * Regulation of stream flow by water storages and use of streams to transport water for irrigation and domestic use also change the natural flow regime. For example, the Mitta Mitta River will be used to transport water from the Dartmouth Dam to the Hume Weir and will be required during infrequent drought periods to carry regulated flows up to bank-full capacity for several months during summer.
- * The construction of barriers such as road embankments and bridges, through which the river must pass, has often resulted in substantial modification of the bed and banks. Present policy, however, is that all proposed replacement or new structures across waterways, flood plains, and depressions are referred to the State Rivers and Water Supply Commission and to the River Improvement Trust, where one is involved, for approval.

River improvement authorities, in attempting to cope with the consequences of these changes, carry out works that sometimes adversely affect landscape and nature conservation values, but sometimes ultimately enhance these values.

Removal of snags from the centres of wide streams damages fish habitat, but the tethering of these snags against the banks may provide alternative fish habitat, as well as protecting the banks from erosion. Realigning and regrading of eroding beds and banks often removes holes and backwaters of value as fish habitat and for angling and swimming in a particular location. On the other hand, these operations, in preventing erosion, reduce transportation of silt.

River improvement works are sometimes aesthetically displeasing, particularly during construction and in the early stages after completion, but their ultimate aim is to prevent erosion and to allow re-establishment of vegetative cover along the stream banks. The construction of mesh fencing or log barriers frequently makes access to the river difficult, but is an integral part of preventing stream erosion.

River improvement trusts are at present limited in their responsibility under the *River Improvement Act 1958* to the stream environs within the districts under their control. They are therefore frequently able to treat only the symptoms of problems, as the causes may lie in the catchments beyond the area of their responsibility. Works that they carry out are often limited by lack of funds and frequently amount to little more than stop-gap measures. There is thus little opportunity in the design and implementation of works for consideration of their likely impact on areas outside the trusts' districts.

The flow regimes of some rivers must of course be modified and flood plains used for agriculture, but it is appropriate to look at the principles of the natural system in seeking solutions to the problems that thus arise rather than to move further from those principles.

The Council believes that the following principles should be applied in determining the need for and design of river improvement works.

- * Where problems in river management arise, the whole catchment should be considered in seeking a solution.
- * Works designed primarily for flood control should aim at reducing the rate of run-off of the catchment.
- * The degree to which minor flooding can be tolerated by the community should be determined in each case. It may often be more appropriate to take action to minimize the consequences of flooding than to attempt to prevent it.
- * An adequate vegetation cover should be maintained along stream frontages to stabilize the banks and to reduce the velocity of flood-waters as they leave and re-enter the stream course.
- * Structures such as road embankments and bridges on flood plains are a variation of the natural situation, and consideration should be given in their design to their effect on the flood pattern.
- * Works carried out within the bed and banks of a stream to change the alignment, gradient, and cross-section should be kept to the minimum necessary.
- * Consideration should be given in the design of works to maintaining or enhancing landscape values and the value of the stream for recreation and as a habitat for wildlife.

Recommendations

- G2** That the assessment of the need for, and the planning and implementation of, any works involving changes to the beds and banks of streams be based on the principles set out above.
- G3** That plans for all works (other than those of a minor nature), together with an assessment of their environmental consequences, be submitted to the *Standing Consultative Committee on River Improvement* for consideration prior to the commencement of works.

G4 That detailed guidelines based on the principles set out above be prepared by the *Standing Consultative Committee on River Improvement* to ensure that an optimum balance is achieved between the purpose and implementation of works on the one hand and the maintenance or enhancement of the stream's landscape values and its value as a habitat for wildlife and for recreation on the other.

Note : The above-mentioned *Standing Consultative Committee on River Improvement* now in existence comprises representatives from the following :

Ministry for Conservation
 Conservation Council of Victoria
 Soil Conservation Authority
 Fisheries and Wildlife Division
 Forests Commission
 Department of Crown Lands and Survey
 Association of Victoria River Improvement Trusts
 State Rivers and Water Supply Commission

STREAMSIDE RESERVES

Throughout the freehold regions of the alpine area, small blocks of public land adjoin streams but are not included in the public-land water frontage. Two of these blocks have been designated streamside reserves because of their particular value for recreation.

The management authority may provide facilities for activities such as camping on streamside reserves in areas where conflict with nature conservation values are minimal. Every effort should be made to encourage regeneration or restoration of the native vegetation.

It is intended that public-land water frontages adjacent to or within streamside reserves be managed by the authority responsible for the streamside reserve.

Note : Streamside reserves are separate and distinct from the public-land water frontages described previously in this chapter.

Recommendations

G5-G6 That the areas described below and shown on the maps be used to :

- (a) provide passive recreation such as picnicking, walking, angling, and, where permitted by the managing authority, camping
- (b) conserve flora and fauna
- (c) provide grazing, at the discretion of the management authority, if this use does not conflict with the maintenance of the water quality of the adjacent stream or with (a) and (b)

and that they be reserved under section 14 of the *Land Act* 1958 and managed as indicated in the schedule below.

G5 8 ha north of allotment 2 of Section B, Parish of Narrobuk North—to be managed by the Forests Commission.

Note : As a result of a change in course of the Macalister River, this streamside reserve (G5) is now on the northern side of the river.

G6 4 ha, being allotment 28D, Parish of Bundara-Munjie—to be managed by the Department of Crown Lands and Survey.

H. LAKE RESERVE

Lake Omeo

Lake Omeo lies in an internal drainage basin apparently formed by block-faulting, the movements damming back and defeating a tributary of Morass Creek.

The lake is filled by a few small streams—the main one being Minute Creek—in times of peak rainfall, and in 1975 was filled for the first time in 15 years. Water is lost primarily by evaporation, causing the lake to dry out within a few years unless sufficient rainfall is maintained. Proposals to keep the lake filled by diverting water from Morass Creek have never been pursued.

When water levels are suitable, the lake is frequented by waterfowl and is used for aquatic sports such as sailing and speed-boating.

When dry, the lake-bed is used as a common for grazing stock. The south-east perimeter of the reserve is used as a landing ground.

Recommendation

H1 Lake Omeo

That the area of 758 ha shown on the map continue to be used according to its capabilities for :

- (a) recreation
- (b) a waterfowl feeding and resting area
- (c) grazing
- (d) landing ground

and that it be permanently reserved under section 14 of the *Land Act* 1958 and managed by the Department of Crown Lands and Survey.

I. RECREATION

The term recreation includes the multitude of different activities that people undertake during their leisure time. In fact, the distinguishing characteristic of recreation is not the activity itself so much as the attitude with which it is undertaken—activities (or inactivities) undertaken with little or no feeling of compulsion can be considered to be recreation.

Outdoor recreation is of particular interest to Council, as the public land of the area provides important opportunities for it. Throughout these recommendations reference is made to the various forms of outdoor recreation in a number of ways :

- * Formal recreation activities include all organized sports and other group activities, while activities such as picnicking, fishing, and hiking are grouped as informal.
- * Passive recreation covers situations where the individual obtains his recreation through absorbing the sights, sounds, and atmosphere of the surrounding environment while expending little physical effort. Examples are picnicking, nature observation, and strolling.
- * Active recreation covers situations where the individual must expend considerable physical effort to obtain some mastery of physical forces in order to satisfy his particular recreational needs. Examples are playing organized sport, bushwalking, and rock-climbing.
- * Open-space recreation includes all recreational activities that require spacious outdoor surroundings, whether the activities be active or passive, formal or informal.
- * Intensive recreation involves large numbers of people per unit area.

In view of the predicted increase in demand for outdoor recreation and the high capability of some public land to meet this demand, the Council, in its recommendations, has recognized that much public land should be available for recreational uses of some sort. Accordingly, it has recommended a variety of zones and reserves that will provide a wide range of opportunities. Council could not, however, make recommendations covering in detail all the forms of recreation currently pursued on public land. These include activities such as bushwalking, rock-climbing, orienteering, canoeing, fishing, hunting, fossicking, picnicking, horse-riding, boating, trail-bike riding, and pleasure driving. Council believes that activities such as these can be accommodated, without detriment to other values, somewhere on public land. Consequently Council points out that outdoor recreation in general is an acceptable primary or secondary use of much public land (except for reference areas and some water storages and their buffers) and has left the details of recreational use to the land manager.

The various recreation activities differ in their requirements for types of land, size of area, and site location. They also differ in their impact on the land and on other activities (including other forms of recreation). Generally, any one activity pursued at a low level of intensity poses little threat to the environment and seldom conflicts

with other activities. But conflicts and problems can arise with increasing intensity, particularly when one or more forms of recreation attract very large numbers of people or vehicles to small areas.

There is always the problem of recreation damaging the environment it seeks to use. Council therefore believes that the land managers should aim at controlling the levels and patterns of recreational use according to the capability of the area to sustain such use without significant conflict with the primary purpose of the area or significant environmental deterioration, while at the same time avoiding any unnecessary restrictions. Thus more stringent restrictions can be expected in areas where the vegetation and soils are sensitive to damage, such as in alpine, subalpine, and low-rainfall areas, and where the natural environment or special natural features are being preserved.

Some recreational activities, including camping, bushwalking, and ski-touring, are currently dispersed throughout the area and are undertaken without extensive development of facilities. Council believes, however, that where intensive recreational use occurs it may be necessary to provide special facilities to cope with larger numbers of people. For example, it will probably be necessary to provide camping facilities in designated areas such as Sheeppark Flat, Wrens Flat, Wellington River, Eagle Vale, Harrierville, Anglers Rest, Staleyville, Gibbo River, and Nariel as indicated in the General Use and Protection and Recreation Zones. Picnicking facilities in some of the major tourist areas should also be provided. Although suggesting that some areas be developed as campsites, the Council considers that large areas should remain available for dispersed or bush camping. That is, in these areas users should be allowed to camp where they choose rather than be restricted to camping areas designated by the managing authority.

Four particular forms of recreation that may pose a problem for the land managers, whether now or in the future, are further discussed below.

Motorized Recreation

Much outdoor recreation depends on motor vehicles. These may be conventional cars, four-wheel-drive vehicles, or motor-bikes. They may be used for touring and sight-seeing, as a means of obtaining access to a particular area where other forms of recreation will be undertaken, or—when they are driven in competitive rallies or in adverse but challenging road conditions—as a source of recreation in themselves.

Any vehicle registered under the *Motor Car Act 1958* may be used on any road on public land that comes within the meaning of a highway as defined in that Act. On public land, roads are defined in the *Land Conservation (Vehicle Control) Regulations* as being “any road formed for the passage of vehicles having four or more wheels”.

Motor vehicles, including trail-bikes, leaving roads on public land without the written permission of the land management authority contravene the provisions of the *Land Conservation (Vehicle Control) Act 1972* and *Regulations*. Moreover they can, and do, cause extreme damage to vegetation and soils.

Authorities responsible for the construction and maintenance of roads, including vehicular tracks, on public land may consider closing such roads temporarily or permanently when traffic exceeds their physical capacity, for safety reasons, or when vehicular access or its associated activities seriously conflict with the area's primary purpose. Erosion hazard areas may be proclaimed according to the provisions of the above Act, enabling strict control to be enforced. Seasonal closure of some roads may be necessary to avoid erosion and excessive maintenance, or because of extreme fire hazard.

A number of four-wheel-drive clubs have acknowledged the need for restrictions on motorized recreation in certain areas and during some periods of the year, and generally support the use of existing legislation to control undesirable activities. Clubs also recognize the need to inform and educate participants in motorized recreation of the environmental consequences of improper use of four-wheel-drive vehicles. The management authorities should continue to encourage the promotion of responsible attitudes to recreational vehicle use.

A significant and growing proportion of the population are becoming involved in recreational touring, which depends on the use of roads and tracks on public land. Sales figures for four-wheel-drive vehicles rose by 47 per cent. over the period 1975-76, and Council has received a large number of submissions from persons interested in the pursuit of activities based on the provision of access into isolated portions of the alpine area. If this demand is to be catered for, without the deterioration and resultant closure of a large number of roads and tracks, additional funds will need to be made available for road and track maintenance.

Deer Hunting

Deer-hunting is a recreational activity currently undertaken in much of the public land in the alpine area. It is carried out using guns or bows and either with or without hounds. (Hounds are not used when stalking deer.) Under the *Wildlife (Game) Regulations* 1976, No. 2, hunting of Sambar deer with hounds is permitted year-round. Concern has been expressed about the use of hounds because of the possible killing and maiming of native animals and because hounds may become lost during the hunt and add to the wild-dog problem in the area. The extent of these problems are substantially unknown, and little research information is available. Council believes that the effects of hunting with hounds on native animals, on the Sambar deer population, and on the wild-dog problem should be determined. The Fisheries and Wildlife Division should continue to conduct investigations into the management of deer and research into the effects of hunting, particularly with hounds, in collaboration with the authorities managing public land and the Deer Advisory Council.

The Council has proposed that neither hunting nor the use of firearms should be permitted in parts of the Protection and Recreation Zone. In the remainder of the zone, hunting deer without hounds, that is, deer-stalking, would be permitted. No restrictions on hunting, other than existing legal requirements, are proposed for the bulk of the land within the Alpine Reserve. The details of these recommendations are given in the respective sections of this report.

Youth Camps

There are some permanent camp sites used by scouts, schools, church groups, and the like on public land in the study area, and demand for new sites is continuing.

Users have generally preferred sites situated in pleasant bushland, close to a permanent stream, readily accessible by road, and in areas where the safety of the camp and its occupants can be ensured during periods of high fire danger. Such sites are relatively scarce and their use for youth camps is in direct competition with their use for less-restrictive public activities, such as picnicking or general camping.

Camps on public land vary greatly—in the purpose for which they are constructed, in their standard of maintenance, and in the degree to which they are used. Some are designed to provide full accommodation, with campers living in huts that have electricity and hot water provided; others have only minimal facilities, with campers living in tents. Some have considerable amounts of money and volunteers' time and effort put into their construction and maintenance; others have been built and are maintained at very low standards. Some are used for much of the year, with the owner organization allowing use by other groups. Others are used only occasionally, and exclusively by one group.

User groups have an increasing tendency to acquire freehold land for their actual camp site, while using adjacent public land for their outdoor activities, and Council believes this trend should be encouraged. While recognizing that a variety of types of camps may be needed, Council believes that any camps permitted on public land should be properly located, constructed, and maintained. For efficient management of camps, it may be necessary for a single organization to be given tenure over a minimum area at any individual camp site, under the control of the land management authority. Council believes, however, that these camps should still be used as fully as possible consistent with avoiding damage to the environment. The wider use of camps on public land is desirable in order to avoid proliferation of camp sites, and there is a need for co-ordination of information regarding the availability of those camps that could be used by groups who do not have tenure of their own.

Skiing

Although the alpine and subalpine environments are sensitive to disturbance in spring, summer, and autumn, this is not generally the case during the winter, when the ground surface is covered by snow much of the time. During periods of thawing and freezing, however, which occur on occasions due to the unreliability of snow cover, soils and vegetation can be damaged through frost heave, and wind and rain action. The Spring thaw can also cause soil erosion and damage to vegetation.

Council recognizes that a wide range of recreational demands is made on alpine and subalpine areas, particularly during the winter. In the case of downhill skiing, specialized facilities involving substantial expenditure are required.

The ski resorts in the study area account for more than 70 per cent. of separate visits by downhill skiers to snow resorts in Victoria. The number of separate visits to Victorian ski resorts during the snow season is variously estimated to be growing by 14 per cent. or 17 per cent. annually.

Existing Ski Resorts

Existing ski resorts vary in their capabilities to cater for the increasing demand. The location of the user population and the future mix of skier categories are two main market components that influence the development of facilities. The main user market in Victoria is likely to continue to come from Melbourne, Albury-Wodonga, and the Latrobe Valley.

Mount Buller at present has a full range of slopes from beginner to advanced. Its total existing capacity of lift-serviced slopes is calculated to be 4,160 skiers at any one time. This is fully utilized during peak periods. The existing accommodation facilities provide 4,325 visitor beds.

Falls Creek has extensive novice and intermediate slopes but virtually no beginner or advanced slopes. The present capacity of lift-serviced slopes is 1,540 skiers and accommodation facilities provide 2,035 visitor beds.

Mount Hotham has limited beginner and novice slopes, but has a large potential for intermediate and advanced slopes. Its estimated existing capacity of lift-serviced slopes is 770 and it contains 1,120 visitor beds.

Mount Buller is the largest ski resort in Victoria and caters mainly for Melbourne visitors, a high proportion of whom visit the area on weekends. Falls Creek and Mount Hotham, being an average of three hours' driving time further from Melbourne, cater for weekend and longer-stay visitors from Melbourne and day visitors from other centres, mainly in the north-east and Gippsland.

Resort Development

Of a number of new areas with potential for development, some could be developed in conjunction with existing resorts. A major criterion in evaluating areas for possible future development is the need to provide sheltered slopes with a variety of aspects to provide good snow conditions under various climatic conditions. Other major considerations include location relative to the main population centres, access, parking facilities, environmental effects, and potential conflicts with other uses and values.

Council has investigated the potential for additional downhill skiing facilities in a number of areas, including existing resorts as well as many presently undeveloped locations. It was concluded that the first priority should be the development of existing resorts at Mount Buller, Falls Creek, and Mount Hotham, to their optimum capacity taking into account their inherent capacities for snow sports and environmental considerations and potential land-use conflicts. This would include the creation of 122 ha of new ski slopes at Corn Hill near Mount Buller, further development at Falls Creek, and the further development of the Swindlers Valley area at Mount Hotham. Details of the resort area boundaries are given in recommendations I6-I9.

In addition to the above developments, it was considered that resort facilities at Mount Stirling and the expansion of facilities at Lake Mountain (Melbourne study area) should be given a high priority. The Lake Mountain area is popular for

bushwalking during summer, but with careful planning Council considers that both winter and summer recreation activities can be enhanced with little conflict. The nature conservation values of the area, particularly those in the Echo Flat locality, should be protected.

The development of Mount Stirling as a resort should be commenced after substantial completion of the Mount Buller resort. Additional facilities with a wide variety of slopes in the three main skier categories (beginner, intermediate, and advanced) will be created within an average of 3½ hours' travel time from Melbourne. This resort would provide day-use facilities and, in time, overnight accommodation associated with the snowfields. It would also serve as a base for cross-country skiing. The further development of the Lake Mountain area for snow play activities could reduce the numbers of non-skiers visiting the Mount Buller–Mount Stirling complex and thus relieve pressure on day-visitor facilities.

The development of Mount Stirling must be carefully planned to minimize the visual and physical impact on the environment and on summer recreation activities in the area. It is, however, not in a remote locality and is surrounded by tracks and logging roads, and associated timber harvesting. The location and extent of accommodation facilities associated with the snowfields should be determined only after careful study.

The resorts proposed by Council provide for a balanced development catering for the main skier market centres and the main skier categories. It is envisaged that a mix of accommodation at high and low levels would be provided, low-level development of all-year-round facilities being based in the vicinity of the townships of Mirimbah, Mount Beauty–Tawonga, Bright, Harrietville, and Omeo. Dispersed development of low-density accommodation facilities should be avoided to minimize the cost of providing essential services, the environmental effects, and the visual impact, particularly in the non-snow season. All accommodation facilities within Alpine Resorts should be limited to declared areas that can be adequately serviced and can satisfy requirements for catchment protection.

The detailed investigation undertaken by Council indicated that the developments proposed above would cater for the immediate needs for additional resort facilities. When optimum capacity of these resorts is achieved, the next priority for development should be Mount McKay, to be developed as an extension to the Falls Creek Alpine Resort. Council expresses concern at the possible environmental consequences resulting from development of some other potential ski areas, such as Bakers Spur, Mount Bogong, Cobungra Gap, Mount Feathertop–Bungalow Spur, and Mount Fainter and believes that detailed studies of the likely effects of any development in these areas on the environment and other land uses will be required if these areas are further considered for development.

Alpine Resort Reservation and Management

The Council believes that ski villages—and their ski runs, chair lifts, and associated service areas—should be reserved by legislation as alpine resorts. Each resort should be managed by a committee of management—comprising representatives of the people or bodies that use the area, have investments there, or have responsibility for some aspect of management.

The Council considers that the committee could contain representatives of each of the following :

Government

- * the department to whom the committee of management is responsible, whose nominee should be the chairman
- * those of the following departments whose expertise is required in the management of that resort :
 - Soil Conservation Authority
 - Country Roads Board
 - Public Works Department
- * the appropriate Shire Council

Commercial

- * ski-lift interests
- * other commercial interests

User groups

- * the Victorian Ski Association (chosen from a panel nominated by that Association)
- * lessees in the area

plus a member with special knowledge of or interest in all aspects of alpine recreation over the whole year.

Council also believes that the means for effective co-ordination of the management of alpine resorts should be established. This co-ordination should include :

- (a) preparation of a planning policy statement for all ski resorts, prescribing :
 - (i) minimum standards for building
 - (ii) standards for slope development
 - (iii) standards for provision of services
 - (iv) *guidelines for occupancy, tenure, franchises for new development, and statutory rules*
 - (v) standards for the conservation of the environment
- (b) consideration of broad schemes for major development at alpine resorts and priorities for disbursement of public funds for major capital works.

Cross-country Skiing

This activity embraces day trips from nearby holiday accommodation or from homes, overnight trips to huts or snow camping, lang lauf racing, and ski-orienting. Large sections of the alpine area presently support such activity and most areas are capable of increased utilization.

Cross-country skiing is growing rapidly, although the number of people involved is still small relative to the number of downhill skiers. Its growth rate is likely to be sustained for some time because it costs relatively little, a number of suitable areas are reasonably accessible, and it is considered by many to be more enjoyable for novices, particularly family groups, than downhill skiing.

Conflicts with other uses are relatively few and no specific areas need be set aside for the pursuit of this activity except adjacent to or within areas used for downhill skiing. The committee of management is responsible for the delineation of nordic ski trails within resort area boundaries and should co-operate with the managing authority of adjacent land in the provision of trails and snow-pole lines that extend beyond the resort boundaries. Information centres and base stations for nordic skiers should also be established as part of the facilities in each alpine resort. These centres should provide details of the various trails in the area, location of refuge huts, and weather information, and act as a route-registration base for skiers.

The management authorities of both the resort and adjacent land should co-operate in the provision of the base stations and in the provision and maintenance of refuge huts. Council has no objection to the establishment of additional refuge huts (in other than wilderness and reference zones) provided sites are chosen to minimize the environmental and visual impact of such huts.

Recommendations

Recreation

- I1** That public land continue to be available for a wide range of recreational uses where these can be accommodated without detriment to other values. Land management authorities should aim at controlling the types, levels, and patterns of recreational use according to the capability of particular areas to sustain such use without irreversible change or significant conflict with the primary purpose of the area.

Recreation Reserves

- I2** That existing recreation reserves be used for organized sports (football, horse-racing, golf, etc.) and informal recreation (picnicking, camping, etc.) as permitted by the managing authority

that native trees be conserved where possible

and that these areas be permanently reserved under section 14 of the *Land Act* 1958 and managed by the Department of Crown Lands and Survey.

Motorized Recreation

- I3** That vehicular use of roads (within the meaning of the *Land Conservation (Vehicle Control) Regulations*) continue to be permitted on public land except where closure is necessary because of erosion hazard, seasonal conditions, excessive maintenance, public safety, or conflict with the primary use of the area.

- 14** That the use of over-snow vehicles be prohibited except where a permit for their use has been obtained from the relevant committee of management or land management authority.

Alpine Resorts

- 15** That the area directly affected by recreation and commercial development at each alpine resort be reserved by legislation as an alpine resort. (The boundary of each resort area may require minor adjustments in the future and these should be decided upon after consultation between the committee of management of the resort and the managing authority of the adjacent land.)

16-19

- (a) That the areas listed below and shown on the maps be reserved as alpine resorts
- (b) that development planning and implementation in each resort area minimize the environmental and visual impact of facilities, consistent with the efficient planning and management of a ski resort
- (c) and that each resort be managed under the relevant legislation by a committee appointed by the appropriate Minister, which should include representatives of government departments, commercial interests, and user groups as set out in the section on Alpine Resort Reservation and Management above.

16 Mount Buller Alpine Resort (1,780 ha)

- (a) That the resort area shown on the map be developed to optimum capacity for downhill skiing

and that a representative of the Forests Commission be chairman of the committee of management for the resort.

17 Mount Stirling Alpine Resort (2,030 ha)

- (a) That the resort area shown on the map be developed for downhill and nordic recreational skiing
- (b) that the extent and location of accommodation facilities be determined only after detailed study of the available options
- (c) that the development of this resort be phased into follow the achievement of optimum capacity at existing resorts

and that this resort be managed in conjunction with the Mount Buller Alpine Resort and a representative of the Forests Commission be chairman of the committee of management.

NOTE : Logging on a once-only basis should be permitted in limited areas as indicated on Map C.

18 Mount Hotham Alpine Resort (2,530 ha)

- (a) That the resort area shown on the map be developed to optimum capacity for downhill skiing consistent with the requirements of cross-country skiers particularly in the Mount Loch and Swindlers Spur (Spargos Hut) areas

- (b) that wildlife habitats, particularly those of the mountain pigmy possum, be protected by management prescriptions prepared by the Fisheries and Wildlife Division
- (c) that significant plant species be protected
- (d) that ski lift development not take place in areas adjacent to the Alpine Walking Track

and that a representative of the Department of Crown Lands and Survey be chairman of the committee of management

19 Falls Creek Alpine Resort (1,360 ha)

- (a) That the resort area shown on the maps be developed to optimum capacity for downhill skiing consistent with the requirements of nordic recreational skiers
- (b) that the decision regarding provision of car parking facilities in the Rocky Valley area be subject to environmental evaluation
- (c) that the location of this area within a proclaimed water supply catchment be recognized in the development plans for the area.
- (d) that the Australian Department of Science, Antarctic Division, and the State Electricity Commission be permitted to continue occupation of facilities in the resort area
- (e) that development of tourist facilities within the buffer zone adjacent to the Rocky Valley Dam be subject to the agreement of the State Electricity Commission

and that a representative of the State Electricity Commission be chairman of the committee of management.

Note : The rare mountain pigmy possum has been recorded in the Mount McKay area adjacent to the Falls Creek Resort. Should fauna surveys show that the mountain pigmy possum occurs within the resort area, then its habitat should be protected by management prescriptions prepared by the Fisheries and Wildlife Division.

J. ROADSIDE CONSERVATION

The primary purpose of road reserves is to provide for communication, transport, and access. Vegetation along the road verges can have particularly high conservation, recreation and landscape values, however, especially in the agricultural districts where most of the native vegetation has been cleared. Generally this vegetation, although it affects landscape values, is somewhat less important for conservation in the Alpine area. The roadside environment does, however, depend largely on management of the road reserve. It is important that the managers concerned (usually the Country Roads Board and Shire Councils), and the managers of adjacent public land, consider these landscape values, and that this vegetation be disturbed to the minimum extent consistent with the safe and efficient design and use of the road.

Unused Roads

When Victoria was being settled, surveyors provided access to every block by means of a surveyed Crown road. Many of these have never been used as roads, and they are usually held by the occupiers of the adjoining land under an unused-road licence. The Forests Commission controls the vegetation on unused roads that have been formally declared as such.

Roadside Picnic Areas

In attractive locations, small areas should be developed to provide for travellers who wish to relax and picnic away from the road reserve. It is not intended that these areas would cater for large numbers of people, but limited picnicking facilities should be provided.

Recommendations

J1 That road reserves throughout the study area continue to be used for communication, transport, access, surveys, and utilities.

Landscape, recreation, and nature conservation values can best be protected by observing the following guidelines. The Council recognizes that many of these are already being implemented by the bodies responsible for the construction and maintenance of roads.

- (a) When improvements to a road are being carried out, trees and shrubs on the road reserve should be disturbed to the minimum extent consistent with the safe and efficient design and use of the road.
- (b) Major works to re-align minor roads carrying trees and shrubs should not be undertaken unless clearly warranted by the nature and volume of the traffic carried, and the managers of adjacent public land should be consulted regarding such works.
- (c) Every effort should be made to retain significant geological features exposed in existing cuttings, when roads are widened or re-aligned.

- (d) Where re-alignment of a road results in a section of the old road being cut off, wherever possible that section should not be sold but used as a recreation and rest area or incorporated into an adjacent appropriate reserve.
- (e) Where a pipeline or overhead wires are to follow a road carrying trees and shrubs in a rural district, every effort should be made to locate the easements on private land alongside the road if this is already cleared, rather than clearing roadside vegetation to accommodate them.
- (f) While recognizing the need for clearing or pruning of vegetation close to power lines to reduce the associated fire risk, the State Electricity Commission should consult with the Forests Commission regarding the manner in which the risk posed by vegetation can be reduced, while at the same time reducing the environmental impact to a minimum.
- (g) Road-making materials should not be taken from road reserves unless suitable alternative sources are unavailable. Any such removal should be done so as to ensure a minimum disturbance of the native vegetation, and the disturbed area should be rehabilitated, where possible, with vegetation native to the area.
- (h) Burning-off, slashing, or clearing roadside vegetation should be kept to a minimum consistent with providing adequate fire protection.
- (i) Weeds and vermin on roads should be controlled by means that do not conflict with the uses given above.
- (j) The various road management authorities, when planning to upgrade roads that have heavy recreational use, should give due consideration to recreational requirements, and give priority along such roads (when funds are available) to the development of roadside recreation facilities.

J2 That the following guidelines be applied to unused roads.

- (i) The clearing of native trees and shrubs other than noxious weeds should continue to be clearly prohibited in the conditions of unused-road licences.
- (ii) A condition permitting public use of licensed unused roads should be written into unused-road licences where necessary to provide practical access to public land.
- (iii) Unused roads or easements should not be alienated if there is any likelihood that they will have value for future traffic, nature conservation, recreation, or other public use.

J3 That the land management authorities establish picnic areas in suitable locations adjacent to the road reserves.

K. AGRICULTURE

Most land in the Alpine area suitable for agriculture was alienated during the period of early settlement. The public land generally does not have significant value for agricultural development, apart from certain areas located within or adjacent to the main agricultural districts. These areas are suitable only as additions to existing holdings.

Grazing on Public Land

Public land in the Alpine area has been an important resource for grazing since the early days of settlement. Cattlemen and grazing have played an important role in the history of the high country. They pioneered the area, and often assisted other early users by acting as guides and by providing horses for transport of people, supplies, and equipment. Their huts continue to be important for the safety and convenience of bushwalkers and cross-country skiers.

Today about 100 graziers run cattle here. The utilization of these blocks is closely integrated with the management of feed supplies on the graziers' home properties. The public land provides a very low-cost grazing area, which is of considerable importance to the financial viability of many of the cattlemen. The nature, and in many cases the size, of the graziers' freehold land does not generally permit diversification into other forms of agricultural production.

The level of dependence on the public land varies from grazier to grazier. In a few cases, little use is made of the runs, but in most they play a major part in the operator's broad management systems. The usual system is for cattle to be taken to the high country in late spring—early summer and remain there until the autumn. By sending the cattle to the grazing runs, the graziers conserve some spring pasture and the summer growth on the home properties, which the cattle can then graze on return in autumn, although not all cattle return to the home properties. Many of the calves are sold directly after the muster on the runs at special autumn calf sales. Other cattle are transferred directly from the summer runs to lower-elevation winter bush blocks. These cattle may then be sold directly from the bush blocks or not returned to the home properties until late winter. In many cases 50 to 75 per cent. of all natural increases of the beef herds spend only the first 3–4 months of their lives on the home properties. Likewise, many of the breeding cows spend only 4–5 months of the year there.

Public land in the area varies in its sensitivity to grazing pressure. The area of grasslands and herbfields above the tree-line (about 11,000 ha), although small compared with the total public land, is particularly sensitive and, because of the harsh alpine environment, recovers extremely slowly from any form of disturbance. Cattle preferentially graze the herbs, and tend to concentrate in mossbeds and snowpatch areas. On the Kosciusko plateau of New South Wales, it has been demonstrated that the mossbeds and peat soils of drainage lines are of prime importance in catchment hydrology because of their retarding effect on the release of water to streams, their promotion of early snow melt, and their action in filtering silt. These aspects have significance for hydroelectric power generation from the Kiewa scheme, and for the prolongation of the spring and summer flows that are valuable for irrigation. The

full quantitative effects of these phenomena on the hydrology of the Victorian alpine areas are unknown, but, in general, continued cattle grazing is preventing or retarding recovery of entrenched drainage lines through the mossbeds.

Council considers, however, that current controls on stock numbers and length of the grazing season have substantially halted trends towards deterioration of water catchments (except for the mossbeds and snowpatch areas on which stock may concentrate) ; but to attain the highest standards of catchment condition the long-term phasing out of grazing in many of these areas would be required. The effects of roads and other engineering works may have caused more serious changes in hydrology than grazing alone.

The pattern of grazing on the alpine and subalpine grasslands and herbfields adversely affects nature conservation values by reducing the structural and floristic diversity of the vegetation as well as its luxuriance. Grazing can also reduce the summer display of wildflowers that is a notable feature of ungrazed alpine herbfields. In the ungrazed Kosciusko National Park, the wildflower display is a major tourist attraction. The alpine vegetation also provides habitat for a numerous and varied invertebrate population, including a number of species largely restricted to the alpine zone. A small number of vertebrate species also inhabit the area.

Grazing and fire have led to an increased proportion of shrub species in the vegetation mosaic. Data from experimental plots on the Bogong High Plains indicate that, in the absence of these two agents, shrubs in the natural grasslands and herbfields are likely to be replaced by grasses and herbs over a period of 30–50 years. The progress of the various vegetation communities towards their natural climaxes, with a reduction in the shrub population, will reduce the amount of fuel. During the summer growing period, the grasslands and herbfields will not readily carry fire except on a few days of high fire risk in each year. Most fires that threaten this zone originate from lower areas, and the best way of protecting it from fire is to carry out protective burning in the peppermint-gum forests at lower elevations.

Since the 1940s controls of grazing have been progressively implemented to contain damage that was occurring in some sensitive areas due to heavy grazing pressures and the associated practice of burning-off by licensees. These controls have primarily applied to the area above the tree-line. The Soil Conservation Authority was given supervisory control over all grazing above the snow-line (the 1,219 m contour) by a Premier's Directive in 1960 ; it currently determines the allowable number of cattle and the duration of grazing on the Bogong High Plains and adjacent high country, and the Bennison Tablelands and Moroka Basin regions. Highly sensitive areas such as the summits of Mount Bogong, Mount Hotham, Mount Loch, and Mount Feathertop have been withdrawn from grazing. This control has been carried out in close co-operation with the cattlemen.

The impact of grazing is greatest in the alpine zone, but is significant in much of the subalpine zone, especially in areas that contain mossbeds. The Council believes that although grazing is an acceptable use in much of the forested land below the snow-line, supervision will be necessary to ensure that irreversible damage to natural ecosystems does not occur. The conditions governing grazing in particular areas should be modified from time to time, depending on the condition of the soil or vegetation or on the need to protect other values.

Council recognizes the very high nature conservation values of the alpine and sub-alpine grasslands and herbfields but, because of the difficulty in re-organizing the licences that contribute significantly to the livelihood of the cattlemen, the phasing out of grazing there can only be achieved gradually unless alternative grazing can be provided elsewhere. Council believes, however, that controls on grazing in the area above the tree-line should be extended, and considers that grazing should be withdrawn from portions of the Bogong High Plains and areas near Mount Feathertop, Mount Howitt, and the Bluff. Cattle numbers may need to be reduced in other high-altitude areas, particularly runs containing sensitive summits and ridges. The supervisory control of all grazing above the snow-line should remain the responsibility of the Soil Conservation Authority. The current practice on the Bogong High Plains (where grazing licences can only be transferred to immediate family members) should be continued and extended to other areas where gradual phasing out of grazing is desirable.

In addition, no sub-leasing or assignment of grazing rights should be permitted and, in general, areas currently excluded from grazing or over which no licence is current should remain free from grazing.

Forms of Land Tenure

Grazing rights in the area are granted by the Department of Crown Lands and Survey and the Forests Commission. These are presently annual licences or short-term agistment rights. The Council believes that grazing on public land should be controlled by issuing agistment rights, annual licences, or longer-term licences, depending on the circumstances as outlined below. In all cases the management authority must be able to exercise general supervision of grazing management, control stocking rates, and exclude stock temporarily or permanently from parts of the licence area.

The issue of agistment rights, or annual licences with stock limits, is suited to situations where :

- (a) the areas are in the alpine and subalpine grasslands and herbfields (above 1,219 m)
- (b) the area is included in a park
- (c) it may be necessary to limit grazing in the future because of flora and fauna values, the need to protect water supply, or erosion hazard
- (d) the use for grazing is clearly subordinate to other uses
- (e) grazing is used occasionally as a management tool
- (f) the demand for grazing is intermittent
- (g) the areas to be grazed are small.

In some situations at low elevation the managing authority could permit the issue of longer-term licences that, while maintaining supervisory control over grazing management, would give the licensee greater security of tenure and thus encourage him to make best use of the forage resource. They would not lead to freehold tenure. In proclaimed water supply catchments or in catchments that may be proclaimed in the future, conditions may apply precluding the granting of longer-term licences or affecting those

already granted. Some suggested terms and conditions for grazing licences are set out below.

- (i) Provision should be made to allow the managing authority to exercise general supervision of grazing management, especially with respect to times of grazing and stocking rates.
- (ii) When three-quarters of the licence period has expired, the licence should be reviewed and a decision made on renewal (longer-term licences only).
- (iii) Grazing may be excluded either temporarily or permanently from parts of the licence area, as determined by the managing authority.
- (iv) Licences for grazing on the high-altitude grasslands and herbfields should not be transferable except to members of the immediate family of the current licence-holder.
- (v) No sub-leasing or assignment of grazing rights should be permitted.
- (vi) Cultivation should not be permitted.
- (vii) Vermin and noxious weed control should continue to be the responsibility of the licence-holder under the supervision of the managing authority.
- (viii) No sheep should be permitted to graze on licensed areas above an elevation of 1,000 m.
- (ix) The lighting of fires for burning-off by the licensee should continue to be prohibited.
- (x) Grazing licences would not imply any form of exclusive use or control over the area by the licensee.
- (xi) Licences should be subject to any other terms and conditions that the managing authority considers necessary.
- (xii) Licences should be liable to cancellation for non-compliance with the conditions, at the discretion of the Minister.

Grazing is presently controlled by the land management authority responsible for each particular area, with the Soil Conservation Authority being consulted for areas above 1,219 m. Council believes that there should be a greater degree of co-ordination between authorities and the formulation of a common policy in the selection and management of areas on which grazing will be permitted. In particular, fees charged should reflect the grazing value of the land. Each region where grazing of public land is important needs a committee comprising, as appropriate for the region, representatives from the Forests Commission, the Department of Crown Lands and Survey, the Department of Agriculture, the Soil Conservation Authority, the National Parks Service, the State Electricity Commission, and the graziers. These committees should advise the management authority with respect to :

- * selection of the area suitable for grazing, their allocation, and the delineation of their boundaries (Council's recommendations may necessitate some re-allocation of licences)
- * type of livestock, stocking rates, and dates of entry and removal

- * exclusion of stock when and where necessary to provide for conservation of flora and fauna, protection of water catchment values, protection of forest regeneration works, or the reclamation of eroded areas.
- * permanent exclusion of stock from some control areas
- * fencing and water supply
- * additional research necessary to monitor the effects of grazing on catchment hydrology and nature conservation values.

The District Advisory Committees of the Soil Conservation Authority—currently established in the Bogong High Plains, the Snowy-Bennison Plains, and the Upper Goulburn catchment areas—could form the basis of these committees. If representation from a large number of the departments referred to above is necessary in any region, then existing legislation will need to be modified. (At present the District Advisory Committees are limited to a maximum membership of seven, a majority of which must represent grazing, agricultural, or other relevant interests.) The Soil Conservation Authority should continue to co-ordinate the liaison between the committees and land management authorities.

Recommendations

Land Recommended for Agriculture

K1-K15 That the land described below and shown on the maps be used for agriculture. (It is intended that this land should form additions to present farms.)

and that

with reference to section 5 (3) of the *Land Conservation Act* 1970, this land be made available for agriculture in accordance with the provisions of the *Land Act* 1958.

- K1** 8 ha—west of allotment 15 of section 15, Parish of Wonnangatta.
- K2** 6 ha—being allotment 25 of section 15, Parish of Wonnangatta.
- K3** 4 ha—south of allotment 17 of section 15, Parish of Wonnangatta.
- K4** 8 ha—being allotment 26A of section 17, Parish of Budgee Budgee.
- K5** 141 ha—being allotment 13A of section 1, Parish of Bingo-Munjie.
- K6** 61 ha—east of allotments 6, 7, 8, 9, 10, and 11 of section 2, Parish of Wollonaby.
- K7** 11 ha—adjacent to allotment 9 of section 6, Parish of Wermatong.
- K8** 100 ha—north of allotment 17, Parish of Mowamba.
- K9** 20 ha—being portions of allotments 69A and 74, Parish of Kancobin.
- K10** 64 ha—being allotment 46A and Crown land to the north, Parish of Jinderboine.

- K11** 48 ha—south of allotment 20, Parish of Jinderboine.
- K12** 31 ha—west of allotments 3A and 3D of section 16, Parish of Hinno-Munjie.
- K13** 17 ha—adjacent to allotment 2A of section 2, Parish of Cobungra.
- K14** 60 ha—being portions of allotments 4A and 5 of Section 2, Parish of Moonip.
- K15** 4 ha—north of allotment 14A, Parish of Gelantipy East.

Land Suitable for Agriculture

- K16–K17** That the land described below and shown on the maps is suitable to be developed for agricultural production but the timing of release for this purpose be subject to review by Council.
- K16** 456 ha—being Crown land in the Parishes of Mowamba and Beloka, west of allotments 1, 2, 7B, and 8A of Section 1, Parish of Beloka.
- K17** 250 ha—south of allotments 19 and 24 of Section 1, Parish of Beloka.

Grazing on Public Land

- K18** That grazing on some areas be phased out as indicated in the recommendations for the Wilderness, Reference, and Protection and Recreation Zones.
- K19** That, in other areas of public land, grazing be subject to the policies outlined in this section and meet the major objectives set by Council for particular areas.
- K20** That the form of tenure for grazing on public land be that considered most appropriate by the management authority—agistment, annual licence, or longer-term licence.
- K21** That committees, as described above, advise the management authorities on matters relating to grazing on public land.
- K22** That the fees charged for grazing on public land reflect the grazing value of the land.

MINERAL AND STONE PRODUCTION

The continued existence of our technological society will depend on the availability of minerals. The study area contains known deposits of "gold" and "minerals" as defined in the *Mines Act* 1958 and as subsequently gazetted (metallic minerals, coal, etc.). Nevertheless, knowledge of the location of our mineral resources is far from complete and new deposits of commercial significance will undoubtedly be found. Furthermore, currently uneconomic deposits of important minerals may become economically exploitable, and other minerals that are not used at present may become important.

Government has the responsibility to establish the existence and extent of the State's mineral resources. When a new deposit is discovered in an area where mineral extraction is not a currently approved land use, it may be of such importance that a change of the land use is required in the national interest. The decision on whether such a change is in fact necessary can only be made against a background of the best available knowledge of the location and extent of alternative sources of the particular mineral.

It is important therefore that the reservation of conservation areas should not automatically exclude exploration for mineral or fossil fuel resources, either by exploration companies under strict supervision or by the Mines Department itself. Attention should be directed towards ensuring that other values and interests are protected, rather than attempting to prevent exploration activities.

Materials covered by the definition of "stone" in the *Extractive Industries Act* 1966 (including rock, gravel, clay, sand, and soil) are widespread in the area. There is a strong community demand for new and better roads and buildings, and so for the materials necessary for their construction. Many of these materials are provided from private land, but public land is also an important source.

The Council is concerned by the complexity of legislation and procedures governing extraction of "stone", and by the lack of control accompanying some of these procedures. (For example, the Country Roads Board and municipal councils are not bound by many provisions of the *Extractive Industries Act* 1966.) A substantial number of unwise excavations have been made upon public land, and in some instances the rehabilitation of excavated land is lagging. There is a need for review of existing legislation and procedures to enable more rational use of the "stone" resource of the State.

Poorly planned and located excavations can affect surrounding lands through noise, dust, unsightliness, and erosion, and can diminish the value of the land. With care, however, these effects can be avoided or minimized.

The Council believes that :

- (i) All exploration for and extraction of "gold", "minerals", and/or "petroleum" on public land (including operations under miner's rights) should be subject to the approval of, and to the conditions imposed by, the Department of Mines, such approval and conditions being subject to agreement with the authority managing the public land and the Soil Conservation Authority, and being in conformity with the guidelines outlined hereunder.

- (ii) There should be co-operation and consultation between the land managing authorities, the Mines Department, the Soil Conservation Authority, and the other relevant authorities with respect to the procedures to be adopted for the exploration and extraction of "stone" on public land. Any operations on public land should continue to be subject to the approval of the appropriate managing authority.

In all cases, the procedures that are established should apply to municipal councils, the Country Roads Board, and other public authorities as well as to commercial operators. To ensure this, the relevant Acts may have to be amended.

- (iii) A system should be established that would guarantee, before work commences, the availability of funds for progressive and final reclamation for any excavation or operation. Provision should also be made to enable the acceleration of the rehabilitation of all existing extraction areas on public land.
- (iv) Royalties for materials extracted from public land, including site rental when appropriate, should be more closely related to the market value of the material. This would eliminate the temptation to use public land purely on the grounds of the nominal royalties often levied in the past.
- (v) The following guidelines should apply to all extraction from public land :
- * No sites for the extraction of "gold", "minerals", and "petroleum" should be opened in areas that the Mines Department and the land management authority in consultation consider to be of greater value for their aesthetic or nature conservation values.
 - * The Mines Department should not permit any extraction of "gold", "minerals", or "petroleum", unless satisfied as to the reasonable economic viability of the proposed extraction. The Department should also require, as far as is reasonably possible, the lodgment of mining plans that show the expected post-mining state of the land.
 - * No sites for the extraction of "stone" should be opened in areas that the managing authority, in consultation with the Mines Department, considers to be of greater value for other uses including aesthetic or nature conservation values. The advice of the Mines Department should also be sought as to the desirability of proposed excavations having regard to alternative sources of "stone".
 - * Extraction of "stone" should generally be concentrated on the fewest possible sites in an area, and any one site should be completely worked out and where possible reclamation ensured before a new site is exploited. The type of excavation to be carried out should be that with the lowest environmental impact consistent with effective use of the resource. In general, and where the nature of the resource permits, excavations for "stone" should be deep and limited in area in preference to shallow excavations over a wide area. The extraction of granitic sand occurring as shallow deposits in the weathered profile should not be permitted until it has been established that no suitable alternatives are available. In the special circumstances where approval is given for this form of extraction, particular attention should be given to the prevention of soil erosion.
 - * Where an application for the removal of "stone" from a stream bed is considered, the land management authority should take particular care to ensure that the operations will not directly or indirectly cause erosion of the bed or banks, or

undue pollution of the stream. In addition to the arrangements outlined above for "stone", the land management authority should also consult with the relevant water supply and conservation authorities, and should consider the scenic and recreation values of the area. Alternative sources with a lower environmental impact should be used where they are available. The environmental effect of extraction may be reduced if alluvial stone is obtained from properly managed quarries on the river terraces, rather than from the present stream bed.

- * All extraction sites should be fully reclaimed where possible. Reclamation should follow extraction progressively when possible, but otherwise should begin immediately extraction is completed. The requirements for reclamation should be included in the conditions of the lease or licence before any approval to extract is granted. The reclamation may include, for example, replacing topsoil, revegetating the site with plantation forest, filling a quarry with water and developing the site as a park, using a gravel pit for off-road vehicles, using a quarry for garbage disposal prior to reclamation, or restoring the site as closely as possible to its original topography and revegetating it with species native to the site.

In addition to the above, the approval of the Soil Conservation Authority should continue to be sought for any exploration or extraction operations for "gold", "minerals", "petroleum", or "stone", where the subject land is :

- (a) at an elevation exceeding 1,200 m
- (b) within a coastal foreshore reserve
- (c) within a proclaimed water supply catchment.

Recommendations

- L1** That public land in the study area (other than land exempted or excepted from occupation for mining purposes under the *Mines Act 1958*) continue to be available for extraction of "gold", "minerals", "petroleum", and "stone" subject to the principles and guidelines set out above.
- L2** That public land in the study area continue to be available for exploration for "gold", "minerals", "petroleum" and "stone" subject to the principles and guidelines set out above.

NOTE : The Warrambat Slate Quarry is referred to in section A, Alpine Reserve—General Use Zone

M. UTILITIES AND SURVEY

Many utilities occupy public land. They include roads, pipelines, powerlines, power stations, hospitals, churches, public halls, shire offices and depots, garbage depots, sanitary depots, cemeteries, and sewage-treatment works. These recommendations do not specifically refer to many of the small areas used for the purposes listed above, as no change of use is proposed. It is intended that for such areas existing legal uses and tenure should continue.

It is not possible at present to provide for future requirements of land for survey and utilities, in the absence of firm planning proposals accompanied by the necessary detailed information. The use of land for these purposes will need to be considered when particular projects are firmly proposed. The various recommendations in the report are not intended to preclude such use of the land, and would be subject to review at the appropriate time.

Council believes that government agencies concerned with provision and installation of communication equipment, transmission lines, pumped storage sites, power stations, port facilities, pipelines, roads, etc. should be requested to submit to the Council and the management authority during the early planning stages any major proposals that would involve occupation agreements or the setting aside of sites on public land. This would assist in achieving co-ordinated planning, and perhaps avoid the necessity for costly resurveys.

Recommendations

General Utilities

- M1** That existing or approved easements be used to provide access and services.
- M2** That new powerlines, pipelines, communications equipment, and other utilities be planned to minimize disturbance to public land and protect the values associated with this land, that they not be sited on public land without the agreement of the managing authority and where appropriate the Soil Conservation Authority, that new pipelines and powerlines follow existing easements if possible (this may require widening some easements), and that authorities have the right to occupy a minimum area for access and maintenance around their installations.

Garbage and Sanitary Depots

Council believes that sites on public land used for the disposal of garbage and sanitary material should be located to cause minimal conflict with nature conservation values, having regard to the cost of alternatives. Sites should be provided in reasonable proximity to users to minimize transport costs and illegal dumping of rubbish.

- M3** That the areas used on a temporary basis (such as garbage depots and sanitary depots) be fully rehabilitated. (This should apply to sites used illegally as well as those used legally. Where the user or users are known, rehabilitation should be at their expense.)

Fire Look-outs

- M4** That the Forests Commission have the right to occupy a minimum area around each of the fire look-out installations.

Trigonometrical Stations

The Council recognizes the necessity to reserve sites in the future for new trigonometrical stations.

- M5** That the Department of Crown Lands and Survey have the right to occupy a minimum area around the station and provide lines of sight.

Navigation Aids

- M6** That the Department of Transport have the right to occupy a minimum area for access and maintenance around the navigation aids on Mount Livingstone.

Roads

Roads and tracks serve a number of needs—for example, access for landholders, tourism and recreation, fire protection, timber production, and mining—but may conflict with other primary uses (water supply, some forms of recreation, or nature conservation), particularly in areas of high erosion hazard above 1,200 m.

- M7** That in the Protection and Recreation and Natural Features Zones, other areas above 1,200 m, and other parts of proclaimed catchments, the management authorities in collaboration with the Soil Conservation Authority classify roads and tracks according to the demands and requirements for use and the hazards and conflicts associated with them.

Other Utility Areas

- M8** That existing legal uses and tenure continue for areas that are at present reserved and used for utility purposes such as public buildings, municipal depots, cemeteries, schools, etc.

Low-level Road

The Premier has referred the question of a low-level road to the State Co-ordination Council for discussion and recommendation.

N. TOWNSHIP LAND

Public land in townships is currently used for a wide range of purposes. The Council has not proposed any change of use for such public land where the present use is for schools, public halls, sports grounds, and the like. In general, public land in townships, other than those areas that have been specifically reserved and except where otherwise indicated below, should remain as unreserved Crown land to meet future requirements.

A number of deserted or near-deserted townships first proclaimed during the gold-mining boom of the late 1800s and early 1900s occur within the Alpine area, often in isolated localities. Council recommends that certain of these townships be rescinded and portions of others be rescinded where they contain public land that is no longer required for township purposes. Many of these contain the remains of cottages and mining machinery, evidence of reef-mining, and pioneer cemeteries. These relics of Victoria's mining past should be preserved and registered where possible by the authority managing the surrounding public land.

Recommendations

N1 That the following proclaimed townships be rescinded in accordance with the provisions of the *Land Act 1958* :

Brookville

Glendart

and that portions of the following townships be rescinded and added to the adjacent public land :

Glen Wills

Nariel

Matlock

Sunnyside

Note : The boundaries of these townships would be defined by the Department of Crown Lands and Survey following the acceptance of these recommendations by the government.

Mount Beauty

Mount Beauty, which formed part of the Kiewa works area, was established by the State Electricity Commission to house workers on the Kiewa project. In 1957, parts of Mount Beauty were excised from the Kiewa works area and municipal administration was transferred to the Shire of Bright. Council believes that Mount Beauty should be proclaimed as a township.

N2 That the area known as Mount Beauty and shown on the map be proclaimed as a township under the provisions of the *Land Act 1958*, and that the public land within the township be the responsibility of the State Electricity Commission.

Dartmouth

The Dartmouth village was established to house construction workers and their families during construction of the Dartmouth Reservoir by the State Rivers and Water Supply Commission, as the constructing authority for the River Murray Commission. After completion of this project, and following the expected development of recreational facilities associated with the reservoir, the Dartmouth village could have importance as a tourist centre. Accordingly, Council believes that on completion of the Dartmouth project the village should be proclaimed as a township.

- N3** That on completion of the Dartmouth project, and when no longer required by the State Rivers and Water Supply Commission, the Dartmouth village be proclaimed as a township under the provisions of the *Land Act* 1958.

Suggan Buggan

- N4** That, if required, land within the township of Suggan Buggan be made available for commercial development of overnight-accommodation facilities.

McKillops Bridge

- N5** That an area of approximately 20 ha south of McKillops Bridge be temporarily reserved for possible commercial development associated with the Snowy River and Tingaringy National Parks.

Note : Any such development should be undertaken only with the approval of the National Parks Service (see recommendation B2).

O. UNCOMMITTED LAND

In the recommendations for the adjacent North-eastern and Melbourne areas, substantial parcels of land bordering the Alpine area were left uncommitted, pending the study and recommendations for this area.

In defining the western and northern boundaries of the Alpine Reserve, catchments and topographical features have been taken into consideration. Consequently some of the uncommitted land referred to above has been recommended for inclusion in the Reserve while some small areas along the boundary of the Alpine area would be better added to uncommitted land in adjacent areas.

Uncommitted land is to be securely retained as public land, although changes in its status may be required if these are recommended following a review by this Council. It may be used to satisfy present needs, provided this does not cause changes that would be difficult to reverse.

The principles underlying the use of uncommitted land have been outlined in more detail in recently published final recommendations, such as those for the Melbourne, East Gippsland, and Mallee areas.

Recommendation

O1 That the land (13,290 ha) indicated on map A be used to :

- (a) maintain the capability of the land to meet future demands
- (b) produce those goods and services required by the community (such as forest produce and grazing) that can be supplied without seriously reducing the long-term ability of the land to meet future needs.

and that it be Crown land withheld from sale and be protected forest under the provisions of the *Forests Act* 1958.

P. DEFENCE FORCES TRAINING

The Australian Army and the Royal Australian Air Force use the alpine area and the air space above it for training purposes.

The Army uses the public land for unit deployment exercises, communication and patrolling exercises, driver and recovery training exercises, and survival and adventure training. Two low-level jet routes traversing parts of the alpine area are used by R.A.A.F. jet aircraft on operational training. Military aircraft operating from East Sale use air space with a lower limit of 4,000 ft over portions of the south-west.

Council believes that military training is a legitimate use of public land, but is aware of the possibility of conflicts arising with some forms of recreation, in particular wilderness recreation. It is Council's view that military training should not occur in reference areas, wilderness areas, and only under special circumstances in parks and other areas of recreation and conservation significance.

Recommendation

- P1** That the following conditions apply to military training conducted on public land ;
- (a) The types of activities, and their timing and location, should be subject to agreement between the appropriate defence department, the managing authority, and other relevant bodies such as the Soil Conservation Authority.
 - (b) The training activities should be carried out under conditions specified by the managing and relevant authorities, to minimize any detrimental effects.
 - (c) The Forests Commission should be consulted (for fire-protection purposes) with respect to training activities in protected forest and protected public land.

Q. OTHER RESERVES AND PUBLIC LAND

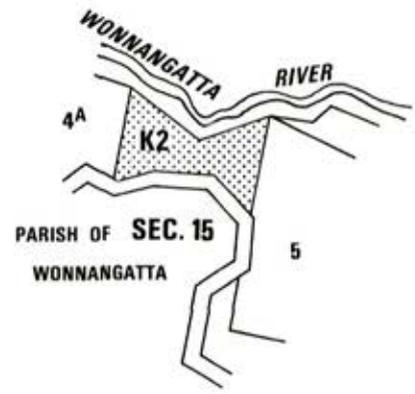
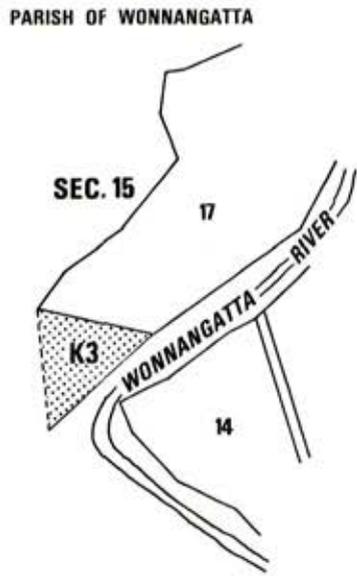
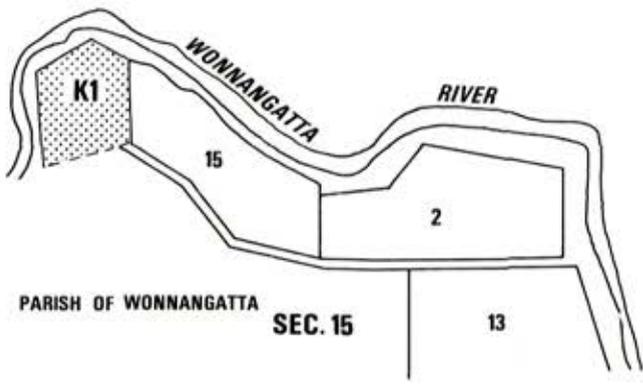
Some small areas of public land not specifically mentioned in these recommendations are external to the proposed Alpine Reserve. Some of these small areas (both reserved and unreserved) receive limited public use.

Recommendation

- Q1** That for small areas of public land external to the Alpine Reserve not specifically mentioned in these recommendations, existing legal uses and tenure continue
and that where the land is not used for a specific purpose at present, such areas be used in a way that will not preclude their reservation in the future for as-yet-unknown public purposes and be managed as if they were uncommitted land.

AGRICULTURE K1-K3 WONNANGATTA

MAP 1

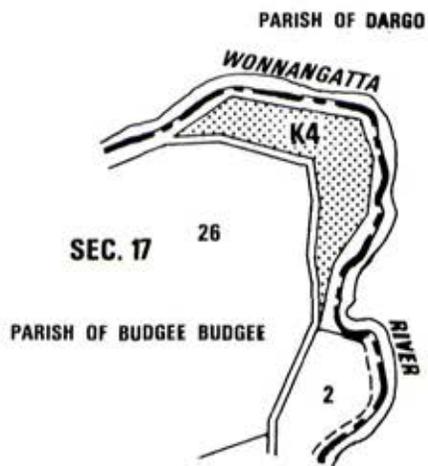


PUBLIC LAND RECOMMENDED FOR ALIENATION

SCALE 1:25 000

**AGRICULTURE K4
BUDGEE BUDGEE**

MAP 2

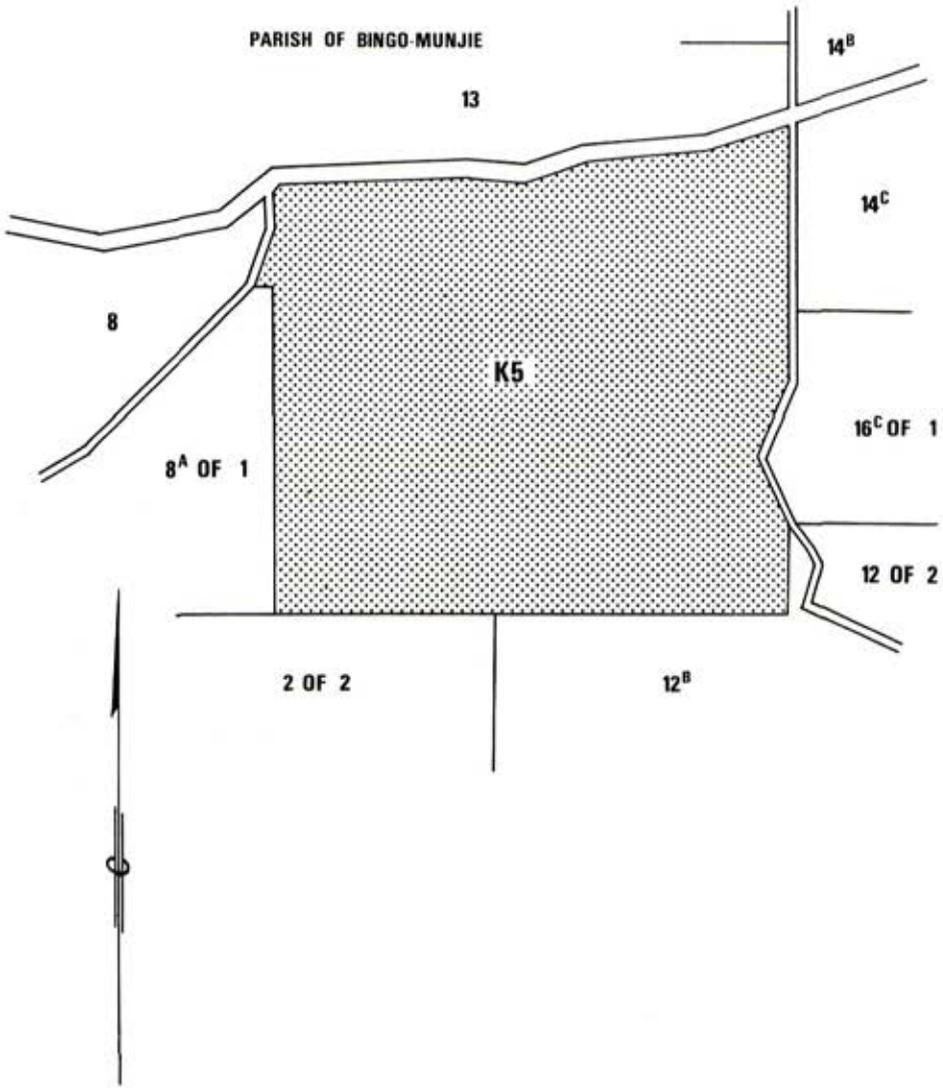


PUBLIC LAND RECOMMENDED FOR ALIENATION

SCALE 1:20 000

AGRICULTURE K5
BINGO-MUNJIE

MAP 3

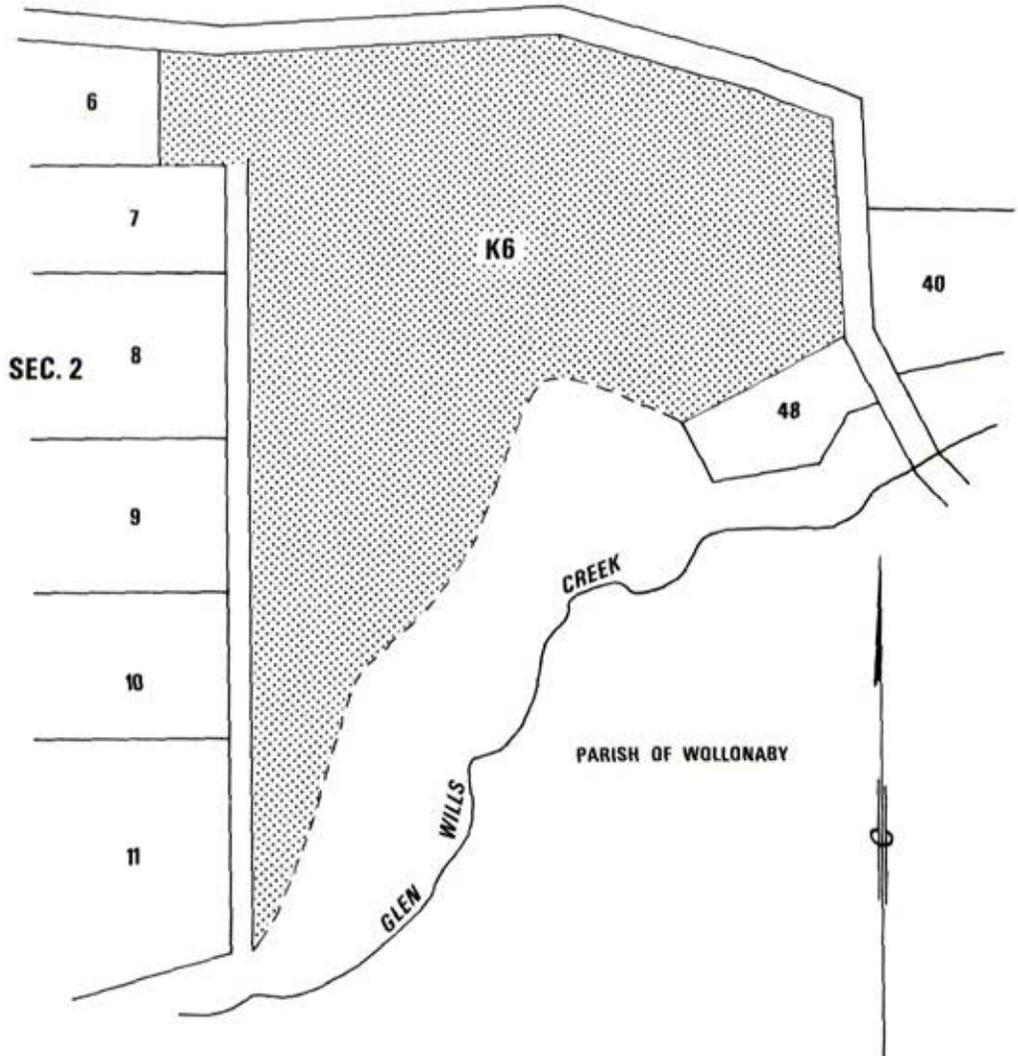


PUBLIC LAND RECOMMENDED FOR ALIENATION

SCALE 1:20 000

**AGRICULTURE K6
WOLLONABY**

MAP 4

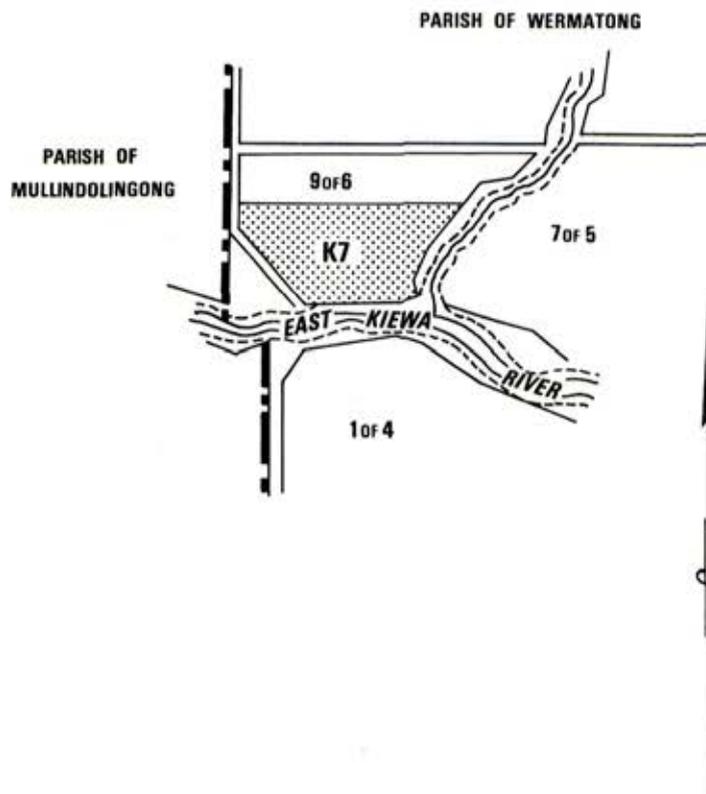


PUBLIC LAND RECOMMENDED FOR ALIENATION

SCALE 1:10 000

**AGRICULTURE K7
WERMATONG**

MAP 5

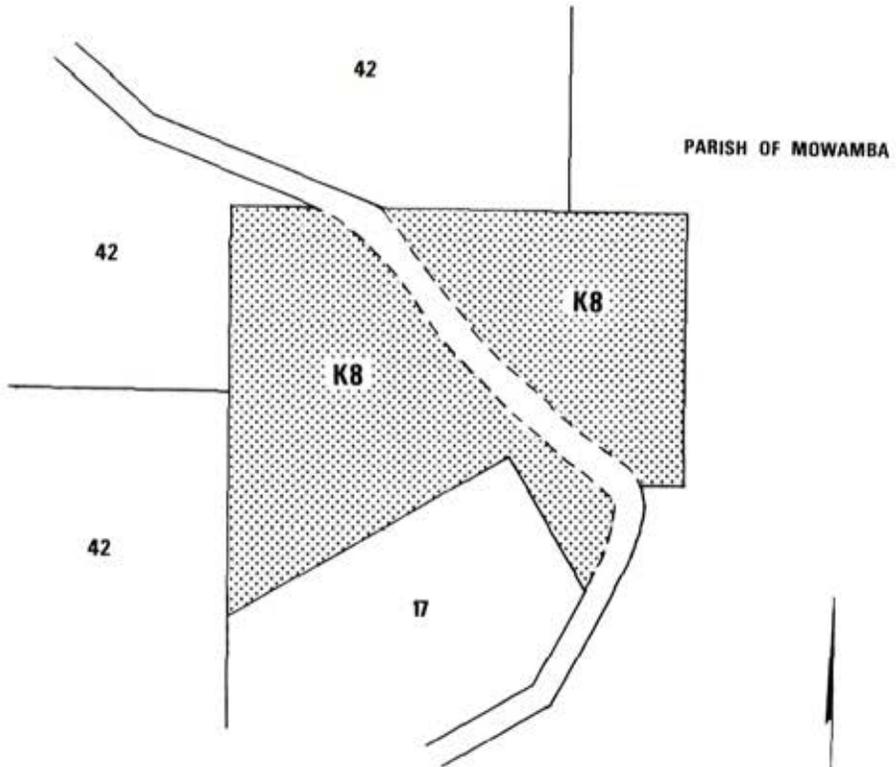


PUBLIC LAND RECOMMENDED FOR ALIENATION

SCALE 1:20 000

**AGRICULTURE K8
MOWAMBA**

MAP 6

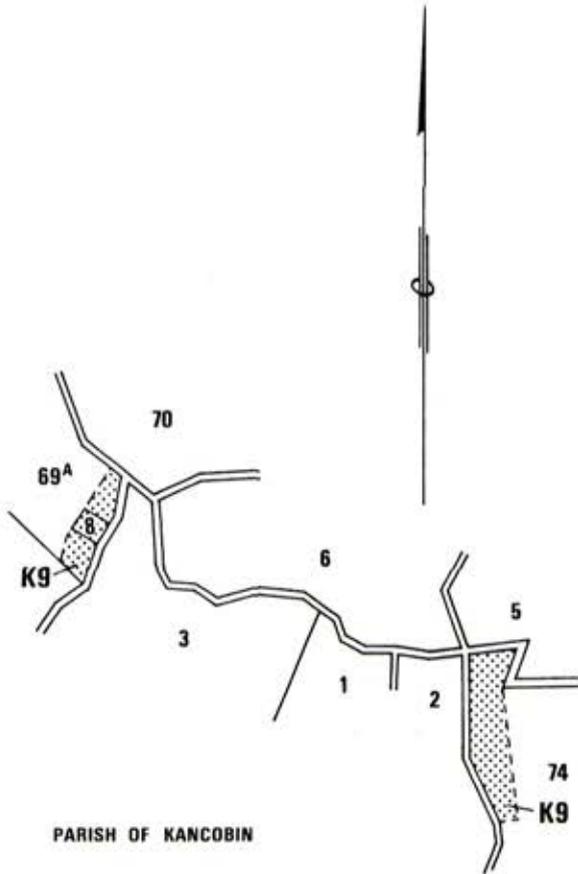


PUBLIC LAND RECOMMENDED FOR ALIENATION

SCALE 1:20 000

AGRICULTURE K9
KANCOBIN

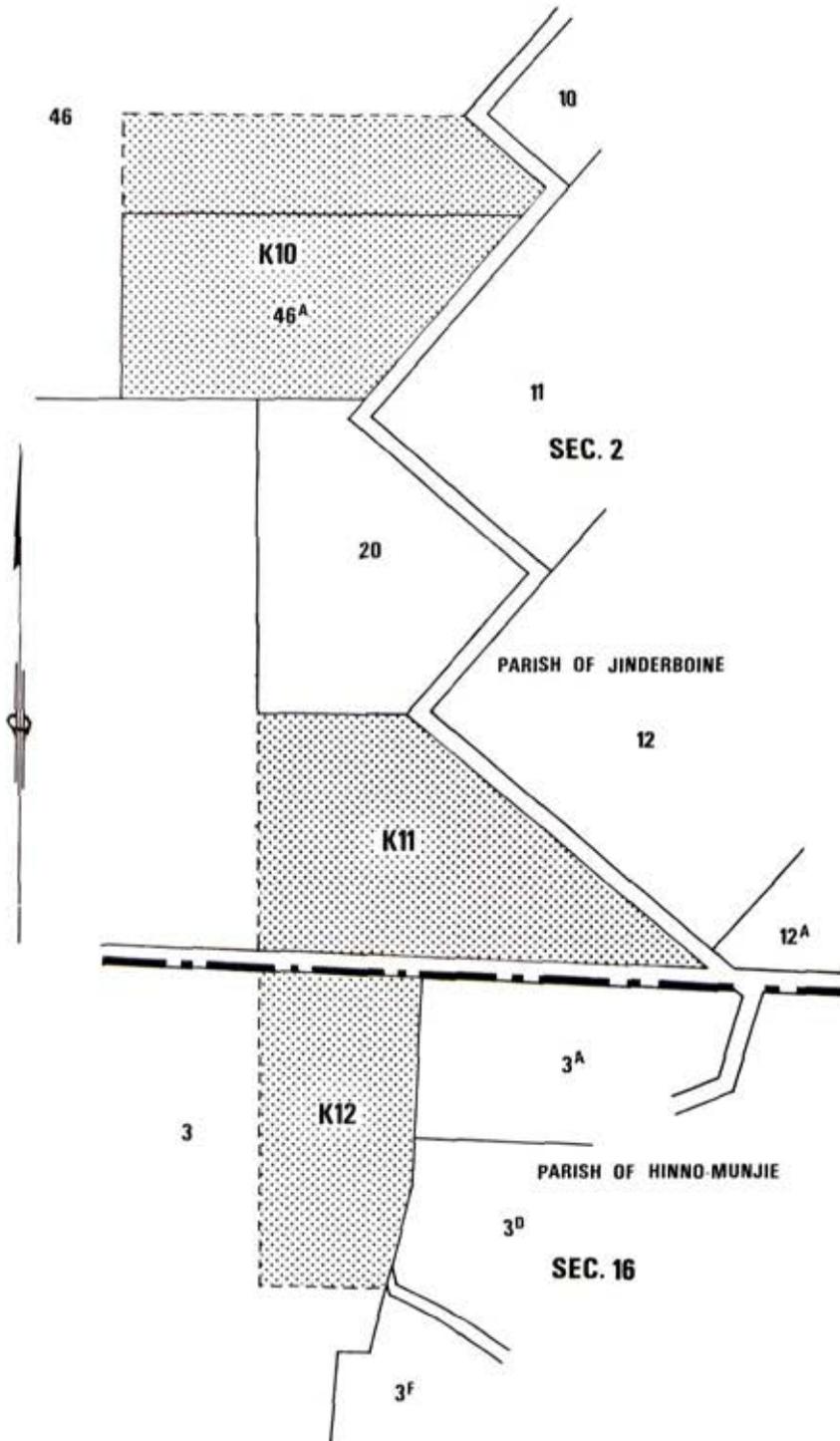
MAP 7



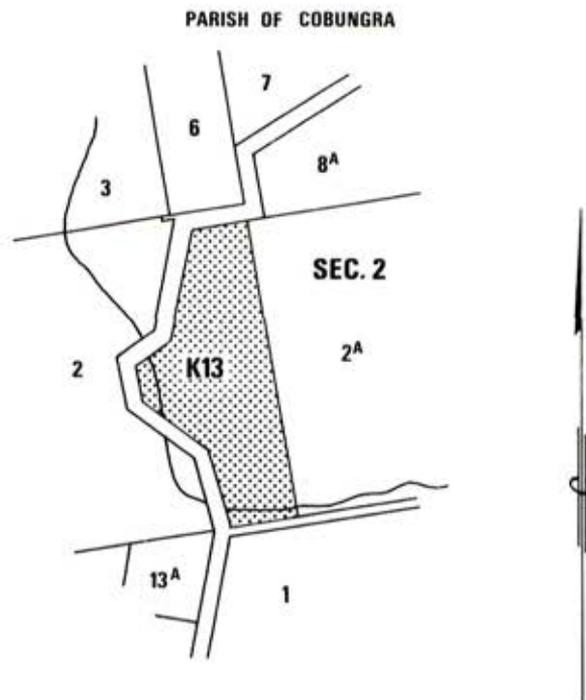
PUBLIC LAND RECOMMENDED FOR ALIENATION

SCALE 1:20 000

JINDERBOINE - HINNO-MUNJIE



PUBLIC LAND RECOMMENDED FOR ALIENATION

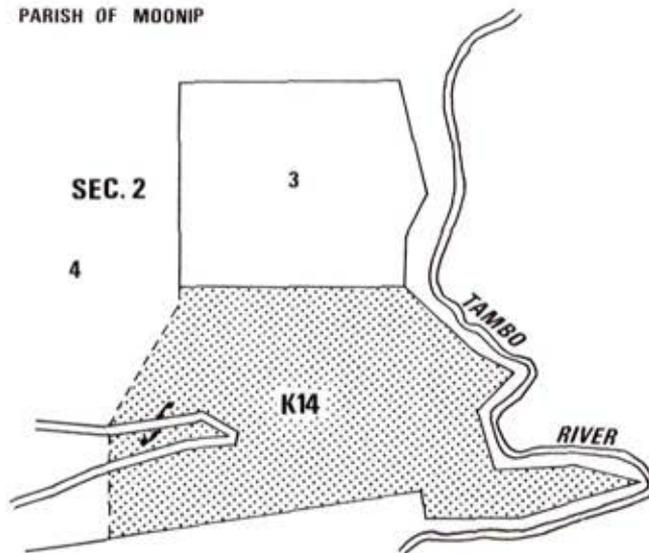


PUBLIC LAND RECOMMENDED FOR ALIENATION

AGRICULTURE K14
MOONIP

MAP 10

PARISH OF MOONIP



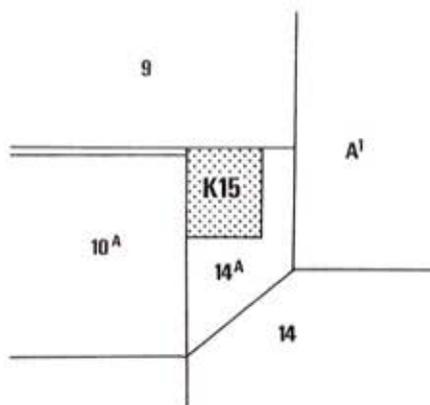
PUBLIC LAND RECOMMENDED FOR ALIENATION

SCALE 1:20 000

**AGRICULTURE K15
GELANTIPY EAST**

MAP 11

PARISH OF GELANTIPY EAST

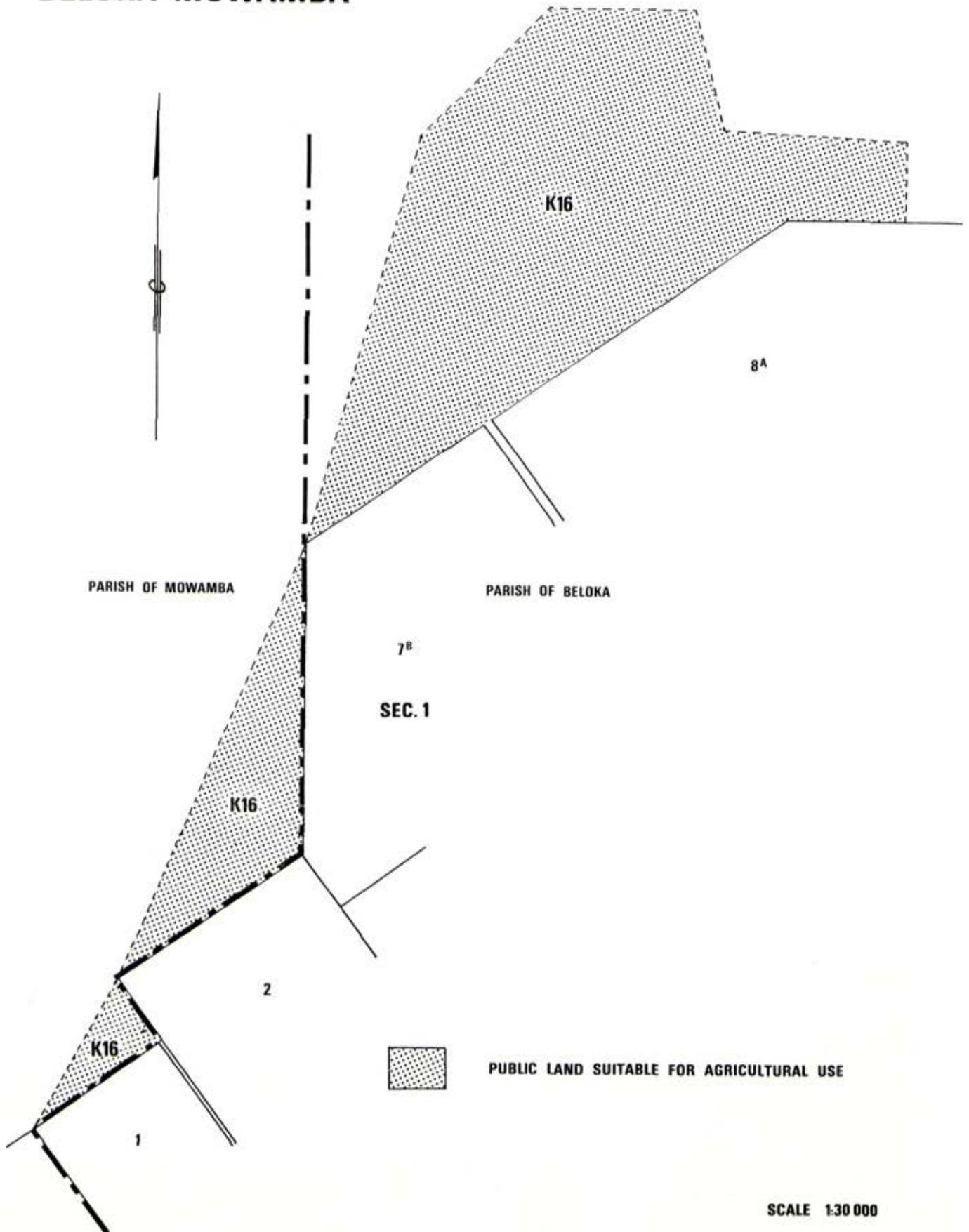


PUBLIC LAND RECOMMENDED FOR ALIENATION

SCALE 1:20 000

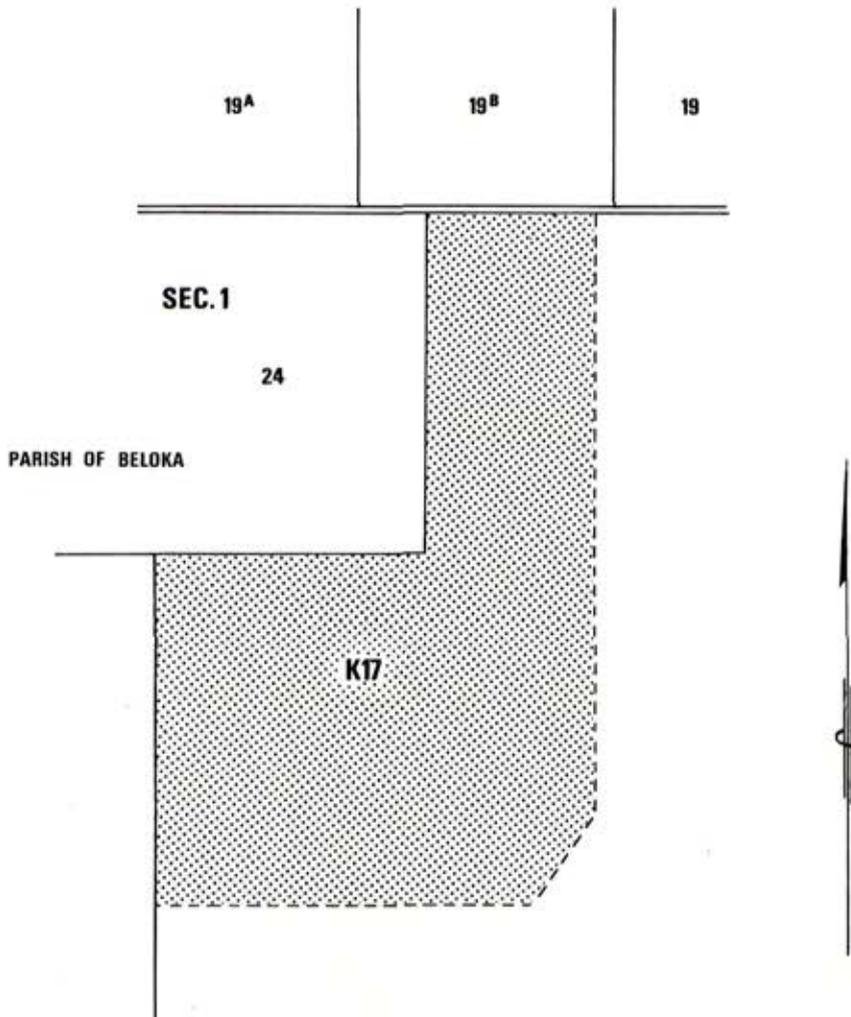
AGRICULTURE K16
BELOKA-MOWAMBA

MAP 12



AGRICULTURE K17
BELOKA

MAP 13



PUBLIC LAND SUITABLE FOR AGRICULTURAL USE

SCALE 1:25 000