PROPOSED RECOMMENDATIONS

EAST GIPPSLAND STUDY AREA

LAND CONSERVATION COUNCIL, VICTORIA
MELBOURNE, FEBRUARY, 1976.

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INTRODUCTION

The publication of proposed recommendations for the East Gippsland Study Area is the second of the steps the Land Conservation Council takes to " carry out investigations and make recommendations to the Minister with respect to the use of public land in order to provide for the balanced use of land in Victoria " (*Land Conservation Act* 1970.)

Procedures

The first step was the publication of the descriptive report on the study area on 14th August, 1974. The Council subsequently received submissions on the future uses of the public land from 456 organizations and individuals, representing a wide range of interests, After considering the submissions and visiting the study area, the Council has prepared these proposed recommendations. These 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 Parliamant.

Layout

This volume contains written recommendations and maps. The recommendations are grouped under major use headings, such as Parks, Timber Production, and so on. Map 1 at a scale of 1 : 250,000 covers the whole study area, and gives a broad view of the recommendations. Maps 2–6 are detailed plans of particular recommendations that could not adequately be defined on Map 1 or in the text. Maps which show the boundaries of all areas subject to recommendations in greater detail are held by the Land Conservation Council.

Land Uses

Table 1 summarizes the proposed recommendations in terms of the major forms of use. It is important to realise that for each primary use there are a number of compatible secondary uses. In addition to stating the best 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.

Large tracts are recommended for timber production and five parks (two national, two State, and one regional park) and a wilderness are recommended. The Council also recommends the creation of reference areas and education areas covering the wide range of land types found in the study area, and wildlife reserves for sites containing valuable faunal habitats, as well as other types of reserves for different purposes.

Council is aware that in recommending the reservation of areas of land as parks, reference areas and other reserves for nature conservation, it has been necessary to include some areas which have value for timber production. The volume of timber in these reserves is approximately 13 per cent. of the total estimated volume of the available resource in the East Gippsland Study Area. The remaining 87 per cent. is located either in reserved forest or on uncommitted land and is therefore available for use by the timber industry.

TABLE 1

RECOMMENDED PUBLIC LAND USE

Recommended Land Use	Area (ha)	Percentage of all Land in Study Area	Percentage of Public Land
Parks	114 200	12	14
Wilderness	47 000	5	6
Reference areas	9 460	1	1
Wildlife, flora and fauna reserves	15 380	2	2
Other recreation and conservation areas	3 680	1	1
Hardwood production	434 000	47	53
Education areas	1 500	1	1
Agriculture	4 500	1	1
Utilities and survey	710	1	1
Uncommitted land	184 000	20	23

Where a given area of land is subject to demands from competing uses, it is not possible to satisfy them all. However, these recommendations attempt to achieve balance in providing for the present needs of most forms of use while retaining flexibility and the opportunity to adjust to future changes in the demands upon land. They do so by placing as much of the public land as possible under forms of use that do not have a major impact on the natural ecosystem, and by placing areas into the " uncommitted land " category. Flexibility in planning is essential, since land use should be reviewed periodically as community needs and technology change.

GENERAL RECOMMENDATIONS

These recommendations qualify those in the body of the text. The Council recommends that :

(i) The authorities responsible for managing and protecting the public land be given the resources necessary for the task.

(ii) 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.

In its previous recommendations the Council 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 not only *State forests* and *national parks*, but also *protected public land*, from fire, although in *national parks* and *protected public lands* fire prevention works may be undertaken only with the agreement of the managing authority or as determined by the Governor-in-Council.

In *State forest*, which comprises *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.

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

Our knowledge of the distribution and ecology of plants and animals and other features is very imperfect and there must be many places in Victoria where special values are still unrecognized and for which no special provision can be made in present planning.

(iv) As the boundaries of many of the areas referred to in the recommendations have not been precisely surveyed, they may be subject to minor modification, road excisions, and other adjustments that may become necessary.

(v) Where areas of public land are not specifically referred to in these recommendations, present legal uses and tenures continue.

(vi) The recommendations in this publication do not change the status of roads, passing through or abutting public land, that are at present declared roads under the *Country Roads Act* 1958.

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. If these resources are not provided, the Council's recommendations cannot be effectively implemented. There is an urgent need to make additional field staff and finance available, particularly to the National Parks Service. The Council recommends that the present legal status and management of public land in each case be retained until the recommended authorities have the capacity to manage such areas. It recognizes that in some cases existing legislation will have to be amended in order to effectively implement the recommendations in this volume.

A. PARKS

The number of people participating in recreation activities in natural surroundings is increasing rapidly, and the Council believes that participation will continue to increase. However, the area of natural land available for these activities is decreasing and it is essential to allocate land to them now, before alienation and clearing further reduce the resources available.

A park is here defined as " an area of land in a natural or semi-natural condition, reserved because of its scenery, floral and faunal content, historical interest, or other features, which is used by the public primarily for open-space recreation and education ".

This definition encompasses many different types of parks, the main differences arising from variation in size and content and the types and intensity of uses to which they are subjected. Definitions of different types of parks are needed to clarify the main purpose for which a park is created. Such definitions will help planners, managers, and users of parks.

It is necessary to establish the aims of management of areas or zones within parks. Among these, the conservation of native flora, fauna and other natural features would be an essential part of national and State park management and should include the identification and strict protection of significant ecological systems as well as the development and use of manipulative techniques to maintain or enhance special values associated with flora and fauna. Special care will be required in the location and management of areas zoned for intensive recreation to prevent damage to the environment.

This publication presents recommendations concerning parks in terms of the uses to which the land should be put. Parks have also been placed into categories, according to the scheme of classification suggested below.

The categories are not to be confused with the existing terminology of national park, forest park, etc., which mainly denotes tenure and the managing body rather than the types of purpose for which they are to be used. For instance, some of the present national parks are more akin in character and purpose to a State or regional park than to the national park of nation-wide significance outlined in the classification.

Park Categories

National park

An extensive area of public land, of nation-wide significance because of its outstanding natural features and diverse land types, set aside primarily for public enjoyment, education, and inspiration in natural environments.

The conservation of native flora, fauna, and other features would be an essential part of national park management. Interpretative facilities would be provided. Development of facilities would be limited to a very small portion of the park. Activities would largely consist of sightseeing and the observation of flora, fauna, and other natural features. Wilderness zones, which are large undisturbed tracts of land used for solitude and primitive unconfined forms of recreation, could be within a national park. It is envisaged that Victoria would contain only a few national parks.

State park

An area of public land, containing one or more land types, set aside primarily to provide for public enjoyment, education, and inspiration in natural environments.

State parks should include samples of each major land type not already represented in national parks. Interpretative services would be provided. Development of facilities would be limited to a very small portion of the park. Activities would largely consist of sightseeing and the observation of flora, fauna, and other natural features.

Regional park

An area of public land, readily accessible from urban centres or a major tourist route, set aside primarily to provide open-space recreation in natural or semi-natural surroundings for large numbers of people.

These parks would be intensively developed for passive recreation such as picnicking and walking for pleasure and could include reasonable vehicular access. Although natural beauty would enhance their value, proximity to an urban centre is more important than natural attributes. Other uses—such as timber harvesting, fossicking, and stone extraction—may be permitted where they are compatible with the primary use.

Recommendations

National parks

A1 Croajingolong

That the area of 81 000 ha indicated on Map 1 be used to :

(*a*) provide opportunities for recreational and education experience related to enjoying and understanding natural environments ;

(*b*) conserve and protect natural ecosystems ;

that

(*c*) as the park extends to low water mark any commercial fishing in this portion of Mallacoota and Tamboon Inlets should be subject to conditions imposed by the National Parks Service in consultation with the Division of Fisheries and Wildlife ;

(*d*) sites of archaeological or historical significance be protected ;

(*e*) vehicular access be permitted to a number of points on the coast, including the Point Hicks area and Wingan Inlet (see also note 7 below) ;

(*f*) policy with regard to the activities of motor boats on Tamboon Inlet should be determined by the park managing authority after consultation with the Shire of Orbost, and the managing authority should be the responsible authority under the *Motor Boating Act* 1961 (see also notes 2, 3 and 4 below) ;

(*g*) the managing authority should consult with the Fisheries and Wildlife Division concerning wildlife management within the parks ;

(*h*) honey production be permitted in zones of the park, subject to conditions imposed by the managing authority ;

(*i*) grazing be phased out ;

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

This park, situated almost half-way between Sydney and Melbourne, is one of the most important parks in south-eastern Australia, and is of international significance. It contains representative samples, in a relatively undisturbed condition, of many environments that have been substantially altered elsewhere.

The park has considerable value for nature conservation. Most of the land types of the coastal parts of the study area are represented, with their associated diverse vegetation types, fauna, and geological types. The park contains the habitats and known occurrences of numerous rare and interesting plant species, including many at the limit of their range. Several rare animal species occur here, including the smokey mouse, ground parrot, and Australian grayling.

The park is extremely valuable for recreation, as a major proportion of Australia's population lives within a day's travel. It incorporates the shores of estuaries (inlets), extensive ocean beaches, cliff-backed coves, and rocky promontories, all in an unusually undisturbed condition. In addition to its coastal features, the park has other important recreational values. Several peaks form excellent lookout points. The varied vegetation—of forest, jungle, woodland, and heath, with spectacular displays of wildflowers—is of particular interest, and wildlife is abundant and diverse.

Notes :

1. The park boundary extends to low water mark and within Mallacoota Inlet includes all islands exposed at low water.
2. The Ports and Harbors Division, which controls the waters of Mallacoota Inlet, should consult with the National Parks Service before undertaking any works or before zoning boating activities on the Inlet where these are likely to affect the recreational and nature conservation values of the park.
3. The Shire of Orbost, which controls the boating activities on Sydenham Inlet, should consult with the National Parks Service before zoning boating activities where these are likely to affect the recreational and nature conservation values of the park.
4. Tamboon Inlet has been used for recreation for many years, particularly by the residents of the Cann River area. In addition there are several small areas of private property on the Inlet. The park should be zoned in this area to minimize conflicts between the traditional activities and the management needs of the park.
5. In the Betka River catchment, all public land required for water storages, diversion works, and associated facilities, together with a buffer strip (when defined by the Soil Conservation Authority in a land use determination), is excluded from the park (see recommendation E2), but should be managed in consultation with the National Parks Service. The managing authority should consult with the Soil Conservation Authority before implementing any changes in land use or development works in that section of the park within the Betka River water supply catchment.
6. An area of approximately 75 ha near Point Hicks, excluded from the park, has been recommended to be temporarily reserved for possible development associated with the park. Any such development would be undertaken only after receiving the prior approval of the National Parks Service (see recommendation R2).

7. Council would not oppose the upgrading of the existing Aerodrome, Betka, and Stony Peak tracks to provide an alternative access route between Mallacoota and the Princes Highway, nor would it oppose upgrading of the " Old Coast Road " between Bemm River and Cann River townships for tourist use. Any roadworks within the Betka River water supply catchment will require the prior approval of the Soil Conservation Authority.

8. Land has been excluded from the park for the possible expansion of Mallacoota and Tamboon, and for community activities not appropriate in a national park.

9. The park incorporates the existing Captain James Cook, Wingan Inlet, and Mallacoota National Parks, and adjoins the Nadgee Nature Reserve (in New South Wales).

A2 Tingaringy

That the land (17 000 ha) shown on Map 1 be used to :

(*a*) provide opportunities for recreation and educational experience related to enjoying and understanding natural environments;

(*b*) conserve and protect natural ecosystems;

that low intensity grazing of cattle be permitted in limited areas subject to adequate protection of the park, the Kosciusko National Park in New South Wales, and the proposed Gattamurh Creek reference area ;

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

This park is important for nature conservation. It contains substantial areas of cypress pine and white box open forest and woodland—vegetation associations of very restricted distribution within Victoria. These associations contrast markedly with open forest IV of alpine ash and brown barrel occurring in the east of the park, and with white sallee woodland on the highest peaks. Little is known of the fauna. The altitudinal range is approximately 180–1430 m. The park is also valuable for recreation. The most important recreation features are the Snowy River and Mount Tingaringy, but the whole park is rugged and well suited to bushwalking and similar recreational activities. The park adjoins the Kosciusko National Park (in New South Wales) along the Victoria–New South Wales border.

Note : The McKillops Bridge area is within the park, and should be zoned to allow for traditional uses.

State parks

A3 Coopracambra

That the land (13 000 ha) shown on Map 1 be used to :

(*a*) provide opportunities for recreation and educational experience related to enjoying and understanding natural environments ;

(*b*) conserve and protect natural ecosystems ;

(*c*) protect features of particular geological significance ;

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

The main features of this park are the gorge of the Genoa River, with its steep sandstone escarpments, and the undisturbed forest environment. The park contains land types not represented in other Victorian parks. The Upper Devonian sediments are of particular importance as they support diverse vegetation associations, including species not recorded elsewhere in Victoria. They also contain plant fossils and the site where the well-known fossilized footprints were found. Portion of this park adjoins the Nungatta National Park in New South Wales.

A4 Lake Tyers

That the land (2400 ha) shown on Map 1 be used to :

(*a*) provide opportunities for recreation and educational experience related to enjoying and understanding natural environments ;

(*b*) conserve and protect natural ecosystems ;

that:

(*c*) features of historical interest be preserved ;

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

This park contains a range of habitats, with a corresponding variety of flora and fauna. The habitats include salt-marsh, swamps, sand dunes, wet gullies, and forest. Tunnels and caves have formed in the Miocene limestone that outcrops along the shores of Lake Tyers, and bats use some of these for roosting.

The park is very valuable for recreation, with ocean frontage (part of the Ninety Mile Beach) as well as the eastern shore of Lake Tyers. It should be zoned in the vicinity of the sand bar at the entrance to Lake Tyers to minimize conflicts between the traditional activities and the management needs of the park.

Small quantities of forest produce would be available from time to time associated with the development of the park.

Regional park

A5 Mount Raymond

That the land (800 ha) shown on the map be used to :

(*a*) provide opportunities for open-space recreation and education for large numbers of people, related to the enjoyment and understanding of natural environments ;

(*b*) protect and conserve natural ecosystems to the extent that this is consistent with (*a*) above ;

(*c*) provide sites for a fire tower and television translator ;

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

This park adjoins the Princes Highway about 12 km east of Orbost. Mount Raymond offers panoramic views over Orbost, the Snowy River flats, Lake Curlip, and Marlo. The population of terrestrial orchids is noteworthy, and should be considered when the park is further developed.

B. WILDERNESS

The concept of wilderness (" an uncultivated and uninhabited tract "—Oxford Dictionary) is at present receiving attention in Australia after having been established by legislation in the U.S.A. in 1964 (*The Wilderness Act*).

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 systems, and on equal terms with nature.

Wilderness, therefore, requires land that still retains its primeval character, and is without improvements or human habitation. Wilderness areas are used for recreation of a primitive unconfined nature, and thus, to preserve the wilderness values, it will be necessary to protect the natural ecosystems and maintain land forms and populations of plants and animals in an undisturbed state. Because of this requirement, wilderness areas will have considerable nature conservation values.

Areas suitable for wilderness are a very scarce resource, and are becoming scarcer as the road and fire-trail network on public land is extended and upgraded.

The main elements of the appeal of wilderness are :

- Spiritual refreshment and an awareness of solitude arising from close contact with the uninhabited, undisturbed natural environment ;
- The knowledge that large wild natural areas, untouched by Man, exist and can be experienced ;
- Refuge from the pressures, sights, and sounds of modern urban life ;
- The adventure and challenge of pitting one's powers of endurance and self-reliance against the forces of nature.

To fulfil the uses for which they are intended, wildernesses must be very large. They should require at least several days to traverse on foot at their narrowest point. This spaciousness is the essential characteristic distinguishing wildernesses from the many other smaller undisturbed or primitive areas that may be found as " islands " even in areas that have been developed for more intensive uses.

Many smaller undisturbed areas that can provide some degree of solitude will continue to exist as zones in parks or other areas, and can be used by people who do not wish to spend several days in the isolation of wild country. But these smaller areas are not a substitute for the wilderness described here.

Management of a wilderness would aim at maintaining the value of the area for solitude and unconfined types of recreation by strictly controlling the number of people using the area at any one time. Experience in the United States of America has shown that tourism and the more conventional forms of outdoor recreation commonly associated with parks are among the greatest threats to wilderness.

Wilderness activities may include canoeing, hiking, and cross-country skiing as well as activities, such as horse-riding, that may not be acceptable in some parks. Vehicles (other than those necessary for management), timber production, grazing, and mining would be excluded from the wilderness.

Users of wilderness areas 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.

There should be only two, or at the most three, wildernesses in Victoria. These would include one in the rugged and heavily forested mountain region, preferably covering from sub-alpine to foothill and riparian environments, and one in the semi-arid Mallee country. This will ensure that opportunities continue to exist in a range of environments for people to travel for several days in wild challenging conditions without hearing or seeing evidence of human activity.

Recommendation

B1 That the area (46 000 ha) shown on Map 1 be used to :

(*a*) provide opportunities for solitude and unconfined forms of recreation in unmodified natural environments ;

that

(*b*) the value of the area for providing solitude be maintained by strictly 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 ;

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

This relatively undisturbed area includes the Snowy River and its often precipitous environs, the Rodger River Gorge, the densely forested Gelantipy plateau, the rugged Bowen Range, the entire catchment of Mountain Creek, and part of the Rodger River Catchment.

The area provides outstanding opportunities for white-water canoeing, rock climbing, and bushwalking. A series of high-grade rapids on the Snowy River, rocky stream environs, cliffs, steep escarpments, and dense forests offer a challenge to these modes of travel. Climatic conditions vary from hot and dry in summer, patricularly at the lower elevations, to regular snowfalls at the higher elevations during winter. The area is sufficiently large and the boundaries have been so chosen that relatively large numbers of people can use the area at any one time and enjoy a sense of isolation, remoteness, and solitude. The inclusion of enclosed landscapes of tall forests on the plateau, and the valleys of the Snowy and Rodger Rivers and Mountain Creek ensure that cleared land and forestry operations are not visible from most of the area. Sounds associated with Man would be minimal.

The carrying capacity of the area is enhanced by the impenetrable nature of some areas, the generally dissected terrain, and the sequences of streams that enable many alternative, well-watered walking routes to be used.

The range of elevations (50–1300 m), geology and climate has resulted in a range of land types characterised by soils varying from shallow stony to deep friable ones and vegetation ranging from dry woodland through tall forest to sub-alpine woodlands.

The area is located to the north-west of a large hardwood timber resource, and adequate fire protection of this resource should be recognized in the management of the wilderness area.

A possible westwards extension of the wilderness area outside the study area is shown on the map.

C. REFERENCE AREAS

Reference areas are tracts of public land containing viable samples of one or more land types that are relatively undisturbed and that are reserved in perpetuity 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.

Reference areas would normally be typical examples of land types that have been extensively developed elsewhere for productive uses such as agriculture or softwood production. The course and effects of human alteration and utilization of the land can be measured against these relatively stable natural areas. Most developed regions have few areas remaining that are suitable as reference areas.

In common with references and standards used in other fields, these areas must not be tampered with and natural processes should be allowed to continue undisturbed. Reference areas should be sufficiently large to be viable and 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 reference area 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 on the reference area.

Access should be restricted and experimental manipulation should not be permitted. Reference 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 reference areas, the Council foresees the need for new legislation to specify the status of these areas and for the establishment of an advisory committee to determine the broad policies for the management of reference areas and their buffers.

Note : The selection of the reference areas listed here is based on our current knowledge of the land types in the study area, and additional areas will be needed as better information on ecology and land use problems becomes available.

Recommendations

C1–C13 (*a*) That the areas listed below and shown on Map 1 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*) That each reference area be surrounded by a buffer and the authority managing the buffer be responsible for the management of the enclosed reference area, and that the delineation of buffer zones be by joint agreement between the managing authority and the advisory committee.

C1 Gattamurh Creek (400 ha)

This area is representative of steep mountainous terrain with soil parent material of acid igneous rock (Lower Devonian granite) and low rainfall. Vegetation is woodland and open forest I and II of white box and white cypress pine. The area falls within the Jingallala land system.

C2 Gelantipy Plateau (720 ha)

The area is representative of plateaux formed on acid igneous rock (Middle Devonian volcanics) where rainfall is high. Vegetation is alpine ash and messmate open forest IV. The area falls within the Errinundra and Bullamalk land systems.

C3 Mountain Creek (1400 ha)

The area is representative of steep mountainous terrain with soil parent material of sedimentary rock (Ordovician) and high rainfall. Vegetation is mountain ash and brown barrel open forest IV, messmate–peppermint open forest III, and stringybark–box open forest II. The area falls within the Bullamalk land system.

C4 Zig Zag Creek (600 ha)

This area is representative of steep foothills with soil parent material of sedimentary rock (Ordovician) and low rainfall. Vegetation is stringybark open forest II and III. The area falls within the Pinnak land system.

C5 Concordia Gully (760 ha)

This area is representative of plateaux formed on sedimentary rock (Ordovician) where rainfall is moderate. Vegetation is peppermint–stringybark open forest II and III. The area falls within the Cabanandra land system.

C6 Big River (370 ha)

The area is representative of steep mountainous terrain developed on acid igneous rock (Upper Devonian granite) where rainfall is high. The vegetation is shining gum, alpine ash, and brown barrel open forest IV. This area falls within the Wat Wat land system.

C7 Musket Creek (450 ha)

This area is representative of plateaux developed on Ordovician age sedimentary rock where rainfall is high. Vegetation is messmate–gum and brown barrel open forest IV and peppermint–gum open forest III. The area falls within the Errinundra land system.

C8 Camp Creek (860 ha)

This area is representative of coastal dunes and swales formed from Quaternary age sediments. The vegetation is yertchuck–southern mahogany–brown stringybark woodland I and II, silver-top–white stringybark open forest III, and heath. The area falls within the Barga land system.

C9 Yambulla (380 ha)

This area is representative of steep foothill terrain on Devonian sedimentary rock where rainfall is moderate. The vegetation is silvertop–stringybark open forest III, stringybark–box open forest II, and stringybark woodland I–II. The area falls within the Koola land system.

C10 Merragunegin (650 ha)

This area is representative of steep foothill terrain developed on Ordovician sedimentary rock where rainfall is moderate. Vegetation is messmate and silvertop–stringybark open forest III, and yertchuck–red stringybark woodland I and II. The area falls within the Weeragua land system.

C11 Baawang (670 ha)

This area is representative of coastal sand dunes, and includes both bare and vegetated dunes and swales.

C12 Benedore River (1200 ha)

This area is representative of steep to undulating foothills on acid igneous rocks (Lower Devonian granite) and Ordovician and Tertiary sediments where rainfall is moderate. Vegetation is red bloodwood–silvertop open forest. The area falls within the Wooyoot land system.

C13 Seal Creek (1000 ha)

This area is representative of coastal plains on Tertiary sediments where rainfall is moderate. Vegetation is red bloodwood–silvertop open forest and heath. The area falls within the Wooyoot land system.

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D. WILDLIFE RESERVES

While some of Australia's animals have adapted to the changes in the environment brought by European Man, the populations of many have seriously declined, and a few have become extinct.

The conservation of fauna depends on conservation of habitat, and in Victoria the public lands contain large areas of diverse natural habitats. While some forms of land use do not have marked detrimental effects on habitat, it is necessary to set some areas aside specifically for conserving fish and wildlife, and for developing wildlife conservation techniques.

These areas are selected firstly for conservation of species that are harvested or directly utilized by the community. Secondly, they may contain the habitat of endangered species. Thirdly, they may include areas that have particular wildlife values (such as specialized breeding grounds), a high species diversity, or educational or scientific interest.

The council believes that, in areas with particular wildlife values, the authorities managing public land should note the need for both research into, and application of, wildlife management techniques, and actively collaborate with the Fisheries and Wildlife Division regarding these aspects of wildlife conservation.

In East Gippsland some classes of habitat may require deliberate management to maintain optimum conditions for important wildlife species. Some examples are listed below :

1. Wet heathland may gradually dry out by a process of peating. It may become necessary to maintain a certain number of shallow swamps or bogs in the heath, either by removing peat or by blocking drainage lines, to benefit such species as mourning skink and eastern brittle bird.

   Prolonged protection of heath from fire may lead to lower diversity of plant species and ultimately the intrusion and domination of small trees. This is detrimental to such animals as the ground parrot and emu wren, and some areas of low new heath should be maintained by deliberate burning if necessary. The optimum intensity and frequency of fire will have to be determined.

   Such procedures would be appropriate anywhere along the East Gippsland coast, but the choice of precise localities would have to await a thorough inventory of the habitat and its associated fauna. One promising area however is the complex of heath, woodland, and open forest between Sydenham Inlet and Cape Conran, because this is known to support a wide diversity of vertebrate species.

2. The number of white-breasted sea eagles may be limited partly by the availability of suitable nest sites along the coast. Some trees appear to be used as traditional nest sites, and parent birds are liable to desert the nest site if disturbed. Therefore the location of nesting trees should be recorded and an attempt made to keep human intrusion into these areas to a minimum. If circumstances require it, the environs of some nest sites could be proclaimed prohibited areas under the *Wildlife Act* 1975.

3. Where stands of saw banksia or silver banksia occur in association with commercially harvestable timber, they should be preserved, since they provide an extremely important food source for birds, mammals, and insects.

4. Wherever closed forest II (jungle) occurs it should be strictly protected and a free margin of open forest left around it. This plant association is very limited in extent and supports a characteristic avifauna—including brush cuckoo, large-billed scrub-wren, pink robin, lewin honeyeater, sooty owl, black-faced flycatcher, and brown warbler—and the highest density of brown antechinus, Stuarts antechinus, and bush rats in the study area.

Recommendations

D1 Ewing Marsh

That the area of 7300 ha indicated on Map 1 be used primarily to conserve native fauna, and for public education and recreation where this does not conflict with the primary aim,

and that it be permanently reserved under section 14 of the *Land Act* 1958, and managed by the Division of Fisheries and Wildlife.

Ewing Marsh is an important wetland area with significance for water fowl production and duck hunting. It also supports a small population of hog deer. The woodland and forests of the hinterland is important for native mammals and birds.

D2 Lake Corringle—Lake Wat Wat

That the area of 800 ha indicated on Map 1 be used primarily to conserve native fauna, and for public education and recreation where this does not conflict with the primary aim,

and that it be permanently reserved under section 14 of the *Land Act* 1958, and managed by the Division of Fisheries and Wildlife.

Lakes Corringle and Wat Wat form an important wetland area for water birds and duck-hunting.

D3 Lake Curlip

That the area of 1000 ha indicated on Map 1 be used primarily to conserve native fauna, and for public education and recreation where this does not conflict with the primary aim,

and that it be permanently reserved under section 14 of the *Land Act* 1958, and managed by the Division of Fisheries and Wildlife.

Lake Curlip is an important wetland area for water-birds and duck-hunting.

E. WATER PRODUCTION

Various streams in the study area are important for town water supply and irrigation.

Two catchments—Rocky River (supplying Orbost, Marlo, and Newmerella) and Betka River (supplying Mallacoota)—are proclaimed water supply catchments. Public land in these proclaimed catchments has been shown by blue cross-hatching on the map. Implementation of any recommendations for this public land will require recognition that water catchment values, such as water yield, quality, and flow regime are of prime concern.

Two other major catchments are important for town water supply, although they are not proclaimed catchments. These are the Brodribb (supplying Orbost, Marlo, and Newmerella) and the Cann (supplying Cann River).

None of the catchments in the study area is used solely for water production. Hardwood timber harvesting, recreation, and other forest uses are carried out on most public land areas within catchments, while normal agricultural pursuits are followed on most freehold areas.

Multiple use

It is realized that the optimum combination of land uses for catchments must vary from one land type to another, depending on the manner in which the environmental variables of climate, parent material, topography, soils, and organisms are inter-related. The Council is aware that a particular use may not impair the quantity, frequency, or quality of water yield in one instance, whereas in another it may have a profound effect.

Where a number of other products are required from a water supply catchment, the catchment should be proclaimed under section 22 (1) of the *Soil Conservation and Land Utilization Act* 1958 and also under section 5 (1) (*b*) of the *Land Conservation Act* 1970.

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

The implementation of proper management of land uses within catchments is of prime importance, and recognition must be given to the greater-than-normal need for high levels of protection. Implementation of any recommendations for public land within catchments will require recognition that water catchment values such as water yield, quality, and flow regime are of prime concern. The necessity for research to provide guidelines for such management is recognized.

Where the intensity of multiple land use in catchments is increasing, water supply authorities should provide, at the earliest possible time, facilities for sterilization of all drinking water.

Additional water needs

Future additional water needs for domestic purposes and for stock and irrigation may require the construction of additional water storages and offtakes in the area. No specific areas can be reserved for this purpose until the need arises and possible sites are investigated.

Recommendations

E1 Rocky River

That all public land required for water storages, diversion works, and associated facilities, together with the buffer strip defined in the land-use determination (Determination of Land-use Plan No. 1988, published in the *Victoria Government Gazette*, No. 60, 2nd August, 1967), be used :

(*a*) for water supply purposes ;

(*b*) for other activities permitted by the water supply authority after consultation with the soil Conservation Authority and the Environment Protection Authority;

and that it be permanently reserved under section 14 of the *Land Act* 1958 for water supply purposes, and managed by the Orbost Waterworks Trust.

E2 Betka River

That all public land required for water storages, diversion works, and associated facilities, together with the buffer strip when defined by the Soil Conservation Authority in the land-use determination, be used :

(*a*) for water supply purposes ;

(*b*) for other activities permitted by the water supply authority after consultation with the Soil Conservation Authority and the Environment Protection Authority ;

and that it be permanently reserved under section 14 of the *Land Act* 1958 for water supply purposes and managed by the Mallacoota Waterworks Trust in consultation with the National Parks Service.

F. TIMBER PRODUCTION

Hardwood Production

The East Gippsland study area at present sustains an annual sawlog supply of about 320 000 m^3. This represents about 26 per cent. of the hardwood sawlogs currently produced each year from public land in Victoria.

The Council's recommendations set aside 425 000 ha primarily for timber production and, subject to certain conditions, harvesting operations would be permitted on uncommitted land (S1), except as specified in recommendation S1 [c (i)] dealing with the Goolengook River area. Council believes that this provides a source sufficient to maintain a viable timber industry, which would continue to make a significant contribution to the economy of the region and the State.

Recommendations

F1 That the area of approximately 425 000 ha shown on Map 1 be used :

(*a*) primarily to produce hardwood timber in a manner having due regard for catchment values and landscape values as seen from the main roads ;

that

(*b*) major secondary uses be to :

(i) provide opportunities for open-space recreation and education ;

(ii) conserve native plants and animals, and provide opportunities for the development of wildlife conservation techniques in consultation with the Fisheries and Wildlife Division (see Chapter D—Wildlife Reserves). Particular attention should be given to the conservation of the following native animals—greater glider, yellow-bellied glider, tiger cat, potoroo, platypus, eastern water dragon, sooty owl, and powerful owl;

(iii) produce honey, gravel, sand, and other forest produce as defined in the *Forests Act* 1958 ;

(iv) provide areas for grazing ;

that

(*c*) areas of special recreation, nature conservation, or scenic value be protected, and notable plants and animals be conserved, particularly those listed below :

(i) Mount Kaye
Mount Kaye is a prominent granitic peak of value for recreation and nature conservation. The following rare plant species occur there : wax flower (*Eriostemon virgatus*), long clubmoss, club-rush (*Scirpus gunnii*), long-leaf bitter pea, dainty wedge-pea, and mat-rush (*Lomandra obliqua*).

(ii) Brodribb River
The valley of the Brodribb River contains " jungle " vegetation that is valuable for nature conservation.

(iii) Coast Range
The easternmost stand of mountain ash and the adjacent extensive stands of sassafras closed forest that straddle the Coast Range road.

(iv) Maramingo Hill
Maramingo Hill provides good views of surrounding areas.

(v) Beehive Creek
Beehive Creek contains a series of attractive waterfalls and cascades among granite boulders.

(vi) Tonghi Creek
Attractive cascades exist in Tonghi Creek north of the Princes Highway.

(vii) Combienbar
Waterfalls occur in serveral tributaries of the Combienbar River.

(viii) Tennyson Creek
The upper part of Tennyson Creek catchment should be managed in such a way as to retain its nature conservation values and supplement the adjacent flora reserve in New South Wales.

and that it remain or become reserved forest managed by the Forests Commission.

Softwood Production

At this time, Council does not consider that land should be reserved for softwood planting in the East Gippsland Study Area. However, the uncommitted land includes some areas that could be suitable for this purpose in the future.

The need to allocate areas for softwood will be reviewed if a requirement to supplement existing timber supplies arises. If, after review, it is considered necessary to allocate land for this use, some areas may be made available to private companies on the basis of long-term leases, provided these companies embark on a programme of softwood planting on suitable freehold land in the vicinity of public land set aside for this purpose.

Utilization of Sawlog Residues

Timber operations in East Gippsland are primarily aimed at producing sawlogs on a rotation of at least 70 years. Considerable volumes of wood are left on the ground in the forest as sawlog residues, which could be utilized for pulpwood. This, however, has certain environmental implications. Council has given consideration to the utilization of these sawlog residues, and other pulpwood-class material, but, because of the lack of information relevant to such use, is not in a position to recommend either *for or against* the commencement of large-scale pulpwood operations.

However, Council believes that, while recommending uses for land in the East Gippsland Study Area that exclude the commercial harvesting of timber (wilderness, parks, reference areas, etc.), the option to establish an economically viable, major pulpwood industry has been maintained. At the same time, options have been maintained to enable other strategies to be employed that have a lower annual volume requirement and that would have a lesser environmental effect than a large-scale operation.

The following recommendations are made in the event that a pulpwood industry is established in East Gippsland.

Recommendations

F2 That no commitments be made to supply industry with pulpwood, other than for experimental purposes, until an environmental assessment has been made that considers the scale of the operation and long-term effects.

F3 That, if a pulpwood-based industry is established, pulpwood production from sawlog harvesting residues and from associated regeneration operations be fully utilized in preference to harvesting pulpwood from additional land, subject to branches and leaves being left in the forest.

F4 That, if a pulpwood-based industry is to be established, the Forests Commission—in consultation with the Soil Conservation Authority, Fisheries and Wildlife Division, State Rivers and Water Supply Commission, and other appropriate bodies—prepare detailed guidelines and continue to monitor the key environmental effects of the operations, and that desirable modifications to operational procedures and to the guidelines be progressively made as new knowledge becomes available.

F5 That, if it is found necessary to supplement available supplies of pulpwood, consideration be given to implementing high-yielding production strategies, such as shorter rotation or, after review by Council, the establishment of softwood plantations.

Additional information regarding the utilization of sawlog residues is provided as a Supplement to these Recommendations.

The Council has set out below a number of principles, which it believes should provide a framework for the detailed guidelines in the event that the Government decides to establish a pulpwood industry in East Gippsland.

Principles

A. Retained areas

(1) A minimum distance of 40 metres from each bank of all permanent streams should be reserved from felling operations. This width should be increased where necessary to protect values associated with streams and their environs. As far as practicable, streams should be kept clear of logging debris. There should be no snigging through streams or retained strips and—except for operations associated with the construction of roads, crossings, or other essential works—no clearing, log dumping, log loading, or similar operations should be permitted in these areas.

(2) Areas of significance for nature conservation or recreation should be identified and protected by reservation from felling or by applying special prescriptions to forest operations.

(3) Retained areas should be linked wherever possible, to provide continuous habitat for fauna.

B. Harvesting

(1) Careful attention should be given by the managing authority to road and track location, design, and drainage, with consideration being given to both their functional purpose and their impact on the environment.

(2) Intensive utilization operations should be avoided on areas of high erosion hazard, including steep slopes.

(3) Where clear cutting is necessary because of silvicultural, economic, or other requirements, careful consideration should be given to coupe configuration and size. The cutting area (coupe) should normally not exceed 80 ha in area.

(4) Individual cutting areas should be separated in space and time, as far as economically possible, so as to create habitat and landscape diversity and minimize any adverse effect on soil and water values.

(5) Mature and veteran trees should be retained as scattered individuals and in groups as far as practicable on cutting areas and chosen to meet both silvicultural and nature conservation requirements.

(6) Camp sites associated with harvesting operations, log dumps, and log landings should be carefully sited and rehabilitated when no longer required. Where practicable, snig tracks should receive similar attention.

C. Regeneration

(1) The regeneration techniques used should be chosen so as to minimize the impact on the environment consistent with achieving adequate regeneration.

(2) Tree species used to regenerate areas should be those native to the site, where possible.

D. Protection

(1) Fire-protection measures involving fuel-reduction burning should aim at creating a mosaic of burnt and unburnt areas, so that habitat for soil microfauna and other animals is not seriously impaired and soil and water values are maintained.

(2) Measures to control injurious biological agents involving application of pesticides and herbicides should be carefully assessed for their possible deleterious effect on the environment. Use of particular chemicals should be avoided where unacceptable adverse effects are indicated.

G. FLORA AND FAUNA RESERVES

Flora Reserves

These areas are significant because of the particular species or associations of native plants they contain.

Recommendations

G1–G6 That the areas indicated on Map 1 and described below be used to conserve particular species or associations of native plants,

and that they be reserved under section 14 of the *Land Act* 1958.

G1 Mottle Range

Approximately 120 ha be used to preserve the only known natural occurrence of spotted gum within Victoria and be managed by the Forests Commission.

G2 Delegate River

Approximately 600 ha be used to preserve sub-alpine bog vegetation and be managed by the Forests Commission.

G3 Goonmirk Rocks

Approximately 390 ha be used to preserve montane closed forest, and particularly trees of mountain plum pine and be managed by the Forests Commission.

G4 Kanuka Creek

Approximately 180 ha be used to protect shining gum open forest and sassafras closed forest and be managed by the Forests Commission.

G5 Jones Creek

Approximately 225 ha be used to protect lowland closed forest and silvertop, brown barrel, messmate, and gully gum open forest and be managed by the Forests Commission.

G6 Maramingo Creek

Approximately 320 ha be used to preserve swamp vegetation, and particularly lanky fescue, bog clubmoss, rare veined sun orchid, rush fringe lily, dwarf yellow-eye, and two-coloured panic and be managed by the Forests Commission.

Flora and Fauna Reserves

These areas are significant because of the particular species or associations of native plants and animals they contain.

Recommendations

G7–G9 That the areas shown on the map(s) and described below be used to conserve native plants and animals,

and that they be reserved under section 14 of the *Land Act* 1958.

G7 Brodribb River

Approximately 36 ha be used to preserve a remnant of the land type on the Snowy River–Brodribb River flood plain, with particular emphasis on the cabbage fan palm and native fauna, and be managed by the Division of Fisheries and Wildlife.

G8 Cabbage Tree Creek

Approximately 1700 ha be used to preserve streamside communities, and particularly cabbage fan palm, and be managed by the National Parks Service. This reserve includes an important representative sample of the Noorinbee land system.

G9 Mount Drummer

Approximately 2500 ha be used to preserve lowland closed forest (" jungle ") communities, and particularly oval fork-fern, prickly tree fern, and violet nightshade, and be managed by the National Parks Service.

The Mount Drummer closed forest is of great botanical interest and provides habitat for a number of animal species that are closely associated with closed forest. This habitat has limited extent in Victoria.

H. BUSHLAND RESERVES

These pieces of land, relatively small and isolated from large blocks of public land, carry remnants of native vegetation, providing diversity in the landscape.

Recommendations

H1–H3 That the areas indicated on Maps 1 and 2 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 that they be reserved under section 14 of the *Land Act* 1958 and managed by the Department of Crown Lands and Survey.

Development of new recreation facilities should be permitted only where this does not conflict with the primary aim.

H1 Mount Bendock

Approximately 165 ha at Mount Bendock.

H2 Cann River

Approximately 10 ha in the township of Cann River, west of the Cann River.

H3 Mallacoota

Approximately 30 ha in the township of Mallacoota.

I. THE COAST

The coastline of the study area is a resource of great value for both recreation and nature conservation.

In formulating the following recommendations for public land along the coast, the Council is aware that coasts represent a dynamic zone of interaction between land and sea, encompassing fragile environments.

The various management authorities of coastal land should take steps to ensure that management is co-ordinated.

All works to be implemented by any Committees of Management on the coastal reserve should be subject to prior approval by the Department of Crown Lands and Survey.

Other Government agencies concerned with coastal development (such as the Ministry for Tourism and the Department of Youth, Sport and Recreation), or with coastal maintenance (such as the Ports and Harbors Division of the Public Works Department) should also consult with the management authority before authorizing any expenditure for the implementation of coastal works.

As well as planning the wise use of coastal public land, the Council recognizes the necessity to preserve in the present condition sections of the coastline that represent the various coastal systems occurring within the study area.

Coastal Reserves

A coastal reserve is an area of public land on the coast set aside primarily for public recreation, education, and inspiration in coastal environments.

Coastal areas specifically reserved for some other purposes (parks, wildlife reserves, and sites for navigational aids or harbors) would not be included in the coastal reserve.

Recommendations

I1–2 That the areas listed below and shown on Map 1 :

(*a*) be used to :

(i) provide opportunities for open-space recreation for large numbers of people, and also low-intensity recreation related to the enjoyment and understanding of nature ;

(ii) protect and conserve natural ecosystems, and geomorphological, archaeological, and historic features for public enjoyment and inspiration and for education and scientific study ;

(iii) ensure the conservation of both aquatic and terrestrial fauna and flora ;

(iv) protect and conserve the natural characteristics of the coastal landscape ;

(v) provide facilities for shipping, fishing and boating, together with the necessary navigation aids ;

that

(*b*) the areas be zoned by the management authority in order to provide for the range of uses outlined above ;

that

(*c*) the areas be managed according to the policies developed by the management authority in consultation with the Ports and Harbors Division, the Soil Conservation Authority, and the municipalities ;

that

(*d*) the management policies for the coastal reserve recognize the following principles :

(i) new roads should not be sited along the coast but rather should be located far enough back in the hinterland to avoid damaging sensitive environments or impairing the scenic qualities of coastal landscape ;

(ii) any major coastal development projects should be subject to a detailed environmental study prior to commencement by the body proposing such development (examples of such projects would include proposals for jetties, marinas, mining, sea walls, etc.) ;

(iii) occupation of coastal public land by individuals or organizations should be phased out, and no new occupation leases should be granted ;

(iv) when camp sites and car parks are to be established on coastal reserves, the management authority should avoid locating these on sensitive areas or areas of importance for nature conservation ;

that

(*e*) in order to rectify or prevent soil erosion on coastal public land, the Soil Conservation Authority may, after consultation with the managing authority and the Ports and Harbors Division, recommend that the Governor-in-Council proclaim certain sections of the coast with a view to carrying out such reclamation and stablization measures as are necessary and determining appropriate land uses and management practices ;

and that

(*f*) the areas be permanently reserved under section 14 of the *Land Act* 1958 as coastal reserve, their seaward boundary being low-water mark, and be managed by the Department of Crown Lands and Survey.

I1 Corringle Creek to Sydenham Inlet

This reserve includes the eastern end of the Ninety Mile Beach, both sides of the mouth of the Snowy River, Point Ricardo, Cape Conran, Pearl Point, the Yeerung River estuary, Dock Inlet, and Sydenham Inlet. The Department of Crown Lands and Survey should make provision for camping at Cape Conran in accordance with the principles outlined above.

I2 Mallacoota

This reserve includes the water frontage to Mallacoota Inlet from opposite Snapper Point to the entrance of the Inlet, Bastion Point, the lower part of the Betka River estuary, and ocean frontage to the southern end of Mallacoota aerodrome. There is an existing camping area on this coastal reserve.

J. PUBLIC LAND WATER FRONTAGES AND RIVER IMPROVEMENT

Public-land Water Frontages

Along numerous rivers and streams in the study area a strip of public land has been retained between the water and adjacent alienated land. No public-land strip adjoins land alienated before 1881, and a large number of 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 water 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. In both cases the land is under the control of the Department of Crown Lands and Survey, while the water is under the control of the State Rivers and Water Supply Commission.

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

Forest produce on public-land water frontages is under the control of the Forests Commission except where a committee of management has been formed. Public-land frontages alongside artificial water storages and aqueducts are often under the control of the management authority that controls the water (e.g. State Rivers and Water Supply Commission).

Public-land water frontages are often held under licence by adjoining occupiers 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 due to 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 week-ends. Education of the public to understand the rural environment is perhaps the best solution in the long term.

These licensed river frontages are, however, public land and they are often valuable for low-intensity recreation such as walking, fishing and observing nature, and provide access to extensive lengths of streams and lake shores. As mentioned above, the public are legally entitled only 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. Unlicensed public-land frontages are normally fenced off from adjacent feehold land. There is no obligation for a landholder to provide access through feehold land to a public-land water frontage, and nothing in these recommendations suggests 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 the 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 that, elsewhere in these recommendations, have been set aside either as part of a large reserve, such as a national park or reserved forest, or for some special purpose, such as a wildlife, flora, or recreation reserve.

Recommendations

J1 That the public land defined above :

(*a*) be used to :

(i) protect adjoining land from erosion due to flooding 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 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 should 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 of fires, use of motor vehicles and motorized recreation vehicles should be prohibited ;

(ii) Licencees 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*) On public-land water frontages the Department of Crown Lands and Survey be consulted prior to the proclamation of roads or the construction of roadways or the erection of buildings;

that

(*d*) (i) It be permanently reserved under section 14 of the *Land Act* 1958 as a water-frontage reserve ;

(ii) Where it is adjacent to or within a proposed national park, State park, regional park, reserved forest, bushland reserve, streamside reserve, scenic reserve, flora and fauna reserve, or wildlife reserve, it be managed by the authority responsible for the adjoining or surrounding land ;

(iii) Where it is not adjacent to a park or reserve 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 ;

and that

(*e*) the relevant provisions of the *Water Act* 1958 and the *Forest Act* 1958 continue to apply.

River Improvement

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

Snowy River ;
Brodribb River ;
Cann River.

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-prevention works on the banks such as 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.

This 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.

Regulation of stream flow by water storages and use of streams to transport water for irrigation and domestic use also cause changes in the natural flow regime.

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, but present policy 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 that sometimes ultimately enhance landscape 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 a fish habitat and for angling and swimming in a particular location. However, 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.

Access to the river is frequently made difficult by the construction of mesh fencing or log barriers, but works of this nature are 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 often 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 the likely impact of trusts' works programmes on areas outside their districts.

The flow regimes of some rivers must, of course, be modified and flood plains used for agriculture, but it is appropriate to look to 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

J2–J4 The Council recommends that :

J2 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.

J3 Plans for all works, other than those of a minor nature, 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.

J4 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 and the maintenance or enhancement of landscape values and the value of the stream as a habitat for wildlife and for recreation.

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 Victorian River Improvement Trusts.
State Rivers and Water Supply Commission.

K. ROADSIDE CONSERVATION

Generally the vegetation on road reserves, although important for landscape reasons, is somewhat less important for conservation in East Gippsland than in areas that have been predominantly cleared for agriculture. The roadside environment of main roads does, however, depend largely on management of the road reserve. It is important that the managers of road reserves for main roads (usually the Country Roads Board and the Orbost Shire Council), and the managers of adjacent public land, consider these important landscape values, and that vegetation on the road reserve be disturbed to the minimum extent consistent with the safe and efficient design and use of the road.

Along some of the roads, the reserve carries picnic areas and wayside stops, but along the major tourist routes there is an additional need for areas sufficiently large to allow travellers to be isolated from the road environment and to allow dispersion of picnickers. These areas should have scenic qualities, perhaps incorporating a stream, and be sufficiently stable to withstand intensive use. They would be used by travellers for relaxation and picnicking and should have some development, such as picnic facilities, including fireplaces, where appropriate. Examples of locations that may be developed for off-road picnic areas are where the Princes Highway crosses the Bemm, Thurra, and Wingan Rivers, and where the Bonang Highway runs along Martin Creek and the Brodribb River south of Goongerah.

Recommendation

K1 That land management authorities establish areas, such as described above, to be used by travellers for relaxation and picnicking.

L. EDUCATION AREAS

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

Environmental education is indispensably 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 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 (including parks, wildlife reserves, and hardwood production areas) be available for educational uses. Council believes that in most situations educational studies can take place without conflicting with the primary use for which the area is set aside. Indeed, in some cases it is the manipulation of the land for the 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 educational use 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 education areas 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 education areas, the Council has sought to provide :

- Examples of major land types in the study area.
- Areas of maximum diversity, preferably with natural boundaries.
- Areas large enough to be viable and to allow recovery of different sections as use is rotated.
- Proximity to other land types and a variety of land uses nearby.
- Reasonable vehicular access to the area.
- Areas in different parts of the study area.
- Sites selected in order to minimize fire, erosion, and pollution hazards.

No one organization should have the exclusive right to use a particular education area, as it is important that students have the opportunity to visit a number of education 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 at each education area, and it would be desirable to have accommodation either on the area or at some nearby locality. 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 education areas 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 usage of the areas.

Recommendations

L1–L4 That the areas of public land listed below and shown on Map 1 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 education areas 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 reserved under section 14 of the *Land Act* 1958.

L1 Bidwell (315 ha)

This area is an example of the plateau environment and higher-elevation vegetation.

L2 Sardine Creek (200 ha)

This area is an example of the foothill environment, and includes a substantial frontage to the Brodribb River.

L3 Yeerung (490 ha)

This area includes coastal heath and woodland communities. It is in close proximity to the estuary of the Yeerung River, ocean beach, and also Cape Conran, with its rocky shores of both Devonian granitic and Ordovician sedimentary rock and the exposed interface between these rock types.

NOTE : Coastal heathland presents a particular fire hazard and special measures may be necessary to ensure adequate protection of this education area from fire.

L4 Serpentine Creek (510 ha)

This area is an example of the coastal plains environment.

M. RECREATION AND RECREATION RESERVES

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 as much as the attitude with which it is undertaken—activities (or inactivities) undertaken with little or no feeling of compulsion are almost certainly recreation.

Outdoor recreation, which is simply recreation that is typically carried on outdoors, is of particular interest to Council as the public land of the study area provides important opportunities for this type of recreation. Throughout these recommendations the countless forms of outdoor recreation have been referred to 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, bush-walking, 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. For example, areas carrying 10 000 visitors or more per hectare per year would be considered to be intensively used.

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 making its recommendations, has suggested that much public land be available for recreational uses of some sort.

Various types of recreation have been recommended as a primary use of land in six cases :

(1) Recreation reserves, where small areas of land are developed for a particular type of recreation—often organized sports, such as golf, target shooting, horse riding, tennis, football and so on, or for other formalized activities, such as caravan parks. (See Recommendations M4–8.)

(2) National and State parks—where land has been set aside to ensure that opportunities continue to exist for types of recreation requiring relatively undisturbed environments. (See Recommendations A1–4.)

(3) Regional park—where land readily accessible from Orbost and the Princes Highway is developed for intensive recreation, generally of a passive nature. It is intended that this will cater for many of the activities requiring open space in pleasant surroundings and free the State and national parks to cater for the more special forms of recreation requiring relatively undisturbed environments. (See Recommendation A5.)

(4) Wilderness—where land has been set aside to ensure that opportunities continue to exist for recreational activities requiring an environment free from signs of Man's influence. (See Recommendation B1.)

(5) Scenic reserves—where major vantage points are developed for intensive recreation of a passive nature. (See Recommendations N1–7.)

(6) Coastal reserves—where water and scenery combine to provide a recreational resource of extremely high value. (See Recommendations I1–2.)

Apart from these special cases it has not been possible for Council to make recommendations covering in detail all the forms of recreation currently pursued on public land. These include activities such as bush-walking, 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 reference areas and some water storages and their buffers) and has left the details of recreational use to the land managers.

The various recreational 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 recreational activities). Generally, any one activity pursued at a low level of intensity poses little threat to the environment and does not often conflict with other activities. With increasing intensity, conflicts and problems can arise. 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 irreversible damage or significant conflict with the primary purposes of the area, while at the same time avoiding any unnecessary restrictions on usage. Special care will be required in the location and management of areas zoned for intensive recreation to prevent environmental damage. Thus, more stringent restrictions can be expected in areas where the vegetation and soils are sensitive to damage, such as in sub-alpine, coastal, and low-rainfall areas, and where the natural environment or special natural features are being preserved.

Two particular recreational activities that may pose a problem for the land managers, whether now or in the future, are further discussed below.

Motorized recreation

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

Any vehicle, whether car, four-wheel-drive, or motor-bike, registered under the *Motor Car Act* 1958, has access to any legally open road anywhere 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 ". The land management authorities can close roads when traffic is in excess of the physical capacity

of the road, or when vehicluar access or its associated activities seriously conflict with the primary purpose for which the area is used. Seasonal closure of some roads may be necessary to avoid erosion and excessive maintenance, or because of extreme fire hazard. As the intensity of recreational use increases on public land, it is inevitable that more roads and tracks will be closed to vehicular access, particularly in areas with erodible soils. Council believes that these closures will not significantly reduce the many hundreds of kilometres of roads and tracks currently open to the public.

Motor vehicles 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, and can, and do, cause extreme damage to vegetation and soils.

The demand exists for the provision of some areas of public land in order to accommodate and relocate the off-road activities of motor vehicles, particularly trail-bikes. Such areas could, for example, be in the form of defined trails in some hardwood or softwood forests, or could include disused quarries, or parts of some recreation reserves close to urban centres. Where possible, the alternative use of suitable private land should be considered. Areas chosen, whether public land or freehold, would have to be in situations where damage to soil and vegetation would be minimal, and where noise would not cause undue disturbance to other people using or living in nearby areas. Council points out that there is a serious and growing problem of damage to soils and vegetation associated with spectators attracted by these activities.

Youth camps

Currently there are no permanent youth camp sites in the study area. Demand is likely to increase, however, for sites for use by scouts, schools, church groups, and the like. 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 and with electricity and hot water provided ; others have only minimal facilities, with campers living in tents. Some have had considerable amounts of money and volunteers' time and effort put into their contruction 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.

There is an increasing tendency for user groups 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. Where camps are permitted on public land, Council believes that these should be properly located, constructed, and maintained, while recognizing that a variety of types of camp may be needed. 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.

Recommendations

M1 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.

M2 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 erodible soils, seasonal conditions, excessive maintenance, or conflict with the primary use of the area.

M3 That the area of approximately 45 ha east of allotment 9A of Section B, Parish of Newmerella, be made available for off-road vehicular use under the provisions of the *Land Act* 1958 and be managed by the Department of Crown Lands and Survey.

NOTE : If there is a demand for additional land for the above purpose, the land management authorities may provide for this from land under their control.

M4–M9 That the areas described below and shown on Maps 1, 3 and 4 be used for organized sports (football, etc.) horse-racing, golf, picnicking, camping, and informal recreation as permitted by the managing authority,

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

M4 Existing recreation reserves.

M5 Marlo (3·9 ha)

This is an extension to the existing camping reserve.

M6 Tonghi (95 ha)

This area, south-west of Cann River, is to provide a golf course and other recreational facilities for the people of Cann River, and native vegetation should be retained where practicable.

M7 Cann River (4 ha)

This reserve, adjacent to the Princes Highway in the west of the Township of Cann River, is currently used as a camping area, but its size has been increased to allow for future expansion.

M8 Cann River (10 ha)

This area, in the north-west of the Township of Cann River, west of the Cann Valley Highway, is for recreational use by the people of Cann River and tourists.

N. SCENIC RESERVES

These areas are set aside to preserve scenic features or lookouts of particular significance.

Recommendations

N1–N7 That the areas shown on Map 1 and listed below be used to preserve scenic features or lookouts,

and that they be reserved under section 14 of the *Land Act* 1958 and managed by the Forests Commission.

N1 Raymond Creek (500 ha)

N2 Martins Creek (200 ha)

N3 The Gap (170 ha)

N4 Mount Delegate (300 ha)

NOTE : no new gravel pits should be opened up, and consideration should be given in management to minimizing the visual impact of existing pits.

N5 Mount Ellery (1400 ha)

N6 Arte River (100 ha)

N7 Bemm River (600 ha)

O. AGRICULTURE

Alienation

Council has carefully considered the submissions received regarding the use of public lands for agricultural production, and has made recommendations for the alienation of areas of public land considered most suitable for agriculture.

The land already alienated has some potential for increased production through more intensive development of already-cleared land and through the clearing of freehold that is still forested.

The study area contains areas of public land with potential for development for agriculture. Much of this land has been left uncommitted, and could be alienated in the future for agricultural production if economic conditions favour development.

Recommendation

O1 That the land described in schedule 1 below (approximately 4500 ha) and indicated on Maps 1, 5 and 6 be used for agriculture.

With reference to section 5 (3) of the *Land Conservation Act* 1970, the Council considers that the best method of dealing with the land in the schedule is in accordance with the provisions of the *Land Act* 1958. It is intended that this land should be used to increase the efficiency of agricultural production in the area.

SCHEDULE 1

Land Recommended for Agriculture

Parish.	Location.	Area (ha).
Bidwell	Allotment 5C of section A	60
Orbost	North of allotment 47B of section A	94
Newmerella	Adjacent to allotment 8E of section C	3·6
Newmerella	North of allotment 15 of section B	16
Noorinbee	Allotments 24 and 24L	47
Noorinbee	East of allotments 31 and 31A	90
Nowa Nowa South ..	Part of allotment 7B	4·1
Tildesley East	Allotment 2C of section A	44
Tildesley West	Allotment 33	80
Tildesley West	Allotment 41H	15
Tonghi	East of allotment 29C	100
Bete Bolong South ..	South-east of Parish	Approx. 1400
Tildesley East	North-east of Parish	
Waygara	North-west of Parish	
Noorinbee	West of allotments 10, 30A, 18, 38, 38C, and 39B of section A	Approx. 2500
Tonghi	East of Old Coast Road	

Forest Grazing

Forest grazing has formed an integral part of the agriculture of the study area for many years. Currently 35 graziers hold forest grazing licences from either the Department of Crown Lands and Survey or the Forests Commission. Between 15 per cent. and 20 per cent. of the beef cattle in the study area are run in the bush at some stage each year.

In some instances, farmers have incorporated the grazing of leased land into their system of grazing management. In addition, some parts of the study area suffer from effects or regular and frequent flooding and waterlogging of pastures. This problem can be alleviated by provision of higher dry ground on which to keep stock when land on the farms is too wet. In both these situations consideration should be given to making land available under a longer-term lease (such as 21 years) rather than under an annual licence. In some stiuations, however, it would be preferable to provide land under agistment or annual licence.

Twenty-one-year leases with stringent conditions on the use of fire and with conditions that permit the managing authority to exercise general supervision of the management of the leased land, especially with respect to stocking rates—give the lessee reasonable security of tenure, and thus encourage him to conserve the grazing resource and to erect improvements, such as water points and fencing.

In addition to regular flooding and waterlogging, situations arise from time to time that lead to shortages of feed for grazing (these include drought, fire, and severe and widespread flooding). Council believes areas should be available to meet these emergency situations, and here grazing could be controlled either by the issue of agistment rights or annual grazing licences. It is possible that stock may have to be transported from the farm to the forest grazing area, in order to alleviate a localized shortage of fodder.

Recommendation

O2 That grazing be permitted on land reserved for timber production and on uncommitted land, the precise areas to be determined by the management authority ;

and that

on areas where grazing is permitted the form of tenure be annual licence, agistment, or a longer-term lease of up to 21 years, whichever form of tenure the management authority considers most appropriate.

Council believes there is a need for a committee to advise the management authority regarding the selection and management of areas on which grazing will be permitted. This committee should comprise representatives of the Forests Commission, the Department of Crown Lands and Survey, the Department of Agriculture, the Soil Conservation Authority, and the graziers, and should advise the management authority with respect to the following matters :

(i) form of tenure;

(ii) the areas suitable for grazing and the delineation of their boundaries;

(iii) type of livestock and annual stocking rates;

(iv) fencing, water supply, and other improvements;

(v) reclamation of eroded areas;

(vi) exclusion of stock from some areas in order to permit the conservation of flora and fauna, or the regeneration of vegetation, and the permanent exclusion of stock from control areas.

In advising the management authority, due consideration should be given to the financial implications of terms and conditions that may be attached to the lease. Some suggested terms and conditions are given below.

(i) In the case of long-term leases, the lease will be reviewed after two-thirds of the time has expired and a decision on renewal for a further period will then be made.

(ii) Cultivation and clearing will not be permitted, except when this is necessary to control vermin and noxious weeds.

(iii) Leased areas will continue to be available for timber production, apiculture, and other uses that would be permitted if the area was not leased.

(iv) The conditions applying at present to grazing licences and leases under the *Land Act* 1958 and the *Forest Act* 1958 that are consistent with these recommendations and suggested terms and conditions will apply.

Agricultural Research

An experimental farm (Tostaree Pilot Farm) was established in the early 1960s to assess the likely costs of development of farms in the Hartland area (Waygara land system). The site was selected after a soil survey of the whole Hartland area, because it contains soils representative of the area. Although the farm is not currently used for agricultural research, it may be valuable for that purpose in the future.

Recommendation

O3 That the Tostaree Pilot Farm be reserved under section 14 of the *Land Act* 1958 and be managed by the Department of Crown Lands and Survey.

P. MINERAL AND STONE PRODUCTION

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.), and further deposits will probably be found.

The continued existence of our technological society will depend on the availability of minerals. Our present mineral requirements may be well known, but it is impossible to predict future needs arising from further scientific advances. Presently known but uneconomic deposits of currently important minerals may become economically exploitable ; 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. It is therefore important that the reservation of conservation areas should not automatically exclude exploration for mineral or petroleum 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 are widespread in the area. These materials include rock of any kind, gravel, clay, sand, and soil.

There is a strong community demand for new and better roads and buildings, and so for the materials needed for their construction. Elsewhere in the State most of these materials are supplied from private land, but in East Gippsland, public land is the most important source.

The Council is concerned at the complexity of legislation and procedures governing extraction of " stone ", and the lack of control accompanying some of these procedures, whether in theory or in practice. (For example, the Country Roads Board and municipal councils are not bound by many of the 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. Poorly planned and located excavations can affect surrounding lands through noise, dust, unsightliness and erosion, and diminish or destroy the value of the land for nature conservation ; however, with care these effects can be minimized.

The Council is also concerned at the wide privileges conferred on the holder of a miner's right.

The Council believes that :

(i) All exploration for and extraction of " gold ", " minerals ", and/or " petroleum " on public land should be subject to the approval of, and conditions imposed by, the Department of Mines.

In considering an application, the Department of Mines should apply the guidelines listed below, and should be required to consult the public authority that manages the land and enforce any reasonable conditions imposed by that authority within the field of its expertise. In addition, the Department should be required to consult with the Soil Conservation Authority and enforce any conditions imposed by that Authority if the area disturbed will exceed 0·2 ha or where the area is an erosion hazard area, a coastal reserve, at an elevation greater than 1200 m, or within a proclaimed water supply catchment.

(ii) All exploration for and extraction of " stone " on public land should be subject to the approval of and conditions imposed by the authority that manages the land. Where the area disturbed will exceed 0·2 ha or where the area is an erosion hazard area, a coastal reserve, at an elevation greater than 1200 m, or within a proclaimed water supply catchment, the managing authority is required to obtain the approval of the Soil Conservation Authority and enforce any conditions imposed by that Authority.

If approval for extraction of " stone " is granted by the authority that manages the land (and the Soil Conservation Authority when necessary), any project involving extraction of material to a depth of more than 2 metres below the land surface should then be subject to the approval of, and conditions imposed by, the Department of Mines as is currently required of extractive industries. These requirements should apply to municipal councils, the Country Roads Board, and other public authorities, as well as to commercial operators, but to allow this, the relevant Acts would have to be amended.

(iii) A system should be established that would guarantee that funds for rehabilitation would be available for any operation, before the operation commences. This is already the case for operations where the *Extractive Industries Act* applies.

(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 of " gold ", " minerals ", " petroleum ", or " stone " from public land.

- No sites for the extraction of " gold ", " minerals ", and " petroleum " should be opened in areas considered, by the Department of Mines after consultation with the land management authority, to be of greater value for their aesthetic or nature conservation values. Similarly, no sites for the extraction of " stone " should be opened in areas considered by the relevant public authority to be of greater value for their aesthetic or nature conservation values.
- Extraction of " stone " should be concentrated on the fewest possible sites in an area, and any one site should be completely worked out and rehabilitation ensured before a new site is exploited. The emphasis should be on quarries properly managed for " stone " production, rather than shallow surface pits. In particular, the extraction of granite sand occurring as shallow deposits 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 must 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. Prior to approval being given, there should be consultation with the State Rivers and Water Supply Commission, the Soil Conservation Authority, and the Fisheries and Wildlife Division, and consideration should be given to the scenic and recreation values of the area.

Alternative sources with a lower environmental effect should be used where they are available. The environmental effect of its extraction may be reduced if alluvial stone is obtained from properly managed quarries on the river terraces, rather than from the present bed of a stream.

- All extraction sites should be fully rehabilitated. Rehabilitation should follow extraction progressively when possible, but otherwise should begin immediately extraction is completed. The aims for rehabilitation should be defined by the authority that manages the land, and may include, for example, 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 rehabilitation, or restoring the site as closely as possible to its original topography and revegetating it with species native to the site.

Recommendation

P1 That public land in the study area continue to be available for exploration and extraction of " gold ", " minerals ", " petroleum ", and " stone ", subject to the principles and guidelines set out above.

Q. UTILITIES, SURVEY, AND OTHER RESERVES

Utilities and Survey

Many existing utilities occupy public land ; these include roads, powerlines, schools and school plantations, churches, cemeteries, and so on. Many small areas where no change in use is proposed are not referred to specifically.

In the absence of detailed information, it is not possible at this time to provide for future requirements for land for utilities and survey. Land for these purposes will need to be allocated when particular projects are under consideration.

Roads, power-lines and pipelines.

To assist in achieving co-ordinated planning, and possibly avoid the necessity for costly resurveys, Council suggests that government agencies concerned with provision and installation of communication equipment, transmission lines, pipelines, roads, etc., submit to the Council during the early planning stages any major proposals that would involve occupation agreements or the setting aside of sites on public land.

For many years there has been discussion about an " ocean road " to encourage tourism (ocean roads are coast-hugging tourist or scenic roads, routed as closely as possible to the shoreline, often on vulnerable dunes or cliffs). In addition it has been suggested the proposed ocean road would ease the problem of Bemm River and Mallacoota being isolated by flood or fire.

Council is generally opposed to ocean roads because of their adverse effects on coastal planning and coastal land use, but believes that road access should be available to a number of points along the coast (see Recommendation A1 (*e*)). Consideration should be given to alleviation of the flood problem by realigning existing access roads, and alleviation of fire access difficulty by upgrading some existing tracks.

Council also believes that the Old Coast Road between the townships of Bemm River and Cann River, and the Aerodrome Track, Betka Track, and Stony Peak Road between Mallacoota Aerodrome and the Princes Highway could be upgraded to a standard suitable for tourist use.

Recommendations

Q1 That existing easements continue to be used to provide access and services.

Q2 That new roads, power-lines and pipelines be sited to minimize disturbance to public land and protect the values associated with this land ; they should not impinge on parks, reference areas, coastal reserves, bushland reserves, or scenic reserves without the approval of the management authority. New pipelines and power-lines should follow existing easements if possible ; this may require widening of some easements.

Sewage treatment works

Public land in the Parish of Newmerella is used for the treatment of sewage from Orbost.

Q3 That the area of 259 ha shown on Map 1 continue to be used and reserved for treatment of sewage.

Marlo aerodrome

The aerodrome approximately 5 miles east of Marlo is situated on public land.

Q4 That the area of approximately 450 ha shown on Map 1 continue to be used and reserved for aerodrome purposes. This area supports a major remnant of the native vegetation of the Marlo plains, which should be protected to the extent consistent with the management of the aerodrome.

Maramingo rubbish tip

A small area near the intersection of the Princes Highway and the Wangarabell Road is used for rubbish disposal and gravel extraction.

Q5 That the area of 4 ha shown on Map 1 be used as a rubbish tip. Extraction of gravel may continue.

Ports

Mallacoota Inlet and the Snowy River are proclaimed ports under the control of the Ports and Harbors Division, Public Works Department. The waters of Mallacoota Inlet have considerable value for recreation and also have nature conservation value. The Public Works Department should consult with the National Parks Service to ensure that recreation and nature conservation values associated with the Croajingalong National Park are protected. Lakes Curlip and Corringle, which form part of the port of Snowy River, have value for nature conservation and recreation, and the Public Works Department should consult with the Fisheries and Wildlife Division to ensure that recreation and nature conservation values associated with these areas are protected.

Trigonometrical stations

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

Q6 That the minimum area necessary for survey purposes be reserved around trigonometrical stations on public land in the study area where it would otherwise remain as unreserved Crown land and, where other forms of public land tenure occupy a minimum area around the station and provide lines of sight.

Other Reserves

For a number of small areas of public land reserved for water, gravel, camping, State schools, and so on, there are no specific recommendations. For these the Council recommends that existing legal uses and tenure continue, as in Q7 below.

Recommendation

Q7 That, for small areas of public land not specifically mentioned in this publication, existing legal uses and tenure continue.

R. 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. Some land in the townships of Marlo, Cann River and Mallacoota has been recommended for bushland reserves and recreation reserves.

In general, all public land in townships should remain in the uncommitted state to meet future requirements, and can be allocated when required.

Council has made provision for possible future expansion of Bemm River, Cann River, and Mallacoota by recommending that adjacent public land be uncommitted.

Cape Conran

To meet the demand for additional coastal settlements providing accommodation for tourists in a coastal environment, Cape Conran is an outstanding site, providing an environment different from those of other coastal towns in East Gippsland. Such a seaside village would be intended to cater for holiday-makers, and many of the facilities and services required by a permanent population could be located in Marlo or elsewhere. As there are no permanent buildings or freehold land within the township site, Cape Conran provides an opportunity for planned development from the beginning.

Recommendations

R1 Cape Conran

(*a*) That the Department of Crown Lands and Survey investigate a site at Cape Conran, other than on the coastal reserve, that would be suitable for the establishment of a seaside village.

(*b*) That, before any development begins, a comprehensive plan be prepared by the appropriate authorities, taking into account environmental and pollution factors.

(*c*) That all residences and holiday-home sites be confined to the village site and not be located on the adjacent coastal reserve, and that existing permissive occupancies be terminated and structures removed so that the relevant area is fully available for public use by 1985.

R2 Point Hicks

That an area of land of approximately 75 ha at Point Hicks be temporarily reserved for possible development associated with the Croajingalong National Park.

Note : Any such development should be undertaken only with the approval of the managing authority of the Croajingalong park (see Recommendation A1).

S. UNCOMMITTED LAND

In planning land use, known resources are allocated to satisfy known or predicted demands. However, Council is aware that many changes cannot be foreseen and that resources themselves will change as exploration, investigation, and technology progress. For these reasons it is desirable that planning be flexible so that, when land use is reviewed, resources can be re-allocated or adapted to meet changed demands. Changes in demand may affect present uses or may create entirely new ones.

Provision for future demands is made by placing land under flexible forms of use (that is, uses that do not have a major impact on the ecosystem) and by retaining as much land as possible in an uncommitted state.

Such uncommitted land is securely retained as public land, although the form of tenure permits changes in use or status if these are recommended following revision by this Council. All resources on uncommitted land are to be carefully managed in order to prevent the impairment of the land's capability for future uses. In practice, this means conserving the capabilities that the land is known to possess, while allowing low levels of some types of use (providing this can be done without reducing options for future uses by causing changes that would be difficult to reverse). Uncommitted land includes areas that, although having a low capability to satisfy any known demand, have an unknown (and perhaps high) capability to satisfy future demands.

It also includes areas that, although having a high capability to satisfy one or more known demands, are at present not committed to any one use, as foreseeable requirements can readily be met from other areas.

Council wishes to emphasize that sufficient resources should be made available to the authorities responsible for managing uncommitted land to permit careful management of the land. In particular, measures to protect the land and adjacent areas from soil erosion, wildfire, and vermin and noxious weeds are essential.

Recommendation

S1 That the land (184 000 ha) indicated on Map 1 and listed in the schedule below, be used to :

(*a*) achieve or maintain stability of the land and maintain its usefulness for possible future uses ;

(*b*) provide other products (including forest produce) and services (including grazing) where this can be done in a manner compatible with (*a*) above ;

(*c*) protect special values or features.

These include :

(i) Goolengook River (2900 ha)

The Council recommends that, contrary to (*b*) above, the whole of the land in this category be withheld from logging or new roading until 1985 when it is anticipated the use of this area will be reviewed.

(ii) Hard-to-Seek Creek and Wingan River (14 000 ha)

The Council recommends consultation between the Department of Crown Lands and Survey, the Forests Commission of Victoria, and the National Parks Service regarding forest operations, including provision of access, so that the values of the adjacent Croajingalong National Park and Bendore River reference area are adequately protected.

(iii) Teal, David, and Dowell Creeks catchments (2000 ha).

The habitat of bass, grayling, mullet, bream, and other fish should be protected by excluding logging from a strip 100 metres from the banks of Teal Creek and strips of 20 to 40 metres from each bank of minor or major streams respectively elsewhere.

(iv) *Snowy River*

Land should be conserved along the Snowy River between Lucas Point and Bete Bolong, particularly in the vicinity of Wood Point, where rare plant species, including black-stem maiden-hair and *Symplocus*, which is unknown elsewhere in Victoria, occur.

(v) *Serpentine Creek*

Where the Yalmy Road crosses Serpentine Creek, many orchid species occur, including the uncommon leafy greenhood (*Pterostylis cucullata*).

(vi) *Yeerung River*

Heaths and woodland between the Cabbage Tree Creek–Cape Conran Road and the Manorina–Bemm River Road are valuable habitat for flora and fauna.

(vii) *Chandlers Creek*

The catchments of Chandlers Creek and Survey Camp Creek contain rare plant species, including lacy wedge-fern and green midge-orchid.

(viii) *Reed-bed Creek*

Swamps along Reed-bed Creek are valuable for flora.

(ix) *Reedy Creek*

The swamps associated with Reedy Creek are valuable for nature conservation and contain rare plant species, including the guinea flower (*Hibbertia rufa*), rush fringe-lily, and leafless tongue orchid;

and that new access tracks or roads be constructed on this land only where necessary for management ;

and that it be uncommitted land withheld from sale under section 36 of the *Land Act* 1958 and that it be *protected forest* under the provisions of the *Forest Act* 1958.

NOTE : It is proposed that small unreserved areas not shown on the map, or not specifically mentioned, be uncommitted land under this Recommendation.

SUPPLEMENT

PROPOSED PULPWOOD INDUSTRY—EAST GIPPSLAND STUDY AREA

In the course of formulating proposed recommendations for the East Gippsland Study Area, the Council found it necessary to appoint a committee drawn from its members to investigate proposals for a pulp industry based on pulpwood resources in the area. The essential findings of this committee are set out below. Its recommendations were approved by Council and are incorporated in the Timber Production section of this report.

A. Wood Pulp Industry—Australia

The pulp and paper industry must be considered on a national basis, as the bulk of production takes place in some States and pulp and products are transported to others.

Four major types of industries in Australia rely substantially on eucalypt pulpwood in Australia. These are the packaging and industrial paper, the newsprint, the printing and writing papers, and the chip export industries.

Brief outlines of these industries are included in Appendix (i). The most feasible alternative industries that could utilize the East Gippsland eucalypt pulpwood resource would appear to be production of kraft pulp (for manufacture into packaging paper and other industrial papers) or the production of wood chips (which might then be exported).

Australia consumed 720 000 tonnes of packaging and industrial paper in 1970, and growth has been about 6 to 7 per cent. per annum since then. This is expected to decrease to about 4·4 per cent. by 1980 (1). About 48 per cent. of this production is based on recycled paper, 18 per cent. on imported pulp, and 34 per cent. on pulp produced from Australian-grown wood.

From population predictions for 2010, of between 16·5 million and 19 million (2) and a *per capita* consumption of 0·116 tonnes per annum (3), the demand for packaging and industrial paper is expected to be between 1·9 and 2·2 million tonnes per annum by 2010.

Current and firmly planned expansion of existing Australian pulp mills supplying this market should enable production of about 600 000 tonnes of pulp per annum by 1983.

The upper and lower Australian demand projections for pulp for packaging and industrial papers, and the existing and firmly planned expansion of existing Australian pulp mills supplying this market, are depicted in Figures A and B. It is feasible that up to 55 per cent. of total paper production could be based on recycled paper, as indicated in these Figures.

Considering the lower population projections (Prediction 1), self-sufficiency in raw material supplies for packaging and industrial paper should be achieved by about 1980. A surplus is indicated until about 1990, but after this time a deficit is predicted, rising to 270 000 tonnes per annum by 2010.

Prediction 2, based on the higher population projections, indicates that Australia could be self-sufficient from about 1981 to 1985 but after this time an increasing deficit is predicted, rising to 400 000 tonnes per annum by 2010.

FIG. A PACKAGING AND INDUSTRIAL PAPER–PREDICTION 1

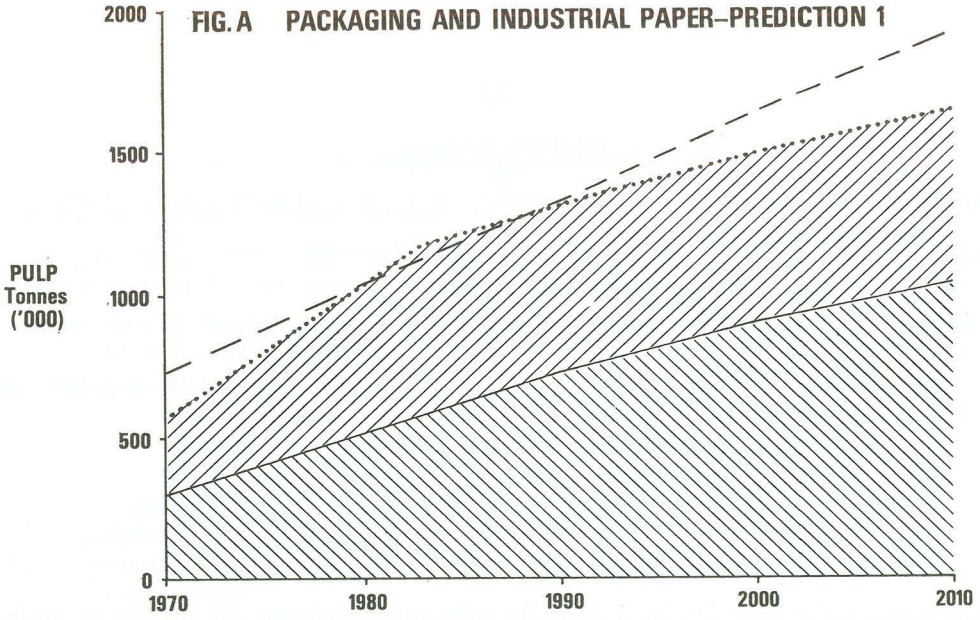
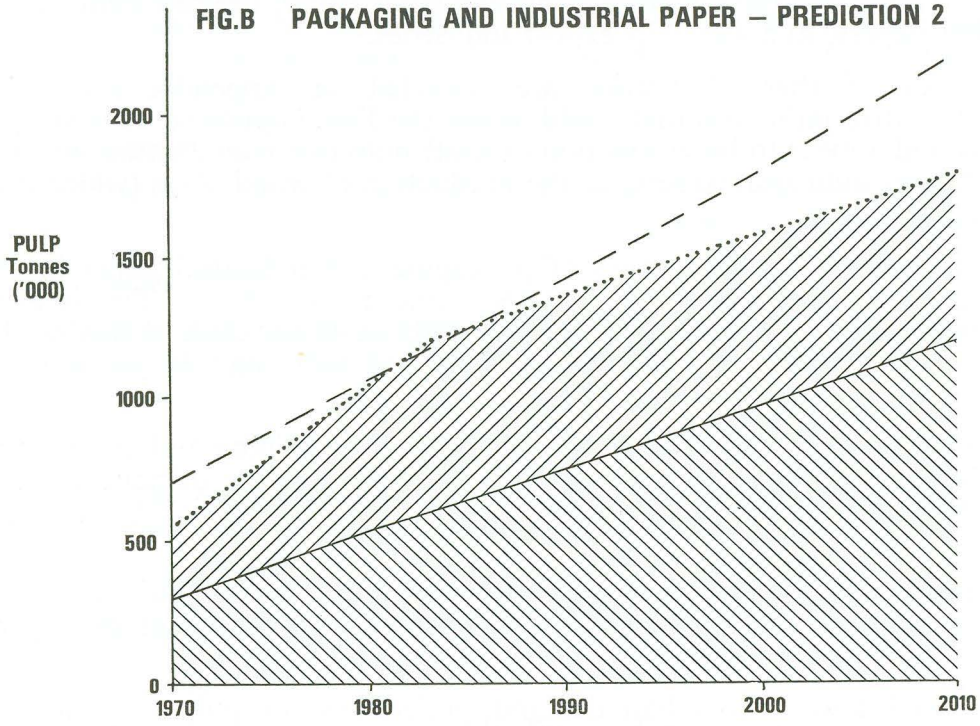


FIG.B PACKAGING AND INDUSTRIAL PAPER – PREDICTION 2



— — — — — Predicted Australian pulp consumption (A)

..... Currently planned Australian pulp production (B)

Pulp produced from pulpwood and sawmill residues

Pulp produced from recycled paper (C)

(A) Derived by equating predicted pulp consumption with predicted paper consumption

(B) Pulp production from pulpwood and sawmill residues of 600,000 tonnes/annum by 1983

(C) FORWOOD predictions of recycling proportions (Reference 3)

Imports could meet some of this deficit in the future. Arguments have been raised against a policy of self-sufficiency for a trading nation with substantial wood reserves, such as Australia (4). Imports of pulp in 1970 amounted to 18 per cent. of the total required.

An additional mill producing 180 000 tonnes of pulp annually (enabling the production of about the same amount of paper products) would require about 750 000 tonnes of pulpwood and chips per annum. The minimum economic size of a kraft chemical mill has been estimated to be approximately 180 000 tonnes per annum (5, 6).

It is predicted that a world-wide shortage of pulp and chips will continue, leading to an estimated export opportunity of 8 million tonnes per annum between 1990 and 2010 (3). In 1974–75, 2·5 million tonnes were exported from Australia—2 million tonnes from Tasmania and 0·5 million tonnes from New South Wales (7).

B. Australian Pulpwood Resources

Substantial eucalypt pulpwood resources exist in several localities in Australia. In some areas, pulpwood-using industries are associated with these and are shown in Appendix (ii). It is apparent that additional eucalypt pulp could be produced by :

(i) expanding existing pulp mill capacities at some localities ;

(ii) replacing present wood-chip export industries by woodpulp industries in Tasmania, southern New South Wales, and Western Australia ;

(iii) utilizing untapped resources in East Gippsland and northern New South Wales.

C. Industries Using Eucalypt Pulpwood and or Chips Obtained from Victoria or Southern New South Wales

Four large industries use eucalypts for pulpwood and for chips in Victoria and southern New South Wales : A.P.M.'s pulp mills at Maryvale and Smorgon's mills at Melbourne produce pulp for manufacture into packaging and industrial papers ; Hardboards Australia at Bacchus Marsh manufactures hardboard from supplies of pulpwood and sawlog residues ; Harris–Daishowa exports chips from Eden. Further details appear in Appendix (iii).

D. Pulpwood Resource in East Gippsland

Apart from the areas covered by existing supply agreements, the largest potential source of eucalypt pulpwood in Victoria is in the East Gippsland region, to the east and north-east of the A.P.M. Forest Area (as defined by legislation). This region includes the study area.

The region comprises some 1·5 million hectares of State forest and supports annual sawlog allocations of 533 000 m^3, which amounts to more than 40 per cent. of the Victorian hardwood total. This proportion is expected to decline with the progressive use of regrowth eucalypt forest and softwood plantations for sawlog supplies.

It is believed that the area could sustain an annual yield of about 800 000 m^3 of green pulpwood from the residue of trees felled for sawlogs and from trees not suitable for sawlogs and not required for other purposes, such as seed trees and trees for faunal habitat. This includes approximately 600 000 m^3 from reserved forest and protected forest within the East Gippsland Study Area.

The study area figure is based on cutting an estimated present standing pulpwood volume of 43 400 000 m³ harvested over 70 years. This assumes that the standing pulpwood volume remains at the same level over this period of time and that pulpwood and sawlog utilization standards remain the same. In preparing this estimate of volume, the Forests Commission has excluded areas where slopes exceed 30°, unproductive areas such as grassland and heathland, all forest with a stand top height less than 18 metres for coastal and low-foothill forest, and elsewhere, all stands less than 28 metres stand top height. Species unacceptable for pulpwood have been excluded from calculations. No allowances have been made for areas reserved along streams or for residual trees left as seed trees or habitat trees. Pulpwood volumes in regrowth stands have not been included in the estimates, but eventually these areas would contribute to the total availability of pulpwood.

Under the agreement with A.P.M., up to 20 per cent. of the minimum annual supply may have to be met from outside the forest area. This quantity will rise from 58 000 m³ in 1975 to a level of 153 000 m³ by 1982–83. This requirement could be met partly from north-eastern Victoria, but, in the main, would have to be obtained from East Gippsland.

Based on current sawlog allocations, a volume of approximately 155 000 m³ of slabs and edgings from sawmills in the East Gippsland area is potentially available for wood pulp, including chips currently carted to Eden from Victorian mills.

E. Potential Pulpwood-based Industries for East Gippsland

The Victorian Government has indicated its interest in the establishment of a pulpwood-based industry in the East Gippsland area, to stimulate the local economy and to foster economically viable decentralized development.

There have been a number of requests to the Government for long-term rights for utilization of the East Gippsland pulpwood resource.

F. Alternative Proposals

A number of alternative strategies for utilization of the pulpwood resource in East Gippsland and for alternative supply sources should be taken into account when recommending land uses in the East Gippsland study area. These are discussed below.

1. Manufacture of pulp in East Gippsland based on the East Gippsland pulpwood resource.

This would involve the establishment of a pulp mill in the area, probably in the Orbost locality. A kraft mill based on an annual intake of about 750 000 tonnes of raw material (pulpwood and sawmill residues) would be a likely possibility.

2. *Export of wood chips*

A large market for wood chips is predicted in the future. A chipping mill sited at Orbost, or an expansion of the mill at Eden, could be contemplated. The current industry at Eden provides one guide to the minimum economic size and life of a wood chip mill.

The Eden mill processed 220 000 tonnes of pulpwood in 1971. Since then, intake has expanded to an anticipated level of 570 000 tonnes and 137 000 tonnes of chips from sawmill residues in 1975. A new chip mill will lift production further. This industry has a guaranteed minimum supply of 530 000 tonnes per annum from State forests until 1989 and appears to be economically viable (8). Thus, on the basis of the New South Wales experience, it appears that an alternative way to utilize pulpwood resources from East Gippsland could be to establish a chip industry requiring about 500 000 tonnes of pulpwood each year.

3. *Linking East Gippsland and southern New South Wales resources to support a large pulp mill or integrated pulp and paper mills in East Gippsland*

It is extimated that a pulp mill can economically draw on pulpwood supplies from land within a radius of up to 150 kilometres (9). If this criterion is applied to a pulp mill at Orbost, estimated resources in State forests could maintain an annual supply of about 1 300 000 tonnes of wood. This could comprise about 180 000 tonnes of chips from sawmill waste, 630 000 tonnes of pulpwood from East Gippsland (A.P.M.'s annual supply requirements of up to 164 000 tonnes from outside its forest area is excluded), and about 500 000 tonnes from New South Wales, if this resource, at present exported as chips, is diverted to Orbost. An annual supply of 1 300 000 tonnes is well in excess of the minimum required at present for an economically viable kraft pulp mill or integrated pulp and paper mills.

A pulp mill at Eden could draw on at least the same order of supplies from State forest in East Gippsland and New South Wales.

4. *Reduced rotations with eucalypts*

Managing native forests on a rotation of 40 years instead of 70 years would increase productivity of pulpwood, but would not contribute to sawlog supplies. Growth rates of about 5 m^3 per hectare per annum could be expected from management of coastal foothill forests on a 40-year rotation.

A net area of about 18 000 ha of suitable land would be required to produce 90 000 m^3 per annum, that is, about 15 per cent. of 600 000 m^3 per annum.

In New South Wales the Forestry Commission estimates that annual production will increase from about 618 000 m^3 per annum to 1 100 000 m^3 per annum in about 35 years' time. That would be after the present old growth has been cut over completely, with supplies based on a 40-year rotation.

The use of selected species and application of fertilizer would increase yields even further. Short rotations and other intensive production methods, however, increase the environmental effects.

5. *Softwood plantations*

Softwood plantations would produce significantly greater volumes of pulpwood in a short time span, when compared with native forest. They would also introduce an advantageous element of versatility into pulp production. An average softwood plantation in East Gippsland is likely to produce about 18 m^3 of wood per hectare per annum. If softwood replaces productive silvertop forests (production about 5 m^3 per hectare per annum), then the net gain is 13 m^3 per hectare per annum. Production of an extra 90 000 m^3 of green pulpwood annually would require a net area of about 7000 ha. Sufficient suitable public land is available and could be used for this purpose.

6. *Use of other pulp resources in Victoria*

A.P.M. has a guaranteed supply outside its forest area of up to 58 000 m^3 in 1975–76, increasing to 153 000 m^3 by 1982–83. The agreement was based on trends estimated in 1973. If A.P.M.'s expansion is slower than planned, or if part of the pulpwood supply from outside the A.P.M. forest area can be obtained from areas other than East Gippsland, an additional pulpwood resource would become available to supplement supplies for an East Gippsland industry.

It may, in the future, prove economic to transport some of the pulpwood resources of north-eastern Victoria to either Maryvale or Orbost.

7. *Recycling of waste paper*

Waste paper is used mainly in the production of pulp for packaging and industrial papers. This is expected to remain at about 50 per cent. of the raw material used to make these products. Cost of transport and ease of collection are key factors in the economic use of waste paper. Because of these factors, mills at Maryvale and West Footscray (Smorgon's) are better situated to utilize recycled paper, rather than one situated at Orbost. Accordingly, the recycling of waste paper could not be expected to be a major component of raw material supplying an Orbost mill.

G. Effects of a Pulpwood-based Industry in East Gippsland

1. *Economic effects*

(*a*) Regional development

The timber industry currently employs about 600 to 700 persons in sawmills, in the forests and in transporting raw material. It is estimated that a pulpwood-based industry would offer additional direct employment for about the same number, and this doubling of employment capacity would greatly stimulate the regional economy and assist decentralization to some degree.

(*b*) Economic benefits

More economic and effective forest management would ensue, due to increased returns from an otherwise unused timber resource, creation of more favourable regeneration conditions, and reduction of the fire hazard. These economic benefits accrue to the community at large.

2. *Environmental effects*

The establishment of a pulpwood industry of the size proposed will require commitment of a major portion of East Gippsland forests for one primary use—sawlog and pulpwood production—which will close some options for its use in the future. The establishment of a pulpwood industry of the size proposed would have significant environmental effects due to the mill itself, and to the forest operations necessary to supply it.

Some of the possible environmental effects of a pulpwood-based industry are discussed below.

(*a*) Mill

The mill could require in the order of 70 megalitres of water per day, thus involving diversions from the Snowy River and possibly the Brodribb River. If the Snowy River alone were to be utilized, then some impoundment would be necessary to

ensure supplies during minimum stream flows. This could affect availability of water for irrigation on the Orbost flats and for other purposes.

Bleached kraft pulp mills are not large energy consumers, but some energy would have to be transported to the region in one form or another. Electricity or natural gas are two alternatives. Pulp mill effluents, which constitute varying pollution hazards according to the type of mill and stage of pulp processing, are subject to greater controls in some overseas countries than presently exist in Victoria. Pollution is both organic (from fibre wastes) and inorganic. Effluent disposal and air emissions would have to meet Environment Protection Authority requirements.

(*b*) Forest

The East Gippsland region is one of great beauty, with a large range of land types that have been little disturbed in the past, relative to other areas of the State. The region contains a great richness and diversity of flora and fauna. The quality of water in the streams is excellent. Soil erosion is generally limited in extent throughout the study area, but is an important potential hazard.

The introduction of a large-scale integrated sawlog–pulpwood harvesting operation will cause significant changes to the forest environment. These can be minimized by adoption and implementation of adequate principles and guidelines.

It should be recognized that pulpwood harvesting is one aspect of wood production in a whole range of harvesting procedures. As most pulpwood is obtained from the same areas as sawlogs, the operations such as roading, felling, snigging, and regeneration treatment are common to both sawlog and pulwood procurement, and the main difference of integrated operations is in the intensity of utilization of a given area. Integrated operations differ from some intensive harvesting operations by the removal of wood from the site that would otherwise have been left as a cull tree, or as sawlog residue that would have been burnt or left to decay.

The precise nature and significance of any change can only be determined by long-term research. Distinguishing between the effects of pulpwood/sawlog harvesting and sawlog harvesting would require considerable research. Some of the environmental effects are mentioned briefly below.

(i) Soil compaction, disturbance, and erosion due to roading, felling, snigging, and other forest operations.

(ii) Soil nutrient losses, changes to patterns of nutrient recycling, and deterioration of soil structure.

(iii) Alteration of stream characteristics, such as quality, quantity, and flow regime. This may affect stream ecology and uses, such as fresh-water angling and other forms of recreation.

(iv) Changes in species composition of vegetation associations. This may be caused by obvious means, such as resowing with alien tree species. Other forest management practices, such as regeneration burning or fertilizer applications may have considerable effect on the composition of the understorey.

(v) Changes in gene pools of both flora and fauna. It is possible that forestry practices of the type envisaged could reduce the genetic diversity of the East Gippsland flora and fauna populations. Associated with a reduction in genetic

diversity of a species is the decrease in its adaptability to changing environments in the long term and loss of exploitable germ-plasm available to future plant or animal breeders.

(vi) Changes in fauna populations by variations in the quality and quantity of available habitat, for example, alterations to structure and composition of vegetation. Local populations of some wildlife species may be severely reduced by loss of mature trees or decreased diversity of flowering plants.

(vii) Creation of instability in the environment leading to substantial and irreversible changes because of the introduction of pest plants or animals, or other injurious agents, such as cinnamon fungus, or by altering the balance between a host and the organisms that attack it.

(viii) Alteration of aesthetic appearance and recreational characteristics of the forest. Harvesting may have short-term visual effects, but at the same time, forest roads provide increased opportunities for forest recreation.

It is not possible to predict the exact nature, extent, or significance of these changes on the basis of present knowledge. An environmental-effects assessment is essential before any commitment to industry is authorized. The Forests Commission is gathering data—based on past and current experience, directly and through other interested and qualified bodies—on the likely environmental effects. Studies on a few experimental sites in the study area, involving integrated sawlog-pulpwood operations, have been approved by the Government. The full extent and effect of changes will be realized only through long-term research.

H. Land-use Implications

The Forests Commission has estimated that all productive pubic land in the study area could support a sustained annual supply of 600 000 m^3, based on a 70-year rotation.

Of all the alternative strategies to utilize the pulpwood resource, a kraft pulpmill at Orbost would require the greatest volume, and the Forests Commission considers that 600 000 m^3 per annum would be the minimum amount of pulpwood necessary for an economically viable mill. Therefore, the minimum amount of land required in the East Gippsland study area would be all the land carrying productive forest, if other alternative supply strategies were discounted. This would preclude any other recommendation that assigns another primary use to land where intensive timber production is incompatible.

There are strong arguments for areas for parks, wilderness, reference, flora and fauna, education, and other primary uses, which must be considered when deciding on land-use recommendations.

The following table outlines the estimated pulpwood resources contained for some areas in various land-use categories. Parks and wilderness areas remove the option to harvest 12·7 per cent. of the pulpwood resource. The uncommitted land near Mount Ellery, with its particular land-use stipulations, makes it possible to retain the option of including another 1 per cent. of the resource in a pulpwood supply area while, at the same time, maintaining options for inclusion into a park or other type of reserve where timber harvesting is not permitted.

Proposed land-use category.	Area.		Pulpwood volume.*	
	Total (ha).	Percentage of public land.	000's tonnes.	Percentage of pulpwood resource in study area.
1. Croajingalong Park	81 000	9·9	4 100	8·9
2. Coopracambra Park	13 000	1·6	510	1·1
3. Tingaringy Park	17 000	2·1	90	0·2
4. Snowy–Bowen Wilderness	46 000	5·6	1 120	2·5
(Sub-total)	157 000	19·2	5 820	12·7
5. Ellery (uncommitted land)	2 900	0·4	420	1·0
Grand total	159 900	19·6	6 240	13·7

* These resource estimates are provisional only.

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Appendix (i)

INDUSTRIES RELYING ON SUBSTANTIAL SUPPLIES OF EUCALYPT PULPWOOD

Packaging and industrial paper

Australian Paper Manufacturers Ltd. (A.P.M.) supplies about 75 per cent. of the Australian market, Smorgon Consolidated Industries Ltd. (S.C.I.) about 10 per cent. and A.P.P.M. (in Tasmania) about 5 per cent. About 10 per cent. is imported (1). A.P.M. obtains its raw material from several sources. About 50 per cent. comes from recycled paper, 15 per cent. from imported pulp, and 35 per cent. from pulp manufactured from both eucalypt and softwood (2). Two-thirds of the pulp is manufactured at Maryvale, Victoria.

Newsprint

Australian Newsprint Manufactuers Ltd. (A.N.M.) operating a mill at Boyer, Tasmania, is the sole Australian producer of newsprint. In 1972–73 it produced 196 000 tonnes (1), which represents about one-third of Australian consumption. Present capacity is 210 000 tonnes per annum (1).

Future consumption is expected to increase to between 0·94 and 1·1 million tonnes by 2010, based on poulations of 16·5 and 19 million and *per capita* consumption of 0·057 tonnes in that year (0·038 tonnes in 1970). This leaves a considerable deficit in the pulp required to lift Australian production levels to meet the predicted consumption.

Expansion of the mill at Boyer to meet the increased demands may not be as economic as the establishment of a new mill because of the limits of the forest resource, and industrial and transportation problems. The shortfall is likely to be between 0·94 and 1·03 million tonnes by 2010.

The minimum economic size for a pulp mill appears to be one with a production capacity of about 220 000 tonnes of newsprint per annum, with a pulpwood requirement of about 500 000 per annum (3). The Boyer mill utilizes mature ash-type eucalpyts and, at present, it does not appear technically feasible to produce groundwood pulp from the mix of eucalypt species growing in East Gipppsland.

Printing and writing papers.

Associated Pulp and Paper Mills Ltd. (A.P.P.M.) is the main Australian producer of printing and writing papers. Total Australian production currently meets 50 per cent. of consumption, which in 1970 totalled 241 000 tonnes (1). By 2010 domestic consumption is predicted to rise to between 728 000 and 838 000 tonnes (4), based on forecasts of population and *per capita* consumption from previously quoted sources.

Export pulp and chips

A predicted world-wide shortage of pulp and chips should lead to an estimated export opportunity of 8 million tonnes per annum by 1990 (4).

At present about 2·5 million tonnes of chips are exported per annum. Harris–Daishowa at Eden exported 0·5 million tonnes in 1974–75, and 2·0 million tonnes was exported from Tasmania (5). Large-scale export of eucalypt wood chips will begin from Manjimup (Western Australia) this year (1976).

References

(1) Forestry and Wood-based Industries Development Conference (Forwood)—Report of Panel 5—Wood-based Industries (Australian Government Publishing Service : Canberra, 1975)

(2) Information Supplied by Australian Paper Manufacturers Ltd.

(3) Information Supplied by Forests Commission of Victoria

(4) Forestry and Wood-based Industries Development Conference (Forwood)—Report. (Australian Government Publishing Service : Canberra, 1975)

(5) Anon—" Exports and Imports ". (Commonwealth Bureau of Census and Statistics : Canberra, 1975)

APPENDIX (ii)

MAJOR EUCALYPT PULPWOOD RESOURCES IN AUSTRALIA

The table below indicates the localities, areas of productive State forest, and pulpwood-using industries, based substantially on eucalypt pulpwood, associated with each region (1).

MAJOR AUSTRALIAN CENTRES WITH SUBSTANTIAL EUCALYPT PULPWOOD RESOURCES

Locality.	Region.	Area of productive State forest (ha).		
		Native forest.	Plantation.	Pulpwood-using industries.
1. N.S.W. north coast	12. Coffs ..	362 700	3 800	None
2. N.S.W. south coast	23. Eden and 21. (part) Nowra	186 600	3 600+	Harris-Daishowa (export chips)
3. Eastern Victoria	26, 27, 28, 29 and 30	1 352 300	33 300	A.P.M. (packaging) S.C.I. (packaging) H.A.L. (hardboard)
4. Mid-north and north-eastern Tasmania	33. ..	275 700	10 900	A.P.P.M. (fine papers) A.P.P.M. (export chips) Northern wood chips (export chips—private land)
5. Central east coast Tasmania ..	34. Devonport, Georgetown	299 100	3 300	A.N.M. (newsprint) T.P.F.H. (export and chips)
6. South-eastern Tasmania	35. Huonville ..	130 600	100	A.P.M. (packaging)
7. North-western Tasmania ..	37. Burnie ..	205 000	3 700	A.P.P.M. (fine papers)
8. South-western Western Australia ..	43 and 44 Manjimup	3 025 500	40 400	(Export chips in near future)

REFERENCE

(1) FORESTRY AND WOOD-BASED INDUSTRIES DEVELOPMENT CONFERENCE (FORWOOD)—Report of Panel 2—Forest Resources. (Australian Government Publishing Service : Canberra, 1975)

APPENDIX (iii)

INDUSTRIES USING EUCALYPT PULPWOOD AND/OR CHIPS OBTAINED FROM VICTORIA OR SOUTHERN NEW SOUTH WALES

(*a*) Australian Paper Manufacturers Ltd. (A.P.M.)

A.P.M.'s pulp mills at Maryvale produce about 175 000 tonnes of pulp per annum. This requires an annual supply of about 630 000 tonnes of pulpwood. A new paper mill is scheduled for completion next year. The *Forests* (*Wood Pulp Agreements*) *Act* 1974 has provided for increased eucalypt supplies, rising from a minimum annual supply of 290 000 m^3 of eucalypt pulpwood in 1975–76 to 765 000 m^3 from 1982–83 onwards.

These supplies are to come mainly from the A.P.M. forest area as defined by legislation, but up to 20 per cent. of the minimum annual supply may be met from outside this area ; that is, 58 000 m^3 in 1975–76, increasing to 153 000 m^3 by 1982–83. Softwood requirements will be met from an expansion of company plantations and from Forests Commission plantations, as provided for by the legislation mentioned above. Wood chips from sawmill residues will also supplement supplies.

(*b*) Smorgon Consolidated Industries Pty. Ltd. (S.C.I.)

This company also pulps eucalypts and softwoods for manufacture into packaging paper and paper board. In 1972–73 S.C.I. produced 92 000 tonnes of paper.

Current total productive capacity is 97 000 tonnes of paper per annum, and the commissioning of a new paper machine in the near future will increase the capacity to 157 000 tonnes. The current annual supply level from State forest is about 60 000 m^3, but requirements will increase to about 100 000 m^3 when the new paper machine is operating.

To date, the Otway State Forest has been the main source of eucalypt supplies. Increased requirements could be met from forests on public land to the north of Melbourne.

(*c*) Hardboards Australia Ltd. (H.A.L.)

This company manufactures hardboard from eucalypt pulpwood and sawmill residue. This material is mostly derived from the Wombat Forest and adjacent public land. Supplies of up to 70 000 tonnes of pulpwood per annum are guaranteed by legislation.

(*d*) Harris–Daishowa (Australia) Pty. Ltd.

An agreement between this company and the New South Wales Government provided for a supply of 530 000 tonnes of wood chips per annum from Crown forests up until December, 1989. Within the Eden pulpwood supply area, the New South Wales Forestry Commission plans to manage some 182 000 ha of eucalypt forest on a 40-year pulpwood rotation, which is estimated to produce 618 000 m^3 of pulpwood per annum until the area has been completely cut over and then produce about 1 100 000 m^3 per annum from the regrowth forest.

The company plans to process about 700 000 tonnes of wood in 1975. Of this, 63 per cent. (440 000 tonnes) will be from New South Wales State forest, 9 per cent. (130 000 tonnes) from private property clearing (a non-sustainable supply source), 12 per cent. (83 000 tonnes) from residues from Victorian sawmills, and 7 per cent. (50 000 tonnes) from New South Wales sawmills (1).

The New South Wales Government, in its agreement with the company, indicated its desire to have the wood chips converted to pulp locally, in due course, rather than exported in an unprocessed form. The company has applied to the Victorian Government for substantial supplies of pulpwood from Victorian public land to allow expansion of the Eden export project and, if feasible, the construction of a pulp mill. However, there are problems in supplying enough water (a minimum-sized bleached kraft pulp mill requires 70 megalitres per day) to a mill sited at Eden, and Orbost has been considered as a possible alternative site.

REFERENCE

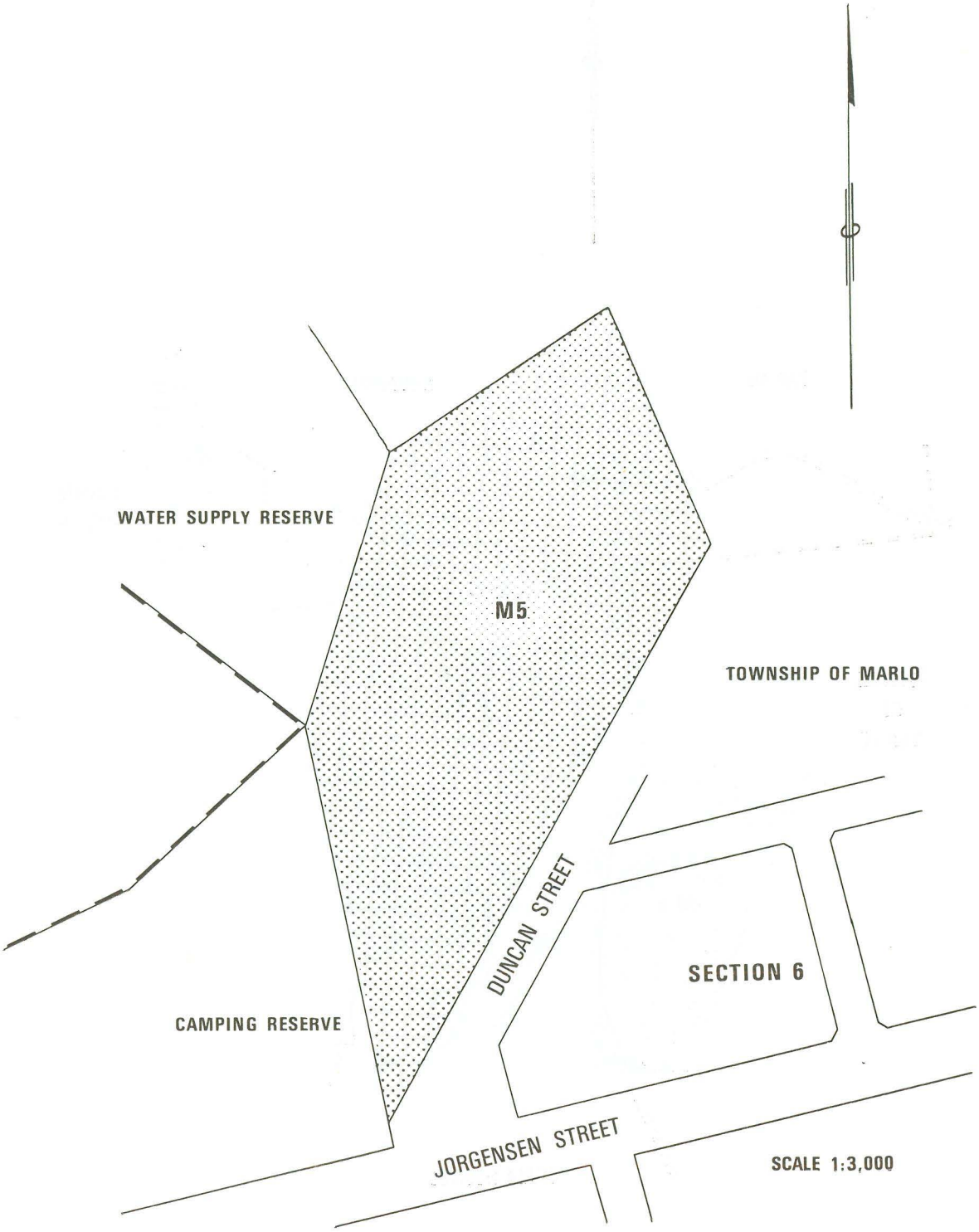
(1) SCOTT, W. D.—" A Study of the Environmental, Economic and Sociological Consequences of the Woodchip Operations in Eden, New South Wales." W. D. Scott and Co. Pty. Ltd., 1975)

By Authority: C. H. RIXON, Government Printer, Melbourne.

MAPS

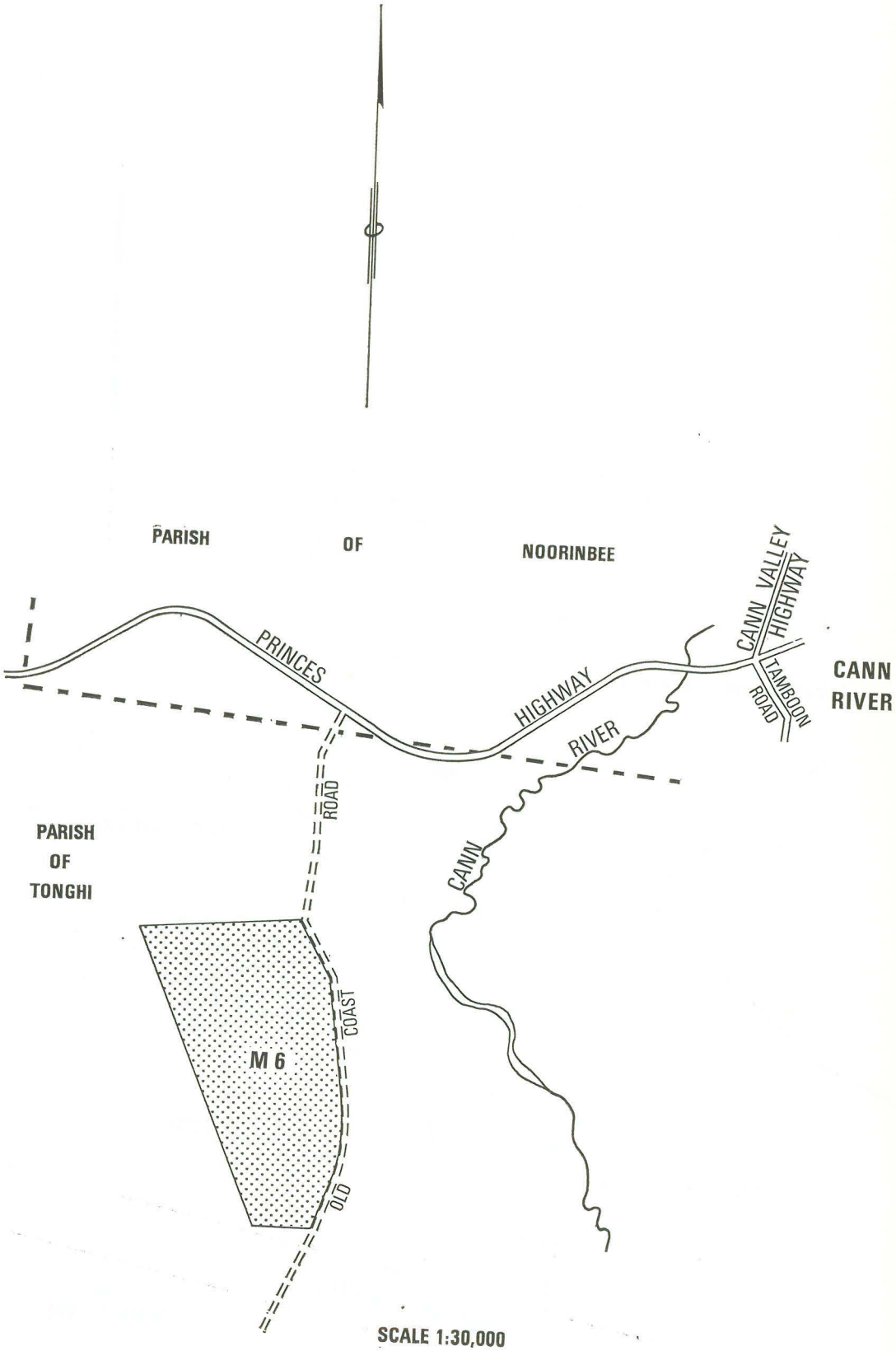
RECREATION RESERVE M5
MARLO

MAP NO.3



RECREATION RESERVE M6
TONGHI

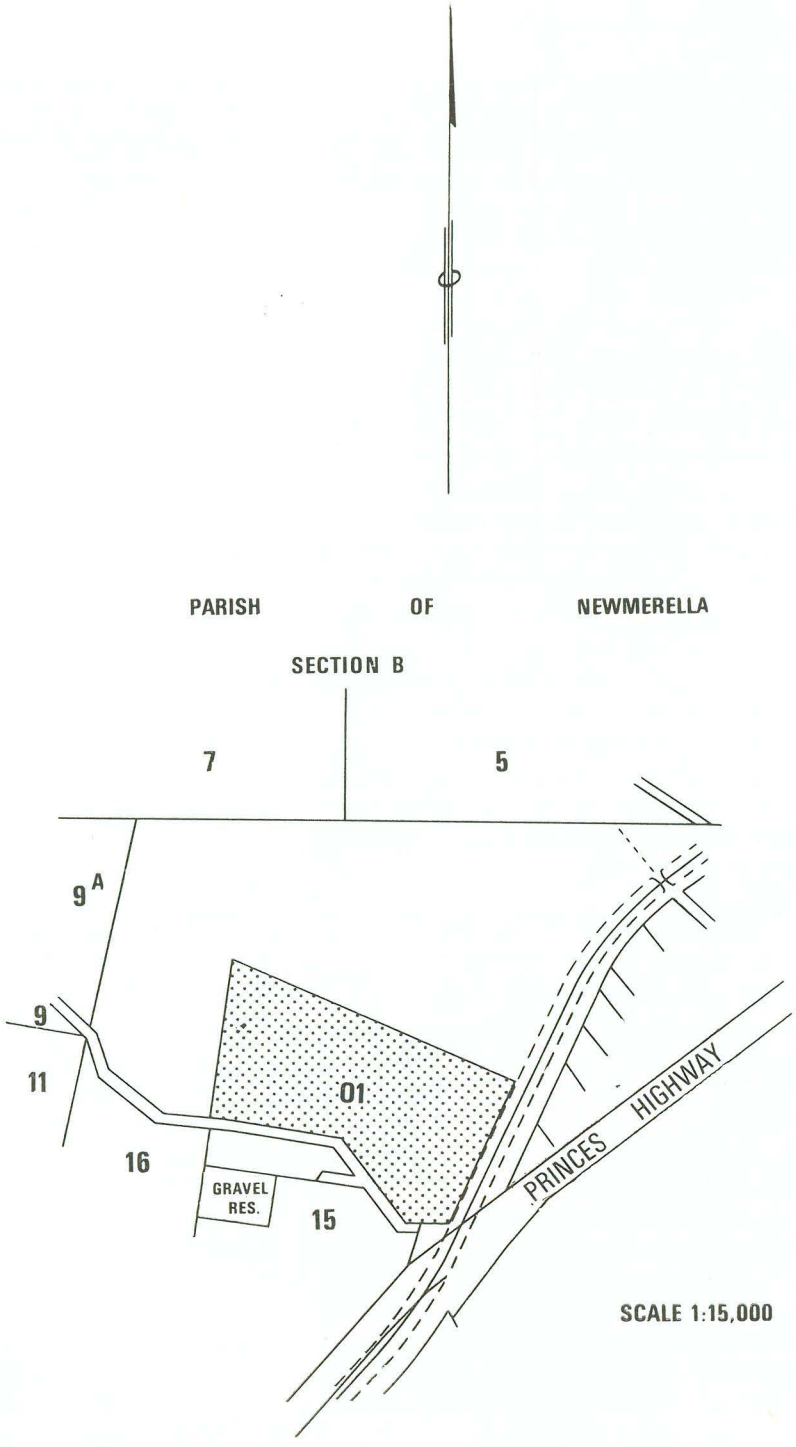
MAP No.4

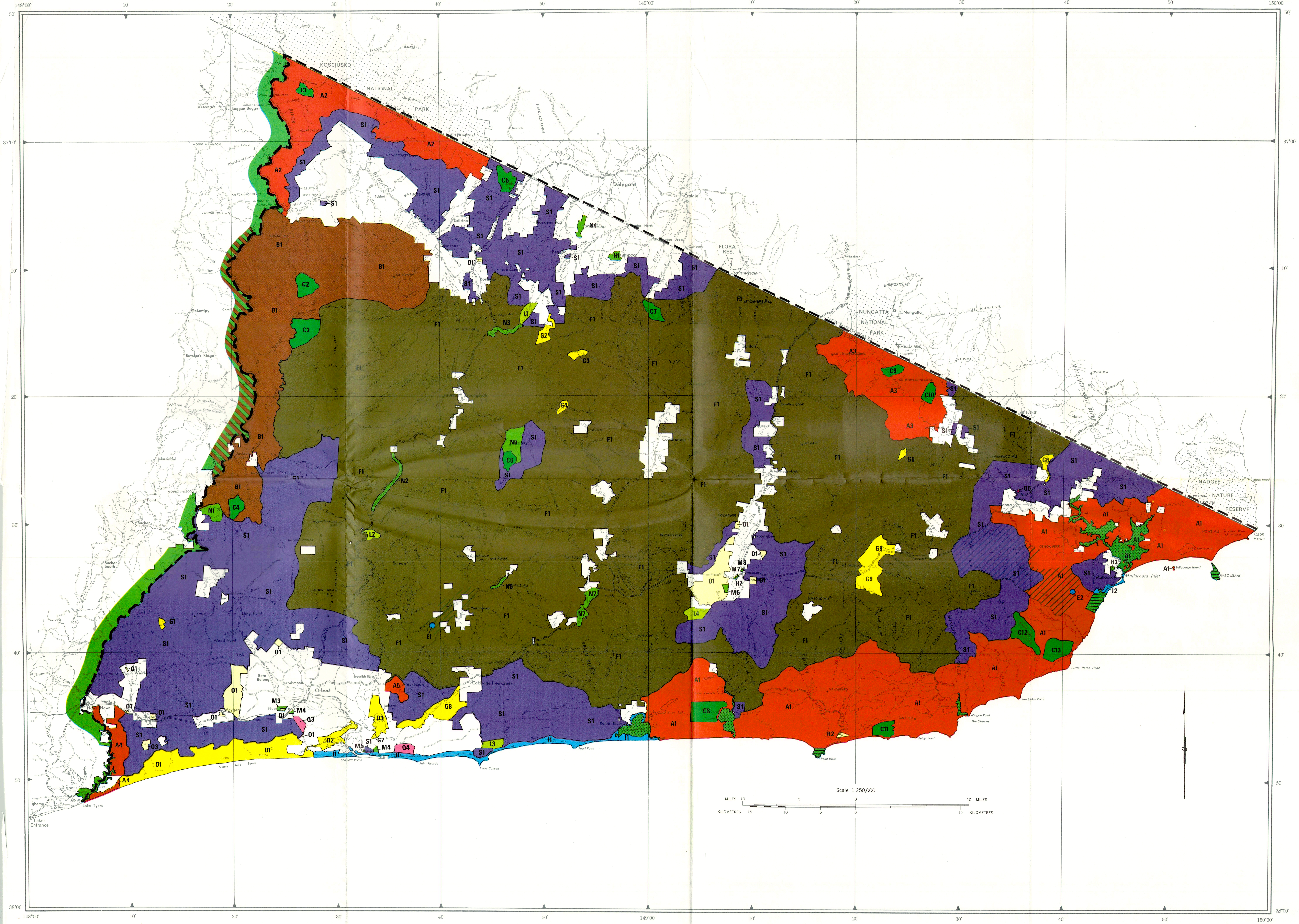


AGRICULTURE 01

MAP No.5

NEWMERELLA





PROPOSED RECOMMMENDATIONS

LAND CONSERVATION COUNCIL

VICTORIA

EAST GIPPSLAND STUDY AREA

PARKS	National	A1 *Croajingalong* A2 *Tingaringy*
	State	A3 *Coopracambra* A4 *Lake Tyers*
	Regional	A5 *Mt.Raymond*
WILDERNESS		B1
REFERENCE AREAS		C1 *Gattamurrh Creek* C2 *Gelantipy Plateau* C3 *Mountain Creek* C4 *Zig Zag Creek* C5 *Concordia Gully* C6 *Big River* C7 *Musket Creek* C8 *Camp Creek* C9 *Yambulla* C10 *Merragunegin* C11 *Baawang* C12 *Benedore River* C13 *Seal Creek*
WILDLIFE RESERVES		D1 *Ewing Marsh* D2 *Lake Corringle—Lake Wat Wat* D3 *Lake Curlip*
WATER PRODUCTION		E1 *Rocky River* E2 *Betka River*
HARDWOOD PRODUCTION		F1
FLORA AND FAUNA	Flora	G1 *Mottle Range* G2 *Delegate River* G3 *Goonmirk Rocks* G4 *Kanuka Creek* G5 *Jones Creek* G6 *Maramingo Creek*
	Flora and Fauna	G7 *Brodribb River* G8 *Cabbage Tree Creek* G9 *Mt.Drummer*
BUSHLAND RESERVES		H1 *Mt.Bendock* H2 *Cann River* H3 *Mallacoota*
COASTAL RESERVES		I1 *Corringle Creek to Sydenham Inlet* I2 *Mallacoota*
EDUCATION AREAS		L1 *Bidwell* L2 *Sardine Creek* L3 *Yeerung* L4 *Serpentine Creek*
RECREATION RESERVES		M3 *Newmerella* M4 *Various* M5 *Marlo* M6 *Tonghi* M7 *Cann River* M8 *Cann River*
SCENIC RESERVES		N1 *Raymond Creek* N2 *Martin Creek* N3 *The Gap* N4 *Mt.Delegate* N5 *Mt.Ellery* N6 *Arte River* N7 *Bemm River*
AGRICULTURE		O1 *Various* O3 *Tostaree Pilot Farm*
UTILITIES AND SURVEY		Q3 *Newmerella sewerage treatment works* Q4 *Marlo Aerodrome* Q5 *Maramingo Rubbish Tip*
TOWNSHIP LAND		R2 *Point Hicks*
UNCOMMITTED LAND		S1
		Public land in proclaimed water supply catchments
		Possible extension of wilderness
		Public land for which there is no specific recommendation
		Public land outside the study area
		Australian Government land (not "public land" as defined in the Land Conservation Act 1970)

BOUNDARY OF STUDY AREA

MAP No. 1