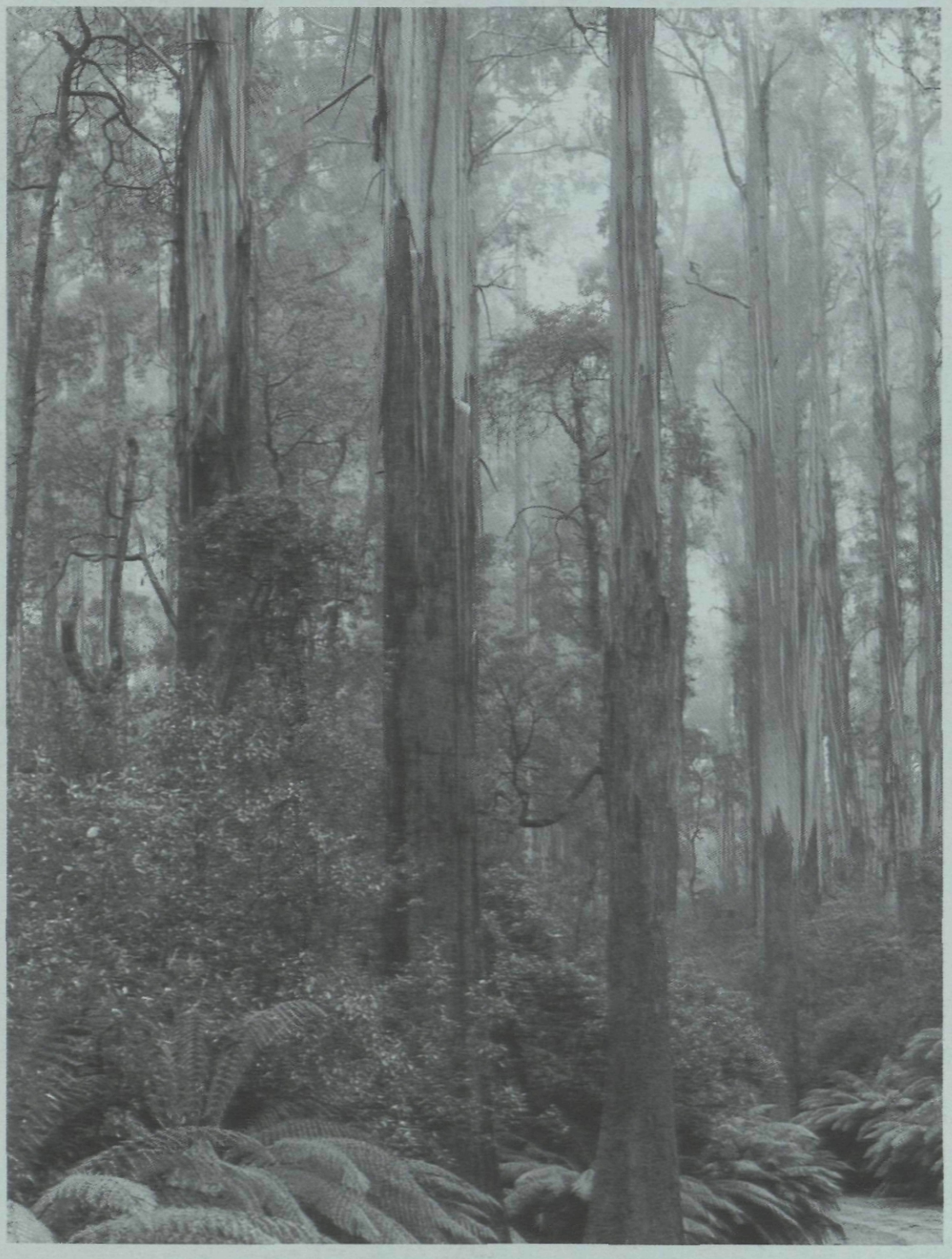
MELBOURNE AREA

DISTRICT 2 REVIEW

FINAL RECOMMENDATIONS



LCC LAND CONSERVATION COUNCIL

MELBOURNE AREA

DISTRICT 2 REVIEW

FINAL RECOMMENDATIONS

JULY 1994

LAND CONSERVATION COUNCIL
First Floor, 477 Collins Street, Melbourne,
Victoria 3000
Phone: (03) 628 5142
Government of Victoria

ISBN 0 7241 9266 2

Price $5.00

Cover photograph:

Old-growth ash forest in Melbourne
Water's Wallaby Creek water supply catchment

Photograph provided courtesy of Melbourne Water

Members of the Land Conservation Council

D.M. Calder, M.Sc., Ph.D., M.I.Biol. (Deputy Chairman)

P.J. Dowd, B.Sc.(Eng.); Deputy Secretary, Resources Development, Department of Energy and Minerals

R.L. Leivers Dip.Agr.Sc; B.Agr.Sc.(Hons); Director, Catchment and Land Management, Department of Conservation and Natural Resources

R.D. Malcolmson, MBE., B.Sc., F.A.I.M., M.I.P.M.A., M.Inst.P., M.A.I.P.

B. Nicholls, M.Ec., B.Ec., Hons. (1st Class), TPTC; Secretary, Department of Planning and Development

P. Price, B.Sc, Dip.Ed.

R.P. Rawson, Dip.For.(Cres.), B.Sc.F.; Director, Forests Service, Department of Conservation and Natural Resources

D. Robinson, B.Sc.(Hons.), Ph.D.

D.S. Saunders, B.Agr.Sc.; Director, National Parks Service, Department of Conservation and Natural Resources

P.G. Sheehan, Dip.For.(Cres.), B.Sc.F, M.Sc.F.; Director, Flora, Fauna and Fisheries, Department of Conservation and Natural Resources

P.D. Sutherland, B.A., B.Sc.(Hons); Manager, Sustainable Development, Department of Agriculture

A.H. Teese, B.Agr.Sc., T.S.T.C.

A. Thompson, B.Eng., M.Sc., D.I.C., F.I.E. Aust.; Secretary, Department of Conservation and Natural Resources

---

Mr D.H.F. Scott, A.O., retired as Chairman of the Council in May 1994. He chaired all but one of the meetings of Council relating to the Melbourne Area, District 2, Review. Mr Scott was appointed Chairman of the Council in 1984 and during this time, ensured that the principles on which the Council is based were upheld. His strong belief in the need for effective community consultation was reflected in the manner in which the numerous investigations for which he was responsible were conducted.

Council expresses its sincere appreciation of Mr Scott's major contribution to public land-use planning in Victoria as Chairman of the Land Conservation Council.

CONTENTS

		Page
Introduction		1
	Final recommendations	14
A	Parks	32
	National parks	34
	State parks	61
	Regional parks	74
B	Reference areas	82
C	Nature conservation reserves	85
	Specific flora and fauna	90
	Nature conservation reserves	99
D	Water production	114
E	Timber production and State forest	129
	State forest	147
F	Historic and cultural features reserves	166
G	Natural features reserves	182
	Streams and frontages	183
	Natural and scenic features	195
	Bushland areas	197
H	Coasts	205
I	Alpine resorts	213
J	Community use areas	223
	Education areas	223
	Recreation	227
	Parklands and gardens	236
	Buildings in public use	239
K	Plantations	240
L	Earth resources	248
M	Services and utilities	252
	Transport	253
	Electricity and gas	258
	Communications, survey and navigation	260
	Municipal buildings and services	261
	Hospitals, public offices and justice, and Water and sewerage services	263
	Cemeteries, and Other utility uses	265
N	Uncategorised public land	268
O	Land not required for public purposes	274
P	Military training	280

Page

Appendices

I List of submissions 287

II Council's proposals for public land now included in cities 299
(i) Rural City of Seymour 299
(ii) City of Cranbourne 302

III Ecological vegetation classes and floristic vegetation communities 307

IV Physical and chemical water quality 314

V Recommendations for heritage rivers 315

VI Guidelines for protection of the Alpine Walking Track 322

VII Community Use Areas 323
(i) Recreation areas 323
(ii) Buildings in public use 324

VIII Services and Utilities 326
(i) Hospitals, public offices and justice 326
(ii) Water and sewerage services 326
(ii) Cemeteries 327

IX Uncategorised Public Land 328

X Guidelines for land exchange proposals 330

Maps

A Final recommendations - 1:250 000 .. .. back pocket

B Dandenongs Area .. .. back pocket

C Wonthaggi Area .. .. back pocket

D Lake Mountain 281

E Arthurs Seat 282

F Warrandyte—Kinglake nature conservation link .. .. back pocket

G Public land around Crib Point 283

INTRODUCTION

This report contains the Land Conservation Council's final recommendations following its review of the use of public land in the Melbourne Area, District 2. The recommendations in the text are grouped under major headings, such as parks, nature conservation reserves, community-use areas and so on. Accompanying the text, a map at the scale of 1:250 000 covers the whole study area and gives a broad view of the proposed land uses. More detailed maps show the location of the recommended land uses in the vicinity of the Dandenongs, Wonthaggi, Lake Mountain, Arthurs Seat, Watsons Creek and Crib Point. Additional information on boundaries is held by the Council.

The Land Conservation Council

The Land Conservation Council was established by the *Land Conservation Act* 1970. One of its three functions, as defined by the *Act*, is to carry out investigations and make recommendations to the Minister with respect to the use of public land in order to provide for the balanced use of land in Victoria. In making its recommendations, Council is required to have regard both to the present and future needs of the people of Victoria in relation to the creation and preservation of areas of conservation and recreation value. In this context, the Council endeavours to make recommendations that are relevant both to the present and to 50—100 years hence.

Under its legislation, Council must have regard to the social and economic implications of its recommendations. It has also taken the view that it must achieve a balance between community needs of public land as seen from local, regional, State and national perspectives. As such, it provides for a wide range of uses on public land, including water supply, the harvesting of forest produce, apiculture and mineral and stone extraction, as well as conservation and recreation.

Land-use issues are often distinguished by their extraordinary complexity, polarisation of opinion and the diverse and frequently highly technical matters that must be addressed. Accurate and accessible data are often lacking, debates are frequently unstructured and superficial and the terms used, such as conservation, development and sustainability, lack precise, widely understood meanings.

As the Fitzgerald Inquiry Report on Fraser Island (May 1991) points out, 'there can be no outcome to this Inquiry or any other process which does not have disadvantages as well as advantages, and which will not result in dissatisfaction and complaints. Ultimately, the decisions which must be made are political and the decisions to be made are about competing values and interests'.

Mr Fitzgerald also stated that a report of this kind 'cannot establish indisputable, immutable, factual or scientific findings or apply recognised principles to make recommendations, which satisfy every need. Zero-based planning is impossible; the slate is not perfectly clean; the *status quo* includes not only the present natural environment, but also the lives, activities and aspirations of communities and individuals. Although future options should not be foreclosed where that can be avoided, governments have to make essential decisions, despite uncertainties, on the basis of available information and advice'.

These comments apply equally to the Council's recommendations which, although they draw largely on the available information base, including that provided by the community in discussions and submissions, inevitably involve some judgements based on the Council's view of its requirement to recommend on the balanced use of public land. It is for the government to determine whether to adopt Council's recommendations.

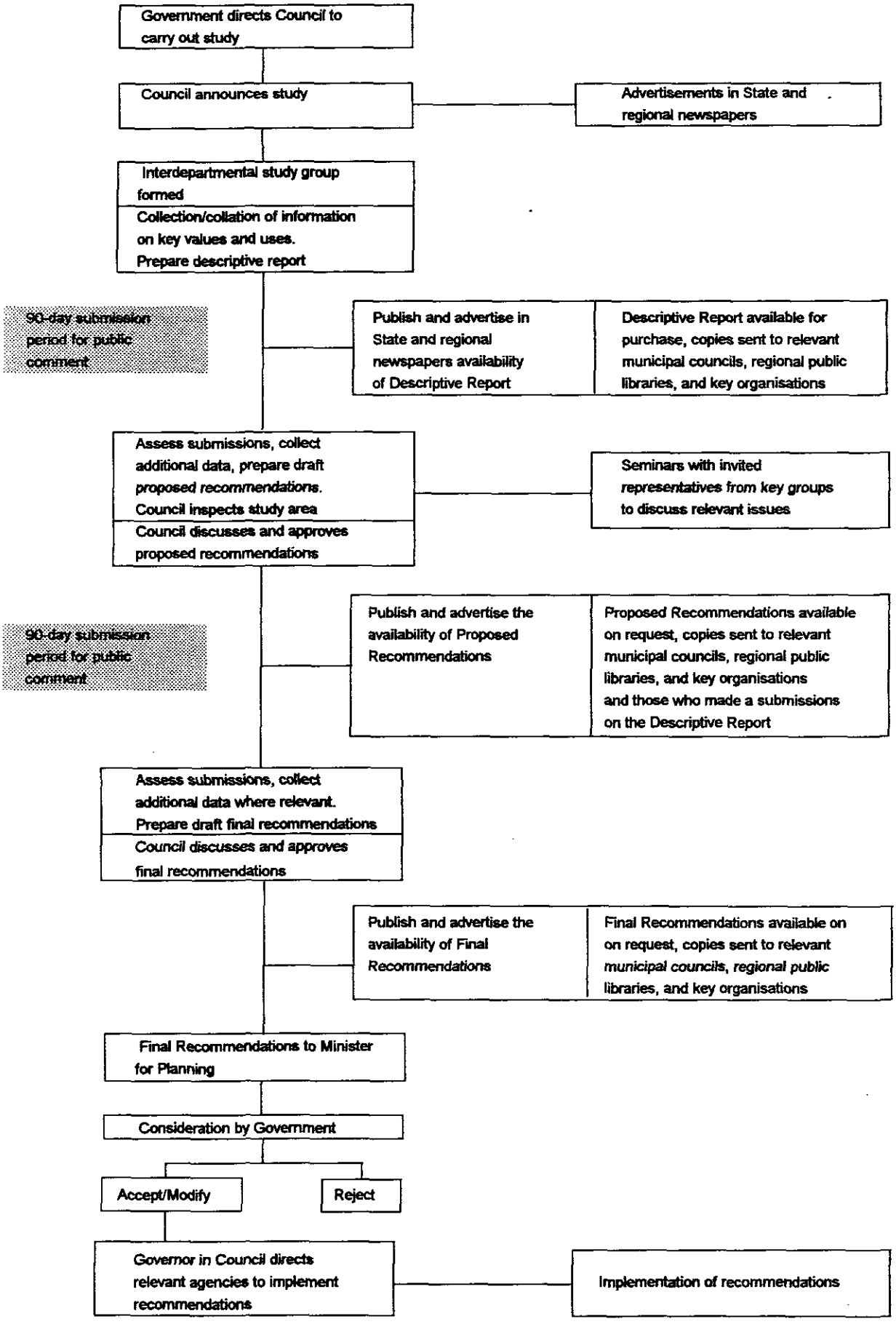
Investigation process for the review

The investigation process is shown diagrammatically in Figure 1.

Notices showing the boundary of the area of the Melbourne Area, District 2, Review and advising that an investigation was to be carried out were published in the *Victoria Government Gazette* on 27 May 1987, and in local and other Victorian newspapers in May 1987. The descriptive resources report was published in August 1991.

The resources report described the physical and biological attributes of the study area,

Figure 1: INVESTIGATION PROCESS



including an assessment of various natural resources, present public land uses and alternative forms of land use with an assessment of the hazards and conflicts associated with specific uses, and discussed the major land-use issues in the study area. It provided a factual basis upon which members of the community could base their submissions to the Council.

Media organisations, libraries, parliamentarians, municipal councils, State government departments and interested groups were notified of the availability of the report; many also received a complimentary copy. Copies were made available for viewing and purchase in a number of city and country locations. A brochure describing the report was also prepared and widely distributed.

Submissions were sought for a period of 90 days following the publication of the report. In addition, formal briefings and discussions were held with relevant municipal councils as well as with major industry, recreation and conservation groups. A general invitation was made for any person to contact the Council.

Prior to the formulation of its proposed recommendations, the Council sought additional resource information, undertook several inspections in the area to gain first-hand information on the range of values and potential conflicts, obtained the detailed comments of public land managers, conducted workshops for interested organisations on conservation and timber-production issues and considered an independently prepared social and economic assessment.

The proposed recommendations were published on 1 April 1993 and submissions again invited from the public for a further 90 days. All submissions received were forwarded to the Council members for their consideration. Comments and issues raised during meetings with individuals and groups were also made available to Council members.

These final recommendations are the last stage of the process followed by the Council in accordance with the *Land Conservation Act* 1970. They have been presented to the Minister for Planning for consideration by the government. The unexpected delay between the proposed and final recommendations has occurred because the Council wanted to evaluate the findings of the joint Australian Heritage Commission/Department of Conservation and Natural Resources (AHC/CNR) study of the Central Highlands before completing its recommendations. Unfortunately, that study was delayed approximately 4 months, due mainly to the large volume of data which needed analysis and consideration.

Recommendations in this publication apply solely to public land within Council's jurisdiction - that is, public land outside cities and rural cities. Council is not empowered to make recommendations for private land. In November 1993, the Rural City of Seymour was declared over the former Shire and, in April 1994, Cranbourne Shire became the City of Cranbourne. As a result, a number of areas of Crown land listed in the proposed recommendations do not now appear as recommendations; these are listed in Appendix II. In the latter case, Council had already agreed to its final recommendations for land in the Shire. Appendix II lists those agreed final recommendations.

Public land-use categories

Council's recommendations identify land-use categories and, for each category:

* specify its purpose
* nominate the suitable uses
* list the inappropriate uses that are not permitted there
* may include policies that explain or interpret its basic purposes
* may refer to principles and/or guidelines to be put into effect in more detailed management plans or site-specific proposals
* specify the form of reservation

The Council has, in the past, used some 50 public land-use categories to identify and distinguish between different recommended uses. Some concern has been expressed in the community that this large number of categories causes confusion. Public land managers have commented that the current administrative process for reservation is very cumbersome and time-consuming and that the public confusion makes management more difficult.

These concerns were discussed in the Council's Statewide Assessment of Public Land Use report in 1988.

Following review of the nature and intent of the land-use categories previously employed, the Council has adopted a system of 19 principal categories. This has been achieved by

simplifying the previous categories and amalgamating the wording of the recommendations to apply generally to all areas covered by each chapter, but adding references to specific characteristics and uses that provide sub-divisions within the broader category. For instance, in Chapter G, Natural Features Reserves, a general recommendation applies to the whole category, but particular recommendations apply to specific elements such as stream-side areas, natural and scenic features and bushland.

This approach retains continuity with the former recommendation wording for distinct reserve types. However, it will simplify the reservation process, as areas will be reserved according to the title of the chapter.

Principles adopted in developing the recommendations

In formulating its proposed recommendations, the Council, as in past investigations, established a set of principles to guide its discussions and against which it could evaluate the range of information on land-use issues in Melbourne Area, District 2. These principles, which the Council also applied to the preparation of the final recommendations, follow.

* The conservation reserve system in Victoria should contain adequate representation of the major land systems, vegetation communities and faunal habitats in the State.

* The long-term conservation of significant, rare, endangered or notable species should be provided for, although it may not be necessary or possible to include the entire range or habitat of each within the conservation reserve system.

* All public land in the study area is to be reviewed and the values already included in the State-wide system of conservation reserves are to be taken into account when consideration is being given to any additional reserves.

* The park system should provide for a range of recreational activities, although not all should necessarily be provided in every park or throughout the one park. Land managers must continue to zone parks to protect important conservation and other values and to avoid or minimise the impact of incompatible uses, both on park values and on user groups.

* Harvesting of forest products should be permitted in State forest under management prescriptions to prevent *ad hoc* variations to operations. The sustainable levels of output should be specified in legislation in order to offer a secure future to industry.

* Land designated as State forest has significant water-production, landscape, cultural and conservation values. It contains many rare plants and, considering it occupies about 40% of all public land in the State, has major significance as faunal habitat. In addition, it provides a range of products required by the community, the most significant being sawn timber and pulpwood for paper production, and also provides important recreation opportunities, some of which may not be appropriate in parks. The Council considers that provision for this range of uses is an appropriate function of State forest.

* The concept of multiple use of all public land espoused by some community groups and organisations does not provide adequate protection of the significant values that have been identified. It is therefore considered necessary to establish a conservation reserve system to protect significant values as well as designate other areas where some activities and some values may be mutually incompatible.

* The National Forest Policy Statement endorses the Council's long-standing approach to conservation. This approach, as outlined in the strategy, has three elements. First, parts of public native forest estate are to be set aside in dedicated nature conservation reserves to protect native forest communities. Second, complementary management will occur outside reserves. Third, the management of private forests in sympathy with nature conservation goals will be promoted. Thus, the need for a dedicated nature conservation reserve system is widely recognised as an integral component of a broad conservation strategy, not as an alternative to the concept of multiple use.

* While it is not its role to predict the nature or future trends of the sawn timber and pulpwood markets, the Council does have a responsibility to make recommendations to the government on the balanced use of land, including the wise use of resources obtained from it.

* In accordance with the *Land Conservation Act* 1970, the Council must take into account the social and economic implications of any new land-use recommendation that it makes.

New information

The Council is aware that not all needs for the use of public land can be foreseen, and that the value of environmental resources will change as exploration, research and technology progress. For these reasons, its members believe that periodic reviews of public land use in the State are desirable, and areas must be expected to be re-allocated or adapted to meet changed demands.

The Council has taken the view that it would not automatically review public land use in a particular area. Rather, it will review only when a clear case exists - for example if a change occurs in the resources required by the community, or if a substantial body of new information becomes available.

Since the publication of the Council's final recommendations for the Melbourne Area in 1977, a considerable body of new information has been collected. This has generated a number of issues about the way that public land in the region should be used. The new information is described below.

Flora and fauna

Previous surveys of the natural resources of the study area have, in most cases, been regional or site-specific and, as a result, the available information covered only part of the area.

From the outset of this review, the Council recognised that it required a comprehensive study of the vegetation and fauna on public land, to provide an objective basis for future land-use decisions.

The Flora and Fauna Survey Group of the former Department of Conservation and Environment undertook a synthesis of data that had been gathered during the range of regional and localised studies conducted since publication of the Council's first resources report for the area in 1974. Additional information was gathered in the course of the study, particularly for the northern sectors where information was sparse.

Aerial photograph interpretation and field checking were undertaken and combined with other vegetation surveys to determine the nature and location of the plant communities on public land in the study area and to prepare a floristic vegetation map of the region.

Information from other studies has been integrated with that compiled by the Department of Conservation and Natural Resources.

The Wildlife Branch of the Department also undertook extensive field surveys of the fauna and collated existing information. The results of many of the earlier surveys have been entered on the Atlas of Victorian Wildlife. That data-base enabled assessment of the distribution, abundance and conservation status of the fauna of the study area. The habitat of most species of native fauna is strongly vegetation-dependent, and the broad plant communities identified in the flora survey were used to describe the major faunal habitats.

More than 2120 different species of plants have been recorded in the study area, 1553 of which are endemic. Of these, some 89 are regarded as rare and threatened and a further 12 have not been recorded since 1950 and are now presumed to be extinct there.

More than 35 distinct floristic communities have been described. Of these, one is considered to be rare, three vulnerable and nine regionally or locally depleted.

The Council considers that the reserve system should (as far as possible) include adequate representation of all major plant communities. This has been important in consideration of the additional areas recommended for parks and other nature conservation reserves.

The protection of native fauna depends on the availability and protection of suitable habitat. The study area includes a range of habitats for native animals and supports a number of significant faunal assemblages as well as rare or notable species. Some 471 species of native vertebrates are currently known for the area and these comprise 66 mammals, 320 birds, 19 fresh-water fish, 44 reptiles and 22 amphibians. A further 35 vertebrate species

are introduced. Data on invertebrates are not well known.

Land systems

Land systems identified in various studies across the State have recently been brought under a standardised labelling code such that land with similar characteristics is included in the same system irrespective of where it occurs in Victoria. This was not the case previously.

Some 780 land systems have been identified for Victoria, 101 of which occur in Melbourne Area, District 2.

The Council recognises that it is not possible to represent all land systems in reserves. However, it believes that the more extensive ones should be represented where suitable areas exist on public land, as well as smaller ones where these have important land-use or landform characteristics.

For the purposes of the Council's 1988 Statewide Assessment of Public Land Use, a land system was considered to be adequately represented if at least 10% of its estimated total area in the State fell within conservation reserves. On that basis, prior to these recommendations, 23 of the 101 land systems within the study area would be considered to be adequately reserved. Many of the remainder, however, are very small or have little or no representation on public land in the study area. Taking these factors into account, 15 land systems that have significant occurrences on public land in the study area are considered to be inadequately represented in the existing reserve system, although some are represented to a small degree in the reserves. These deficiencies have been considered by the Council in making its final recommendations.

Other information

The Council commissioned several other studies relating to the study area, covering the identification of sites of historical significance and also Aboriginal history and associations with public land. Although unpublished, the reports of these studies are available for inspection at the Council's office.

During preparation of the proposed recommendations, the Council engaged Henshall Hansen Associates in conjunction with Read Sturgess and Associates to prepare a social and economic evaluation of the Central Highlands (Stage 1). The report from this study is also available for inspection. A follow-up study (Stage 2) is discussed below.

AHC/CNR joint study

During the later stages of this review, the Australian Heritage Commission and the Department of Conservation and Natural Resources were asked by the Victorian government to undertake a joint study of the heritage values of the Central Highlands area, which comprises a large proportion of the Council's Melbourne Area, District 2. The aims of the study were to:

* identify areas in the Central Highlands that merit listing on the Register of the National Estate
* assess the representation of national estate values in the existing and proposed conservation reserve systems
* provide conservation advice on the maintenance of national estate values

In addition, the Victorian government considered that the new information generated could be considered by the Land Conservation Council in its Melbourne Area, District 2, Review.

A large volume of data was assembled during the study to identify national estate values using the criteria set out in the *Australian Heritage Commission Act* 1975. The study covered both natural and cultural values and included an exhaustive review of all existing databases available to the two agencies. The most important information sources were the existing CNR historical, flora and fauna databases, the Central Highlands Old Growth Forest Project and previous studies, notably the Land Conservation Council reports. Much of this information was available to and had been considered by the LCC in developing these recommendations but a considerable body of new data on cultural heritage and other values was also collected as part of the joint study.

For a full description of the study and its findings, those interested should refer to the joint study report. In preparing its final recommendations, the Council had access to the report, associated maps and other relevant information from the study. A review of the draft report, and recommendations arising, is included later in this chapter.

Submissions received for the investigation

Following publication of its descriptive report in 1991, Council received 1425 submissions and letters; a further 1993 were received in response to the proposed recommendations. These provided opinions and comments and many provided valuable information. The Council considered all submissions and letters received prior to its preparation of these final recommendations, but did not treat these as if they were responding to a poll or referendum.

Submissions were received from a cross-section of the community, representing a diverse range of individuals and of interest groups and organisations, as well as many municipal and State government bodies. More than 60% of submissions were from outside the Melbourne metropolitan area.

Table 1 provides a summary of the sources and types of the submissions received in response to the proposed recommendations. A complete list of all those who made submissions, in response to both the descriptive report and the proposed recommendations, is provided in Appendix I.

All submissions received by the Council are available for public inspection at the Council's office, 1st Floor, 477 Collins Street, Melbourne.

The content of any submission marked by the author as 'confidential' can be made available for public inspection under the *Freedom of Information Act* 1982, but only after removal of any information that would identify authorship.

Council appreciates the significant time and effort put into the preparation of the submissions.

Submissions provided information on the values of specific areas, suggested areas to be added to the parks and reserves system, emphasised the importance to the community of the timber industry, deer-hunting and the snow resorts and raised a range of other issues affecting the study area. Opinions as to the preferred future land use of particular areas were often conflicting.

A summary of the comments made in the first round of submissions (in response to the descriptive report) was provided in the proposed recommendations. The next section summarises the views raised in the submissions and letters in response to the proposed recommendations. Table 2 provides a broad listing of the issues raised.

Table 1

SOURCE AND TYPE OF SECOND SUBMISSIONS

	Number of submissions
Number of submissions:	
Submissions received before closing date	1922
Letters received after closing date	71
Total number received	1993
Submission type:	
Standard response [see (a) below]	1369
Other	624
Place of origin:	
Melbourne	695
Country	1259
Interstate	25
Not known	14
Type of group making submission:	
Government department	23
Local municipality	13
Individual	1783
Interest group [see (b) below]	174
(a) Major sources of standard submissions:	
Forest Protection Society	726
Australian Deer Association	409
VNPA	166
(b) Interest group breakdown:	
Academic	4
Conservation	63
Industry	11
Recreation	58
Commercial/business	28
Community	10

Notes:
1. The table includes letters received after the closing date for submissions.
2. Standard submissions include those following a pattern of response established by an organisation or form letters.

Outline of issues raised

The inclusion of issues in the following outline does not necessarily imply Council endorsement or rejection of the opinions expressed. Council is also aware that some statements made in submissions are factually incorrect and has also not set out to respond specifically to the matters raised.

Submissions in the first round (received in response to the descriptive report) were usually of a general nature or pointed out the significance of specific areas or activities. Because the proposed recommendations indicated the Council's views on land use in the study area, they provided a focus for

response by those preparing the second round of submissions.

Table 2

ISSUES RAISED IN SECOND SUBMISSIONS

Issues raised	Number commenting		
	Comment only	Information	Total
Central Highlands park	1180	56	1236
Dandenong Ranges park	74	21	95
Other parks	647	83	730
Conservation - general	46	3	49
Leadbeater's possum	64	18	82
Rainforest	94	15	109
Old-growth forests	65	11	76
Flora and fauna	49	34	83
Timber	867	43	910
Water	97	23	120
Recreation - general	173	35	208
Deer-hunting	558	27	585
Ski resorts	157	37	194
Lake Mountain	166	18	184
Small-area issues	61	65	126
The coast	21	19	40
Other subjects	45	56	101

Note: Many of the submissions raised several issues.

General comments

The proposed recommendations were summarised as having apparently achieved a balance between the capability of the area for wood production and meeting the requirements of the environment and society. Some concern was expressed that the Council should not finalise its recommendations until all other studies, principally those of the Australian Heritage Commission/CNR, were completed.

While some submissions expressed the view that the Council had proposed insufficient genuine new conservation reserves, others maintained that recreation and conservation can be achieved through the principles of multiple use of managed forests and that reservation was unnecessary, perhaps undesirable. It was suggested that specific classification of the land causes polarisation of opinion and that some alternative approach should be pursued.

There was considerable focus on the perceived benefits and disadvantages of timber harvesting from native forests.

Parks

Many of the submissions focused on the proposed Central Highlands National Park, some suggesting ways in which all the parks and other conservation areas here could be linked as a single park. Some suggested a link with the Alpine National Park. Some stated the view that the management of areas as parks did not necessarily achieve better protection of their biodiversity, as many areas of public land including existing parks, have weeds and feral animal problems and one view was that apiculture was in conflict with the principles of park management. Others suggested that the inclusion of recreation areas in parks meant that resources would be diverted from recreation to conservation and that vehicular access and other facilities would be restricted.

The value of preserving biological diversity in parks and the potential of these areas as a source of genetic material was recognised, although there was suggestion that experimental logging and salvage of damaged trees should also be permitted.

Central Highlands park proposal

A large number of the submissions addressed this proposal and in general supported the concept, in some cases with qualifications, although some believed that the catchments are managed now for conservation and that there is no need for a park. It was suggested that the water catchments are viable conservation reserves in their own right and would provide adequate representation of the ash forests without the need for additions of surrounding State forest. On the other hand, many were supportive of the view that the proposed park should be larger and a number of specific additions were suggested. A larger park was seen as providing adequate protection for all the identified values of the Central Highlands as well as enabling visitor access to the range of attributes without requiring unrestricted entry into the water supply catchments. The contiguity of a large park would allow for ecological processes to continue naturally and enhance the survival of the flora and fauna over time.

Many of the concerns about the proposed park related to the potential loss to the industry of the timber resources in the areas linking the catchments. Some of the correspondents suggested that the configuration of the park was dictated by the need to retain areas for

logging. While some consider that the linking corridors are too narrow, others believe that there is no ecological need to link the catchments at the expense of timber resources, as the linking areas will remain continuously and extensively forested and the links could be provided for in management plans, habitat would be maintained or enhanced through managing the structure of the forests. It was suggested by some that the park would create more jobs through tourism than would be lost to the timber industry.

It was also suggested that the corporate goals of Melbourne Water may conflict with co-operative management of the park.

Dandenong Ranges park

The majority of the submissions concerning this park expressed concern about the perceived downgrading of its status due to the proposal to class it as a State rather than a national park, and some described the values of the area by way of support. Several submissions suggested additions to the park. The designation of agricultural land within a proposed extension to the park was also addressed.

Other parks

By way of contrast, the proposal to designate the French Island park as a national park rather than a State one raised concern about possible changes to management in terms of hunting, grazing and other activities, and information was provided in support of this concern as well as about the uses and condition of the SEC land here and the former prison farm. Other submissions supported the proposal.

Additions were suggested to the existing Baw Baw, Kinglake, Eildon, Cathedral and Warrandyte parks and to the proposed Phillip Island park. The proposal to permit the continued management of parts of the latter park by Committees of Management raised concern about the emphasis that such management may give to recreation rather than conservation. Its reservation status was also addressed and information was provided about bird breeding areas as well as the presence of gemstones and dimension stone resources on the island.

Submissions generally supported the inclusion of the Fraser park within the Eildon State park, but some suggested co-ordinating management of the park and the buffer to Lake Eildon better rather than including the buffer in the park. The proposal to exclude hunting from Eildon State Park caused considerable concern among hunters and was the basis of the majority of the submissions that addressed hunting, although some supported the proposal on the basis that hunting is considered to be incompatible with the principles of park management. Many people indicated the regularity with which this area is used for hunting and its relative importance.

Respondents also pointed out the importance to the respective licensees of grazing stock in parts of the Bunyip State park, the presence of pine plantations in the proposed addition to the Moondarra park, the condition of the understorey vegetation of the parts of the Arthurs Seat park, the need for control of cinnamon fungus in the Nepean park and the presence of gemstones and historical artefacts in the proposed Kurth Kiln regional park.

Nature conservation

Some advocates for additional conservation reserves considered that representation in reserves of 20% of the area of each vegetation type was inadequate and it was suggested that the Flora and Fauna Guarantee was neither a management plan nor a measure for the long-term protection of species. On the other hand, others put the view that the degree of protection afforded to species in State forest through such measures as the Guarantee and the Code of Forest Practices should be taken into consideration, although some considered that the specific requirements of some species make such measures inadequate for protection of faunal habitat.

The Warrandyte—Kinglake nature conservation link was seen as an imaginative proposal that would complement the local government environmental living zone and there were suggestions that the concept should be expanded to incorporate more Melbourne Water land in the vicinity. Additional information was provided about values and uses of components of the link, including One Tree Hill, along with proposals for wider links to allow for the establishment of home ranges and dispersal of fauna within the area. The future management of the link was addressed, with concern that Melbourne Parks and Waterways has a recreational focus and that the link requires to be managed primarily for conservation.

Leadbeater's possum

Detailed additional data on the location and habitat requirements of Leadbeater's possum were provided as well as information on the progress of preparation of an Action Statement under the Flora and Fauna Guarantee. It was acknowledged that more research on the species is required before management plans can be finalised. For some, the presence of this species formed the basis of proposed reserves to protect its habitat. The view was put that the existing logging and management regimes do not permit the development of hollows and that replacement of wattle areas by eucalypts causes the loss of habitat. Others suggested that suitable habitat should be provided for all species, not just this one.

Rainforest

Some submissions considered that the definition of this community should be expanded to include transitional stands with emergent eucalypts and others that it should include montane riparian thickets. There was concern that current management practices prevent the re-development of rainforest and that myrtle wilt disease may be related to disturbance associated with logging. Some suggested that the buffers identified in the Code of Forest Practices for the protection of this community were inadequate and that it should be protected on a catchment basis or by the inclusion of all areas of significance in a park. Others differed, maintaining that the Code does provide adequate protection.

The indication on the proposed recommendations map of the general location of rainforest in State forest caused some confusion, some believing that the areas showed the actual extent of the community, others that they were suggestive of specific reserves. The co-existence of rainforests and old-growth forest was seen as an outcome of the fire history of an area.

Old-growth forest

Several correspondents suggested that the Council should delay finalising its recommendations until the Australian Heritage Commission had finished its studies and an inventory of the old-growth forests in the area was available. Some believed that current management strategies are inadequate for the protection of the older forests and that this should be achieved by reservation. Others argued that the exclusion of logging and fires from the area will see the older forests diminish in extent.

Other flora and fauna

Some respondents expressed concern that the encouraging results of the work that has identified the spotted tree frog in those streams targeted as the most likely to support it has prejudiced the potential for providing specific reserves for its habitat. Some considered that its habitat should be protected until its biology and ecology are known and others suggested variously that at least part or the whole of the Taponga River catchment should be placed in a park. It was also recognised that, although the Taponga catchment has little disturbance, the Wongungarra River catchment (in the Alps) is the most suitable area to act as a study reference for the species.

Submissions suggested specific reserves for tall astelia and pointed out the coincidence of occurrence of this species with old tramlines. The suggestion was also made that the habitat of the orange-bellied parrot should be afforded the same degree of protection as that of the helmeted honeyeater.

Timber

The polarity of views about timber harvesting and the industry remained evident. The views were again tendered: that all native forests should be protected by the immediate cessation of logging in old-growth forests and areas of high conservation value and the cessation of all logging in State forest by 1995; that the industry is subsidised by the community; that its resource base is shifting from native-grown hardwoods to plantation-grown softwoods; that it could operate out of existing plantations; and that plantations to replace the resource should be established on the sawmillers' own lands.

An alternative view was that the areas that would be used for viable plantations are necessary for food production. One analysis indicated that the replacement of hardwood timber by softwood affects only the mixed-species resource, whereas almost all of the reductions in the timber resource are in the ash component.

Concern that the stream buffers were inadequate prompted the suggestion that they should be about 200 m wide to act as wildlife corridors. A similar concern about the width of wildlife corridors indicated in management plans led to a proposal that they should be of a

specific minimum width and reserved, because prescriptions can be changed. The ability of provisions under the Code of Forest Practices to adequately protect identified values was questioned and breaches of the Code and regulations were cited.

Correspondents suggested that logging causes a reduction in the abundance of some species, the loss of trees with hollows and a reduction of habitat through the development of an even-aged forest structure following harvesting, that regrowth following logging is a barrier to the movement of wildlife and that the impact of logging on the ecosystem is not fully understood. Some also noted that maturity of trees from the perspective of sawlogs differs from ecological maturity.

Some questioned the accuracy of sustainable yield calculations and suggested that these would be overestimates in view of the fact that management prescriptions require the protection of older-aged forests and yet they are included as part of the timber resource - permitting the expectation that they will be available in the future.

It was suggested that the increase in the availability of timber expected as the current regrowth trees matured should be used to provide additions to the parks rather than to increase the level of supply to industry. On the other hand such an increase in timber supply was seen as the opportunity to provide for further development of the industry along with the associated social and economic benefits.

Information provided on the continued restructuring of the industry pointed out that some 25% of hardwood timber from the region was processed beyond the green stage. Management of the forests was stated to be ecologically sustainable; alternative groups claimed that the forests are managed for economic rather than ecological sustainability.

In line with the suggestion that there should be no net withdrawal of resources available to the industry, the progressive inclusion of more timber resources in parks was considered to be the wrong signal to the industry at a time when it was seeking security of access to resources to continue its restructuring. Industry groups expressed concern that this, coupled with the losses incurred through processes other than those of the Council, would increase pressure on the remaining resource, with the potential for shortening harvesting rotations and losing the ability to meet potential growth in domestic and Asian markets. The reduction in the availability of the resource was also seen as a reduction in the flexibility of the land manager to continue to supply logs following disasters such as major fire.

The paper industry at Maryvale indicated that it was dependent on the ash resource and that the close proximity of the Central Highlands forests to the mill kept supply costs down. Whereas some saw pulpwood production as inextricably linked to sawlog production, others suggested that pulpwood-only production should be permitted from the forests.

One group of submissions discussed the social and economic importance of the industry and emphasised its value to rural communities, considering the contribution that recreational activities may make to these communities as an alternative source of employment as both seasonal, and unknown in scale. It was contended that more jobs have been lost through mechanisation of the timber industry than would be lost through proposals to increase the area of parks. Any loss of employment opportunities was considered unacceptable and, regardless of any mechanisms to defer the impact of any resource withdrawal, maintained that the costs would eventually be borne by the community and procrastination will only suspend political and socio-economic reality.

Water

The Thomson catchment wood/water debate dominated discussion in this area in terms of the value of old-growth trees in the catchment as minimal water users and as habitat trees. A suggestion was made that the ash eucalypt species should be replaced by mixed species as these use less water.

The suggestion that harvesting should be stopped in the catchment and that alternative timber supplies are available in the Strzelecki Ranges was tendered. However, wood from the Thomson catchment was identified as being a critical component of the supplies to the Maryvale pulpmill and it was pointed out that the Land-use Determination for this catchment permits timber harvesting, that the water quality can be protected through catchment management strategies and that this and other environmental values of the area can be adequately protected under the Code of Forest Practices.

It was stated that water from the Thomson River is needed to flush the Gippsland Lakes and that decisions about the allocation of water from the Thomson Dam pay little attention to the requirements of canoeing, and a suggestion was made that the whole issue could be resolved by an auction of water rights. It was advocated that, before a decision is made about the Thomson catchment, an investigation of the wood/water relationship for all catchments in the State should be undertaken.

Other water-related issues included: a request for a Land-use Determination for the Rubicon River catchment; keeping logging to a minimum in proclaimed catchments to reduce erosion and sedimentation; and maintenance of the ban on eductor dredges.

Recreation

The diversity of comments in this field reflected the range of recreational opportunities in the region. Information was provided about the popularity and requirements of the area for vehicle-based recreation. Although respondents recognised that the provision of access is a management issue, there was concern about the progressive reduction in four-wheel-drive access as selected tracks are upgraded to log-truck standard and redundant tracks closed, and view that access will be restricted under park policies. More access in parks and water supply catchments was requested. Letters raised potential problems arising from the development by the Rural Water Corporation of additional access to a part of the Lake Eildon frontage, as well as concern that recreational access should be retained to areas now under the control of the Victorian Plantations Corporation.

The use of tracks by vehicles and horses was seen to be incompatible with their use by walkers and suggestions were made that wider buffers to logging should be established along popular walking routes. The value of the area for gemstones and recreational gold-mining was also described.

Considerable correspondence dealt with the proposal to rationalise some rifle ranges in the area. Some expressed the views that additional ranges should be established and that target-shooting should be permitted throughout State forest and hunting permitted throughout all public land. The opposing views were tendered that recreational hunting is not a form of control of vermin and feral animals.

Deer-hunting

Strong representation was received about the proposal to exclude hunting from the Eildon State Park and many submissions described the value and regular use of this particular area. Some suggested that the exclusion of hunting should be on a case-by-case basis rather than by land-use category, others that deer-hunting should be as of right throughout all public land.

Information was presented about the expansion of deer throughout the State and about hunting techniques. It was suggested that if hunting did not occur then deer numbers would increase to the extent that they would cause environmental damage, that deer should be eradicated from parks because of their potential to carry disease and that hunting should be permitted in the water supply catchments to control deer numbers and to deter illegal hunters.

The Central Highlands Sanctuary was generally recognised as being no longer necessary, although it was suggested that it should be retained to provide other recreational users some area in State forest that was free of hunters. The proposal to identify a 'stalking only' zone in State forest was seen as causing further confusion.

It was stated that responsible hunters do not hunt in the vicinity of Walhalla Township and a boundary for a no-hunting zone here was suggested.

Ski resorts

Submissions discussed the potential impact on snow cover of an enhanced 'greenhouse effect' and raised suggestions that the alpine resorts will eventually fail because of it. The proposal for a defined code of practice for the development of ski trails received some support and it was suggested that the presence of resorts in the upper catchments was endangering the water quality of streams.

The proposal to designate Mount Torbreck as a natural features reserve also received support, although there was suggestion that the area may be required as a resort in the future.

Both the Mount Baw Baw and the Lake Mountain resorts were described as 'nursery' areas where novice skiers can learn in safety.

Mount Baw Baw Alpine Resort

Some opposed the proposal to excise a small area from the adjoining park to add to this resort, mainly on the principle that there should be no excision of land from any park to permit commercial ventures, but also because of the remote and natural values of the subject area. Others suggested that the reverse should occur and that the area of the resort should be included in the adjoining national park. A third group supported the proposal along with the proposal that the boundary to the resort be rationalised to avoid sensitive wet areas. It was pointed out that the existing cross-country trail system was inadequate for future increases in patronage and that it was not necessary to exclude trail development from the adjoining park on the basis of protection of the remote and natural values.

Lake Mountain Alpine Resort

Opinion about the proposal to include this resort in the Central Highlands park was also considerably polarised. Much of the debate centred on the perceived ability of the respective land managers to provide for the recreational uses of the area and economic gain to the manager while protecting the nature conservation values, and on the proposal for dual management. Some suggested that a resort should be defined and that it should occupy all land down to the 1200 m contour, others that the whole area should be part of the park.

The importance of Lake Mountain to local businesses, particularly in Marysville, was emphasised and there was concern that the 7-year leases possible under the *National Parks Act* 1975 were insufficient for the establishment of viable businesses.

The coast

Conservation, recreational and industrial values were described for various sections along the coast and it was suggested that the coast should be available for occupancy by private groups to achieve the maximum benefit of its tourist potential - subject to environmental assessment.

It was considered that grazing should be permitted along the coastal reserve subject to the development of a management plan and, similarly, decisions about structures in camping areas should be left to the land manager.

Suggestions received about marine parks proposed that high-tide roosts for birds should be protected from land-based activities, and expressed concern about the lack of implementation of the Wildlife Management Co-operative Areas.

Small area issues

Comments were provided about the uses and values of specific areas in most land-use categories of the proposed recommendations, including the following topics:

* suggestions for the expansion of some reference areas and information about boundary issues for others
* information about McKenzie Flora Reserve (now C7); highlighting the importance of Gresswell Forest (C31) in the context of the city; support for the expansion of Yellingbo (C36) and Sassafras Creek (C37) Fauna and Flora Reserves to protect the habitat of the helmeted honeyeater; records of species of fungi in Lang Lang Fauna and Flora Reserve (C41); and the need to provide specifically for the protection of the giant Gippsland earthworm
* suggestions of areas to be set aside as historical and cultural features reserves, including: Matlock township; information about the scenic values of parcels of land adjacent to the Puffing Billy corridor; notes about old rail lines, the proposed Hume and Hovell trail and timber-harvesting relics in the Disappointment forest; and the suggestion that, because of the widespread nature of the numerous historical sites, a zone concept should be applied rather than specific reserves. It was also suggested that a State-wide review of historical areas may bring about variation to some of the Council's classifications. Advice about the process of the Historic Mining Sites Assessment Committee was provided as well as the advice that the buffers under the *Mineral Resources Development Act* 1990 may not always be necessary to protect historical sites
* discussion about stream frontage licences and management, about exclusion of grazing from the frontages because of damage to banks and degradation of water quality, with the provision of off-stream watering points, and about the use of grazing as a management tool
* the principle of exclusion of timber extraction and grazing from all natural

features reserves, including the suggestion that all bushland areas should be fenced and all human disturbance excluded and the observation that the understorey of bushland areas was as important as the overstorey

Specific comment was made, for instance, about: the outlook from Seven Acre Rock (now G41); the conflict between the need for a rubbish tip and the recreational and floral values of Alexandra Bushland Reserve (G56); the Myanook Bush Retreat (G194); Wright Forest (G202); damage by recreational and other users of Camp Fairnie and the adjoining area (G226); and the conflict between grazing and protection of values of the Phillip Island Koala Reserve (C44).

Correspondents made suggestions about the future status of small parcels of State forest west of the Lake Eildon and for protection (from logging) of the visual corridor along the Alpine Walking Track, expressed concern about the alignment of a road to be upgraded adjoining Cranbourne Botanic Garden, proposed a site for an astronomical observatory and forwarded requests for the exchange or alienation of specific parcels of land.

Roadsides with nature conservation and scenic value were identified on the Mornington Peninsula. It was noted that managers of roadsides should ensure that important geological features in road cuttings should remain accessible, and the observation made that unused roads are difficult to identify and are under-utilised for recreation.

Other subjects

Several submissions suggested that the Council should review its proposed earth resources policy and expressed concern about differentiation between scientific research and mineral exploration, about the Council's recognition of the need to identify a resource and the possible conflict with its ban on exploration and about the linking of recreational fossicking with commercial activities. They suggested that the Council had not accounted for mineral values in its economic evaluations and noted that effective rehabilitation was possible after a resource was extracted. It was further proposed that the Council should only recommend restrictions on mineral exploration and mining where there is no alternative. One submission noted that it is the prerogative of Parliament to decide whether an area of prospectivity in a park should be mined and that the Council should not be encouraging such use.

Information was provided about the sand resources and extraction activities at The Gurdies and Wonthaggi. It was also suggested that extractive industries and waste disposal activities should be restricted at The Gurdies, Grantville and Lang Lang to protect bird habitat.

Apiculture was viewed as in conflict with park goals whereas the industry seeks continued access to appropriate sites.

Some questioned the application of results of the commissioned social and economic impact assessment to the Council's recommendations, and suggested that more consideration should have been given to the broader implications of resource withdrawal. It was also suggested that the analysis of tourism should have been better as it was believed that visitation to the area is greater than stated in the assessment.

Various government departments provided advice about their respective functions and aims as these related to the proposed recommendations: the Public Transport Corporation in terms of historical buildings on its land; the Department of Energy and Minerals in terms of its right to object to restrictions being placed on exploration and mining without the need to prove the existence of a resource; the State Electricity Commission about the use of the proposed Andersons Creek overburden site, about power station sites and about its plantation planting guidelines; and VICROADS about its policies on the preservation and replacement of native vegetation, its recognition of historical features and access to earth resources.

FINAL RECOMMENDATIONS

The Council recommends the continued use or establishment of: parks in areas of particular importance for recreation and nature conservation; reference areas and education areas (covering most of the range of land types found in the study area); nature conservation reserves for areas of value for the conservation of representative plant communities and important animal habitat; and natural features reserves and historical and cultural features

reserves to protect sites containing particular elements of the natural or cultural landscape. Substantial areas are recommended as State forest, which are available for a wide range of uses but in a way that is consistent with their sustainability for the full range of resources over time.

Not all land can be available for all people for all activities. It is the task of the Council and the land manager to plan for the use of public land to ensure that user groups have an opportunity to carry out their activities and, where there is potential conflict, to separate those activities in space and time. In other words, all legitimate activities may be provided for, where appropriate, but not on all public land. Where demands from competing uses vie for a given area of land, it may not be possible to satisfy them all. Wherever possible, 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 such needs. 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.

Flexibility in planning is essential. We have only imperfect knowledge of many resources (for example, minerals), of the distribution and ecology of plants and of the ecological requirements of native animals. There must be many places in Victoria where special values remain unrecognised and for which no special provision can be made in present planning. Furthermore, future needs for resources or environmental protection on public land may require alteration or modification of these recommendations, which are based on the best information currently available.

Table 3 provides a summary of the final recommendations in terms of the major forms of land use.

Table 3

RECOMMENDED PUBLIC LAND USE

Land-use categories	Area (ha)	Percentage of land in the study area covered by these recommendations	
		All land	Public land
National parks	115 160	7.4	15.5
State parks	57 290	3.7	7.7
Regional parks	6 650	0.4	0.9
Reference areas	6 470	0.4	0.9
Nature conservation reserves	11 250	0.7	1.5
Water production	28 220	1.8	3.8
State forest	465 460	29.8	62.6
Historical and cultural features reserves	6 690	0.4	0.9
Natural features reserves	19 850	1.3	2.7
Coastal reserves	2 960	0.2	0.4
Alpine resorts	890	<0.1	0.1
Community-use areas	4 150	0.3	0.6
Plantations	14 660	0.9	2.0
Earth resources	470	<0.1	<0.1
Services and utilities	3 500	0.2	0.5
Land not required for public purposes	1 010	<0.1	0.1

Notes:
1. The study area covers some 1 563 330 ha (excluding Cranbourne and Seymour), of which some 744 680 ha (48%) is public land (source - Natural Resource Systems Branch, Department of Conservation and Natural Resources).
2. Other land uses collectively make up the balance and not all parcels of land in each small-block category have been measured.
3. Numbers are rounded.

It is important to realise that each primary use has a number of compatible secondary uses. In addition to nominating 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.

In formulating these recommendations the Council has considered the available

information from a wide range of sources and has taken into account the various issues raised above. Information on natural resources in the area was evaluated, bearing in mind the significance of those resources on a State-wide basis.

In selecting areas for inclusion in the recommended reserve system. the Council considered representation of land systems and major land types, vegetation communities, fauna and threatened species, as well as the significance of the study area in a State-wide perspective with respect to nature conservation, timber production and other uses. In the light of that evaluation, it is recommending the extension of the existing reserve system in order to incorporate the range of represented values, bearing in mind the State-wide context.

Under the *Land Conservation Act* 1970, the Council has the responsibility to make recommendations on the use of public land in order to provide for the balanced use of land in Victoria. In making its recommendations, the Council must have regard to both the present and future needs of the people of Victoria in relation to several criteria that emphasise the need to protect significant conservation and recreation values.

Council has also taken the view that it must achieve a balance between these and other needs required by the community from public land from a local, regional, State and even national perspective. At the same time, it must also ensure that other public land is available for legitimate uses such as the harvesting of forest produce and mineral extraction.

It has been suggested that the multi-purpose management of public land can provide for the protection of all the significant values that are identified while still allowing commercial use of the natural resources - in other words, that there is no need to create national parks and other conservation reserves.

The concept of national parks is internationally recognised and embraces the notion that representative examples of the major land and vegetation types, together with the outstanding natural features occurring on public land, should not be subjected to commercial exploitation nor the environmental disturbance associated with such enterprises. These areas should, because of their significance, be afforded the maximum possible protection in legislation.

In national and State parks, the aims of management are to provide recreational and educational opportunities consistent with the preservation and protection of the natural environment, indigenous species and other conservation values. Development associated with the recreational use of these parks is confined to small areas to minimise disturbance.

In State forest, however, management aims differ and timber production is a major use. The Council supports the continuation of timber production subject to the provisions outlined in Chapter E of these recommendations. Exploration for and extraction of earth resources, grazing and apiculture are also important uses of State forest, which is managed for a multiplicity of uses.

Protection of natural values is an essential part of the management of most public land and uses must be consistent with the aim of avoiding predictable long-term environmental damage. In some cases, however, decisions often favour one form of use over another and the maintenance of biological diversity and protection of natural values can be reduced when resource utilisation is the primary use.

The Council believes that, in parts of the public land estate, pressures to modify the natural environment should be minimised. Consequently it has adopted the policy of setting aside areas of public land for parks, to be used in ways that are consistent with nature conservation.

Many people and conservation groups have requested that a large area within the Central Highlands be placed in a major conservation reserve. An important aim of the Council is to maintain the community's high regard for Victoria's conservation reserve system by ensuring it is representative and viable, and contains, in particular, those areas that are outstanding or significant. The areas in Melbourne Area, District 2, defined by the Council for inclusion in the national park system contain such outstanding and significant biological, scenic and recreation values, as well as representation of major land systems.

The Council nevertheless recognises that many areas of public land in the study area that are not included in new or existing nature conservation reserves have important conservation values that need to be protected. Most of these are specifically identified in the

recommendations for State forest, where protection has been, and will continue to be, provided to such values. Indeed, State forest plays a crucial role in conservation of the State's resources and, considering it occupies about 40% of all public land in Victoria, is of utmost significance as floral and faunal habitat. Emphasis on the protection of other values outside the reserve system is reflected in the aims of the State Conservation Strategy, which are to:

* maintain essential ecological processes and life-support systems
* preserve genetic diversity
* maintain renewable resources
* protect and manage natural systems and their diversity for the non-material needs of society

Public land in the region has special significance with respect to the conservation of Leadbeater's possum, helmeted honeyeater, spotted tree frog, brown galaxias, tall astelia and cool temperate rainforest. It is expected that all such values in State forest will be protected as part of the Forest Management Planning process and, where appropriate, under the provisions of the *Flora and Fauna Guarantee Act* 1988 and other relevant legislation.

Summary of recommendations

The Council has reaffirmed, with some adjustments, its previous recommendations concerning the wide range of existing parks and reserves in the study area and has recommended additions to some.

Melbourne's main water supply catchments contain the best representation of the wet sclerophyll forests and cool temperate rainforests in the State and include a range of other vegetation communities, high-quality faunal habitat and other nature conservation and cultural values, as well as requiring continued protection to ensure the provision of high-quality water. In recognition of these values, the Council has recommended the establishment of a new national park in the Central Highlands and a substantial addition to the Kinglake National Park that incorporate these catchments.

The plateau of Lake Mountain is included in the recommended Ash Ranges National Park to protect its important conservation values. In recognition of the importance of the area as a cross-country ski resort, however, the Council has identified an alpine resort here that is essentially the same as the one now in place. The Alpine Resorts Commission will continue to manage the winter recreation facilities and services of the area.

The Council believes that the existing State park on French Island should be designated as a national park in recognition of its increased area and identified values.

Public land on Phillip Island contains a wide range of significant natural, cultural and recreational values. To ensure protection of these values and to achieve their integrated management, the Council has recommended that the bulk of public land on the island be incorporated in a new State park. Recommendations for two new regional parks at Kurth Kiln (near Gembrook) and in the Plenty Valley recognise the importance of public land close to urban centres for recreation in relatively natural environments.

A new reference area is recommended, to add to the system of reserves across the State specifically set aside to protect unmodified examples of land types as standards for scientific research. A new education area is also recommended, to complement the range of such areas available for studies of the natural environment.

Several new nature conservation reserves are recommended to complement the provisions within parks for the representation and protection of floral and faunal values. Combined, the existing and new parks, reference areas and nature conservation reserves provide for good representation within the reserve system of each of the principal vegetation communities of the study area (see Table 4 in Chapter C).

The new parks and reserves include substantial representation of 10 of the 15 land systems that have significant occurrences on public land in the study area but are considered to be inadequately represented in the existing reserve system. A small proportion of each of the remaining land systems is located within reserves but the respective portions are less than 10%.

After accounting for the existing and new parks and reserves, about 63% of the public land of the study area remains as State forest. Timber makes an important contribution to the local and State economy and Council has recommended that timber production should continue from State forest, subject to protection

of environmental values as laid down in the Code of Forest Practices for Timber Production.

In the context of the new land classification system mentioned above, other recommendations identify historical and cultural features reserves and natural features reserves to protect specific elements of the cultural and natural landscape, and the designation of areas for community uses, such as for recreation areas and public buildings.

Other recommendations include areas for the protection of water supply, for recreation, education and protection of landscapes and ecosystems along the coast, for a small addition to the Baw Baw Alpine Resort and for plantations.

Social and economic implications of the proposed recommendations

During the later stages of preparation of the proposed recommendations, the Council commissioned the consultants Henshall Hansen Associates and Read Sturgess and Associates to undertake Stage 2 of their social and economic study of the Central Highlands. The report from that study - '*A Social and Economic Impact Assessment of Draft Proposed Recommendations for Land Use in the Central Highlands (Melbourne Area District 2), Victoria*' - is available for inspection at the Council's office.

The following gives and overview of the execu-
tive summary of that report. The consultants noted that, in most cases, there was little quantitative information available by which to measure the benefits and costs of the Council's proposals. They were therefore unable to quantify many of them in monetary terms.

The major benefit of the proposed recommendations would be the protection of nature conservation values in the proposed national park and other reserves. The major cost would be in terms of the value to the sawmilling industry of the timber resources forgone by their inclusion in the park.

On the basis that the sustainable yields of sawlogs from the respective Forest Management Areas would immediately be reduced from current levels by a total of about 5100 cu.m per annum, the consultants estimated that the net loss that the proposed recommendations (if implemented) would bring to the State economy would lie in the range of $260 000 to $460 000 per year. The gross ex-mill value (which includes the value of inputs) of the timber production forgone could have been up to some $3.3 million per year. In terms of employment, about 22 of the jobs involved in the timber industry to the stage of despatch from the mill door would have been displaced. The associated indirect displacement - beyond the mill door - would be an additional 33 jobs.

Changes in the numbers of visitors to an area would affect employment. The consultants noted a possible but unknown increase in employment in the tourist sector if the proposals were implemented. They expressed a belief that inclusion of the Lake Mountain Alpine Resort in the proposed Central Highlands National Park would result in a change in priorities of management and might produce a slower rate of increase in winter visitors than if Lake Mountain remained as an Alpine Resort. On the other hand, depending on the degree to which the area is promoted and facilities provided, the number of visitors may increase during summer if the area is part of a park.

The consultants believed that both the reduction in employment from loss of timber resources and the possible increase from tourism that would arise from the proposed recommendations would be experienced in small towns in the study area.

During preparation of the recommendations, the Council was concerned about the potential flow-on effects that a reduction in availability of sawlog resources would have in terms of employment, current and future investment and impacts on some communities in the study area, particularly in the current economic climate. It was also aware of other requirements relating to planning and management of State forest that may further reduce the availability of timber resources. It has therefore proposed that the current legislated yield of sawlogs from the respective forest management areas be sustained through the current period to 2001, and that reconciliation of the reduced availability of logs be undertaken in the next period, when a net increase in sustainable yield was expected. This issue is discussed further in Chapter E.

Public land and the Aboriginal people

The Aboriginal people are the first Australians and as such make a special contribution to

Australian culture and society. They have lived in south-eastern Australia for more than 30 000 years and have strong emotional and cultural ties to the land. Aboriginal groups believe certain areas (such as sacred sites and ceremonial grounds) have a particular significance. Other sites that provide valuable evidence of occupation and Aboriginal culture are also regarded as highly important.

There is a paucity of information from Aboriginal sources about Aboriginal life and culture in the study area prior to European settlement and most information derives from historical records dating from 1835.

The study area was once occupied by several tribes - the *Bunurong*, *Woiworung* and *Taungurong* - which formed the dominant component of the 'Kulin nation'. A small portion of the eastern part of the study area was probably occupied by the *Kurnai* from Gippsland. The Kulin tribes traditionally held joint gatherings on the banks of the Yarra river and elsewhere. Until the advent of European settlement, they lived mostly by gathering food and hunting and relocated their camps as they moved across the landscape. The evidence to date indicates that occupation was centred on the river systems and coasts, although it is also known that they travelled to the mountains.

Relative to most of Australia, the region has been well studied for pre-contact sites, especially along the coast. However, further studies are needed to prepare a comprehensive register of sites and to provide an understanding, from inland sites, of human occupation older than 6000 years. The Council believes that such studies should be carried out in association with surveys (such as for flora and fauna) conducted by the Department of Conservation and Natural Resources.

Archaeological sites, which provide evidence of early Aboriginal occupation, are important parts of Australia's cultural heritage. Such sites include middens, stone tool scatters, scarred trees, rock art sites, ceremonial stone arrangements, stone quarries and camp-sites.

Damage or disturbance (whether deliberate or inadvertent) to archaeological relics and sites is prohibited without a permit issued under the Victorian *Archaeological and Aboriginal Relics Preservation Act* 1984.

Under Commonwealth legislation - the *Aboriginal and Torres Strait Islander Act* 1984 - Aboriginal communities are empowered as decision-makers in relation to the protection of Aboriginal places and objects. In accordance with this Act, land management works or activities that have the potential to affect Aboriginal archaeological sites, places or objects should only be carried out with the permission of the relevant Aboriginal community.

For the Melbourne Area, District 2, these communities are the Dandenong and District, the Healesville and District and the Morwell Aboriginal Co-operatives. The majority of members of these co-operatives are descendants of the tribes inhabiting the region at the time of European contact. The co-operatives provide services for the health, social, housing and cultural needs of Aborigines within an approximately 50-km radius of their headquarters.

The June 1992 'Mabo' judgement of the High Court of Australia, now recognised in legislation, is a significant development with respect to land issues. In this judgement, the High Court overturned the legal doctrine of '*terra nullius*', which assumed that Australia was unoccupied at the time of European settlement and expressed the view that Aboriginal peoples hold a common law property right over land and sea in accordance with the custom and traditional use of those areas. It also decided that such 'native title' continues to exist where land has not been alienated by the Crown and if continuous traditional association can be demonstrated. The full implications of this judgement are uncertain and are likely to be clarified in the next few years.

Where Aboriginal people have maintained their association with the land, their long history of dependence on the natural environment for food, fibre and shelter has provided them with a vast knowledge of the land and its plants and animals - and of sustainable land use. Where knowledge of these practices has survived, there is the opportunity for the integration of such knowledge into present land management practices.

In recent years, government departments have enhanced opportunities for the employment of Aboriginal people in government programs. Prospects for additional employment exist, particularly in connection with the management of public lands and the establishment and staffing of interpretative facilities.

It should be noted that involvement of the Aboriginal community in the identification, protection and management of sites of particular cultural significance is required under the Commonwealth legislation. Council recommends that the Aboriginal community should be involved in the preparation of management plans for public land.

It is also important that a detailed oral history of Aboriginal culture of the area be prepared as soon as possible, before valuable information is lost forever.

Melbourne Parks and Waterways

In January 1993, the government established 'Melbourne Parks and Waterways' - a separate enterprise encompassing the parks, waterways and environmental operations of Melbourne Water Corporation.

A new inter-agency 'Parks and Waterways Program' replaces but maintains the fundamental direction of the Open Space 2000 program, which was launched in 1991. That program aimed, over 10 years, to build upon and improve Melbourne's existing open space network, with the major focus being the creation of open space links from Port Phillip Bay across Melbourne to the surrounding ranges. It involved a grant scheme for community projects.

The original program encompassed a number of the municipalities within Melbourne Area, District 2, together with those in metropolitan Melbourne outside Council's study area.

The priorities for the Parks and Waterways Program, which has joined with Greening Australia, Victoria in the co-ordination of providing community grants, are to:

* create linkages between parks and reserves
* protect, improve and restore flora and fauna habitats or cultural sites of national or State significance
* improve creeks, rivers and foreshores

The program is supported by a secretariat in Melbourne Parks and Waterways and overseen by a Ministerial Council, which will have a comprehensive membership drawn from the community.

Public land (as defined in the *Land Conservation Act* 1970) is an important component of the proposed linked system of reserves. However, open space areas also include municipal freehold land and metropolitan parks (now managed by Melbourne Parks and Waterways), and some strategic private freehold land may also be considered as proposed public open space.

Council's recommendations for Crown land around Port Phillip Bay and Western Port, on Mornington Peninsula, along water frontages, in the Dandenongs and, in particular, the proposed Warrandyte-Kinglake habitat link, are all complementary and contribute to the goal of a linked system of parks and reserves.

Australian Heritage Commission

A statutory authority, the Australian Heritage Commission (AHC), was established under the *Australian Heritage Commission Act* 1975 as the Commonwealth government's policy, advisory and administrative body responsible for the National Estate. The National Estate is defined in the legislation as 'those places, being components of the natural environment of Australia, or the cultural environment of Australia, that have aesthetic, historical, scientific or social significance or other special value for future generations, as well as for the present community'. Australia's National Estate is thus a wide-ranging concept that covers a variety of features.

Register of National Estate

One of the Commission's major responsibilities is to prepare and maintain the Register of the National Estate - a national register of places in Australia that have heritage value. Heritage values are those that have cultural or natural significance to the community, as defined in section 4 of the *Australian Heritage Commission Act* 1975.

Compilation of a comprehensive register will take many years and will be a continuing process, but all registrations will have the same status irrespective of the time of their entry. There is no hierarchy among different categories of places.

The primary role of the Australian Heritage Commission is to identify the National Estate and to provide advice to the Commonwealth government about its conservation. Such advice, if accepted, is binding on all Commonwealth Ministers and agencies. The AHC or its Act has no jurisdiction over State governments or their agencies.

In the past, the AHC has lacked data on national estate values, particularly in a regional context, and its lack has hampered its ability to provide detailed, usable advice to the Commonwealth government. In recent times, therefore, the AHC has initiated regional assessments in several States to overcome the previous limitations.

Regional assessment of the Central Highlands

Regional assessments not only provide valuable data for use by the AHC but are also a valuable source of information for land mangers and planning organisations in the State. In accordance with the principles set down in the Inter-governmental Agreement on the Environment (IGAE), the Victorian government sought to co-ordinate a regional assessment of the Central Highlands area to the east of Melbourne conducted by the AHC and the Department of Conservation and Natural Resources (CNR) - referred to here as the AHC/CNR joint study - with the Council's public-land-use review of the Melbourne Area, District 2, which includes the Central Highlands. The joint study draft report was published in June 1994. The primary aim of the co-ordination, as set out in the IGAE, was to avoid duplication of effort during the collection of basic information on cultural and natural values in the region under investigation.

The Council's process has, however, remained independent of this regional assessment process. The Council has ensured that areas recommended for protection or resource use meet its own established criteria. Its recommendations also take into account consideration of socio-economic factors in determining the balanced use of land - which is not a requirement of the AHC process.

The AHC/CNR joint project has published a draft list of places that could be considered for inclusion on the Register of the National Estate, for public comment. A final list of places will be prepared following receipt and review of public comment.

Each organisation recognised that the data collected may be used in different ways, principally because the AHC and the LCC processes lead to somewhat different outcomes. The two agencies are also responsible to different levels of government, which have differing functions with respect to the use and management of land in Victoria.

The AHC process involves an identification of national estate values according to a series of criteria set down in the *Australian Heritage Commission Act* 1975, and all places that exceed an established threshold for each value are included on the Register of the National Estate. Inclusion on the Register highlights a particular value at a place and, along with the conservation advice attached to it, provides a guide to land managers as to the best method of maintaining that value. The nature of the particular value, together with its degree of sensitivity or robustness to various forms of disturbance, determines the type of conservation advice. It is a common, but incorrect, perception that including a place on the Register of National Estate automatically requires its inclusion in a national park or some other form of conservation reserve. This is not the case, and the AHC recognises that many national estate values can be adequately protected in other ways.

The AHC process identifies places for the Register of the National Estate, irrespective of land tenure. In contrast, the Land Conservation Council is a land-use planning body that makes recommendations to the Victorian government for public land only, in accordance with the *Land Conservation Act* 1970. The Council makes recommendations that are essentially broad-scale and strategic in nature and there is a clear understanding that land managers undertake more-detailed planning processes using the broad framework and principles it has established. The Council has its own criteria, which are set down in the *Land Conservation Act 1970*, to guide the development of recommendations to government on the 'balanced' use of land in Victoria.

Among its guiding principles the Council believes that the conservation reserve system across the State should contain representative examples of the major habitats and their associated flora, fauna and other significant features and that these areas should be free of major disturbing influences. The concept of 'balanced' use implies that not all areas can be set aside in the conservation reserve system and the Council's criteria, as set down in its legislation, must provide for other uses on public land.

A major distinction between the AHC outcome and an LCC outcome, therefore, is that the Register lists all places, whether on private or public land, that are considered above threshold, whereas the LCC, subject to its

consideration of balanced land use and on public land only, may recommend setting side the best examples in the conservation reserve system, and protecting other occurrences using a range of mechanisms, including other legislation such as the *Flora and Fauna Guarantee Act* 1988 and the *Forests Act* 1958. The Council has always used a range of mechanisms to protect values on public land and this is consistent with the advice provided on a range of values identified by the AHC in the Central Highlands.

Unlike the AHC, the Council is required to have regard to the social and economic implications of its recommendations and this may also result in different outcomes arising from the two processes. That does not imply that one process or the other is any more or less appropriate.

As a result of the commencement of the AHC/CNR joint study, the Council delayed publication of its final recommendations by at least 6 months in order to assess the findings of that study in relation to the Council's review of public land use. The joint study team has provided several briefings on the findings and made its draft report available to Council prior to completing its final recommendations.

The methodologies used in the joint study to identify and evaluate the significance of particular values have been subjected to peer review by experts, who have been drawn from various fields of interest and who are represented on a technical advisory group, through workshops and in forums with various practitioners for some aspects - such as cultural values. The whole process has been guided by a steering committee, which also had input into the methodologies used.

For these reasons the Council has not reviewed the methodologies used. It is, however, aware of these and of the thresholding and their application to the values assessed. In addition, discussion has taken place on the correct interpretation of the findings and Council has been guided in this process by AHC and CNR staff.

Council has focused particularly on those values that are sensitive to disturbances such as timber harvesting, and has noted the conservation advice in the joint study report. It also has a responsibility to look beyond the joint study region in the Central Highlands and to take into account similar values State-wide, particularly when considering the issue of representativeness of a range of values. This too may result in different outcomes for the two processes.

Finally, the Council acknowledges that the data provided by the joint study process use, as a base, information collected as part of the LCC review of the Melbourne Area, but have added considerably to the available knowledge of values and their location.

New work has been undertaken; for example, the Old Growth study and several consultancies dealing with cultural and environmental values have provided a significant volume of new data. A series of workshops also provided direct input to the identification of values from regional communities.

Use of the CNR Geographic Information System (GIS) enabled storage and analysis of the large volume of data. In the past, data were stored manually, either on maps or in databases that would refer to maps. The databases would indicate which attribute applied to which land unit. Storing this information accurately was costly and extremely demanding of the specialised skills and time of staff. Analysing the information to any extent for areas as large as the Central Highlands was nearly impossible.

The GIS technology enables data to be stored in a computer system, so that custom-designed analysis and maps can be produced far more readily than through manual techniques. While the computer does not make the data more accurate, it significantly increases the types of analyses possible and provides ready access to spatially referred information. This will be an invaluable tool for CNR in its ongoing management of public land in the region.

Since February 1994, the Council has been involved in discussions with the joint study team and has been given access progressively to the findings of the study. It formed a committee to work more closely with the study team and to formulate a Council response to the findings. The following text summarises that response and is arranged according to the values listed in Chapter 4 of the joint study report.

Council wishes to acknowledge the significant contribution by staff of the AHC and CNR in this study and their co-operation in applying the information from the joint study that is relevant to the Council's land-use planning function.

It is important to note that consideration of the joint study information has led to changes in the Council's recommendations and has provided further supporting information for other recommendations. It should be remembered, however, that the findings of the joint study are in draft form only and are subject to public comment and review before a final National Estate listing is formulated.

The joint study applied the degree of representation in parks and reserves identified in the Council's proposed recommendations. Where appropriate, the following comments take into account the Council's final recommendations.

Council has always viewed the information arising out of the joint study as one input to its consideration of land use recommendations. Discussion of the values identified below does not necessarily imply acceptance of the comments made in the joint study report.

Review of Draft Joint Study Report and *Recommendations Arising*

1. Values in the Goulburn, Big and Aberfeldy catchments

In considering the findings of the joint study the Council notes, in particular, the range of values occurring in the north-eastern part of the region, within the Goulburn, Big and Aberfeldy catchments. These values include montane dry woodlands that are poorly represented in Melbourne District 2, but similar vegetation occurs extensively in the adjoining Alpine and North-eastern study areas, where it is certainly represented within existing parks and reserves. On a State-wide basis, dry woodlands are common and almost 40% of their total occurrence is included in parks and other conservation reserves.

The same broad area also contains virtually all of the dry forest old growth identified in the Central Highlands. As no similar old-growth studies have yet been conducted in the adjoining Alpine and North-eastern areas, it is not possible at this stage to identify a broader regional context for these dry forest old-growth stands. The Council notes that the identification of the stands has been essentially by aerial-photograph interpretation to delineate growth forms that resemble the oldest successional stages in these forest types. No field checking has been undertaken and there is some doubt about the accuracy of the disturbance information in this north-eastern area. Disturbance could be more widespread, and therefore some of the identified stands may in fact not meet the disturbance threshold established for old growth. Therefore, some stands shown as old growth may not exist on the ground; alternatively, others might not have been identified.

Given that some uncertainty remains about the extent of disturbance in this region, some variation in the extent of the natural landscape values may also occur.

Council considers that this part of the Central Highlands does contain important values. But until further information that enables a broader regional context to be established and more-detailed information on the exact location of values, particularly stands of old growth, becomes available, it is not in a position to recommend whether additional reserves are necessary and, if so, where they might best be located.

The Council is aware that further old-growth studies by CNR, with funding from the National Forest Policy Program, are to be undertaken in adjoining areas of the State, and also identification of ecological vegetation classes. This work should provide the broader regional context described above.

Recommendation I(a)

That if, in the future, additional reservation to provide for adequate representation of dry forest old growth and montane dry woodland identified in the north-eastern part of the study is shown to be warranted, the Department of Conservation and Natural Resources identify an area of sufficient size and take the necessary steps to provide for its permanent reservation, such as that afforded by the *Crown Land (Reserves) Act* 1978.

Note: The identified values are not under threat from timber harvesting, nor any immediate threat from other uses. However, CNR should ensure that the values are maintained in the interim period.

2. Natural landscapes (Criterion B1)

The natural landscapes value identifies extensive areas that have not been significantly modified by European activity. In the context of natural landscapes, roads were not considered as a disturbance factor, nor were weeds, vermin, wildfire or fuel-reduction

burning. However, the value is sensitive to disturbance such as timber harvesting, mining and grazing.

Council did not specifically address the concept of natural landscapes as defined by the joint study and therefore did not identify any essentially undisturbed areas during its investigation. Nevertheless, when developing recommendations for parks and reserves, it used information gathered during its Wilderness Special Investigation as well as other data on disturbance arising from the review of Melbourne Area, District 2.

The joint study aimed at identifying only relatively large areas that remain essentially undisturbed by European activity. It considers such areas to be rare in Australia. However, if roading and other factors are not regarded as disturbance, quite sizeable areas in Victoria would probably meet thresholds established for this value. Some 19 places have been identified, one of very high significance, two of high significance and 16 of moderate significance. The ratings depend largely on size, with the largest areas being attributed higher significance. Some 64% of the total area of the value is included in existing or proposed parks and reserves. The area of very high significance lies in the Upper Yarra catchment within the Council's recommended Ash Ranges National Park. The two areas of high significance occur in the north-east of the study area and are in State forest. Eight of the remaining 16 are included in parks and reserves. In summary, given the comments above, the Council notes that the joint study has drawn attention to these areas, but does not consider all of them need to be included in parks or other conservation reserves.

3. **Wilderness** (Criterion B1)

No wilderness has been identified in the Central Highlands area. This is consistent with the findings of the Council's State-wide Wilderness Special Investigation.

4. **Remote and natural areas** (Criterion B1)

One area has been identified by the joint study as being above threshold. It occurs in the Upper Yarra catchment and within the Council's recommended Ash Ranges National Park. However, it does not meet the LCC criteria for remote and natural areas identified in the Council's Wilderness Special Investigation, which was conducted State-wide. In developing its recommendations for the Melbourne Area, District 2, Review, the Council confirmed the importance of the Baw Baw Remote and Natural Area, which is one of the few large untracked sub-alpine areas in the State.

5. **Succession** (Criterion A2)

This value refers to areas undergoing natural succession, in which one vegetation stage or class replaces another over time. Two types are distinguished: primary succession occurs over a long time period; secondary succession follows a major disturbance such as wildfire.

The joint study identified areas where the two types are taking place. Council has not specifically identified all such places in past studies, but has recognised the value as one to be protected in the park and conservation reserve system. Succession is a component of community dynamics.

Many areas did not meet the criteria essentially because some form of disturbance has disrupted the succession process. Both types of succession are well represented within the park and reserve system, with total representation amounting to 89%. Many of the areas outside parks and reserves are linear in nature and, particularly those associated with rainforest, would be protected in part by the Code of Forest Practices. It should also be noted that succession is a dynamic process occurring throughout all vegetation classes in the forest estate and the aim of management should be to retain examples of all stages across the region. The Council considered that it was not necessary to include all examples of this value specifically in parks and reserves.

Recommendation I(b)

That, in addition to the protection afforded by parks and reserves, the land manager ensure that examples of all stages of succession are retained across the region.

6. **Principal characteristics of ecological vegetation classes** (Criterion D1)

The joint study identified typical examples of each Ecological Vegetation Class (EVC). The EVCs generally coincide with the floristic vegetation communities identified in Council's descriptive report for the Melbourne Area, District 2 and are based on the same survey

data. Appendix III lists each class, the corresponding community and the characteristic species.

In accordance with its own criteria, the Council agreed that undisturbed examples of each EVC should be retained across the region as proposed in the joint study report. To evaluate the representation of each EVC in the study area, the Council used, as a guide, three levels of representation based on the rarity or otherwise of a particular EVC. A level of 30% could be regarded as appropriate for common EVCs, 60% for uncommon and 90% for those that are rare. Several researchers have developed and used such a guide in recent times, although applying it in different ways. It is important to note here that in the following comments the Council is using these levels of representation as a guide only and is applying them to those areas that are in the existing or proposed park and conservation reserve system, which includes reference areas, wilderness areas, national parks, State parks and nature conservation reserves. The joint study report applies the levels to these and other categories of land, so the two sets of data on representation are not comparable. On a regional basis, using as a guide the 30/60/90 representation criteria, EVCs are generally well represented in proposed parks and reserves. Exceptions are montane dry woodland and riparian thicket. In the case of the former, which occurs in the north-eastern part of the study area and coincides with a number of other values, the Council has proposed a course of action that is outlined earlier in this section.

Riparian thicket - a vegetation type confined to stream margins at lower elevations - is a rare vegetation class; it occurs in the north-western part of the study area and is poorly represented in the current and proposed park and reserve system. However, because of its linear shape and scattered distribution, protection by reservation is difficult. The Council emphasises that land managers need to protect this community, and that efforts should be made to set aside some examples when they are in close proximity to proposed reserves. Further, the Council considers that the land manager should address the goal of providing examples of EVCs in each 'geographic unit' within the region, as identified by the joint study, in preparing forest area management plans and should use combination of reserve and special protection zones to achieve that goal. (The concept of the 'geographic unit' is designed essentially as a tool to provide for the variation of values within a region and is intended for use by land managers.)

Parks and other conservation reserves ensure protection of the best examples of a range of values, including vegetation classes, and they also provide a stable context in which to appreciate and understand those values. At the State-wide and broad regional levels, the park and reserve system provides for the variation in values.

With respect to the total area of each EVC in the study area, montane damp forest, herb-rich foothill forest and damp forest, which are common EVCs, do not reach the 30% guideline. Montane damp forest is dominated by alpine ash and CNR's floristic information had previously combined alpine ash forests with shining gum forests into a 'montane forest' grouping. Given that the main distribution of alpine ash occurs further east and that total representation is some 38%, the Council considers that there is no need for further inclusion of the community in parks and reserves on the basis of representation.

Herb-rich foothill forest comprises the lower-elevation narrow-leaf peppermint forests in the Central Highlands, that together with shrubby foothill forest and heathy foothill forest, complete the range of narrow-leaf peppermint forests across the region. This extensive forest type reaches the 30% guideline at the State-wide level when the additional representation proposed by the Council in these recommendations is taken into account.

Damp forest is extensive in the region and is dominated by messmate and mountain grey gum. This community too is widespread across the State, where more than 25% of the total occurrence is included in the park and reserve system. The Council considers that further representation of this EVC in the reserve system is not necessary.

In all three cases, however, land managers should give consideration to the ecological/genetic variation of these EVCs across their range in developing forest area management plans.

Four linear EVCs have also been identified and all occur along watercourses and are therefore subject to the provisions for protection contained in the Code of Forest Practices.

With respect to rainforest, about 66% of the total area in the Central Highlands is included

in parks and reserves and a large proportion of the floodplain riparian woodland is included in the Goulburn Heritage River and is unavailable for timber harvesting.

Recommendation I(c)

That the land manager give particular emphasis to the protection of riparian thicket that is confined to stream margins within State forest.

Recommendation I(d)

That the land manager provide for further protection of examples of ecological vegetation classes in forest management area plans, to encompass the geographic spread and ecological/genetic variation within each class.

7. Old growth (Criterion B1)

It is important to note that 'old growth' as defined in the joint study is a component of the older-aged forests in the region.

The Council has considered these older-aged forests separately.

Council considers that the representation of 'montane and wet forest' (94%) and that of old growth in 'other' forest types, principally rainforest (86%), are adequate in the proposed reserve system. The Council also considers that dry forest old growth (of which 31% occurs in the existing and recommended reserve system), which occurs in the north-eastern part of the study area and coincides with a number of other values, should be addressed in accordance with the process outlined earlier in this section.

Damp forest old growth is rare in the Central Highlands (700 ha) and comprises essentially forests dominated by mountain grey gum and messmate. Some 39% is included in the proposed reserve system. The remainder occurs as small stands scattered across the study area. The Council obtained further information on the location of this old-growth type. The 40 individual stands range up to about 100 ha, with the majority less than 50 ha. The largest stand is still less than 200 ha and is located within the new Ash Ranges National Park.

Council recommends that all such stands be permanently excluded from timber-harvesting operations and other disturbances and be designated as special protection zones in relevant forest area management plans. The Council also notes that the survey and identification of old growth was done using only aerial-photo interpretation. No field checking has been undertaken. It is therefore possible that some stands shown as old growth may not exist on the ground or their location may not be accurately plotted. Alternatively, some stands of old growth might have been missed. The protection of damp forest old growth recommended here does not imply that all such stands in other areas of the State should be similarly protected.

Recommendation I(e)

That all stands of damp forest old growth in the study area be permanently excluded from timber-harvesting operations and other disturbances.

8. Remnant vegetation (Criterion A2)

Council considered that it was important to assess the reservation status of the four remnant vegetation classes in terms of their State-wide distribution, given that these have their main distribution outside the Central Highlands. In the case of plains grassland the whole occurrence within Melbourne Area District 2 is located on private land, while the area of plains grassy woodland occurs in the Yan Yean Reservoir catchment. This area is within the City of Whittlesea and therefore outside Council's jurisdiction. Box woodlands and floodplain riparian woodland are represented in the State-wide reserve system, 30% and 22% respectively, although further representation could be justified. However, the study area under review is not the one most suited to expand that representation.

9. Relictual vegetation (Criterion A1)

The joint study identified the following four EVCs that contain primitive or ancient species and considered as comprising relics of former vegetation types:

* cool temperate rainforest, of which some 65% is included in the reserve system and the remainder is subject to the processes of the Code of Forest Practices
* sub-alpine complex, of which 86% is in the reserve system
* wet/swamp heathland, of which 92% is in the reserve system
* examples of wet forest within identified refugial areas of which 52% is within existing and proposed parks and reserves

Both the second and third types are well represented and, as they are further protected under the Code of Forest Practices, would not be harvested where they occur in State forest. The refugial areas of wet forest identified in the joint study (described later) are essentially the wetter south-eastern facing slopes. The largest and most consolidated one occurs in the Ash Ranges National Park.

The joint study identified the oldest growth stages of wet forest as critical for relictual flora. When this is taken into account, the recommended Ash Ranges National Park - including the Donna Buang addition which significantly increases the representation of this value - probably incorporates more than 90% of these oldest stands. The following areas not included in the existing or proposed parks and reserves also contain wet forest in refugial areas:

- Cement Creek headwaters
- Armstrong Creek headwaters
- Ada River headwaters
- Pioneer Creek headwaters
- south-western slopes of the Baw Baw Plateau
- headwaters of the Tanjil River
- west of Whitehouse Creek

These occurrences are generally small or isolated and Council considers that their values should be considered as part of the forest management planning process. The Council recognises the conservation values of these areas and the relationship of some to park boundaries and linking areas, and considers that these values should be taken into account in forest management planning processes.

10. Nationally rare/uncommon EVCs (Criterion B1)

Plains grassland is the only one identified, but virtually all of it is on private land.

11. Flora species richness analysis (Criterion A3)

In the past, the LCC has not specifically considered this value, which the joint study derived by modelling existing data and applying appropriate thresholds. The value operates at a landscape (broad) scale rather than at a site-specific scale; it is resilient to short-term and/or localised disturbance but is sensitive to long-term and extensive disturbances such as permanent clearing. The Council's recommended land use ensures that permanent clearing is not permitted.

12. Threatened flora (Criterion B1), endemic flora (Criterion A1), disjunct flora (Criterion A) and limit of range flora in the Australian context (Criterion A1)

Some 178 species have been identified by the joint study in relation to these four values. The joint study advice is to develop specific prescriptions for the protection of individual species and, as required, areas of concentration - namely because the response to disturbance varies between individual species.

The *Flora and Fauna Guarantee Act* 1988 provides a co-ordinated mechanism for the protection of all species that are in a demonstrable state of decline likely to result in extinction or are significantly prone to threats that are also likely to result in extinction. It is therefore possible that not all species identified under the last three values would be protected under the Flora and Fauna Guarantee provisions. For those species not covered, the Council considers that specific measures to protect them should be provided in forest management plans. It believes that such protection is appropriate for species whose currently known occurrences are scattered across the study area. The Flora and Fauna Guarantee legislation and forest management planning processes are capable of dealing with such values in a comprehensive way and can accommodate future discoveries. The critical element is knowing where the sites are and ensuring that land managers are aware of their significance and take that into account in their planning processes.

Some sites are included in parks and other conservation reserves. Some of the isolated blocks of public land away from the main forest area in the Central Highlands also contain important occurrences of several rare, threatened or endangered species. The Flora and Fauna Guarantee legislation covers all occurrences of such species, irrespective of land tenure, and is an important mechanism alongside other actions such as formal reservation for the protection of significant conservation values. The Council also considers that the joint study findings with respect to these values should assist land managers in identifying priorities for listing processes and further research needs.

13. Key fauna habitats (Criterion A2)

In the joint study, the key fauna habitats are identified in the joint study are identified specifically because they perform a special function in maintaining particular faunal complements within the region. Other 'key' habitats contribute significantly to the maintenance of faunal diversity and abundance in the region.

Three of the four key habitats described are site-specific and, in relation to the invertebrate habitats, appear to have been selected because they are the only sites for which there are some data. The remnant habitat in the Plenty Gorge is mostly outside the Council's study area. Those small areas of public land within the study area and adjacent to the river have been included in a regional park, for which the recommendations make special reference to the need to protect important habitat values when recreation developments are being considered. The site incorporating Woori Yallock Creek and its tributaries relates to the helmeted honeyeater and is included in a nature conservation reserve. Most of the sub-alpine and wet sub-alpine heathlands that are considered important for invertebrates are included in existing or recommended parks and reserves and, in State forest, are not subject to timber harvesting.

The key invertebrate habitats that occur in the Upper Yarra and O'Shannassy areas are within the new Ash Ranges National Park. The remaining two sites are essentially riparian and are therefore excluded from timber harvesting by the Code of Forest Practices.

All abandoned mines used by colonial breeding or roosting bats should be protected by 'special area' designations in relevant forest area management plans. Some species will also be included under the provisions of the *Flora and Fauna Guarantee Act* 1988.

The remaining 'key fauna habitat' is described as 'multi-aged forest dominated by large old trees'. The joint study advice is that the older mature and senescing trees should be maintained and provision made for recruitment into these older growth stages. Information arising from the joint study indicates that existing and recommended parks and reserves include virtually all the senescent-dominated and mature/senescent co-dominant and a significant proportion of the mature wet and montane wet forests. Some other multi-aged stands in State forest would be protected under the Leadbeater's possum strategies.

14. Rare and uncommon fauna habitat classes (Criterion B1)

The joint study identified a total of 102 habitat classes, including 32 rare and 30 uncommon ones. Most are small occurrences with larger areas in the O'Shannassy catchment.

Council sought more information about the location of these habitats. The relevant maps show that these habitats are generally small and are scattered across the whole region. Some are linear in nature. The Council therefore considered that they should be protected across their full range and that appropriate management guidelines should be established to achieve this during the development of forest area management plans.

15. Fauna species richness (Criterion A3)

In the past, this value has not been specifically considered by the LCC. It was developed in a similar manner to that of flora richness. Given that the value operates at the broad scale and is resilient to disturbance, other than long-term permanent disturbance such as clearing, the Council is satisfied that these recommendations ensure its protection.

16. Places of high invertebrate richness (Criterion A3)

The joint study identified these places on the basis that they were the only areas for which data were available. The Paps Scenic Reserve, Sweetwater Creek Flora and Fauna Reserve and the Upper Yarra catchment stream system (within the Ash Ranges National Park) are considered as being rich in invertebrates.

Council considers that such values warrant recognition but that a lot more work needs to be done before a comprehensive picture of places significant for invertebrates could be established.

17. Threatened fauna species (Criterion B1)

The joint study recognised 177 places where species listed on the Australian and Victorian registers of rare and threatened species occur in the Central Highlands.

Given that the Flora and Fauna Guarantee legislation includes provisions for the protection of these species, the Council

considers that mechanisms exist to ensure that these values can be adequately protected, irrespective of land tenure.

18. Endemic fauna (Criterion A1)

This value describes those species whose distribution is confined to the Central Highlands or those whose distribution is confined to Victoria and are found in the study area. However, a species may be endemic but not necessarily endangered or rare.

Eighteen endemic faunal species have been identified and 14 areas were identified as being important for endemic fauna. Ten of these species are being considered under the Flora and Fauna Guarantee process.

Sensitivity to disturbance varies from one species to another, so the conservation advice is to develop prescriptions for the protection of individual species. The Council considered that protection of these values can be achieved by a combination of the provisions of the Flora and Fauna Guarantee legislation and the preparation of specific prescriptions in relevant forest area management plans for those species not covered the *Flora and Fauna Guarantee Act* 1988. It should be noted that the park and reserve system, includes occurrences of some endemic species, such as the helmeted honeyeater, Baw Baw frog, Leadbeater's possum and the Eltham copper butterfly.

19. Refuges from climate change (Criterion A1)

Such refuges contain characteristics of earlier climatic regimes, but the Council has not specifically considered this value in the past. However, given that it operates at the broad scale and is resilient to localised short-term disturbance but is sensitive to long-term permanent disturbance such as clearing, the Council is satisfied that these recommendations ensure its protection. The joint study did not consider future climatic change and whether or not that change would be naturally induced or the result of the greenhouse effect. More research into the implications of the greenhouse effect on flora and fauna distribution changes is required before such refuges can be accurately determined.

20. Refuges from frequent fire and drought (Criterion A2)

This value has not been specifically considered in the past by the LCC.

Although these refuges operate on a much shorter time frame than those relating to climatic change, the joint study considered that they operate at the broad scale and are resilient to short-term localised disturbance.

The Council therefore considers that its existing recommendations ensure the protection of the value.

21. Geological and geomorphological values (a range of Criteria)

Of the 23 geological sites that come above the joint study's threshold, 17 are within the Council's study area and on public land. The Council considers that these values should be protected by provisions in the relevant forest area management plans.

The four geomorphological sites that were assessed as being above threshold, are now recommended for inclusion in the existing or proposed conservation reserve system.

22. Research and teaching sites and type localities (Criterion C1)

The Council considers that land managers should take such places into account in their planning processes to protect identified values.

23. Aboriginal places - archaeological (Criterion C2)

All sites in the study area with physical remains of any kind relating to Aboriginal culture are protected under the *Archaeological and Aboriginal Relics Preservation Act* 1972. Under the Commonwealth's *Aboriginal and Torres Strait Islander Protection Act* 1987, significant places and objects can be protected from development. The Council considers that these legislative mechanisms are comprehensive and therefore provide the most effective methods of protecting these values.

The Council agrees, however, with the comments relating to the need for improved communication and consultation mechanisms between Aboriginal communities, Aboriginal Affairs Victoria and the Department of Conservation and Natural Resources. It is clear that the major threat to such sites is a lack of information about their locations. Consultation also involves providing relevant information to land managers and ensuring that appropriate access to sites is available to allow proper protection and maintenance of values.

Recommendation I(f)

That Aboriginal Affairs Victoria and the Department of Conservation and Natural Resources seek to improve communication and consultation mechanisms with Aboriginal communities in the region to provide for enhanced protection of sites of Aboriginal archaeological and cultural significance.

24. Aboriginal contact and historical sites

The joint study identified some 140 sites that may or may not have remains or relics. They include sites associated with traditional activities. Survival of fabric is often not essential at the sites, but the joint study advice is that land managers should take into account the values and any extant fabric at these places as part of their planning processes. Aboriginal Affairs Victoria does not list such places on its site register and the Council considers that it should address this issue. As many of the places occur on private land and a range of public land tenures, a mechanism dealing with the protection of all such places is required.

25. Historic places

Some of the more than 200 historical places described in the joint study, are on private land. Most of the larger ones are included in various types of parks and reserves while the remainder are listed as values to be protected in State forest.

26. Places of social value

The joint study report recognised that this value is difficult to assess. However, such places have high community use and visibility, and the study nominated some 54 places. A number are existing recreational sites such as parks, picnic spots, reservoirs and forest drives. Others are on freehold land. The study based its assessments on a discussion paper prepared by the AHC in 1992 and methodologies developed by several different authors since 1988. A range of values was drawn up and a series of regional heritage workshops were held to identify particular localities. Most of the larger areas are included in parks and reserves while the remainder on public land could be listed as sites with values to be protected in State forest.

27. Places of aesthetic value

The joint study defined aesthetic value as including aspects of aesthetic quality, visual abstract quality, evocative quality and meanings that people associate with landscapes. It found no established data sources identifying such places, and therefore drew information from: community heritage workshops; art and literature; recreational and tourist information; professional reports and other studies; forest planners and field staff; and the CNR's visual management system.

Some 66 sites came above threshold. Most places are essentially robust, but maintenance of vegetation cover is considered important for the majority. Aesthetic value relates principally to human resource or experience of the environment and it can be drastically affected by a number of minor actions, such as straightening a road, which is liable to damage scenic quality.

All the sites, except one of the larger ones, occur in parks and reserves (some are Section 50 reserves within State forest). The Council believes that the remaining area (South Hell's Gate) does not warrant specific mention in its recommendations. The Council considers that the smaller sites can be protected by provisions in forest management area plans, where appropriate.

Council has not considered the smaller places with historical, social and aesthetic values in detail, but considers that land managers should take appropriate action to protect identified values. Such protection may take various forms, including reservation under the *Crown Land (Reserves) Act* 1978 or Section 50 of the *Forests Act* 1958 or protection in the relevant forest management area plan or other management plans.

GENERAL RECOMMENDATIONS

Recommendations II and III qualify those in the body of this document.

Council wishes to stress the need for adequate resourcing for management and protection of public land, as it has made its recommendations on the assumption that sufficient staff and finance will be provided for the appropriate management. Unless these resources are provided by government,

Council's recommendations cannot be effectively implemented. However, it must be recognised that most of the public land is managed by the one authority - the Department of Conservation and Natural Resources - regardless of the current or proposed land-use category. New resources will be required where the intensity of management increases as a result of these recommendations.

Council emphasises that pest plants and animals pose problems in the management of public land. Finance and staff are required to research and implement methods of controlling pest species. As with most public land, fire protection and suppression measures may be necessary from time to time. Council therefore recommends:

II That the authorities responsible for managing and protecting public land and water resources be allocated the resources necessary for the task.

Council expects that further study and investigation may identify additional areas with special values and discover new earth resources. In addition, new uses of existing resources may also be discovered. Present planning cannot specifically provide for the conservation of these values or the utilisation of these resources. Council therefore makes three recommendations:

III That, when significant new discoveries are made relating to land and resources within their administration, government agencies enlist the best advice available on the importance of such discoveries and how they should be managed. Advice from relevant organisations other than government authorities and academic institutions should be sought whenever appropriate.

IV That Aboriginal cultural and archaeological site surveys be carried out on public land where appropriate

(a) where it is subject to proposals for development, and

(b) in association with other surveys being carried out by land managers.

V That, where specific Aboriginal associations are identified, the land managers should provide opportunities at an early stage for relevant Aboriginal communities to become involved in the preparation of management plans.

Recommendations VI to IX concern the implementation of recommendations.

Council recognises that, in some cases, existing legislation may have to be amended, or new legislation passed, in order to effectively implement some recommendations. It is aware that this may result in a delay, perhaps of several years, before some of its recommendations can be implemented. The Council is concerned that, where implementation of the recommendations would involve a change of land tenure, actions during the delay period could affect identified values or reduce management efficiency.

VI That, until the formal procedures for the implementation of those recommendations approved by government are completed, the present legal status and management responsibilities continue, except that the land be managed in accordance with the approved recommendations.

VII That the boundaries of many areas, if they have not been precisely surveyed, be subject to minor modifications, road excisions, easements and other adjustments that may be necessary.

VIII That, in cases where occupation does not agree with title, the Department of Conservation and Natural Resources may at its discretion make adjustments to boundaries of public land when implementing these recommendations.

IX That the recommendations in this report do not change the status of roads passing through or abutting public land that are at present declared roads under the *Transport Act* 1983.

A. PARKS

Victoria contains substantial areas of public land that have been retained in a relatively natural state. The number of people using these areas for recreation is increasing and will probably continue to do so. Pressures for the use of public land in ways that would change its condition are also increasing. Council believes that it is essential to reserve, now, viable samples of the various land and vegetation types, together with the outstanding natural features, that occur on public land. These areas can best be reserved in a system of parks.

Several large tracts in the study area are essentially natural and contain examples of the landscape and flora and fauna that have remained relatively undisturbed since European settlement. Such lands are a valuable part of our heritage, and dedication of substantial representation of them for nature conservation provides for the benefit, education and enjoyment of present and future generations. This principle of land use is a major consideration in determining that areas should be reserved as parks.

A park is defined here as 'an area of land in a natural or mostly 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; they vary mainly in size and content and in the types and intensity of uses to which they are subjected. Definitions of different types of parks are provided below to clarify the main purposes for which each one is created to guide planners, managers and users of parks.

It is necessary to establish the management aims that apply to 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. This should include the identification and strict protection of significant ecological systems as well as the development and use of techniques (including husbandry techniques and population manipulation) to enable species of particular interest to be studied and special values associated with flora and fauna to be maintained or enhanced.

The location and management of areas zoned for intensive recreation will require special care to prevent damage to the environment.

Park management

Council recognises that wildfires, however caused, must be prevented from threatening life, property and natural resources in the State. The measures necessary to control wildfires must be taken in parks as in other areas. The suppression of fires in parks reserved under the *National Parks Act* 1975 remains the responsibility of the Department of Conservation and Natural Resources (CNR).

Fire-prevention measures such as maintenance of fire-access tracks and protective burning will also be required in those areas of parks that have strategic importance for fire-control.

The particular measures to be taken in individual parks will be incorporated in the protection plans prepared by CNR.

Two organisations - CNR and the Country Fire Authority - share the duty of fire-prevention in rural Victoria and have closely co-ordinated arrangements for mutual co-operation. The Country Fire Authority also has fire-control responsibility for land that is vested in or under the control of Melbourne Water Corporation, although Melbourne Water retains the capacity of first attack for any fire occurring on land under its control.

Control of vermin and noxious weeds within parks will continue to be the responsibility of CNR, and will be carried out in accordance with plans prepared by the Department. Managers could use community groups and organisations to assist in the control or eradication of introduced species where appropriate and subject to an approved program. This could involve the use of experienced hunters.

With sensitive and responsive planning and management, the Council believes, the parks should be able to cater for a broad spectrum of public recreation activities without prejudicing other major functions - namely, long-term conservation and protection of each area's special natural features.

An essential aim in the reservation of an area as a park is to provide for the public's enjoyment, and therefore public access will be maintained. Indeed, additional access may be provided to interesting areas by way of nature trails and walking tracks.

The Council believes that the park system should offer a wide range of recreational uses. There is a place not only for activities such as photography, bird-watching and nature study, but also for those like scenic driving and touring using the existing tracks as well as the system of formed roads.

To ensure that the importance of protection and conservation of the intrinsic values of parks is recognised through management, the Council has recommended that all parks be reserved under the *National Parks Act* 1975. As a result of an amendment to that Act in 1989, for both national and State parks, the Director is required to:

'(i) preserve and protect the park in its natural condition for the use, enjoyment and education of the public;

(ii) preserve and protect indigenous flora and fauna in the park;

(iii) exterminate or control exotic fauna in the park;

(iv) eradicate or control exotic flora in the park...'

The Act, therefore, does not differentiate between the two classes of park in terms of the requirements on the Director for their management, and revocation of either requires an Act of Parliament.

The Council has recommended that most of the parks should be managed directly by CNR. However, parts of the park system described in these recommendations (addition A4 to the Kinglake National Park, and Recommendation A12 - the Ash Ranges National Park) include co-operative management of adjoining areas by Melbourne Water and CNR. In order to facilitate the development of a co-operative agreement and management plan for these parks, the Council has outlined below a series of principles as a basis for management. It is intended that these principles address the key issues associated with management of the park. They do not preclude the managers from addressing other issues considered to be important.

Principles for management of parks where both the Department of Conservation and Natural Resources and Melbourne Water Corporation are involved

* Management priorities should be the continued protection of the very high conservation values of the park together with the protection of water quality and yield.

* Continued high priority should also be given to fire prevention and control to protect water quality and yield. The policy of active co-operation with statutory fire-fighting authorities should continue.

* The land should be reserved as a single area under the appropriate legislation, but the on-ground management should continue as at present; that is, Melbourne Water continues to manage the water supply catchments and CNR manages the balance.

* A co-operative agreement on the management of the park should be drawn up between Melbourne Water and CNR to recognise both the on-ground requirements and the working relationship between the two and should form the basis for the preparation of a detailed plan of management for the park. A draft plan should be published and public comment sought prior to the publication of a final plan, which should be completed within 2 years of the park being placed on a schedule of the *National Parks Act* 1975.

* Should any dispute arise in relation to the management of the park, a final determination should be made jointly by the Minister for Natural Resources and the Minister for Conservation and Environment.

* Field staff of both Melbourne Water and CNR should have the same powers in relation to enforcement responsibilities. Reciprocal arrangements with respect to carrying out those responsibilities should be established.

* Priority should be given to developing a comprehensive program to control exotic flora and fauna.

* While control of public entry to the water supply catchments should continue, to reduce the risk of contamination of water supplies and the possibility of fire, the land managers should provide

new opportunities for pedestrian-based within the park. They should also explore the opportunities for other recreation facilities, including camping areas outside the present water supply catchments. Additional public vehicular access to the current water supply catchments should not be permitted, although managers should provide access for disabled people to visit examples of the park's key features. Recreational hunting should not be permitted in the park.

* Where catastrophic events (such as wildfire) kill or damage areas of forest, salvage-logging should not be permitted, in order to permit natural processes to occur.

* Melbourne Water should continue its program of catchment hydrology research into all aspects of forest management as they affect stream values and, as appropriate, incorporate the research results into catchment management policies.

* Research activities by *bona fide* research institutions should continue to be permitted where the proposed activities do not conflict with protection of water quality or yield or maintenance of conservation values.

* Should future augmentation of water supplies to Melbourne require the construction of facilities within the park, this should be permitted, provided adequate safeguards are implemented to protect significant conservation values and water quality and that management of the area protect and enhance the recreational values.

NATIONAL PARKS

A national park is defined as:

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

The conservation of native flora, fauna and other natural features would be an essential part of national park management. Interpretative services would be provided. Development of facilities would be confined to a very small portion of the park. Activities would largely consist of sightseeing and the observation of natural features. Wilderness zones, which are relatively undisturbed tracts of land used for solitude and wide-ranging forms of recreation, could be designated within a national park.

As well as the recommendation below that applies to all the existing and proposed national parks and their additions, specific recommendations may apply to individual parks or areas.

NATIONAL PARKS

Recommendations

A1—A3,A5—A11 That the areas described below be used to:

(i) conserve and protect natural ecosystems

(ii) protect sites of cultural importance

(iii) supply water and protect water catchments and streams

(iv) provide opportunities for recreation and education associated with the enjoyment and understanding of natural and cultural environments

that

(v) apiculture not be permitted except on traditionally licensed sites and the number of sites be maintained, subject to:

(continued)

A1—A3,A5—A11 Recommendations (continued)

(a) the outcome of research into the ecological impacts of this industry

(b) park management requirements

(vi) harvesting of forest products not be permitted

(vii) grazing by domestic stock not be permitted

(viii) hunting and the use of firearms not be permitted, except where specified below

and that they be included on a schedule to the *National Parks Act* 1975.

Note:
Specific recommendations apply to the proposed Wallaby Creek addition (A4) to the Kinglake National Park and the new Ash Ranges National Park (A12); these are set out in full in the relevant sections.

EXISTING NATIONAL PARKS

A1: Kinglake National Park

Land at Kinglake was reserved as a national park prior to Council's recommendations in 1977. This designation has been retained, although the Council at that time recommended that the original area, together with additional parcels of land, should be set aside as a State park. The additional areas and the classification were approved by the government.

The Council is now proposing further substantial additions of land to the Kinglake park, which would then encompass a total area of some 18 120 ha (this includes the portion of the existing park in the study area, the portion of it in the City of Whittlesea, the proposed additions and the reference areas within the proposed Wallaby Creek addition - which are traditionally set aside as zones within a park).

In the context of the total land area now proposed to be included in the park, and the wide representation of land types, plant communities and other values that the existing park and the additions contribute, the Council now believes that the greater area warrants designation as a national park.

The park consists of three large, irregularly shaped parcels of land and a number of smaller ones. It abuts freehold land on most of its boundaries.

Located within the dissected East Victorian Uplands (geomorphic unit 1.1), the plateau (described by land systems $1.1/Gs7_4$ and $1.1/Gs8_1$) and dissected terrain here (land systems $1.1/Ss7_2$, $1.1/Ss7_3$, $1.1/Ss7_4$ and $1.1/Ss8_5$) have developed on marine sediments of Silurian and Lower Devonian origin.

Vegetation types within the park are typical of those found in the dry forests of the foothills and southern slopes of the Great Divide. The most common are grassy dry forests, damp forests and shrubby foothill forests to the north, grading into heathy dry forests in the south. Many of the streams are bordered by riparian forest. The rare plant creeping grevillea (*Grevillea repens*) grows here.

The park supports a high diversity of native animals and a large number of rare or threatened species, including the powerful owl, sooty owl, barking owl, tree goanna, tiger quoll and brush-tailed phascogale; it also contains roosting colonies of common bent-wing bat and eastern horseshoe-bat.

Its chief scenic features are fern gullies and waterfalls and the panoramic views that can be obtained from a number of vantage points across the cleared lowlands towards Melbourne. Recreational use is high and includes nature study, walking on tracks or through the bush, picnicking, horse-riding and some camping in designated sites. A number of public roads traverse the park.

Kinglake National Park

Recommendation

A1 That the area of 9500 ha, indicated on Map A, be used in accordance with the general recommendation for national parks outlined above.

Notes:
1. A parcel of about 15 ha in the east of the existing park is separated from the balance of the park by the Melba Highway and is further segmented by the main road to Toolangi. No values of special significance have been identified here and, to achieve rationalisation of the park boundary, this area is not included in the above recommendation and should revert to State forest.
2. It is recommended that the Kinglake Education Area (M8 in the 1977 recommendations) not be retained as an education area but be incorporated in the park, see Chapter J - Community Use Areas. This already lies within the existing park but is identified as a separate zone.
3. A further area of approximately 1620 ha of the existing park is located within the City of Whittlesea.

Additions to the Kinglake National Park

Three areas are proposed for addition to the existing Kinglake National Park. These additions facilitate ease of management of the park by consolidating park boundaries, and improve public access to the park. They contain important nature conservation and recreational values that complement and enhance the values of the park itself as well as those of the other parks and reserves in the State.

A2: Yea River addition to the Kinglake National Park

This proposed addition, of about 200 ha, comprises the area recommended by the Council in 1977 as the Yea River Regional Park.

Its major recreational focus is the floodplain of the Yea River, which is readily accessible from the Melba Highway. The surrounding forest provides an important scenic backdrop.

West of the Yea River, the land rises steeply to Andrews Hill and contains no vehicular access. It supports damp forest and shrubby foothill forests, with mountain ash in sheltered gullies. The relatively intact riparian forest along the river is considered to be of regional botanical significance.

This addition facilitates the management of the adjoining section of the existing park and rationalises the boundaries. Further, because Education Area J2 is incorporated as a zone within the existing park, it provides a continuum of park straddling the Great Dividing Range along the western side of the Melba Highway.

Yea River addition

Recommendation

A2 That the area of approximately 200 ha, indicated on Map A, be added to Kinglake National Park and used in accordance with the general recommendation for national parks outlined above.

A3: Reedy Creek addition to the Kinglake National Park

This recommended addition of 300 ha extends the park south to Buttermans Track - a popular tourist road - and provides a rational boundary to the park as well as a readily recognisable boundary between the park and the Warrandyte—Kinglake nature conservation link (C48) and freehold land to the south.

The Reedy Creek area supports grassy dry forest (red box, red stringybark, long-leaf box), riparian forest (manna gum, swamp gum), riparian thicket (woolly tea-tree, silver wattle) and grassland of kangaroo grass. It provides habitat for a range of fauna such as brush-tailed phascogale, brush bronzewing,

brush cuckoo and red-browed treecreeper, and forms part of the range of the powerful owls based on One Tree Hill.

The land was purchased by Melbourne Water and forms part of the catchment to the proposed Little Watsons Creek Reservoir, which is an option for augmentation of Melbourne's water supplies.

Reedy Creek addition

Recommendation

A3 That the area of approximately 300 ha, indicated on Map A, be added to Kinglake National Park and used in accordance with the general recommendation for national parks outlined above.

Note:
A main easement for the Gas and Fuel Corporation of Victoria crosses this area.

A4: Wallaby Creek addition to the Kinglake National Park

Comprising the catchments to Wallaby and Silver Creeks, this recommended addition encompasses some 6200 ha (including the enclosed reference areas) and forms the bulk of the land that contributes water to the Wallaby Creek water supply system. This and the associated buffer areas (see Recommendation E8) are managed by Melbourne Water.

Topography and land systems

The addition ranges in elevation from 200 m to 700 m, as it contains portion of the Mount Disappointment range.

Much of the soil is of granitic origin and forms flat to moderate slopes. Forming part of the dissected East Victorian Uplands geomorphic unit (1.1), the two main land systems here - $1.1/Sg8_1$ and $1.1/Gg8_1$ - are found only in this study area and, except for the existing reference areas, are not otherwise represented in nature conservation reserves. A further land system included here - $1.1/Ss7_3$ - comprises the steeply sloping land on sedimentary rocks at the junction with the granite.

Vegetation

This land contains a substantial area of both mature and regrowth (mostly of 1926 origin) wet forest of mountain ash. Much of the northern portion also contains mature damp forest of messmate.

Mature, relatively undisturbed examples of cool temperate rainforest, wet forest and damp forest, shrubby foothill forest and riparian forest here are considered to be of State botanical significance. The stands of tall, old mountain ash trees are also considered to be of State historical significance as examples of the forests that preceded settlement.

Fauna

The older-aged forests provide important habitat for hollow-dependent species and the cool temperate rainforest provides breeding habitat for the pink robin.

Cultural values

Built between 1883 and 1887 to supplement the Yan Yean system, the Wallaby and Silver Creek water supply schemes were built of local stone and crafted to a high standard. The various elements of this scheme are considered to be of State historical significance. Those incorporated in the park addition include the weir, aqueduct and 600 metre-long tunnel associated with Silver Creek, and the Nimmo Falls quarry - which supplied the granite facings for the project and thus has regional significance.

Other values

This area retains high biological integrity because of the protective forms of management undertaken by Melbourne Water and its predecessors. Nothing in these recommendations is intended to reduce this level of protection.

The area's principal value to the parks system of the State lies in its representative stands of essentially natural mature and regrowth forests and of land systems. It contributes a

component to the Kinglake National Park that is based principally on nature conservation and provides an important scientific and educational resource. It has been used for long-term studies of the ecology of ash forests. Much of the existing park, on the other hand, is oriented towards a range of recreational uses.

During the 1983 wildfires, large tracts of this catchment were burnt and significant stands of mountain ash were killed or damaged. These tracts were salvage-logged under prescriptions designed to protect water values.

This area is used infrequently for supervised tours of the forests. Melbourne Water is reviewing the possibility of providing further opportunities for supervised or controlled public access to its catchments.

A number of principles for park management, listed in the preamble to parks, recognise the separate but complementary functions of CNR and Melbourne Water. These principles are directed towards co-operative management of the areas of land that make up the parks in which the respective instrumentalities retain management responsibility. Similar arrangements are recommended for the Wallaby Creek addition to the Kinglake National Park and the Ash Ranges National Park.

Wallaby Creek addition

Recommendation

A4 That the area of approximately 5600 ha, indicated on Map A, be added to the Kinglake National Park and used to:

(i) supply water and protect catchments and streams

(ii) conserve and protect natural ecosystems

(iii) protect sites of cultural importance

(iv) consistent with (i), (ii) and (iii) above, provide opportunities for recreation and education associated with the enjoyment and understanding of natural environments

that

(v) the results of hydrological research that would achieve positive benefits for both water yield and protection of the natural values be incorporated in the management plan

(vi) the timing, location, nature and intensity of scientific, educational and recreational use be subject to joint agreement between Melbourne Water and the Department of Conservation and Natural Resources

(vii) harvesting of forest products not be permitted

(viii) grazing by domestic stock not be permitted

(ix) apiculture not be permitted

(x) hunting and the use of firearms not be permitted

(xi) no new public vehicular access be provided within the water-supply catchments

that

(xii) the two agencies enter into a Co-operative Management Agreement for this portion of the park

(xiii) a management plan be prepared that accommodates the principles outlined in the preamble to this chapter

(continued)

A4 Recommendation (continued)

(xiv) an advisory committee, comprising representatives from Melbourne Water, the Department of Conservation and Natural Resources and community interest groups be established to assist management planning

and that the area be included on a schedule to the *National Parks Act* 1975 as part of the Kinglake National Park, with specific recognition in the Act of the Co-operative Management Agreement.

Notes:
1. The area stated above refers only to the park addition indicated on Map A. The addition also encloses Reference Areas B1 and B2 (totalling about 600 ha in the study area). Reference areas are usually designated as zones within a park.
2. The upper catchment of the Plenty River, which is part of the Wallaby Creek water supply system, also contributes to the high nature conservation and scientific values of the forests of the region. In addition to those vegetation classes represented in the Wallaby Creek and Silver Creek catchments, it contains heathy dry forests. A rare plant - creeping grevillea - occurs here. Moreover, the catchment includes 'The Cascades' - a series of granite steps some 220 m long in the Wallaby Creek aqueduct, designed to break the flow of the water as it descends into Jack Creek. This (built in 1883), the Jacks Creek channel (1886) and the Toorourrong Reservoir (1885) - all within the catchment - are considered to be of State historical significance.

As a result of the declaration of the City of Whittlesea, the Plenty River headwaters are no longer within the Melbourne Area, District 2. Council believes that public land within this catchment (which incorporates the larger part of the Disappointment Reference Area and the Joey Creek Reference Area and totals some 4220 ha) would make an important contribution to the Kinglake National Park and that consideration should be given to its inclusion with the Wallaby Creek addition. Together with the reference areas surrounded by the park, this would bring the total area of the Kinglake National Park to some 22 320 ha.

A5: Dandenong Ranges National Park

Land acquisition in the Dandenong Ranges

Much of the land comprising the existing Dandenong Ranges National Park and the recommended additions has been acquired over time by the government. The Ferntree Gully National Park was first reserved as a site for public recreation in 1881 and declared a national park in 1928. The historic Doongalla estate was purchased in 1950 and Kalorama Park in the 1960s. A land-purchase program instituted following disastrous fires in the 1960s has enabled the acquisition of land on the western and northern faces of the Dandenong Ranges to facilitate fire management.

The Council in 1977 recommended that an area of some 400 ha, which encompassed the then-existing Ferntree Gully National Park, be a regional park. At the same time the Council recommended that three other major blocks of public land in the Dandenongs - Sherbrooke Forest, Doongalla Forest and Olinda Forest - together with a large number of smaller parcels of public land in the region extending east to Cockatoo, be included in a 3000-ha Dandenongs Regional Park.

By 1977, the former Melbourne and Metropolitan Board of Works had acquired land for a proposed additional water storage (Silvan No. 2) north of the existing Silvan Reservoir and abutting the Olinda Forest. In the 1977 recommendations also, the Council recommended inclusion of this land in the Dandenongs Regional Park until it was required for water supply purposes.

Subsequent to those 1977 recommendations, the government acquired further parcels of land that effectively link the Ferntree Gully park with Doongalla Forest to the north (Sassafrass corridor) and with Sherbrooke Forest to the east (Upwey corridor). Other land purchases have enabled consolidation of a number of boundaries.

In addition to the land purchases for the existing Dandenong Ranges National Park, the government has acquired a large tract of land at Kalorama (in the Montrose-Mount Evelyn area) together with smaller parcels within inappropriate subdivisions here as well as on

steep unstable slopes at Olinda. In all, some $9 million has been spent on the buy-back program.

Melbourne Water has also decided that the site of the Silvan No. 2 reservoir is surplus to requirements.

In 1987, the government declared the Dandenong Ranges National Park (which includes parts of both the regional parks previously recommended by the Council).

In the proposed recommendations for this review the Council stated that the classification of State park, which reflected the inherent characteristics of the area, would ensure protection of the park's important nature conservation values while continuing to provide for the high recreational use.

Even with the recommended additions (described below), the park in the Dandenong Ranges does not strictly meet the Council's criteria for national park classification. However, the Council recognises that many people have expressed concern about the proposal to reclassify the area currently recognised as a national park even though, as explained in the preamble to this section, national and State parks are subject to the same management requirements under the *National Parks Act* 1975. Accordingly, the Council will continue to identify this area as the Dandenong Ranges National Park.

Existing Dandenong Ranges National Park

The Dandenong Ranges National Park, proclaimed in 1987, covers some 1920 ha and includes the areas formerly known as the Ferntree Gully National Park, Sherbrooke State Forest and Doongalla State Forest.

Topography and land systems

Falling within the dissected uplands of the Eastern Victorian Uplands (geomorphic unit 1.1), the park includes land systems that are otherwise not represented, or only poorly represented, in the nature conservation reserve system.

The Dandenong Ranges consists largely of mountainous country formed predominantly from Upper Devonian volcanics. The existing park comprises stony loams (land system $1.1/Sv7_3$) and red or brown earths ($1.1/Sv8_1$) derived from the volcanics.

Vegetation

The existing park supports high-quality examples of wet forest, damp forest, shrubby foothill forest and the locally rare and depleted grassy dry forest vegetation classes. It has State botanical significance based on the quality of these classes, the large and high-quality stands of cool temperate rainforest here and the presence of five rare plant species - pinkwood (*Beyeria viscosa*), foothills spider-orchid (*Caladenia oenochila*), slender tree-fern (*Cyathea cunninghamii*), clover glycine (*Glycine latrobeana*) and the netted brake (*Pteris comans*) - and the two vulnerable species green leek-orchid (*Prasophyllum lindleyanum*) and fairy lanterns (*Thismia rodwayi*). In all, some 350 species of indigenous plants have been recorded in the park.

Representative vegetation classes in the existing park and the recommended additions complement those in the existing parks and nature conservation reserves of the region, including the recommended Ash Ranges National Park.

Fauna

Populations of the rare broad-toothed rat, powerful owl and sooty owl inhabit the existing park, as well as the tree goanna, which is classed as threatened. The forests are also important for their representation of wet forest fauna and the high educational value they provide close to Melbourne. The lyrebirds here are of particular interest to visitors and provide scientific value, having been studied and monitored for some 30 years.

Recreation

The Dandenong Ranges have been described as containing a 'significant mixture of images including forests, fern gullies, gardens, craft shops, small townships in the hills, lookouts with views, restaurants and tea houses, scenic drives, wild flowers, picnic and barbecue areas'. They provide a major attraction for tourism and receive around two million visitors a year, and the park is a focus of interest. Its proximity to Melbourne makes it popular for day trips and visitors undertake a wide range of activities. Sightseeing and picnicking, usually in association with pleasure driving, and nature-based and day walking activities are the most common; horse-riding is undertaken in some areas. All the major parcels of land making up the park are interlaced with walking

tracks. Public vehicular access is largely restricted to roads surrounding the park, although several scenic drives through it, notably the Mount Dandenong Tourist Road, encourage an appreciation of its values.

Cultural values

Little physical evidence remains of the occupation of the area by the Aborigines prior to European settlement.

Initially reserved in 1882, the Fern Tree Gully area was one of Victoria's first national parks - officially established in 1928. It became one of Melbourne's most popular resorts. A number of tourist facilities and animal enclosures were built here in the first half of this century; those remaining are of historical interest.

Management

The park, with the recommended additions, comprises four separate parcels of land linked through narrow corridors and has a considerable length of boundary in proportion to the total area. As a result, and because of the close proximity of urban land, parts of its indigenous understorey vegetation have been invaded by escapee garden plants, and domestic dogs and cats have had an impact on the native fauna, notably the lyrebird population and other species of ground-dwelling wildlife. Other sections of the park have been disturbed by previous land uses.

While some parts have been subject to weed infestation and the impact of feral animals, these issues are being addressed through firm action by neighbouring municipalities, the park managers and a range of interested community groups. 'ParkCare' programs also operate. Pest plants and animals will require on-going management.

Current fire-prevention activities (principally on the park's western and north-western margins) involve a fuel-reduction burning program and, in some locations, mechanical removal of the understorey. The high fire hazard of these areas and the close proximity of extensive urban development mean that fire-protection activities will remain an integral part of park management.

Dandenong Ranges National Park

Recommendation

A5 That the area of 1830 ha, indicated on Maps A and B, be used in accordance with the general recommendation for national parks outlined above

and that

(ix) the extant early 20th Century recreational facilities of the former Ferntree Gully National Park be protected.

Notes:

1. A further 90 ha of the existing park falls within the City of Knox and is therefore outside the study area.
2. The western and north-western slopes of the park require a high level of fire-protection management.
3. A parcel of freehold land abutting the Doongalla block is owned by the local municipality and managed by the Director of National Parks and Wildlife as if it were part of the park. This land would form an appropriate addition to the park.

A6: Additions to the Dandenong Ranges National Park

The Council is recommending a number of additions to the existing Dandenong Ranges National Park, notably a large parcel of public land of some 1060 ha that includes the Olinda Forest and extends to Mount Evelyn and Montrose. In all, the park would then cover some 3356 ha, consisting of four parcels of land linked by public-land corridors.

In accordance with its 1977 proposals, the Council recommends that the Olinda State Forest be included in a park in the Dandenong Ranges. Further, as an outcome of this review of the values and use of all land in area, the Council is recommending the addition to the park of the land at Kalorama at the northern extremity of the ranges, as well as all smaller

blocks of public land, including those purchased as part of the Dandenongs buy-back program, that support native vegetation and either abut or form parts of links or corridors between the major blocks of the park.

New information has also become available on the natural and cultural values and uses of public land in the area outside the existing park.

The parcels of public land that comprise the existing park and the recommended additions complement each other and the State-wide system of parks in terms of representation of vegetation classes (those in the south, for instance, support wet forest while the northern areas support damp forest and foothill forest communities) and land systems, and in the provision of a range of recreational opportunities.

Resource implications

None of the areas comprising the recommended additions to the park is used for, or currently available for, timber production.

The recommended park additions fall within a region with potential for producing gold, tin and tungsten, but contain no identified commercial resources. No exploration or extraction tenements are current there.

Olinda Forest and Kalorama addition to the park - A6(a)

This recommended addition to the park includes the areas around Kalorama known as the Mount Evelyn and Montrose State Forests, Olinda State Forest, Kalorama Park and the site of the (no longer required) Silvan No. 2 reservoir and covers some 1060 ha.

The larger parcels - comprising Olinda State Forest and the land around Kalorama - are comparatively little disturbed and support a range of characteristics and values that add to and complement those of the three major areas of the existing park.

Like much of the Dandenong Ranges, the parcels include mountainous country derived chiefly from Upper Devonian volcanics with similar land systems, but also include red friable or shallow stony earths ($1.1/Sv8_2$ and $1.1/Sv8_3$). The former is inadequately represented in conservation reserves in the State. Gentler slopes here comprise red earths derived from Lower Devonian marine sediments; land system $1.1/Ss8_1$, which is also considered to be inadequately represented in reserves.

These two areas support representative examples of damp forest, riparian forest and heathy foothill forest and are considered to be of regional botanical significance. The drier foothill forests are the most extensive remaining in the Dandenong Ranges. The relatively undisturbed condition of most of the area enhances its value for faunal habitat.

Kalorama Park, comprising a lookout and picnic site, is readily accessible to visitors and provides expansive views across the section of the Olinda Creek valley within this part of the recommended national park. It also includes the scenic Olinda Falls - another recreational focus. An extensive network of fire management tracks throughout provides opportunities for walking and access for other activities such as nature study. The area has high capacity for over-night, lightweight camping. Opportunities for extended walks and camping are limited elsewhere in the Dandenong Ranges.

Corridors and links - A6(b)

The government's land-acquisition program has resulted in corridors of public land essentially linking the main parcels of public land in the Dandenongs. These links support areas of nature conservation value and, in addition to facilitating more effective management of the park and of fire, provide both habitat links and opportunities for the development and enhancement of recreational access.

As well as recommending the land forming the Sassafrass and Upwey corridors, Council is recommending two other linking areas for addition to the Dandenong Ranges National Park. One, to the north, between the Doongalla block and the Kalorama block in the Montrose-Mount Evelyn area, comprises land purchased by the government.

The second incorporates existing Crown reserves that support remnant forest and extends east from Mount Dandenong in the Doongalla block to the Olinda Forest. It includes the public land water-frontage reserves along two tributaries of Olinda Creek (traversed by a stream-side walking track), the Mechanics and Singleton Reserves and the Mount Dandenong Arboretum. Remnant native forest in the William Ricketts Sanctuary also makes an important contribution to this

link, notwithstanding its recommendation as a Community Use Reserve (see Chapter J).

Other minor additions - A6(c)

Several other small parcels of reserved public land and resumed land, on and close to the boundaries of the three major parcels of land that comprise the existing park, complement the nature conservation values and recreational opportunities of the park and are recommended for addition. They include the northern parts of the area known as the '40-acre Nicholas Paddock' and of the former Yanakie homestead block, a Departmental depot at Woolrich Road (to be a special zone within the park) and land adjoining Sherbrooke Road, which was once leased by the former Burnham Beeches Estate (this area may continue to be used as a picnic venue subject to protection of remnant eucalypts and restoration of the original horse-riding 'tan track' and associated planted corridor).

Other notable additions include Burkes Lookout Reserve, Fiveways Reserve and the Mount Dandenong Observatory Reserve - all of which provide expansive views of the park and across much of the Melbourne metropolitan area. The summit of Mount Dandenong, with the lookout, picnic area and restaurant, is a major venue for visitors to the Dandenong Ranges and an important focus for the park.

Additions to the Dandenong Ranges National Park

Recommendation

A6 That the areas described above and indicated on Maps A and B, totalling about 1600 ha, be added to the Dandenong Ranges National Park and used in accordance with the general recommendation for national parks outlined above

and that

(ix) the Mount Dandenong Arboretum and 'Skyhigh' restaurant and associated facilities be included as special management zones within the park.

Notes:

1. Provision should be made to enable leasing of the 'Skyhigh' restaurant and associated facilities.
2. Legal access should continue to be provided to private land surrounded by and adjacent to the recommended park additions.
3. Implementation of the recommendation to add the Olinda Forest and Kalorama areas to the park will involve the transfer of most of the now-redundant Silvan No. 2 reservoir land from Melbourne Water to CNR. Those parts not included in the park addition have been so modified that the land is not considered suitable for inclusion in the park. Portions have been cleared and part, since the 1930s, used as a flower farm. These areas are recommended as not required for public purposes (see Recommendation 02).
4. The Kalorama area includes a number of small dams that provide water for the horticultural operations on the inliers of leasehold. This use may continue subject to the requirements of the land manager.
5. A small portion of the R.J. Hamer Arboretum, at the southern end of the Olinda Forest block, is included in the park (see Chapter J - Community Use Areas).
6. The Council supports the government's on-going land-acquisition program to assist in the consolidation of the park boundaries and in fire management. Opportunities for further boundary rationalisation, perhaps by way of land exchange, should also be explored.

A7: Baw Baw National Park

The Baw Baw National Park was recommended by the Council in 1977 and includes the Baw Baw Plateau and steeply dissected terrain in the valleys of the Aberfeldy and Thomson Rivers.

The plateau is composed of granodiorite and the distinctive features associated with its weathering are considered to be of national geological and geomorphological significance.

A high proportion of the plateau supports treeless alpine vegetation (dry sub-alpine shrubland and damp and wet sub-alpine heathland), but also includes sub-alpine woodlands of snow gum, riparian thickets and montane wet forest. Populations of 13 rare and

threatened plant species occur here and contribute to its classification as an area of national botanical significance; these include the Baw Baw berry (*Wittsteinia vacciniacea*), one of only two plant genera that are endemic to Victoria. The steep southern fall to the Thomson River, which includes Mount Erica, supports cool temperate rainforest as well as wet forest and damp forest and is considered to be of State botanical significance. The eastern section that includes the lower reaches of the Aberfeldy River supports heathy dry forests, shrubby foothill forests and damp forests.

A unique faunal assemblage occurs on the plateau. It includes the only known habitat of the Baw Baw frog - a vulnerable species and supports the rare broad-toothed rat. Substantial areas of older forest here were not salvage-logged after the 1939 fires and the high density of stags amid the regrowth provides valuable habitat for a range of hollow-dependent fauna such as the rare sooty owl and, particularly, the endangered Leadbeater's possum.

The park provides excellent opportunities for snow-play and cross-country skiing in remote, semi-remote and natural settings as well as bushwalking, rock-climbing, canoeing and, where appropriate, fishing, horse-riding and four-wheel-driving. It forms part of the catchment of the Thomson Reservoir.

The Alpine Walking Track traverses the Baw Baw Plateau - largely along the route of the old Baw Baw Track, which was cut in 1907 as a tourist track linking the upper Yarra valley and Walhalla.

In its 1977 recommendations, the Council specified that:

* no further villages be developed on the plateau
* no skiing facilities be developed on the Thomson side of the plateau
* the Nordic ski trails (the St Phillack Loop Trail and the Tullicoutty Cup route) associated with the Baw Baw Alpine Resort be maintained
* a proposed road from Rocky Knob to Baw Baw village not be built
* the Thomson Valley Road continue to provide the access to the upper Thomson valley

Further, in its Final Recommendations following the Wilderness Special Investigation, the Council in 1991 recommended that the plateau be protected as an area 'with remote and natural attributes'. This recommendation was made in recognition of its relatively large size, absence of vehicular tracks, virtual absence of structures, essentially natural condition and the opportunities for self-reliant recreation - including snow-based activities. That area is now included on Schedule 6 of the *National Parks Act* 1975. This situation is reinforced by Council's recommendation below, that no machine-groomed cross-country ski trails should be permitted in the park.

Following review of the opportunities for down-hill skiing in the adjacent Mount Baw Baw Alpine Resort, the Council believes that it would be appropriate for a new down-hill ski run near Neulyne Plain (abutting the border to the resort but presently in the park) to be established. This would involve the excision of about 10 ha from the park and would be subject to the preparation of an Environmental Effects Statement that takes into account the capacity of the existing resort area and a demonstrated need for such an expansion, as well as the environmental acceptability of the project (see Recommendation I5).

Land to the east of the Thomson Valley Road (which was included in the park following Council's recommendations in 1977), is part of an extensive area that supports habitat for sambar deer and was, prior to that inclusion, a popular hunting venue.

Although the Council in 1977 did not address deer-hunting in relation to the park, the subsequent declaration of the park resulted in the prohibition of this activity, in accord with park management policy.

In consideration of proposals to re-admit hunting to this area, Council was conscious of the necessity to ensure that the activity would not conflict with other recreational users of the park. The Council is of the opinion that hunting by stalking only, on a seasonal basis, could be permitted in the section of the Baw Baw National Park east of the Thomson Valley Road. This is the same basis under which hunting is permitted in certain sections of the Alpine National Park: the activity is permitted during the winter months when visitation to the park (below the snow-line) by other recreational users is minimal. Hunting and the use of firearms would not be permitted, however, in the popular camping areas at the Aberfeldy Bridge (Walhalla—Aberfeldy Road) and at the crossing of the Aberfeldy River by Fultons Creek Track.

Baw Baw National Park

Recommendation

A7 That the area of approximately 12 500 ha, indicated on Map A, be used in accordance with the general recommendation for national parks outlined above and for those purposes approved by the government following publication in November 1991 of the Final Recommendations arising from the Wilderness Special Investigation

except that

(ix) development of machine-groomed cross-country ski trails not be permitted in the park (see also Recommendation I6)

and that

(x) deer-hunting, by stalking only, be permitted on a seasonal basis in that part of the park east of the Thomson Valley Road, the timing and length of season and other conditions to be determined by the land manager (see Note 3).

Notes:

1. Council has recommended that the Baw Baw Reference Area, within the park, be expanded (see Recommendation B11).
2. Council has recommended the excision of about 10 ha from the park to provide for a minor extension to the Baw Baw Alpine Resort (see Recommendation I5).
3. With respect to Recommendation A7(x), hunting and the use of firearms is to be excluded from the camping sites within the park at the Aberfeldy Bridge (the crossing of the Aberfeldy River by the Walhalla-Aberfeldy Road) and at the crossing of the Aberfeldy River by Fultons Track.

A8: Addition to the Baw Baw National Park

The Council is recommending the addition to the Baw Baw National Park of some 131 ha lying between the northern end of the park and the Thomson Valley Road. This area contains wet heathland that includes the rare species Gunn's richea (*Richea gunnii*) and supports a stand of spinning gum (*Eucalyptus perriniana*).

It includes a camping site and is traversed by the Alpine Walking Track, which provides the northern access to the park from the Thomson Valley Road.

Addition to Baw Baw National Park

Recommendation

A8 That the area of 131 ha, indicated on Map A, be added to the Baw Baw National Park and used in accordance with the general recommendation for national parks outlined above.

A9: Rationalisation of the boundary to Baw Baw National Park

Interpretation on the ground of several sections of the boundary to the park east of the Thomson Valley Road has presented some difficulties for day-to-day management. In three places, on the main road associated with the Thomson Dam, on Fultons Creek Track (in the north) and on Binns Track (in the east), either small areas of the park are isolated from the major part by the road or small areas of State forest lie between the road and the park. It is recommended that the boundary to the park be rationalised back to the respective roads to overcome these problems.

In the south, the exact location on the ground of the common boundary between the park and the Walhalla Historic Area is difficult to determine. Accordingly, it is further recommended that the southern boundary be

aligned with topographic features. This variation to the park boundary would also mean that the section of the Alpine Walking Track here would fall wholly within either the park or the historic area (it currently exits the park into State forest and then passes into the historic area).

These variations would provide a small net addition to the area of the park.

Rationalisation of the park boundary

Recommendation

A9 That the boundary to the section of the Baw Baw National Park east of the Thomson Valley Road be rationalised to the surrounding roads or to appropriate topographic features.

Note:
The common boundary between the park and the Walhalla Historic Area should continue south-east along Mormon Town Track to its junction with Britannia Spur Track, then follow a creek down to the Thomson River at Poverty Point then follow Steel Bridge Track to the Thomson Valley Road.

A10: Nepean National Park

In 1977, the Council recommended that the larger blocks of public land on the Mornington Peninsula - which included the Bass Strait coastline extending from Point Nepean to Flinders, Highfield Farm and at Greens Bush (then recently acquired) and a parcel at Arthurs Seat - should be reserved as the Cape Schanck—Arthurs Seat Regional Park.

The government subsequently acquired additional land in the region, principally at Greens Bush and around Arthurs Seat, together with portions of former Commonwealth government land at Point Nepean. In 1988, the government proclaimed the Point Nepean National Park.

At present, the Point Nepean National Park essentially comprises two large parcels. One, of 1200 ha, stretches for some 40 km along the Bass Strait coastline from Point Nepean to Flinders. The other, of about 1250 ha, which extends inland from Cape Schanck and comprises the two adjoining areas of Highfields and Greens Bush, contains the largest remaining area of remnant native vegetation on the Mornington Peninsula. These two parcels complement each other's natural and recreational values.

The Council's current review of land in the region has taken into account the additional parcels acquired by the government since 1977, its representation of land systems and the assessment of the significance of its floral and faunal values (described below), its importance for recreation and, in particular, the nationally significant historical values of the Point Nepean area (within a portion of the existing park outside the study area). In the context of these values, the Council endorses the existing national park status of the land.

Topography and land systems

Much of the coastline of the park is fringed by wave-cut platforms and displays a wide variety of geomorphic features such as cliffs and bluffs with shore platforms and small off-shore stacks derived from rocks of both calcareous and volcanic origin. The cliffed calcarenite coast between Point Nepean and the Rye Ocean Beach has been considered of State geomorphic significance. Elsewhere, dunes and sandy beaches occur. Point Nepean (within the existing park but lying just to the west of the study area) includes one of Victoria's few prograding sandy forelands and provides additional examples of calcareous cliffs and shore platforms. It abuts the Harold Holt Marine Reserve.

The park provides the only representation in the Victorian conservation reserve system of three particular land systems: two formed within the barrier complexes of the Southern Victorian Coastal Plains (geomorphic unit 8.5) comprise unconsolidated calcareous sands (land system 8.5/PCcl7) and siliceous sands ($8.5/PCc7_5$), while land system $3.3/Gvf7_2$ comprises clays of volcanic origin within the geomorphic unit (3.3) of the moderately dissected ridge of the Southern Victorian Uplands.

Vegetation

A range of vegetation communities characteristic of coastal areas is found here and includes coastal associations of dune scrub, banksia woodland, grassy forest, tussock grassland and heathland, as well as riparian forest, and swamp and sand heathland. A number of significant plants grow here, including three rare species - helmet-orchid (*Corybas despectans*), a daisy-bush (*Olearia* sp.aff. *lanuginosa*) and netted brake (*Pteris comans*) - and three endangered species - dainty maidenhair (*Adiantum capillus-veneris*), purple eyebright (*Euphrasia collina* ssp. *muelleri*) and coastal tobacco (*Nicotiana maritima*).

While the bulk of the park supports remnant native vegetation, some of the previous farmland is cleared or semi-cleared, principally in the north and around the original Highfield farmhouse. The farmhouse remains and is used as a base for visitors to the park. Some cleared areas have been fenced and are regenerating, others may be maintained as grazing areas for kangaroos (to reduce grazing pressure on adjoining farmland) and some will be required for fire-breaks and access.

Fauna

Faunal values of the park are also high, containing as it does the most extensive remnant of coastal grassy forest habitat on the Mornington Peninsula. Two rare species - the powerful owl (*Ninox strenua*) and Lewins rail (*Rallus pectoralis*) - have been recorded here.

Cultural

Although Point Nepean lies outside the study area, its significant cultural values contribute to the 'national' status of this park. These values arise from a range of historical features, such as Fort Nepean (which was occupied from 1882 to 1945 and which includes gun emplacements, bunkers, barracks and engine-houses), the cemetery (dating from 1854 to 1951) and other fortified areas at Eagles Nest and Fort Pierce.

Recreation

The coastal area has had a long history of recreational use. Picnic areas, lookouts and walk-ways were constructed throughout the Sorrento Back Beach area in the 1870s by the entrepreneur George Coppin, and are still in use. Intensively used recreational nodes include London Bridge, Portsea Back Beach, Sorrento Back Beach, Koonya Ocean Beach, Blairgowrie Back Beach, Rye Ocean Beach, St. Andrews Beach, Gunnamatta Beach, Pines picnic area, Cape Schanck and Flinders. Facilities and activities at these sites include hang-gliding, horse-riding, car-parks, toilet blocks and changing sheds, beach shacks, extensive board-walks, surf life-saving club-houses, picnic areas and barbecues, as well as a large number of additional beach access points where the only facilities are generally car-parks and pedestrian walk-ways.

In contrast, public access at Point Nepean is limited due to the presence of unexploded munitions (a legacy of the occupation by the Department of Defence), and the Greens Bush area is used mainly for passive recreation.

An extensive and expanding system of walking trails is being developed on the Mornington Peninsula, among which the 'Two Bays Walking Track' and the 'Nepean Way' traverse the park.

Cape Schanck lighthouse

This lighthouse was completed in 1859, making it one of the State's earliest. The lighthouse reserve is currently Commonwealth freehold (under the jurisdiction of the Australian Maritime Safety Authority) and forms an inlier in the existing park. Although the Authority requires the lighthouse, the Commonwealth government recently declared surplus the remainder of the reserve, which includes the lighthouse-keepers' cottages and other associated buildings. Under existing administrative procedures, the State government has first right of refusal and negotiations for possible transfer to the State are in progress.

Although the immediate environs of the lighthouse are cleared, the reserve includes the surrounding cliffs and bluffs and much of it supports native vegetation that is contiguous with that of the surrounding park.

In view of the location of the lighthouse reserve within the park and its intrinsic natural and historical values, the Council believes that it would form an appropriate addition to the park should negotiations for its transfer be successful. Council is aware that the lighthouse and one of the keepers' cottages are presently leased by a commercial operator and that a concession exists for tours of the lighthouse.

Nepean National Park

Recommendation

A10 That the area of 2250 ha, indicated on Map A, be used in accordance with the general recommendation for national parks outlined above and for those purposes approved by the government

and that
(ix) the remaining beach boxes at Flinders be removed.

Notes:
1. A further area of some 200 ha of the Nepean National Park, including the South Channel Fort, falls within the Melbourne Area, District 1.
2. The outfall pipe for sewerage effluent from Melbourne Water's South Eastern Purification Plant crosses the park to discharge into the ocean near Boags Rocks. Land in the vicinity has been transferred to the Crown and should be consolidated into the park.
3. The Sorrento cemetery and the nearby refuse transfer station are excluded from the park.
4. Council is aware that part of the Cape Schanck car-park is on municipal freehold. It believes that this area should also be included in the park - possibly by way of land transfer.
5. The Cape Schanck Lighthouse Reserve is surplus to the requirements of the Commonwealth and negotiations to transfer it to the State are under way. Council believes that, subject to successful negotiations, the reserve should be included in the park. Further, Council believes that it would be appropriate for other areas of Commonwealth land at Point Nepean to be included in the park.
6. The historic Point Nepean cemetery is within the park but outside the study area. Council believes that this historic cemetery should be closed to further burials.
7. Council considers that CNR should liaise with the Shire of Flinders about a block of land owned by the Shire and used by the Main Ridge Pony Club, to ensure that the use and management of this area does not detrimentally affect the values of the park adjoining it downstream.
8. Council is aware that CNR is developing options for the future use of the Highfield bunkhouse and adjacent cleared land.
9. Measures should be introduced for the control of the dieback fungus *Phytophthora cinnamomi* at Greens Bush.
10. Council has had a long-standing policy that occupation of coastal public land by individuals should be phased out (see Chapter H). Beach boxes, such as those at Flinders, are usually intrusive, restrict public access, use and enjoyment of the beach area, may cause or aggravate erosion and constitute a private use of public resources. The few beach boxes remaining at Flinders are in a poor state of repair and are not known to be of historical significance.

NEW NATIONAL PARKS

A11: French Island National Park

Council in 1977 recommended that virtually all of the public land on French Island be included in a State park. This recommendation was accepted by government and the park is on a schedule to the *National Parks Act* 1975.

Since 1977, the government has exchanged and acquired a number of parcels of land on the Island such that the bulk of the remaining native vegetation there now lies within a mostly contiguous block of public land.

Council considers that all land acquired since 1977, including a significant portion of that purchased by the former State Electricity Commission (see Chapter M), should be included in the park and, in recognition of the area's very significant natural values (described below), it should be a national park. It should be noted that the management of the area would be the same, whether it is a national or a State park. As pointed out in the preamble of this chapter, the *National Parks Act* 1975 does not differentiate between these two classes in terms of the requirements on the Director of National Parks and Wildlife for their management.

Topography and land systems

Most of French Island comprises fans and terraces formed from sands and clays in the South Victorian Coastal Plains geomorphic unit (8.4). Within the State's nature conservation

reserve system, the only substantial representation of the land systems of the coastal sand plains (8.4/PCc7) and clayey-sand plains (8.4/Pcf7) of Western Port are found in the French Island park.

Extensive mangrove and saltmarsh areas along the north coast of the Island are of State geomorphological importance, as is the sand spit along the west coast between Tankerton and River Point, which is an important research site for coastal dynamics and sediment movement.

Vegetation

The French Island park is considered to be of at least State botanical significance because it contains high-quality representative examples of: sand heathland of heath tea-tree (*Leptospermum myrsinoides*); shrubby foothill forest of messmate and narrow-leaf peppermint with an understorey of heath tea-tree and prickly tea-tree (*L. juniperinum*); swamp scrub; coastal heathland; coastal saltmarsh; and swamp sedgeland. Examples of grassy woodland also occur.

Further, the park contains the rare plants burnettia (*Burnettia cuneata*), bog clubmoss (*Lycopodium serpentinum*), long pink-bells (*Tetratheca stenocarpa*), blotched sun-orchid (*Thelymitra benthamiana*), tall sun-orchid (*T. media* var. *carno-lutea*) and French Island sun-orchid (*T.* sp.aff. *ixiodes*), as well as four vulnerable species - a spider orchid (*Caladenia insularis*), slender leek-orchid (*Prasophyllum parviflorum*), prawn greenhood (*Pterostylis pedoglossa*) and hoary sun-orchid (*T. mucida*).

Fauna

French Island's isolation from the mainland (which has prevented its invasion by foxes) and the limited degree of disturbance of the vegetation have enhanced its importance for the rich vertebrate fauna it supports, with more than 230 species recorded. It is the stronghold in Victoria for the rare king quail and in the study area for the uncommon long-nosed potoroo. It is used by the rare and endangered orange-bellied parrot on its migration from Tasmania and supports one of Victoria's four permanent breeding colonies of the Australian pelican.

A breeding site of the white-bellied sea-eagle (the last one remaining in the study area) is located in open forest near Red Bluff on land purchased by the former SEC - now recommended for inclusion in the park. The island also supports good populations of the uncommon swamp skink and a large and healthy, although introduced, population of koalas.

Its fresh-water wetlands provide habitat for a variety of water-birds and the mudflats abutting the park are used as feeding and roosting areas by migratory waders.

Cultural

French Island was first settled by Europeans in 1854. Evidence of Aboriginal occupation is now limited to a few shell middens. Government agricultural settlement programs of the 1890s were unsuccessful, largely due to the difficulties of isolation, and much of the less-productive land in the north reverted to the Crown.

Old salt-harvesting pans can still be discerned on the coast within the park as well as pine plantations dating from the turn of the century.

The McLeod Prison Farm was established on the eastern end of the Island in 1916 with the aim of rehabilitating inmates by teaching them farming skills. The small areas of the former farm that support native vegetation are in the park but the more substantial buildings of this penal settlement, built in 1946, and the cleared land are not.

An isolated grave occurs on Tortoise Head and the oldest extant building on the island, an 1850s wattle and daub dwelling, is partly within the park.

Recreation

A number of camp sites have been developed and a network of management trails provide ready access for walking and nature study. The park has extensive opportunities for both day and extended-stay visitors, although resources to provide for nature-based recreation have been limited to date. Access to the island is by ferry, with very limited vehicular access.

In the past, during open seasons for duck-hunting, a number of the island's residents have hunted duck on wetlands in the park. Following proclamation of the State park, this activity has been prohibited there except, in recent years, on Decoy and Bullock Swamps. These swamps are more saline than most other wetlands on the island and are used as roosting

sites by a number of wading birds. The orange-bellied parrot has also been recorded here. Council considers that, in view of the nature conservation values of these swamps, hunting is an inappropriate use. Further, Council believes that hunting of native species (duck) is inappropriate in a park.

Red Bluff

The former State Electricity Commission purchased land near Red Bluff for a possible thermal power station, but the site is now surplus to requirements. Native vegetation covers the majority of the site and includes areas of open forest which are of limited extent on the island. In 1977, the Council recommended that, should the site not be required for a power station, it should be added to the French Island park. In light of the fact that the land is not so required, the Council now re-affirms that recommendation, except for the cleared central portion which it has classified as not being required for public purposes (see Chapter O).

French Island National Park

Recommendation

A11 That the area of 8800 ha, together with the inter-tidal area of about 960 ha, indicated on Map A, be used in accordance with the general recommendation for national parks outlined above

that

(ix) its boundary remain 150 m seaward of high-water mark (see Note 3 below)

and that it be included on a schedule to the *National Parks Act* 1975 and managed as a National Park.

Notes:

1. The park includes the existing French Island State Park together with the southern tip of Tortoise Head, coastal frontage at Stockyard Point, public land frontages along Red Bill and Mosquito Creeks (which retain riparian vegetation contiguous with the existing park), Barralliar, Pelican and Ram Island and part of the electricity industry land at Red Bluff. Following its transfer to the Crown, land on the west coast that is currently owned by French Island Industries should also be added.
2. Excluded from the park are the cemetery, refuse tip, Tankerton Jetty and barge landing sites near Red Bluff and an area around the former McLeod Prison. Tankerton jetty and the site near Red Bluff are excluded to permit the establishment of a Committee of Management to manage and service them (see Coastal Reserves - Recommendation H2). An area near Elizabeth Island that is licensed for mariculture is also excluded.
3. The gazetted boundary to the existing State park is 150 m seaward of high-water mark. The future status of the entire inter-tidal zone will be investigated in the context of the nature conservation values and other uses of the whole of Western Port during Council's Marine and Coastal Special Investigation. Management provisions to ensure the protection and/or sustainable use of the marine resources of the area will be addressed at that time.
4. The transfer of land at Red Bluff from the former SEC to CNR should be expedited. A small section of this land is one of the possible cable landing and converter sites for the proposed 'Basslink' power grid with Tasmania (see Chapter M - Services and Utilities). Such a proposal could require a small onshore easement or site for facilities; provided they do not affect the nesting requirements of the sea eagle, these could be accommodated as a special zone within the park.
5. Grazing by stock and slashing could be permitted in the short term for management purposes, at times and places to be determined by the land manager. Active management is also required to prevent further invasion by exotic softwood species.
6. The government has explored a number of options for the future use of the former McLeod Prison Farm. The Council believes that the area comprising the prison and the surrounding cleared farmland should not be included in the park and has identified it as not being required for public purposes (see Chapter O).

A12: Ash Ranges National Park

Encompassing some 75 900 ha, this new park incorporates the catchments of the Maroondah, O'Shannassy and Upper Yarra Reservoirs that feed into Melbourne's domestic water supply system, and extends north to include Lake Mountain . The upper reaches of the Acheron River and Armstrong Creek and a section of the Cement Creek catchment provide important links between these areas and are also valuable additions to the park, as too are the upper reaches of the Taggerty River.

The three catchments and the linking areas contain arguably the best representation of mature wet forests and cool temperate rainforests in the State. As such, they provide one of the most significant opportunities for the protection and maintenance of mature wet forest habitat - which, among other values, is of major importance to those faunal species that depend on hollow-bearing trees for their survival.

The new park also contains good representations of several major land types that, although extensive, are confined to the Central Highlands. A detailed discussion of these and other values is provided below.

More than 100 years ago, the government that instituted Melbourne's water supply decided that, to protect water yield and quality as much as possible, the catchments from which it was gathered should be managed by the water supply authority and used solely for water-harvesting. It further decided that people should not be allowed to undertake activities that could affect the catchment adversely.

The policy of strict control on activities has been maintained in the catchments of the Maroondah, O'Shannassy and upper Yarra Rivers, as well as in those of the other Yarra River tributaries that contribute to Melbourne's water supply (Cement, Armstrong, McMahons and Starvation Creeks), and the Wallaby Creek catchment. However, the form of management undertaken in the main water supply catchments - which excludes routine timber-harvesting and includes strong emphasis on road maintenance and the control of fire, public access and pest plants and animals - has also significantly benefited flora and fauna conservation.

During preparation of both the proposed and final recommendations, the Council considered a number of options for the area, ranging from no park to a larger Ash Ranges National Park. The recommended park described below is considerably smaller than many of the options suggested to the Council. Nevertheless, it recognises the important conservation, recreation and water values of the area while still accounting for the community's timber needs.

Topography and land systems

Rising from an altitude of about 200 m on the valley floors to more than 1460 m, the recommended park includes the gentler slopes in the lower Maroondah catchment, the broad ridge-tops and deeply dissected slopes within the O'Shannassy and upper Armstrong Creek catchments, the steep upper slopes that form the rim of the catchments and the alpine plateau of Lake Mountain. The park lies at the western limit of the East Victorian Uplands - a major geomorphic province of the State (the dissected uplands comprising geomorphic unit 1.1).

The land system that encompasses the red and brown earths ($1.1/Sv8_1$, found in a number of valleys in the proposed park) and that of the shallower stony earths ($1.1/Sv8_2$, which comprises the bulk of the Maroondah, O'Shannassy and upper Acheron River catchments, and the steep slopes surrounding the Lake Mountain plateau) are derived mainly from volcanic rocks of Upper Devonian origin and are confined to the study area. The former also appears in riparian situations in other parts of the Yarra Valley. Elsewhere, land system $1.1/Sv8_2$ is found in the Snobs Creek basin in State forest to the north and small areas fall within the Dandenong Ranges National Park. This land system is currently considered to be inadequately represented in the State's conservation reserves. The small, undulating, volcanic plateau of Lake Mountain (described by land system $1.3/Gv9_1$) is similar to the High Plains (geomorphic unit 1.3) occurring in the Alpine National Park.

The brown earths of the upper Yarra River catchment are derived from sedimentary rocks of Lower Devonian origin. The steep slopes forming the bulk of the catchment comprise land system $1.1/Ss8_2$, which is also confined to the study area. This land system, currently considered to be inadequately represented in the State's reserves, is also located in the timber-producing leased water-supply catchments of McMahon and Starvation Creeks (not within the proposed park). The other land system of the steep country - $1.1/Ss8_3$ - covers

only a small area here but is widely represented in the Alpine National Park to the east.

A small area of gentler sloping country within the south-eastern rim of the upper Yarra catchment comprises land system 1.1/$Gg8_8$. Consisting of friable earths derived from granitic rocks of Devonian origin, the land system is confined to this region of the Central Highlands and is considered to be poorly represented in conservation reserves in the State. It also forms the Toorongo Plateau, which is outside the park and an important timber-production area.

Similarly derived from granitic rocks are small areas of steep-sloped hills of red and brown earths of land system 1.1/$Sg8_3$, in the south of the upper Yarra catchment, and of red friable earths of 1.1/Sg81 around Whitehouse Creek to the north. The former system, too, is confined to the study area, but covers an extensive region and occurs in both the Baw Baw National Park and the Bunyip State Park.

Two other systems of the more gentler sloping country on sedimentary rocks make up the balance. Land system 1.1/$Gs8_2$ includes the red and brown earths of the small plateaux in the Upper Yarra and O'Shannassy catchments. It does occur in reserves elsewhere in the State but is nevertheless considered to be inadequately reserved. A small area of 1.1/$Gs7_2$, which consists of yellow duplex soils on gentle slopes, lies immediately adjacent to the Upper Yarra Reservoir. This land system occurs only in small pockets and is confined to the study area. Most of its occurrences are on private land and it is considered to be poorly represented in the State-wide system of conservation reserves.

Vegetation

The new park contains a wide diversity of vegetation classes, providing substantial representation of the mountain and foothill forests of the Central Highlands of Victoria and, at Lake Mountain, an element of the alpine environments. Its large size and the limited amount of disturbance provide the rich and diverse vegetation with a high degree of protection, ensuring its long-term viability.

Of the 20 ecological vegetation classes identified in the AHC/CNR joint study for the sub-alpine, montane, moist and dry forests of the region, 14 are located in this park. Those not included lie mainly in the north of the Central Highlands and are largely represented in the Cathedral, Kinglake and Eildon parks.

The moist forests here comprise extensive areas of mature, undisturbed cool temperate rainforest, good-quality mature and regrowth wet (mountain ash) forest and damp (messmate and mountain grey gum) forest. In addition, riparian forests comprise manna gum and blackwood and riparian thickets include woolly tea-tree and scented paperbark. The plant communities also include montane wet forests of shining gum and, at higher altitudes, montane damp forests of alpine ash as well as montane riparian thickets of mountain tea-tree, myrtle beech and Baw Baw berry. The lower slopes support foothill forests of messmate and narrow-leaf peppermint, with heathy dry forests of broad-leaf peppermint on the more exposed slopes.

Mountain ash forest and cool temperate rainforest have inadequate representation in existing parks and nature conservation reserves in central Victoria, if their occurrence in the Melbourne Water catchments is ignored. Table 4 in Chapter C - Nature Conservation Reserves - provides an indication of the degree to which the range of vegetation classes found in the study area would increase in representation within conservation reserves under these recommendations; most of the increased representation occurs within this new park.

The Maroondah, Acheron and O'Shannassy catchments are considered to be of national botanical significance, while those of the upper Yarra River, Armstrong Creek and the upper Taggerty River are classed as having State botanical significance. This significance is attributed to their representation of the component plant communities, the rich variety of plants that they contain and the ecological integrity and viability of the vegetation arising from their large size and history of protection. Their scientific and educational values are also very high. The Upper Yarra catchment, in particular, supports a wide range of vegetation types, from heathy dry forests on the exposed, lower slopes of Clear Creek to wet forests and rainforest.

Montane and foothill forests in the new park contain the rare species slender tree-fern (*Cyathea cunninghamii*), tree geebung (*Persoonia arborea*) and tufted club-sedge (*Isolepis wakefieldiana*), as well as shiny phebalium (*Phebalium wilsonii*) and bog sun-orchid (*Thelymitra circumsepta*), both of which are classed as vulnerable in Victoria.

Lake Mountain lies at the western limit of sub-alpine vegetation on mainland Australia. This area, particularly, has very significant nature conservation values. It is notable for the high diversity of plant species (over 150 indigenous species) and communities - which encompass the full range of sub-alpine forms - from alpine bogs, herbfield/grasslands, heaths and wet alpine heaths to woodlands, tall open forest and rainforest - within a relatively small area. More than one-third of the plants recorded above an altitude of 1200 m are at the western limit of their distribution in Victoria and some species are at the lowest altitudinal limit of their range.

Lake Mountain derives further botanical importance from the presence of a number of significant species: in addition to the rare and restricted snowdrop wood sorrel (*Oxalis magellanica*), rare and interesting species include bent-grass (*Deyeusix parviseta*), wax berry (*Gaultheria appressa*), mountain hook-sedge (*Uncincia compacta*) and three species endemic to Victoria - Baw Baw berry (*Wittsteinia vacciniceae*), lilac berry (*Trochocarpa clarkie*) and forest sedge (*Carex alsphila*). An interesting (and very old) stand of mountain plum-pine (*Podocarpus lawrencei*) also occurs here.

The bog and heath communities display a unique ecology associated with the successional stages and include rare and interesting plant species such as turquoise coprosma (*Coprosma moorei*), Baw Baw daisy (*Brachycome obovata*), forest sedge and lilac berry, which are apparently restricted to these sites.

However, the areas of botanical significance extend beyond the bogs and heathlands. Baw Baw berry and wax berry are associated with the snow gum woodland and the myrtle beech (*Nothofagus cunninghamii*) rainforest. Myrtle beech is another species of biogeographical significance.

The Flora Branch of CNR has prepared maps (at 1:100 000 scale) broadly depicting the ecological vegetation classes of the study area. These have enabled the degree of representation of the classes within existing and new parks and other nature conservation reserves to be estimated (see Table 4 - Chapter C).

Cool temperate rainforest, for instance, occurs in protected gully heads and associated slopes and along streams throughout the wetter, mountainous parts of the region. Of about 2370 ha of this community on public land in the study area, more than 66% is located in existing and proposed parks - mainly in the proposed Ash Ranges park.

As discussed in Chapter C, 'old-growth' or 'ecologically mature' forests have high conservation values and have diminished in extent since European settlement. Old-growth wet (mountain ash) and montane (alpine ash and shining gum) forests - known collectively as 'ash forests' - have received particular attention.

The sawlog resource documents record a total of some 30 000 ha of mature and overmature ash forest for the study area. The three main water supply catchments within this new park, alone, contain almost 13 500 ha, or 42% of that total.

Older-aged forests of other eucalypt (mixed) species, however, are also considered to have high conservation values. The study area contains nearly 195 000 ha of mature and overmature mixed-species forest. Almost 18 000 ha (5%) is located in the three Melbourne Water catchments within the park.

Fires prior to and following European settlement have produced a mixture of age classes in the vegetation. Although the regrowth forests originate mainly from the 1939 fires, some younger regrowth stands range from 10 to 66 years old and older stands range from about 90 to more than 230 years of age.

Because of the dynamic nature of the forests, many occurrences of younger age classes intersperse the more mature stands. For instance, many of the understorey species of the older forests of the O'Shannassy catchment (except in some gullies and sheltered areas) are of 1939 origin, and small patches of ash eucalypt regeneration of a variety of ages have either replaced individual mature trees that have died and fallen or established themselves in small openings caused by the various fires.

There is little evidence of timber-harvesting in the main catchments; much of the early activity was selective felling and some evidence remains in the form of holes in the trunks of trees and high stumps where spring-boards were used. No logging took place in the O'Shannassy catchment after 1910, nor in the Upper Yarra catchment after 1956. Except for small-scale clear-falling and thinning operations associated with hydrology research

on the south face of Mount Riddell and to the north of Fernshaw, no logging has taken place in the Maroondah catchment since 1890.

Fauna

The park has very high faunal significance, making it one of the key regions in the State for its diversity of mammals and other vertebrates. The large areas of undisturbed old and mixed-age forests in the park are particularly important for the conservation of hollow-dependent species such as arboreal mammals, bats, owls and parrots. Further enhancing that importance, by the diversity of types and age in the vegetation ensures habitats for a broad range of species.

In particular, the Highlands contain the hollow-dependent significant fauna Leadbeater's possum, which is classified as 'endangered' (this new park contains more than 20% of its known distribution), large-footed myotis (threatened) and sooty owl (listed as rare). Its other hollow-using species include the great pipistrelle, yellow-tailed black cockatoo and yellow-bellied glider.

The rainforests here provide spring and summer breeding habitat for the pink robin, listed as uncommon and restricted to south-eastern Australia. Taggerty River, upstream of the Lady Talbot Drive crossing, is important habitat for the fish species barred galaxias (*Galaxias olidus* var. *fuscus*), which is listed as a threatened species on the schedule to the *Flora and Fauna Guarantee Act* 1988.

In addition, the Maroondah catchment contains the entire known population of the vulnerable Mount Donna Buang wingless stonefly (*Riekoperla darlingtoni*) - one of the two Victorian species listed by the IUCN - while the rare smoky mouse occurs on the dry ridge-tops in the Upper Yarra catchment. Lake Mountain is one of the few known localities of two rare copepods - *Canthocamptus dedeckkeri* and *C. mammillifurca* - found in the sub-alpine heathlands. The Lake Mountain fauna also include several other species of significance, including the rare broad-toothed rat found in the sub-alpine vegetation and Leadbeater's possum, which has been recorded in both the alpine ash community and snow gum woodland.

One of the principal considerations for the linking of the three water-supply catchments has been the necessity to secure a range of forest types and ages and thus protect the existing and potential contiguous habitat - mainly of Leadbeater's possum, but also of other species that require intact older-aged and regrowth forests. This possum, for instance, inhabits the contiguous forests of the upper Acheron, O'Shannassy, Maroondah, upper Armstrong and Upper Yarra catchments; populations of sooty owl are also found here. The park forms part of the Council's response to the principles and provisions being formulated for the conservation of the habitat of Leadbeater's possum (see Chapter C - Nature Conservation Reserves).

Further discussion about provisions within State forest for linking parks and reserves and other nodes of nature conservation value is provided in Chapter C.

Cultural

The extensive old, mature and mixed-aged forests and individual old trees throughout the recommended park are considered to be of historical importance, being indicative of the nature of the forests prior to European settlement. Although no specific sites of Aboriginal occupation have been identified here, the extent of scatters of artefacts indicate that the Central Highlands were probably occupied sporadically and on a seasonal basis.

Cumberland Scenic Reserve (initially reserved in 1923 because of its stands of large, very old trees and rainforests) is included in the park, as also is the Furmston Tree in the north-east of the Maroondah catchment. This tree is possibly 400 years old and is considered to be of State historical significance as a specimen and for its social role as a popular recreational venue in the 1930s (however, it is now considered dangerous as it is in a final stage of senescence and may collapse in the near future).

A number of mines were established from the 1860s in the goldfield extending from Warburton up the Reefton Spur, some of which continued to operate until at least 1939. About nine, including the Contention Mine, have been identified in the park as well as associated aqueducts, camp sites and other artefacts (including Brown's camp, associated with the Bears and Donovans Creeks sluicing areas).

Sluicing for gold was also carried out in the upper Yarra field at Warburton from the late 1850s and the artefacts remaining here include water races, open-cut mines,

shafts, tunnels and small dams. The many features of this field are now accessible via the 'Upper Yarra Goldfields Walk', located within the new park. Also within the park are the Big and Little Peninsula Tunnels on the Yarra River. Both tunnels are attributed to Chinese miners and date from about the 1870s.

In the 1860s, too, the Yarra Track was established to link the Woods Point goldfields to Melbourne. It travelled up the Watts River to Fernshaw (closed as a settlement in the late 1880s when the area became part of the metropolis' water supply catchment), then over Mount Dom Dom, across the Acheron valley to Mount Strickland and across the Paradise Plains (a settlement abandoned in 1864 in favour of Marysville) to the Cumberland River, then finally along The Great Divide to the goldfields beyond Matlock. Artefacts along this route include the Big Culvert near Cambarville and the clearing at Paradise Plains. The Baw Baw Track (1899), which followed the upper Yarra River, was upgraded by the Public Works Department in 1906 to link Warburton township with Walhalla across the Baw Baw plateau. The remains of a hut associated with this route are located adjacent the river near Falls Creek (also once a popular scenic spot before closure of the catchment).

The Mount Horsefall Sawmilling Company constructed two sawmills (always known as the Davis No. 1 and No. 2 mills) on the southern edge of the Upper Yarra catchment in the early 1920s. The enterprise failed through a combination of adversities and poor management decisions, culminating with the 1939 fires. The remains of these mills and the associated settlement have high historical and archaeological significance.

Of similar historical importance are the remains of a two-stage incline railway running down the steep valley of Cement Creek, below Mount Donna Buang. Multi-stage inclines were rare in Victoria; this one operated between 1907 and 1932.

A pioneering family - the Keppels - ran cattle and sheep on Lake Mountain from the 1870s to 1963, one of the longest continuous alpine grazing occupations by the one family. A number of features of the area are named after the family; the route between their home at Buxton and Lake Mountain, for instance, is known as Keppels Track.

Access and recreation

The high tourism potential of the park arises from its close proximity to Melbourne and the townships of Healesville, Warburton and Marysville, in combination with its outstanding natural and cultural values.

Lake Mountain is a rapidly growing cross-country skiing and snow-play area and received about 200 000 visitors in 1990. The access road and car-parks for this area are contained within the existing Lake Mountain Alpine Resort. The main skiing areas, however, lie outside it.

In its proposed recommendations, the Council included the existing Lake Mountain Alpine Resort in the park. Following review of the values and uses here, the Council is reaffirming its proposal that the areas supporting the principal nature conservation values be incorporated in the park. However, to facilitate appropriate development and maintenance of the infrastructure related to its use for cross-country skiing, the Council is now recommending that the area encompassing the commercial facilities, car-parks and the proposed biathlon course be included in an alpine resort managed by the Alpine Resorts Commission (see Chapter I).

Further, the Council is recommending the zoning of the land within the park (see Map D in Chapter I) in which ski trails have been developed to allow for on-going management and maintenance of these facilities. Further development of cross-country ski trails may take place in this zone subject to adoption of a development and management plan that is agreed to by both the Alpine Resorts Commission and CNR. In this way, the Commission retains responsibility for commercial development and maintenance within the resort. CNR will retain responsibility for the park, while the Commission may undertake development and management of the ski trails according to the approved plan. This process is similar to the one existing at present, under which all of the current development outside the existing resort has taken place, although, under the Council's recommendations, the agreed development and management plan will be binding on both CNR and the Commission and any works beyond that in the agreed plan would be subject to the Environmental Effects Statement process.

Public vehicular access is possible to parts of the park along main roads such as the

Maroondah Highway, the Acheron Way, the Marysville—Woods Point (Cumberland) and the Warburton—Woods Point (Reefton Spur) Roads, the Toorongo Road and Lady Talbot Drive. All are popular tourist routes and most offer scenic views. Other minor roads and tracks provide access to sections of the perimeters of the three water supply catchments. The Ben Cairn Road provides panoramic views of Warburton to the south and into the Maroondah catchment to the north.

A number of walking tracks provide access to lookouts such as Mount Donna Buang and Ben Cairn, to waterfalls like the Cora Lyn, Cumberland, Keppel and Phantom falls, through the rainforests of the Taggerty River, along the route of the incline railway in the Cement Creek valley and through a section of the upper Yarra goldfields. The boulders of Ben Cairn are used for rock-climbing and a hang-gliding ramp has been constructed over a steep gully beside the Healesville—Donna Buang road.

Day-walking tracks have been available in the Maroondah water supply catchment for some 100 years and provide access to Mounts Juliet, Monda, St Leonard and Riddell and to Carters Gap - overlooking the Acheron valley. There is potential for other walking tracks to be provided, including within the water supply catchments away from watercourses. Melbourne Water is currently reviewing the possibility of providing more opportunities for further limited, unsupervised access and other controlled access for the public in these areas. Nevertheless, some restrictions on public access to the main catchments will remain, to protect water quality.

The recommended park contains a wealth of scenic tall mountain forests, fern gullies and rainforests, including the magnificent old, rich and undisturbed forests of the O'Shannassy. A rich fern-gully vegetation found in the Acheron valley includes very old stands of king fern. Some of the largest mountain ash and some of the oldest, and least-disturbed, fern gullies are located near Cumberland.

A number of picnic sites have been developed, such as at Donnelly Weir, Coranderrk, Fernshaw, Taggerty River and Cambarville as well as at the tunnels on the Big and Little Peninsulas on the Yarra River. Other picnic sites are available adjacent to the park at the reservoir parks below the Maroondah and Upper Yarra Dams, as well as at Somers in the Acheron valley, and camping sites are provided downstream on the Taggerty River.

Access to the catchments for scientific study of the values specific to those areas has been possible in the past and this provision will continue. The new park is valuable as a venue to observe and study arboreal mammals; the accessibility of Cambarville makes that area particularly important for this activity.

Melbourne Water manages a network of fire access tracks throughout the water supply catchments and nothing in these recommendations is intended to change this situation.

Other values

In its final recommendations in 1991, following the Rivers and Streams Special Investigation, the Council nominated the O'Shannassy as an 'essentially natural catchment' (one of 26 in the State in which the physical and biological processes are essentially unimpaired by such activities as roadworks, clearing, logging and stock-grazing). The Council recommended that the catchment's high values for nature conservation and water quality be protected, but that it continue to be available for water production with Melbourne Water as the manager. This was approved by Orders in Council on 7 July 1992. It is now scheduled under the *Heritage Rivers Act* 1992 and will remain as an overlying zone in the new national park and protected through management prescriptions.

Implications for timber

Timber-harvesting was specifically excluded from the O'Shannassy catchment when it was gazetted in 1908 and the Maroondah and Upper Yarra catchments are not available for timber production under Melbourne Water policy. That policy, however, does not preclude the salvage of wood from fire-killed trees (such as occurred in the Wallaby Creek catchment following a fire in 1982) or the potential for thinning of dense regrowth stands, if it is established that these activities would not adversely affect water quality and would substantially augment water supplies in the long term.

The conservation strategy for Victoria in 1987 - 'Protecting the Environment' - stated that 'the harvesting of timber will continue to be prohibited in those of Melbourne's water supply catchments which are unavailable for

logging at present'. Under these recommendations, no harvesting of timber, whether as salvage following fire or to thin the forest, would be permitted in the park.

Timber-harvesting is permitted in the catchments of the Cement and Armstrong Creeks (portions of which are within the new park) and of the McMahons and Starvation Creeks, under the arrangement that any two may be available for harvesting at a time; in practice, only one has been required for timber supply at a time. For the period that timber harvesting is being undertaken in a particular catchment, its water is allowed to flow directly into the Yarra River and is not used to supply consumers in the metropolitan area.

The recommended park contains a net area of 3326 ha of currently available productive forest and would make unavailable 430 922 cu.m of sawlogs and 607 379 cu.m of pulpwood. However, this net area includes 1000 ha of forest defined in the timber resource estimates as 'mature/over-mature', a component of older-aged forests, parts of which would not be harvested under other constraints. All of this resource, including the mature/overmature trees, is included in the calculated - legislated - sustainable yields of sawlogs from the respective forest management areas.

Chapter E (Timber Production and State Forest) indicates the reduction in sustainable yield of sawlogs that would occur if these recommendations were approved. Should the sustainable levels of sawlog output be reduced during the current licence period (1993 to 2001), the Central Forest Management Area (FMA) would experience a reduction in output of 2.6% (to 112 000 cu.m per annum), while the Dandenong FMA would experience a 12.5% reduction (to 35 875 cu.m per annum). All of the affected timber resources lie within the Ash Ranges National Park.

The Council is concerned at the implications for employment, business investment and local communities that would arise if the output of sawlogs was immediately reduced. Accordingly, it is recommending that the impact on sustainable yield of the reduction in available resources should be deferred until the next licence period, when an increase in the sustainable output is expected. Sufficient resources would remain available within State forest to permit an increase in output (albeit less than that currently expected) even after discounting the volume of timber included in the new park and reserves (see Chapter E).

Implications for minerals

A broad area with high potential for gold and antimony mineralisation underlies the Armstrong Creek catchment and includes the goldfield that extends upstream along the Yarra valley from Warburton and along Reefton Spur. This field was tapped by a number of mines from the 1860s. The new park incorporates portion of it. The balance of the park lies within zones that have only partially been assessed for their potential for gold, tin and tungsten, but no commercially viable deposits are currently known there. An application for an Exploration Licence, lodged in November 1993, straddles the Reefton Spur and encompasses Snobs Creek catchment within the Upper Yarra section of the new park.

Implications for water

As indicated previously, activities in the Maroondah, O'Shannassy and Upper Yarra catchments are strictly controlled. The tributary catchments (Cement, Armstrong, McMahons and Starvation Creeks), on the other hand, are periodically available for timber-harvesting, at which time the water is diverted directly into the Yarra River. Water from the Cement and Armstrong Creeks is also used to maintain environmental flows in the Yarra River.

The yield of water from the older ash forests is about double that of the regrowth areas. As the 27 000 ha (approximately) of ash-type regrowth forest in the Maroondah, O'Shannassy and Upper Yarra catchments matures over the next 50 years, their water yield will increase at an average rate of about 2000 ML per annum to a total of about 95 000 ML per annum. This increase is equivalent to about 25% of Melbourne's current annual consumption. Ultimately, these catchments are expected to yield a maximum of about 130 000 ML per annum.

None of the uses recommended for the new park would compromise the quality or quantity of water currently supplied from the catchments. Water supply facilities and storages, including a 200-metre buffer around each of the storages, are not part of the park (see Chapter D - Water Production).

Arrangements to facilitate the co-operative management of the area as a park and a water supply area are set out in the preamble to this chapter.

Melbourne Water Resources Review

The Melbourne Water Resources Review Panel, in its Interim Report of 1992 'Water For Our Future', identified a number of options for augmentation of water supplies to Melbourne. They included several diversions of streams within and adjacent to this new park, each of which would involve the construction of portals and tunnels within the park.

One possible water diversion site has been identified on the Acheron River, near White Hill (downstream of the park boundary). The water would be piped through a tunnel to the Maroondah catchment; such water would then be treated before entering the metropolitan supply system. This proposal would require relocation of part of a popular tourist route - the Acheron Way - but would not necessarily involve closure of the area to the public. The Acheron valley is a popular recreation area and continued public access to it is an important asset of the park.

The volume of water that could be diverted from the Acheron River would be in excess of the capacity of the Maroondah Reservoir. Accordingly, the proposal includes an additional tunnel from the Watts River, within the Maroondah catchment, that would carry water from the Watts into the Yarra—Silvan conduit. In this way water from the Acheron River would enter the Maroondah system and be treated; and untreated water from the Watts River (part of the closed catchment) would pass into the Silvan reservoir and thence directly into the supply system.

The Review document proposed an alternative to the above in which water from both the Acheron and the Watts would be diverted directly into the Yarra-Silvan conduit. Water that enters that conduit is required to be of very high quality because it is not treated before entering the metropolitan supply system. To protect water quality, this alternative proposal would probably necessitate the closure of the upper Acheron valley to public access. Either option for the Acheron River would involve some reduction in nature conservation values through flooding of part of the valley.

Another proposal, in which water would be diverted from Cement Creek into the Yarra-Silvan conduit, would possibly result in restrictions on recreational use of land within the park along the Acheron Way and on the eastern fall of Mount Donna Buang - a very popular area for day-trippers from Melbourne.

None of these proposals is definite; they are options of relatively low priority that have been advanced for consideration.

The Council's proposal for the Ash Ranges park does not prevent future augmentation of Melbourne's water supplies, but requires adequate safeguards to protect the significant nature conservation values and water quality in the area and that management of the area protects and enhances its recreational values.

Co-operative park management

The Council is recommending that this park should be managed co-operatively by CNR and Melbourne Water, with Melbourne Water continuing to manage the three catchments under its control and the CNR managing the remainder.

In order to facilitate the development of a co-operative agreement and management plan for the park, the Council has outlined a series of principles as a basis for management. They are set out in the preamble to this chapter and apply to both this park and the Wallaby Creek addition to the Kinglake National Park.

The priority of listing of the elements of the following recommendation recognises that the principal function of the catchments is to provide water.

As discussed previously, co-operative management will also be necessary between CNR and the Alpine Resorts Commission in the implementation of a development and management plan for part of the park at Lake Mountain (see Map D in Chapter I) to allow for on-going management and maintenance of ski trails. CNR will retain responsibility for the park, while the Commission may undertake development and management of the ski trails according to the approved plan.

Ash Ranges National Park

Recommendation

A12 That the area of 75 900 ha indicated on Map A be used to:

(i) supply water and protect catchments and streams

(ii) conserve and protect natural ecosystems

(iii) protect sites of cultural importance

(iv) consistent with (i), (ii) and (iii) above, provide opportunities for recreation and education associated with the enjoyment and understanding of natural environments

that

(v) the results of hydrological research that would achieve positive benefits for both water yield and protection of the natural values be incorporated in the management plan

(vi) the timing, location, nature and intensity of scientific, educational and recreational use be subject to joint agreement between Melbourne Water and the Department of Conservation and Natural Resources

(vii) harvesting of forest products not be permitted

(viii) grazing by domestic stock not be permitted

(ix) hunting and the use of firearms not be permitted

(x) no new public vehicular access be provided within the water supply catchments

that

(xi) on the basis that Melbourne Water continues to manage the water supply catchments areas and the Department of Conservation and Natural Resources manages the balance of the park, the two agencies should jointly prepare a management plan and co-operative management agreement that accommodate the principles outlined in the preamble to this chapter

(xii) an Advisory Committee, comprising representatives from Melbourne Water, the Department of Conservation and Natural Resources and community interest groups be established to assist management planning

that

(xiii) in accordance with recommendations I9(i) and I9(iv) (see Chapter I - Alpine Resorts), the area indicated on Map D, being part of the Lake Mountain section of the park, be zoned to allow on-going management and maintenance by the Alpine Resorts Commission of existing ski trails and for further track development in accordance with the agreed development and management plan for Lake Mountain

(xiv) provision be made for the on-going occupancy of the O'Shannassy Lodge

and that the area be included on a schedule to the *National Parks Act* 1975 with specific recognition in the Act of the Co-operative Management Agreement.

(continued)

A12 Recommendation (continued)

Notes:
1. The area for the park stated above does not include the four enclosed Reference Areas (B3, B4, B5 and B6), which total a further 3760 ha.
2. Two residences at Cambarville (included in the new park) are occupied under annual licences issued under the *Forests Act* 1958. These licences should apply only to the current licensees and not be transferred.
3. Lake Mountain and Mount Donna Buang Alpine Resorts, both included in this new park, are on the Schedule to the *Alpine Resorts Act* 1983. It is recommended that the latter be deleted from the Schedule to the Act and that the boundary to the Lake Mountain resort be varied (see Chapter I - Alpine Resorts - Recommendations I8 and I10).
4. The O'Shannassy Lodge (O'Shannassy Country Resort), within the park near Warburton, is privately leased through the Victorian Tourism Commission and operates as a convention centre. The purpose of Recommendation A12(xiv) is to encourage commercial viability of the facility.

Other areas suggested for inclusion in the Ash Ranges park

The Council received a number of submissions for a more extensive park in the Central Highlands, principally that from the Victorian National Parks Association (VNPA). That suggestion sought to link most of the existing parks and nature conservation reserves in the region, together with the catchments supplying Melbourne's water and other areas of biological and recreational importance, to form a single park. In response to the proposed recommendations, the VNPA maintained the principle of a much larger park, but concentrated on suggesting the addition of areas in the immediate vicinity of the park proposed by the Council.

The Council maintains that, rather than expanding parks to incorporate every area that contains some element of biological or cultural importance, the State should centre its system of parks and nature conservation reserves on those areas that contain the more outstanding natural values and provide protection for viable samples of the various land and vegetation types. Council has therefore proposed a considerably smaller park than that suggested by the conservation groups. Further, the Council wishes to ensure that sufficient timber resource is available to meet the needs of the timber industry. Its consideration of the larger park proposals revealed that the implications for the timber industry would amount to more than the loss of ash timber resources. They would also mean a significant reduction in log size towards the end of the current licence period, and a larger proportion of the logs supplied would need to be of mixed species to maintain sustainable yield levels. Furthermore, the recommended park is judged to contain adequate representation of those major land types and vegetation and faunal communities previously lacking in the reserve system.

In addition, the Council investigated other options, such as: the possibility of linking the Ash Ranges park with the Baw Baw National Park; not recommending a new large park in the region; Melbourne's water supply catchments, alone, being considered as nature conservation reserves; and other variations of the above proposals.

The new Ash Ranges National Park and the other existing and proposed parks and reserves contain a wide and comprehensive representation of the diverse and important plant and animal communities and other major natural and cultural attributes of the Central Highlands. The recommendations also recognise the inherent values of the water supply catchments.

The Council considered the extent of representation of the important values within the existing and new park and nature conservation reserve system, the additional provisions in these recommendations for protection of particular values and the provisions available for the protection of values through the Code of Forest Practices for Timber Production and under the provisions of the *Flora and Fauna Guarantee Act* 1988. On balance, it believes that further substantial representation of biological values within the park and nature conservation reserve system, beyond that now recommended, is not warranted, bearing in mind the other mechanisms in place to protect such values.

STATE PARKS

A State park is defined as:

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

State parks should include samples of major land types not already represented in national parks and, as in national parks, the conservation of native flora and fauna would be an essential feature of management. Interpretative services would be provided. Development of facilities would be limited to a very small portion of a park. Activities would largely consist of sightseeing and the observation of flora, fauna and other natural features. State parks recommended by the Council are intended to complement the national parks so that, together, they form a State-wide system. As noted in the preamble to this chapter, the *National Parks Act* 1975 does not differentiate between national and State parks in terms of the management requirements or security of tenure.

As well as the recommendation below that applies to all the existing and recommended new State parks and their additions, specific recommendations may apply to each of them; these are listed in the recommendations for the respective parks.

STATE PARKS

Recommendations

A13—A27 That the areas described below be used to:

(i) conserve and protect natural ecosystems

(ii) protect sites of cultural importance

(iii) supply water and protect water catchments and streams

(iv) provide opportunities for recreation and education associated with the enjoyment and understanding of natural and cultural environments

that

(v) apiculture not be permitted except on traditionally licensed sites and the number of sites be maintained, subject to:

  (a) the outcome of research into the ecological impacts of this industry
  (b) park management requirements

(vi) harvesting of forest products not be permitted

(vii) grazing by domestic stock not be permitted, except as specified in A21 below

(viii) hunting and the use of firearms not be permitted, except where specified below

and that they be included on a schedule to the *National Parks Act* 1975.

EXISTING STATE PARKS

A13: Cathedral Range State Park

The principal features of this park are the highly scenic, rocky, razor-back ridge of the Cathedral Range, the gorge of the Little River as it drops from the Cerberean Plateau and the river flats downstream. The dipslopes developed on the Middle Devonian sediments and the alluvial fans at the base of the escarpments are considered to be of State geological significance.

It is a particularly popular venue for camping, walking and rock-climbing and contains the historically significant Cook's sawmill, the remains of which are in excellent condition,

and the associated tramway, segments of which are intact.

The park is considered to be of State botanical significance based on the diversity and undisturbed nature of the vegetation communities, which range from montane damp (alpine ash) forest to grassy dry forest. They include wet (mountain ash) forest, small areas of cool temperate rainforest, damp (messmate) forest and riparian forest. Also present are rocky outcrop scrub, herb-rich foothill forest of messmate and narrow-leaf peppermint and heathy dry forest of broad-leaf peppermint.

This park was approved by the government following publication of the final recommendations for the Melbourne Area in January 1977.

Cathedral Range State Park

Recommendation

A13 That the area of 3600 ha, indicated on Map A, be used in accordance with the general recommendation for State parks outlined above.

A14: Little River addition to Cathedral Range State Park

The Crown frontage along Little River provides the main entrance from Cathedral Lane to the park. It also abuts the section of the river within the freehold block enclosed by the park.

Comprising a total of about 39 ha, this frontage is temporarily reserved under the *Crown Lands (Reserves) Act* 1978 for the 'Conservation of an Area of Natural Interest' and placed under the control and management of the Director of National Parks. Its addition to the park ensures its complementary management with the park.

Little River addition

Recommendation

A14 That the area of approximately 39 ha, indicated on Map A, be added to the Cathedral Range State Park and used according to the general recommendation for State parks outlined above.

A15: Eildon State Park

The main features of this park are the scenic, steeply dissected Mount Enterprise and Rocky Spur, together with the recreational attraction of Lake Eildon - used essentially as a storage for irrigation water.

The park is considered to be of State botanical significance and the ecological vegetation classes it contains grade from grassy dry forest, heathy dry forest and herb-rich foothill forest in the lowland areas to damp forest and riparian forest in the south.

Abandoned mines in the park contain colonies of the common bent-wing bat and eastern horseshoe bat and the drier forests are habitat for the brush-tailed phascogale and the powerful owl.

In its 1977 recommendations, the Council provided for the continuation of the existing mining exploration leases; these leases have expired and no new ones will be issued. Also in its 1977 recommendations, the Council delineated a 200-m buffer strip between the park and the full-supply level of Lake Eildon to be reserved for water supply purposes and managed by the (former) State Rivers and Water Supply Commission, with the agreement of the National Parks Service in relation to management policies. The catchment to Lake Eildon was proclaimed under section 22(1) of the *Soil Conservation and Land Utilization Act* 1958. The water is used largely for irrigation, but also for power-generation and some domestic use.

No formal agreement has been reached and some confusion exists about permitted activities along the buffer between the park and the reservoir. Accordingly the Council is recommending that the Director of National

Parks and the Rural Water Corporation (or successor body) enter into an agreement over the management of the buffer and the land between full-supply level and the actual water level of the lake, which varies seasonally [see Recommendation A15(ix)]. This will provide consistency in management and regulation of the use of the dryland areas of the lake surrounds, particularly as the focus of use of the park is the lake and recreational activities on the lake can have an impact on the surrounding park.

Recreational hunting in parks reserved under the *National Parks Act* 1975 is generally not permitted, although specific legislative provisions have been enacted to permit hunting in some parks. Deer-hunting by stalking is currently permitted seasonally in the Big River section (about 18 000 ha) of the Eildon State Park, which supports a high population density of sambar deer. In the proposed recommendations, the Council proposed that deer-hunting should no longer be permitted within the park. However, a large number of submissions to the Council indicated the high regard in which the hunting community hold this area.

The Big River section of the Eildon State Park offers an ideal venue for the inexperienced 'beginner' hunter, it is accessible to two-wheel-drive vehicles, and the amount of equipment required by the hunter is not as great as for the more remote areas. The topography is not too severe and the area is well contained by roads and Lake Eildon. It is also the best area close to Melbourne for hunters with limited time. As many as 30 hunters could use the area on any weekend in the winter. Hunting groups consider it one of the most important hunting areas in the State.

In view of its particular importance to deer-hunters, the Council has recommended that seasonal hunting may continue in the Big River area [see Recommendation A15(x)].

The Eildon State Park was approved by the government following publication of the final recommendations for the Melbourne Area in January 1977.

Eildon State Park

Recommendation

A15 That the area of 29 500 ha, indicated on Map A, be used in accordance with the general recommendation for State parks outlined above

that

(ix) within 2 years of acceptance of this recommendation, the Director of National Parks and the Rural Water Corporation (or successor body) enter into an agreement over the co-ordinated management of both the buffer to Lake Eildon and the land exposed at any time below full-supply level to provide a consistency in management that complements both protection of water quality and appropriate use of the park

and that

(x) deer-hunting by stalking may be permitted seasonally in the Big River section of the park, the timing and length of season to be determined by the land manager.

Notes:
1. The boundary to the park lies 200 m (horizontal distance) above full-supply level of Lake Eildon (see Recommendation D1—D13 and D2).
2. The land extending to 200 m above the full-supply level of Lake Eildon is subject to a Land Use Determination under the *Soil Conservation and Land Utilization Act* 1958.

A16: Fraser Park addition to the Eildon State Park

Fraser National Park was proclaimed in 1957. It comprises portion of farmland that was purchased for, but would not have been inundated by, Lake Eildon. It was the first new park to come under the control of the newly formed National Parks Authority and was named after the government Minister who presented the National Parks Bill to Parliament.

The park overlooks Lake Eildon. It is particularly popular for camping and for hiking. In 1977, the Council recommended the

3750-ha area be a regional park in recognition of the opportunities it provides for informal recreation for large numbers of people. It contains a number of artefacts of the mining and grazing eras, including an outstation building and stock yards, which are relatively rare relics of 19th century grazing history.

Much of the former freehold included in the park was once cleared, but extensive revegetation with native plants is occurring as a result of rabbit control and the removal of grazing, in addition to planting on the cleared areas. The small, isolated examples of box woodland here complement the range of vegetation communities in the Eildon State Park as a whole.

Addition of this area to the State park would provide consistent and complementary management of all park lands surrounding Lake Eildon.

Fraser Park addition

Recommendation

A16 That the existing Fraser National Park of 3990 ha, indicated on Map A, be added to the Eildon State park and used according to the general recommendation for State parks outlined above.

Note:
The Council believes that, in recognition of the historical association of this area with the name 'Fraser', and concurrent with the addition of this land to the Eildon State Park, the whole park should be named the 'Eildon—Fraser State Park'.

A17: Mount Pinninger addition to the Eildon State Park

Foggs Lookout, on the western point of the Mount Pinninger ridge, is an important focal point for day visitors to Eildon and provides extensive views across Lake Eildon and of the park. The area contains evidence of old mining works.

It was part of the Eildon State Park recommended by the Council in 1977. It is currently vested in the Rural Water Corporation.

Mount Pinninger addition

Recommendation

A17 That area of about 165 ha, indicated on Map A, be added to the Eildon State Park and used according to the general recommendation for State parks outlined above.

A18: Warrandyte State Park

The Warrandyte State Park contains an impressive array of natural and cultural features close to Melbourne and provides enjoyment for many thousands of visitors each year. It was declared a park in 1975 and, at that time, incorporated the Pound Bend, Jumping Creek and Black Flat Reserves and covered some 135 ha.

In 1977, the Council recommended additional land upstream of the Jumping Creek confluence with the Yarra River be included in the park and that, in recognition of its fragmented nature amid surrounding residential allotments, and its importance for land- and water-based recreation for large numbers of people, it be reserved as a regional park. Downstream of the Jumping Creek confluence, and south of the Yarra River, the land falls within the City of Doncaster and Templestowe and is therefore outside the study area.

The park has been substantially increased in size through the acquisition of land and now covers 586 ha.

It contains examples of five indigenous vegetation classes. In its eastern half they remain largely intact and are considered to be of State botanical significance, based on the high-quality remnants of grassy dry forest, valley forest and riparian forest, and the presence of the rare foothills spider-orchid (*Caladenia oenochila*).

The area supports habitat for the eastern grey kangaroo, swamp wallaby, platypus, brush-tailed phascogale and koala. Some 130 indigenous bird species have been recorded here, including the endangered regent honeyeater.

Anderson Creek was the site of the first reported gold discovery in Victoria and Pound Bend tunnel (built in 1870) and the Warrandyte gold workings are considered to be of State historical significance. The Island, in the Yarra River, was created by prospectors re-routing the river.

Warrandyte State Park

Recommendation

A18 That the area of 270 ha, indicated on Map A, be used in accordance with the general recommendation for State parks outlined above.

Note: This recommendation applies to that portion of the park within the study area. A further 320 ha falls within the City of Doncaster and Templestowe.

A19: Mount Lofty addition to the Warrandyte State Park

Mount Lofty, a high ridge forming a peninsula on the south side the Yarra River, is at the head of the Warrandyte gorge, upstream of the present park. The land (88 ha) was acquired by Melbourne Water as part of the now defunct Yarra Brae Reservoir project. It was former farmland and is largely cleared. Revegetation is occurring in some places, although it is still used for grazing.

The Yarra River can be seen from the upper slopes of Mount Lofty and is highly scenic, with a number of rapids as well as steep rock faces on its northern bank. A major river access point for canoeists is located on the upstream side of this area.

Mount Lofty addition

Recommendation

A19 That the area of 88 ha, indicated on Map A, be added to the Warrandyte State Park and used according to the general recommendation for State parks outlined above.

A20: Other additions to the Warrandyte State Park

The addition to the park of public land frontage and other land managed by Melbourne Water on the northern side of the Yarra River, opposite both the existing park and the Mount Lofty addition (described above), will provide consistent management for public land on both sides of the river. The Yarra River has been afforded the status of a Victorian Heritage River.

Other additions

Recommendation

A20 That the public land abutting the Yarra River, totalling about 54 ha and indicated on Maps A and F, be added to the Warrandyte State Park and used according to the general recommendation for State parks outlined above.

A21: Bunyip State Park

This park supports a rich flora and fauna. Ecological vegetation classes include wet (mountain ash) forest, damp (messmate) forest, heathy foothill (silvertop) forest, heathy woodland, riparian forest, swampy forest, riparian thicket, wet heathland and swamp

heathland. The heathlands contain the rare plants gully grevillea (*Grevillea barklyana*), bristly shield-fern (*Lastreopsis hispida*), swamp bush-pea (*Pultenaea weindorferi*), long pink-bells (*Tetratheca stenocarpa*) and wiry bog-sedge (*Schoenus carsei*), as well as the vulnerable species brickmakers saw-sedge (*Gahnia grandis*).

The wet heathland provides habitat for the swamp antechinus (classified as rare in Victoria) and the riparian vegetation along Bunyip River and a number of its tributaries, particularly Diamond Creek (which flows through this park and the recommended Gembrook park addition), support habitat suitable for the re-establishment of the helmeted honeyeater.

The park lies within the dissected uplands of the Eastern Victoria Uplands (geomorphic unit 1.1). The soils are derived largely from granitic rocks of Upper Devonian origin and include the red and brown earths of the steeper country (land system $1.1/Sg8_3$) and the yellow duplex soils of the gentler slopes ($1.1/Gg7_1$). Yellow duplex soils have also developed on the clays of the alluvial plain of the Bunyip River ($1.1/Pf7_4$).

Its close proximity to major population centres and the large number of tracks mean that the park receives a high level of recreational use, particularly for horse-riding, touring in four-wheel-drive and conventional vehicles and motor-bikes, picnicking and bushwalking.

Government approved this park following publication of the final recommendations for the Melbourne Area in January 1977 and was declared a park in September 1992. The scheduled boundary of the park differs slightly from that recommended by the Council, however, to exclude some areas where activities conflict with park management.

Bunyip State Park

Recommendation

A21 That the area of 13 700 ha, indicated on Map A, be used in accordance with the general recommendation for State parks outlined above

except that

(ix) horse-riding be permitted at such times and sites as approved by the land manager

(x) grazing may continue within the park (and the recommended addition A22, described below) on those parts of existing grazing licences that are currently used for grazing and shelter for domestic stock and provide protection for adjoining freehold, but that the grazing licences not be transferable (see Note 2)

(xi) the area occupied by the Bunyip Sambar Project not be expanded beyond that currently fenced, the land not be used for any other purpose and the licence not be transferable (see Note 3)

and that

(xii) the licence for the Brighton Grammar School Camp may continue but that the site and facilities be available to the broader community (see Note 4).

Notes:

1. Bunyip River and a number of its tributaries, particularly Diamond Creek, support habitat suitable for the re-establishment of populations of helmeted honeyeater.
2. A total of about 184 ha in both the existing park and the recommended addition to the park (A22 below) is currently occupied by nine grazing licences (in addition to the sambar research site - Note 3 below) with a total grazing capacity for about 25 head of cattle. Rationalisation of the grazing licences so that they apply only to those areas actually used will considerably reduce the total area in the park that is under licence.
3. The Australian Deer Association is licensed to occupy a 13-ha site in the south of the existing Bunyip State Park to enable research projects into the ecology of sambar deer.
4. Brighton Grammar School is licensed to occupy 2.5 ha at the junction of Ryson and Bullock Creeks as a school camp.

A22: Gembrook park addition to the Bunyip State Park

This area was set aside by the Council in 1977 as the Gembrook Regional Park. Comprising about 2700 ha and lying adjacent to the south-western corner of the Bunyip State Park, it is similar to the Bunyip park in both the vegetation it contains and in its recreational use. Management of the two areas to date has been complementary and this recommendation to combine the two will rationalise classification of the land.

It adds to the parks system a small, but the only, representation on public land of land system $1.1/Gv8_2$, comprising gently sloping hill country having red friable earths of volcanic origin. This land system is located predominantly on freehold land.

In its 1977 recommendations, the Council provided for the continuation of low-intensity timber-harvesting (principally firewood collection) within the regional park. That activity would no longer be permitted in the State park.

A former record of the occurrence of helmeted honeyeater is located in the portion of Diamond Creek lying within the park addition. The riparian vegetation along this creek contains the best available habitat for the re-introduction of the bird to this area.

Gembrook park addition

Recommendation

A22 That the area of 2700 ha, indicated on Map A, be added to the Bunyip State Park and used in accordance with the general recommendation for State parks outlined above and Recommendation A21 above.

A23: Moondarra State Park

The chief features of this park are the vegetation communities and examples of land types that have developed on the Tertiary and Palaeozoic sediments of the Moondarra Plateau - a section of the dissected uplands in the Eastern Victorian Uplands. The land systems here comprise 1.1/Gf7 - gently sloping country with yellow duplex soils derived from clays - and $1.1/Ss8_{11}$ - steep-sided hills having shallow stony loams of sedimentary origin. The park also extends into geomorphic unit 9.3, which represents the high terraces and fans of Gippsland on the South Victorian Riverine Plains and comprises gently sloping country with a variety of soil types, including duplex soils derived from clays and sands (land system $9.3/Gfc7_2$).

The park contains damp forest, heathy foothill forest, swampy riparian forest, wet heathland, swamp heathland, heathy woodland and riparian forest vegetation classes. Two rare plants, burnettia (*Burnettia cuneata*) and cliff cudweed (*Gnaphalium umbricola*), are found here.

In 1977, the Council indicated that, because of the location of the park in relation to the brown-coal open-cut mines, special plans for fire protection would be required for implementation by the land manager and the former State Electricity Commission.

Prior to its acceptance by government, the park originally recommended by the Council in 1977 was reduced in size to exclude much of the land surrounding the Moondarra Reservoir, which was under the control of the former Latrobe Valley Water and Sewerage Board (now the Latrobe Region Water Authority - 'Gippsland Water'). That area was to remain as 'uncommitted land, withheld from sale and remaining under present tenure and management until reviewed by Council' and was to be used to 'maintain the stability of the land and its usefulness for all future possible uses'.

The proposed recommendations again sought inclusion of the land surrounding the Moondarra Reservoir with the State Park. However, a number of softwood plantations are dispersed through this area and compromise its integrity. These plantations are being progressively harvested but are being replanted with softwoods. The resources of the hardwood forest under Gippsland Water's management here may also be harvested. Accordingly, the Council now recommends that the land surrounding the reservoir area be

identified as land that is equivalent to State forest but is managed by water authorities (see Recommendation E8).

This park is on the schedule to the *National Parks Act* 1975. However, 170 ha in the upper reaches of the Anderson Creek catchment, in the south-west, is not yet part of the park, although it is being managed as if it were. The former State Electricity Commission indicated that the area may be required for the dumping for overburden from open-cut coal-mining some 30 years from now, at the earliest. The *National Parks Act* 1975 provides for the addition of the land to the park should it not be required for dumping purposes.

Council believes that, because of the long time lag before any firm decision will be made about this site, the fact that it comprises less than 15% of the total area identified for possible use as an overburden dump and the uncertainty that it will be required in any case, the 170-ha area in the upper Anderson Creek should be made part of the park. Should dumping of overburden proceed in the balance of the Anderson Creek catchment at some future date, the Council considers that appropriate landforming and drainage of the dump site should be undertaken to avoid compromising the natural values of this section of the park.

Moondarra State Park

Recommendation

A23 That the area of 6500 ha, indicated on Map A, be used in accordance with the general recommendation for State parks outlined above

and that

(ix) the land in the Anderson Creek headwaters, currently on the Schedule to the *National Parks Act* 1975, but not yet part of the park, be included in the park.

Note:
The area of 6500 ha includes the land in the Anderson Creek catchment.

A24: Mount Worth State Park

This area supports the only significantly large tract of native vegetation in the western Strzelecki Ranges. It includes remnant wet (mountain ash) forest among a mosaic of regenerating vegetation. The scenic fern gullies here include two rare species - slender tree-fern (*Cyathea cunninghamii*) and skirted tree-fern (*C. marcescens*).

The park supports one of few occurrences on public land of the giant Gippsland earthworm - a threatened species. It is restricted to an area of some 100 000 ha in the Bass River catchment, but its distribution is patchy. On freehold, the species is now only found on steep hillsides and in gullies unsuitable for ploughing.

A number of waterfalls occur here and various points in and adjacent to the park provide scenic views across the Latrobe Valley and the Strzeleckis to the sea.

In its final recommendations for the Melbourne Area in January 1977, the Council recommended that some 200 ha here be a regional park. A larger area was subsequently reserved as a State park.

Mount Worth State Park

Recommendation

A24 That the area of 180 ha, indicated on Map A, be used in accordance with the general recommendation for State parks outlined above.

Note:
A further 860 ha of this park lies outside Melbourne Area, District 2 as a result of the declaration of the Rural City of Warragul.

A25: Arthurs Seat State Park

Arthurs Seat, named after a mountain near Edinburgh, Scotland, comprises a prominent granite massif overlooking Port Phillip Bay near Dromana on the Mornington Peninsula.

Land was first reserved for public purposes here in 1863 and the area was declared a State park in 1988. It includes a number of parcels on the western and northern escarpments that have been acquired by government. Urban development fringes most of its western side.

The park comprises a moderately dissected ridge formed from Devonian granite in the South Victorian Uplands and consists of one land system 3.3/Sg7 (providing its only representation in the parks system).

Because the park supports one of the few large remnants of native vegetation on the Mornington Peninsula, it has important nature conservation values. It contains representative examples of coastal grassy forest and heathy woodland. The endangered species purple eyebright (*Euphrasia collina* ssp. *muelleri*) and the vulnerable species clover glycine (*Glycine latrobeana*) occur here.

Lying within a 'Scenic Area' declared by the Governor in Council in 1969, the park has high landscape values, as it overlooks the southern Mornington Peninsula and provides commanding views of Port Phillip Bay and the Mornington and Bellarine Peninsulas.

Seawinds, a 34-ha property near the summit of Arthurs Seat, was first taken up over 100 years ago and was purchased by the government in 1975. It consists of formal gardens and lawns, which include sculptures by William Ricketts, as well as grazing paddocks.

Walking tracks traverse the area and provide access to 'Lookout Hill' (with views towards Melbourne) and Kings Falls (a cascade on the south-western slopes). The park features a number of scenic lookouts and a picnic area has been developed at Seawinds.

This park was part of the Cape Schanck—Arthurs Seat Regional Park approved by government following publication of the final recommendations for the Melbourne Area in January 1977.

Arthurs Seat State Park

Recommendation

A25 That the area of 350 ha, indicated on Maps A and E, continue to be used in accordance with the general recommendation for State parks outlined above

and that

(ix) arrangements be made under the leasing provisions of the *National Parks Act* 1975 for the continued operation of the chairlift.

A26: Additions to the Arthurs Seat State Park

A number of blocks of land in the vicinity of Arthurs Seat State Park have been brought into public ownership. These areas, described below and indicated on Map E, have conservation and recreational values that complement those of the existing park.

Rosebud block - A26a - (6.5 ha)

This area is currently part of the Rosebud Public Park, but has not been developed. It abuts the western slopes of the Arthurs Seat State Park and contains remnant native vegetation.

McKeller Reserve - A26b - (46 ha)

An area of little-disturbed heathy woodland and coastal grassy forest adjoins Seawinds and forms an important link to the southern section of the park. As well as its high nature conservation values, it provides opportunities for nature-based recreation and walking. It is traversed by the Two Bays Walking Track (which extends across the Peninsula between Port Phillip Bay and Western Port), and a separate circuit walk links to the Seawinds picnic area.

The Victorian Conservation Trust - a public authority - owns the reserve, and CNR has entered into an agreement with the Trust to manage the area as if it were part of the park.

Arthurs Seat Public Park - A26c - (62 ha)

Long reserved for public use, over time this land has been developed to enhance the enjoyment of visitors. It includes a number of lookouts that provide spectacular views across Mornington Peninsula to Bass Strait and Port Phillip Bay. The scenic Arthurs Seat Road, opened in 1928, winds up the mountain and a chairlift provides a more direct ascent. Recently constructed walking tracks provide access to and through the coastal woodlands of this visually dominant section of the park.

It is an important focus of recreational activity in the Arthurs Seat area, has high landscape value and supports a reasonably intact vegetation community not otherwise represented in the park, which makes it a valuable addition.

Tower Hill road link - A26d - (23 ha)

A public appeal provided funds to acquire this corridor of bushland between the two main blocks of public land of Arthurs Seat. It facilitates free movement of wildlife and the retention of landscape values and will permit the establishment of linking walking tracks. The land-purchase program is continuing.

Parkdale block - A26e - (136 ha)

The important landscape value of the north face of Arthurs Seat has been recognised since the 1970s and a land acquisition program was implemented to ensure that these values are protected into the future. Parkdale is the largest block acquired here and its heathy woodlands, coastal grassy forests, riparian environments, lookout points and network of tracks will significantly enhance the nature conservation and landscape values of the State park.

Additions to the Arthurs Seat State Park

Recommendation

A26 That the areas described above and totalling about 274 ha, indicated on the Maps A and E, be added to the Arthurs Seat State Park and used in accordance with the general recommendation for State parks outlined above.

Note:
Negotiations should continue between CNR and the Shire of Flinders with a view to ensuring complementary management of adjacent municipal lands. (Council is aware that an area of some 145 ha, comprising Shire freehold and land held by a philanthropic trust, may be added to the park in the future.)

NEW STATE PARK

A27: Phillip Island

The recommended new park incorporates the southern coastline of Phillip Island from McHaffies Point to, and including, Cape Woolamai, plus Churchill Island and the coastline of Swan Bay, as well as the largest remaining contiguous area of native vegetation on the island. That vegetation extends from the centre of the island to the coast - encompassing the Oswin Roberts Koala Reserve, Rhyll Swamp and Rhyll Inlet. Seal Rocks and other small off-shore islands are also included in the park.

The future status of the intertidal flats of Swan Bay between Rhyll and Newhaven, and of other off-shore areas such as around the Nobbies, will be investigated in the context of the whole of Western Port during the Marine and Coastal Special Investigation and are not included in the park discussed in this recommendation.

Council's recommendations in 1977 provided for a number of wildlife reserves on the island, the majority of which are now included in the recommended State park. The Council made no recommendation for Churchill Island at that time because it was freehold land. The island was subsequently purchased by the Victorian Conservation Trust and - together with areas on the main island at the head of the bridge leading to it - is now managed by the Director of National Parks under Section 19A of the *National Parks Act* 1975. This area is a valuable and complementary component of the recommended park.

Since 1977, the government has acquired additional land in a number of other locations on Phillip Island. These include areas: on the Summerland Peninsula (where a buy-back program is current); adjacent to the Penguin Reserve; abutting the Bass Strait coast between Berry Beach and Storm Bay; seaward of the Sunderland Bay and Surf Beach housing estates; and abutting Rhyll Swamp. New information has also become available on the nature conservation values of public land here.

As described below, much of the public land on Phillip Island contains a wide range of special natural, cultural and recreational values. The Council believes that the integrated management of these areas of high value is best achieved by including them within the one land use category. Protection of these values in the recommended park will complement the intensively used sandy coastline of the island's north shore (see Chapter H - Coasts).

Further, because of the diversity of recreational uses in the area and the high level of management provided by the Penguin Reserve Committee of Management, the Council considers that special provision should be made under the legislation to permit the delegation of management responsibility for certain parts of this park to Committees of Management.

Topography and land systems

In the west, Point Grant and the Summerland area - both within the proposed park - comprise a low basaltic plateau bounded by precipitous bluffs. Formally an island, this became linked to the basaltic main island by high sand dunes. The high, steep Bass Strait coastline of the park provides exposures of the underlying basalt as cliffs and rocky shore platforms up to 100-m wide.

Cape Woolamai in the park's extreme south-east is also a former island, joined to the main island by high sand dunes. In contrast to Point Grant, this is a granite massif and its cliffs are among the highest on the Victorian coast, rising abruptly to almost 100 m. They contain deep gorge-like clefts and gutters developed along steeply dipping joints in the granite, and the presence of sand dunes aligned along these joints is unique in Victoria. Serrated rock stacks fringe part of this coast and are isolated from the cliffs at high tide. Granitic coastlines are uncommon in Victoria, although they are well represented in the Wilsons Promontory National Park.

Along its Bass Strait coast, this park is exposed to high-energy swell and storm wave action, contrasting markedly with its more sheltered environments on the island's north-eastern shoreline facing Western Port. There, a broad sandbank has partially filled a shallow embayment to form Rhyll Inlet and its broad intertidal flats. Inland of Rhyll Inlet is the fresh-water Rhyll Swamp - a former embayment that was isolated from the sea by sandy beach ridges some 6000 years ago. The Council will resolve the status of the adjoining Swan Bay tidal flats in the Marine and Coastal Special Investigation.

The recommended park includes representation of two geomorphic units of southern Victoria: the Mornington Peninsula series of moderately dissected ridges of the South Victorian Uplands (geomorphic unit 3.3) and the barrier complexes of the South Victorian Coastal Plains (geomorphic unit 8.5). In the former, the soils developed on the Tertiary basalt are either red friable earths (land system $3.3/Gvf7_2$), as on Churchill Island, or clays or yellow duplex soils ($3.3/Pvf7_1$ and $3.3/Pf7_2$); the small area of exposed Devonian granite at Cape Woolamai is described by land system 3.3/Sg7. The unconsolidated sand dunes of the coastal plain are represented by land systems, $8.5/PCc7_3$ and $8.5/PCc7_4$. The land systems on the basalts are poorly represented in conservation reserves elsewhere in the State.

Both the high granite cliffs of Cape Woolamai and the sandy isthmus linking it with the main island are considered to have national geomorphological significance, based on the unusual example here of the multiple processes that shape dune sands and its classic example of a former island now linked to a larger land mass. Of State significance is the coast from Thorny Beach to Native Dog Creek, where one of the best exposures of Early Tertiary volcanic sequences in Australia is located. Other sites of special interest include: the tidal Rhyll Inlet with a complex array of active and relict geomorphic features; the exposure of volcanic tuffs at McHaffie Point; an exposure of several lava flows at Point Grant and The Nobbies; an example of stages of reclamation of the former seaway at Swan Lake; dykes intruding the basalt platform at Kitty Miller Bay; Storm Bay and Pyramid Rock where the contact between the volcanics and the pre-volcanic (granitic) land surface is evident; and a quartzite ridge at Smith Beach. Kitty Miller Bay is also of interest as a locality of the semi-precious agates and zeolites.

Vegetation

The Bass Strait shoreline supports coastal dune scrub and coastal tussock grassland - the latter is rare in Victoria and mostly grows on the islands of Bass Strait. This south coastal section of the park supports a rare plant species, coast ballart (*Exocarpus syrticola*), and two vulnerable ones - shore spleenwort (*Asplenium obtusatum*) and crimson berry (*Cyathodes juniperina*). The surrounding Rhyll Inlet supports coastal saltmarsh, coastal banksia woodland, coastal dune scrub and swamp scrub. Intact examples of the island's once-extensive coastal grassy forests occur in the park west and south of Rhyll Swamp.

Fauna

Along its southern coastline, the park supports the State's largest nesting colonies of the short-tailed shearwater - a significant species that breeds exclusively in Australia (small colonies are also found on French Island, on Griffiths Island off Port Fairy and on the off-shore islands of Wilsons Promontory). It also supports the second-largest breeding colony of the little (or fairy) penguin - another significant species and the only penguin to breed in Australia (the largest colony is on Gabo Island, off the East Gippsland coast). Breeding colonies of the hooded plover are also found here and elsewhere in the park. The largest colony of fur seals in Australia is located at Seal Rocks.

Tidal flats at Rhyll Inlet and Swan Bay are of special value for birds and form part of the more extensive Western Port site of importance for wading birds, which is listed on the Ramsar Convention (convention on wetlands of international importance - especially for waterfowl habitat) and the bird species are covered by agreements with Japan (JAMBA) and China (CAMBA).

More than 50 species of bird have been recorded in Rhyll Swamp. This area supports one of the few Victorian breeding colonies of royal spoonbill; large numbers of sacred ibis and straw-necked ibis also breed here as well as the little pied cormorant and some ducks, such as the musk duck and chestnut teal. Rhyll Swamp and an adjoining block of remnant woodland to the south support a small population of long-nosed potoroo and four other species of terrestrial mammals - water-rat, swamp wallaby, koala and echidna. Eight species of bat are also recorded for the island.

Cultural

The park includes a large number of middens along the coast, a legacy of Aboriginal usage of the area prior to European settlement. Some of these sites are of special archaeological interest.

In 1801, the first European agricultural crops grown in Victoria and one of its earliest buildings were established on the 57-ha Churchill Island. Extant historical features here include cottages built in 1866 and an 1872 homestead together with surrounding gardens and many agricultural artefacts. Some very old - up to 500 years old - specimens of moonah (*Melaleuca lanceolata*) grow here.

A quarry established at Red Point on the eastern shore of Cape Woolamai in 1891 produced pink and grey granite for facings on buildings in Melbourne. At the height of its operation, 300 people lived at the Cape. The 300-m-long quarry is still evident along the shore, as are the remains, 20 m off-shore, of a jetty constructed from steel railway line.

Recreation

A range of opportunities for informal recreation are available on the western and southern shores, including some of the best surf beaches in Victoria - particularly Woolamai Surf Beach, which has a long-established State and national reputation for consistently good waves in all seasons and tides. It has been a venue for both State and national competitions for many years and as such provides a significant contribution to the Island's economy.

Colonies of short-tailed shearwaters lie close to main beach access points below the Sunderland Bay Estate and the Smiths Beach Estate. Council believes that, with careful management, continued access to the beach should be compatible with the protection of the nature conservation values of these areas.

At Cape Woolamai, an area containing a clubhouse of the Surf Life Saving Club Association, car-park and other facilities is currently managed by the Shire of Phillip Island. Following concern about the environmental effects of the access road to the site, the government determined that a new inland road should be constructed to the area through the centre of the sandy isthmus, together with a new clubhouse, toilet block and 300-vehicle car-park on the existing site.

The primary focus of the Penguin Reserve, at the western extremity of the park, is tourism: the site receives about 500 000 visitors a year, and up to 3800 a night. The area is currently managed to provide quality experiences for visitors and contributes significantly to Victoria's and Australia's tourism and economic well-being; up to 100 people are employed here. Interpretation of wildlife is also an important function of the Penguin Reserve and the protection of wildlife and its habitat is an integral component of the present management.

Proposals under an approved management plan for the Summerlands (Penguin Reserve) area include the construction of a new road to Point Grant, designed to reduce the impact that the present road has on the penguins. It would also provide continued access to the surfing beaches. Construction of new visitor facilities at Flynn Reef, Cat Bay and Shelly Beach are also proposed.

Council believes that the existing management and proposals for the Penguin Reserve and Cape Grant areas should continue and be provided for by appropriate zoning.

The park also provides extensive opportunities for passive recreation on the beaches and existing and planned walking tracks. A lookout constructed on Conservation Hill overlooks Rhyll Inlet, and car-parks, toilet blocks and other visitor facilities are located at access points to the surfing beaches and other popular sites, such as Point Grant. A walking track along the southern coastline has been proposed.

Recreational hunting is not currently permitted in any of the existing reserves incorporated in the recommended park and will not be permitted in the park.

Swan Bay

In 1977 Council recommended that Swan Bay be declared a Wildlife Management Co-operative Area. Since then, the primary water-bird forage area has been classed as having national zoological significance while the rest of the bay has been identified as of State significance for waders. Boat access to Rhyll and Newhaven pass through this recommended co-operative area and commercial fishing is carried out on the off-shore margin of the intertidal flats.

Council considers that commercial and recreational fishing and boating should be carried out in a manner that is consistent with the protection of the area's nature conservation values. Its members believe that the intertidal flats between Rhyll and Newhaven would be a valuable addition to the Phillip Island State Park, but that such a proposal is better considered as part of the Council's Marine and Coastal Special Investigation. Management provisions to ensure the protection and sustainable use of the local marine resources will also be addressed in that investigation.

Phillip Island State Park

Recommendation

A27 That the area of about 2400 ha, indicated on Map A, be used in accordance with the general recommendation for State parks outlined above

that

(ix) between Rhyll and Newhaven, the park boundary be 150 m seaward of high water mark, otherwise its boundary be low-water mark

(x) a management plan be prepared for the whole park, which:

(a) defines detailed management arrangements for the park as well as management actions

(b) is prepared in conjunction with existing community-based advisory committees

(continued)

A27 Recommendation (continued)

(xi) the existing infrastructure at the Phillip Island Penguin Reserve and the proposed developments of visitor facilities at Cape Woolamai and Point Grant be provided for in park zoning plans

(xii) management of the area known as the Phillip Island Penguin Reserve remain with the Penguin Reserve Committee of Management and consideration be given to delegating the management of other specific areas

(xiii) fossicking for gemstones for recreation or education, using non-mechanical hand tools, may be permitted at such locations and at such times as the manager may prescribe

and that

(xiv) the park be managed by the Department of Conservation and Natural Resources but that specific provision be made under the *National Parks Act* 1975 for delegated management of sections of this park (see Note 1).

Notes:

1. The special provision for delegated management of portions of this State park (Recommendation A27(xiv) above) should apply only to this park and should not be used as a precedent for delegated management in other parks.
2. The future status of Swan Bay and other off-shore areas such as around The Nobbies will be investigated in the context of the nature conservation values and uses of the whole of Western Port during Council's Marine and Coastal Special Investigation. Management provisions to ensure the protection and sustainable use of the marine resources of the area will also be addressed at that time.
3. A draft 'Wildlife Strategy Plan for Phillip Island' included assessment of the potential of the island's faunal values to facilitate opportunities for tourism. It also proposed that facilities be developed to enable the public to view penguins (now completed), koalas (being constructed outside the park), short-tailed shearwater rookeries (possibly at Forrest Caves or Cape Woolamai) and the intertidal flats (possibly at Rhyll Inlet).
4. The boundary between the park and freehold should be accurately delineated to avoid problems with respect to grazing and clearing activities, particularly along the southern coastline.
5. A number of areas will require revegetation, although opportunities for views from vehicular access should be retained.
6. Council is aware that dimension stone extracted in the past from a quarry on Cape Woolamai has been used to construct a number of now historically significant buildings and that future restoration works may impose a requirement for additional stone. The Council believes that the re-opening of such quarries should only be considered if it is demonstrated that stone derived from the exact original source is essential for the success of the required restoration, and that such proposals be subject to an Environmental Effects Statement.

REGIONAL PARKS

A regional park is defined as:

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

These parks would be intensively developed for informal recreation and could include road systems. Although natural beauty would enhance their value, closeness to an urban centre is more important than natural attributes.

Other uses, such as mineral or stone extraction or timber-harvesting, may be permitted where they are compatible with the primary use. Portions may be of special nature conservation value and the protection of these values would be integral to park management.

REGIONAL PARKS

Recommendations

A28—A36 That the areas described below be used to:

(i) provide opportunities for large numbers of people for informal recreation associated with the enjoyment of natural surroundings

(ii) conserve and protect indigenous flora and fauna, and natural features consistent with (i) above

(iii) protect features of historical or cultural significance

(iv) low-intensity grazing, apiculture and low levels of timber-harvesting be permitted in particular cases where they are consistent with (i), (ii) and (iii) above and subject to:
(a) the approval of the land manager

and
(b) an evaluation of whether these activities are appropriate in each case

and that, unless otherwise specified, they be managed by the Department of Conservation and Natural Resources.

EXISTING REGIONAL PARKS

A28: Wandong Regional Park

This area is readily accessible from Wandong and the Hume Freeway via the scenic drives to Mount Disappointment and Strath Creek Falls. Its use will increase in the future as the projected increase in the population of Plenty Valley is realised.

The park includes part of the route of the timber tramway system that linked the Comet sawmill near Mount Disappointment (see Historic and Cultural Features Reserve - F9) to Wandong, and includes 'The Bump' incline on the line as well as the site of Harpers sawmill. The tramway formations are still evident in several places and would make serviceable walking tracks.

Government approved the park following publication of the final recommendations for the Melbourne Area in January 1977. At that time, the Council recommended that timber-harvesting should continue 'as an aid to the primary objectives'.

The Council is also recommending a 150-ha addition to the park at White Elephant Gap, which will extend and enhance the park's recreational and camping opportunities.

Wandong Regional Park

Recommendations

Existing Wandong Regional Park

A28 That the area of 700 ha, indicated on Map A, be used in accordance with the general recommendation for regional parks outlined above.

Addition to the Wandong Regional Park

A29 That the area of 150 ha, indicated on Map A, be added to the Wandong Regional Park and used in accordance with the general recommendation for regional parks outlined above.

A30: Lysterfield Lake Regional Park

The former State Rivers and Water Supply Commission acquired land in this area in 1930 and completed construction of Lysterfield Reservoir in 1936. Subsequently, the Commission acquired most of the catchment to the reservoir to reduce pollution of the water. At the time of Council's 1977 recommendations, Lysterfield Reservoir was still part of the water-supply system. Accordingly, it was set aside as a water-production reserve under the management of the Commission.

Prior to its management by the Commission, much of the catchment had been cleared and used for agriculture. Following its acquisition, plantations of eucalypts (principally the non-indigenous spotted gum) were established and these now cover about half of the catchment. Remnant native vegetation covers a further 30%. When the nearby Cardinia Reservoir (see Recommendation D60) was completed and filled in the late 1970s, Lysterfield Reservoir was no longer required for domestic water supply. Following the recommendations of an interdepartmental committee of inquiry, the area was proclaimed a park under the *National Parks Act* 1975 and opened to the public in 1986. The reservoir is no longer used for water supply.

The park provides for both water-based and land-based recreation. Car-parks, picnic areas, boat-launching areas, artificial beaches, bird hides and walking tracks have been constructed. The lake itself is a popular venue for sailing, sailboarding, canoeing and rowing.

Remnant native vegetation is dominated by shrubby foothill forest of long-leaf box, broad-leaf peppermint and messmate, and a closed scrub along the drainage lines comprises mainly prickly tea-tree and scented paper-bark. The wide diversity of faunal species recorded includes more than 130 species of birds, a number of which are regionally rare (but itinerant) water-birds. The area supports a small population of eastern grey kangaroo and swamp wallaby.

Council is also recommending the addition to the existing park of an area of public land abutting its northern side.

Lysterfield Lake Regional Park

Recommendations

Existing Lysterfield Lake Regional Park

A30 That the area of 745 ha, indicated on Map A, be used in accordance with the general recommendation for regional parks outlined above.

Addition to the Lysterfield Lake Regional Park

A31 That the area of 120 ha, indicated on Map A, be added to the Lysterfield Regional Park and used in accordance with the general recommendation for regional parks outlined above.

Notes:
1. The western part of the existing park, about 622 ha in extent, lies within the Cities of Knox and Berwick and is therefore not part of the study area. Nevertheless, it forms an integral part of the regional park.
2. Council is aware of a program to purchase land supporting remnant natural vegetation to the west (and outside the study area) to link the regional park with the Churchill National Park. The Council considers that, if this does occur, these areas should be managed as part of an integrated unit but that the regional park should remain as such.

A32: Crossover Regional Park

This park lies close to Melbourne, the Latrobe Valley and the Tarago River and features fern gullies and the old Warragul—Noojee railway. Its scenic values form part of the regional tourist attraction and, while it is not heavily used at present, the park has considerable potential as a roadside stopping place and for recreation. It is in the area covered by the

Shire-sponsored 'Gourmet Deli Region' - a concept of identifying a tourist route that includes the attractions of the region in terms of accommodation, food and other values.

The potential of this area has not yet been realised but should become apparent as the population of the Latrobe Valley increases.

Government approved the existing park following publication of the final recommendations for the Melbourne Area in January 1977.

Abutting the eastern end of the existing regional park is the former Township of Crossover. The township site is largely public land and the Council is recommending that it should be added to the existing park. It is traversed by the disused Neerim rail line (which also traverses the length of the existing regional park) and contains relics of the old township, providing additional historical context to the park. The land has natural values similar to those of the adjoining park and it is readily accessible to the public.

In 1977, the Council recommended that the former township site should be an education area. However, the larger Fumina Education Area (J5), to the north-east, provides similar educational values.

Crossover Regional Park

Recommendations

Existing Crossover Regional Park

A32 That the area of 330 ha, indicated on Map A, be used in accordance with the general recommendation for regional parks outlined above.

Notes:
1. An area licensed for occupation by a sawmill, in the east of Crown allotment 8D, is not included in the park.
2. Small softwood plantations located in the north-west of the park have been partially harvested and the land permitted to revegetate. Another small plantation is extant in the south-west. Following harvesting of the plantations, the land should be revegetated with indigenous species.
3. The Township of Rokeby is contiguous with the western side of this park but within the Rural City of Warragul. The disused Warragul--Noojee railway and abutting public land within the township is partially vegetated and provides a continuum of public land between the park and the Tarago River - interrupted only by the main road to Neerim South. Council believes that this land should be managed as part of the park to provide for recreational access between the park and the river, and that appropriate revegetation work should be undertaken.

Addition to the Crossover Regional Park

A33 That the area of 60 ha, indicated on Map A, be added to the Crossover Regional Park and used in accordance with the general recommendation for regional parks outlined above.

Note:
Use of this area for educational purposes may continue.

A34: Tyers Regional Park

This park borders the Tyers River Gorge and is close to the population centres of the Latrobe Valley. It contains examples of riparian forest, heathy foothill forest, damp forest and grassy dry forest. Outcrops of richly fossiliferous limestone here are of geological interest.

The area originally recommended by the Council in 1977 as regional park was reduced slightly in size prior to its acceptance by government to exclude land adjacent to the Moondarra Reservoir, which at that time was under the control of the Latrobe Valley Water and Sewerage Board (now the Latrobe Region Water Authority - 'Gippsland Water').

Specific recommendations for the park included that:

(a) it supply water and protect catchments
(b) development should encourage high-intensity use at suitable locations away from the Tyers Gorge area
(c) protection of water supply installations receive particular attention
(d) provision be made in the park for activities that complement an 'environmental park' that was being developed on adjoining private land

and that

(e) an area leased to the Scout Association be added to the park on expiration of the lease, but the Association should have continued access to the site.

In 1982, following its investigation of the South Gippsland Area, District 2, Council recommended that land in that study area be added to the park.

Tyers Regional Park

Recommendation

A34 That the area of 1010 ha, indicated on Map A, be used in accordance with the general recommendation for regional parks outlined above.

Note:
A further 810 ha of this park lie outside the study area.

NEW REGIONAL PARKS

A35: Plenty Gorge Regional Park

The Plenty Gorge Metropolitan Park extends south along the Plenty River from Yarrambat to Janefield. This metropolitan park is being established as part of the program under Melbourne Parks and Waterways (a separate enterprise, formerly part of the Melbourne Water Corporation) to expand Melbourne's parks system. The program incorporates the former Open Space 2000 program undertaken in conjunction with CNR.

Most of the park comprises the floor and adjacent moderate to steep slopes of the Plenty River valley, which is incised into the largely basaltic plains landscape.

Although its main use will be recreation, the park retains important natural values, including the Plenty River and its gorge, wetlands, grassland areas, remnants of indigenous vegetation and geological features, as well as sites of historical and Aboriginal cultural importance.

The area supports valuable examples of grassy dry forest and box woodland on the slopes. Riparian forest grows along the valley floor. Although under pressure from introduced plants and animals, some 410 native plants and 265 native vertebrate species have been recorded here. Up to 500 swift parrots (20% of the Australian population and a species classified as vulnerable), the endangered regent honeyeater and the rare grey goshawk, barking owl and brush-tailed phascogale have been observed in this area.

In most of the park, the key opportunity is for passive recreation and education in the natural or semi-natural surroundings of the valley, although sports and club activities are undertaken at Yarrambat Park using developed facilities. The park contains a number of picnic areas, including some at Yarrambat Park. A continuous pathway is envisaged for its whole length.

Land included here comes is under various tenures: Crown land and Melbourne Water land (both of which are public land under the *Land Conservation Act* 1970); municipal land; and freehold land (which is classed as 'proposed public open space' under the local government planning schemes).

The Plenty River between Gold Street, Greensborough North and Bannons Lane, Yarrambat, forms a boundary to the Melbourne Area, District 2, such that only land east of the river is in the study area. Land west of the river falls within the City of Whittlesea and is therefore not public land under the Act. Altogether, the park totals about 1400 ha, of which 115 ha is public land in the study area.

Plenty Gorge Regional Park

Recommendation

A35 That the areas totalling 115 ha, indicated on Map A, be used in accordance with the general recommendation for regional parks outlined above and, along with the associated areas of parkland, be managed as part of the Plenty Gorge Metropolitan Park

that

(v) botanical and faunal habitat values be protected when development of the park for recreation is being undertaken

and that it be managed by Melbourne Parks and Waterways with advice from the Department of Conservation and Natural Resources.

A36: Kurth Kiln Regional Park

Located between Yarra Junction and Gembrook, this park extends east from Kurth Kiln to Egg Rock and the Bunyip River divide and includes all public land in the Tomahawk Creek catchment .

Kurth Kiln - a large solid brick and concrete kiln built during World War II to produce charcoal - is unique in the State. Together with a number of associated buildings and other extant structures, it has been classified as of State historical significance. Remnants of a number of pre-1939 sawmills and associated tramways also occur here, as does evidence of early mining activity.

Informal picnic grounds have been established at Kurth Kiln, which is the main focus of recreational activity. Other scenic sites include Egg Rock, waterfalls and a feature called 'Ship Rock' at a picnic area known as Ewart Park.

The area's natural and historical features make it popular for walking, nature study, touring, car-based camping and horse-riding. The close proximity of the Scout Association's Gilwell Park ensures the regular use by young people for activities such as hiking and orienteering. Some people also seek gemstones here.

The recommended park has a range of nature conservation and other natural values. Egg Rock, which is an extensive outcrop of granite rock that has been weathered to produce large tors and exfoliation sheets, is of special geological and geomorphological interest.

The park supports a number of ecological vegetation classes ranging from mountain ash wet forest and riparian forest to shrubby foothill forest and swamp heathland. It has a rich orchid flora and contains the rare plant long pink-bells (*Tetratheca stenocarpa*) and two vulnerable species - tall astelia (*Astelia australiana*) and brickmakers saw-sedge (*Gahnia grandis*). These and other important species should be protected.

Part of the recommended park is used for low-intensity timber-harvesting of logs, poles and firewood and this activity may continue.

Tomahawk Creek and McCrae Creek catchments in the east are both proclaimed water supply catchments and a source of water for Gembrook and nearby towns. Careful attention will be required to the management of land immediately adjacent to the offtake weirs (see Recommendations D4 and D42), the use and maintenance of tracks and the extraction of timber resources.

Kurth Kiln Regional Park

Recommendation

A36 That the area of 3470 ha, indicated on Map A, be used in accordance with the general recommendation for regional parks outlined above

that

(v) important plant species and sites and artefacts of cultural value be protected

(continued)

A36 Recommendation (continued)

(vi) the land manager consult with Melbourne Water on the use and management of land in the Tomahawk Creek and McCrae Creek water supply catchments to avoid deterioration in stream flow and water quality

and that

(vii) recreational fossicking with non-mechanical hand tools may be permitted by the manager at such locations and at such times as the manager may prescribe.

Notes:
1. The area falls within a region that is strategically important for fire protection and parts are subject to fuel-reduction burning.
2. The stone resources of the Boundary Road quarry on the margin of the park will remain available for the construction and maintenance of forest roads.
3. The lower reaches of streams within this new park support habitat suitable for the re-establishment of helmeted honeyeater.

CARDINIA CREEK

The South Eastern Growth Area of greater Melbourne encompasses the Berwick-Pakenham urban corridor. Planning for this corridor has identified a need for opportunities for open space for an envisaged future population of some 300 000 people.

Melbourne Water has promoted a proposal for a regional park based on Cardinia Creek in the Beaconsfield Area. Two discussion papers on this proposal were released in 1993 and Melbourne Parks and Waterways consulted widely in the community to assist its development. It would affect public land, such as a proposed nature conservation reserve, water frontage reserves and existing recreation and unused road reserves. The bulk of the land likely to be affected by the proposal is, however, private land.

In view of the preliminary stage of the planning for this proposal and the extent to which it affects private land, Council has not made a recommendation concerning such a park. Council does, however, envisage that the uses recommended in this volume, for those areas of public land involved, would not conflict with the concept.

A 119-ha block of land in this area was recently purchased by the Victorian Conservation Trust and supports remnant swamp gum woodland that has the potential to be excellent habitat for the endangered helmeted honeyeater.

MARINE PARK

The Bunurong Marine Park was created by the former Department of Conservation and Environment in late 1991. It straddles the border between Council's Melbourne Study Area and South Gippsland Area, District 2 along the coastline at Cape Paterson.

The existing marine park extends a kilometre seawards from the shoreline and encompasses reefs and intertidal rock platforms that include pools and rock pinnacles. A diversity of marine life is found here. The draft management plan for the area includes comment on the adjacent narrow coastal strip of abutting public land and proposes the establishment of a Marine and Coastal Park covering the entire area.

Subsequent to the Council commencing its investigation for the review of Melbourne Area, District 2, it was directed by the government to undertake an investigation of marine and coastal areas. Accordingly, those issues relating to the protection and sustainable use of marine resources will be covered by that new investigation. This will ensure an appropriate State-wide context for the consideration of the marine environment.

The existing Bunurong Marine Park is shown on Map A. Council is not making a recommendation about this area, and will review the appropriateness, boundaries and tenure of a marine reserve here as part of its current Marine and Coastal Special Investigation.

YARRA VALLEY MULTI-PURPOSE PARK

Council's final recommendations in 1977 provided for the establishment of a 'Yarra Valley Multi-purpose Park', which encompassed the Maroondah, O'Shannassy and Upper Yarra catchments, most of the public land between Gembrook and Healesville and land around Yarra Junction, Warburton, McMahons Creek, Powelltown and Hoddles Creek. Those recommendations set out a scheme of zoning of the park that included reference and education areas and recreation, hardwood production, scenic landscape and restricted (water-supply) zones.

Although the government at that time excluded the water-supply catchments from the proposed park, it approved the zoning for the balance of the area. However, the park was never gazetted.

As a consequence of its review of land-use categories, Council no longer utilises the 'multi-purpose park' category. Sections of the original area recommended in 1977 as the Yarra Valley Multi-purpose Park are now recommended for inclusion in the Ash Ranges National Park (Recommendation A12 above) and the Kurth Kiln Regional Park (Recommendation A36 above), as specific reserves - such as Reference Areas, Education Areas, Natural Features (bushland) Reserves, as well as water production reserves that incorporate storage and diversion works. The previous 'intensive hardwood production' zone and much of the 'recreation and hardwood' zone are now included within State forest.

B. 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. People concerned with studying land for particular comparative purposes may then refer to such areas, especially when attempting to solve problems arising from the use of land. Reference areas include typical examples of land types that have been modified elsewhere for productive uses such as agriculture, mining or intensive timber production. The course and effects of human alteration and utilisation can be measured against these relatively stable natural 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 should be surrounding 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 areas from damaging or potentially damaging activities nearby. It will also protect important values in the surrounding land from potentially damaging natural processes occurring within the reference area.

Access should be restricted, and experimental manipulation should not be permitted. Setting aside such areas will enable continued study of natural features and processes - for example, fauna, hydrology and nutrient cycling. These studies are important in increasing our knowledge of the ecological laws and processes on which humanity'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 land). These areas preserve a valuable pool of genetic material. Wild species are often used to genetically strengthen inbred races of domestic plants and animals, and the future use of gene pools will probably expand far beyond this.

The *Reference Areas Act* 1978 provides for reference areas to be proclaimed by the Governor in Council, and for the Minister to issue directives for their protection, control and management. An advisory committee, established under the Act, assists the Minister. The selection of the reference areas in the study area is based on current knowledge of the land types, and additional areas may be needed as better information on ecology and land-use problems becomes available.

As a result of the declaration of the municipality of Whittlesea as a city, the Joey Creek, Yan Yean (north) and Yan Yean (south) Reference Areas (identified in 1977 as B9, B10 and B11) and the bulk of the Disappointment Reference Area (B8 in 1977) which were recommended by the Council in 1977, are no longer included in the current study. These areas are all located within land managed by the Melbourne Water Corporation. Their values will continue to be protected and they will remain as integral elements in the State-wide system of reference areas.

The new reference area listed below is described in terms of the vegetation types and land systems it represents. The land systems descriptions incorporate symbols that correspond to those set out in the report 'Land Systems of Victoria' prepared by J.N. Rowan in 1990 for the Department of Conservation and Environment and the Land Conservation Council.

REFERENCE AREAS

Recommendations

B1—B15 That the reference areas listed below:

(i) 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

(continued)

B1—B15 Recommendations (continued)

(ii) be surrounded by a buffer of adjoining public land, and that delineation of the buffer be by joint arrangement between the advisory committee and the land manager of both the area itself and of the land adjacent to the reference area

that

(iii) activities (such as grazing, exploration for minerals, mining, timber harvesting and beekeeping) that conflict with the purposes of a reference area not be permitted, and any such activities in the reference areas described below cease when these recommendations are adopted

and that they be proclaimed under the *Reference Areas Act* 1978 and managed by the Department of Conservation and Natural Resources.

Existing reference areas

These areas were approved by the government following publication of the final recommendations for the Melbourne Area in January 1977.

Existing reference areas

Recommendations

B1—B10, B12—B14 That the reference areas listed below and indicated on Map A, be used in accordance with the general recommendation for reference areas outlined above.

B1 Stony Creek (445 ha)
B2 Disappointment (part only) (190 ha)
Notes:
1. The area proclaimed for this reference area is larger than that recommended by the Council in 1977.
2. The bulk of it lies within the City of Whittlesea.
B3 Watts Creek (890 ha)
B4 Deep Creek (1045 ha)
Note:
The area proclaimed for this reference area is larger than that recommended by the Council in 1977.
B5 Walsh Creek (945 ha)
B6 Mount Gregory (880 ha)
B7 Diamond Creek (420 ha)
B8 Bennie Creek (200 ha)
B9 Hawthorn Creek (415 ha)
B10 Baw Baw (80 ha)
B12 Eaglehawk Creek (290 ha)
B13 French Island (north) (195 ha)
B14 French Island (east) (200 ha)

Note:
The major part of the Disappointment Reference Area and all of the Joey Creek, Yan Yean (north) and Yan Yean (south) Reference Areas (approved by the government following publication of the final recommendations for the Melbourne Area in January 1977) are located within the City of Whittlesea.

Extension to the Baw Baw Reference Area

This extension adds to the representation of sub-alpine heathland and bog communities in the system and enhances the viability of the Baw Baw Reference Area (B10 above).

Baw Baw extension

Recommendation

B11 That the area of 55 ha, indicated on Map A, be added to the Baw Baw Reference Area and used in accordance with the general recommendation for reference areas outlined above.

New reference area

B15 Pretty Creek (170 ha)

Altitude range: 220 m to 420 m.

Climate: temperate to montane; mean annual rainfall of more than 700 mm.

Land systems: located in the Central Victorian Dissected Uplands (geomorphic unit 1.1): brown earths on steep, hilly country on sedimentary soils ($1.1/Ss8_{11}$) and yellow duplex soils derived from finely textured unconsolidated deposits on moderately sloping hills (1.1/Gf7).

Vegetation: shrubby foothill forests with small areas of damp and wet forest.

Land system 1.1/Gf7 is confined to the study area. It is located in both the existing Bull Beef nature conservation reserve and the Moondarra State Park. Its occurrence within this geomorphic unit is therefore adequately represented in conservation reserves, but it has not been represented in a reference area. The importance of this new reference area rests in the representation of land system 1.1/Gf7 in the reference area system.

New reference area

Recommendation

B15 That the area of 170 ha, described above and indicated on Map A, be used in accordance with the general recommendation for reference areas outlined above.

C. NATURE CONSERVATION RESERVES

Depending on the particular values under consideration and the potential land-use conflicts, protection of areas with identified conservation values may be achieved through their inclusion in the park system (see Chapter A), through their inclusion in reserves that focus on the specific values, such as those described in this chapter or, within State forest, through the implementation of management prescriptions under the Code of Forest Practices for Timber Production. The Code provides State-wide guidelines for environmental care in timber-production areas. The schedule provided in Chapter E, of special features to be protected in State forest, indicates the range of natural and cultural values that may be protected under the Code.

This chapter embraces the former categories of Flora Reserves, Flora and Fauna Reserves and those Wildlife Reserves where hunting is not permitted.

Flora and Fauna Guarantee Act 1988

The purpose of this Act is 'to establish a legal and administrative structure to enable and promote the conservation of Victoria's native flora and fauna and to provide for a choice of procedures which can be used for the conservation, management or control of flora and fauna and the management of potentially threatening processes'. Schedule 2 of the Act contains a list of taxa and communities that are threatened; Schedule 3 contains the list of potentially threatening processes.

The Act includes provision for management and stipulates that the Secretary of the Department of Conservation and Natural Resources (CNR) must prepare a Flora and Fauna Guarantee Strategy. A draft strategy was released for public comment in September 1992; a final is in preparation. Provision is also made for the amendment of this document by the Secretary. The main aims of the strategy are to focus on managing floral and faunal assets within the public estate, enhancing those on private lands in co-operation with landholders and managing potentially threatening processes that are pervasive throughout Victoria.

Not only does the Guarantee provide for the protection and rescue of species that are already threatened with extinction, it also aims to prevent those not presently threatened from becoming so. Although it aims to ensure that all native species can flourish - that is, maintain a natural level of distribution and abundance - the Guarantee concentrates on recovery of threatened species.

Under the Act, the Governor in Council (on the recommendation of the Minister) has the power to place on the Schedule of the Act - that is, to 'list' - a species, ecological community or potentially threatening process, following advice from a Scientific Advisory Committee, or to delist it. This provides the process whereby native species or communities at risk of extinction and potentially threatening processes are identified and where controls designed to protect the critical habitats of nominated flora and fauna are specified.

Preparation of action statements and management plans and determination of critical habitats are responsibilities of the Secretary of CNR, who has the power to amend these as required. In the case of action statements, preparation and amendment requires consideration of advice given by the Victorian Catchment and Land Protection Council, and any other relevant nature conservation, social and economic matters.

The Minister has the power to make and revoke an Interim Conservation Order on Crown land to conserve critical habitat. Such an Order can operate for up to 2 years and must be renewed to remain in force beyond this period.

As with Forest Area Management Plans, the provisions of the *Flora and Fauna Guarantee Act* 1988 do not afford the same level of protection as does the permanent reservation of areas under the *Crown Land (Reserves) Act* 1978 or the *National Parks Act* 1975, and decisions to amend or revoke protection rest with the Secretary of the Department or the Minister, not the Parliament. Nevertheless, areas of particular importance identified through the Guarantee process may subsequently be permanently reserved.

The *Flora and Fauna Guarantee Act* 1988 has a degree of flexibility that enables management of many species about which little is known at present. In these circumstances, the creation of permanent reserves may not be appropriate, or it may be that not enough is known to be able to define a permanent reserve boundary at a particular time, although the process can ensure that short-term actions do not compromise the long-term future of the species. In other cases, urgent action will be required and this Act provides a mechanism to take it. Further, the Act applies to both public and private land.

Nature conservation in the study area

The Wildlife Branch and the Flora and Fauna Survey Group of the former Department of Conservation and Environment synthesised existing data, undertook extensive field surveys on the flora and fauna of the study area and prepared comprehensive reports for inclusion in the descriptive report (published in August 1991).

In that report, the description of the major floristic vegetation communities was based on analysis of floristic vegetation surveys. The intensity of sampling was sufficient only to identify and describe the major common vegetation communities, however, and substantial variation in the structure and species composition of similar communities may occur from site to site. Nevertheless, that analysis enabled a comparison of the values of respective areas and provided a basis for determining the extent of new parks and nature conservation reserves in the study area. Table 4 in the proposed recommendations compared the degree of representation of those floristic vegetation communities in existing and proposed conservation reserves.

In preparation of natural resource data for the joint study of the Central Highlands, CNR further refined the vegetation classification system such that it now incorporates ecological information as well as floristic and structural data. This classification system - 'Ecological Vegetation Classes' (EVC) - is designed to facilitate State-wide comparison of the classes. Essentially, it differs little from the classification system described in the proposed recommendations, although some of the former communities have been renamed or subdivided. These changes, and the characteristic species of each class, are listed in Appendix III.

Table 4 compares the degree of representation of vegetation classes in the existing system of conservation reserves with that in the recommended new reserves, and utilises the EVC system where possible. This facilitates both comparison of the Council's recommendations with findings of the AHC/CNR joint project and future analyses on a State-wide basis.

Another important determinant in considering nature conservation reserves has been a report and supporting data on sites of botanical significance, prepared by the Flora and Fauna Survey Group. Those sites were identified by analysis of data collected during the range of studies undertaken in the region, from published reports and from information from people with particular knowledge of botanically important sites.

All tracts of native vegetation provide habitat for some species of wildlife, and hence have some faunal value. The study area contains many sites of high value for conservation of fauna and the Wildlife Branch drew on an extensive database to prepare a supplementary report describing such sites.

Assessment of the significance of each area for both flora and fauna took account of its importance, or that of the community or species, in demonstrating existing ecological processes or natural systems, its integrity and viability, the richness and diversity of species it contained, the rarity of the respective species or community, the degree to which it was representative of a plant or animal community and the scientific and educational value of the area, community or species. This approach is similar to that used by the Australian Heritage Commission in evaluating land for inclusion on the Register of the National Estate.

Information on areas of botanical and faunal significance provided a basis for incorporation of land into the parks system, enabled the Council to identify, where appropriate, specific sites for nature conservation reserves or provided the relevant data for inclusion on the schedule of values to be protected in State forest.

The study area supports a very diverse vertebrate fauna and a large proportion of the State's threatened faunal species. It contains the entire range of Victoria's two faunal emblems - Leadbeater's possum and helmeted honeyeater. The proximity of Melbourne has

Table 4

REPRESENTATION OF ECOLOGICAL VEGETATION CLASSES IN CONSERVATION RESERVES

Ecological vegetation class	Proportional (%) representation[1]			
	Existing land use		Recommended land use	
	Total area (ha)	Conservation[2] reserves	Melbourne Water	Conservation[2] reserves
Treeless alpine vegetation	1 825	79.5	6.9	86.7
Sub-alpine woodland	8 000	62.9	0.0	68.2
Montane dry woodland[3]	9 940	1.2	0.0	1.2
Montane forest[3]	73 430	5.2	17.6	25.2
Montane riparian thicket	3 060	24.8	3.7	33.5
Cool temperate rainforest[4]	2 370	2.0	46.0	66.2
Wet forest	113 700	4.9	21.1	28.8
Damp forest	160 060	7.7	8.5	16.6
Riparian vegetation	30 971	10.1	7.6	20.2
Foothill forest	182 420	15.0	3.7	19.9
Valley forest	800	91.2	0.0	93.5
Heathy dry forest	16 940	15.6	3.0	18.5
Grassy dry forest	40 010	41.3	0.0	42.8
Rocky outcrop shrubland	200	95.6	0.0	99.1
Box woodland	33	98.4	0.0	98.4
Plains grassy woodland	48	0.0	0.0	69.2
Floodplain riparian woodland	1 210	5.2	0.0	5.2
Heathy woodland	5 390	53.6	0.0	68.5
Wet/swamp heathland	3 160	84.3	0.0	90.8
Sand heathland	4 680	80.0	0.0	93.9
Coastal heathland	3 000	87.3	0.0	99.3
Dry coast complex	2 390	30.1	0.0	42.0
Wet coast complex	2 330	58.2	0.0	77.9
Swamp scrub	1 040	52.6	0.0	68.6

Notes:

1. Information provided by the Geographic Information Systems (GIS) section of CNR; July 1994. For the Central Highlands area, the vegetation classes are those identified for the joint study by the Australian Heritage Commission and CNR. Elsewhere the vegetation classes are those communities identified on the floristic vegetation map accompanying the descriptive report (see Appendix III for further explanation).
2. Conservation reserves in this study area include national and State parks (Chapter A), reference areas (Chapter B) and nature conservation reserves (Chapter C).
3. Montane dry (peppermint—candlebark) woodlands are generally found on the northern slopes in the study area immediately below the montane (alpine ash) forests. Although the former vegetation community has limited representation in the existing and recommended conservation reserves of the study area, existing conservation reserves contain more than 35% of its total area in the State. Similarly, they include more than 35% of the total area of montane forests in the State.
4. Areas of rainforest, linear vegetation classes and other small but important communities are exaggerated in the GIS process. The area recorded in this table for rainforest is derived from the more accurate detailed work undertaken by CNR as part of the Commonwealth's National Rainforest Conservation Program.
5. Area numbers are rounded.

contributed to the alienation and clearing of a variety of habitats, which has affected both the status and distribution of fauna.

Isolated blocks of public land are often significant for flora conservation because they tend to occur in regions in which particular vegetation communities, such as box woodlands, have been extensively cleared for agricultural development and other uses. The remnant vegetation on these fragmented blocks and on linear strips of public land - such as roadsides, unused road reserves public land water frontage reserves - also performs a secondary role as wildlife habitat and corridors and can support viable populations of species.

The continued expansion of the greater metropolitan area is also placing pressure on the remaining parcels of native vegetation. 'The Pines' reserve and other Crown land in the vicinity of the Keith Turnbull Research

Institute in the City of Frankston, for instance, support important vegetation communities - including remnant heathlands - that are becoming less extensive as a result of urban development. The habitat values of vegetation on such isolated blocks of public land are often complemented by similar values of retained vegetation on private land. Strategic planning for conservation of remnant vegetation on private land is occurring in some municipalities and Amendment S5 to all Planning Schemes in Victoria (approved by Parliament in October 1991) requires that prior approval be obtained for any clearing of native vegetation of more than 0.4 ha on freehold land and that such approval be only given if neither land degradation nor loss of significant natural ecosystem values is likely to occur.

In consideration of the degree of representation in potential nature conservation reserves of examples of vegetation communities and the habitat of important species of wildlife, the Council has also taken account of the extent to which those communities and habitats are already included in existing parks and reserves in the State and the additions to parks recommended in Chapter A.

Habitat corridors

The establishment and maintenance of corridors to link isolated populations of wildlife have been widely advocated as practical conservation measures to enhance wildlife conservation in disturbed environments. Linear corridor habitats can be identified in most landscapes: road-side strips of trees or stream-side reserves surrounded by cleared farmland; stream-side strips of native vegetation amid pine plantations; or the narrow strips of riparian vegetation or rainforest along moist gullies in the extensive forests of the study area.

Essentially, the corridors through farmland or plantations are linear habitats that differ from a more extensive, surrounding matrix and provide continuity between populations in reserved areas to prevent their isolation and decline. Frequently, they link one or more patches of habitat in the landscape and may provide a pathway for animal movement; they may also occur as isolated lines of habitat. Their effectiveness for conservation depends upon:

* their structure - that is, length and width, the number and length of gaps, the number of junctions with other corridors and the presence of 'nodes' of habitat along the length
* their functional connectivity - that is, the behaviour of the species utilising the corridor, the scale of the species' movements and their response to the structure of the corridor

In the forests of the study area, the system of retained wildlife habitats includes nature conservation reserves and other reserves (such as the Melbourne Water catchments) as well as areas excepted from harvesting (because of steep slopes or because they are uneconomic for harvesting), buffer strips to protect water quality, sites of floral or faunal significance (such as rainforests) and a hierarchy of wildlife corridors in the areas used for timber harvesting.

Further, one of the options under consideration in the respective forest management plans in the study area is a proposal to establish a series of 'biolinks' between the major parks and reserves in the regions. These biolinks, ranging from 300 to 1500 m in width, would also link with other areas of conservation value and timber harvesting would be excluded. The network of wildlife corridors within the adjoining productive forest would also be retained.

One of Council's principal considerations when proposing to link the O'Shannassy, Maroondah and Upper Yarra water-supply catchments to create the Ash Ranges National Park has been the necessity to secure a range of forest types and ages and thus protect existing, and potential, contiguous habitat - mainly of Leadbeater's possum, but also of other species that require intact older-aged and regrowth forests.

Old-growth forest

'Old-growth' or 'ecologically mature' forests have high conservation values and have diminished in extent since European settlement. Old-growth wet (mountain ash) forests, montane damp (alpine ash) and montane wet (shining gum) forests - known collectively as 'ash forests' - have received particular attention.

Several definitions of 'old-growth' exist, and these generally focus on the key features of old and large individual plants and the natural condition of the vegetation. In 1991-92, CNR undertook a major survey of old-growth attributes of the forests of East Gippsland.

That study has precisely defined the attributes that should be recorded and has specified particular threshold levels for classifying areas of old-growth forest. It has provided a definition of old-growth forest as:

> *'Forest which contains significant amounts of its oldest growth stage in the upper stratum - usually senescing trees - and has been subjected to any disturbance, the effect of which is now negligible.'*

Old-growth forests include vegetation communities with a high degree of naturalness and maximum physical development, often containing veteran individual plant specimens of both eucalypt and understorey species. Specialised micro-environments in the wetter forest types may provide habitat for epiphytic orchids and ferns, mosses and lichens. Such forests in water-supply catchments optimise both the quality and quantity of water produced. As well as their important floral values, old-growth forests also have significant faunal values.

The East Gippsland study has facilitated the process whereby old-growth forests in south-eastern Australia can be objectively classified and mapped. The methodology developed for that study was applied during the recent joint study by CNR and the Australian Heritage Commission (AHC) to an inventory of old-growth forests in the Central Highlands.

Aerial photographs supported by some field checking suggest that old-growth forests occur generally in numerous small patches scattered throughout the Central Highlands, although larger aggregations are located in Melbourne's water-supply catchments. The results of the joint study indicate that dry forests (heathy dry forest, montane dry woodland and heathy dry woodland) contain the greatest total area of old-growth (some 23 300 ha), although the nature of such mixed-species forests means that identification of old-growth here is problematic without intensive field surveys.

Altogether, the AHC/CNR joint study has revealed that, of the 6200 ha of old-growth montane and wet forests identified, 94% falls within existing and proposed parks and conservation reserves as do 39% of the 700 ha of old-growth damp forests, 31% of the dry forests and 86% of the total of 2100 ha of old-growth in other forest types.

Any older-aged forests in which the trees have achieved sufficient maturity to form hollows are important for hollow-dependent fauna. To avoid confusion with other definitions and to facilitate recognition of the importance for wildlife of any of the older forests, the Council has used the term 'older-aged forests' when referring to these areas.

Most arboreal mammals and bats within the study area require hollows for nesting and roosting, as do many bird species. For some species (such as sooty owl), the older-aged ash forests here are the principal habitat. Others (such as greater glider), while also occurring in regeneration, are most abundant in older forests. The section later in this chapter concerning Leadbeater's possum discusses the status of older-aged ash forests in the study area and emphasises their long-term importance.

Ash forests also occur in multi-aged form, as a result of either past selective harvesting operations, or low-intensity wildfire. These forests provide very important habitat for a range of wildlife species.

While most discussion is centred on the ash species, older-aged mixed-species forests are also important for fauna conservation. The eucalypt species of these forests regenerate after wildfire both through epicormic growth on adult trees and through seedlings, resulting in multi-aged forests. The high structural diversity of such forests provides a wide range of foraging substrates and a variety of hollow sizes, both of which enable the forests to support a range of species.

Senescent trees and those that have been damaged or killed by fire or other processes are important to the health of the ecosystem. Their importance is exemplified in the situation in respect of Leadbeater's possum, discussed later.

Particularly in parks and nature conservation reserves, it is important to retain dead and damaged trees so that the full expression of ecological processes and succession is permitted. Logging operations that salvage damaged trees would extend the otherwise short-term deleterious impact of wildfire and would produce their own long-term impact on the ecology. In the Baw Baw National Park, for instance, the areas of particular value as Leadbeater's possum habitat are those that were not salvage-logged following the 1939 wildfires. These areas now contain high densities of stags among the regrowth ash eucalypts.

SPECIFIC FLORA AND FAUNA

Tall astelia

A member of the lily family, tall astelia (*Astelia australiana*) is a robust perennial plant that can reach 2 m in height.

The species is endemic to, and extremely localised in, Victoria, being known to occur in only two regions. Only 12 occurrences are known at the time of these recommendations - all within State forest. One colony has been found in Youngs Creek catchment in the Otway Ranges, near Lavers Hill. The balance are located in the Central Highlands, within the upper catchments of the La Trobe, Bunyip and Yarra Rivers. The species occurs primarily on alluvium in gullies within cool temperate rainforest dominated by myrtle beech.

Although this species has about 11 occurrences in the study area, its rhizomatous habit leads to the formation of colonies or dense groves, making it difficult to distinguish individual plants, of which there may be only a small number.

Tall astelia is listed on Schedule 2 of the *Flora and Fauna Guarantee Act* 1988 as a threatened species and is recorded as vulnerable for both the State and Australia. An Action Statement has been prepared and approved.

The extent of tall astelia has declined since European settlement, having been much reduced by successive fires. Its cool temperate rainforest habitat is highly sensitive to fire. Other threats identified in the Action Statement include invasion by weeds, myrtle wilt (which is a lethal fungal disease of myrtle beech and which could cause modification of the habitat) and direct damage such as might occur with accidental felling of a tree into a colony during timber harvesting or roading.

Concern is raised in the Action Statement that the establishment of extensive immature eucalypt forest (fire or logging regrowth) in the sub-catchments containing rainforest in which tall astelia is located may affect the colonies' susceptibility to fire. This issue must be resolved as, to date, no clear evidence either supports or refutes the contention.

Interim conservation areas

Under the Action Statement, one sub-catchment in the head of each major river catchment in which tall astelia occurs will be excluded from timber harvesting and maintained undisturbed for conservation and reference purposes until review of the Statement in 1996. These areas, representing the least disturbed in which the species is found, are Bjorksten Creek (La Trobe River catchment), the upper section of Seven Acre Creek (Bunyip River catchment) and a tributary to Tomahawk Creek (Yarra River catchment).

The Action Statement sets additional prescriptions for the protection of other colonies of the species. In particular it specifies the establishment of 100-m buffers around each colony to improve its prospects of survival in case of fire, to avoid physical damage from tree-felling and to allow ecological development of the species. Moreover, timber harvesting will be excluded from 100-m buffers around stands of cool temperate rainforest or riparian scrub habitat that also supports tall astelia, as well as from a 40-m buffer along all gullies upstream of stands of the species.

Council is concerned that tall astelia is preserved. It notes that further studies of the species are currently occurring and that these studies will very likely lead to revision of the Flora and Fauna Guarantee Action Statement. The Council recommends that the species should be conserved in the long term through implementation of the revised Action Statement, including the creation of appropriate conservation reserves. In the interim, it recommends that a conservative approach to the management of tall astelia be adopted, consistent with the existing Action Statement.

Tall astelia
Recommendation

C1 That:

(a) until the respective Flora and Fauna Guarantee Action Statement is revised in 1996, tall astelia be managed according to the existing Action Statement

(b) following revision of the respective Flora and Fauna Guarantee Action Statement, tall astelia be conserved through implementation of that Action Statement, such conservation to include appropriate reserves.

Rainforest

Dominated by myrtle beech (*Nothofagus cunninghamii*) and southern sassafras (*Atherosperma moschatum*), the cool temperate rainforests in the Central Highlands are remnants of a much wider, ancient distribution of plant communities. They are now generally restricted to sheltered gully sites throughout the wetter, mountainous parts of the study area where fire frequency and intensity has been low and moist conditions have been maintained. This community also occurs in the Otway Ranges and East Gippsland.

A detailed floristic study of rainforest in the State was undertaken as part of the National Rainforest Conservation Program, funded by the Commonwealth. That study provides valuable information about the extent of rainforest communities in the State, the distribution of rainforest species and the significance of particular stands. It has been an important input to review of the status of rainforest in Victoria.

In the Code of Forest Practices for Timber Production, rainforest is defined ecologically as closed (more than 70% foliage cover) broadleaf forest vegetation with a continuous canopy of rainforest trees of variable height and with a characteristic composition of species and life forms. The species forming the rainforest canopy are shade-tolerant trees able to regenerate below an undisturbed canopy or in small gaps in the canopy resulting from locally occurring minor disturbances, such as windthrow or lightning strike, which are part of the rainforest ecosystem. Such species are not dependent on fire for their regeneration.

In the absence of fire, rainforest probably colonises wet forest. There is some dispute about the definition of rainforest, centered on the view that it should also include other closed communities that have similar botanical composition to that of mature rainforests (in which eucalypts are absent) but are transitional and include eucalypts in the canopy.

The Scientific Advisory Committee for the Flora and Fauna Guarantee considered that the community is subject to influences likely to result in its extinction - being in a state of decline and prone to future threats, such as wildfire, edge effects and disturbance from nearby logging - and in May 1992 recommended that cool temperate rainforest be listed on Schedule 2 of the *Flora and Fauna Guarantee Act* 1988.

In the study area, the dominant species of the community - myrtle beech and southern sassafras - typically form a more or less continuous dense canopy up to 40 m high. Scattered emergent eucalypts may be present. Blackwood (*Acacia melanoxylon*) may also form part of the canopy in some stands, but this species is also widespread in other vegetation communities.

The vegetation beneath the canopy includes tree-, ground- and epiphytic ferns. Several rare plant species occur in some rainforest stands, notably tall astelia, oval fork-fern (*Tmesipteris ovata*), bristly shield-fern (*Lastreopsis hispida*), and Baw Baw berry (*Wittsteinia vacciniacea*). Sixteen species of rare bryophytes - 6 mosses and 10 liverworts - appear to be restricted to cool temperate rainforest in the State. The community also represents a major part of the habitat of pink robin and at least part of the habitat of sooty owl.

Myrtle wilt is a disease of myrtle beech. It was first documented in 1973, and is known to occur in Tasmania and southern Victoria. It is associated with infection by a native fungus, *Chalara australis*, which causes wilting and leaf-fall, beginning in the crown. Most infected trees die, usually 12 to 30 months after the first symptoms appear. Small, isolated and dense stands and those that include a eucalypt overstorey appear most vulnerable and mature trees the most susceptible.

The disease is spread primarily through air- and water-borne inoculum and possibly through local root-grafting. Wounds, particularly to the stem of myrtles, provide sites for infection. Damage may be natural, such as from a falling tree branch or fire, or as a result of timber harvesting and roading. The presence and extent of myrtle wilt in the study area, and the threat it may pose to the rainforest here, have not been studied in detail.

Cool temperate rainforest occupies 2380 ha in the study area. The catchments controlled by Melbourne Water support about 1100 ha (46% of the total), 7 ha are located on freehold land, while the existing parks and reserves contain some 50 ha. Taking into account the recommendations in this document, about 1570 ha of rainforest in the study area (66% of the total) now fall within existing and recommended parks and nature conservation reserves.

Provisions, through management prescriptions, for the protection of the other areas of

rainforest are included in Chapter E - State forest (see Recommendation E4).

Leadbeater's possum

One of the State's two faunal emblems, Leadbeater's possum (*Gymnobelideus leadbeateri*) is endemic to Victoria. It is classified as 'vulnerable' by the International Union for the Conservation of Nature (1988), designated as 'endangered' by the Committee of Nature Conservation Ministers in 1989 and the Department of Conservation and Natural Resources in 1993 and has been listed as a threatened taxon on Schedule 2 of the *Flora and Fauna Guarantee Act* 1988.

Over the last decade, extensive surveys have been undertaken to determine the distribution of the species as well as a considerable amount of intensive research on its habitat requirements. The existence of suitable habitat and past records suggest that Leadbeater's possum had a wider distribution than currently reported but its current entire range now occurs within Melbourne Area, District 2, and is largely restricted to the montane ash forests of the Central Highlands. These forests comprise vegetation communities dominated by mountain ash, alpine ash or shining gum.

The possums are not uniformly distributed throughout this area and recent research has also indicated that both distribution and abundance are largely determined by the availability of food and nest sites. The type of habitat resource it requires, including the extent and distribution of various categories of habitat, is now well known for more than 50% of the total ash forest resource within the known distribution of the species, in terms of extent and spatial distribution. Nevertheless, information about suitable habitat, and its ecology, is still evolving.

Recent research has considerably refined the knowledge about the species and the large data-base generated has facilitated computer modelling. Translation of these results from the research format to practical management is a difficult task.

Of interest is a small resident colony of Leadbeater's possum in a lowland forest dominated by mountain swamp gum along Cockatoo Creek (within the area covered under Recommendation C36 below). The habitat here contrasts markedly with that of the montane forests of the Central Highlands. It may, however, be similar to the habitat that was on the edge of Koo-Wee-Rup swamp at Tynong, long since drained and cleared, from where a specimen was collected prior to 1910.

Of further interest is a number of sightings in snow gum forests at Lake Mountain and Mt Baw Baw. In the most recent, the species was observed sheltering in the stumps of large old snow gums. The contribution these forests make to the population of Leadbeater's possum, both now and in the future, is as yet unknown.

Habitat preferences

The number of trees with hollows indicates the availability of nest sites for Leadbeater's possum, while the basal area of *Acacia* species relates to the abundance of an important food source, wattle exudates, and a relatively dense understorey that enables the possum to move freely through the forest in search of food.

Leadbeater's possum has three principal habitat requirements: suitable nest trees; structurally dense vegetation; and availability of food.

Suitable nest trees

Tree hollows are essential for shelter and breeding. Abundance of the possum increases with increase in the number of trees with hollows, and its abundance appears not to reach a plateau in numbers, even on sites with high densities of trees. Earlier studies predicted that Leadbeater's possum would be absent from the majority of sites with fewer than 4.2 potential nest-trees per 3 ha. More recent work, however, has found it in sites supporting fewer than this number. Individuals of a colony move around and use a number of nest trees.

Although, on average, ash trees begin to form hollows when approximately 120 years old, these may not be suitable as nest sites for the possum until they are about 200 years old. Some nest trees are at least 400 years old. Those preferred are short, large-diameter dead trees (stags) that contain numerous hollows and are surrounded by dense understorey vegetation. Where only a few trees have hollows, there is a reduced chance that they will have the characteristics making them suitable for occupation by Leadbeater's possum. The quality of the trees is important for the species rather than the total number *per se*.

For management purposes, CNR has defined a Leadbeater's nest tree as a living hollow-bearing tree that is more than 6 m tall and at least 1.1 m in butt diameter or a dead hollow-bearing tree of a similar height with a butt diameter of at least 0.7 m.

Fewer possums are found in forests on steeper slopes, possibly because fewer trees with hollows are located there and possibly because the shallower and drier soils usually found on the slopes may affect the structure and quantity of the understorey vegetation.

Structurally dense vegetation

Leadbeater's possum harvests a dispersed food supply. The species lacks a gliding membrane and must therefore run and jump between trees and, as a result, requires a relatively continuous layer through which to move. Structurally dense regrowth or a dense understorey of wattles and other shrubs in older-growth forests are therefore important habitat components.

Availability of food

The possum obtains major components of its food resource from smooth-barked eucalypts and some species of wattle. About 20% of its diet comprises arthropods (the protein they provide appears to affect its breeding pattern), particularly tree crickets (which shelter in loose bark hanging from living trees and appear to be the most nutritionally important), and beetles, moths and spiders. The balance is made up of plant exudates (wattle gum, nectar and eucalypt manna) and insect exudates (psyllid honeydew).

Forests with a high quantity of such loose bark supported greater numbers of the possum than forests where this resource was scarce. On the other hand the abundance of the possum fell with an increase in the number of shrubs, probably as a function of the species' preference for sites with a high basal area of *Acacia* species.

The availability of all known food resources varies seasonally and therefore both wattles and eucalypts are necessary habitat components.

Hence, the habitat requirements of Leadbeater's possum are best met by an ample supply of old trees with hollows and an adequate supply of food - provided by wattles and eucalypts.

Threats

The 1939 fires burnt 79% of the Central Highlands. The resulting dense regeneration and wattle currently provide foraging substrate and permit mobility for the possum, while the older trees killed or damaged by the fire provide nesting sites. Research shows that the value of these forests as habitat is reducing, and the major threat to the long-term survival of Leadbeater's possum in some areas is the collapse of the nest trees killed in the 1939 fires.

Fire and logging may also reduce the availability of nest trees. The rate of senescence and decline in numbers of nest trees increases under conventional clear-falling operations, through their exposure to wind, the effects of regeneration burning and their removal for safety reasons. Fewer nest trees remain after clear-falling than after wildfire. Clear-falling of the same forest coupe with a periodicity of less than 150 years significantly reduces or eliminates the potential for hollows becoming available on that area in the future.

Outlook in regrowth forests

Most of the current nest trees were killed or damaged by the 1939 fires and have provided valuable nesting habitat since then, especially where they are associated with regrowth ash forest and/or a dense wattle understorey.

To date, CNR has conducted aerial photo-interpretation assessment which includes individual identification of all live and dead emergent hollow-bearing trees, vegetation types and age classes, including old growth. It has now assessed about 55% of all ash forest within the known range of Leadbeater's possum. The possum has been found in at least 25 Forest Management Blocks in State forest in the Central Highlands. Only about 6% of the total area of the 12 Forest Management Blocks so far assessed for suitable Leadbeater's possum habitat - using aerial photograph interpretation - supports older-aged living and dead ash trees among 1939 ash regeneration. The preferred short, large-diameter dead stags are usually below the canopy level of the regrowth and cannot be identified on aerial photographs. As a result, additional nest trees and high-quality habitat are often located during on-ground inspections.

However, information in 1985 indicated that the preferred nest trees were collapsing at an average annual rate of more than 3.6%, such

that, in the next 50 to 100 years, their availability for Leadbeater's possum will be significantly diminished. Apart from scattered mature trees among the regrowth, hollows suitable for the possum will be confined essentially to the older-aged and uneven-aged forests.

Furthermore, even if timber harvesting were excluded, the regrowth ash forests will not be capable of providing the recruitment of suitable nest trees for a further 150 years - assuming that ash trees must be about 200 years old before they can provide the possum's needs. It follows that the existing older-aged forests must continue to provide habitat for at least another 150 years unless alternative silvicultural systems can be applied at an operational level.

Outlook in older-aged forest

The remaining older-aged and uneven-aged ash forests within the range of Leadbeater's possum throughout the Central Highlands are therefore of critical importance for its long-term survival and are also important for other native fauna that nest in tree hollows. While the possum has lower population densities in these forests than in regrowth, they are the only areas capable of providing nest trees during the hiatus over the next 150 years before the 1939 regrowth trees are suitable. With time, older trees in these forests will die and eventually collapse; nest trees will then be provided by recruitment from younger trees.

In the Central Highlands, older-aged ash forests (essentially those forests recorded in resource documents as mature/overmature) cover a gross area of some 14 000 ha of State forest and a further 9900 ha in the Maroondah, O'Shannassy and Upper Yarra water supply catchments. These catchments are presently unavailable for timber harvesting.

Mature ash trees are capable of surviving fires of moderate intensity. If these forests are burnt, regeneration of ash and understorey species will be promoted in gaps. This is most likely the mechanism by which much of the ash forests regenerated prior to 1939.

The 1939 fires, however, were so intense throughout much of the Central Highlands that few areas of the original forest escaped. In addition, the concerted effort to salvage the burnt logs covered extensive areas and included many trees that had survived the fire. Within State forest, older-aged forests are now generally located on sheltered south-east-facing slopes, in and adjacent to moist gullies or on relatively flat plateaux. Many such sites tended not to be severely burnt in the 1939 fires.

Fires do not necessarily kill every tree. Usually, native forests comprise a mosaic of stands and individual trees of various ages. Those trees that are killed may produce nest trees in the short term and the survivors, even if damaged (or because of it), will have the potential to provide habitat into the future.

It follows that, apart from the older-aged and uneven-aged forests, and unless specific silvicultural practices are instituted to accelerate the production of nest trees in regrowth forests, a gap of some 150 years in the recruitment of nest trees (even with the exclusion of timber harvesting) will cover much of the Central Highlands. CNR is developing silvicultural systems aimed at reducing the loss of existing habitat, and providing new habitat or accelerating its production in the future.

Information on the required numbers of individuals of Leadbeater's possum to ensure the long-term survival of populations is being further analysed; also, we currently have insufficient data on the possum's ability to survive in patches and strips of suitable habitat. This indicates the importance of ensuring the maintenance of the habitat across its range to enable repopulation of harvested areas.

Any strategy to protect Leadbeater's possum must therefore have two key elements:

* protection of older-aged, uneven-aged forest and existing hollow-bearing trees in regrowth (especially live trees)
* mechanisms that provide for the development of new nest trees for Leadbeater's possum

Having recognised that, unless silvicultural practices can accelerate the process, the regrowth forests may only be of value in at least 150 years' time, we need to make a start now. Otherwise, the time before new habitat becomes available will be extended.

Principles and provisions for the conservation of the habitat of Leadbeater's possum

Information about the habitat requirements of Leadbeater's possum and its management is

continually evolving. At present CNR field staff are operating under the guideline - 'Management Strategies for Leadbeater's Possum' (March 1991) - which was developed to address the two key elements listed above. In formulating the strategies, the Department must also provide for a level of timber production that will meet legislated commitments. The strategies therefore provide a compromise between two uses of the same resource. The Management Strategies are currently being interpreted as detailed prescriptions in forest utilisation and management plans.

In 1991, the Scientific Advisory Committee for the Flora and Fauna Guarantee recommended that Leadbeater's possum should be listed on Schedule 2 to the *Flora and Fauna Guarantee Act* 1988 as a threatened taxon. CNR is now preparing a draft action statement under the Guarantee, which will update the Management Strategies and which, when completed and approved, will become the basis for detailed management prescriptions.

The Council considers that the following principles, which apply chiefly to the conservation of the habitat of Leadbeater's possum, have equal relevance to the habitat of other hollow-dependent species, as the possum requires the hollows provided by trees in an advanced stage of maturity; so the trees have progressed through the full range of their growth stages and have provided habitat for other species along the way. Most of these principles are incorporated in the Management Strategies and are being addressed by CNR during preparation of the draft action statement.

* *Suitable habitat should be maintained across the distribution of Leadbeater's possum in the Central Highlands to provide for the long-term survival of the species.*

Population viability analysis suggests that it is possible that only populations of more than 200 may persist in the long term where suitable habitat can be conserved or established and subsequently maintained without a reduction in carrying capacity. It predicts that populations of 50 or fewer are highly vulnerable to extinction in the next 100 years. Populations of 200 or more animals, on the other hand, were demographically and genetically stable over a 100-year period that had no losses in carrying capacity arising from collapse of trees with hollows, minimal levels of environmental variation and negligible impacts from wildfires. Interpretation of the studies suggests that a population of 25 animals would require a 75-ha patch of old-growth forest and a 3000-ha patch would support 1000 animals. This would indicate that the suggested minimum viable population of 200 individuals in a particular locality would require about 600 ha.

* *Where they have been identified as providing important habitat for hollow-dependent species, older-aged ash forests (essentially comprising trees established prior to 1900), mixed-aged ash forests in which the older-aged trees predominate and individual, living older-aged ash eucalypt trees should be conserved.*

This can be achieved through a combination of parks and reserves and management prescriptions.

The new Ash Ranges National Park contains the bulk of the mature and older-aged ash forest of the Central Highlands and lies at the centre of the distribution of Leadbeater's possum. Together with the other existing and recommended reserves and parks within the range of the possum, some 16 300 ha of older-aged ash forest (about 62% of the total in the study area) would be included in reserves. Additional areas of the older trees are located on steep slopes or adjacent to streams or are unsuitable for harvesting and are excluded from harvesting under prescriptions laid down in the Code of Forest Practices for Timber Production. Furthermore, the remainder is also not subject to harvesting under current prescriptions for the management of Leadbeater's possum.

CNR recently completed a study of the old-growth forests of the Central Highlands to contribute to the investigation of the area by the AHC (see the previous discussion in this chapter about old-growth forests). That study provides information about the location, extent and condition of the older-aged forests within the range of Leadbeater's possum. The Council has used this information in preparing its final recommendations.

The Scientific Advisory Committee for the Flora and Fauna Guarantee in 1991 also recommended that the loss of hollow-bearing trees from Victorian native forests be listed as a 'potentially threatening process' under the *Flora and Fauna Guarantee Act* 1988.

* *A proportion of the regrowth ash forest in the Central Highlands should similarly be set aside.*

This would provide for the development of new habitat suitable for Leadbeater's possum and other hollow-dependent species in the long term.

The recommended national park here and the other existing and recommended parks and reserves contain some 36 890 ha (26%) of the ash regrowth of the Central Highlands and are contiguous with older-aged and uneven-age forests. The Council recognises that, once again, areas excluded from timber harvesting by prescriptions contribute an additional 13% of regrowth that will not be harvested.

Further, the management strategies for Leadbeater's possum currently provide for the protection of regrowth ash forests in State forest (which contain at least 12 live or dead hollow-bearing trees per 3 hectares and include a wattle understorey), at least until they no longer provide suitable habitat for the possum - that is, until most or all of the nest trees have collapsed. Such areas would assist in maintaining the maximum possible possum population in the short term, while the older-aged forests and the retained areas of regrowth forest are capable of providing the on-going recruitment of nest trees for hollow-dependent fauna.

* *Salvage logging following fire or other damaging agency should take place according to established procedures that protect the habitat of Leadbeater's possum.*

The importance of retaining damaged and dead trees as potential habitat was discussed above under old-growth forests. It is also important to retain many trees that have survived the fire relatively undamaged, as they can provide habitat at later stages of the stand's development.

* *Management prescriptions, which may include specific silvicultural practices, should be developed for timber-production forests in order to conserve existing habitat as a complement to the reserve system and to enhance and increase suitable habitat for hollow-dependent fauna, particularly Leadbeater's possum.*

As an example, guidelines developed by CNR to assist field staff in implementation of the Leadbeater's prescriptions also provide for the interconnection of areas of ecologically important forest with suitable corridors to maintain a continuous reserve system; this is supported by the Council.

* *Subject to other requirements for nature conservation, such as to provide for the protection of other specific plants and animals, the remaining regrowth ash forests should be available for timber production.*

Costs of the various levels of protection also require assessment. Provision of artificial nest-boxes in areas of important habitat, for instance, would be an expensive option and is not considered viable for large areas. However, a program of habitat development must start now, otherwise the benefits will be delayed.

Further discussion about the management prescriptions in train and specific recommendations to protect Leadbeater's possum habitat are provided in Chapter E - State Forest.

Helmeted honeyeater

Victoria's other faunal emblem, the helmeted honeyeater (*Lichenostomus melanops cassidix*), is one of the State's rarest birds. It is an endangered species, and the entire wild population currently totals about 70 individuals.

Helmeted honeyeater is considered to be a sub-species of the widespread yellow-tufted honeyeater, but is differentiated from the latter by a distinctive crest or 'helmet' on its forehead.

Around the turn of the century the bird was found in riparian habitats throughout the Western Port and middle Yarra River catchments, where it appears to have been relatively uncommon. By 1965 it was found only in remnant vegetation along the Woori Yallock, Cockatoo, Sheep Station and Cardinia Creeks. The Yellingbo State Nature Reserve was proclaimed in 1965 to incorporate the bird's habitat along the first three of these creeks - which then, as now, were the major strongholds of the species.

Council, in its 1977 recommendations, recommended the creation of a 160-ha wildlife reserve at Yellingbo - reflecting the reserve referred to above.

Since 1977, acquisition of land occupied by the species has brought the area of the reserve to some 560 ha. Negotiations are under way for further acquisitions. An associated program of regeneration of suitable habitat has seen more than 100 000 trees and shrubs planted here.

Until recent years the population has continued to decline. Of the colonies known in 1977, that recorded at Butterfield Reserve (at the confluence of Sassafras and Menzies Creeks) has not been sighted since 1979. The colony along Cardinia Creek (near its confluence with Stony Creek) declined from an estimated 100 individuals in 1948 to some six to eight in 1982 and, like the colony at Cockatoo, has not been recorded since the wildfires of Ash Wednesday in February 1983.

The only remaining colony is at Yellingbo (located along the Cockatoo and Macclesfield Creeks). Notwithstanding the extensions to the reserve and the replanting programs, its numbers have continued to decline: in 1963 at least 180 individuals were estimated to be here; in 1978 and 1979, between 100 and 150 birds were found; by 1990/91 the total had diminished to approximately 60 individuals with 15 breeding pairs. At present, about 22 breeding pairs are known here, of a total of some 70 individuals.

It is now known, with the benefit of hindsight, that reservation of land and enhancement of existing core habitat, alone, will not ensure the survival of the helmeted honeyeater.

The Department of Conservation and Natural Resources, in consultation with other scientific experts, has prepared a broad, multifaceted recovery plan for the species. The long-term aim of the plan, adopted as a formal action statement under the *Flora and Fauna Guarantee Act* 1988, is 'to ensure the survival of the helmeted honeyeater by achieving a stable population of at least 1000 individuals in at least 10 separate but interconnected colonies dispersed along several creek systems in the mid Yarra River and Western Port catchments'. It is envisaged that this will ensure that the population of the helmeted honeyeater is self-sustaining and capable of withstanding foreseeable demographic, environmental and genetic variables, and natural catastrophes.

The short-term aim of the plan was to increase, to 100 adults, the number of helmeted honeyeaters in the wild. To this end, the plan set out the following tasks:

* form a recovery team
* survey yellow-tufted honeyeaters in west Gippsland
* clarify phylogenetic relationships between the three races of the species
* examine genetic diversity
* monitor the wild population
* study interactions with bell miners
* undertake population viability analysis
* define vegetation communities and processes
* research causes of eucalypt dieback
* prepare a revegetation strategy
* prepare a management plan for the Yellingbo reserve
* document land tenure and threats at critical sites
* establish a captive colony
* prepare a strategy for the release of captive-bred birds.

Management requires habitat manipulation, culling of competing species (the bell miner) and use of aviaries to prepare the captive-bred or translocated birds for release.

Sites containing extant wild populations, those without extant populations but known to have been used since 1950 and those without extant populations but with potential for the establishment of colonies of helmeted honeyeater are all considered important for achieving the long-term aim of the recovery plan. Based on present knowledge, such sites would comprise lowland swamp forest (for nesting sites) within the species' known range, preferably adjacent to heathy open-forest communities.

It is accepted that not all of these sites will be on Crown land, and remnant vegetation on adjoining freehold land may be critical to the realisation of a site's potential.

Rehabilitation of the land in and around the only extant population at Yellingbo remains critical.

In view of the endangered status of the helmeted honeyeater together with the isolation of the bird's habitat among freehold, and on the basis of existing information, Council recommends that the Yellingbo Reserve be extended and set aside as a nature conservation reserve (Recommendation C36), that a new

nature conservation reserve be created along Sassafras Creek (Recommendation C37) and that special measures be undertaken if new colonies are located, as well as at release sites (Recommendation C2).

Helmeted honeyeater

Recommendation

C2 That, if a colony of helmeted honeyeater is located within a park or reserve, or an area is nominated by the Helmeted Honeyeater Recovery Team as a suitable release site, the protection and preservation of the species and its habitat be a primary goal of management of that portion of the park, reserve or area.

Spotted tree frog

The spotted tree frog (*Litoria spenceri*) is classified as endangered nationally (ANZECCS 1991) and is considered to be an endangered species in Victoria. The Department of Conservation and Natural Resources is currently preparing an action statement for the management of this species under the Flora and Fauna Guarantee.

From 1988 to the time of preparation of the descriptive report, extensive searches at all sites in which the species had previously been recorded in Victoria yielded only two extant populations - at Taponga River in this study area and in the Wongungarra River in the Alpine Area. Outside Victoria, the only record came from Bogong Creek near Mount Kosciusko. This led to the conclusion that the spotted tree frog appeared to have recently become extinct at the sites on 10 of the 12 river systems where it had previously been recorded and that, accordingly, immediate steps should be taken to conserve the two extant populations in Victoria.

The causes of this apparent decline were not obvious, although disturbance by eductor dredging, timber harvesting, recreational activities and introduced predators were suggested.

The Arthur Rylah Institute's 1991 *Technical Report Series* No 116: 'Conservation Status, Ecology and Management of the Spotted Tree Frog *(Litoria spenceri)*', by Watson *et al.*, suggested various measures to minimise disturbance to the streams. For the Taponga River, these included relocation of picnic and camping facilities, closure of the stream system to fishing and prevention of further disturbance such as roading, timber harvesting and fuel-reduction burning in the catchment (at least until knowledge about the distribution of the frog was increased and adequate studies undertaken of its life-history and demography).

The report also suggested that the catchment of the Wongungarra River be accorded a land-use status that would preclude further disturbance. Since that time, a moratorium has been established on timber-harvesting activities in the Wongungarra River catchment and the area set up as a control for research purposes pending the completion of the research program. Council endorses this action. The moratorium expires early in 1996.

Between early 1992 and 1994 an exhaustive survey was conducted for the species throughout its known range. Sampling was conducted along both sides of the Great Divide, targeting less disturbed and more remote sections of streams, particularly in the catchments in which the species had previously been recorded. Every stream within the broad distribution of the species within Victoria was examined, comprising approximately 70 streams and 130 km of stream searches. The results of this survey reveal 11 spotted tree frog populations. These occur in the catchments of 16 streams, with several populations occurring at the confluences of streams. The species was relocated at two former recorded sites - Lightning Creek and Big River (Mitta Mitta). The species was located in the catchments of a further four streams in which it had been recorded historically, but only in more remote, less-disturbed areas. It was not found in the four remaining streams in which the species had been formerly recorded, or in any of their tributaries.

In view of the amount of survey work conducted, it is likely that few if any other populations exist. Most of the remaining populations are small and of limited extent. The two largest populations in Victoria occur in the Melbourne Area, District 2; in the Taponga River system (Taponga River, Still Creek and White Creek) and the Goulburn and Black River system. Other populations within the study area occur along the Big River and Jamieson River (north branch), in both of which rivers the species is very rare. Elsewhere within the study area the species has

disappeared from former locations on the Goulburn River at Woods Point, Big River at the Eildon—Jamieson Road and Howqua River at Sheepyard Flat.

The abundance and distribution of the population of the frog on the Taponga River and its tributary - Still Creek - have remained much the same (the second-greatest density) over the period of the surveys.

Disturbance - including existing tracks and new construction work, blackberries, camping, fishing and cattle grazing - has occurred along a number of streams where the spotted tree frog was found. The degree to which frog population declines can be correlated with human disturbance will be discussed in the report of the above surveys. Despite the prohibition of eductor dredging in Victoria, some has occurred in a number of streams in the vicinity of frog populations, including the Goulburn River in the study area.

The biology and ecology of the species are at present uncertain and, until more definite data are available, there is concern that any activities that have the potential to adversely affect its survival should be avoided. For instance, the Council received suggestions that the whole 7850-ha Taponga River catchment should be reserved for the protection of the habitat of the known population of spotted tree frog. The ease of access to the site and detailed knowledge of the history of this particular population make it a valuable scientific resource. Research into the frog's ecology and habitat is currently being conducted there.

Nevertheless - and particularly in the light of the recent discoveries of new populations, the rediscovery of the species in streams where it was thought to be extinct and the moratorium on timber harvesting in the Wongungarra River catchment for research purposes - the Council considers it inappropriate at this stage to recommend the reservation of specific areas as nature conservation reserves on the basis of the presence of the frog, believing that the species should be managed under the action statement.

Pending further research to identify the full distribution and habitat requirements of the species, and the finalisation of the action statement, it is recommended that management of those stream catchments in which the spotted tree frog is located takes account of the need to protect its habitat and that, when identified, sites of particular importance, such as critical breeding areas, be securely protected (see Chapter E - State Forest). In addition, further research is required in order to develop effective management strategies for the long-term conservation of the species.

Spotted tree frog
Recommendation

C3 That:

(a) until the respective Flora and Fauna Guarantee action statement is prepared, management of those stream catchments in which the spotted tree frog is located takes account of the need to protect its habitat

and that

(b) (i) following completion of the Flora and Fauna Guarantee action statement, sites of particular importance for spotted tree frog be conserved through implementation of that action statement

(ii) such conservation to include establishment of appropriate reserves.

NATURE CONSERVATION RESERVES

In addition to the floristic and wildlife values of the existing and recommended new parks in Melbourne Area, District 2, a number of areas support indigenous vegetation with considerable floristic importance. Others are important not only for their floral values but also because of the significance of their wildlife populations and habitats.

Council has recognised the special conservation significance of these areas and has accordingly recommended their reservation as nature conservation reserves. They are set aside primarily to conserve species of plants or animals that may be rare or endangered, critical habitat or other plant associations and animals that have particular conservation

significance. Timber production from these areas would not be permitted.

Council's recommendations for previous study areas have differentiated between flora reserves and fauna and flora reserves.

Flora reserves contain examples of indigenous vegetation with considerable floristic value in a natural or relatively natural state. They were set aside primarily to conserve plant species that may be rare or endangered, and plant associations or communities that are of particular conservation significance.

Fauna and flora reserves support valu able habitat for populations of significant indigenous fauna and may also contain examples of indigenous vegetation with floristic importance.

In terms of the requirements for management, there is little difference between the two classes of land use. Accordingly, the Council recommends that they all be set aside as nature conservation reserves, rather than differentiating between them.

In all such reserves, suppression of fires remains the responsibility of CNR. Appropriate fire-prevention measures such as maintenance of fire-access tracks and protective burning will be carried out where necessary, as will the control of vermin and noxious weeds.

NATURE CONSERVATION RESERVES

Recommendations

C4—C47 That the areas described below and indicated on the maps be used to:

(i) conserve and protect species, communities or habitats of indigenous animals and plants

(ii) provide for educational and scientific study if consistent with (i) above, and in ways that minimally affect the area

(iii) provide for passive recreation such as nature study and picnicking by small numbers of people, where consistent with (i) above or as otherwise specified

that

(iv) grazing, harvesting of forest products, hunting and the use of firearms not be permitted

(v) apiculture not be permitted except on traditionally licensed sites and subject to:

(a) the outcome of research into the ecological impacts of this industry
and
(b) management requirements

and that, unless otherwise specified, they be permanently reserved under section 4 of the *Crown Land (Reserves) Act* 1978 and be managed by the Department of Conservation and Natural Resources.

Existing nature conservation reserves

These areas were previously recommended as flora reserves or flora and fauna reserves. The existing Hughes Creek and Horseshoe Lagoon reserves are within the recently declared Rural City of Seymour.

C4 Gobur (410 ha). CA 39A of section C, Parish of Gobur

Representative examples of grassy dry forest and herb-rich foothill forest.

C5 Yarck (540 ha). CAs 31, 32 and 32B of section A, Parish of Yarck

Representative examples of damp forest, herb-rich foothill forest and grassy dry forest.

C6 Switzerland Range (483 ha). CAs 33A and 34B of section B, Parish of Switzerland

Examples of damp forest, grassy dry forest and herb-rich foothill forest.

C7 McKenzie (40 ha). CA 19R, Parish of Alexandra

A small example of box woodland.

C8 Upper Beaconsfield (Critchley Parker Jnr Reserve) (35 ha). CA 67A, Parish of Pakenham

A small example of shrubby foothill forest with an intact understorey.

C9 Sweetwater Creek (1240 ha)

Heathy woodland of yertchuk (*Eucalyptus consideniana*), small grass tree (*Xanthorrhoea minor*) and wiry spear grass (*Stipa muelleri*). Coral fern (*Gleichenia* spp.) dominates the ground layer in the wetter and more sheltered aspects.

Vertebrate fauna include the white-footed dunnart, grey kangaroo, chestnut-rumped hylacola, Spencer's skink and the rare mourning skink. The area is also significant for butterflies.

This reserve was recommended by the Council in 1983 following the Hill End Special Investigation.

C10 Bull Beef Creek (1320 ha)

Yertchuk woodland with a dense heath understorey dominated by prickly tea-tree (*Leptospermum juniperinum*), scrambling coral fern (*Gleichenia microphylla*), hairpin banksia (*Banksia spinulosa*) and spreading rope-rush (*Calorophus lateriflorus*).

The area supports two rare species - broad-toothed rat and mourning skink - as well as the bush rat, swamp rat, brown antechinus, dusky antechinus, long-nosed bandicoot, swamp wallaby and wombat.

This reserve was recommended by the Council in 1983 following the Hill End Special Investigation. It originally covered about 1490 ha, but the recommended new 170-ha reference area at Pretty Creek (B15) now occupies the north-eastern corner.

C11 Main Ridge (64 ha). CA 5 of section A, Parish of Flinders

Examples of coastal grassy forest and riparian forest.

C12 Kangerong (21.5 ha). CAs 22D, 22E, 22F, 22G and 22H, Parish of Kangerong
An example of foothill forest.

C13 Buckley (32.6 ha). CA 107A, Parish of Bittern

Examples of coastal grassy forest and swamp scrub.

C14 Grantville (120 ha). CA 214C, Parish of Corinella

An important remnant of sand heathland, coastal grassy forest and swamp scrub provides faunal habitat that was once much more widespread in the region.

This area was recommended as a flora and fauna reserve (H24) in 1977. The government varied that recommendation to permit the Commonwealth of Australia to continue to use a rifle range here. Warning flags are required to be flown when the range is in use.

Recommendation

Grantville

C14(vi) That the existing rifle range be licensed and its use be permitted to continue, but that no additional facilities be provided nor any additional areas cleared.

Note: Unauthorised access through this reserve should be controlled.

C15 The Gurdies (260 ha). CA 97F, Parish of Corinella

Valuable examples of heathy foothill forest, sand heathland and swamp scrub. This remnant of once more-widespread vegetation communities supports the swamp antechinus and the swift parrot.

C15 Note: Unauthorised access through this reserve should be controlled. Road access to the enclosed stone reserve should, however, continue to be available.

C16 Hurdy Gurdy Creek (43 ha). CAs 102B, Parish of Corinella

An important remnant of the once more-widespread vegetation communities of riparian forest and coastal grassy forest.

C17 Nyora (24 ha). CAs 19 and 20, Parish of Jeetho West

A remnant of damp forest and swampy riparian forest. The large number of hollow-bearing trees here provide valuable faunal habitat.

This area was considered by the Council after publication of the 1977 recommendations and was subsequently declared a flora reserve.

> **C17** Note: The historical railway dam in this reserve should be protected.

C18 Outtrim (2.3 ha). CAs 25U and 25X, Parish of Kongwak

A population of the rare species bog gum or Gippsland mallee *(Eucalyptus kitsoniana)*.

> **C18** Note: This recommendation includes a small addition, being the unused portion of the former Outtrim cemetery (see Recommendation F37).

Recommended new nature conservation reserves

C19 Caveat (1.13 ha). CAs 20A and 20B of section A, Parish of Switzerland

Representative examples of riparian forest and herb-rich foothill forest. The area includes herbfields and mossbeds on outcropping granite boulders, a rare community. It was recommended as a bushland reserve (I30) in 1977.

> **C19** Note: Excluded from this reserve is 0.1 ha in the north-east corner, recommended as land not required for public purposes (see Chapter O).

C20 Homewood (30 ha). CAs 39F and 42E, Parish of Ghin Ghin

Important and representative remnants of floodplain riparian woodland and associated wetland communities of the Goulburn River floodplain, sections of which have a rich and diverse flora. The relative isolation of this island has contributed to the protection of its fauna.

Recommended as wildlife reserve C10 in 1977.

C21 Molesworth (28 ha). CAs 5 and 6 of section C, Township of Molesworth

This area of natural billabongs and river red gum woodland also represents Goulburn River-side flora and fauna. Homewood and Molesworth are within an area assessed as being of State significance for waterbirds and breeding ducks.

Recommended as wildlife reserve C11 in 1977.

C22 Yea River (32 ha). CAs 47A and 47B, Parish of Murrindindi

A valuable representation of riparian forest, including variants dominated by burgan (*Kunzea ericoides*), and foothill forest on a rise above the river.
The area was recommended as a bushland reserve (I27) in 1977.

C23 Jamieson River/Deep Creek (25 ha). Part of CAs 15A and 26A and adjacent Crown land, Parish of Jamieson

A population of the rare golden pomaderris (*Pomaderris aurea*) on the alluvial terrace, considered to be of State botanical significance, occurs here.

C24 Buxton Silver Gum Reserve (16.9 ha)

A relatively intact stand and the largest natural population of Buxton gum *(Eucalyptus crenulata)* - a species considered to be endangered in its natural habitat. This species is the subject of an action statement under the Flora and Fauna Guarantee. The site is considered to be of national botanical significance.

C25 Mount Bullfight (600 ha)

Sub-alpine woodland of snow gum and small areas of wet sub-alpine heathland. The latter vegetation community is considered to be of State botanical significance because of the presence of the rare species Gunn's richea (*Richea gunnii*). Small areas of older-aged alpine ash forest also occur here.

This area receives a low level of use by bush-walkers and cross-country skiers.

C26 St Andrews (12.8 ha). CAs 3, 4 and 8 of section 4A, Township of Queenstown and CA 51A of section C, Parish of Greensborough

A good example of grassy dry forest with a grassy, species-rich understorey.

This area was recommended as a bushland reserve (I50) in 1977.

C27 Smiths Gully and Peter Franke Reserve (15.3 ha). CAs 10A and 16A and part of 19D of section C, Parish of Queenstown

This area has a high diversity of mammals and birds, including records of regent honeyeater, brush-tailed phascogale, large-footed myotis, long-nosed bandicoot and powerful owl.

The Peter Franke Reserve contains the foundations of a former government mining battery and an associated concrete dam, which are of historical interest and should be protected.

C28 Boomers Reserve (27.3 ha). CAs 96C and 96D of section C, Parish of Greensborough

A representative stand of grassy dry forest, which is considered to be of State botanical significance, containing some rare and several regionally significant species.

C29 One Tree Hill (143 ha). CAs 13A and 23D of section A, Parish of Queenstown

Incorporating the upper catchment and frontage to Happy Valley Creek, this existing Crown land reserve is outstanding for both its botanical and faunal values. It has been assessed as being of State botanical significance for its ecological integrity and viability, rarity and representation of community types.

It contains the most extensive stands of the depleted red box grassy dry forest, and the most intact overlap of that dry forest with messmate damp forest, in the north-eastern environs of Melbourne. It has a rich and diverse ground flora, including slender tick-trefoil (*Desmodium varians*), which is on the list of Victorian rare or threatened species.

A 1994 report on 'Sites of Faunal and Habitat Significance in the North East Region of Melbourne' that C. Beardsell prepared for the North East Region of Councils (NEROC) identifies One Tree Hill as being of State faunal significance, for the three reasons set out below.

* The One Tree Hill Mine contains roosting colonies of two cave-dwelling bat species (common bent-wing bat and eastern horseshoe bat), both designated 'restricted colonial breeding or roosting' status. The common bent-wing bat roost is the second-largest in Central Victoria.

* The region has high faunal diversity (24 species) for arboreal and ground-dwelling mammals

* In addition to the presence of four vulnerable, rare or insufficiently known species - barking owl, powerful owl, brush-tailed phascogale and common dunnart (all classed as 'rare')- the powerful owl and common dunnart have been observed breeding here. Records from One Tree Hill represent 20% of all recent sightings of the brush-tailed phascogale, and almost 20% of recent common dunnart sightings, in the greater Melbourne area.

In all, this area has 22 faunal species assessed as regionally threatened, rare or restricted in the greater Melbourne area. Some 79 bird, 24 mammal, 7 reptile and 7 frog species have been recorded here.

One Tree Hill also contributes to the proposed Warrandyte—Kinglake habitat link (C50). It is considered to be an important component of the link between the Kinglake Ranges and the Yarra River.

Improved management has successfully reduced the incidence of illegal activities which used to occur here.

Given this area's size and proximity to Melbourne, Council considers that appropriate, low impact recreational activities should be permitted as secondary uses - such as walking, nature observation (especially for birds and flora), environmental education, orienteering, and picnicking. Other activities that could be considered, provided they were managed to minimise impacts and avoid sensitive areas, are mountain bike riding and horse-riding.

The consent of the land manager is required before mineral exploration or mining can take place in nature conservation reserves . In this reserve, consideration of any future applications for exploration or mining should take particular note of the potential impacts on the important bat colonies roosting in certain old mine shafts and drives.

Recommendation

One Tree Hill

C29 That:

(vi) a range of low impact recreation activities be permitted provided they are carefully managed

(vii) the land managers take particular note of potential impacts on the bat colonies when assessing proposals for mineral exploration or mining.

Note: In assessing specific mining proposals, the potential impact on conservation values and whether access can be obtained from outside the reserve should be assessed.

C30 Ironbark Road (1.75 ha)
Crown land adjoining CA 13A, Parish of Nillumbik

This area adjoining Ironbark Road has a grassy dry forest overstorey, and a rich understorey. It is fenced but is accessible for walkers.

C31 Gresswell Forest (46.1 ha). CA 16F, Parish of Keelbundora

Representative examples of plains grassy woodland, a community that is rare in the study area, are found here. The area has a very diverse bat and bird fauna, with records of regent honeyeater and eastern broad-nosed bat. It is the most diverse area for bats close to Melbourne.

In 1993, the government announced that a master-plan would be prepared for the 246-ha area adjoining the proposed reserve. There are seven Commonwealth and State health and psychiatric institutions in the entire area, of which six are scheduled to close under a recently adopted consolidation plan. Various studies were commissioned as part of the master-planning exercise, including a vegetation and fauna habitat assessment.

In that assessment, the adjoining Gresswell Hill was identified as a key part of a site of high regional ecological significance. Its red gum and yellow box grassy woodland community is of high regional significance, has a shrub understorey that, floristically and structurally, is largely intact and comprises some 70 native species. In the Bundoora—Mont Park study area it was the site in best botanical condition. It also had diverse bird and bat fauna and contains a number of individual trees of good or very good faunal habitat value. It was assessed as being of regional faunal significance.

Gresswell Forest

C31 Notes:

1. Gresswell Forest is managed for conservation by staff of the LaTrobe University Wildlife Reserve.
2. On the basis of the above comments, Gresswell Hill should be managed to protect its values.
3. The Gresswell Forest is linked to the LaTrobe University Wildlife Reserve by the Strathallan habitat corridor.
4. Development of the area surrounding Gresswell Hospital should aim to retain existing red gums where possible, particularly those trees assessed as being of high conservation value.

C32 Pauline Toner Butterfly Reserve (2.1 ha). CA 14A of section 5, Parish of Nillumbik

Representative examples of grassy dry forest, including several regionally significant plant species, set aside to protect a population of the vulnerable species - the Eltham copper butterfly (*Paralucia pyrodiscus lucida*). This species is listed as a threatened taxon under the *Flora and Fauna Guarantee Act* 1988 and an Action Statement has been prepared.

The Pauline Toner Reserve is one of very few sites where this highly specialised butterfly occurs; the habitat is therefore *critical. Populations are in decline* elsewhere in the region due to the small size of the sites and the housing development and associated activities adjacent to them. Those sites supporting the butterfly require conscientious management to maintain their natural diversity, structure and integrity. Adequate resources are necessary for appropriate management for the butterfly.

C33 Spadoni's Reserve (3 ha). Parts of CAs B4 and B5, Parish of Yering

This area and the adjoining Yarra River frontage contain one of only two extant natural populations of Buxton gum (*Eucalyptus crenulata*), which is considered to be of national botanical significance.

C34 Coranderrk (144 ha). CAs 95A and 95B, Parish of Gracedale

A high diversity of representative vegetation types is found here, including *Eucalyptus obliqua* damp forest, *E. radiata* foothill forest, *E. ovata—E. camphora* swampy riparian forest, *E. viminalis* riparian forest, and floodplain wetland complex with *Phragmites australis*.

The total of 350 plant species here indicates the vegetation's diversity. Three species are of State, and 76 of regional significance.

It supports a high mammal diversity comprising 33 native species, including 12 species of bat - the highest diversity within the study area and the highest density known within Victoria of the large-footed myotis. Other significant species found here include the grey goshawk, powerful owl, eastern broad-nosed bat and tree goanna. Some 60 eastern grey kangaroos, and about 60 swamp wallabies are also present in the reserve, which is surrounded by a high fence.

The 'Nature Trail', within the Healesville Sanctuary, abuts the Coranderrk reserve. This 4-ha area is included within the recommended nature conservation reserve and provides additional representation of *E. radiata* foothill forest and *E. viminalis* riparian forest, and supports *populations of 5 regionally significant* plant species.

Recommendation

Coranderrk

C34(vi) That passive recreation and other access to this reserve not be permitted except by arrangement with the managers

and that it continue to be managed by the Zoological Board of Victoria.

Notes:
1. The area is often used for flora and fauna research, which should continue to be permitted by arrangement with the management of the Sanctuary.
2. Healesville Sanctuary itself, the administration buildings, sheds, Lake Coranderrk, and the plantation that is used to provide food for the koalas are not included in the recommended nature conservation reserve but are classified as a Community Use Area (see Recommendation J23).

C35 Warramate Hills (Yarraloch) (486 ha). CAs 131 and 133B, and parts of CAs 132, 133, 133A, 134, 134A, Parish of Gruyere

This area, recently acquired by the government, is located near the junction of Woori Yallock Creek with the Yarra River and contains one of the few areas of relatively undisturbed native vegetation in the Yarra Valley.

It supports high quality and unusually weed-free examples of damp forest, wet forest, shrubby foothill forest, heathy foothill forest, riparian forest and floodplain communities, having more than 190 plant species. Zoological studies of the area indicate a wide range of native species including 20 mammals, 74 species of birds, three of reptiles (including the threatened tree goanna), and an endangered species of invertebrate (a damsel fly).

C35 Note: Use of the residential study station for environmental education may continue.

C36 Yellingbo (590 ha). CAs 1C, 16A, 16B, 28A, 17C, 72G, 72J, 72M and land adjacent to CA 6A, Parish of Woori Yallock; CAs 104A, 154A, 163A and 165C, Parish of Wandin Yallock; CA 77F, Parish of Nangana; CA 47A, Township of Yellingbo

The original area, which was recommended as a wildlife reserve (C13) in 1977, extended along Cockatoo, Sheep Station and Woori Yallock Creeks in the vicinity of Yellingbo. The reserve was subsequently extended by land purchases. Council recommends that the reserve be extended for about 1.5 km upstream along Woori Yallock Creek as well as a short distance downstream.

The reserve supports damp forest, wet heathland, swamp heathland, and swampy riparian forest. The latter is dominated by mountain swamp gum (*Eucalyptus camphora*) at an unusually low elevation and close to its western limit in the State.

As noted above, this area supports the only remaining population of the helmeted honeyeater. It also supports an outlying and atypical population of Leadbeater's possum and possibly the largest population of swamp skink in Victoria. Powerful owl, barking owl, glossy grass skink have also been recorded here and large numbers of swift parrots feed on the manna gum when it flowers.

C37 Sassafras Creek (230 ha). CA 44A of section B, CAs 23A, 60, 62, 70A, 78 and 79A of section C, CAs 11A and 12 of section E, CA 34A of section K, CA 24A of section L, and CA 65A of section M, Parish of Monbulk; CAs 31B, 45A and 46B of section A, Parish of Narree Worran; CAs 26A and 57B, Parish of Nangana

This area incorporates frontages along Sassafras Creek, Ti Tree Creek, Menzies Creek and the lower reaches of Emerald Creek.

Helmeted honeyeater has been found here in the past and it has been identified as a potential site for re-introduction of the species. The area includes examples of damp forest and shrubby foothill forest. Mountain ash dominates the overstorey in the upper reaches, while mountain grey gum and manna gum dominate the lower reaches. These communities provide habitat for a wide diversity of faunal species. The rare slender tree-fern is found here in a number of locations.

A walking track (initiated in the 1920s) traverses the area and several picnic sites are accessible by vehicle. This track should be maintained.

C37 Note: This recommended reserve includes the areas of public land that support forest and fern gullies adjoining the water frontage reserve, but excludes the Baynes Park Reserve at Monbulk.

C38 Baluk Willam (66 ha). CAs 43K, 43K[1] and 43L, Parish of Narree Worran

Representative examples of shrubby foothill forest, damp forest, small areas of wet forest, and heathy woodland dominated by silver-leaf stringybark (*Eucalyptus cephalocarpa*). Some 170 plant species have been recorded here. The area is considered to be of State botanical significance and many of the plant species are not represented in any other biological reserve in Victoria.

This land was purchased and set aside as a flora and fauna reserve subsequent to Council's 1977 recommendations.

C39 Beaconsfield Reserve (38.3 ha). CAs 54A and 54B, Parish of Pakenham

Representative occurrences of swampy riparian forest and swamp scrub, the latter

community being particularly depleted. A number of regionally significant plant species occur here.

This area was recommended as a bushland reserve (I63) in 1977. It is within the area under consideration by Melbourne Parks and Waterways for a proposed regional park along Cardinia Creek.

Recommendation

Beaconsfield Reserve

C39(vi) That this area not be permanently reserved pending decisions on the development of the proposed park, but that it be managed to protect its values.

C40 North Western Port (1810 ha, including public land in the City of Cranbourne). CAs 111B and 111C of no section, Parish of Sherwood; CA 28H2, parts CA 28H, 28J, 29 and 29A, Parish of Tyabb; land 150 m off-shore from high-water mark abutting the Western Port frontage in the Parishes of Langwarrin, Sherwood, Koo-Wee-Rup and Yallock.

In 1977 the Council recommended the establishment of a wildlife reserve that extended along the Western Port coastline from Bungower Road - near Tyabb, to Yallock Creek - near Koo-Wee-Rup and included the islands of the inner bay between French Island and the mainland.

This reserve was to protect the feeding and roosting areas of waterfowl and migratory waders.

In recognition of the important nature conservation values of the coastal land, it is now recommended that the public land coastal frontage of the former wildlife reserve - extended east to the mouth of Lang Lang River, and extending 150 m off-shore from high water mark, together with Moodys Inlet and Quail and Chinaman Islands and public land blocks supporting remnant vegetation south of Bungower Road, be included in a nature conservation reserve.

The coastal strip supports sand heathland, coastal saltmarsh (with extensive mangroves), and swamp scrub, while the off-shore strip includes mangroves. Quail and Chinaman Islands, which also support good examples of sand heathland and coastal saltmarsh as well as coastal heathland, include a low woodland vegetation dominated by coast manna gum (a community that is apparently unique to Quail Island and the opposite coast near Warneet). These islands are considered to be of State botanical significance.

The relatively undisturbed mangrove and saltmarsh areas of Watson Inlet and Quail Island are of State geomorphological significance.

A range of mammal and bird species is found on Quail and Chinaman Islands. The off-shore areas are primary wader foraging and resting areas and are considered to be of national zoological significance. Of note also is a population of the rare swamp skink in the coastal saltmarsh.

The eastern end of this reserve to the Lang Lang river comprises a somewhat discontinuous Crown frontage but includes geomorphologically significant earth cliffs displaying the impact of drainage of the Koo-Wee-Rup Swamp (remnants of which are found in the Yallock Creek swamp sediments), a site where the rare and endangered orange-bellied parrot has been recorded, and an important high-tide roost for waders. There is little public access to this section of the recommended reserve.

Moodys Inlet encompasses remnant melaleuca scrub and the mangrove-fringed anabranches of Deep Creek.

Levee banks constructed to reduce tidal inundation of adjacent low-lying farmland have, in many instances, effectively incorporated public land with adjoining freehold.

Most of this coast, excluding Quail and Chinaman Islands and the west shore of Watson Inlet, is within the City of Cranbourne. The following recommendation applies to these exclusions and the intertidal and subtidal areas. Council's intentions for the remaining area are listed in Appendix II.

Recommendation

North Western Port

C40 That:

(vi) no further jetties be permitted

(vii) monitoring of the introduced intertidal grass - *Spartina* - continue and, where possible, it be eradicated.

Notes:
1. Council's intention is to include most of the mangroves in the reserve and, as their extent has not been surveyed, the seaward boundary of the recommended reserve extends a notional 150 m from high water mark. The future status of the intertidal areas will be investigated in the context of the nature conservation values of the whole of Western Port during Council's Marine and Coastal Special Investigation. Management provisions to ensure the protection and/or sustainable use of the marine resources of the area will also be addressed at that time.
2. Barralliar, Pelican and Ram Islands, included in the previous wildlife reserve, are now recommended to be included in the new French Island National Park (see Recommendation A11).
3. Developed sections of the coast at Cannons Creek, Warneet, Blind Bight, and Tooradin were excluded from the previously recommended wildlife reserve by the government and now form part of the coastal reserve - see Chapter H.
4. This reserve includes an area of natural vegetation on the northern and coastal margins of the National Electricity's proposed North Tyabb terminal station site and a large area of remnant vegetation south of Bungower Road which is on land surplus to the Commission's requirements.

C41 Lang Lang (400 ha). CAs 74D, 75 and part of CA 74C, Parish of Lang Lang; CAs 121, 123B and 124A, Parish of Lang Lang East

This new reserve comprises one of the few large areas of vegetated public land amongst largely cleared freehold around Lang Lang, enhancing its landscape values.

Vegetation consists predominantly of mostly weed free sand heathland of *Leptospermum myrsinoides* (some stands of which are very old), but includes swamp sedgeland as well as riparian forest fringing Adams Creek, a tributary of the Lang Lang River. The area includes several swamps which are perched above the water table.

Recent research work has indicated the presence of a variety of fungi including a number of significant species - one of which, *Hypocreopsis* sp., is thought to represent a new genus record for Australia. In all over 80 species of fungi have been recorded.

It supports remnant habitat for a wide range of mammals, birds, reptiles (including the lace monitor), and nine species of amphibian.

A railway line bisects the recommended reserve which includes a number of cleared fire breaks; nevertheless it is little disturbed and few weed species are found here.

The short, curving dune crests and internal drainage depressions are representative of the Cranbourne Sand topography.

C41 Notes:
1. This new reserve includes the Crown frontage of Adams Creek but excludes the railway reserve which bisects it.
2. Council is aware that the area contains considerable sand resources. Portion of it was included in a stone reserve in Council's 1977 recommendations.
3. The western part of this proposed reserve is within the City of Cranbourne - see Appendix II for Council's intentions.
4. The long absence of fire may be a critical habitat requirement of the fungus *Hypocreopsis*.

C42 Mount Martha Park (50 ha). CAs 52 and 52A of section 26, Parish of Mooroodue

Grassy woodland of snow gum and rough-bark manna gum, swamp gum woodland, and a grassy woodland complex with drooping sheoke.

It is thought that much of the original vegetation here was cleared in the 1860s and has since regenerated; indigenous tree species have also been planted. The area also includes an arboretum of native (although not necessarily indigenous) species, constructed nature trails and a lookout tower. It was recommended as a recreation reserve in 1977.

C42 Notes:
1. The picnic area to the east is not included within the recommended reserve; see Chapter J - Community Use Areas.
2. The Shire of Mornington has engaged consultants to prepare vegetation and faunal assessments of the area, which will form the basis of a management plan.

C43 Bald Hill (23 ha). CA 10A of section 19, and CA 20E, Parish Kangerong

Examples of heathy woodland, coastal grassy forest, and sand heathland. The original (3.6 ha) area was recommended as a bushland reserve (I85) in 1977; additional land was subsequently donated to the Crown.

C44 Ventnor Koala Reserve (65 ha)

While much of this reserve was cleared and modified in the past, it now supports a well established eucalypt plantation which provides important habitat for a koala population. Public access is presently restricted and the reserve is used for koala research. This area was recommended as part of a wildlife reserve (C15) in 1977.

C45 Phillip Island Koala Conservation Centre (29 ha). CAs 121A and 121D and part of CA 120, Parish of Phillip Island

This area incorporates the public land portion (recently purchased by the government) of the Phillip Island Koala Conservation Centre and the nearby Five Ways Koala Reserve. The Centre also includes the 6.6-ha David Forrest Koala Reserve - owned by the Shire of Phillip Island - and abuts the Oswin Roberts Koala Reserve which is part of Council's recommended Phillip Island State Park - see Recommendation A27.

Koalas were introduced to Phillip Island late last century and the population increased rapidly, however their numbers have plummeted in recent years. The Conservation Centre is a means of increasing the population so that koalas may be re-introduced over a wider area on the island as habitat is improved.

The Koala Conservation Centre is planned to include an information centre, toilet block, car parks, artificial wetlands, a koala enclosure encompassing an area of remnant native vegetation, and a smaller observation enclosure. It will also include a larger adjacent area to be managed as a tree plantation, producing eucalypt leaves to feed the koala population of the close-viewing area and the Koala Rehabilitation Centre.

Recommendation

Phillip Island Koala Conservation Centre

C45 That:

(vi) manipulation of natural systems be permitted to ensure the protection and enhancement of koala habitat and food sources

and

(vii) provisions for the interpretation and viewing of koalas be permitted.

Note: Most of this area is managed as a separate unit by the Phillip Island Penguin Reserve Committee of Management; this arrangement should continue.

C46 Reef Island and Bass River mouth (180 ha). CAs 81A, 82B and 82C, Parish of Corinella; CAs 8 and 18 of section 28, Parish of Woolamai

The coast and Reef Island vegetation is mainly coastal saltmarsh which forms part of the larger Western Port site of significance for foraging and resting of waders. The endangered orange-bellied parrot occasionally feeds here.

Recommendation

Reef Island and Bass River mouth

C46(vi) That monitoring of the introduced intertidal grass - *Spartina* - continue and, where possible, it be eradicated.

Note:
The seaward boundary of the recommended reserve extends a notional 150 m from high water mark.

The delta complex of the lower floodplain and intertidal sandy zone of the Bass River is of State geomorphological significance and provides opportunity for research into deltaic and intertidal dynamics.

C47 Wonthaggi heathlands (225 ha). CAs 47A and 47C, and part of CA 47B, Parish of Wonthaggi

Valuable and relatively natural examples of sand heathland and coastal heathland, as well as coastal dune scrub and coastal banksia woodland communities. The area is considered to be of State botanical significance and is of high conservation value for fauna, supporting the rare swamp antechinus. The swamp rat and at least 35 species of birds are also found here. It provides opportunities for passive activities such as walking, nature study, photography, and education.

C47 Notes:
1. Appropriate warnings should be erected to restrict public access through those parts of the reserve affected by the rifle range for the periods that the range is in use.
2. Parts of the area are subject to invasion by pine seedlings; a continuing program of rehabilitation is required for the former experimental pine plantation area.

C48 Warrandyte—Kinglake nature conservation link

This recommendation identifies a habitat link between the Yarra River at Warrandyte State Park, and the Kinglake National Park. The link traverses a topographic gradient from an elevation of about 50 m on the Yarra, near Bend of Isles, to about 500 m on the Kinglake Plateau, and supports a range of vegetation communities. The main purpose of this link is to provide a native forest corridor for fauna between the Yarra River valley and the Kinglake Plateau.

The habitat link is of value to fauna in the following ways: for maintenance of genetic exchange between otherwise isolated populations; for seasonal or migratory movements; for juvenile dispersal; and for expansion of the foraging range of higher altitude species into lower elevations.

Species observed using the area in one or more of these ways include the powerful owl, yellow-tailed black cockatoo, brush cuckoo, pink robin, crescent honeyeater, red-browed treecreeper, brush-tailed phascogale, long-nosed bandicoot, feathertail glider, mountain brushtail possum, bat species, and McCoys skink. Common bent-wing bats, banded at the One Tree Hill Mine, have been recorded at the aqueduct in the 'Round the Bend Cooperative' area south of Sugarloaf Reservoir. Superb lyrebirds, dispersed seasonally from Kinglake National Park, are seen in the Five Mile Creek area, and great pipistrelles and McCoys skinks, typical of wetter forests, have been recorded at lower elevations in the habitat link. Butterfly species from Kinglake National Park use the area similarly. For example, Banks' brown, has been recorded at its low-elevation limit in One Tree Hill.

For animals living in the area, the habitat link needs to be at least as wide as the diameter of their home range, for their gradual dispersal.

The Melbourne Parks and Waterways program (see Introduction) is proposing to develop and enhance Melbourne's open space network from Port Phillip Bay to the Ranges. Its draft strategy identifies particular stream frontage reserves and other linear reservations, such as disused railways, as the frame of the network.

The Yarra Valley is a primary focus of Melbourne's open space. A reasonably

continuous and, in places, quite wide public parkland strip exists along the Yarra River from Ivanhoe to Wonga Park. Upstream of Wonga Park to near Healesville, however, long reaches of the Yarra have no frontage reserve and the best opportunity for continuity of the public land strip lies along the Watsons Creek valley to the north.

The most suitable site for the provision of a habitat link broadly follows the lower valley of Watsons Creek from its junction with the Yarra, north of Wonga Park. The recommended nature conservation link is indicated in detail on Map F. The frontage reserve along most of Watsons Creek, other Crown land, notably One Tree Hill, the eastern part of the St Andrews rifle range, and Happy Valley con-tribute to a substantial link between the Yarra River and the Mount Everard section of the Kinglake National Park. The remainder of this link comprises land held by Melbourne Water. Watsons Creek frontage contains high quality remnants of riparian forest, which is depleted and often disturbed elsewhere in the region. One Tree Hill is recommended separately to be a nature conservation reserve (see Recommendation C29 above). The St Andrews rifle range is located in the western end of its reserve and is used by the Diamond Valley and Eltham rifle clubs. The portion of its reserve east of Rifle Range Road, identified as part of the habitat link, supports intact grassy dry forest.

The condition of the land held by Melbourne Water varies. Some areas, contiguous with One Tree Hill and the rifle range, are densely forested and are in botanically good condition, therefore providing good habitat. These areas carry mainly grassy dry forest, displaying a transition from riparian forest along the drainage lines, to low elevation box-stringybark woodlands on shallow stony soils near the Yarra River, and to low foothill grassy dry forests. Closer to Kinglake National Park, valley forest increases in extent, with broad-leaf peppermint - mealy stringybark heathy dry forests occurring as elevation increases into the park.

The identified habitat link follows the moist forests along valleys and includes the adjoining transitional vegetation and drier spurs and ridges, such that a range of microclimates and habitat types is maintained along a topographic and botanical gradient. The link should be managed to ensure that birds, arboreal mammals and ground fauna can have ready passage between localised areas and, as appropriate, are able to traverse the whole link. The Eltham—Yarra Glen Road limits the movement of some fauna and specific measures may be required.

Further development of Melbourne Water's Sugarloaf Reservoir and associated Winneke water treatment plant would involve increasing the pumping capacity from the river (planned to be constructed before 2010) and construction of the Upper Watsons Creek reservoir (which remains an augmentation option). Melbourne Water has been buying land in the catchment to Watsons Creek and now has a substantial landholding. Some of this land is partly cleared and other parts require some revegetation. Four old houses remain on the boundary of the habitat lank and are not included in this proposal. Some of the surplus Melbourne Water land included in the link indicated in the Proposed Recommendations has recently been sold. The sale process had commenced prior to publication of the Proposed Recommendations.

The habitat link includes land around Rob Roy Bridge that would be inundated by the proposed reservoir. If a decision is made to construct it, Melbourne Water should ensure that a 500—750-m wide habitat link is maintained around its western margin, above full supply level.

Warrandyte—Kinglake *nature conservation link*

Recommendation

C48 That the Warrandyte—Kinglake area (of 1432 ha) shown on Maps A and F:

(i) be retained as public land and managed cooperatively by the Department of Conservation and Natural Resources and Melbourne Water as a habitat link in accordance with the recommendation for nature conservation reserves outlined above

(continued)

C48 Recommendation (continued)

that

(ii) cleared or semi-cleared land within the link be revegetated, where appropriate, using indigenous species

(iii) if the Upper Watsons Creek reservoir proceeds, Melbourne Water ensure that a habitat link is around the western side of the storage maintained

(iv) if the Upper Watsons Creek reservoir does not proceed, or if Melbourne Water decides to dispose of its land holdings, the Melbourne Water land within the link be transferred to and managed by the Department of Conservation and Natural Resources on a basis to be agreed between the two authorities

(v) a range of low-impact recreation activities be permitted, provided they are carefully managed

(vi) specific sites which are available and used for recreation, such as the surrounds of Sugarloaf Reservoir, continue to be managed by Melbourne Parks and Waterways

C49 Additional nature conservation links - Watsons Creek/St Andrews area

Several submissions proposed that further Melbourne Water land (between Panton Hill and Watsons Creek) should be added to the above habitat link, specifically as east-west links to other reserves along Long Gully (G146), Smiths Gully (C27), Boomers Reserve (C28), and Diamond Creek (G1), and as north—south links along Skyline Road (east of Sugarloaf Reservoir) and upper Watsons Creek.

Substantial areas are held by Melbourne Water following purchase for the original large Watsons Creek dam proposal. This land-holding, declared surplus in 1982, was considered in detail in the mid-1980s by the Watsons Creek Land Consultative Committee, and certain areas were recommended for retention as public open space, while other areas were designated for sale but with conditions limiting permitted uses (in a 'bushland zone' or 'conservation A' under planning controls) in order to protect nature conservation values. The areas are identified on the Watsons Creek Project 'indicative development plan', agreed to in 1988.

The Shire of Eltham has recently been considering this issue, acting as consultants to Melbourne Parks and Waterways, and has identified a number of areas with high nature conservation values, developing the earlier proposals. The report for NEROC on 'Sites of Faunal and Habitat Significance in the North East Region of Melbourne' (see text related to C29) has been taken into account in these recommendations.

The report identifies Long Gully headwaters (linking Long Gully to Boomers Reserve) as having 'very high' habitat significance and 'State' faunal significance. This area supports a diverse vegetation, including an important mature forest of red ironbark with a varied and rich understorey. Over 70 vertebrate faunal species have been recorded here, including the powerful owl and brush-tailed phascogale, and several regionally threatened species.

The central section of Long Gully has 'high' habitat significance and 'regional' faunal significance.

Upper Watsons Creek and the Yarra Ridge north-east from Sugarloaf Reservoir are combined in the sites of faunal and habitat significance report, and are assessed as 'high' habitat significance and 'State' faunal significance. This includes one of the most intact and extensive stands of manna gum riparian forest in the region, along upper Watsons Creek. Barking owl, brush-tailed phascogale, and common dunnart have been recorded here, along with four regionally threatened species and a total of over 120 vertebrate fauna species.

Council recognises the values found in these links in the Panton Hill—Watsons Creek—Christmas Hills areas, and the need for protection of much of the existing adjoining forested land to reduce fragmentation of habitat. However, the Council has not

recommended that these areas necessarily remain as public land, if their condition and values can be protected by other means such as municipal planning scheme controls.

Additional nature conservation links - Watsons Creek/St Andrews area

Recommendation

C49 That:

(i) areas of public land identified in the report to the North East Region of Councils (NEROC) as having particular values, other than those subject to specific recommendations of the Land Conservation Council, be protected as far as is possible by retention in the public estate as public open space or, if sold, by conservation covenants, planning scheme zoning, or native vegetation retention controls as appropriate

(ii) land in the following areas be recognised as the most important of those to be protected as public open space or by the methods outlined in C49(i) above in order to provide habitat links to Long Gully, Boomers Reserve, and Smiths Gully, and east of Sugarloaf Reservoir from the Yarra River to the Kinglake National Park (see Note)

Koos Road
Bakehouse Road—Rodger Road
Bluehouse Road—Long Gully Road
Clintons Road—Bluehouse Road Ironbarks
Yarra Ridge—Skyline Road

(iii) the recommendations and information in the NEROC report be taken into account by the land managers when preparing or revising management plans for parks and reserves.

Note: Recommendation C49(ii) does not require that the areas providing additional habitat links be necessarily retained as public land if their condition and values are protected using other means.

Essentially Natural Catchments

Following its Special Investigation of Rivers and Streams, Council in 1991 recommended that two areas in this study area should remain unaltered from their present condition and be managed as Essentially Natural Catchments. One, the O'Shannassy River catchment falls within the recommended Ash Ranges National Park. The other, Williams Creek, is in State forest near Jamieson. These are recognised as overlays on existing land uses and are protected under the *Heritage Rivers Act* 1992 through management prescriptions.

Essentially Natural Catchments

Recommendation

C50 That the O'Shannassy River and Williams Creek Essentially Natural Catchments, indicated on Map A, continue to be used for those purposes approved by the government following publication of the final recommendations for the Rivers and Streams Special Investigation in June 1991 and specified in the *Heritage Rivers Act* 1992.

D. WATER PRODUCTION

Water supply catchments in Melbourne Area, District 2, are very important in a State context. They provide all the water used in the greater Melbourne—Mornington Peninsula—Western Port areas and most of that used in the Latrobe Valley for urban and industrial purposes. Irrigation water - a large part of that supplied to the lower Goulburn and Gippsland areas - is stored in Lake Eildon, or taken from the Thomson and La Trobe Rivers.

Since the Council's final recommendations in 1977 there have been many changes to the administration of water services. Every former water authority has been restructured and the number reduced from 32 authorities to 12. Melbourne Water Corporation now has responsibility for water supply in virtually all of the Yarra and Western Port Basins (including Mornington Peninsula but excluding the supplies from the Tarago Water Board to Warragul and Drouin). Kilmore, Broadford, Seymour and Marysville are now supplied by the Mid-Goulburn Regional Water Board. The Latrobe Region Water Authority (Gippsland Water) supplies Yarragon, Trafalgar, Thorpdale and Erica as well as cities and industry in the Latrobe Valley. Several other new authorities manage one or more former town water systems. The government announced further restructuring plans in April 1994, which proposed four domestic water supply authorities in Melbourne Area, District 2: Melbourne Water, Gippsland Water and the Mid-Goulburn and South Gippsland Regional Water Authorities. The Rural Water Corporation has been divided into regions, with the Lake Eildon—Goulburn system now managed by the Rural Water Corporation's Goulburn—Murray Region.

Current management and use

Melbourne. Water Corporation's water supply system illustrates the range of catchment management approaches. The Corporation's 'core catchments' - O'Shannassy, Upper Yarra, Maroondah (and adjoining creeks), Wallaby, Toorourrong and Yan Yean - are managed for water production, but they contain some public roads and, although limited in area and strictly regulated, recreation is a secondary use at some sites. The only treatment of the water supplied to a large sector of Melbourne is disinfection, commonly by chlorination, when it is necessary.

The Thomson Reservoir provides a long detention time for water, allowing settlement of suspended matter and bacterial die-off, before it enters the Upper Yarra Reservoir. In its forested public land catchment, timber harvesting and recreation, subject to track closures and a limit on camping, are currently permitted.

At Yering Gorge, Melbourne Water has pumped from the Yarra River to Sugarloaf Reservoir since 1980. The Yarra catchment to this point includes the Lilydale, Warburton, Yarra Junction, Healesville and part of the Dandenongs urban areas, intensive and extensive agriculture and hundreds of kilometres of roading. Public land in the Yering Gorge catchment includes: the bulk of the recommended Ash Ranges National Park (Recommendation A12), which incorporates the Yarra 'core catchments'; part of the Dandenong Ranges National Park (Recommendation A5), which is used extensively for recreation; and some State forest used for hardwood production. This pumped water, which provides about 17% of Melbourne's supply, is fully treated to World Health Organisation standards before entering the reticulation system.

In 1991, Melbourne Water took over management of the Tarago Reservoir, a major supply source for the Mornington Peninsula. Its catchment includes some 7580 ha of State forest and about 3500 ha of farmland, mainly pasture.

Accordingly, since the early 1970s when all of Melbourne's catchments were 'closed', Melbourne Water has substantially broadened its approach to catchment management, and has developed experience in harvesting water from catchments with a range of uses and the necessary levels of water treatment.

Other water supply catchments in Melbourne Area, District 2, in West Gippsland and the Goulburn Valley, were listed in the descriptive report. These all have a multiplicity of land uses.

Catchment land uses

Recognising that the prime water-producing areas of the State coincide with the principal mountain and forested areas, and that these areas together with inland water bodies form major attractions for recreation, the Council has maintained that, in many areas, catchments can be managed for a range of uses consistent with the provision of adequate protection of the water resources. The increasing availability of hydrological research results and water quality analyses has highlighted a continuing need for efforts towards improving water quality through better catchment protection, particularly in domestic water supply catchments.

Recreational use of domestic water supply storages is in general not appropriate except where supplies are treated. For example, non-motorised boating is now permitted on Sugarloaf Reservoir, the water from which is fully treated before use. Where it is permitted, recreational use must be carefully controlled to ensure adequate protection of water quality. Responsibility for this must remain with the water supply authority.

The Council realises that the optimum combination of land uses for catchments will vary from one land type to another. A particular use that may not impair the quantity, distribution or quality of water yield under one set of circumstances may have a detrimental effect in another. Changes in land use, which could detrimentally affect the quality, quantity or distribution of water supplied from a catchment, should only be made following full consideration of the benefits and disadvantages associated with the various land-use options. These considerations should take account of the interests of the groups likely to be affected by any changes as well as broader regional and State-wide issues.

LAND-USE PLANNING

Council notes that the land-use planning status varies between catchments in the study area. Of the 26 catchments proclaimed under the *Soil Conservation and Land Utilization Act* 1958 (SC&LU Act), 16 were proclaimed since the 1977 recommendations. Eight water sources are no longer used, being replaced by better-quality supplies, and four sources - Bunyip River, Beaconsfield Reservoir, Dee River and Walker Creek - are maintained as reserves.

An accelerated program for catchment proclamation was initiated as part of the Council's Statewide Assessment of Public Land Use (1988), and the three catchments given priority in Melbourne Area, District 2, were since proclaimed.

The catchments to another 26 diversions or storages were not proclaimed; 18 of these are Melbourne Water installations. Council maintains that all domestic water supply catchments should be investigated. Where a catchment supplying water used for domestic, industrial or irrigation purposes has a multiplicity of uses, the relevant regional catchment and land protection board (see below) should consider recommending its declaration as a special water supply catchment area.

Within Melbourne Area, District 2, for example, some concern has been expressed about water quality in the Rubicon River, which supplies Generation Victoria's hydro-electricity generation plant (see Chapter M) and the township of Thornton.

In proclaimed catchments, and following consultation with the Land Conservation Council, a land-use determination was previously able to be made for a catchment under section 23 of the SC&LU Act. This specified the most suitable uses of all land in the catchment, and included delineation of protective strips around storages and along major watercourses. Since the 1977 recommendations, land-use determinations were completed for Lake Eildon, Delatite River, Tanjil River and Thomson Reservoir catchments in the study area. Twelve land-use determinations in all were prepared for the study area, although three - for Healesville and Micks Creek, both replaced by water from another source, and Thomson Stages 1, 1A and 2, superseded by Thomson Reservoir - are no longer in effect.

Catchment and Land Protection Act 1994

New catchment and land protection legislation has been developed to replace the SC&LU Act and vermin and noxious weeds legislation. It embraces the principles of sustainable land use, integrated and co-ordinated catchment management, maintaining land productivity while protecting the environment, ensuring soil, water and associated plant and animal life do not become degraded and involving the community, and includes performance monitoring. A Victorian catchment and land protection council and regional catchment and land protection boards are to be established.

The Act removes the Land Conservation Council's role in recommending water supply catchment proclamation, which has been replaced by special area declaration, now the responsibility of the regional boards. The Council's role of advising the Minister for Natural Resources on the use of land in special water supply catchment areas has been retained. In declared special areas, special area plans can be prepared. Within water supply catchments these would be equivalent to the former land-use determinations.

The Council has expressed support for the principles underlying the Bill, and commented that its own operating principles:

* independence from day-to-day direction by government, and from the land managers
* members to have a comprehensive range of appropriate expertise
* consultation with relevant parties

could be applied where appropriate by the new council and boards.

Decade of Landcare

As part of National Decade of Landcare, nine regional landcare plans have been prepared covering Victoria. Melbourne Area, District 2, is partly within the Port Phillip—Western Port, Gippsland and Goulburn—Broken Regions. In relation to water resource issues, those plans identify water-quality deterioration as a key problem and propose an integrated catchment management approach. The Port Phillip—Western Port plan, for example, further proposes:

* preparation of catchment management plans
* emphasis on the importance of protecting wetlands and stream-bank vegetation
* improvement in the water quality of run-off from development and disturbed sites
* priority for new sewer connections
* co-ordinated assessment of stream conditions
* research on links between land use, land management and water quality
* identification and protection of groundwater recharge areas

The principles in the plans are intended to apply generally to river basins rather than specifically to water supply catchments. However, the subsequent identification of priorities should recognise water supply catchments.

Catchment land tenure

Council believes that in many situations it is neither necessary nor indeed practicable for a water supply authority to control and manage all land in its water catchment.

When water authorities control their catchments, it is generally the result of historical circumstances. The core catchments of Melbourne's supply system were vested in the then Board of Works following serious outbreaks of water-borne disease last century. Subsequent governments have maintained that system, and so Melbourne consumers have had access to high-quality water requiring minimal treatment, and hence avoided major treatment costs. As outlined above, Melbourne Water now also harvests substantial volumes of water from catchments that are largely not under its control.

Small water supply authorities have not had the resources to purchase or manage all the land in their catchments. They have been obliged to take water from catchments with a multiplicity of uses, hence the need for the catchment planning mechanisms mentioned above.

Elsewhere in these recommendations, the Council has recommended that the Maroondah, O'Shannassy and Upper Yarra catchments form the basis of an Ash Ranges National Park, and the Wallaby/Silver Creek catchments be added to the Kinglake National Park. The recommended management regime in these parks would not permit timber harvesting, and would require park zoning to strictly limit recreation in the catchments. Management of the parks would be by co-operative arrangement between Melbourne Water and the Department of Conservation and Natural Resources (CNR), with Melbourne Water continuing to manage the catchments. This would effectively continue the present management of these areas, and would reflect both their importance for water supply to about 75% of Victoria's population and the research results indicating the major water yield and potential water-quality implications of changes in management, as discussed below, as well as their importance for conservation of other natural values.

Hydrological behaviour

A further consideration is the hydrological behaviour of a catchment. Melbourne Water has been carrying out a comprehensive experimental program of hydrological research

since the 1960s. The main objects have been to study the effect of forest operations on water quality and the relationships between vegetation type and water yield, with emphasis on ash forests. A key result has been the estimation of water yield reduction occurring in regenerating ash forests following bushfire or logging. Kuczera's (1985) study of a wide range of catchments in the Central Highlands indicates that, compared with yield from a pre-existing mature forest, water production would initially increase, but flows would then sharply reduce to a minimum at age 30 of about half the original yields, only returning to pre-fire yields after some 150 years.

Mixed-species forests have shown no observed reduction in water yield after fire. Their response after clearfelling and regeneration is uncertain.

Council considers that, in general, authorities with land management responsibilities within water supply catchments should be conscious of the implications of their management decisions on water production, and should consult, co-operate and reach agreement with the respective water supply authority and CNR regarding the type, location and timing of management activities.

Buffer zone around water storages and diversions

Where the water supply authority does not control all the land in its catchment, it should control and manage a buffer zone, such as that defined in the land-use determination, around storages and diversion works. This buffer zone is separate from the protective strips along watercourses, which, although important for protection of supply, would not by themselves form a manageable unit.

In addition, the authority should control and manage the storages and the areas on which capital works associated with water supply are situated, together with any other areas that may be needed for efficient management.

Each catchment and water supply system has individual characteristics and the determination of the buffer zone will need to take account of the differences. In determining the extent of the zone, planners should give consideration to factors such as ground slope, soil type, vegetative cover, adjoining land use, types of facilities available for treating the water, end-use of the water, detention time in the storage and the need to both control public use of the storage and its immediate surrounds and maintain access for management. The buffer zones around small domestic water storages, for example, are more sensitive to land-use pressures than those around large irrigation storages.

The buffer zone should be large enough to reduce entry of most pollutants into the storage by way of filtration of overland flow, absorption through the soil and assimilation in watercourses. The desirability of making it a practical management unit should also be taken into account.

In some instances it may not be practical for the water supply authority to manage all, or part, of the zone. In such cases the authority should reach agreement with the adjacent land manager. The agreement may include leaving the management with that adjacent land manager on the basis that it would manage the zone with the prime object of protecting the water quality.

A 200-m land-use determination buffer is designated around Lake Eildon. Where this abuts the present Fraser park and Eildon State Park, management difficulties have arisen because activities such as camping and the lighting of camp fires are carried out in parts of the buffer zone. Further, the zone is located above full supply level, whereas the reservoir normally operates below that level, exposing more foreshore area. Except at designated sites, camping and lighting fires are inappropriate in both the buffer zone and the abutting parks. Management difficulties have resulted, as the above areas are not covered by the regulations applying to the parks.

It is now recommended (see Recommendation A15(x)) that an agreement on co-ordinated management of these areas be reached between the Director of National Parks and the Rural Water Corporation.

THOMSON CATCHMENT - WOOD *V.* WATER

The 48 220-ha catchment above the Thomson Dam comprises some 42 620 ha of State forest, part of the Baw Baw National Park (3330 ha) and 2270 ha of water surface. The forests contain 15 800 ha of ash species and 26 000 ha of mixed species. The former comprise alpine ash and shining gum montane forests and mountain ash wet forest. The mixed-species forests include mountain grey gum and messmate damp forest, silvertop

foothill forest and broad-leaf peppermint heathy dry forest. These contain substantial timber resources and, in accordance with the Code of Forest Practices for Timber Production, the net productive area of ash species is 12 600 ha, and of mixed species is 7970 ha. About 1000 ha, mainly ash forest, has recently been logged and regenerated.

Timber production from this catchment is, to some extent, competitive with water production, as discussed below. Recent studies of the relative economic values of timber and water production in the Thomson catchment were commissioned jointly by Melbourne Water and CNR. Two reports were produced - 'Evaluation of the Economic Values of Wood and Water for the Thomson Catchment' by Read Sturgess and Associates *et al.* (June 1992) and 'Phase Two of the Study into the Economic Evaluation Of Wood and Water for the Thomson Catchment' by Read Sturgess and Associates and Tasman Economic Research (February 1994). The first study estimated timber yields and volumes for eight timber-harvesting options - no logging, harvesting at various ages or thinning [see Table 5(i)] - together with the resulting stream flows.

The consultants made various assumptions, which are discussed in their reports. They also pointed out that, as their first study was purely an economic comparison, other important matters needed to be considered. These included:

* the implications of any change from the *status quo* for employment levels and the regional economy (the second study assessed these)

* the implications for conservation and recreation values and for downstream uses such as fresh-water flushing of the Gippsland Lakes

They suggested further studies of these matters and of other harvesting options.

The outcomes of the first study were controversial and particular concerns were raised about the different ways it valued water and timber. Accordingly, the second study reviewed the valuation methods - resulting in lower values for water than in the first study - and considered 12 timber-harvesting options. Table 5(ii) lists the options studied.

Findings

Applying the model developed by Kuczera to the run-off levels recorded in the Thomson catchment, fire or logging would be expected to cause a sharp reduction in annual water yield from a mature forest - from 11.9 ML (megalitres) per hectare to about 5.8 ML per ha over some 30 years. A gradual increase would then occur over some 120 years to the pre-existing flow rate.

At present the Thomson catchment is available for timber production. Any change in catchment conditions that increased stream flow would provide additional water to meet growth in demand, and could allow the next augmentation of Melbourne's water supply system (see below) to be delayed, leading to savings in both cases. Any corresponding reduction in timber availability would have a cost, as it all contributes to the regional sustainable yield volumes of timber supplied for industry and to associated employment.

The consultants estimated timber and water values in the catchment. Analyses in the first study estimated the price for water as $530 per ML. The second study valued water at its 'opportunity cost', that is, extra water in Thomson Dam is worth at least the savings from postponement of future augmentations to water supply capacity. In the case of timber, the consultants applied the results of other studies, which concluded that a true value in the forest could be estimated by adding to the set royalty values an amount representing the market price of timber licence transfers, converted to an annual sum. This differed for each timber grade, and the consultants' analyses used 33%, 41% and 61% above current royalty values for A/B-, C- and D-grade logs respectively.

All their analyses and results indicate the pre-eminent value of domestic water. The net present values of catchment outputs for the base case in the second study comprise timber production ($51M) and water supply augmentation costs of $1337M.

Economic analyses in both studies suggested that output would be increased with virtually all the harvesting options considered, compared with the *status quo*. Table 5 lists the more economically favourable options, in order, for the first and second studies respectively, expressed as net present values. The net present value is the value today, net of costs, of the stream of income from water and timber,

Table 5

NET PRESENT VALUE OF TIMBER-HARVESTING OPTIONS IN THOMSON CATCHMENT COMPARED WITH THE *STATUS QUO*

5(i) Results of first study (1992)	($ Million)
* Big strip (35-m corridors harvested, with long rotation)	169
* No logging	147
* 200-yr rotation with uniform thinning	113
* 200-yr rotation	102
* 120-yr rotation	45
* 80-yr rotation with uniform thinning	19
* 40-yr rotation	4
* *Status quo* - 80-yr rotation	0

5(ii) Results of second study (1994) - economic analysis 5% discount rate, 'observed' water consumption growth (base case)	($ Million)
* Strip-thin at 50 yrs (50% of total area by 35-m wide strips); fell remainder on 200-yr rotation)	54
* Strip-thin (as above) at 50 yrs; fell remainder on 120-yr rotation	47
* Strip-thin (as above) at 50 yrs; fell remainder on 80-yr rotation	43
* Strip-thin (as above) at 20 yrs (50% by 20-m strips); fell remainder on 50-yr rotation	34
* Thin below at 10 yrs; fell remainder on 50-yr rotation	28
* Strip-thin at 10 yrs (cut 5 m, leave 15 m) and again at 20 yrs (cut alternate strips); fell remainder on 80-yr rotation	25
* No logging	17
* Strip-thin at 20 yrs and 60 yrs (as for 10- and 20-yr strip-thin above); fell remainder on 120-yr rotation	16
* Clearfell on 120-yr rotation	4
* Clearfell on 200-yr rotation	1
* *Status quo* - 80-yr rotation	0
* Clearfell on 20-yr rotation	-519

5(iii) Results of second study (1994) - financial analysis 8% discount rate, 'observed' water consumption growth	($ Million)
* Strip-thin at 50 yrs; fell remainder on 200-yr rotation	81
* Clearfell on 200-yr rotation	77
* No logging	44
* Strip-thin at 10 and 20 yrs; fell remainder on 80-yr rotation	16
* Strip-thin at 50 yrs; fell remainder on 120-yr rotation	15
* Strip-thin at 20 yrs; fell remainder on 50-yr rotation	15
* *Status quo* - 80-yr rotation	0
* Clearfell on 120-yr rotation	-5
* Strip-thin at 50 yrs; fell remainder on 80-yr rotation	-12
* Strip-thin at 20 and 60 yrs; fell remainder on 120-yr rotation	-25
* Thin below at 10 yrs; fell remainder on 50-yr rotation	-83
* Clearfell on 20-yr rotation	-525

5(iv) Results of second study (1994) - regional job effects	(full-time job equivalents, 1992–2021)
* Clearfell on 20-yr rotation	639
* Strip-thin at 20 yrs; fell remainder on 50-yr rotation	287
* Thin below at 10 yrs; fell remainder on 50-yr rotation	272
* Strip-thin at 50 yrs; fell remainder on 80-yr rotation	238
* Strip-thin at 50 yrs; fell remainder on 120-yr rotation	134
* Strip-thin at 50 yrs; fell remainder on 200-yr rotation	50
* Strip-thin at 10 and 20 yrs; fell remainder on 80-yr rotation	10
* *Status quo* - 80-yr rotation	0
* Strip-thin at 20 and 60 yrs; fell remainder on 120-yr rotation	-146
* Clearfell on 120-yr rotation	-151
* Clearfell on 200-yr rotation	-272
* No logging	-478

for all future years. It is calculated by estimating the income (in 1992 or 1993 dollars) for each future year, discounting future income back to the present, and totalling for all years.

For a standing forest, the first study found that economic output would apparently increase the most either through increasing rotation length together with use of strip or uniform thinning, or through ceasing logging. There was insufficient evidence to determine categorically which of those changes would yield the greatest net social benefit. The second study found that, in the 'base case', various strip-thinning options combined with long or short rotations were the most economically favourable. In particular, strip thinning at age 50 and felling the remainder on a 200-year rotation was the most favourable under the economic analysis 'base case' assumptions, and under various sensitivity analyses. It was also most favourable under the financial analysis.

Financial analysis differs from economic analysis in that it better reflects the actual cash movements experienced by the agencies involved. The financial analysis used a discount rate of 8%, higher augmentation costs and royalty value only for timber price. Its results show that 200-year rotations with or without strip thinning are the most favourable options, followed by no logging. Several options are less favourable than the *status quo* under the financial analysis.

Regional effects of the various options were quantified in the second study by employment changes from the *status quo* as listed in Table 5(iv). 'No logging' would result in 478 jobs lost over the next three decades. Long rotations - 120 and 200 years - would also lead to losses, respectively 151 and 272 jobs. However, all thinning options (but one), and the 20-year rotation option, would result in job increases, some substantial. The best option under the economic and financial analyses - strip-thin at 50 years, with 200-year rotation - would lead to a modest increase of 50 jobs over 30 years.

Sensitivity of results

In the first study, the levels of net present values varied substantially if a higher or lower water price was used, and varied to a lesser extent with the timber price. The consultants made the point that changing the price level has very little effect on the relative order of the options. They estimated that water price would have to be less than one-third of their estimate - $530 per ML - before the *status quo* (80-year logging rotation) became more economically favourable than the best option (big strip corridor harvesting).

The consultants comment that, in the second study, uncertainty remains about many issues that are central to the economic analysis. The wood and water valuations were found to be sensitive to a number of factors, in particular:

* discount rate
* rate of growth in water consumption
* whether or not water yield from the mixed-species forest in the Thomson varies with tree age, as is the case for ash type forests
* whether or not full treatment of Thomson water would be necessitated by a 20-year or other short rotations
* level of augmentation costs

Other factors, including the effect of changes to timber values and confidence ranges for hydrological relationships and timber yields, did not influence the conclusions.

Results of the sensitivity analyses reinforce strip thinning at 50 years with 200-year rotation as apparently the most favourable option. It was ranked first in 14 of the 22 analyses, under a range of conditions - low and high discount rates, low and high timber prices, lower water-sale price, with or without Kuczera-behaviour of mixed species and for all parameter changes in Kuczera's equation. Second-most favourable was the no logging option, which ranked first in five analyses - when water supply augmentation costs were doubled, and when low interest rates were combined with another factor favourable to water over timber. Another option, with strip thinning at 50 years, and 120-year rotation, was third-most favourable, with no first rankings but 13 second rankings, normally where the most favourable option (above) was ranked first.

Research needs

The consultants identified the following further research needs:

* whether or not water yield from the mixed-species forest in the Thomson varies with tree age
* whether or not full treatment of Thomson water would be necessitated by short rotations

* level of costs for future augmentation to water supply capacity
* the likely incidence of bushfires and their impacts on the results of this type of economic analysis

They also comment that if strip thinning were to be implemented, as it has never been practised on a large scale, careful monitoring would be warranted during the early years.

The Council's response to the report follows.

Taking into account information and views in submissions following the proposed recommendations, Council evaluated the Thomson catchment for its land system representation, vegetation and fauna in relation to those in existing and recommended new parks and nature conservation reserves. However, as it would not contribute significantly to overcoming deficiencies in those reserves, Council considered it should not be recommended as a park or conservation reserve.

Both consultants' reports are primarily directed to CNR and Melbourne Water. Ultimately, it is a matter for the Minister for Natural Resources, and the government, to decide the central issue: whether there should be a change from the *status quo*.

The Council recognises there was some criticism of the methodology used in the first study; however, this was addressed in the second study. Assumptions and judgements are always made in such economic studies. Nevertheless the Council is satisfied that the methodology used was sound, the analyses were comprehensive and the assumptions were reasonable, within the limits explained in the reports.

Several options, such as the various strip thinnings and uniform thinning at age 10, may have important environmental implications. These include changes to forest structure, possibly affecting fauna habitat and floristics, increased edge effects and impact on scenic landscape value and on recreational amenity. Such implications were not addressed in the second study so their effects have not been quantified.

All the rotation options considered assume that no major bushfires will occur in the catchment. Such outbreaks kill ash eucalypt species and regenerate a dense crop of seedling trees, initiating the whole water-flow reduction process once more. While fire protection and fire-fighting are now much more effective than in 1939, the risk of fire remains. For example, in 1982/83 some 14 600 ha of Melbourne Water's catchments were burnt.

The 120- and 200-year rotations, with their reduced logging yield, must be considered in the light of the existing commitments of sawlogs to the timber industry from this area. This also applies to the no-logging option, except that it would have a greater impact on timber resource availability than the extended rotations. The employment estimates show these three options would have substantial impacts on regional jobs.

The question of future timber harvesting in the Thomson catchment also raises broader issues - for example, the impact of softwood substitutes on hardwood production, and the funding of new plantations. The issue of plantation timber substitution is further discussed in Chapter E.

Council believes that, given the sensitivity of the analyses to a number of factors and the absence of assessment of the environmental implications of strip thinning, the findings of the report do not provide a clear basis for immediate change to management within the catchment. It also considers that further work should be undertaken to validate the outcomes and technical applicability of each option, taking into consideration the current timber-supply commitments, with a view to any change in management being implemented in the next supply period, commencing in 2002.

WATER QUALITY

It is possible to improve the quality of water by partial or complete treatment - at a cost. Complete treatment involves sedimentation, filtration and disinfection, commonly by chlorination. Partial treatment is usually disinfection only. However, the higher the original quality of the water, the cheaper and more efficient the treatment becomes and, in most cases, the more acceptable the end-product.

In many catchments it is already difficult to maintain existing water quality. This problem is likely to become greater as pressures to allow various forms of land development and use of natural resources increase. Even with properly planned and controlled land use in catchments, most water supply authorities consider it necessary to at least disinfect water supplied from their storages. All Melbourne

metropolitan systems have the facility to chlorinate water and, elsewhere in Victoria, 81% of the population receive water from supplies that have disinfection facilities. Of the 32 non-Melbourne Water systems in, or taking water from, the study area, 26 employ such treatment.

Domestic water quality is an important public health issue. A working group on rural drinking-water quality, set up in October 1993 as part of the government's water sector restructuring, recently found that only 32% of rural Victorians receive water of acceptable bacteriological quality. Data from an earlier report 'Drinking Water Quality - Victoria 1984—1989' (DCE, 1992) indicate that, over that period, 22% of the non-metropolitan population received water supplies that comply with (modified) World Health Organisation bacteriological standards. The 10% improvement resulted from $80 million expenditure on water-quality improvements, such as installation of disinfection equipment, over the last 5 years. For metropolitan supplies, derived largely from protected catchments, the less rigorous National Health and Medical Research Council (NHMRC) criteria were applied, and virtually all supplies sampled met these criteria, except for the Healesville and Upper Yarra zones.

In relation to other quality criteria, Appendix IV (from the same report) summarises physical and chemical quality. The results show that a significant proportion of the non-metropolitan population was supplied with water that did not meet the World Health Organisation's guidelines for aluminium, iron, colour and trihalomethane levels.

Algal blooms have recently become more frequent in domestic water supply storages. These can have nuisance value, adding taste, odour or colour to water supplies, or can interfere with filtering or other treatment. However, some algal species produce nerve or liver toxins and are of major public health concern. Algal blooms are generally associated with elevated levels of nutrients, particularly phosphorus and nitrogen, sourced either directly from the catchment or from mobilisation of nutrients stored in reservoir-bottom sediments.

The report 'Integrated Catchment and Reservoir Management Study: Candowie and Lance Creek Reservoirs' (CNR 1992) discussed these two reservoirs (D53 and D55 in the following recommendations), which have small catchments that are cleared and farmed, and which have suffered a succession of major and minor algal blooms over the last 11 years. The study involved farmer land-owners in the catchments from the outset, and identified practical measures to reduce nutrient inputs from the catchments. In dealing with these problems, it addressed the questions of land-use responsibilities and the contribution of funds by the water authority.

Other water-borne organisms of increasing public health concern include the disease-causing protozoans *Giardia lamblia* and *Cryptosporidium* species.

These are difficult to treat, and *Giardia* is believed to pose a potential threat to Victorian health and water supplies over the present decade. *Cryptosporidium* was the subject of a notice issued in 1992 by the Department of Health and Community Services to residents in some rural areas advising them to boil drinking water. This was not in response to an outbreak of *Cryptosporidium*-linked disease, but was a caution for people with depressed immune systems in response to the finding of the organism as a result of using new monitoring methods.

Sources of poor water quality

The failure of some supplies to meet bacterial water quality standards generally reflects a catchment problem. Organic matter, usually from the catchment, must be present, while the actual bacterial contamination can come from land uses, human activities or fauna in the catchment, or from birds fouling water stored in reservoirs or open service basins.

With respect to the physical and chemical criteria, colour, turbidity, aluminium and most other ions are derived from the catchment. High copper and iron levels are often derived from the reticulation pipes. Trihalomethanes are formed in the reticulated supply when high levels of chlorine used for disinfection react with organic compounds, especially those that colour water. For bacteria and other parameters of health significance, the designated standard is a guideline indicating the potential for health effects.

Water quality trends

Another report - the State of the Environment Report on Agriculture, 1992 - contains summaries of trends in water quality in rivers and streams generally, rather than just water supply catchments. As an example, that report

refers to results from five sampling sites along the Yarra River upstream from the Yering Gorge offtake to Sugarloaf Reservoir - that is, within a catchment supplying domestic water. For each parameter, it rates the condition as excellent, good, moderate, poor or degraded, and also lists the trend over 10 years (or more) - whether improving, stable or deteriorating.

For suspended solids, three sampling sites had poor-quality water with a stable trend and one site had degraded, stable quality. Turbidity values - two sites with excellent quality, two poor - were stable or deteriorating (one at each level). Total nitrogen levels were poor and stable for four sites, and poor but improving at one site. Total phosphorus level was poor and stable at Yering Gorge, while four upstream values were moderate - two improving, one stable and one deteriorating. In total, while some sites have good or improving quality, there is not an evident trend towards improvement over the 10-year period. Closer analysis of the data would allow better targeting of problem sources.

Council recognises that other water supply authorities will need to consider upgrading their treatment facilities in the future. In order to provide for this requirement, Council believes it is important for the government to continue to apply long-term policies to maintain water supply of a satisfactory quality.

In order to safeguard water quality and the quantity and timing of yield, management must be directed towards avoiding loss of infiltration capacity, damage to other hydrologic properties, soil erosion and contamination from chemical or biological sources.

Proper management of land uses within domestic water supply catchments is extremely important and recognition must be given to the need for high levels of protection. Values such as water yield, quality and flow regime must be of major concern when implementing recommendations for public land within such catchments. The Council recognises the need for appropriate guidelines specific to water supply catchments, and for research to provide additional information.

In the Yarra catchment in particular, the Yarracare program is a joint government—community project to prepare a plan that:

* sets out long-term goals for environmental quality, especially in relation to water quality
* establishes broad priorities for action to achieve those goals
* develops specific programs for government and community actions designed to protect the catchment

ADDITIONAL WATER NEEDS

Future water needs for domestic, stock and irrigation purposes may require the construction of additional water storages.

In particular, the Melbourne Water Resources Review Panel has reported on several options for the Melbourne supply system. This Panel was established to review the management of Melbourne's water to the year 2020, including a strategic study of supply options for the future.

Its report makes several references of relevance to Melbourne Area, District 2, including: possible strip thinning in catchments; proposals to harvest additional water from Cement Creek and Lower Yarra (Yering Gorge); construction of a reservoir on Watsons Creek to store additional Yarra River water; and investigation of new diversions from the Acheron River, the Big River (above Lake Eildon) and the Black and Upper Goulburn Rivers.

Strip thinning would be inappropriate in the Melbourne Water catchments recommended for inclusion in the Ash Ranges and Kinglake National Parks. The Council's response to proposals for new diversions or storages within the recommended Ash Ranges National Park - including Cement Creek and Acheron River - has been discussed in Chapter A.

Following the Council's final recommendations in 1991 arising from the Rivers and Streams Special Investigation, the Yarra River (from Warburton to Warrandyte) is a Heritage River under the *Heritage Rivers Act* 1992 (see Chapter G).

Under the provisions of that Act, new (including increased) diversions, such as those associated with an off-stream storage at Watsons Creek, would only be permitted if their volumes, timing and offtake did not significantly impair Yarra River fish habitat canoeing quality or scenic landscape values.

The Big River is also a Heritage River. The Act provides that any new diversion of water from the Big River would only be permitted if its volume and timing and the design of the offtake structure did not significantly impair

in-stream habitat conditions or the passage of in-stream fauna or reduce scenic landscape value. The Council's recommendations explain that this is considered feasible.

The Black River meets the upper Goulburn River within a recommended 'river zone' (see Chapter E). The primary aim of management in river zones is to protect natural and scenic values. Provided measures were taken to protect any natural values at the site, and to minimise the scenic impact, this recommendation would not prevent construction of a storage and/or diversion works there.

In planning for new water proposals, the possible results of storages and their water releases on ecosystems, in particular the effects on estuaries and on fish and wildlife habitat downstream - including impact on free passage of migratory fish species - should be determined and taken into account in environmental effects statements or other planning stages. A related matter is the allocation of environmental flows down the Thomson River, which is also a Heritage River in the reach between the Thomson Dam and Cowwarr.

The Council recognises that further augmentation of water supplies in the study area will be necessary, but cannot make specific provision for those developments until definite proposals are made. In most cases an environment effects statement is required as part of the planning of any new major storage.

Areas used for water or sewerage pipes, channels etc. and tanks, towers etc. in the reticulation system, and other such areas are covered by Recommendations M16 and M17.

WATER PRODUCTION

Recommendations

D1—D13 That, in the case of the locations listed below and shown on Map A (all these locations being within catchments that have been proclaimed and for which land-use determinations have been made), the following areas:

(a) the storage areas

(b) diversion works

(c) associated facilities

(d) the buffer zones around diversion works and storages, as defined in the land-use determination

(e) any other allotments as considered necessary

be used for:

(i) water supply purposes

(ii) other activities permitted by the water supply authority after consultation with the Department of Conservation and Natural Resources and the Environment Protection Authority

and that, unless otherwise securely reserved, these areas be permanently reserved under section 4 of the *Crown Land (Reserves) Act* 1978 for water supply purposes, and be managed by the water supply authority named.

Notes:

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

(continued)

D1—D13 Recommendations (continued)

2. In some instances it may not be practicable for the water supply authority to manage all or part of the buffer zone. In such cases agreement should be reached between the appropriate land management authority and the water supply authority. The agreement may include leaving the management of the buffer zone with the adjacent land management authority on the basis that it would be managed with the prime object of protecting the water quality.

D1 Hazel and Harpers Creeks offtakes, Mid-Goulburn Regional Water Board

D2 Eildon Reservoir, Rural Water Corporation

D2 Note: The threatened species leafy greenhood (*Pterostylis cucullata*), located within the 200-m buffer, should be protected.

D3 Delatite River diversion, Mansfield and District Water Board

D4 McCrae Creek offtake, Melbourne Water

D5 Bunyip River offtake, Melbourne Water

D6 Upper Tarago diversion (Peterson Weir) Tarago Water Board

D7 Tarago Reservoir, Melbourne Water

D8 Thomson (stages 1 and 2 diversions), Melbourne Water

D9 Thomson Reservoir, Melbourne Water (see box opposite)

D10 Trigger Creek diversion, Latrobe Region Water Authority

D11 Tanjil River, Latrobe Region Water Authority

Thomson Catchment

Given the sensitivity of the Thomson catchment 'wood *v.* water' analyses to several factors, and the absence of assessment of the environmental implications of strip thinning, the findings of the economic study reports do not provide a clear basis for immediate change to management within the catchment. Further work should take into consideration the current timber supply commitments, with any change in management being implemented in the next supply period, commencing in 2002.

Recommendation

D9(iii) That in relation to the Thomson catchment wood *v.* water studies, further work be undertaken to validate the outcomes and technical applicability of each timber harvesting option.

D12 Blue Rock Reservoir

D12 Note: This storage was constructed by the Rural Water Corporation; however, it is now managed by Gippsland Water.

D13 Moondarra Reservoir, Latrobe Region Water Authority

Recommendations

D14—D55 That, in the case of the locations listed below and shown on Map A (all these locations being within catchments for which no land-use determinations have been made), the present tenure and management of public land continue for the time being

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

(a) the storage areas

(continued)

D14—D55 Recommendations (continued)

(b) diversion works

(c) associated facilities

(d) the buffer zones around diversion works and storages, as defined in the land-use determination

(e) any other allotments considered necessary

be used for:

(i) water supply purposes

(ii) other activities permitted by the water supply authority after consultation with the Department of Conservation and Natural Resources and the Environment Protection Authority

and that, unless otherwise securely reserved, these areas be permanently reserved under section 4 of the *Crown Land (Reserves) Act* 1978 for water supply purposes, and be managed by the water supply authority named.

Notes:
1. The buffer should be wide enough to prevent direct pollution, to filter overland flow of water and to control access. Its width will vary to suit differences in ground slope, soil type, vegetative cover, adjoining land use and type of facilities available for treating the water.
2. The primary object of management of the buffer zone must be to protect water quality. Subject to this principle, the water supply authority may permit other secondary uses on the buffer. In such cases, the principles of management must be agreed upon by that authority and any other authorities concerned.

D14 Sunday Creek Reservoir, Mid-Goulburn Regional Water Board

D15 Hellhole diversion, Melbourne Water

D16 Mud Creek diversion, Melbourne Water

D17 Stony Creek diversion, Melbourne Water

D18 Silver Creek diversion, Melbourne Water

D19 Wallaby Creek diversion, Melbourne Water

D20 Yea River diversion, Yea Water Board

D21 Goulburn River diversion, Shire of Alexandra

D22 Rubicon River diversion, Shire of Alexandra (see box opposite)

D23 Steavenson River diversion (Buxton), Shire of Alexandra

D24 Beauty Spot Reservoir, Mid-Goulburn Regional Water Board

D25 Steavenson River diversion (Marysville), Mid-Goulburn Regional Water Board

D26 Brewery Creek diversion, Mansfield and District Water Board

D27 Lower Yarra - Yering Gorge, Melbourne Water

D28 Donnellys Creek diversion, Melbourne Water

D29 Sawpit Creek diversion, Melbourne Water

Rubicon Catchment

Recommendation

D22(iii) That management of the Rubicon catchment be such that the quality and quantity of water produced meets the requirements of Generation Victoria and downstream users.

D30 Maroondah Reservoir, Melbourne Water

D31 Grace Burn diversion, Melbourne Water

D32 Coranderrk Creek diversion, Melbourne Water

D33 Dee River, Melbourne Water

D34 Walker Creek, Melbourne Water

D35 Cement Creek diversion, Melbourne Water

D36 O'Shannassy Reservoir, Melbourne Water

D37 Armstrong (West) diversion, Melbourne Water

D38 Armstrong (East) diversion, Melbourne Water

D39 Starvation Creek diversion, Melbourne Water

D40 McMahons Creek diversion, Melbourne Water

D41 Upper Yarra Reservoir, Melbourne Water

D42 Tomahawk Creek, Melbourne Water

D43 Deep Creek diversion, Tarago Water Board

D44 Loch River diversion, Tarago Water Board

D45 Labertouche Creek offtake, Tarago Water Board

D46 Rollo Creek Reservoir, Latrobe Region Water Authority

D47 Narracan Creek diversion, Latrobe Region Water Authority

D48 Little Narracan Creek diversion, Latrobe Region Water Authority

D49 Yallourn storage, Generation Victoria

D50 Little Bass River Reservoir, Korumburra Water Board

D51 Bellview and Ness Creeks storages, Korumburra Water Board

D52 Ruby Creek Reservoir, Leongatha Water Board

D53 Tennent Creek (Candowie Reservoir), Westernport Water Board

D54 Candowie Reservoir (North Arm), Westernport Water Board

D55 Lance Creek Reservoir, Wonthaggi - Inverloch Water Board

OFF-RIVER STORAGES

Recommendations

D56—D60 That the following off-river storages and their immediate catchments (except where other recommendations apply) be used for water supply purposes

that the special features specified below be protected

and that they remain under their existing tenure and control.

Notes:
1. No proclamation is necessary for these catchments.
2. Refer also to the recommendation for reservoir parks in Chapter J.

D56 Sugarloaf Reservoir, Melbourne Water

Filled with Yarra River water pumped from the Yering Gorge offtake (Recommendation D29), the reservoir has all its water outflows to the northern Melbourne suburbs fully treated at the adjoining Winneke Treatment Plant. Part of this area is included in the Warrandyte—Kinglake nature conservation link (see Recommendation C48).

D57 Silvan Reservoir, Melbourne Water

This reservoir and local catchment supply Melbourne's eastern - and, if required,

central and western - suburbs. Water is diverted here from the O'Shannassy and Upper Yarra Reservoirs. The water is effectively untreated and the catchment, closed to public access, retains representative examples of damp forest, foothill forest and heathy woodland communities. The catchment abuts the Dandenongs National Park. The area's nature conservation values should be protected, and the area managed in consultation with the managers of the adjoining park.

D58 Cardinia Reservoir, Melbourne Water

The Cardinia Reservoir was constructed in response to the 'Public Works Inquiry into Melbourne's Future Water Supply', being completed in 1973. Together with its immediate catchment it covers 2800 ha. It is essentially an off-river storage linked to the Upper Yarra Reservoir and other sources via the Silvan Reservoir.

The catchment contains: important and representative examples of damp forest, foothill forest and heathy woodland communities; an occurrence of mealy stringybark (*Eucalyptus cephalocarpa*), a species whose distribution is much reduced; and an unconfirmed record of a threatened subspecies of the purple eyebright. It also has a diverse assemblage of birds, including a record of the white-bellied sea-eagle and a number of regionally uncommon species. It is of particular value as a closed area during the duck season, and has a large population of eastern grey kangaroos and one of long-nosed bandicoots. The botanical and faunal values of the reservoir's immediate catchment should be protected.

D59 Beaconsfield Reservoir, Melbourne Water

While it has some local catchment, the Beaconsfield Reservoir is filled mainly by water from the Tarago River system.

D60 Devil Bend Reservoir, Melbourne Water

The catchment includes relatively undisturbed areas of coastal grassy forest, swamp gum and associated wetland communities of both botanical and faunal significance. It is an important drought and duck-hunting refuge for water birds. The vulnerable grey-crowned babbler (parts of the last remaining population south of the Great Divide) and the rare blue-billed duck and Baillon's crake have been recorded. These should be protected.

HERITAGE RIVERS

Recommendation

D61 That, for the Yarra, Goulburn, Thomson, Big and Aberfeldy Heritage Rivers, any proposals for water supply augmentation be in accordance with the provisions of the *Heritage Rivers Act* 1992 and with the other recommendations approved by government following publication of the final recommendation for the Rivers and Streams Special Investigation in June 1991.

E. TIMBER PRODUCTION AND STATE FOREST

PRODUCTION OF SAWN TIMBER

The national situation

There is a substantial international trade in forest products. Exports and imports are determined to a large extent by imbalances in supply and demand and by the nature, location and accessibility of the world's forest resources, both material and man-made. Australia has historically imported a significant proportion of its requirements for sawn timber and paper products and over recent decades, imports of predominantly softwood have accounted for about one-third of Australia's sawn timber supplies.

The lack of indigenous softwood and Australia's dependence on imports influenced plantation expansion programs in the late 1950s and early 1960s. Supplies of plantation softwood sawn timber are now increasing rapidly while the supply of mature hardwood is tending to decline in most States.

Over the last 2 years there has been a dramatic shift in the international market for sawn timber. Supply constraints affecting softwood from the USA and Canada and tropical hardwoods from South East Asia, coupled with strong international demand here, resulted in rising prices and an improvement in the competitiveness of Australian producers.

Increasing supplies of plantation-grown softwood, the recent dramatic changes in international markets and a probable weakening in domestic consumption of sawn timber as population growth declines, are combining to initiate a number of far-reaching changes in the Australian timber industry. These changes, which are already emerging, include:

* a decrease in the volume of sawn timber imports from North America and Asia
* increasing import substitution by both plantation softwood and native hardwood
* continued replacement of unseasoned hardwood by seasoned softwood in dwelling construction and other structural applications
* the re-focusing of hardwood from 'commodity' to 'niche' markets to take advantages of inherent properties, such as strength, hardness, appearance and natural durability, so that it complements rather than competes with softwood
* a recognition that opportunities exist for Australia to increase exports of both hardwood and softwood, particularly in high value-added products.

The shift from old-growth forests to increasing supplies from regrowth forests and plantations of both softwood and hardwood, domestically and overseas, can be expected to play increasingly important roles in changing the structure of the Australian industry. Currently, Australia has about 1 million ha of plantations, of which around 900 000 ha are softwood. These plantations form the basis for the development of a vertically and horizontally integrated forest products industry which produces sawn timber, panel products, pulp and paper.

Plantations offer advantages over native forests because of their high productivity, centralised resource with low transport costs to mill, more uniform quality of product and security of supply. Their main disadvantages are the capital costs of establishment, availability of suitable land, the time lag associated with financial returns on investment, high levels of maintenance and management and the risk of loss due to fire or other agents.

An indication of the extent to which softwoods could substitute technically for hardwoods can be found in South Australia, where, because the native forests have negligible timber-production value, softwoods meet 91% of the sawn timber market. This compares with the current average for Australia of about 60%. In its 'Forest and Timber Inquiry Final Report (Overview)' in 1992, the Resource Assessment Commission (RAC) noted that about 11.5 million cu.m of hardwood logs and 6 million cu.m of softwood logs are harvested each year from Australian forests and plantations. About half of the harvested wood is used as sawlogs and veneer logs; the remainder is used as pulpwood.

Domestic production of wood and wood products meets about two-thirds of the total Australian consumption. Table 6 indicates the turnover and trade balance for various sectors of the industry.

Australia exports about one-third of its annual forest harvest, mainly as hardwood woodchips. Nevertheless, the nation runs a significant balance of payments deficit in forest and timber products. In 1990/91, exports of forest and timber products amounted to $596 million and imports amounted to $1928 million, resulting in a trade deficit of $1332 million.

Table 6

AUSTRALIAN WOOD AND WOOD PRODUCTS INDUSTRY (1988/89) ($ million)

Sector	Turnover	Trade balance[1]
Sawmilling	1781	-500
Plywood and panels	811	-106
Woodchips	365	+367
Pulp and paper	2166	-1126

Note:
1. Negative sign indicates net imports; positive sign indicates net exports.

Source: Resource Assessment Commission (1992), 'Forest and Timber Inquiry Final Report Overview'.

The future of the Australian hardwood sawn timber industry therefore depends on supplying niche markets within the seasoned structural timber market where strength is required, in applications requiring durability and weather resistance (such as decking) and in expansion into markets requiring appearance-grade timbers for furniture, feature veneers, window frames, mouldings and a range of other value-added products. Also, the expansion of industry into overseas markets is a substantial further opportunity to ensure continued viability. The RAC further concluded that, with appropriate product development and marketing, Australian hardwoods would be eagerly sought by other countries because of their unique properties.

David Mayer of Simons Strategic Services Division in Vancouver, (British Columbia), in 1990, noted the following points.

> 'Upper grades of Australia's hardwoods offer the greatest potential for export to niche markets in the Pacific Rim. They are unique in appearance and offer excellent machining and utility properties. They can command higher potential for value adding than softwoods and hence justify any added burdens of marketing and transportation.
>
> Globally, hardwood sawmilling is undergoing significant changes, especially influenced by factors such as the dramatic dislocations in traditional supply regions, notably Thailand and Malaysia.
>
> Thailand has imposed total prohibition on hardwood log exports including very severe penalties on those caught logging illegally. Malaysia has achieved less dramatic conversion curtailment of its industry via export tariffs on lumber. Brazil is struggling to resolve the world concerns of the well publicised destruction of its forests on the one hand and the short term needs of cash crops for its people from cleared land. Over-reactions by the consuming public, notably in Europe has virtually placed all dark hardwoods - regardless of country of origin - on the endangered list.'

Constraints on supply have increased import prices for structural oregon timbers from the United States of America such that they are now more expensive than seasoned hardwood beams. This is providing opportunities for increased sales of large dimension hardwood beams. The prices for rainforest timbers (meranti) have also increased significantly.

Further, H.A. Simons Ltd *et al.* (1990) in the document 'Analysis of Market Prospects for Tasmanian Forest Industry Products', noted that:

> 'In the short term, a significant increase in demand for eucalypt could occur if consumers turn away from imported hardwoods that are not logged on a sustained basis.
>
> Generally, the supply of decorative wood of any kind, such as mahogany, lauan, oak and others is diminishing. Large markets for decorative hardwoods exist in Japan, the UK and in Europe. The scope of additional volume developed in Tasmania should not be difficult to sell in these very large markets. However, eucalypt is not well known outside of Europe. In order to establish a demand, some promotion may be necessary to outline the workability and the beauty of the wood. Also, continuity of supply must be assured if customers are to be interested in this product.
>
> The only competition for these boards will be other Australian eucalypt producers, but demand for select material is likely to exceed supply.'

The hardwood sawlog industry, however, faces serious impediments to improved export performance, among them the costs and complexities of international marketing and the dominance of the industry by small to medium-sized producers and the need to achieve strict controls over quality and consistency of supply. Further, technological improvement and investment are required for hardwood drying and processing facilities. Transport costs, however, are less significant in marketing kiln dried products; it costs about the same to transport timber to Sydney and Brisbane by road as the shipping costs to Asia.

On the basis of information provided to this Council, it would appear that both conservation and industry groups recognise the scenario outlined above. The difference seems to lie in the predicted outcomes of the structural change that is taking place. On the one hand, conservation groups argue that the hardwood sawlog industry based on native forests will virtually disappear over the next 10 years or so and be replaced by softwood and hardwood plantations. The industry maintains that it is responding to the change by moving into value-added products utilising kiln-dried hardwood (both ash and mixed-species eucalypts) and that it is developing new markets (both domestic and overseas) for a wide range of products based on timber from native forests.

The Victorian situation

A report by the former Department of Conservation and Environment (DCE), entitled 'Sawlog Value Adding Survey of East Gippsland Timbers: Market Opportunities for Victorian Hardwood Timber', examined market opportunities for high-value products and the changes needed to realise those opportunities.

The report noted that considerable potential exists for value-added products from Victorian hardwood timbers, mainly within the many small niche markets, and involves competing with imported timbers and non-timber products, particularly metals. The best opportunities occur where Victorian hardwoods have a comparative advantage over pine, imported hardwoods and non-timber products. Their properties of strength, durability and hardness, for instance, in appropriate applications, cannot be matched by pine. The development of technical expertise within the industry and broad economic and environmental benefits may also flow from the use of local hardwoods rather than imported rainforest timbers and metals.

The report also notes that a change in industry's mode of operation will enhance other opportunities. A customer-oriented approach with greater emphasis on marketing, product development and the assurance of quality will also improve marketing effort. Other non-market related factors that influence the potential for value-adding use of Victorian hardwood are also discussed in the report.

In his 1992 paper 'Future Prospects of the Victorian Hardwood Industry', N. Huon of the Victorian Association of Forest Industries (VAFI) noted the divergence of opinion about the future prospects for Victorian hardwood. At one end of the spectrum, a number of conservation groups are suggesting that domestic and overseas softwood will supply virtually all structural markets at the expense of hardwood timbers. These groups consider that the shift to plantation timbers will mean that only small volumes of specialty hardwoods will be marketable within the next 10—15 years. On the assumption that the hardwood industry is in decline and will only be small in the future, they advocate a phasing out of all timber harvesting from native forests over the next 5—10 years.

At the other end of the spectrum are those who believe that hardwood will maintain traditional (house framing and sub-floor) markets as long as producers continue to do what they have done for the past 100 years - except that they may do it a little better. Such a view disregards the significant reduction in hardwood's share of the framing market over the past few years due, in part, to the fluctuating housing market, which hardwood processors are unable to expand into during boom periods because of constraints on the availability of resources.

These views represent the opposite extremes of a very complex issue. However, the Association recognises that two clear facts emerge.

First, Victoria has a well-developed softwood plantation estate on about 212 000 ha of public and private land. As a result, the availability of softwood timbers is increasing dramatically such that, by 2010, the volume available from both public and private plantations will almost treble the current level. This trend has been apparent for the last 20 years. It has therefore been clear that the hardwood sawmilling

industry would face fundamental change during the late 1980s and '90s. These changes are now occurring as softwoods compete successfully in traditional hardwood markets. While hardwood will maintain an advantage in specific sectors of the framing market, it is unlikely that traditional markets will absorb all the available volume and hence, new markets will need to be developed.

Second, the hardwood sawmilling industry is now responding to this challenge, although it is fair to say that the response has been uneven. There are, however, reasons for this.

* Until recently, the demand for unseasoned hardwood has been strong so the industry has had little incentive to change.
* Production for traditional structural markets is a relatively simple operation and can be achieved with modest capital expenditure. Logs can be harvested from the forest and delivered as green sawn timber to a housing site within a matter of days.
* The investment required to exploit further value-added opportunities, in terms of both capital equipment and working capital, is substantial and somewhat daunting for small businesses in the face of a threat that, until recently, has seemed remote.
* The timber industry is very fragmented and fairly conservative. In addition, funding for training and research and development activities has been inadequate for comprehensive product and market development projects.
* Lack of resource security.
* The price of imported hardwoods used for value-added applications, such as meranti, were relatively low.

Under the Chairmanship of Professor David Stokes of Deakin University, the Victorian Wood Products Working Party produced a report in 1993: 'The Wood Products Industry in Victoria - Strategic Directions and Opportunities'.

Many of the issues raised during the development of that report are discussed in this chapter.

The report noted that processing the existing plantations and on-going plantation establishment would place the community in a better position to make future decisions of an economic and environmental nature. It recognised that there will continue to be some issues, particularly related to native forests, where disagreement will continue and governments will need to make political judgements.

The Working Party recognised the need for ongoing plantation and agroforestry establishment for a new eucalypt sawlog resource base but pointed out that such sawlogs would not become available for many decades because of the small area currently established and the long rotations required.

There is no doubt that the Victorian industry is responding to the changes that are taking place at both domestic and international levels. More than $60 million additional investment and product development in value-adding occurred between 1987 and 1994, in response to the increased security of supply resulting from the introduction of 15-year sawlog licences in 1987 and other initiatives undertaken under the Timber Industry Strategy (discussed later). These investments are being driven by a combination of policy direction and market pressure and, as in other industries, most producers are now following the early innovators. As a consequence, more than 25% of hardwood timber is now being processed beyond the green stage, compared with 5% in 1987. Further, although the production of hardwood sawlogs declined through the late 1980s, because of the move to establishing sustainable yields on a regional basis and of the recession, output is now increasing.

Investments include mill rationalisation, new milling and machining equipment, air-drying of sawn stock, kilns, pre-driers and reconditioners. Between 1990 and mid-1994, at least 20 Victorian companies built new hardwood kilns; 60 have been built or are underway since 1987. Much of this investment has occurred at a time when many industries are contracting in response to reduced tariff protection, the worst housing downturn in Victoria in 30 years and the worst recession in 60 years.

Replacement of imported timbers, and in particular tropical rainforest timbers, provides a very large potential market for local hardwood timbers.

In the light the hardwood timber industry's of increasing investment in equipment to add value to green timber, VAFI requested Forestry Technical Services Pty Ltd (FORTECH) in late 1993 to investigate the export and import replacement potential of 12

Victorian hardwood companies that had expressed interest in such developments. The report from FORTECH noted that the international prices of both softwood and hardwood timbers have increased significantly as a result of reductions in supply, that recent changes in the international exchange rates have brought returns from the export markets for timber closer to those from the domestic market and that movements of prices in Australia have created new import-substitution opportunities. It identified a number of potential overseas markets for timber. It also noted that 50% of the timber produced by the 12 mills was dried, and that this would rise to 60% in 1994.

The report by DCE concerning value-adding mentioned above, indicated that Victorian consumption of high-value-added timber exceeded 300 000 cu.m per year, and that local timbers provide only approximately one-third of this.

In late 1993, Victorian hardwood timber producers formed an export network to develop export marketing skills within the hardwood sector and to identify key export markets for its value-added products. The network, called 'Australwood' has already visited several overseas markets and the industry has committed $200 000 to fund the export initiative.

Victoria's current supply of quality hardwoods comes almost entirely from south-east Asian rainforest timbers and Tasmanian and Victorian ash forests. The pressure on future supplies of rainforest timbers from overseas is well documented and the production of timbers from Queensland rainforests has diminished. The Tasmanian ash timber resource has been reduced in recent years through Commonwealth and State government withdrawal of areas previously available for timber production.

Context of the Central Highlands

The VAFI considers that the ash eucalypt forests (mountain ash, alpine ash and shining gum) of the Central Highlands are of national significance to the timber industry and provide the most significant resource for the Victorian sector of the industry. Further, these forests are considered to offer most of the advantages usually attributed to plantations - high productivity, a centralised location close to the major market and high quality. Indeed, native forests exceed hardwood plantations in sawn-timber quality.

Moreover, VAFI considers that the ash timbers are well placed to capitalise on market opportunities that would lead to significant import replacement and export markets.

The ash eucalypt species provide the largest quantity of quality domestic hardwood in Victoria with a proven performance in high-quality 'value-added' product lines such as mouldings, linings, furniture, doors, flooring, parquetry, panelling and seasoned structural beams. They produce timber of a light golden colour when finished, with a straight regular grain. The wood's response to stains and lacquers means that virtually any desired finish can be achieved without losing its distinctive appeal. Its ease of working by hand or machine, good bending properties, strength and stability make it an excellent wood for cabinet work, joinery and many other applications, and it is resistant to wear.

A recent survey revealed that ash eucalypt timbers from Victoria and Tasmania are the most common individual species used by furniture manufacturers in the eastern mainland States and are second only to blackwood in Tasmania. In 1989 the Timber Industry Council estimated the wholesale value of timber products from the Central Highlands at $100 million a year. Further processing into doors, furniture and other products would increase this value by several times at the point of consumption. The fall in supplies of hardwood timbers from interstate and overseas has opened opportunities for Victorian timbers to replace them in niche markets.

Value-adding of sawn timber

As the VAFI notes, ash has been the traditional species group in Victoria's 'further processing' activities. While drying the ash eucalypt timbers, particularly regrowth, requires special expertise and care, it has proved less difficult than dealing with the denser mixed eucalypts of the mountain and foothill forests; thus the current value-adding is centred on ash products. New technologies are being developed, however, and other species are increasingly being processed beyond the unseasoned stage - for example, messmate at the Black Forest Sawmill and yellow stringybark by W.H. Micah and Sons at Erica.

The report by FORTECH mentioned above noted that of the 12 mills investigated, most drew their resources from the Central Highlands. These latter mills were drying

60% of their output in 1992/93 and this was geared to rise to 70% in 1993/94. Three of the larger mills here dry 100% of their output.

About 50% of the dried timber produced by the Central Highlands mills is sold outside Victoria, mainly to Queensland.

The Victorian Timber Industry Strategy sets directions for the development of an economically and ecologically sustainable timber industry. The value-adding drive is the centrepiece of the Strategy, the success of which thus depends heavily on continued access to the Central Highland ash eucalypt resource, which will be Victoria's major future supply of ash timbers.

Value generated by the ash resource

In 1992 Australian Paper Manufacturers Ltd (APM), now Australian Paper, produced the following estimates of the cumulative value of ash timber at various stages, per hectare of the forests currently being harvested within the study area.

*	standing tree - royalty	$ 10 465/ha
*	delivered to mills	$ 29 210/ha
*	ex-mill door	$236 200/ha

Ex-mill-door products are the raw material inputs for further manufacturing into products such as buildings, joinery, furniture, writing papers, stationery, printed material, cardboard and containers. One estimate valued these products at the point of consumption as more than the equivalent of $500 000 per ha.

On the assumption that a market exists for the products, and using the ex-mill door value of $236 200 per ha, Australian Paper estimated that the 181 000 ha of ash eucalypt forests in the study area could generate products worth $43 billion over one forest rotation of 80 years. It further suggested that the mixed eucalypt species forests (covering more than 2.5 times the area of ash) would possibly generate an equivalent value, giving a total of some $80 billion. These figures, however, are based on the total area of ash forest on public land - regardless of tenure, productivity or prescription.

The volumes in currently standing trees, ignoring future growth on the 'net productive area' (see later discussion) would have a current value of product, ex-mill-door, of approximately $4.87 billion.

PULP AND PAPER PRODUCTION

The national situation

During the late 1990s, the domestic pulp and paper industry will have access to a substantial pulpwood resource from Australian hardwood and softwood plantations. This will provide the basis for the industry to grow to meet increasing domestic demand, import replacement and export.

The volume of pulpwood from Australia's native forests that is being exported as woodchips reached a peak in the 1980s and has since declined as a result of the weakness of the Japanese economy and a world over-supply of wood pulp. Alternative sources of woodchips, particularly from the southern states of the USA, have gained market share while eucalypt plantations in South America are coming on stream. Japan has sought to reduce its dependence on Australia and to diversify its sources of supply following proposals in the late 1980s to establish new pulp mills in Australia. As a result, Australia's market share declined from 63% to 43% between 1987 and 1989.

As noted in the Resource Assessment Commission inquiry, national economic gains would accrue if woodchips could be profitably redirected to pulpmills within Australia. However, any new greenfield pulpmill would need to meet strict environmental requirements and be internationally competitive, as a substantial proportion of its output would need to be exported. Such a development seems unlikely in the foreseeable future. To discontinue exports of woodchips for any other reason, particularly at short notice, would seriously disrupt industry and impose severe economic losses on both the industry and local communities. Further, a ban on all exports of woodchips would jeopardise the plantation program by eliminating a primary market for thinnings and pulp-logs.

The National Forest Policy Statement in December 1992 included the following comments.

> 'The issue of efficient use and value-added processing is particularly relevant to the large volumes of pulpwood that are produced during integrated harvesting options in native and plantation forests. At present the Commonwealth government approves the export of unprocessed wood and woodchips from integrated harvesting

operations and sawmill residues, subject to controls aimed at ensuring that environmental values are protected, that the price obtained is consistent with prevailing world market prices, and that unprocessed wood is not exported if it is commercially feasible to process and add value to it in Australia. The export of woodchips derived from integrated (sawlog and pulplog) harvesting operations and sawmill residues enables the community to derive a return from felled wood that is unsuitable as sawlogs and is not required by domestic processors.

* The Commonwealth will remove controls over the export of unprocessed public and private plantation wood, subject to the application of codes of practice to protect environmental values.
* Approvals for the export of woodchips from public and private native forests for terms longer than the current annual renewal period will be considered where those forests are covered as part of a comprehensive regional assessment and a Commonwealth-State regional agreement. These longer term approvals will be consistent with other Commonwealth policies and commitments.
* Commonwealth-State regional agreements based on comprehensive regional assessments or agreements between a State and the Australian Heritage Commission on the management of forests listed on the Register of the National Estate (including the application of harvesting codes of practice) will constitute the basis on which the Commonwealth will meet its legislative obligations under s. 30 of the *Australian Heritage Commission Act* 1974. For areas not covered by comprehensive regional assessments, existing processes and annual export approvals will apply.
* In relation to pulpwood production from native forests, the [State] governments will ensure that domestic processors are given the first opportunity to purchase the resource at a price acceptable to the grower. This policy will come into effect when consideration is given to major changes or renewals to wood resource access.'

Industry's view is that maintenance of the export woodchip trade is crucial for the development of hardwood plantations in Australia. The export market offers an opportunity for plantations to increase output over time, until the scale of operations warrants the establishment in Australia of pulpmills or other manufacturing activities reliant on hardwood supplies.

Pulp and paper supply and demand

Consumption of paper in Australia in 1989/90 was 2 834 000 tonnes, of which imports comprised 958 000 tonnes (34%). Consumption of pulp in Australia over the same period was 1 230 000 tonnes, of which imports comprised 261 000 tonnes (21%).

Table 6 indicates that Australia was a net importer of pulp and paper to the extent of $1.126 billion in 1988/89. Thus, pulp and paper imports contribute substantially to Australia's adverse balance of payments. Sawn timber imports (see Table 6) are also very significant contributors.

In Australian Paper's view, proposals by the Forests and Forests Products Industry Council (FAFPIC) and the Pulp and Paper Manufacturers Federation indicate the substantial improvement that can be made to this situation and the potential for a positive trade balance, provided economically competitive mills can be built.

Potential for the pulpwood industry

A study by H A Simons, 'Competitiveness of Australia's Forest Industries', identified opportunities for solid wood products, newsprint and lightweight coated papers for the domestic markets, and for bleached eucalypt pulp for export markets.

In its submission to the RAC forests inquiry, Australian Paper indicated that 12 major forest regions in Australia are capable of significant development of the forest industry (with other minor regions meeting limited local demands). The analysis for industry development is based on :

* demand over time for each class of forest product
* economic size of new processing plants
* location of available resources

Locations potentially available for eucalypt kraft pulpmills (the best potential developments identified) are:

* south coast of New South Wales/East Gippsland

* central Gippsland
* northern Tasmania
* southern Tasmania
* (south west of) Western Australia

While considering that all of these would be required over the planning period examined, Australian Paper believes that the existing infrastructure in central Gippsland gives this site advantages over the others, although additional resources would be required here from plantations and native forests.

The company maintained that the Central Highlands area (central Gippsland) is among the very limited number of sites capable of supplying pulpwood for one of the most viable prospects for development of Australia's forest industries, and for the diminution of the current account deficit.

The 1993 report by the Victorian Wood Products Working Party identified expansion of eucalypt plantations in the Latrobe region as providing the resources for further expansion of the hardwood pulp industry. While softwood plantation establishment was tapering off, the report noted that the establishment of eucalypt plantations is likely to continue for at least a decade.

The significance of the Central Highlands

The Central Highlands of Victoria are the single most important source of eucalypt wood for the pulpmill at Maryvale. Australian Paper indicated that the high proportion of ash eucalypts in its wood supply is particularly important for the production of high-quality office, photocopy and printing papers. These papers require opacity, smooth surface for printing and uniform fibre quality so that the sheet remains stable during the photocopy process and does not curl when subjected to heat. If a high-quality paper is produced originally it can produce a satisfactory product on recycling, although successful recycling requires some input of virgin fibre to maintain quality and strength. Quality must be maintained to match that of imported papers and meet customer requirements.

In addition, the mill requires ash eucalypt species in order to operate within the capacity of its existing recovery furnaces. These furnaces burn the liquor produced from pulping and recycle the cooking chemicals. Mountain ash requires less bleaching to remove lignin and colour, and thus produces less effluent load than the wood of mixed eucalypt species.

The Maryvale pulp and paper plant has a replacement value in excess of $1 billion and plans for expansion are under consideration. However, determination of the relative levels of domestic paper production and imported pulp and paper involves important economic considerations.

Currently, the study area supplies the major proportion of the eucalypt wood input to the Maryvale mill, including most of the high-quality ash-type pulpwood on which its operation is based. As such, the study area is vital to the economic functioning of the pulpmill and maintains Australian Paper's ability to be internationally competitive.

Ash eucalypt pulpwood has the qualities of good formation, brightness, strength, opacity and resilience. It forms the principal source of kraft pulp that is bleached and made into a range of printing and writing grades. These include book printing, writing paper, business forms, computer paper, directories, magazines and envelopes.

It is also used to produce packaging material such as corrugated boxes, cartons, bags, sacks and wrapping papers. Pulp properties required for these grades are brightness, strength, stiffness and cleanness.

Wood Pulp Agreement Acts

Under the *Forests (Wood Pulp Agreement) Acts* of 1966, 1974 and 1984, Australian Paper has rights to eucalypt pulpwood from State forests. These rights continue until 2004, with provision for extension. Pulpwood is obtained in the course of sawlog operations from trees or parts of trees not suitable for sawmilling or from thinning operations. The agreement currently provides for a 'minimum annual supply' of 500 000 cu.m per annum.

The Central Highlands ash forests, notably in the Erica, Neerim and Powelltown areas, are particularly important to the Maryvale mill and were the basis for the establishment of the mill and the original Wood Pulp Agreement of 1936. Because of this, the current agreement provides for at least 60% of the wood supply to come from ash forests, at least 70% from a defined 'Forest Area' as well as at least 166 000 cu.m from a defined - closer - 'Mill Area'.

Eucalypt pulpwood supply from the study area

Table 7 indicates the volume of eucalypt wood supplied to the Maryvale mill from the study area.

Table 7

EUCALYPT PULPWOOD PROVIDED TO MARYVALE MILL
(1991/1992)

	From study area	From elsewhere	Total supply
	(volume, '000 cu.m)		
Ash species[1]	366 (75% of ash)	119	485 (70%)
Mixed species[2]	54	169	223 (30%)
Total	420 (59% of total)	288	708 (100%)

Notes:
1. Ash - mountain ash, alpine ash, shining gum
2. Mixed - messmate, silvertop, stringybarks, gums
3. These figures include pulpwood from sources other than State forest and from outside the study area.

Australian Paper considers that the significance of the wood supply from the study area is underscored by the fact that no equivalent source of ash pulpwood exists elsewhere in Victoria.

It currently purchases all of the pulpwood produced in the study area from the Central Gippsland (Traralgon) and Dandenong Forests Management Areas (FMAs) of the Department of Conservation and Natural Resources (CNR). About 7000 cu.m from the Central (Alexandra) FMA is also purchased by Australian Paper with the balance utilised by other companies.

Cartage represents an average of about 35% of the cost of wood to the Australian Paper mill, and the company believes that cartage distance must be kept to the minimum if Australian-produced paper is to be competitive.

The company also considers that the forests of the study area have significance that extends beyond the regional level to the State and national levels, as they contribute a substantial component of the raw material for the Australian pulp and paper industry and have potential for further contribution.

The detailed studies undertaken by Australian Paper for submission to the RAC indicate that the paper industry has considerable potential for expansion, provided mills are of internationally competitive size. The Central Highlands of Victoria is one of the limited number of areas in Australia containing a significant consolidated area of forest that can support such a mill.

Expansion of pulp and paper production at Maryvale

In February 1994, commensurate with the merger of the former companies, Australian Paper announced a restructure of its organisation that would centralise the production of white copy paper in Maryvale and reduce its reliance on imported pulp.

The proposed expansion of the mill, if it proceeded, would require an additional 850 000 cu.m of eucalypt pulpwood. To date, about 17 000 ha of eucalypt plantations have been established in the Latrobe Valley region by APM Forests Pty Ltd and the State government. Part of the increased demand would be met by an expansion of the company's plantations.

State policies introduced, concerning the clearance of native vegetation, local government planning schemes and the competing uses for potentially suitable land, were considered by the company to limit expansion of private plantations.

Amendment S13 to the State Section of the *Planning and Environment Act* 1987 was ratified in October 1993. This reduces or removes planning controls on plantation development on cleared private land in certain circumstances and applies the Code of Forest Practices for Timber Production to private land.

The Victorian Fibre Processing and Sustainable Development Jobs Council (Jobs and Environment; 1992) suggests that plantations are unlikely to be viable beyond 70 to 100 km from sites where infrastructure and employment are already located. It indicated that new plantations should be located as close as possible to the main centres in Gippsland, north-east Victoria and the South-west Triangle (south-west Victoria and south-east South Australia).

In the absence of a firm proposal seeking additional wood and a lack of detailed

information on the availability of pulpwood from various parts of the State that could contribute to the Maryvale expansion, it is not possible to determine the implications of the Council's recommendations on an increased pulpwood intake.

It can be indicated, however, that the additional parks and reserves recommended in this report include approximately 622 000 cu.m of currently available pulpwood resource - equivalent to about one and a half years' current supply of pulpwood (at 1991/92 levels) from the study area to the Maryvale mill. But, because pulpwood is available from elsewhere in the study area, making that resource unavailable would probably not cause any diminution of supply to the mill.

However, pulpwood is produced as a residue from the production of sawlogs in the timber-harvesting operation. It follows that, if logging operations are to continue to be sawlog-driven, the provision of pulpwood to the Maryvale mill depends on the continued production of sawlogs. Therefore, it is possible that, should the expansion of the mill proceed, the resource included in the parks and reserves may affect some future sustainable supply of wood to the mill. The nature of that effect cannot be assessed, for the reasons outlined above.

PLANNING FOR TIMBER HARVESTING

Timber industry strategy

In recognition of the environmental importance of Victoria's forests and the substantial contribution of forest-based industries to the State's economy, following the report of the Board of Inquiry into the timber industry, the government in 1986 released Victoria's first Timber Industry Strategy.

The strategy formed an integral part of the State's economic and conservation strategies. It set new directions for forest management and timber production was designed to ensure an economically viable industry within an environmentally acceptable framework. It provided for:

* management to safeguard all forest values and uses, including water quality, landscape, wildlife habitat, recreation and timber production
* long-term planning to ensure that logged forests will be regenerated and tended, so that they continue to provide sustainable yields of forest produce
* value-adding forestry and timber processing - new systems designed to make the most of every log taken from the forest
* new technology to make the Victorian timber industry more competitive on national and international markets
* support for communities where changes in the timber industry are likely to cause social and economic difficulties
* public participation in the planning process

Several other initiatives linked with the Strategy contribute to the protection of environmental values within State forest and lay down operational standards for timber production. They cover:

* a legislated Code of Forest Practices for Timber Production (CFP), which lays down minimum operational standards for timber production and an associated licensing system for those who commercially harvest timber in State forests
* conditions on timber licences requiring compliance with the CFP and the *Occupational Health and Safety Act* 1985
* *Flora and Fauna Guarantee Act* 1988
* a commitment to ban timber harvesting in rainforest, as specified in the CFP
* the preparation of comprehensive Forest Management Plans, which take into account all uses and values and provide for regional site-specific prescriptions

The Strategy also aims at a sawlog-driven, high-value-added industry that achieves the best use of wood withdrawn from the forests and provides long-term employment.

In accordance with the Strategy, all publicly owned native forests in Victoria are now managed on the basis of sustainable sawlog yields calculated for each of the 15 Forest Management Areas across the State. These sawlog volumes have been incorporated in legislation through the *Forests (Timber Harvesting) Act* 1990. Long-term (15-year) licences for sawlog harvesting in State forest are based on these calculated sustainable yield volumes.

Integrated wood harvesting

Integrated wood harvesting is the production of sawlogs and pulpwood in the one operation and has been carried out in the Central Highlands for more than 40 years.

Independent contractors carry out the harvesting, while CNR manages the regeneration. Trees are felled and snigged to landings, where the whole tree is assessed and then cut into different grades of sawlog and pulp as required by the government's Value-Added Utilisation System. Sawlogs are transported to particular sawmills, matching log quality with the individual sawmill's technology. Pulpwood is transported to the Maryvale pulpmill or, in some cases, to other users. Operations in the study area are integrated across 20 sawmills located widely from Alexandra to Heyfield.

Co-operative, integrated logging arrangements apply in the Central Gippsland and Central FMAs to oversee each contractor's operation and the movement of logs to licensees. In addition, CNR monitors adherence to the CFP, and Training and Safety officers from APM Forests ensure that equipment, procedures and training at the workplace meet the appropriate occupational health and safety standards.

The contractors are independent small businesses and their labour force is widely dispersed throughout rural communities.

Council is aware that concern has been raised about clearfelling as a silvicultural technique and the removal of pulpwood (residual roundwood) from logging coupes. Both issues were addressed in the Timber Industry Strategy in 1986. Since that time the Victorian government has initiated two research projects: one deals with the question whether a better balance between environmental and economic considerations can be achieved with silvicultural systems other than clearfelling; the second project addresses the environmental and socio-economic consequences of sawlog-only harvesting and regeneration, and also the incremental effects of the removal of residual roundwood. Interim reports from these projects - the Silvicultural Systems Project and Value-Adding Utilisation System Trial - have been prepared and include some preliminary findings.

Council considers that any future plans for the utilisation of pulpwood should be confined to the areas identified as being suitable and available and be tied strictly to the procurement of sawlogs, unless the material is obtained as a result of silvicultural thinning programs aimed at providing a greater volume of sawlogs when final fellings occur at the end of the rotation. Rotation lengths should continue to be geared to the production of high-quality sawlogs, with the production of pulpwood as a by-product. This would preclude the use of pulpwood cycles, which, particularly in forests close to the mill, could be economically more feasible.

The Timber Industry Strategy noted that opportunities exist to significantly increase the productivity and log quality of certain forests through the application of thinning regimes. Through the 'Young Eucalypt Program', a co-operative venture between the CSIRO, CNR and the Tasmanian Forestry Commission, operational trials have been conducted to investigate the potential of thinning forest stands to improve sawlog production and also to identify ways in which the material removed can be utilised for various products. Operational thinning trials have recently been completed in the Central Highlands. The results indicate that thinning of regrowth forests in suitable areas is a feasible option for State forest (YEP Report 1991).

It should be noted that substantial volumes of pulpwood would be available over the next 30 years or so. These likely wood flows (including those that may be available from thinning operations in regrowth stands) need to be taken into account when considering the way a pulpwood resource may be utilised.

Planning harvesting operations

A system of integrated management planning was developed under the Timber Industry Strategy. Forest management plans are being prepared for each of the 15 FMAs identified across the State. State-wide principles and guidelines for timber-production operations were established in the CFP and these are translated at the local level into detailed principles and prescriptions applicable to the respective FMAs, with harvesting prescriptions to suit local forest types, land and soil types and climate. Public consultation will be part of the preparation process; each plan is valid for 10 years. Wood-utilisation plans detail wood production - in terms of the type, quality and allocation to processors. At the most detailed level, forest coupe plans contain detailed prescriptions applicable to individual harvesting coupes.

Council's Melbourne Area, District 2, is covered by the Dandenong, Central and Central Gippsland Forest Management Area plans. The draft plan for the Dandenong and Central FMAs will be released for public comment after publication of these final recommendations; a draft of the other FMA plan is in preparation.

Through the development of prescriptions and other detailed management proposals, the plans will provide for the protection and management of all forest values.

This planning process needs to be sufficiently flexible and cater for the rescheduling of harvesting areas brought about by the application of particular strategies (such as the draft management strategies for Leadbeater's possum) or through changes in land use. This can in turn, create short-term difficulties in supplying forest produce in accordance with licence conditions and for management of the remaining resource until new infrastructure (roads etc.) are established.

NATIONAL FOREST POLICY STATEMENT

The Commonwealth, State and Territory governments, with the exception of Tasmania, have agreed upon a national approach to the sustainable management and use of Australia's forests. The National Forest Policy Statement, released in late 1992, sets out the vision for Australia's forests and forest industries into the next century, based on the principles of ecologically sustainable development.

The key goals of the Statement as they relate to the Council's recommendations are to:

* determine agreed criteria for comprehensive, adequate and representative reservation systems
* establish a network of dedicated and secure reserves based on these principles, supported by complementary management outside reserves, conditional on satisfactory agreement on criteria
* have a comprehensive, adequate and representative reserve system of old-growth forests and wilderness areas in place by the end of 1995 for public lands
* further develop and apply codes of practice for all commercial and high-impact uses
* avoid or limit clearing of public native forests to cases where regional conservation objectives and catchment management objectives are not compromised
* provide certainty and security to industry of access to resources following protection of conservation values, so that industry can make significant long-term investments in value-adding projects
* further develop pricing and allocation systems that are market-based and allow transferability of rights, a fair return to the community and promotion of the most efficient use of resources
* revise accounting procedures to reflect costs associated with wood production and community services
* implement land-use decision-making processes agreed in the context of the Intergovernmental Agreement on the Environment.

The Council notes that its recommendations are consistent with the National Forest Policy Statement endorsed by the Victorian government and that Victoria has achieved many of the goals of the Statement through the Land Conservation Council process over the last 20 years.

THE TIMBER INDUSTRY BASED ON THE CENTRAL HIGHLANDS

History

Eucalypt forests cover most of the public land in the study area. Utilised for timber production since the earliest days of European settlement, they continue to provide timber and timber products.

The more accessible forests near Melbourne provided building materials and firewood for the growing city in the 19th Century. Gold discoveries in the 1850s vastly increased the timber demand but, because most gold-mining activity occurred elsewhere, forests in the study area remained relatively unaffected. Notable exceptions were at Walhalla, Healesville, Toolangi and Warburton, where large areas of forest were clearfelled and used for fuel, building materials and mining timbers.

Timber provided split palings and shingles from the earliest days of settlement, but sawn-timber uses were restricted by seasoning problems. By 1910 seasoning techniques had been developed and sawmills, associated settlements and tramways for transporting sawlogs were established, at first in the Yarra valley near Warburton and soon after in the

La Trobe and Thomson valleys. Those tramways remaining after the 1939 fires fell into disrepair from the 1940s and some of them have become popular walking tracks. Settlements and tramways were also established at Mount Disappointment, Yea and Goulburn.

Inadequate and unsafe water supplies in early Melbourne necessitated official action in securing a water supply for the city. Those water supply catchments near Melbourne first selected were also used for agricultural production, and the quality of this untreated water soon fell. Restricted access and land-use policies were subsequently applied to a number of catchments specifically designated for water supply, which were vested in, or leased to, the predecessor of Melbourne Water Corporation.

Prior to the development and application of regeneration techniques suitable for eucalypts, logging was selective and trees and logs considered to be low quality for sawn timber were usually left. Investigations subsequently proved that low-quality eucalypt logs were suitable for paper-making and, in 1936, Australian Paper Manufacturers Ltd entered into an agreement with the government to obtain pulpwood from both foothill and mountain forests within a region that includes much of the study area. This agreement was ratified by Act of Parliament and has been revised several times, most recently in 1984. Harvesting pulpwood in conjunction with sawlog-harvesting operations has therefore been a feature of the forests of the study area for more than 50 years.

The fire history of the mountain forests here had a critical influence on the development of the hardwood sawmilling industry in Victoria. In 1926, large tracts in the Acheron Valley and south of the Yarra, extending to Toorongo, Toolangi and Noojee, and at Mount Disappointment were burned by wildfire. Vast areas of forest were severely burnt in the fires of Black Friday 1939. Between them, the 1926 and 1939 fires killed and caused the regeneration of most of the mountain forest in the study area. More recently, fires in 1983 burnt 17 600 ha of mountain forest in the upper Yarra valley, as well as forests at Mount Disappointment and in parts of the Black Range.

World War II resulted in increased demand for timber, which accelerated in the post-war boom in housing construction. Salvage of sawlogs from 1939-fire-killed trees largely provided Victoria's requirements for sawn hardwood timber until the early 1950s, when the older trees had deteriorated and the harvesting operations would have caused unacceptable damage to the developing regrowth. As a result, the timber industry in the study area was scaled down. Access to timber resources in the east and north-east of the State led to the development of sawmills in those areas.

The extensive eucalypt forests within the study area are characterised by relatively small tracts of older-aged mountain forests and extensive regrowth stands that date largely from 1939. Significant but considerably smaller areas date from 1926 and 1983 and very small areas of mountain forest are of other ages.

As the timber industry in other parts of the State (for example, East Gippsland) reduces the volume of timber it harvests annually in order to achieve sustainable yields, the forests within the study area will become increasingly important for timber production in the next 20 years - the period when the 1939 regrowth ash forests approach an optimal (economic) age for harvesting. The Timber Industry Strategy considered that the ash regrowth resource 'will form the backbone of the hardwood sawmilling industry in the future'.

In July 1992, the government noted that, with the creation of national parks in the Victorian Alps and East Gippsland, the ash regrowth forests of the Central Highlands were cited as the alternative timber resource.

HARDWOOD TIMBER RESOURCES

Assessing timber resources available from the total forest necessitates the identification of those areas both suitable for commercial harvesting and available for such activities.

Table 8 provides a summary of the forest resources, by area, for each of the major current land-use categories. Of the total net productive land in the study area (347 400 ha), 75% is in State forest, 15% in parks and reserves and 10% in the protected catchments of Melbourne Water. Within the total of 476 300 ha of State forest in the study area, 30% is not suitable for sawlog production and a further 15.5% is excluded by prescription, leaving 54.5% (or a net area of 259 600 ha) both available and suitable for timber production. The table also indicates complementary analyses for the existing parks and reserves and the Melbourne Water catchments.

Table 8

FOREST AREAS BY MAJOR LAND-USE CATEGORIES

Category	Definition	Area within each land-use category (ha)			
		Entire study area	State forest	Parks and reserves	Melbourne Water catchments
Total forest area	Total area covered by forest (i.e., predominantly single-stemmed vegetation in excess of 5 m high, with tree crown coverage over 30% of the land area)	670 935	476 292	122 529	72 114
Gross productive area	Forests capable of producing merchantable timber (i.e., unsuitable forest types and those under 28 m high excluded)	450 681	334 017	49 958	66 706
Net productive area	Forests suitable for timber (i.e., accounting for land that would be unavailable under the Code of Forest Practices)	347 428	259 623	52 386	35 419

Source: CNR HARIS database. Land tenure is prior to these recommendations.

The timber resource figures in this section were provided by CNR and are based on estimates contained in the Hardwood Area and Resources Information System (HARIS) records of 30 July 1992. Records of resource estimates are dynamic and are continually reviewed as areas are harvested and stands of trees are assessed in detail - providing new information about stand condition and development, timber volumes and other land values. Those data will be included in the draft FMA plans in the Central and Dandenong FMAs which the department will release for public comment in the near future.

Sawlog-driven timber-harvesting operations require forests that are sufficiently productive of millable timber, and not all areas of forest are. Several factors - including an inadequate volume of timber, unsuitable tree species or a low site quality - may cause a forest to be considered as 'unproductive' for sawlog-driven operations.

Gross productive area is the total area of forest capable of producing timber resources and excludes land of low inherent productivity due to soil, topographic and climatic characteristics. Within the study area, this amounts to some 450 700 ha, comprising 67% of the total forest. Table 9 gives the gross productive area for each forest type and age class. It refers to all public land in the study area regardless of tenure.

Table 9

GROSS PRODUCTIVE AREA OF ALL PUBLIC LAND
(by forest type and age class)

Forest type	Area (ha)			
	Mature/overmature	Pre-1940 regrowth	Post-1940 regrowth	Total
Mountain ash	26 497	85 545	13 430	125 472
Alpine ash	2 512	32 724	4 684	39 920
Shining gum	1 051	3 978	108	5 137
Mountain mixed-species	27 617	7 620	2 651	37 888
Foothill mixed-species	164 392	31 927	41 253	237 572
Other species	4 692			4 692
Total	226 761	161 794	62 126	450 681

Note: Numbers in this table are for all public land in the study area.
Source: CNR HARIS Database.

Government-approved land uses determine the forest areas available for timber harvesting. Commercial harvesting is permitted within areas designated as State forest. In its 1977 final recommendations for the Melbourne Study Area, and subsequently approved by the government, the Land Conservation Council made a substantial area of forest available for commercial harvesting.

Timber is also harvested from some State forest that Council's earlier recommendations classified as 'uncommitted'.

Under the Council's land-use recommendations and subsequent land management prescriptions, commercial timber harvesting is not permitted in reference areas, wilderness, national and State parks, nature conservation reserves and education areas.

Low levels of timber harvesting (such as for posts, poles or firewood) may be permitted under some circumstances in regional parks and natural features reserves. Commercial harvesting is not undertaken in the closed water supply catchments that are wholly under the control of Melbourne Water Corporation.

Table 10 shows the gross productive area of all State forest by forest type within the study area. Table 8 provides a comparison with parks and reserves, and the Melbourne Water catchments.

Table 10

GROSS PRODUCTIVE AREA OF ALL STATE FOREST
(by forest type and age class)

	Area (ha)			
Forest type	Mature/overmature	Pre-1940 regrowth	Post-1940 regrowth	Total
Mountain ash	10 790	59 464	12 593	82 847
Alpine ash	2 351	24 830	4 583	31 764
Shining gum	1 051	3 804	108	4 963
Mountain mixed-species	23 544	7 384	2 562	33 490
Foothill mixed-species	118 422	24 173	34 617	177 212
Other species	3 741	-	-	3 741
Total	159 899	119 655	54 463	334 017

Note: Numbers in this table are for all State forest in the study area.
Source: CNR 1994

For the forests available for timber production, the Code of Forest Practices has established guidelines to protect a range of values, which may involve the exclusion of harvesting from some areas. In general, these guidelines exclude logging from steep slopes (generally greater than 30^{0}), stream-side reserves, rainforest buffers, wildlife corridors and sites of floral, faunal, historical and archaeological significance. Prescriptions protecting landscape and recreational values are also applied. Once all exclusion zones are removed, the remaining forest - which is both suitable and available for commercial timber production - is termed the **net productive area**.

Net productive area within the Melbourne Area, District 2 currently totals almost 260 000 ha. This is almost 78% of the gross productive area of State forest or more than 38% of the total forest in the study area. Table 11 shows it by forest type and age class. Table 8 also indicates the equivalent areas in the Melbourne Water catchments and existing parks and reserves.

Table 11

NET PRODUCTIVE AREA OF STATE FOREST
(by forest type and age class)

	Area (ha)			
Forest type	Mature/overmature	Pre-1940 regrowth	Post-1940 regrowth	Total
Mountain ash	6 254	46 793	11 757	64 804
Alpine ash	1 479	20 362	4 530	26 371
Shining gum	527	3 372	105	4 004
Mountain mixed-species	15 906	6 188	2 269	24 363
Foothill mixed-species	87 625	20 262	30 203	138 090
Other species	1 991			1 991
Total	113 782	96 977	48 864	259 623

Note: The net productive area figures in this table may be further reduced when provision for flora and fauna conservation, water catchment protection, recreation and other values are determined through the forest management planning process. Production of the various plans has been deferred until the completion of Council's review.

Source: CNR HARIS Database

Available timber resource

The 259 623 ha of forest currently assessed to be both suitable and available for harvesting contains an estimated 13 582 900 cu.m of sawlogs of grade C or better. Sawlogs are produced from trees that are relatively free from defect (such as hollows, limbs, brown rot and insect attack) for conversion into sawn-timber products; the various sawlog grades are defined in terms of the presence and number of these defects.

In addition, the forest can provide residual roundwood from the merchantable portions of trees harvested in conjunction with sawlog operations. This material provides additional sawn timber and products such as paper-pulp and hardboard, as well as poles and posts, garden chips and reconstituted wood products.

Timber yield varies significantly according to forest type. Mountain ash, alpine ash and shining gum forests, although currently comprising only 37% of the total net productive area, contain more than 83% of C-grade or better sawlog volumes, as shown in Table 12. By comparison, foothill mixed-species forests account for more than 53% of the current net productive area in State forest, but yield less than 12% of the total C-grade or better sawlog timber volumes currently available. These ratios clearly indicate the highly productive ash and shining gum forests' importance of the hardwood resources of the study area.

Sustainable yield

Sustainable production of forest goods and services is one of the goals of timber production from the public land native forests. Sustainable yield is the level of output that can be maintained in perpetuity without impairment of the land's productivity.

The volume of sawlogs from mature forests is forecast for minimum rotations of 80 to 150 years, depending on forest type.

For each FMA the sustainable yield for annual sawlog harvesting from the net available area (under current prescriptions and strategies) has been forecast, and subsequently guaranteed by the *Forests (Timber Harvesting) Act* 1990. However, the sustainable yields may be altered by an order published in the *Government Gazette* where circumstances, such as alteration in the available timber resource, require it. Furthermore, the *Forests Act* 1958 requires the sustainable yields to be reviewed prior to July 1996 and every 5-year period thereafter.

Table 12

RESOURCE WITHIN NET PRODUCTIVE AREA
(by forest type)

Forest type	Volume of A—C-grade sawlogs			Residual roundwood (cu.m)
	Volume of sawlogs (cu.m)	% of total volume	% of net productive area	
Mountain ash	8 165 800	60.1	25.0	12 236 000
Alpine ash	2 690 800	19.8	10.2	3 588 400
Shining gum	460 900	3.4	1.5	1 539 600
Mountain mixed-species	649 000	4.8	9.4	1 334 800
Foothill mixed-species	1 613 800	11.9	53.2	4 175 400
Other	2 600	<0.1	0.8	5 200
Total	13 582 900			22 879 400

Source: CNR HARIS Database

As the FMA boundaries do not correspond exactly with the boundary of Council's Melbourne Area, District 2, it is not possible to determine the sustainable yield specifically for the study area. Table 13, however, gives the legislated sustainable yield for each of the FMAs that overlap it.

Sustainable yields are expected to increase early next century as the timber volume available is supplemented by regrowth, principally arising from the 1939 bushfires. However, the forecast sustainable yield may decrease if wildfire or disease affect substantial forest areas or if changes in existing public land use or land management policies or

prescriptions cause downward revisions of current resource availability estimates through a reduction in the net area available for timber production. Detailed reassessment of the extent and condition of the wood resources, however, may increase or decrease the forecast available volume. A major review of forest resources is currently underway. This Statewide Forest Resources Inventory is due for completion in 1997.

Table 13

SUSTAINABLE YIELDS FOR FOREST MANAGEMENT AREAS

Forest management area	Sustainable yield (cu.m of C-grade + sawlogs per annum)
	Timber supply period 1987 to 2001
Central Gippsland	183 000
Dandenong	41 000
Central	115 000

Note: The sustainable yield indicated is that set down in schedule 3 of the *Forests Act* 1958 - as amended by the *Forests (Timber Harvesting) Act* 1990.

Licences for timber harvesting

A feature of the Timber Industry Strategy concerns the provision of sawlogs from public land to privately owned processing companies. In particular, it also addresses the issues of value-adding processing, security of supply and financial arrangements.

Licences for sawlog supply, negotiated between the former DCE and sawmill operators, have maximum annual totals in line with FMA sustainable yields. The exceptions are those FMAs, such as Wodonga, Wangaratta and Benalla—Mansfield, where a phase-down to sustainable yield levels is taking place. For each 15-year licence, the volume and grade of timber that the Department makes available to the licensee are specified. However, the annual volume cut need not equal the total licensed volume, as the arrangement allows for some flexibility. Licensees can vary the timber volume required and the amount specified in the licence by up to 30% in any one year (but no more than 10% over 5 years).

The government, in early 1992, announced it would honour its obligation to the timber industry in the Central Highlands to provide for a sustainable growth in supply of quality hardwood for the forest products industry, with particular emphasis on value-adding. It also agreed to the early renewal of some 15-year licence contracts where licensees have firm schedules for new investment to expand value-adding processing facilities.

Associated with the log licence system, instituted in 1987, is the Value-adding Utilisation System (VAUS), a feature of the Timber Industry Strategy. This system requires sawlogs to be graded and allocated to processors so as to ensure the highest-value end use. Under the licence system, those mills best suited to producing higher-quality products are allocated higher-quality logs.

About 43% of the raw net volume of hardwood logs supplied to sawmills is converted (recovered) during the sawmilling operation into sawn timber. Another 33% or so comprises waste that can be converted into chips. The remainder of the log volume is lost as sawdust, through the production of over-dimension timber, to allow for shrinkage on drying and planing for value-adding, or is material that will not readily pass through the chippers.

Woodchips are sold annually by the sawmills to the Australian Paper pulpmill at Maryvale. Further pulpwood sales are made to Midway at Geelong for export and to the Australian Forest Industries pulpmill at Myrtleford. The remaining residues are sold as firewood or for garden use, or, because not all mills have chipping facilities, burnt.

Royalty equation system

The money paid by sawmillers to the government for sawlogs and pulpwood provided from State forest in Victoria is known as **royalty**.

The inherent value of a log to the timber industry depends on the amount and quality of products that can be cut from it and on the cost of getting those products to market. The royalty equation system was first introduced in 1950, to reflect these criteria so that sawn timber could be put onto the market at roughly the same price by any sawmiller in the State. The equation system has been reviewed recently.

Adjustments to the royalty are made for:

* the cost of transporting the sawlog from the forest to the mill

* the cost of transporting the sawn timber to the key market (Melbourne)
* a factor for quality based on the maximum amount and quality of sawn timber that can be cut from the sawlog (recovery rate)

Resource use

Government hardwood log allocations from the study area approximate 310 000 cu.m and are supplied to more than 40 sawmills. Several large mills account for more than half the sawlog allocation from the study area. The remainder have small allocations, mostly less than 3000 cu.m. Some of the mills are located outside the study area, but draw primarily on its resource.

Analysis of the market destination for sawn timber from the study area revealed that more than half was for unseasoned structural products, although this is decreasing. The remainder is processed beyond the green stage for a range of value-added products.

As noted earlier, the Central Highlands are the single most important source of eucalypt pulp for the pulpmill at Maryvale. Australian Paper has taken about 500 000 to 550 000 cu.m of pulpwood in each of the last 3 years, from State forests and Victorian Plantations Corporation land, out of a total intake of 700 000 cu.m The balance is wood from private forests and plantations, as well as sawmill residues.

Employment

The hardwood sawmills and the one pulp and paper mill that draw on the public hardwood resource of the study area employ staff directly in the primary processing of the resource, and also employ a wide range of contractors such as fallers, drivers, plant operators and supervisors. CNR employs staff to supervise these operations and carry out road maintenance and reforestation of harvested areas.

Primary processing

In mid 1989, the Timber Industry Council (TIC) conducted a survey of hardwood mills to establish employment in primary processing of the hardwood resources drawn from the study area. It recorded some 640 employees. Using an estimation system that equates mill employment with sawlog input (20 employees per 10 000 cu.m input), the TIC estimated that the sustainable yield for the three FMAs concerned would generate employment for 682 persons.

Future changes in mill productivity will influence employment. Productivity increases are expected to be 2 to 3% per annum and would be associated with employment reductions of 20 or more persons a year in the short term. On the other hand, the TIC report noted the intentions of many mills to undertake considerable investments and structural change, which would generate some additional employment. A feature of the Value-adding Utilisation System (VAUS) is to encourage further value-added processing, which, in turn, increases the technical expertise and job satisfaction of employees.

In 1992, the Maryvale pulp and paper mill directly employed 1070 people, of whom, based on pro-rata figures, some 420 employees would depend on to the eucalypt wood resources drawn from the study area.

Forest workers

Timber mills employ a wide range of contractors for forest operations and log cartage. In the past, there have been difficulties in obtaining reliable data about the work force because of the seasonal and widespread nature of the industry. However, recent legislation requires forest workers to be accredited and licensed.

Up to June 1994, 894 people had been accredited as forest workers in the former Dandenong, Alexandra, Melbourne and Central Gippsland Regions of CNR. Not all of them were employed full time. The majority of these people are likely to work in the public forests of the study area. Australian Paper has had an accreditation system in place from the mid 1970s and all forest workers operating on company land are accredited. In addition, a considerable number of people are involved in forest-based employment like tourism and recreation as well as in secondary industries supporting the timber industry.

Department of Conservation and Natural Resources staff

CNR has major offices located at Dandenong, Alexandra and Traralgon. Head Office staff are also involved in tasks relating to the study area.

Total employment

The Council commissioned the report 'A Social and Economic Impact Assessment in the Central Highlands (Melbourne Area District

2), Victoria (1992)' prepared by the consultants Henshall Hansen Associates and Read Sturgess and Associates. In that report, the consultants indicated that the timber industry in the study area usually supports about 1840 direct jobs, most of which are held by people resident in the study area. These employees work in primary processing, at the Maryvale pulpmill, as accredited forest workers and as government staff; some of them are part-time. The consultants suggested a multiplier of about 2.3 to provide an indication of the number of additional jobs the timber industry supports indirectly. These additional (2390) jobs were in retailing, manufacturing and services.

Timber towns

As a consequence of the historical development of the timber industry, the study area contains several 'timber towns'. Such towns are based on direct and indirect employment in one or more local sawmills. Dependence on mills for employment is usually more acute in the smaller towns.

Examination of Australian Bureau of Statistics' employment data (1986 Census) for selected towns with a population of more than 1000 reveals a generally low number and percentage of the labour force involved in the timber industry. In Alexandra, Broadford, Drouin, Healesville, Millgrove, Trafalgar, Warragul, Woori Yallock and Yarra Junction, the labour force for 'forestry and logging' was usually less than 1%, and only one centre's labour force exceeded 4% in the category 'wood products and furniture'.

The Bureau does not release data on the labour force in towns with populations under 1000 persons. A Timber Industry Council survey of Marysville and Erica (both with fewer than 1000 residents) indicated that 19% of the work force were engaged in the timber industry. Similar situations may also exist for other small towns, such as Crossover, Darnum, Fumina, Narbethong, Noojee, Powelltown, Rokeby and Toolangi.

STATE FOREST

Definition of State forest

In its earlier recommendations, the Council designated the larger areas of forested public land in the State that were not incorporated into parks, or set aside in various reserves or for softwood production, either as areas for hardwood timber production or as uncommitted land. In its final recommendations following the Alpine Area Special Investigation, published in November 1983, the Council recommended that such forested land be managed as a single unit.

The Council decided to refer to this land as 'State forest'. It believes the term best describes public land in both timber production areas and uncommitted land, even though in a State-wide context it may contain a range of vegetation types - from tall mountain forests through to woodlands, mallee scrub, heathlands and swamplands. The name is used for descriptive purposes only, as distinct from the term defined in the *Forests Act* 1958.

State forest comprises a mosaic of forests of varying productivity, and the separation of land into timber production areas and uncommitted land has tended to reinforce the belief that the State's commercially productive hardwood forest is entirely located within hardwood production areas and that timber production is the sole object of management there. In fact, a significant volume of commercial timber is extracted, in conformity with Council's recommendations, from uncommitted land; at the same time, hardwood production areas are managed for a range of uses, as well as for wood production, and contain many areas that are not timber-productive.

Although many of the outstanding natural features and values occurring on public land are included in parks and reserves, the hardwood production areas and uncommitted land contain significant water production, landscape, historical and conservation values. The forests contain many rare plants and, considering they occupy about 40% of all public land, they are of major significance as faunal habitat. The term 'hardwood production' implies quite erroneously that such areas have few values other than for timber production, while the term 'uncommitted land' belies the significance of this land for many different uses - including timber production.

The Council has defined the area of State forest within the study area and, in line with the concept of unified (and) co-ordinated management, believes it would be appropriate for all State forest to be administered under

one Act and be securely reserved under a single land tenure incorporating provisions similar to those currently applying to land administered under the *Forest Act* 1958.

Plantations also form part of Victoria's forest estate and contribute to sawlog and pulpwood resources. The contribution of softwoods to the timber and paper pulp industries was discussed earlier in this chapter. Chapter K - Plantations - discusses the extent of the plantations in the study area.

Land-use goals

State forest throughout the study area has a multiplicity of uses. It is important for the protection of water supply catchments, for conservation of plants and animals and for timber production and provides many opportunities for outdoor recreation. The forests also provide honey, forage, road-making materials, other forest products and minerals to satisfy various community needs.

Management of State forest should take into account the various intrinsic values and ensure that they are maintained and that the use of the range of forest products is ecologically sustainable.

The Code of Forest Practices (CFP), initiated under the Timber Industry Strategy, seeks to ensure that timber-growing and harvesting operations to promote an internationally competitive forest industry are conducted on public land (and those areas of private land where commercial timber-production operations are conducted) in a manner that is compatible with the conservation of the wide range of environmental values associated with those forests.

The CFP provides minimum standards for all timber-production operations in the State. It lays down State-wide principles and guidelines that apply to timber harvesting, timber extraction, roading, regeneration, and reforestation in native forests, as well as to the establishment and tending of soft wood and hardwood plantations. These ensure that:

* land managed for forestry is adequately regenerated and tended following timber harvesting
* reforestation is achieved efficiently and with environmental care
* environmental values including landscape, flora, fauna, archaeological, historical and other cultural sites are conserved, and water catchments are protected
* opportunities are provided for recreation, scientific study, and education

These are also aimed at meeting the objectives of the State Environment Protection Policy for the Waters of Victoria.

Thus, the Code provides minimum standards of environmental care that must be followed in compiling regional prescriptions and setting conditions for the control of particular timber-production operations. The Council endorses the CFP and notes that many of its principles reflect those that the Council itself has advocated for the management of State forest.

It would not have been practical for the Code itself to provide detailed prescriptions that could be applied to every forest situation encountered throughout the State. Variability in climate, forest type, topography, elevation, soil type, land ownership and emphasis on various management goals, requires that practical, detailed operational prescriptions must be developed regionally and must be used in specifying conditions for each timber-production site.

Forest management plans and other plans are written in accordance with the CFP and regional prescriptions. For each FMA the Department details the harvesting principles and prescriptions applicable to the local forest, land and soil types and climate. Operational conditions for each timber-harvesting site are set out in a Forest Coupe Plan.

More detailed goals for environmental care with regard to planning and conducting of timber-growing and harvesting operations have also been set down in the Code. These seek to ensure that:

* water quality is protected by measures that prevent the direct disturbance of streams, springs, swampy ground and bodies of standing water, and of their physical, chemical or biological quality
* stream flow is maintained by the careful planning of operations
* soil stability is protected by measures that regulate site disturbance
* soil, water catchment and landscape values are protected by the careful location, construction, and maintenance of timber-extraction roads, and regulation of their use

* fauna, flora and landscape are protected by the careful planning of operations and the reservation of appropriate patches and corridors of vegetation
* the floral and faunal diversity of native forests, including a range of successional stages, is maintained on public land
* forests are protected from the introduction of and spread of pest plants and animals, plant diseases and insect pests
* intensive recreation sites and areas of high scenic quality are protected from adverse effects of operations on adjoining public land
* significant biological, archaeological and historical sites are preserved
* forest values are protected by the removal of rubbish from sites following timber-production operations

In relation to these goals, the Code contains a number of principles referred to below, which are based on harvesting prescriptions used by CNR. In addition, a schedule of values within State forest is provided. These should be protected by the implementation of management prescriptions.

Soil conservation and catchment protection

Buffer strips to streams should be adequate and not logged and, where possible, should not be subject to other operations that cause soil disturbance. They should, as far as practicable, be protected from fire. The width of the buffer should be determined after consideration of the sensitivity of the particular stream environment.

The CFP specifies that 'water quality must be protected by:

* the retention of riparian and other vegetation within at least 20 m of a permanent stream (stream-side reserve)
* the retention of riparian and other vegetation within 20 m or other greater approved distance from permanent springs, swampy ground and bodies of standing water
* the retention of a filter strip at least 5 m wide on either side of temporary streams and drainage lines.

Wherever appropriate, increased reserves beyond the minimum standards specified above must be applied to protect environmental factors; these may apply to permanent and temporary streams, drainage lines, and other wet areas referred to above.'

Timber harvesting in domestic water supply catchments should be undertaken in accordance with the principles outlined in the CFP. Management of the catchments providing water used by the Rubicon hydro-electric scheme should ensure protection of water quality.

All roads, snig tracks, log landings and log dumps should be located, designed, constructed and maintained to minimise erosion and deterioration of water quality. These should be adequately drained, and breached, barred and rehabilitated to encourage rapid regeneration when no longer required.

Intensive utilisation operations should be excluded from areas of high erosion hazard and from slopes generally greater than 30^{0}.

Care should continue to be taken when harvesting operations take place during winter and during and following periods of heavy rainfall and regional prescriptions adhered to regarding the closure of unsurfaced logging roads. Seasonal closure of other roads will continue to be necessary because of excessive damage, erosion or cost of maintenance, or because of extreme fire hazard.

Under the forest planning system outlined in the Timber Industry Strategy, forest roading and harvesting operations are subject to plans prepared by CNR. Public comment is invited prior to their implementation to ensure the aims outlined in the above principles can be achieved.

Recreation and landscape

Special consideration should be given to road location, to the size and shape of logging coupes and to other activities carried out in the forest in areas of high landscape value.

The CFP requires that such values in areas of high landscape sensitivity be protected by modification to the design and distribution of coupes to:

* minimise skyline impacts
* blend with the natural forms and lines of the landscape
* minimise the concentration of harvested areas
* reduce the abrupt visual impact of harvesting coupes.

Landscape values must also be protected along major tourist roads consistent with fire protection requirement.

CNR has developed a Visual Management System that enables analysis and assessment of landscape quality and the minimisation of the visual impact of management activities. The system can be used to identify a set of landscape management goals based on the character of the landscape, scenic quality, seen-area distance and levels of visitor sensitivity.

Specific prescriptions should continue to be applied to logging and other activities involving disturbance to the natural environment near major roads and popular walking tracks. A section of the Alpine Walking Track passes through State forest, across the catchment to Lake Thomson. This is discussed in Chapter J - Community Use Areas (see Recommendation J14).

Activities involving disturbance to the natural environment should not occur in buffer zones around popular recreation sites and beauty spots.

Areas of native forest adjacent to softwood plantations offer valuable contrast to the landscape and nature conservation values of the adjoining plantations and play an important part in maintaining local balance in land use. The landscape and conservation values of such areas should be maintained.

The Central Highlands Sanctuary (of some 223 000 ha) was originally set aside to protect 'game' (including deer) and 'native game' such as native ducks to ensure that the game had the opportunity to develop and maintain viable populations. It is an overlay classification across all categories of public land encompassing the Toolangi—Black Range forests, the Yarra River system of water supply catchments and the catchments of Snobs Creek and Rubicon and Acheron Rivers.

Portions of the Sanctuary support high densities of sambar deer. Council believes that it is no longer necessary to set aside areas of public land to protect the deer and is therefore proposing that the Sanctuary no longer apply (see Recommendation E9).

Taking into account those parts of the Sanctuary that lie within existing and new parks and reserves where hunting is specifically excluded, some 146 500 ha remains within State forest and, under these recommendations, would become legally available for hunting.

Historical sites

A large number of sites of historical significance have been identified throughout public land in the study area. The existing and recommended new parks include many of these and recommended new historical and cultural features reserves incorporate others. Further sites are included in the table of features to be protected in State forest at the end of this chapter.

When other sites of historical significance or interest (such as artefacts of mining, logging or early settlement) are identified, the sites and their environs should be protected. The desirability or otherwise of upgrading vehicular access to each one should be considered when logging roads are being designed.

River zones

Under the new land-use categories adopted by Council, streams and their frontages that are surrounded by freehold land are now dealt with under 'natural features reserves'. Within State forest, however, streams remain part of the State forest category.

Major rivers and streams invariably constitute one of the most significant scenic elements in the landscape as well as providing a natural focus for recreation.

The variety and nature of the flora and fauna in the riparian zone often give it a greater environmental significance than the surrounding relatively dry uniform forests. The riverine environment exhibits the typical focusing effect of a vegetation strip that is well suited to wildlife passing through a drier environment of less-favoured plant species. Also, the zone where the drier foothill and wetter riverine forests overlap contains the greatest variety of plant species and, therefore, the greatest diversity of faunal habitat types. Often the river valleys carry some of the more significant and attractive vegetation - such as the cool temperate rainforests.

The Council believes that all streams in State forest should be protected in accordance with the principles previously outlined. In the following, however, the Council has referred to a number that have significant scenic and nature conservation values, in addition to those stream sections bordered by rainforest.

While it is not practical to create nature conservation reserves along each of these.

Council considers the importance of these stream-side areas warrants the adoption of management practices that have as their major aim the protection of these areas' special natural features.

Council also believes there is further scope for the sympathetic development of recreational and interpretative facilities that would increase people's enjoyment and understanding of the area's river systems.

Council's final recommendations following several of its more recent studies, including the Alpine Area Special Investigation and the Hill End Special Investigation (both in 1983), provided for 'natural features zones' along the more significant streams in State forest.

With the adoption by Council of the new land-use categories, the term 'natural features reserve' now applies to a specific group of categories. Accordingly, those stream-side areas that would previously have been considered as 'natural features zones' are now recommended as 'river zones'.

River zones refer to stream-side areas in which the importance of the natural, scenic and recreational values warrants the adoption of management practices that have, as their major aim, the protection of those values. The Goulburn River downstream from its junction with the Black River to above Ten Mile, for instance, was afforded an equivalent designation in the final recommendations following the Alpine Area Special Investigation, and it is suggested for the current study that the zoning should be extended down to Lake Eildon.

It is recommended that river zones be applied to eight rivers in Melbourne Area, District 2 (see Recommendation E6 below)

Heritage Rivers

Sections of several rivers in the study area have been afforded Heritage River status under the *Heritage Rivers Act* 1992.

The Heritage River classification is not separate reservation but is an overlay; the underlying tenure continues. Heritage River status applies equally to sections of the river within parks and to those within State forest. Some or all sections of the Howqua, Big, Thomson and Aberfeldy Heritage Rivers lie within State forest while the Goulburn and Yarra Heritage Rivers are largely surrounded by freehold land.

Heritage Rivers are discussed further, and recommendations made, in Chapter G - Natural Features Reserves.

Nature conservation

Significant vegetation communities and colonies of rare or endangered plants and animals should continue to be protected, in consultation with the appropriate specialists. Some species or communities may require long-term monitoring in order to assess their habitat requirements and the most appropriate methods of management to ensure their survival. The managing authority may, in some cases, need to:

* create and manage buffer zones of adequate size
* erect protective fencing
* provide additional weed and vermin control
* manipulate fire regimes to maintain or enhance the viability of certain species
* collect and store seed for use in planting and re-establishment programs.

It may be appropriate for the managing authority to involve local field naturalist groups or other interested parties in some of these management operations.

* Protection strips along streams and watercourses in logging coupes should continue to be linked to other areas in which timber harvesting does not occur, in order to provide wildlife corridors.
* Sufficient mature and veteran trees in logging areas should continue to be retained for fauna habitat.
* All logged areas should, as far as possible, continue to be regenerated with tree species native to the locality, and the species mixture on the site should continue to be retained.
* Caution should continue to be exercised in the aerial application of pesticides and fertilisers; no compounds that may significantly affect native animals should be used; any compounds should be carefully applied so as to avoid damage to retained native vegetation and aquatic environments.

Rainforests

The rainforests in the Central Highlands are remnants of a much wider, ancient distribution

of plant communities, now generally restricted to sheltered gully sites where fire frequency has been low and moist conditions persisted.

A detailed floristic study of rainforest that CNR has conducted, provides valuable information about the significance of particular stands and the distribution of rainforest species.

The range of nature conservation reserves identified in these recommendations would increase the area of rainforest included in such reserves from 50 ha to 1570 ha - about 66% of the total area of rainforest on public land in the study area (see Table 4 - Chapter C). Provision for the protection of other areas in State forest is outlined in Recommendation E4 below.

As fire, mechanical disturbance and wind damage are the most common contemporary causes of rainforest degradation, each area to be protected would comprise both the stand of rainforest and a buffer of an appropriate width. The CFP requires a buffer to linear stands of rainforest to be at least 20 m wide; elsewhere the minimum buffer is 40 m.

Leadbeater's possum

The status of Leadbeater's possum is discussed in Chapter C - Nature Conservation Reserves. That chapter also discusses the habitat requirements of the possum and proposes a set of principles and provisions for the conservation of that habitat.

Under current management prescriptions for Leadbeater's possum, all areas of mature and over-mature ash forest (equivalent for most purposes to the older-aged forests discussed in Chapter C and comprising some 8200 ha of the currently available net productive area of the forest) will be protected from all types of timber harvesting - other than low-intensity selective logging specifically undertaken for habitat development. In addition, all suitable hollow-bearing trees will be protected. Nevertheless, the mature and over-mature ash forests are at present part of the resource on which the current legislated sustainable timber yields have been calculated; to not harvest them will reduce the total resource available to the industry.

Prescriptions for Leadbeater's possum recognise that the regrowth ash forests change structurally and floristically through time and, at certain stages, will not contain all the essential resources that the animal requires. The prescriptions would evolve as new data become available but would essentially reserve areas only while they contain optimal habitat - a concept of a temporary reserve system.

In addition, CNR is using aerial photograph interpretation to aid prediction of Leadbeater's possum habitat by identifying areas of mature ash forest and large hollow-bearing trees emerging over regrowth forest. This is currently targeted at those forest management blocks in which timber harvesting is to take place. Potential habitat is also identified during on-ground assessment of potential logging areas, as many hollow-bearing trees and the wattle understorey are below the canopy of the ash regrowth and are not evident on the photographs.

By July 1993, about 55% of all ash forest within the known distribution of the possum (including the Melbourne Water catchments) had been assessed for suitable habitat. This amounts to some 180 000 ha, of which about 10% is regarded as suitable Leadbeater's habitat.

The assessments also indicated that (for the forest management blocks investigated to the present) about 10% of suitable habitat coincides with areas that would normally be excluded from harvesting under the CFP. However, research suggests that some of these areas may not be preferred habitat. As discussed in Chapter C, the habitat requirements of Leadbeater's possum are best met by an ample supply of short, large-diameter trees with numerous hollows, a dense understorey to facilitate movement and an adequate supply of food, which is found in the combination of wattles and eucalypts. In the Central Highlands, such habitat currently occurs in those areas of 1939 ash regrowth that contain a high density of dead, older trees and a wattle understorey. Harvesting here would impact on the current Leadbeater's possum population, although these forests are likely to be of little value as habitat in 50 or so years' time because the nest trees are collapsing at a rapid rate. In other areas, with a lower density of nest trees, the impact of timber harvesting on current Leadbeater's populations is probably less important.

Under current prescriptions, available ash forests will be cut over every 80 to 120 years. Because ash trees do not begin to develop hollows until they are about 120 years old and are unlikely to provide suitable nest sites for

Leadbeater's possum until they are around 200 years old, very few nest trees will be available on harvested sites in the longer term, unless alternative silvicultural practices can be developed. It should be noted, however, that the CFP specifies a maximum coupe size of 40 ha (many in the Central Highlands do not exceed 20 ha) and the distribution of the coupes over a wide area. These provisions, together with the existence of stream-side reserves, wildlife corridors and retained habitat trees, should decrease the impact of harvesting on Leadbeater's nest sites.

Of the 170 500 ha of regrowth and older-aged ash forest in the study area, about 75 300 ha or 44% either lies within parks and other reserves (prior to these recomendations) or is exempted from harvesting under the CFP because it is unmerchantable, occurs on steep or rocky areas or adjoins streams. This leaves a net productive area of some 95 000 ha of ash forest currently available for wood production (see Table 11).

The combination of existing and new parks and reserves that conserve important attributes of the region also include key elements of the habitat of Leadbeater's possum. Together with management of the remaining State forest according to the CFP and the principles outlined in Chapter C, the area of ash-type forest indicated in Table 14 will be exempted from harvesting and will be permitted to develop naturally; providing habitat for hollow-dependent fauna in the long term.

Table 14

ASH-TYPE FOREST RETAINED IN THE LONG TERM

Location of ash forest	Area (ha)
Existing parks, reserves and the Maroondah, O'Shannassy and Upper Yarra catchments	35 087 (regrowth ash) 15 868 (mature ash)
Excluded by prescription and areas unsuitable for timber production	18 463 (regrowth ash) 5 932 (mature ash)
Additional areas in recommended conservation reserves	1 798 (net regrowth ash) 670 (net mature ash)
	77 818

Notes:
1. The resource documents indicate that an additional 3925 ha net of mature ash forest is located in State forest.
2. The total area of ash type forest in the study area amounts to some 170 500 ha, of which 119 574 ha is in State forest.

These recommendations, together with existing provisions under the CFP and other measures for environmental protection, mean that some 46% of the total area of ash forest would not be used for timber production and would be protected in the long term for wildlife habitat.

Implications of proposals for new parks and reserves

Given the information outlined earlier in this chapter, the Council considers that the timber industry is a significant component of the Victorian economy. The Council believes that the industry is responding positively to the structural changes required and it would be inappropriate to deny the opportunity for a substantial increase in value-adding and to create significant social disruption through the total withdrawal of the ash-timber resource of the Central Highlands.

The Central Highlands will also continue to be a very significant source of high-quality pulpwood for Australian Paper and could provide an important resource of ash pulpwood for any future expansion of pulp and paper production.

Following consideration of the need for adequate representation in nature conservation reserves of the significant environmental values occurring in the Central Highlands, the Council is recommending that a large proportion of the area (some 63%) be State forest.

Council recognises the importance of the study area for timber production and believes that, subject to the protection of specific values and the provisions of the CFP, this use should be permitted to continue in State forest.

Production of hardwood sawlogs should continue to be the primary goal in harvesting operations. Pulpwood should be obtained only as a by-product from sawlog operations or in the course of salvage operations or silvicultural treatment such as thinning.

The Council also supports the value-adding initiatives of the timber industry and believes this should be encouraged to ensure that the different grades of wood are processed to their full value by putting them to their best use. It also supports export initiatives and those that replace imports of wood and paper products.

It is not the role of the Council to determine the extent or rate of use of forests for timber

production. Forest management policies will determine the level of timber offered for sale from State forest within the framework of the legislated sustainable yield and commercial licensing agreements. Irrespective of the level, all operations must be sawlog-driven and carried out in accordance with the CFP and on an ecologically sustainable basis.

As outlined in Chapters A (Parks) and C (Nature Conservation Reserves), the Council also considers that the Central Highlands contains significant environmental values that warrant specific protection in the reserve system. The Council is therefore recommending that a major new national park be established in the Central Highlands, centred on the three main water supply catchments managed by Melbourne Water. These catchments are to be linked through the upper catchments of the Acheron River and Cement and Armstrong Creeks.

Implications for wood supplies

The recommendations for new reserves that would affect available wood resources are the Ash Ranges National Park (Recommendation A12) and the addition to the Baw Baw National Park (A8). The wood resources within these areas, in terms of the respective forest management areas, are indicated in Table 15.

Table 15

CURRENTLY AVAILABLE WOOD RESOURCES WITHIN PROPOSED NEW PARK AREAS

Forest type	Age class	Area statement net productive area (ha)	Volume statement	
			Sawlogs (cu.m)	Pulplogs (cu.m)
Central FMA				
Ash species	mature	476	53 151	115 575
	1939 regrowth	945	177 416	201 972
Dandenong FMA				
Ash species	mature	194	35 040	44 340
	1939 regrowth	766	138 264	184 263
Mixed species	mature	895	21 666	46 486
	1939 regrowth	50	5 385	14 743
Central Gippsland FMA				
Ash species	1939 regrowth	87	5644	14 358
		Total volume:	436 566	621 737

Source: Department of Conservation and Natural Resources, July 1994.

Implications for employment and associated communities

Following Stage 2 of their study undertaken for the Council, the consultants Henshall Hansen Associates and Read Sturgess and Associates provided their report 'A Social and Economic Impact Assessment of Draft Proposed Recommendations for Land Use in the Central Highlands (Melbourne Area District 2), Victoria' 1993.

The consultants estimated that if the proposed recommendations were implemented and if the level of log output was reduced during the current licence period, the total reduction in sustainable yield of sawlogs (5100 cu.m per annum) would involve the displacement of about 22 jobs in the sawmilling industry - that is, in jobs involved to the point of products being despatched from the mill door. Beyond the mill door, a further 33 jobs could be displaced. Because the sawlogs are supplied to a number of sawmills in various towns, the impact would not necessarily be experienced in the one area. It would most likely be dispersed across the industry. The addition in these recommendations of the Donna Buang Face and the link between Whitehouse Creek and Lake Mountain to the Ash Ranges National Park and

a small addition to the Baw Baw National Park would imply further job losses over and above those estimated by the consultants.

Council is concerned about these potential implications and the flow-on effects in terms of employment and current and future investment about the potential implications for some local communities in the study area, particularly in the present economic climate. It is also aware that other factors relating to the management of State forests are likely to impact on sustainable yield of timber from the study area, including detailed resource inventories and development of forest management plans currently under way.

The impact of these is yet to be determined, however it is quite possible that the net effect will be an increase in sustainable yield - which would offset any decrease resulting from Council's recommendations.

For these reasons, the Council is recommending that the government, if it accepts the Council's proposals for parks and reserves in the Central Highlands, should also maintain the current legislated sustainable yield levels until the year 2001. Long-term harvesting licences have been issued on the basis of those legislated sustainable yield levels.

This proposal would avoid any direct or indirect loss in employment in the industry as a result of the Council's recommendations.

Implications for sustainable yield

Under this scenario, the Council's proposed recommendations would have no implications in terms of current legislated sustainable yields until 2001. However, CNR has estimated that during the licence period 2002 to 2016, the Council's recommendations would result in reductions to future sustainable yield levels of around 2.6%, 12.5% and less than 1% in the Central, Dandenong and Central Gippsland FMAs respectively. These estimated reductions may not be necessary as CNR is carrying out a more detailed inventory of resources and is preparing a forest management plan, the results of which may indicate, as previously anticipated, that additional wood will be available, offsetting the impact of Council's recommendations.

These figures do not take account of requirements outside the recommendations of the Council, that may also affect sustainable yield levels.

While it is recognised that this approach delays decisions about the actual level of future sustainable yields from the three FMAs in the Central Highlands until more comprehensive information is available, Council believes that it is necessary and appropriate to minimise the short-term impact of the proposed land-use changes.

Furthermore, as indicated earlier, the timber industry based on native hardwoods is undergoing significant changes in response to the increasing availability and use of softwood timbers in traditional hardwood markets and changes in international markets. The hardwood industry has already made important changes and is shifting towards the production of greater volumes of dried and seasoned hardwood for use in producing value-added goods. It is also expanding existing markets for these products and developing new markets.

The industry maintains that it will be able to use all available timber supplies provided it can develop domestic and export markets with certainty as to the future availability of wood. By 2001, the State government will know whether the industry can achieve this goal and will then be better placed to determine future sustainable yield levels, taking into account both environmental and economic factors.

Given the significant changes that are taking place in the timber industry, including the uncertainty about the contribution that plantation timbers might play in the future, the Council believes that this course of action is appropriate and justified and provides the greatest flexibility for the government in terms of making decisions about the long-term allocation of timber from State forests in the Central Highlands.

THOMSON RIVER CATCHMENT

A number of submissions proposed that the whole of the Thomson River catchment should be included in a national park. As part of its consideration of parks and reserves in the Central Highlands, the Council undertook a detailed evaluation of the representation of major land systems, vegetation and fauna in existing conservation reserves and identified any gaps in that representation.

Based on the evaluation, the Thomson catchment made no significant contribution to overcoming some of the deficiencies identified and the therefore Council considered that the

catchment should not be included in the conservation reserve system.

That is not to say that the Thomson catchment has no conservation value. On the contrary, it contains some significant, but generally localised, sites with important botanical and historical values. The Council considered that such values were better represented elsewhere and that, in special cases localised sites could be adequately protected by the CFP and management prescriptions.

Unlike some of the other water supply catchments providing water to the Melbourne metropolitan area, the Thomson is not a 'closed catchment'. It currently provides for a range of uses including recreation and timber production as well as water production. The reason such activities can be permitted is that the long detention times for water in the Thomson Reservoir and, subsequently, the Upper Yarra Reservoir, reduce the risk of water-borne disease reaching metropolitan consumers.

More recently, it has been proposed by some conservation groups that all timber harvesting cease in the Thomson catchment on the basis that harvesting on an 80-year rotation reduces the volume of water that the catchment could supply. This was the subject of a two-stage economic study and is discussed in the Chapter D - Water Production. The Australian Conservation Foundation (ACF) suggested that Melbourne Water should pay to replace wood resources or compensate the timber industry and dependent industries for timber forgone if logging in the catchment were to stop. If such a program were to proceed, some thousands of hectares of new eucalypt plantations would need to be established to substitute for the pulpwood resources of the Thomson catchment.

A number of conservation groups has suggested that domestic and overseas softwood timber will supply virtually all domestic markets for structural timber at the expense of hardwood timbers. They advocate a phase out of all timber harvesting from native forests.

As discussed earlier, the timber industry argues that it is responding to the loss of traditional markets for hardwoods by developing new markets for kiln-dried value-added hardwood products. It further argues that, instead of the demand for hardwood timbers from native forests declining, similar volumes of wood will be required to supply new and expanding markets (both domestic and overseas) in value-added products.

Although it is conjectural as to which scenario will eventuate, industry argues that the outcome should be determined by market forces, not government policy intervention. However, the Council considers that government has a responsibility to set the broad framework with respect to the use of a public resource. Council therefore believes that the community has the right to know how a public resource will be used in the future.

In relation to the future of the timber industry a number of issues must be addressed. First, it must be decided whether net social, economic and environmental benefits would accrue by excluding timber harvesting from all native forests and replacing it with timber from plantations of both hardwood and softwood on private land.

If such net benefits would accrue, then a number of other matters should be clarified and taken into account:

* the area of land that would be required to match the existing sustainable levels of output of sawlogs and pulpwood
* whether sufficient land of suitable site quality is available for plantations within economic distances of major processing facilities to meet virtually all future timber needs
* whether plantations can produce the desired quality of sawlog and pulpwood suitable for value-added sawn timber and internationally competitive paper commodities
* whether current planning constraints on the establishment of plantations on private land can be overcome
* what impact a major expansion of plantations would have on agricultural production and the communities that depend on it
* the cost and the source of funds to purchase private land if necessary
* whether the difficulties associated with leasing private land for plantations can be overcome to the satisfaction of the landholder, the local community, the timber industry and the government

* the social implications of a major expansion of plantations in rural areas
* the contribution that agroforestry and farm woodlots could make to sawlog and pulpwood requirements
* the environmental benefits and costs of plantation establishment
* the period of transition from native forests to plantations

The Council believes that further work should be undertaken to address these matters, but, until satisfactory answers are available, native forests will be required to supply timber for both sawn products and paper commodities. The timber industry is a vital component of the Victorian economy and of many local communities. It has the potential to make a significant contribution to import replacement, if it can become internationally competitive. An important component in achieving that competitiveness is security of supply of resources and the Council believes that timber from State forests will provide that security for the foreseeable future, in accordance with legislated sustainable yields and proper management of forests, as specified in the Timber Industry Strategy.

If it becomes clear in the future, however, that the demand for hardwood timbers from State forest is declining, it would be wise to ensure that areas scheduled for harvesting were selected where no external costs - such as reduction in water yield in domestic water-supply catchments - would result. In determining the relative priorities of areas to be withdrawn from harvesting in the event of such a reduced demand, the consultants' economic study would indicate that the Thomson catchment would be among those with the highest priority for re-assessment.

Land managed by water authorities

Substantial areas of forested public land in Melbourne Area, District 2 are managed by Melbourne Water and Gippsland Water, manages land in the vicinity of the Moondarra Reservoir.

After accounting for those areas included in the new parks and actually involved in protection of water-supply facilities and reservoirs, a number of forested areas of public land remain, such as those abutting aqueducts or as buffers to the water-supply catchments or surrounding reservoirs, which are managed by the respective water authorities but do not fall into these categories.

Melbourne Water and Gippsland Water retain these areas principally to control access around the water-supply facilities and for fire protection purposes. The areas form integral parts of the regional landscape. Various activities are permitted in them, including timber harvesting, farming or quarrying. Although these areas are described in this chapter and shown as part of State forest on Map A, Recommendation E8 below provides for them to remain the responsibility of the respective water authorities.

STATE FOREST

Recommendations

E1 That the areas shown on Map A be used in accordance with the principles outlined above to:

(i) supply water and protect catchments and streams (see Note 2)

(ii) produce hardwood timber, subject to the following:

(a) harvesting of timber should proceed in accordance with the Code of Forest Practices for Timber Production and relevant prescriptions

(b) research programs established to monitor the environmental effects of harvesting operations should be continued and adequately funded to ensure statistically valid results and modifications to operational procedures and principles should be made progressively as new information becomes available

(c) rotation length should continue to be geared to the production of high-quality sawlogs, with a nominal length of 80 years

(continued)

E1 Recommendation (continued)

and

(d) a range of silvicultural strategies for achieving adequate regeneration within State forest being investigated under the Silvicultural Systems Project should be evaluated by the Department of Conservation and Natural Resources, and those that are determined to be the most appropriate methods (taking into account environmental, economic, social and safety factors) should be adopted for the Central Highlands forests as soon as possible

(iii) conserve native plants and animals, and provide opportunities for the development of wildlife conservation techniques

(iv) provide opportunities for open-space recreation (including hunting) and education

(v) produce honey, forage, gravel, sand, road-making materials and other forest products

that

(vi) in order to minimise the social and economic implications of any reduction in the availability of timber resources, currently legislated sustainable yield levels applying to the study area be maintained until the next supply period commencing in the year 2002

and that they remain or become State forest under the provisions of the *Forests Act* 1958 or similar legislation, and managed by the Department of Conservation and Natural Resources.

Notes:
1. This recommendation covers land recommended by the Council in 1977 for hardwood production, forest area (adjacent to plantations) and uncommitted land, with the exception of areas for which other recommendations have been made in this review. The land formerly classed as 'forest areas' provides a valuable contrast to the landscape and nature conservation values of the adjoining plantations; management of these areas should ensure that they continue to fulfil this function (see also Chapter K - Plantations).
2. Management of the Royston and Rubicon River catchments should ensure that the quality of water used by Generation Victoria's hydro-electric scheme and other downstream water-users is not diminished. Existing prescriptions preclude timber harvesting within 80 m upslope of the aqueducts and 20 m downslope.
3. Small areas of State forest at Marysville and Warburton have been identified as being available for exchange for freehold land (see Chapter O).

Pulpwood production

E2 That pulpwood production be permitted except that:

(i) it be tied strictly to the harvesting of sawlogs in an integrated operation unless it is obtained from salvage operations, silvicultural thinning programs in regrowth stands or timber-stand-improvement work aimed at providing a higher production of sawlogs at final harvesting

and

(ii) it be permitted only on those areas that presently support or have the potential to support forests greater than 28 m top stand height.

Visual management system

E3 That the visual management zones identified by the application of the visual management system be incorporated in regional plans and the land be managed accordingly.

(continued)

Recommendations (continued)

Rainforest

E4 That the areas indicated generally on Map A be used to conserve rainforest

that

(i) each area be protected by a buffer, the width of which should be delineated taking into account the factors outlined above

(ii) when logging operations are conducted in the adjoining forests, no tree is to be fallen into the rainforest or buffer

(iii) recreation activities that do not compromise the integrity of the rainforest be permitted

(iv) grazing and the production of gravel, sand and road-making material not be permitted

(v) all plans for new roads or road-improvement works for those sections falling within rainforest should be submitted to the authority managing the rainforest for approval

(vi) that they be permanently excluded from timber harvesting

and that these areas continue to be managed by the Department of Conservation and Natural Resources.

Notes:
1. Some areas of rainforest may be located within land managed by water authorities included under Recommendation E8 below. These areas would remain under water authority control but management should be in accordance with this recommendation.
2. At the scale of mapping used, the boundaries to the areas cannot be accurately defined nor are all areas of rainforest necessarily indicated. The areas are indicative only of the location of sites of rainforest occurrence and do not suggest areas for reservation.
3. Further areas of rainforest may be identified in the future; this recommendation should also apply to these areas.
4. The Code of Forest Practices for Timber Production specifically excludes timber harvesting from rainforests and a buffer surrounding the rainforests.

Leadbeater's possum

E5 That:

(i) management of the habitat of Leadbeater's possum and other hollow-dependent fauna be in accordance with the principles set out in Chapter C and, following their completion, with the strategies suggested under the Flora and Fauna Guarantee Action Statement

and

(ii) priorities for research into the habitat requirements for Leadbeater's possum in State forest include establishing the minimum necessary dimensions of wildlife corridors.

River zones

E6 That, for those sections of streams described in Schedule 1 below and indicated by cross-hatching on Map A, primary aims of management be:

(i) the protection of natural and scenic features

(ii) the provision of recreational facilities and interpretative aids where this does not conflict with (i) above

(continued)

E6 Recommendations (continued)

that

(iii) timber harvesting and gravel extraction not be permitted

(iv) any new roading be constructed only where essential for the purposes of management, protection and transport of timber and be designed to minimise effects on scenic and nature conservation values

and that management be the responsibility of the authority managing the adjacent public land.

Notes:
1. Portions of some streams designated as river zones also include areas for the protection of rainforest. Management in these portions should give priority to the protection of the rainforest, but should recognise that they also contain a valuable recreational and scenic resource.
2. The hatching on the map should not be taken as delineating exact boundaries to the river zones. It is intended that these zones should include both the visual corridor (comprising those parts of the valley that can be seen from the stream) and the environmental sequence from relatively dry foothill country, through the species-rich intermediate zone, to the riverine section. In many areas the visual corridor will include this sequence and as such will determine the width of the zone. In other places, however, not all of the environmental sequence will be visible from the stream and in these cases the natural features zone will extend beyond the visual corridor. It is not intended that the width of river zones delineated under these guidelines would be less than the buffer strips along streams required by forest management prescriptions or delineated by land-use determinations for a water-supply catchment. While the extent of the zone will vary according to local circumstances, it is expected that it will seldom be less than 100 m or greater than 300 m from the bank on either side of the stream. This zone should be delineated on management plans where appropriate.

Special features to be protected

E7 That the special features in areas of State forest, some of which are listed in Table 16 below, be protected under section 50 of the *Forests Act* 1958, section 4 of the *Crown Land (Reserves) Act* 1978, and the *Flora and Fauna Guarantee Act* 1988, or through the implementation of management prescriptions, as appropriate.

Land managed by water authorities

E8 That the areas of land, described below, continue to be managed by the relevant water authority to protect water quality and as a complement to the adjoining public land.

These areas include:

Melbourne Water land (both vested and freehold)

* buffers to the Wallaby Creek and Maroondah catchments
  Notes:
  1. The Wallaby Creek Lodge and farms in the buffer to the Wallaby Creek catchment are excluded from the area considered under this recommendation (see Chapter N).
  2. A small plantation of Californian redwood planted in the buffer to the Wallaby Creek catchment was established in the early 1930s. It is of historical significance as a contrast to the adjacent mountain ash forests and as a relic of the experiments of the former Melbourne and Metropolitan Board of Works.
* abutting the O'Shannassy and Coranderrk aqueducts
* at McMahons Creek.
* in the Cement Creek basin

(continued)

E8 Recommendations (continued)

Gippsland Water land (both vested and freehold)
*adjacent to the Moondarra Reservoir
Note: This land supports hardwood forest and some 420 ha of softwood plantation that Gippsland Water is managing for wood production.

Central Highlands Sanctuary

E9 That the Central Highlands Sanctuary be revoked.

Schedule 1

STREAMS ON WHICH RIVER ZONES APPLY
(Recommendation E6)

Goulburn River (upstream of Lake Eildon to Woods Point)

Notes:
1. That portion of the river in Council's Alpine study area already carries such a zoning.
2. An extensive, relatively intact example of riparian forest and associated communities is located between Knockwood and Woods Point.
3. The rare species common spleenwort (*Asplenium trichomanes*) and cliff cudweed (*Gnaphalium umbricola*) are located on a cliff overlooking the river near the Jamieson—Woods Point Road.
4. Large-footed myotis (*Myotis adversus*) - a rare species - and the restricted common bent-wing bat (*Miniopterus schreibersii*) are also found here. The threatened species barred galaxias is found in the Woods Point area and a large population of the endangered spotted tree frog is located at the confluence with the Black River.
5. The river has high scenic value and is popular for fishing and canoeing.

Jamieson River

Note:
That portion of the river in Council's Alpine study area already carries such a zoning.

Tyers River (west branch)

Notes:
1. That portion of the west branch that fell within the area covered by Council's Hill End Special Investigation already carries such a zoning.
2. The alluvial plains support well-developed riparian forest with small scattered stands of cool temperate rainforest.
3. High densities of the rare sooty owl (*Tyto tenebricosa*), the most westerly population in Victoria of the leaf-green tree-frog (*Litoria phyllochroa*), the rare large-footed myotis (*Myotis adversus*) and the rare tree goanna (*Varanus varius*) are located within this zone.

Murrindindi River (upstream of the Murrindindi Natural and Scenic Features Reserve - Recommendation G37)

Notes:
1. This section of the river supports a wide variety of well-developed riparian vegetation communities - riparian forest, riparian thicket and swampy riparian forest, and cool temperate rainforest.
2. This is a popular stream for fishing and a number of picnic sites are provided.

Acheron River (downstream from the Ash Ranges National Park)

Notes:
1. A similar zone has been delineated under current Forest Management Plans.
2. A wide variety of relatively mature and undisturbed riparian vegetation occurs along this valley with cool temperate rainforest in its upper reaches.
3. Leadbeater's possum and sooty owl have been recorded in the zone.
4. The remains of concrete seasoning kilns and a steam engine of Feiglin's No. 1 sawmill (1934) are located here.
5. The zone includes the popular tourist route the Acheron Way and 'Somers Park' and a number of other picnic sites.

Snobs Creek (including the Snobs Creek Falls)

Notes:
1. A similar zone has been delineated under current Forest Management Plans.
2. The zone passes through a range of vegetation communities - from grassy dry forest, through damp forest and wet (mountain ash) forest, to montane damp forest, and including rainforest.
3. The rare species common spleenwort (*Asplenium trichomanes*) is located at Snobs Creek Falls.
4. Leadbeater's possum has been recorded in this zone.
5. Road cuttings provide a complete geological section of the Cerberean Cauldron - an Upper Devonian sedimentary-volcanic sequence overlying folded Silurian—Devonian sediments and including a number of ring dykes.
6. The zone includes land formerly reserved as part of the Snobs Creek fish hatchery. Council believes that the hatchery itself is more appropriately set aside as a services and utilities reserve (see Recommendation M21) and that a specific reserve along stream frontage is unnecessary. Nevertheless, management of the catchment should ensure that the quality of water used by the hatchery and other downstream water-users is not diminished.

La Trobe River (upper and middle sections)

Note:
Downstream of Noojee, this zone contains well-developed riparian forest and an associated unusual heathy foothill forest variant with a sparse, tall shrub-layer of black sheoke (*Allocasuarina littoralis*).

Toorongo River (including the Toorongo Falls)

Note:
The continuous strip of riparian forest and wet (mountain ash) forest here retains a high level of naturalness and includes scenic fern gullies.

Table 16

SPECIAL FEATURES TO BE PROTECTED IN STATE FOREST
(Recommendation E7)

These are grouped by geographic regions and Forest Management Areas to assist managers and others to locate the sites.

The joint study of the Central Highlands by the Department of Conservation and Natural Resources and the Australian Heritage Commission (AHC) identified a range of sites, some of which reach the threshold established by the AHC for inclusion on the register of the National Estate. Many occur in the parks and other reserves recommended by the Council or are included in the following schedule of special features to be protected in State forest. Where appropriate, other significant sites that have been identified by this or subsequent studies should also be accounted for in management plans.

Mounts Tallarook and Disappointment, Toolangi and Black Range forests (Central Forest Management Area - west of the Maroondah Highway)

Historical sites:

* Mount Robertson mine and battery
* Robbie's sawmill, Narbethong; remains of a typical recent sawmill (1934—1960s) and associated tramway

Nature conservation:

* rocky outcrop scrub community at Strath Creek Falls
* occurrence of tree geebung (*Persoonia arborea*) in the Yea River headwaters
* population of eastern grey kangaroo (*Macropus giganteus*) at Mount Tallarook
* habitat of the powerful owl in the central area of the Tallarook State forest

Recreation sites and landscape:

* landscape values of the forested escarpments of the Mounts Tallarook and Disappointment forests as viewed from the Hume Highway
* Murchison Falls and Strath Falls and their environs
* the natural environs of the Mounts Despair and Disappointment lookouts
* Sylvia Creek falls and its environs
* the environs of the Toolangi—Black Range Forest Drive

Marysville, Rubicon, Big River and upper Goulburn River forests

(Central Forest Management Area - east of the Maroondah Highway)

Historical sites:

* geodetic cairns at Mt Useful (Central Gippsland), Mt Matlock and the Switzerland Ranges (west of the Maroondah Highway) - constructed during a survey in the 1860s
* sites of former hotels and other settlements along the old Yarra Track, such as Paradise Plains and the Travellers Rest Hotel
* Old Kevington township and the adjacent Sailor Bills Creek mines
* the environs of Gaffney's Creek settlement and the adjacent Wallaby Creek mines - relatively intact sites dating from between 1864 and 1912, and from 1923 to 1927
* townships along the upper Goulburn River at Tunnel Bend, Knockwood, A1 Settlement and Woods Point
* Enoch's Point mines (and the nearby Luck's All Mine) - relatively intact sites dating from between 1864 and 1915
* Leviathan Creek mine workings - a relatively intact site dating from between the 1860s and 1898
* Clarke and Pearce New No. 4 and No. 5 Mills, Royston River; remains of an extant pre-1939 saw mill and another that operated from 1931 to 1953 and associated tramways and log landing sites
* Mount Margaret tramway, Marysville; includes one of Victoria's most intact incline features
* tramways to the south of Marysville, bridges, gearing, huts and stables dating from 1934 to 1945/55
* Snobs Creek tramway, and possibly the best-preserved tramway-lowering gear in the State

Nature conservation:

* unusual occurrence (at an unusually low altitude) of sub-alpine woodland below montane damp forest, at Mount Strickland
* mature and relatively undisturbed riparian vegetation of Springs and Oaks Creeks (occurs both within and upstream of the Big River Heritage River)
* relatively undisturbed and well-developed examples of riparian forest, swampy riparian forest and riparian thicket on the Torbreck River
* the rare forest sedge (*Carex alsophila*) in the headwaters of the south branch of the Torbreck River
* the rare Baw Baw berry (*Wittsteinia vacciniacea*) on Storm Creek, in the headwaters of the south branch of the Torbreck River and in the headwaters of the Royston and Taggerty Rivers
* the rare snowdrop wood-sorrel (*Oxalis magellanica*) in the headwaters of the Royston and Taggerty Rivers
* a population of the vulnerable species sparkling mint bush (*Prostanthera rhombea*) beside Red Hill Track near Mount Timbertop
* stands of the vulnerable *Eucalyptus alligatrix* near the junction of the Taponga and Big Rivers
* box woodland, a vegetation class of limited distribution, and the stand of white box (*Eucalyptus albens*) in the Mt Proctor—Puzzle Range area
* a stand of the rare Omeo gum (*Eucalyptus neglecta*) on Monument Creek (a tributary of Frenchmans Creek)
* the rare powerful owl (*Ninox stenua*), and populations of the rare species large-footed myotis (*Myotis adversus*) and mountain dragon (*Amphibolurus diemensis*) in the Taponga River catchment
* the habitat of the endangered spotted tree-frog (*Litoria spenceri*) in the Taponga River and tributaries - see also the discussion in Chapter C
* the rare smoky mouse (*Pseudomys fumeus*) and the rare mountain dragon in the Mount Terrible area
* the habitat of the endangered Leadbeater's possum (*Gymnobelideus leadbeateri*) and other species closely associated with mountain ash forest - see also the discussion earlier in this chapter and in Chapter C
* the habitat of the endangered brown (barred) galaxias (*Galaxias olidus* var *fuscus*) in the headwaters of the Goulburn River system - in the Torbreck River, Pheasant Creek, Perkins Creek, Godfrey Creek, Raspberry Creek and Gaffneys Creek
* cutting on the Blue Range Road, Taggerty, exposing fossiliferous lake deposits and the volcanic sequence of the Cerberean Cauldron

Recreation sites and landscape:

* the natural environs of Lady Talbot Drive, Marysville (portion lies within the new Ash Ranges National Park)

* landscape values of the forested escarpments as viewed from the Maroondah and Goulburn Valley Highways
* the environs of the Marysville to Woods Point, Warburton to Woods Point and Jamieson to Woods Point Roads, and the Lake Mountain access road

Yarra forest
(Dandenong Forest Management Area)

Historical sites:

* 'The Bump' tunnel, Powelltown; the longest of only three timber tramway tunnels in Victoria and associated with the only timber company that ran a scheduled passenger service
* winch and landing sites, Big Creek Road: an excellent example of post-war timber harvesting technology
* State sawmill site - remains of the first government sawmill
* Lower Goodwood seasoning kilns - the best remaining in the study area
* Old Federal Mill, Starvation Creek

Nature conservation:

* the large population of the otherwise severely depleted black sheoke (*Allocasuarina littoralis*) at Paul Range
* the, now rare, examples of ecologically mature and undisturbed damp forest on Starvation Creek (north)
* populations of the rare Nunniong everlasting (*Helichrysum rogersianum*) at McMahons Creek (north)
* the occurrences of the rare small fork-fern (*Tmesipteris ovata*)
* the vulnerable tall astelia (*Astelia australiana*) within the upper Bunyip River catchment (Council is aware that a moratorium has been placed on timber harvesting in some areas to protect this species - see Chapter C.)
* the habitats of Leadbeater's possum and sooty owl

Recreation sites and landscape:

* the landscape value of Pauls Range
* landscape values of the land bordering the Corranderrk and O'Shannassy aqueducts
* the natural environs of Mount Beenak
* the environs of the La La Falls at Warburton
* the Ada Big Tree and associated walking tracks

Tarago—Latrobe, Neerim and Tanjil—Tyers forests
(Central Gippsland Forest Management Area - west of the Baw Baw road)

Nature conservation:

* the rare gully grevillea (*Grevillea barklyana*) within the catchments of the Bunyip and Tarago Rivers and Ryson Creek
* the rare bristly shield-fern (*Lastreopsis hispida*) within the upper catchments of the Bunyip and Tarago Rivers
* the rare tree geebung (*Persoonia arborea*) within the upper catchments of the Bunyip and Tarago River and on the Toorongo Plateau
* the rare Baw Baw berry (*Wittstenia vacciniacea*) on the Toorongo Plateau and the slopes of Mount Toorongo
* the rare forest sedge (*Carex alsophila*) on the Toorongo Plateau
* the habitat of Leadbeater's possum, the broad-toothed rat and other species closely associated with mountain ash forest

Recreation sites and landscape:

* Cascade Creek and Toorongo Falls
* the environs of the Spion Kopje and Mount Toorongo lookouts
* the natural environs of the Mount Baw Baw road
* the important cultural landscape of the Noojee township and valley

Tanjil, Tyers, Neerim, Boola Boola and **Thomson forests**
(Central Gippsland Forest Management Area - east of the Baw Baw road)

Historical sites:

* the Jordan alluvial goldfield; extant features include a Chinese ceremonial oven at Jericho (the only clearly Chinese feature remaining of a major Chinese settlement on the Jordan), the tunnel at Jericho, and the cemeteries at Jericho and Red Jacket (see also Recommendation F37)
* Dry Creek and New Chum mines: the largest and most intact ore-roasting kilns known in the State
* Lily Creek - the first goldmine in the Aberfeldy district; a relatively intact and accessible site representative of works in the 1870s to 1880s

* White Star mines - two small mines that operated intermittently between 1864 and 1910. White Star No. 1 mine comprises a tunnel connected by a short tramway to a battery site, an intact site retaining a range of artefacts and is an excellent example of a small-scale operation; a number of adits and the remains of a boiler indicate the site of White Star No. 2 mine
* additional features in the Aberfeldy—Toombon region outside the recommended Toombon historical area - F18.
* Ingram's skyline, Western Tyers; the only surviving evidence of skyline logging in the study area
* Mill sites, tramways and associated trestle and make-up bridges in and around Western Tyers and Erica
* Alstergren's sawmill, Thomson valley; relics, including a dug-out, of a sawmilling operation that operated continuously between 1932 and 1950
* Bruntons Bridge; a key bridge and minor settlement beside the main road to the Walhalla goldfields
* the Walhalla tramline and associated trestle bridges

Nature conservation:

* the rare undescribed species of broom-heath (*Monotoca* sp. aff. *elliptica*) near Mount Useful
* the mature stand of montane wet forest dominated by unusually large Tingaringy gum (*Eucalyptus glaucescens*) on the south-western face of the Baw Baw Plateau
* the rare Baw Baw berry and cliff cudweed (*Gnaphalium umbricola*), and the vulnerable long clubmoss (*Lycopodium varium*) and elongate fork-fern (*Tmesipteris elongata*) on the south-western face of the Baw Baw plateau
* the fern filmy maidenhair (*Adiantum diaphanum*) adjacent to Deadlock Creek at Allambee: the general area here supports a good remnant of largely undisturbed wet (mountain ash) forest and includes slender tree-fern

Recreation sites and landscape:

* the environs of the Alpine Walking Track, the route of which is indicated on Map A (see also Chapter J - Community Use Areas; guidelines for the protection of the Alpine Walking Track are provided in Appendix VII)
* the environs of the Walhalla tramway; Thomson River bridge
* the scenic landscape of the Mount Erica range as seen from the Thomson Valley Road

F. HISTORIC AND CULTURAL FEATURES RESERVES

Sites of historical importance associated with pre-European occupation, and with European exploration, pastoral and agricultural development, settlement and the utilisation of timber, water and mineral resources, are found on both private and public land through Melbourne Area, District 2.

For this review, the Council commissioned the report 'Aboriginal Occupation of the Melbourne Area, District 2' (Goulding 1988), which outlined pre-contact Aboriginal culture and post-contact history, summarised archaeological studies and discussed the significance of particular sites.

In addition, the Council commissioned the Historic Places Section of the Department of Conservation and Natural Resources (CNR) to carry out an investigation of the 'European' history of the area. The resulting report contains a substantial and wide-ranging general history, and detailed reports on some 340 historical sites that include significance ratings according to defined criteria (Supple *et al.* 1980). The report forms the basis for the following recommendations.

The general history - 'Fire, Water, Timber and Gold' - identified and introduced the following major themes that (except for fire) also classified the sites: tracks (and settlement), farming, mining, forests (and sawmilling), fire, water and recreation. These themes represent uses that had a major influence on the development and condition of the study area. This was subsequently expanded into the book 'Secrets of the Forest' (Griffiths, 1992), which captures the fascinating history of the Central Highlands ash forests.

The reports from the studies of both Aboriginal occupation and European history are available for inspection at the Council's office.

There is considerable interest in the community about the State's history. This interest is likely to increase, particularly as more becomes known about historical relics located on public land. Council considers that sites of historical interest should be managed to promote public awareness of the history of the area and that they should be protected as far as possible from progressive deterioration arising from exposure to the weather and from accidental or deliberate damage by the public. Community groups have assisted with the maintenance of a number of sites and, where carried out under professional guidance, can assist both in promoting awareness and in site management.

Historic and Cultural Features reserves are sites that contain important relics or have historical associations and range in size from large areas encompassing several historical themes to small reserves that generally have only one theme represented. The larger areas could ultimately contain interpretative centres and recreational facilities such as picnic areas and walking tracks. Others may be too small for the development of recreational facilities, although some aids to interpretation could be provided.

After considering the respective values of the range of sites in the study area, Council recommends the following reserves to represent the area's main historical themes. The recommended reserves are grouped according to their level of significance assessed by CNR. These recommendations complement the protection of sites of historical and archaeological interest within parks, and the schedules of significant features to be protected within other land-use categories (see, for instance, Chapter E - Timber Production and State Forest).

Historic Mining Sites Assessment Committee

This committee was set up in response to one of Council's recommendations in 1981 following the North Central Area investigation. It draws membership from government and non-government people whose charter is to establish a State-wide register of historical mining sites, set standards for assessment and make recommendations on the protection of sites. It is currently preparing management guidelines for mining and exploration operations in historical areas.

HISTORIC AND CULTURAL FEATURES RESERVES

Recommendations

F1—F33, F37 That the areas described below be used to:

(i) protect specific sites that have significant cultural associations or contain relics of buildings, equipment, construction works or other artefacts relating to the history of the locality

(ii) provide opportunities for recreation and education associated with the history of the locality compatible with (i) above

that

(iii) unless specified below, other uses, such as extraction of earth resources and timber harvesting, be permitted at the discretion of the land manager where such uses do not adversely affect the features of historical significance (see Note)

(iv) any earth resource exploration or extraction be undertaken in accordance with management guidelines prepared by the Historic Mining Sites Assessment Committee

(v) the re-use of buildings such as court houses and railway stations, including for community uses, be permitted where appropriate, subject to maintenance of their building fabric and, where relevant, their furniture and fittings

and that they be permanently reserved under section 4 of the *Crown Land (Reserves) Act* 1978 and managed by the Department of Conservation and Natural Resources except where otherwise specified.

Notes:
1. Normal practice in the management of such reserves is that extraction of earth resources is not permitted within 100 m of historical features.
2. For discussion and recommendations regarding disused railways, relevant to proposals F20(g), F23 to F31, refer to Chapter N - Uncategorised Public Land.

F1 Existing Walhalla Historic Area (2275 ha)

Walhalla was recommended by Council as a historic area in 1977, and includes features associated with the township of Walhalla, numerous old mine sites, miners' tracks and remnants of tramway systems.

The gold-mines of Walhalla were among the most productive in Victoria. They stimulated substantial building within the town, construction of an extensive network of tramways to supply timber for the mine boilers and pit props and, later, establishment of a narrow-gauge railway between the town and Moe. Smaller settlements developed around the main town.

Alluvial gold was first discovered at Stringers Creek in January 1863, causing a rush. Larger companies brought in batteries and treatment plants from mid-1864, and development of the area reached its peak between 1885 and 1895, when the population reached about 4500.

Fifteen mines worked Cohens Reef, producing nearly one and a half million ounces of gold. It was the richest gold-bearing reef in the world and, as such, is of geological significance. At the beginning of the 20th century less gold was being found, costs increased as the mines went deeper and the outbreak of World War I led to labour shortages. The major mines had closed by 1914 and the town gradually declined.

Despite the loss of historical features through fire, flooding or relocation, many remain. Part of the Long Tunnel Extended Mine, including its underground machinery chamber, has been re-opened as a tourist attraction. This area provides a vivid representation of Walhalla's highly productive gold-mining era, and the area is considered to be of national historical significance.

F2 Additions to the Walhalla Historic Area

Two additions to the existing Walhalla Historic Area are recommended - public land within the Township of Walhalla, which is surrounded by the existing reserve, and land to the south.

F2(a) Public land within the Township (55 ha)

Public land here contains a number of features from the gold-mining heyday of the township of Walhalla that historians consider to be of State significance. They include the cemetery (1873), band rotunda (1896), post office (1885/86), cricket ground, the entrance to one of the main mines and associated mullock heaps, relic mining machinery, tramway formations and the site of a Chinese vegetable garden. The township was the centre of activity during the gold-mining era and is now the focus of recreation in the area.

Council believes that it is now appropriate to include all of the public lands of the township in the surrounding historic area.

F2(b) Southern extension (330 ha)

This area contains a number of sites and features associated with Walhalla's gold-mining era, including the outlying settlement of Happy Go Lucky, at least four gold-mine sites, a section of the old Walhalla coach road and the Horseshoe Tunnel. Early miners cut the tunnel through a spur to divert the flow of the Thomson River, thereby allowing alluvial gold to be extracted from the dry bed.

Walhalla Historic Area

Recommendations

F1 existing Walhalla Historic Area
F2 additions to the Walhalla Historic Area

That the areas totalling approximately 2660 ha, indicated on Map A, be used in accordance with the general recommendations for historic and cultural features reserves outlined above

and that:

(vi) management of public land be co-ordinated with planning for private land to ensure the preservation of this part of Victoria's history, and to create an environment that will

(continued)

Walhalla Historic Area (continued)

allow visitors to appreciate the historical significance of the town

(vii) timber harvesting be subject to the management plan and conducted in sympathy with the prime purpose of historic areas

(viii) hunting and the use of firearms be prohibited from a zone surrounding the township (see Note 4).

Notes:

1. The boundary of the historic area recommended by Council in 1977 excluded the then township of Walhalla. The township boundaries were amended in 1983 and public land there is now recommended for addition to the reserve - see Recommendation F2.
2. The township of Maidentown, a small outlying settlement associated with the early gold-mining era of Walhalla, straddles the existing boundary of the Historic Area. This recommendation includes a small adjustment to the boundary so that the whole of the township is incorporated within the Historic Area. Council's recommendation to rationalise the boundary to the Baw Baw National Park (see Recommendation A9) involves transfer of the north-western portion of the existing Historic Area to the park.
3. A management plan was approved for the Walhalla Historic Area in 1988 and is being implemented by CNR and the local community. A Walhalla Historic Area Advisory Committee has been established.
4. Problems with the irresponsible use of firearms close to Walhalla township, including an instance of property damage, have been brought to Council's attention. Following advice from the land manager and police, the Council is recommending that a no-hunting zone be established around the Walhalla township. This zone is bounded by the Mormon Town Track, Britannia Spur Track, the Maiden Town Track and the spur through Winch Hill to the Thomson River. This exclusion zone will have little impact on the responsible hunters.
5. Council is aware that part of the former railway has been re-opened as the Walhalla Goldfields Railway and considers that this is an appropriate use.

Recommended new reserves

The following new reserves are largely based on information provided in the site reports for the history of the area. They are listed according to their relative significance - national, State or regional - as identified in those reports.

Areas of national significance

F3 Gulf Station, Yarra Glen (16 ha)

This is one of the oldest groups of farm buildings remaining intact in Victoria and the most complete example of timber-slab building construction. William Bell became a landholder at Yarra Glen in 1854 and with his three sons constructed the complex of 15 shingle-roofed timber farm buildings in the 1850s and '60s. The property remained in the same family until after World War II and - other than a shearing shed, some additions to the homestead and roofing of the buildings with corrugated iron - the farm buildings have changed little since the 1850s.

In addition to the original homestead these comprise stables, kennels, piggery, butchers' shop, schoolhouse, slaughterhouse, sheep-dip, shearing shed, a separate more recent homestead and a combination of milking shed, smithy and hayshed.

Recommendation

Gulf Station

F3(vi) That the educational, recreational and tourist values of the reserve be protected

and that the area continue to be managed by the National Trust as Committee of Management.

F4 Emerald (Puffing Billy) Railway (400 ha)

This railway originally operated between Upper Ferntree Gully and Gembrook and was used for the carriage of goods and passengers from 1900 to 1954. Since 1962 the section of the line from Belgrave to Menzies Creek has been operating as a tourist railway. It was extended to Emerald in 1965 and to Emerald Lake Park in 1975. In 1977 the responsibility for the railway was vested in the Emerald Tourist Railway Board, a statutory body responsible to the Minister for Tourism. In practice, much of the day-to-day management and operation of the railway is delegated to the volunteers of the Puffing Billy Preservation Society, whose activities are a key component of its success and viability. Reconstruction of the original railway line from the present terminus at Emerald Lake to Gembrook is in progress and is expected to be open to traffic in the year 2000.

The Puffing Billy railway is the only remaining narrow-gauge railway operating in Victoria. It was one of four built after the depression of the 1890s, when the construction of additional standard broad-gauge lines was considered too expensive, especially in hilly terrain.

Features of special historical interest include: the engines and carriages, many of which are part of the original rolling stock used on the line; the curved 90-metre-long timber trestle 'Horseshoe Bridge' over Monbulk Creek; extant features of the original station grounds, such as sidings, platforms, station buildings and sheds, most notably at Emerald (of 'outstanding historic interest') and at the Nobelius Nursery Siding, and the water tower at Gembrook; and the line itself.

The Puffing Billy Steam Railway is an integral and essential element of the Dandenongs and a major attraction for domestic, interstate and international visitors, carrying more than 200 000 passengers a year.

Other features of the railway are a steam engine museum at Menzies Creek, the forest and rural scenery through which it passes and the panoramic views southward. Remnant vegetation along the mainly narrow railway corridor is enhanced by adjoining areas of vegetation on both Crown and freehold land.

Recommendation

Emerald (Puffing Billy) Railway

F4(vi) That the recreational, tourist and educational values of the reserve be protected and enhanced

and that the area continue to be managed by the Emerald Tourist Railway Board.

(continued)

Emerald (Puffing Billy) Railway (continued)

Notes:
1. The proposed reserve includes both the area vested in the Emerald Tourist Railway Board and the area, from Emerald lake to Gembrook, over which it is Committee of Management.
2. Management of the lands within the visual and scenic corridor of the railway in a manner sympathetic with the aims of the tourist railway would enhance its value.
3. If the original Emerald station ground is required for railway purposes the play-ground presently sited on its edge should be relocated elsewhere on the station reserve.
4. Part of the Gembrook station ground area is occupied by a Country Fire Authority station. This occupation should be permitted to continue.

F5 Collins Settlement Site, Sorrento (0.04 ha)

The eastern point of The Sisters at Sorrento is part of the site of the first official attempt to establish European settlement in Victoria in 1803. While the settlement lasted only six months, it marked the end of the pre-contact period of Victoria's Aboriginal history. Except for four graves believed to originate at this time, little evidence of it remains. Since 1977, a narrow strip of land abutting the foreshore has been purchased and reserved under the *National Parks Act* 1975. A monument, look-out and visitor centre (a former dwelling) are on the site. This section of coastline is also of geomorphic significance and abuts two beaches used for boating and swimming.

Areas of State significance

F6 Alexandra Court House (0.1 ha)

An integrated complex at Alexandra combined the court house and the offices of the magistrate and warden, clerk of courts, Department of Lands and Survey and post and telegraph. It was built in two stages - 1876/77 and 1884/85 - and is of the Victorian-free classical style, with a recessed entry, Florentine arched arcade and hipped roof. It is substantially intact.

The court house is used by a continuing education program and as an arts centre. The post office section is no longer public land.

F7 Rubicon valley (1430 ha)

This recommended reserve incorporates the State's first hydro-electricity system. The system, which commenced operation in 1928, includes: four power stations - Rubicon (the principal one), Lower Rubicon, Rubicon Falls and Royston; a number of associated dams, racelines and pipelines; and a network of access tramlines, associated trestle bridges (those at Lubra Creek, Beech Creek and Fifteen Thousand are particularly impressive) and a haulage line. The system has changed little from when it was installed and, except for the replacement of some of the galvanised-iron cladding of the power house and wiring systems and the rebuilding of trestle bridges (to original specification) following fire, its original features and machinery are still intact, including the wooden pipelines.

Still fully operational, the hydro-electricity system supplies power directly into the State's main grid.

The recommended reserve also encompasses a number of sites associated with early timber harvesting. Clarke and Pearce's Old No. 1 Mill was the first one built in the Rubicon forest (1907-1939). At one stage it supported a population of 200 people. Little evidence remains of this once technologically innovative mill, however, other than a sawdust heap, stumps and a water-supply dam. Artefacts of other, later Clarke and Pearce mills remain: No. 2 Mill (1920s) and its boilers and other artefacts; Old No. 3 Mill and No. 3 Mill; *in situ* sawdust heap, steam engine and boilers of No. 4 Mill (1929); and the more recent Rubicon Lumber and Tramway Company's No. 1 mill - which Generation Victoria (see chapter M) still utilises for milling timbers for trestle-restoration works. The routes of many of the timber tramways associated with these mills can still be discerned and one of the two most intact timber tramways in this region of State forest is included within the reserve.

The history and development of the hydro-electricity scheme and the harvesting of the catchment's timber resources are inter-twined through the sharing of skills and facilities of tramway and trestle construction, and the re-use of the Rubicon (1933) sawmilling settlement by the former State Electricity Commission. The Rubicon post office and store, built in 1947 and now privately licensed, is the only extant building of this former settlement.

A number of river-side camping areas has been developed.

Recommendation

Rubicon valley

F7(vi) That generation of hydro-electricity and the maintenance of associated facilities be permitted

and that the reserve be managed by the Department of Conservation and Natural Resources in consultation with Generation Victoria, the latter agency to retain responsibility for management of the hydro-electricity scheme component of the reserve.

Notes:
1. Existing prescriptions preclude timber harvesting within 80 m upslope of aqueducts and 20 m downslope.
2. Arrangements for power distribution and the operation of power generation are changing. Council considers that the best method of protecting the historical values of the hydro-electricity system is that it continue to function as a power-generating facility, perhaps as an operational museum - one of a number of options being considered for the Rubicon facility.

F8 Jamieson Court House (0.1 ha)

This gable-roofed brick court house was built in 1864 to serve the growing gold town and was extended in 1886. It features decorative brickwork detailing and has associated stables. It is largely intact except for part of its roofing and guttering.

It is presently used by several community groups and the Department of Conservation and Natural Resources, and is managed by the Historic Buildings Management Committee Inc.

F9 Comet Sawmill, Mount Disappointment (40 ha)

The Comet Sawmill was erected in 1884 and, although burnt out in 1889 and again in 1899, was worked more or less continually until its closure in 1902. It was the largest sawmill in the district and allegedly the largest in Australia in 1894. It was linked to Wandong and the North-eastern Railway by a timber tramway, under the control of the Victorian Railway Commissioners.

Much of its plant was removed when the mill closed. However, foundations, house sites, garden edgings, two large sawdust heaps and short sections of the tramway formation remain.

F9 Notes:
1. Vehicular access to this site should be restricted to prevent further damage to artefacts.
2. Much of the tramway route and some of the more recent sawmill sites associated with it lie within State forest outside the historic area (see Chapter E).

F10 Matlock Hill (50 ha)

The township of Matlock sprang up in 1863, expanded rapidly and by 1865 boasted 14 stores, 7 hotels and a number of other businesses and residences. It was on the Yarra Track, acting as the gateway to the Woods Point and Jordan goldfields. In December 1873 the town was almost completely burnt out in a bushfire and the remaining inhabitants re-established it on a site further down the hill. This circumstance provides a unique opportunity to obtain an insight into Victoria's early mining period, as the original site is free from the overlay of later habitation, although its integrity is compromised by a number of buildings that have been erected since the late 1970s.

Evidence of the hilltop town site includes bottle and other refuse dumps, street alignments and the sites of the original dwellings and businesses. Archaeological investigations to date have already provided an indication of living conditions in this remote and rugged environment in the 1860s. The recommended reserve also includes a disused cemetery, which is partially fenced and contains a number of intact headstones, and evidence of contemporary mine workings such as adits and a water race. The original alignment of the Yarra Track is still discernible. The sites of two satellite towns and a range of mine workings are nearby.

Matlock Hill is on the Great Divide and affords magnificent views over the Thomson River catchment through to the Baw Baw Plateau, as well as northward across the upper Goulburn River valley.

F10 Note:
The reserve surrounds a number of blocks alienated in the 1860s. Some of these have been acquired by Melbourne Water; most are without good title. Council believes that the development of the latter blocks, if any, should be in sympathy with the aims of the surrounding reserve.

F11 Woods Point Gold-mines (450 ha)

This reserve is in two parts and includes a number of mines, workings and settlements associated with the first gold-mining phase in Victorian history.

F11(a) *Sir John Franklin workings*

Gold was first discovered here in 1861, and quartz-mining persisted from 1864 to 1941. The area supported a sizeable mining population for most of the later 19th century. Early mining was to the west on Never Mind Spur, and later on Websters Spur.

Remains of open cuts, adits, air shafts, trenches, mullock heaps, machinery sites, water races, dams, tramways, a benched track and extensive retaining walls are present in this 265-ha area, together with evidence of many house and building sites and associated deciduous trees. Of special interest are the innovations undertaken in response to the difficult mountainous site, including a long self-acting tramway.

F11(b) Standers Creek Mines

Reef gold was discovered here in 1865 and the Royal Standard mine was at one time working the richest reef in the Woods Point area. By the end of 1866 a substantial town had developed, but the reef could not be followed beyond a fault and was worked out by 1870. Other, less successful mines were operated in the vicinity. No gold was produced after 1900.

In addition to a series of adits, shafts and open cuts, many of which are still accessible, the 185-ha site has a dam, incline and self-acting tramway formation, house sites, remnants of rubble chimneys, platforms, walling and machinery footings.

F12 Eltham Court House (0.1 ha)

Built in 1860, this is a substantially intact brick, slate-roofed building. It is presently managed by the Historic Buildings Management Committee Inc. Several community groups are interested in occupancy.

F13 Healesville Court House and Lock-up (0.1 ha)

The court house, built in 1889/90, is the most intact example of the Victorian-free classical style, with hipped gable roof and skillion verandah. The associated lock-up and stable were built in 1866.

CNR sought expressions of interest for the future use of this court house, and subsequently granted the Coranderrk Koori Co-operative an occupancy.

F14 Mississippi No. 1 Mill settlement (75 ha)

The first mill on this site was installed in 1905 and a considerable settlement had developed by the 1920s, including a State school. A second mill was constructed after the 1926 fires. The mills had closed down by 1933. While no standing buildings remain - the site was burnt out by the Ash Wednesday fires of 1983 - evidence of this once thriving settlement can still be discerned. A number of chimney mounds of former dwellings survive, as do benches defining the mill sites, an iron tank, a large number of tramways, rope-worked inclines and the remains of a large bridge of 'make-up' style and of a pigsty constructed bridge on Marble Creek. After the 1939 fires, mills were mostly located in the main towns rather than in the forest. The Mississippi site is little modified and provides a representative example of a pre-1939 forest mill settlement, giving it high archaeological potential.

F14 Note:
The reserve boundaries are set back 100 m from either side of the Mississippi Creek and 200 m from around the mill settlement.

F15 Ada River Sawmills (330 ha)

Evidence of a number of mills here represents the pre-1939 peak of the Victorian timber industry. It is the best-known concentration of former mountain ash milling and associated sites.

Commercial utilisation of the Upper Yarra forests followed the opening of the Warburton railway in 1902 and the construction (in 1913) of a high-standard timber tramway between

Yarra Junction station and Powelltown, the site of the largest sawmill. The magnificent mountain ash forests of the Ada River were mostly inaccessible due to steep country until technology such as the winching of logs was developed, and until kiln seasoning and reconditioning processes were developed in the early 1920s. Two companies - the Ada River Company, with cutting rights over the western half of the area, and the Federal Timber Company (eastern half) - operated during the industry's era of greatest activity here.

The Ada No. 2 mill came into operation in 1928 after a tramline connection to Powelltown was opened up. The key link was the High Lead - a winch incline that brought the tramway over the steep divide between the La Trobe and Ada River valleys - completed in 1927. This mill was burnt out in the 1939 fires. The New Ada Mill, built in 1931/32, escaped the 1939 fires and closed in 1942 after a period of milling salvaged logs.

The New Federal Mill commenced operations in 1934. The company constructed its own three-foot-gauge tramway above the Ada River, across Starlings Gap and thence to Easy Warburton *via* Big Pats Creek. The mill also sawed logs salvaged after the 1939 fires.

A large variety of artefacts remain - tramway formations and cuttings, 'make-up' style bridges, the high lead winching house foundations, traces of the New Ada Mill winching site and the remains of several trestle bridges.

Most of the main structure of the New Ada Mill survives, as do at least ten associated buildings. At the New Federal Mill site, foundations, building materials, huts and a dug-out are still evident.

F15 Notes:
1. Older-aged forest in this reserve should be protected.
2. Increased protection is required for *in situ* artefacts.
3. A forest road crosses the site. This should not be developed as a major recreational access route.
4. The reserve boundaries are set back 100 m from the tramways and minor mill sites and 200 m from the major mill sites.

(continued)

Ada River Sawmills (continued)

5. Several associated historical features are located within the nearby forest. These are included on the schedule of 'Special Features to be Protected in State Forest' - see Chapter E.
6. Timber harvesting is limited in this area under existing prescriptions. The recommended reserve coincides in parts with the (20-m-wide) stream-side buffer strips and the (100-m-wide) buffer to the 'Walk into History'. These are exclusion zones in present forest management plans.

F16 Noojee Trestle Bridge (80 ha)

The major feature of this reserve is an impressive 18-span timber girder bridge, the highest example of this bridge type surviving in the State. It is also notable for being built in a curve. It was built in 1919 on the Warragul to Noojee Railway line, which operated until 1958. The bridge was reconstructed in 1939 and was restored again more recently. The reserve includes the track alignment between the bridge and the township of Noojee, used as a walking track.

F17 Kirchubel's Tramway and Mill, Tanjil Bren (65 ha)

Constructed after the 1939 fires, these remain substantially intact. The tramway is probably the best remaining example in the State.

The mill was set up to salvage fire-killed mountain ash trees before the timber decayed. Logs were transported to the mill on a wooden tramway, which was gradually lengthened, finally extending 1.5 km from the mill. An 'outlet' tramway ran for a kilometre between the mill and the Forests Commission's steel tramway to Tanjil Bren. The presence of this and nearby mills led to the establishment of that town. The tramway is noted for its array of 'crib-log' style bridges, 15 in all, most of which are in good condition, the longest extending 73 m. Both wooden and steel rail sections remain. The mill site includes minor artefacts such as timber uprights and roofing, a boiler and stack, engine bearers, water tanks and a substantial sawdust heap.

In addition, the tramway has potential for use as a walking track.

F17 Notes:
1. The reserve boundaries are located 100 m from the tramway and mill site.
2. It may be necessary to construct temporary access across this reserve to enable harvesting of merchantable timber resources. Any such roading should be sited away from the historical artefacts and be rehabilitated after completion of operations.

F18 Toombon Gold-mines, Aberfeldy (375 ha)

Gold was first discovered at Toombon Creek in 1870 and an adit was built and battery installed by the end of 1872. It was the principal part of the Aberfeldy/Donnellys Creek mining division. The mine operated successfully and supported a township until it closed at the end of 1898. An attempt to re-open it in 1937 was unsuccessful. Other mines - the New Toombon Company and the New Dawn workings - operated briefly in the 1880s.

Evidence remains of the mine workings, building and machinery sites, tramways, tracks, mullock heaps, water races, dams, alluvial terrace workings and the Toombon settlement and cemetery (see also Recommendation F37).

F18 Notes:
1. This area encompasses a number of allotments within the gazetted township of Toombon, which were available for alienation in the late 1880s but for which freehold title is now uncertain. Council believes that those allotments without good title should be included in the recommended historic and cultural features reserve, and that development of the others, if any, should be in sympathy with the aim to create an environment reflecting the area's early mining era.
2. It will be necessary to redirect public vehicular access away from the township and cemetery portions of this reserve, to reduce the possibility of inadvertent damage to artefacts.

F19 Coopers Creek Copper Mine (170 ha)

This area contains the site of Victoria's first copper-mine as well as the remains of a small settlement and lime-works, both associated with the mine. Copper was discovered at Coopers Creek in 1864 and the mine provided the first copper smelted (by a blacksmith at Walhalla) in Victoria. Its most productive period was in the 1870s. It closed in 1880, but operated again between 1910 and 1913, and from 1967 until 1971. Smelters were erected and operated here.

The mine site is on the eastern side of the Thomson River. The settlement is on the opposite side and they were connected by flying fox and a ford.

A limestone quarry and associated kilns were constructed in 1912 and connected to the smelter by a tramway. More recent lime-works were established to the north at Platina and connected by a tramway to a siding on the Moe to Walhalla railway. It was mainly used to provide lime for the building industry, and operated until 1951.

In addition to the mine workings, a variety of other relics remain. These include the remains of the 1860s smelter, more recent ore heaps, tramway formations, a 24-metre steel-girder tramway bridge, ore hopper, incline tramway, winch support and levelled building sites. Remnants of the original lime-works include ore bins, brick kilns, incline tramway, lime dump and quarry. Machinery foundations, kilns and the railway siding remain at Platina.

Only the former Copper Mine Hotel and clearings remain at the Coopers Creek settlement. The area is used for camping by a number of groups.

F19 Note:
Several private allotments occur within the gazetted Township of Coopers Creek. Council believes that any development within the township should be in sympathy with the object of creating an environment reflecting the area's history of mining and associated activities.

F20 State Coal Mine, Wonthaggi (500 ha)

Wonthaggi township developed in conjunction with the State Coal Mine. This underground black-coal-mine was operated by the government and produced coal for Victoria's steam trains. In the context of the role of railways at this time, the mine was an important factor in the development of Victoria. The coalfield and Wonthaggi were

established in 1910; production peaked during the 1920s. The last mine was closed in 1968. In all, some 17 million tonnes of black coal were won from the 12 separate mines.

The Department of Conservation and Natural Resources is developing a comprehensive historic reserve to contain the artefacts of coal-mining. Several separate but interrelated sites would each illustrate one or two components of mining operations. One of the parcels - the 'East Area' - has been reserved for this purpose. Former structures there have been restored and guided tours are conducted.

Nine parcels of land, listed below - each with different but complementary values - were closely associated with coal-mining in the area. The locations of most of these are indicated in detail on Map C.

Recommendation

State Coal Mine, Wonthaggi

F20(vi) That grazing be permitted where appropriate in the areas described below at the discretion of the land manager.

F20(a) Number 20

This site contained all the surface buildings associated with Number 20 Shaft. The ventilation shaft is still evident. This was the location of Wonthaggi mine's worst disaster, commemorated by a number of plaques.

Note:
An old and inappropriate subdivision covers the area and the exact ownership of allotments is not certain. Part of the shaft area is municipal freehold. Further investigation of tenure and boundaries is required.

F20(b) Western

The mine head of the 'West Area Workings', the only remaining 'redstone' mullock heap (a conglomerate of sandstone and low-quality coal) and relics of the 'endless haulage' conveyor belt to the railway head are found here. This area is only partially indicated on Map C.

F20(c) Numbers 9 and 10 Shafts Area

Known locally as 'Orchards', extant historical artefacts include building foundations, mine-head footings and evidence of the haulage line. A large wetland here has been fenced and is regenerating.

Excluded from this area is land recommended to be set aside as a temporary stone reserve (see Recommendation L1).

F20(d) Number 5 Brace/Central Area

This site - the first major coal-production area - developed as the central service area for the State Coal Mine. Artefacts here include the railway marshalling yards and turntable, engine sheds and workshops, weighbridge, sawmill, stores building and the mine's site offices. Also included are the pit pony paddocks, mine rescue station, the former entrance of the McBride Tunnel - which provided access to four northern workings - and the site of the State brickworks.

F20(d) Notes:
1. The actual structure of the power-house that generated electricity for the mine and the town and the associated workshop building are privately owned, although the land on which they are sited is currently leased Crown land. This land has not been included in the reserve as Council believes that, given the private ownership of the improvements and the difficulties of obtaining public funds for maintenance, the most appropriate method to provide for the protection of these buildings is to offer the current leaseholder freehold title to the land, subject to a caveat requiring the protection and maintenance of the power-house and workshop buildings and the provision of opportunities for public access to the site. See also Chapter O.

If the current leaseholder does not seek freehold title to this area under the above conditions, Council believes that, through consultation with the municipal Council, ownership of the buildings be transferred to the Crown by way of a negotiated exchange for land, within the Township of Wonthaggi, that has been recommended in this document as land not required for public purposes. Further, if this eventuates, the Council considers that the land encompassing the buildings should then be made available for lease for an alternative compatible use, subject to the protection and maintenance of the buildings and the provision of public viewing areas on request.

(continued)

Number 5 Brace/Central Area (continued)

2. The road through the area and the former residence of the horse-handler (now freehold) are also excluded from the recommended reserve.
3. Remnant natural vegetation should be protected.

F20(e) East Area

This site contains the mine-head of the East Area Tunnel, which serviced the 'No. 1 Bench Area', the 'No. 3 Bench Area' and the 'No. 18 Shaft Area'. Various mine-building foundations, mullock heaps and machinery relics remain and reconstructed buildings, a kiosk and picnic areas are used in conjunction with mine tours.

F20(f) Eastern incline ventilation shaft

Within this small area, a ventilation shaft serves the incline tunnel between No 18 and the East Area coalfield.

F20(g) Wonthaggi station ground and railway line

In addition to the railway station - an unusual Queen-Anne-style building listed on the Government Buildings Register and presently housing a local museum - the block includes associated yards and part of the former Nyora to Wonthaggi Railway.

Part of the railway easement passes through the Wonthaggi township and provides a link between Central Area, the station grounds, East Area, Kilcunda and Anderson. Retaining a link between these areas along the railway easement would assist visitors to obtain a better understanding of the coal-mining operation and its vital interaction with the railways, permit pedestrian access between some of the major parts of the proposed reserve network and permit the option in the future for establishment of some form of tourist railway or other transport mode. It also includes some remnant native vegetation.

F20(g) Notes:
1. The station area was declared surplus by the then State Transport Authority and transferred to the former Department of Conservation and Environment; the

(continued)

Wonthaggi station ground and railway line (continued)

remainder of the original station ground has been or is to be sold.
2. The proposed reserve includes Apex Park, which provides an open space link between the station and one of the two main streets of the town.
3. Part of the former railway line link between the station ground and the East Area coalfield is presently a Borough-managed open-space reserve (the 'Flincher Street Reserve').
4. Two minor sections have been alienated, while another 20-m section is Crown land under leasehold with a right to freehold. Council believes that contiguous access should be maintained or provided.
5. CNR recently sought expressions of interest in the future management of the whole of this disused railway.

F20(h) Number 18

A shaft at the far end of the East Area tunnels occupied this site, which has potential for use for interpretation purposes, as it is readily accessible from the Inverloch Road. (Not shown on Map C.)

F20(i) Kirrak

Kirrak was the last mine operating at Wonthaggi; the brace building and foundations of all associated buildings remain. (Not shown on Map C.)

F21 Mornington Court House (0.4 ha)

Built in 1860 this simple, five-room brick building has been little modified. It is no longer required for court house purposes and the Mornington historical society is interested in using it as a museum for local history.

F22 Coolart, Somers (87.5 ha)

Coolart is a historic farming property with a substantial homestead - built in 1895 by the Grimwade family - together with associated outbuildings, former dwellings dating from the 1860s and elements of a formal garden. Several artificial ponds provide breeding roosts for a number of waterbirds and give the property important wildlife values. A theatrette and interpretation centre, nature

walks and bird-watching hides have been established.

The property was acquired by the government after the Council's 1977 recommendations and is managed as a tourist destination with the joint goals of enhancement and maintenance of wildlife habitat and restoration of the historical features.

Recommendation

Coolart

F22(vi) That waterbird habitat values be protected.

Areas of regional significance

Note: A number of these sites are currently public land controlled by the Public Transport Corporation.

F23 Yea railway station (7 ha)

Built in 1889 on the now-disused Tallarook to Mansfield railway, this is the most intact Victorian example of a small group of Gothic-styled station buildings.

F24 Cheviot railway tunnel (5 ha)

This brick-lined 250-m tunnel on the disused Tallarook to Mansfield railway traverses the divide between the Yea and Goulburn River catchments. It has a wagon-shaped cross-section, and bluestone dressing abutments.

F25 Alexandra railway station (2 ha)

Built in 1910, this station is in good condition. It is at the terminus of a spur line on the disused Tallarook to Mansfield railway, but was linked to a 20-km narrow-gauge tramline to the Rubicon forests, built in 1912.

The station is used by a local historical society which has established a museum of sawmilling history and runs restored timber-trains on a narrow-gauge tramway circuit.

Recommendation

Alexandra railway station

F25(vi) That use of the site as a museum be permitted to continue.

F26 Woodfield trestle bridge (2 ha)

The 30-m-long bridge on the disused Tallarook to Mansfield railway, near the junction of the Woodfield to Ancona and Bonnie Doon to Merton Roads, is in good condition. It is constructed of timber girders supported on five trestles, the highest being almost 5 m.

F27 Yarra Glen railway station (1 ha)

Lying on the disused Lilydale to Healesville railway, this building represents the style used for a large group of stations (Gisborne group). Built in 1914, its large passenger waiting area reflects the substantial holiday traffic the line previously carried (see also Recommendation J18).

F28 Yarra Glen trestle bridge (15 ha)

Crossing the Yarra River and adjoining floodplain on the disused Lilydale to Healesville railway, this was, in the 1890s, the longest timber trestle bridge in Victoria, although parts have since been supported with earthen embankments. The longest remaining timber section extends some 500 m.

F29 Healesville railway station complex (2 ha)

The station was built in 1902, at the terminus of the now-disused Lilydale to Healesville railway. Rolling stock remains on retained sections of track and at sidings, and the site also carries a goods shed, water tower, turntable and engine shed remnants. The station ground is leased by the Yarra Valley Tourist Railway group, which shares occupancy of the station building with a local community radio station (see also Recommendation J18).

F30 Yarra Junction railway station (0.5 ha)

Located on the now-disused Lilydale to Warburton railway, Yarra Junction was a key station for the local timber industry. It linked with the Powelltown tramway and was at one time one of the busiest stations in the State. The site includes a goods shed and platform mound, in addition to the station building (relocated from Lilydale), which houses a museum operated by the Upper Yarra Valley Historical Society (see also Recommendation J15).

F31 Nyora railway station (7 ha)

Located on the disused Great Southern Railway, the site includes sheds, sidings, tracks, a functioning turntable and a series of coaling stages as well as the station building. These are maintained by the Great Southern Rail Society.

F32 Coal Creek, Korumburra (16 ha)

This mine is among the earliest (1890s) and largest of Victoria's few black-coal-mines. Artefacts remaining from the mining era include the main shaft, mullock heaps, railway sidings, machinery and several buildings. While the reserve - developed as a folk museum - includes a number of new buildings, they are generally reconstructions of original ones or re-sited buildings similar to the original.

Recommendation

Coal Creek

F32(vi) That the educational, recreational and tourist values of the reserve be protected.

F33 Kilcunda Coal-mine (9 ha)

One of the earliest coal-mines in Victoria, the Kilcunda mine was operated by a private company in the early 1870s, and then probably concurrently with the Wonthaggi State Coal Mine. It was linked by a railway to the shipping port at San Remo. Part of the coalfield was reworked up until the 1950s.

Several *in situ* relics remain, including railway sidings, parts of the tramway system along the beach, machinery and building foundations and mullock heaps. Some dwellings remaining here are thought to have been occupied by the keepers of the pit ponies. The field extended into the adjacent coastal reserve and an adit is visible from the shore.

Recommendation

Kilcunda Coal-mine

F33(vi) That grazing be permitted at the discretion of the land manager.

Note:
The status of the occupancy of the dwellings on the reserve requires clarification.

HISTORICAL TRACKS

Development of transport routes was integral to European settlement of the region. Tracks were cut to facilitate land selection, provide access to mining fields and assist in tourist access (such as the Baw Baw track, cut in 1906) and tramways were constructed to transport timber from the forests.

Time has obliterated evidence of many of these early routes. The alignments of some have been re-used, such as parts of McDonald's Track (cut in 1861 to assist with land selection), which are now built over by the Moe to Thorpdale railway, and part of the Yarra Track to the Woods Point goldfields (formed in the early 1860s), which has been replaced by a road. Others (such as the Walhalla coach road) have been upgraded to permit access for forest management or recreation. However, some in more remote areas remain in their original form. Some might have become overgrown; others might have been developed for recreation, such as the Jamieson River mining track and McMillan's 1864 track to the Woods Point goldfields.

As these early tracks and tramways were constructed for pedestrian, pack horse or horse-drawn tram or wagon, they generally have gentle gradients, following river valleys, major ridges and spurs, or along side-cuts. Consequently, they can have value for recreational access, as well as their historical and educational values.

Aboriginal people, prior to European settlement, also had defined access routes, but few details of their location have survived. The routes of early European explorers are also of interest and, from analysis of historical records, can often be re-traced. The route taken by Hume and Hovell is proposed for investigation as a recreational track (see Chapter J - Community Use Areas).

Historical tracks

Recommendation

F34 That:

(i) criteria be developed to assess the historical significance of early mining tracks and timber tramways

(ii) evaluation of all proposed works in the vicinity of early mining tracks and timber tramways should include assessment of the historical significance of such features

(iii) wherever possible, evidence of early transport routes, particularly the sections and features listed in Table 17 below, be protected and managed in a manner that reflects their historical, recreational and educational values.

Table 17

HISTORICAL TRACKS TO BE PROTECTED

McMillan's Track to the Woods Point goldfields

Knockwood to Woods Point track

Woods Point to Standers Creek track

Yarra Track, particularly: the Paradise Plains route and settlement site that abuts the recommended Ash Ranges National Park; and clearings associated with early hotels and guest houses

Baw Baw track and associated approaches

Big Pats Creek and Powelltown timber tramways (part of the 'Walk Into History')

Reid's tramline at Powelltown

Early mining tracks and timber tramways of significance

Bowman's Track, between Beaconsfield and the Upper Yarra - Thomson divide

MEMORIALS

Memorials to war and to the early European explorers are the most common types within the study area. Most occupy public land and are significant historical features both for what they represent and as artefacts in their own right.

War memorials in Australia differ from those in other countries, generally being tributes to those who volunteered to go to war, while the commemorated dead were buried on the other side of the world. Given the general absence of public memorials in the early 1900s, they became prominent landmarks. Those in Victoria commonly feature the soldier on a plinth design (for example, at Yarra Junction) or take the form of an avenue of trees. All have local significance at least, and many, due to their unusual design or social history, or their present use, have regional significance.

Explorers' memorials are a legacy of official attempts to commemorate the pioneers of European settlement. Many arose from the work of the 'Victorian Historical Memorials Committee' (which operated from 1910 to the early 1930s). Simple stone cairns were erected where the paths of Matthew Flinders, George Bass, Hume and Hovell and Count Strzelecki intersected a modern transport route. They represent the growth of popular interest in Australian history that followed federation and have at least local and possibly regional significance. Another series of plaques was established during Victoria's sesquicentenary.

Other notable public memorials include the police memorial at Mansfield, the football team memorial at Mornington and the gold memorial at Warrandyte. A comprehensive inventory of public memorials is being prepared by the Royal Historical Society of Victoria.

Memorials

Recommendation

F35 That notable public memorials, especially those war memorials built after World War I and those forming part of the early 20th century network of cairns commemorating European explorers' travels, be protected.

CEMETERIES AND ISOLATED GRAVES

Cemeteries

Most cemeteries were, and are, located on public land and officially gazetted by the government. They are of great social and cultural value, are often of architectural interest and, because of their past management, may be of horticultural or botanical interest. All have at least local historical significance and several have regional or State significance.

Historically significant cemeteries should be protected. The closed Old Sorrento cemetery, believed to be associated with the first official European settlement of Victoria or with early pastoral settlement, has been recommended as a historic and cultural features reserve (Recommendation F37) and several others are on the schedule of 'Special Features to be Protected in State Forest' (Chapter E).

Those in current use have been included within a services and utilities reserve (Chapter M), with reference to the need to protect those with high historical (or other) values.

Gazettal under the *Cemeteries Act* 1958 is independent of reservation as a cemetery under the *Crown Land (Reserves) Act* 1978 and, consequently, it is possible to include an active cemetery (such as at Walhalla) within a larger historic and cultural features reserve.

Isolated graves

A number of isolated graves in the study area are generally those of early pioneers and miners who died in remote areas. Known ones are often marked by simple headstones.

Cemeteries and isolated graves

Recommendations

Cemeteries

F36 That, wherever possible, historically significant cemeteries, and particular historical features of other cemeteries, be protected

F37 That the Outtrim, Jericho, Red Jacket and Toombon cemeteries be closed to further burials and, together with the Old Sorrento cemetery, be used in accordance with the general recommendations for historic and cultural features reserves outlined above

and that

(vi) where graves occur, they be recognised and any authentic associated headstones or other artefacts be protected.

Note:
The Old Sorrento cemetery is closed to additional burials. The Outtrim cemetery is in the process of being closed (see Recommendation C18), and the Jericho, Red Jacket and Toombon cemeteries have not been used for at least 50 years.

Isolated graves

F38 That, where isolated graves occur on public land, they be recognised and any authentic associated artefacts be protected.

ABORIGINAL CULTURAL ASSOCIATIONS

The Coranderrk Aboriginal Station

Established under the auspices of the Board for the Protection of Aborigines, the Coranderrk Aboriginal Station at Healesville was one of a number throughout Victoria. It was unusual in that the site was chosen and named by the Aboriginal people. A temporary reserve was established in 1863. The Coranderrk community comprised Aborigines from the Woiwurung, Taungurong and, later, the Bunurong, Wurundjeri and other central Victorian groups. It was an important focus of Aboriginal life until it was closed in 1923/24. Most of the reserve, other than the Coranderrk bushland area adjacent to the Healesville Wildlife Sanctuary (see Recommendations C34 and J28) was subsequently sold. The Commonwealth government has agreed that the former Army School of Health land, also adjoining the Sanctuary, be given back to the traditional owners.

Council considers it is important that a method for appropriate recognition of these, and similar, associations be developed. The mission track, in particular, should be considered by the land manager.

Aboriginal associations

Recommendation

F39 That a method be developed for the appropriate recognition of the Aboriginal associations of the former Coranderrk Station area and other areas where appropriate.

G. NATURAL FEATURES RESERVES

Throughout the agricultural regions and urban fringes of the study area, many parcels of public land remain.

The areas listed below are those recommended for reservation because they have natural features worthy of protection. They include heritage rivers, public land along rivers and streams, scenic areas, geological or geomorphological features and remnant bushland.

They have been identified from past recommendations, departmental records, recent aerial photography or field inspections.

While these areas are not recommended primarily for conservation of significant native species, they are important because (along with road reserves) they often provide the only suitable habitat for the many common and uncommon species that either still use, or were once widespread in, those land types that have been largely cleared. They also make various contributions to our well-being, when used for recreation, relaxation, scenic landscape appreciation, education and protection against land degradation. Accordingly, the Council considers that they should be securely reserved.

This chapter contains recommendations for river and stream frontages, stream-side areas, natural and scenic features, geological and geomorphological sites and bushland areas, and confirms earlier recommendations for heritage rivers. Former 'wildlife reserves', that are open for hunting and therefore not recommended as nature conservation reserves, would be included in this category, in accordance with the Council's new public land use categories, although none is located in Melbourne Area, District 2. Similarly, no 'lake reserves' are recommended below, although Council intends that lake reserves in its other study areas now be included with natural features reserves.

In all natural features reserves the suppression of fires is the responsibility of the Department of Conservation and Natural Resources (CNR). Appropriate fire-prevention measures will be carried out where necessary, as will the control of pest plants and animals.

NATURAL FEATURES RESERVES

Recommendations

G1,G2,G5—32,G34—246 That, according to the specific characteristics outlined below, these areas be used to:

(i) protect natural features and values

(ii) provide opportunities:

(a) for education and passive recreation such as picnicking, walking and, where relevant, angling

(b) on wetlands, where specified and subject to other relevant limitations, for hunting (see Note)

(c) for more intensive recreation such as camping where specified below

(iii) conserve indigenous flora and fauna

(iv) maintain scenic features and landscapes

(v) provide protection for cultural heritage features and associations

(continued)

G1,G2,G5—32,G34—246 Recommendations (continued)

(vi) preserve features of geological or geomorphological interest

and that they be permanently reserved under Section 4 of the *Crown Land (Reserves) Act* 1978 and managed by the Department of Conservation and Natural Resources, except where otherwise specified.

Note:
Recommendation (ii)(b) concerning hunting applies in principle to any former 'wildlife reserves' that were in this category. However, none has been so recommended in the study area.

STREAMS AND FRONTAGES

Stream frontages, beds and banks

This classification comprises public land associated with streams flowing through areas that are broadly private land. It may consist of a narrow public land frontage (often 20 m wide) and the bed and banks, or only the bed and banks of the streams.

In 1881, Crown land consisting of the bed and a specified distance (20 to 60 m) from each bank of certain major watercourses was permanently reserved for public purposes. In many instances, the public land water frontage is discontinuous. Although some frontages were set aside in this way before 1881, it was common before that date to alienate land to the water's edge or the centre of the stream, although the beds and banks of watercourses are deemed to have remained public land under the *Water Act* 1905, and subsequent Acts.

Environmental, cultural and other values of frontages

Particularly where native vegetation has been retained, public frontages are integral to the visual character of rural landscapes. Their sinuous form and contrasting colour and texture compared with the surrounding cleared land make frontages a key visual element of high scenic value, which enhances the pleasure of many recreational activities such as angling, picnicking, walking or canoeing, especially in rural areas.

Intact frontages are valuable as wildlife habitat, and produce and maintain aquatic habitat values. Riparian vegetation provides nutrients from leaf litter, creates specific in-stream habitats from fallen limbs and regulates water temperature by shading. Stream frontages often contain the only remnants of native vegetation in areas that are now extensively cleared, forming important corridors for wildlife migration. They may also provide seed stocks for the restoration of degraded land. In addition, ground cover on a well-vegetated frontage reduces the erosive power of both falling rain and overland flow, thereby reducing the potential for bank erosion and consequent reduction of water quality.

Not surprisingly, given the social and economic importance of watercourses and their banks over the last 40 000 years or more, features reflecting cultural events and associations occur there. Scarred trees from which Aborigines obtained bark to make canoes and 19th century bridges are two examples.

Vegetated frontages also provide many benefits for adjacent land-owners, without the owner necessarily requiring direct use. Along rivers susceptible to bank erosion, a public land water frontage is a form of insurance - at least 20 m of public land must first erode before private land comes under threat. In cleared areas the vegetated frontage acts as a windbreak that may reduce wind stress on stock and the loss of moisture from adjacent paddocks, maintaining production. In some areas vegetation along the frontage is important in lowering the local groundwater table, and in all cases is paramount in mitigating river-bank erosion.

Location, ownership and reservation of frontages

As rivers wind across their floodplains, their courses are often subject to change as they create new channels and abandon their old ones. Consequently it is sometimes possible to find an abandoned channel and its strip of associated public land some distance from the present stream, which now has privately owned bed, banks and frontages, although the water in such watercourses is Crown-controlled. This occurs, for example, on the Goulburn River breakaway near the Acheron River confluence.

In many cases, public frontages have been managed with adjoining farmland for many years. They are often not fenced, and it may not be obvious whether the land adjacent to a river is public or private.

The locations of public land water frontages are shown diagrammatically on Map A, and in detail on Parish plans, which are available to the public from the Central Plan Office of the Division of Survey and Mapping in the Department of Finance, and can also be inspected at the regional offices of CNR. If the land abutting a frontage has been alienated, the common boundary shown on Parish plans may consist of surveyed lines or of a series of unsurveyed broken lines, which in either case approximate the limits of the reserved land.

In general, if it is defined as a fixed distance from the river bank and changes in the river course are considered 'imperceptible' rather than 'sudden', the public frontage moves with the river. If the frontage is defined by a surveyed boundary, then changes in the river course will lead to a change in frontage width. In some instances it may lead to the loss of the public frontage. In both cases the beds and banks remain as public land, provided the watercourse remains as the 'boundary' of the adjoining allotments.

In some places the frontage has been permanently reserved for public purposes under the *Land Act* 1958 and in others it is not formally reserved. The land usually comes under the administration of CNR. In all cases the Crown controls the water, and specified persons have a right of use.

Reasons for reservation

Public benefit was fundamental to the concept of reserving river frontages from sale, thus establishing public land water frontages. In the mid 19th century these were set aside to provide for the development of public utilities for the expanding river-boat trade. They were also an important means of access, particularly in mountainous areas, where the valley floor provided an easily followed path.

As land became more densely settled in the 1870s, public frontages became important for the collection of domestic water supply, watering of stock, fishing and general recreation. They were also set aside and uses prescribed to maintain environmental values. For example, those along the Goulburn River were to prevent denudation by tree-felling.

Today, frontages are important public assets, particularly those that are in good condition (or capable of being restored) with stable banks and a good cover of native vegetation. They also form an important buffer in reducing the impact of adjacent land uses on the stream environment.

Agricultural use of frontages

Private use of public frontages for agricultural purposes is widespread. This legally occurs through the issue of a licence. Illegal use was, however, not uncommon in the past, although a recent CNR review of the occupation of Crown land suggested that only about 5% of frontages are grazed without a licence. Among other things, the licensee is required to control pest plants and animals.

Licences have also been issued for the cultivation of limited areas of frontage reserve in the Melbourne Area, District 2. In principle, Council believes cultivation of riverside public land to be an inappropriate use. Cultivation is inconsistent with the maintenance or restoration of riparian and associated in-stream values; it increases the potential for bank instability; and it restricts the use of the frontage for other purposes.

Consequently, Council has recommended that no additional riverside frontage reserves be licensed for cultivation. Council is not aware of the specific circumstances for each of the existing cultivated areas. Frontage reserves licensed for cultivation may, for example, no longer be adjacent to the river, as a result of changes in the river course. Consequently, it would be appropriate for the land managers to evaluate whether cultivation should continue when the licences are being considered for renewal.

Recreation on frontages

Recreational use of licensed frontages is permitted. The *Land (Amendment) Act* 1983 provides for the public to 'enter and remain for recreational purposes' although camping is excluded from licensed frontages. Licensees are required to erect and maintain a suitable means of pedestrian access along the frontage or from other points of public access. The requirement for maintenance of pedestrian access has not been applied to the majority of existing licences, however. Council believes that in some situations - for example, along popular fishing streams - the provision of

stiles would assist pedestrian access and would reduce damage to fences and avoid gates being left open. Public frontages that are unlicensed have no restriction on public access, although use of vehicles is controlled by the *Land Conservation (Vehicle Control) Act* 1973. They are, however, normally fenced off from adjacent freehold land, through which the landholder has no obligation to provide access.

It is neither necessary nor appropriate that a large proportion of the frontage reserves in the study area be developed or promoted for widespread and intensive recreational use. Stream-side areas (see below) may be used for picnicking, walking and angling, conservation of flora and fauna and other purposes.

Similarly, recreational activities that can be carried out at many places along a river, such as picnicking and swimming, should be focused at nodes in the public land water frontage reserves, if the demand is substantial. In choosing the location and development of these nodes, managers should consider: the recreational need for the site; the suitability of the site for recreational use and routine management (in terms of its capability, and its nature conservation and cultural heritage values); provision of readily identified public access to the river; and the adjacent private land use. It is also important that nodes chosen have the widest possible frontage. A bridge or ford crossing the river may often meet these requirements. The careful location and selective development of such nodes is likely to reduce the frustration experienced by riverside land-owners, and by visitors to rivers.

Recreational use of licensed and unlicensed public frontages can create problems for occupiers and licensees of adjacent land, who often discourage public access because of an understandable fear of damage, intentional or otherwise, to property. Vandalism and littering are problems in many areas open to the public, and firm action by authorities with management responsibilities is often required. Control is obtained through the normal exercise of fire, litter, firearm and other regulations, although it needs more effective policing, particularly during holiday periods and at weekends. Education of the public to understand the rural environment is perhaps the best solution in the long run.

Many recreational groups have developed 'codes of behaviour' for their members, which encourage a higher standard of conduct than that required by regulation.

Condition of frontages

Although in the past managing authorities have allowed the clearing of vegetation and the cultivation of limited areas of frontage, the failure to effectively enforce legislation has resulted in the progressive illegal clearing of native vegetation from other public frontages. This, combined with agricultural use involving both grazing and cultivation, has seen the incremental loss of many values and a reduced capability to provide for a variety of uses.

Regeneration of vegetation has not occurred in substantial areas. High, steep and collapsing banks are a hazard for grazing stock; they are unattractive for recreational purposes; and they destroy valuable stream-side vegetation and contribute to stream siltation, which in turn degrades in-stream habitat. Across the State long sections of rivers and their frontages are now degraded and in need of management attention. The State of the Rivers Task Force report (1986) identified the principal causes of river degradation and damage to public frontages as unrestricted stock access to the river, and stock camping on the river bank. This problem has a number of solutions, including the paving of stock watering points.

Restoration

It is clear that resource, technical, social and administrative factors have led to the degradation of beds, banks and frontages. Many of these factors have now changed, or are changing, and the circumstances are now conducive to maintaining river and frontage values and restoring degraded areas.

The resource implications vary. Some options - such as streamlining and co-ordinating administrative arrangements, or where a choice is available between environmentally damaging and environmentally benign approaches - may be cost-neutral; on the other hand some may have high associated costs.

Both financial and labour costs of maintaining streams and their frontages (survey, fencing, pest plant and animal control, revegetation, in-stream works) or restoring the values of degraded frontages are high, and have been major factors holding up change to past approaches to river and frontage management. However, various programs now exist that are leading to improved management. For example, waterway authorities currently spend about $3 million per annum (across the State) on erosion and revegetation programs, and

CNR also provides grants for frontage works. These programs, however, only meet a portion of the total requirements.

In view of the high costs of these activities, Council believes that the introduction of a priority system for the identification, protection and restoration of degraded streams and their frontage sections would lead to a progressive improvement in their condition. While a listing for action is needed in priority order, the condition of Victoria's streams, in particular their frontages, is such that in the long term many sections will need attention. The scale of the problem requires that priorities should be determined for action starting now but continuing over a 10- to 20-year time frame. The Gippsland Regional Landcare Plan, for example, has set a target date of 3 years for revegetation of 40% of river and stream frontages in the region.

Stable streams and well-vegetated frontages would benefit in-stream and bank habitat, stock management and water quality, enhance scenic quality, protect cultural heritage sites and increase property values on adjoining freehold land.

The stream and its frontage make an integrated unit. Unstable streams can lead to the loss of frontages irrespective of the quality of riparian vegetation. In many cases, however, good-quality bank and frontage vegetation is all that is needed to ensure stream stability. Indigenous aquatic and semi-aquatic plants can be used to stabilise banks.

Guidelines

The following guidelines for establishing priorities for action on frontages are considered appropriate.

Priority for management action should be based on the following criteria (not in a particular order):

* recommended Victorian heritage rivers (e.g., Yarra, Goulburn) with public land frontages where values are at risk (refer later in this chapter)

* the presence of natural, cultural heritage or recreational values significant at local level or above, particularly where these values are at risk or where they are sensitive to change

* areas in which special measures are necessary to protect domestic water supplies, buildings and other public utilities

* areas that are currently unstable and require action - where appropriate - to prevent major bed or bank instability, including sections of river that have undergone sudden or major changes in their courses

* degraded areas (it is recognised that the resources required to address highly degraded areas are large; in practice, it may be more cost-effective to allocate resources to maintain the condition of other rivers to prevent them from becoming highly degraded)

In accordance with these guidelines, high-priority areas should be identified and programs developed to maintain or restore the values associated with them. The protection and restoration of these values may involve a range of management options, depending on the proposed uses and the values to be protected. Options may involve, for example, fencing areas to protect flora or unstable banks from stock, control of excessive recreation use or provision of paved areas for stock access to drinking water. Equivalent in-stream actions may also be required.

Frontage grazing licences currently provide that, at the direction of the Secretary for Conservation and Natural Resources, revegetation of licensed land and reclamation of eroded areas be carried out, and that stock be excluded from areas being revegetated or reclaimed.

Development and implementation of management priorities should occur in conjunction with community-based organisations, such as catchment co-ordination groups associated with river management authorities, and local government. This will also provide opportunities for identifying and assessing values and priorities at a local level. Council considers that involvement of local communities and interest groups and a co-operative approach are integral to the success of restoration and maintenance of degraded frontages, beds and banks. It is also important that the goals of any program and the priority of any works be clearly defined.

Council recognises that the successful restoration and maintenance of stream

frontages, beds and banks depends on the interest and support of adjacent land-owners, which will only be gained by a collaborative approach to the identification and resolution of problems.

There are many beneficiaries of restoration works and the ongoing management for control of pest plants and animals and of erosion. These include the adjacent land-owner, those owning river-bank land downstream and upstream, those using the water and the river downstream, visitors to the area and residents in general. This distribution of benefits should be recognised, and appropriate resources for restoration and maintenance should be provided by each of the different beneficiaries. In some areas in the past a landholder contribution has been provided in labour rather than cash.

For equity to be achieved, it is appropriate that the licence fee should be set to reflect its true worth to a licensee, but that a rebate could be provided to the licensee according to restoration works or other management activities carried out from which the community at large gains benefit.

Accurate and accessible technical information on the various river frontage, bed and bank values is needed, to enable them to be managed for their diversity of values. The 1990 'Environmental Guidelines for River Management Works', prepared for the Standing Committee on Rivers and Catchments, assists in this matter.

Given the complexity of values and uses of river frontages, beds and banks, it is important that administrative arrangements are clearly identified and co-ordinated. Particular attention should be given to defining the role of government agencies, particularly since the introduction of the *Water Act* 1989 and the inclusion of the former Department of Water Resources within the Department of Conservation and Natural Resources. It is also important that decisions reflect the wide range of values of frontages, beds and banks, especially nature conservation values. In the past the natural ecological functions of a river system have tended to be ignored, restricting the range of opportunities available to present and future generations. Those who are likely to be immediately affected by frontage, bed and bank management - whether as direct beneficiaries or not - should be consulted. They include the adjacent land-owners, and relevant Landcare and other community groups with an interest in the values and uses of waterways.

Council has made recommendations for public land water frontage reserves since the mid 1970s. However, the previous recommendations, while they recognised the values of public land water frontage reserves, did not sufficiently emphasise the need to maintain these areas in good condition or the need for active restoration programs, nor did they encourage the reserves' use for their potential range of values, especially those associated with appropriate recreation activities. There is also a need to recognise that the streams, their frontages and their catchments have interrelated values and uses and should be managed in a co-ordinated way.

The recommendations listed below are derived from the recommendations arising from the Council's Rivers and Streams Special Investigation (June 1991), which have been approved by the government. They apply to public land water frontages across the Melbourne Area, District 2, and to stream-beds and banks adjacent to public frontages or private land.

A number of submissions raised issues in relation to specific frontages. These have been forwarded to the land managers for attention. Conservation values and management needs along specific streams are listed in Schedule 1 below.

Stream frontages, beds and banks

Recommendations

Public land water frontage reserves

G1 That public land water frontages, where not recommended otherwise for a specific use, be used in accordance with the general recommendations for natural features reserves outlined above

(continued)

G1 Recommendation (continued)

and

(vii) be used to

(a) conserve native flora and fauna as part of an integrated system of habitat networks across the State (see Schedule 1)

(b) maintain or restore indigenous vegetation

(c) protect adjoining land from erosion, and provide for flood passage

(d) protect the character and scenic quality of the local landscape

(e) provide protection for cultural heritage features and associations

(f) provide access for recreational activities and levels of use consistent with (a) to (e) above (see Note 1)

(g) where this does not conflict with (a) to (f) above, allow access for water, and for grazing of stock by adjoining landholders under licence

that

(viii) where frontage reserves are currently licensed for grazing or other purposes, and where stream-bank or frontage vegetation is degraded, frontage vegetation is not regenerating, or stream banks are eroding, consultative groups be established by the public land managers, with waterway management, local government and licensee representatives, as follows:

(a) at a State level, to develop guidelines and programs for restoration of frontages, including re-establishing or regenerating indigenous vegetation

(b) at a regional level, to develop strategies for managing frontage reserves while vegetation is being restored

(c) at a local level, to set priorities and a time-table for frontage restoration and maintenance

that these guidelines, programs and strategies be implemented according to the priorities and time-table so determined (see Notes 2 to 6)

that

(ix) (a) where habitat and landscape are proposed to be restored, particularly in cleared or degraded areas, indigenous trees, shrubs and ground species be planted

(b) if appropriate, suitable areas for more intensive recreational use be identified and facilities established

(c) where land exchanges are proposed that involve frontage land that is no longer adjacent to rivers, efforts be made to prevent loss of any nature conservation or other values of this land from the public land estate (see Note 5)

(d) a method be developed that will allow public land frontages to be readily identified, and such frontages be so marked where appropriate

(x) (a) where a licence has been issued for a public land water frontage as in (vii)(g) above, recreation use by the public for activities such as walking, nature observation or fishing be permitted, while motorised forms of recreation not be permitted

(continued)

G1 Recommendation (continued)

(b) licensees be required to provide stiles in any fences erected across their licence area if requested to do so by the land manager (see Notes 7 and 8)

(c) no new cultivation for agriculture be permitted, and areas currently cultivated be reviewed by the land manager as part of a systematic assessment of river restoration priorities, with a view to phasing out inappropriate cultivation

(d) in particular cases, licensees be required to fence off and exclude stock temporarily from some parts of the licence area where, in the opinion of the land manager, special measures are necessary to protect water supplies, to rehabilitate areas that are eroding or salt-affected, to permit regeneration of native plants that have particular value for nature conservation or to protect cultural, recreational and scenic values that are sensitive to the impacts of grazing (see Note 8)

(xi) commercial logging not be permitted

(xii) extraction of posts, poles and firewood, at a low intensity and on a sustainable basis, be permitted:

(a) subject to the approval of the land manager

(b) except within 20 m of the top of the stream bank, and

(c) except along the Goulburn, Big, Yarra and Thomson Heritage Rivers

(xiii) sand and gravel extraction may be permitted by the land managers where this is consistent with the above uses

(xiv) the Department of Conservation and Natural Resources be consulted prior to the proclamation of roads, the construction of roadways or the creation of buildings on public land water frontages

and that public land water frontages be managed by the Department of Conservation and Natural Resources (or present manager), in consultation with the relevant waterway authority (see Notes 9 and 10).

Stream beds and banks

G2 That stream beds and banks, subject to other relevant recommendations, guidelines and statutory requirements, be used in accordance with the general recommendations for natural features reserves outlined above

and

(vii) be used to:

(a) conserve or restore habitat for native flora and fauna

(b) provide for appropriate recreational activities and levels of use

(c) provide for flood passage and drainage requirements of adjacent land

(d) where necessary, provide for the passage of artificial flows of water stored within the catchment or transferred from other catchments

(viii) be maintained in a stable condition using environmentally sound techniques

(continued)

G2 Recommendation (continued)

(ix) where this does not conflict with the above, provide a source of sand and gravel

and that stream beds and banks be managed by the relevant waterway authority or the Rural Water Corporation (or present manager), in consultation with the Department of Conservation and Natural Resources.

G3 That

(i) the interrelated nature of the values and uses of river frontages, beds and banks be recognised in management planning and implementation

(ii) initiatives be developed and implemented to remove economic, social, administrative and technical factors that lead to losses of river bed, bank, and frontage values, or to difficulties in achieving effective and co-ordinated restoration and maintenance programs

and that

(iii) programs for stream bed, bank and frontage stability be carried out in accordance with Recommendation F9 of the Rivers and Streams Special Investigation 1991.

Notes:
1. Recommendation F1(h) (see LCC's final recommendations for the Rivers and Streams Special Investigation, 1991) provides that a code of behaviour for recreational users of river frontages be developed and promoted.
2. Council recognises that a number of bodies currently exist that undertake, or are capable of undertaking, the functional requirements at State, regional or local levels. In this context 'regional' would cover a single river basin or a number of adjacent basins, and 'local' an area within a river basin, such as individual drainage catchments or a particular river reach.
3. It is envisaged that, for community consultation, Catchment Co-ordination Groups where they exist, or similar groups where they do not, could carry out or facilitate stages G1(viii)(b) and (viii)(c) above, and that the Standing Committee on Rivers and Catchments or equivalent organisation could carry out or facilitate G1(viii)(a). When determining priorities, restoration or maintenance programs that lead to direct site improvement are to be given precedence.
4. Vegetation re-establishment or regeneration may require the temporary or permanent removal of stock from some frontage areas.
5. These areas could include values such as remnant vegetation, wetland habitat and opportunities for recreational use or contain features of cultural significance, such as scarred trees.
6. Identification of priorities in G1(viii)(c) should take into account the guidelines set out above.
7. The choice of a suitable design for stiles should involve representatives of the frontage user groups such as the Victorian Farmers' Federation and peak recreation groups.
8. These are provisions in existing legislation, regulations or licences.
9. It is Council's intention that these areas remain within the public land estate and be securely reserved. The *Crown Land (Reserves) Act* 1978 requires that areas to be reserved be surveyed, a process that is expensive and protracted. If alternative methods become available that will achieve Council's intention of secure reservation - for example using a record plan - then these could be used, provided the reservation is otherwise comparable to permanent reservation under the *Crown Land (Reserves) Act* 1978.
10. In a pilot program, responsibility for management of public land water frontages in the Tarwin River catchment has recently been transferred to the Tarwin River Management Board.

Schedule 1

CONSERVATION VALUES AND MANAGEMENT NEEDS ON SPECIFIC STREAMS

* Goulburn River: the frontage reserves here contain important remnants of floodplain riparian woodland and associated wetland plant communities; they have State significance as representative examples, and for the

botanical richness and diversity at some sites. Goulburn River wetlands are also of faunal significance. The management plan, as required under the *Heritage Rivers Act* 1992, should identify site-specific values and management needs (see also Recommendation G33).

* Murrindindi River: relatively intact and representative riparian forests, grading into floodplain riparian woodland, occur along these frontage reserves. Bank erosion requires management attention.

* Diamond Creek: a high diversity of mammals and birds has been recorded in this frontage reserve, including species such as the long-nosed bandicoot, which is uncommon in fragmented landscapes.

* Watsons Creek: from Christmas Hills to the Kinglake National Park, much of this frontage has relatively intact riparian forest or valley forest, and is of 'high' habitat and 'State' faunal significance (Beardsell, in press.), particularly as an additional habitat link.

* Little Yarra River: sections of this reserve between Gilderoy and Gladysdale contain representative examples of swampy riparian forest, riparian thicket, swamp heathland and adjoining wet forest. These areas should be protected from fire and nutrient-laden run-off from surrounding land.

* Big Pats Creek: tall, mixed-age riparian forest containing mature manna gum occurs on this reserve. Weed invasion requires management attention.

* Monbulk Creek: the small areas of Crown land along Monbulk and Bellbird Creeks form part of a habitat corridor between the Sherbrooke Forest area and the Lysterfield Regional Park.

* Cannibal Creek: the dwarf galaxias and pigmy perch have been recorded here.

* Bass River: appropriate measures should be taken to conserve habitat for the giant Gippsland earthworm.

* Tarwin River: the intact riparian forest and associated wet forest in this reserve are vulnerable to weed invasion (see also Bushland Area G91).

Helmeted honeyeater

The recovery plan for this species has been discussed in Chapter C - Nature Conservation Reserves. The following recommendations apply to public land water frontages along other streams with suitable habitat for helmeted honeyeaters.

Helmeted honeyeater

Recommendation

G4 That, if an extant population of helmeted honeyeaters is located within the boundaries of a public land water frontage or other natural features reserve, or if parts of a reserve are nominated by the Recovery Team as a suitable release site, then the land-use category be reviewed with a view to ensuring that the preservation of the helmeted honeyeater is a primary management objective of the reserve or the relevant portion of the reserve.

Note:
In such cases it may be a necessary to enhance existing vegetation and to specifically exclude grazing or other conflicting land uses.

The following creeks have been identified as having suitable habitat for the helmeted honeyeater:
* that part of the Woori Yallock Creek frontage between the recommended Yellingbo and Sassafras Creek Nature Conservation Reserves (Recommendations C36 and C37 respectively)
* that part of the Cockatoo Creek frontage between the Yellingbo Reserve (C36) and recommended bushland area G202
* those parts of Shepherd and McCrae Creek frontages not within the recommended Kurth Kiln Regional Park
* Cardinia Creek frontages, including Muddy and Stony Creeks
* the upper reaches and tributaries of the Bass and Powlett River frontages where they retain natural vegetation

STREAM-SIDE AREAS

In some instances, small accessible blocks of public land adjoin streams but are not included in the public land water frontage.

These blocks have, where appropriate, been designated stream-side areas. Some are currently reserved under Section 4 of the *Crown Land (Reserves) Act* 1978; others are unreserved Crown land, although they may be licensed for grazing. Vegetation on these areas varies from open forests to open woodlands. Every effort should be made to conserve native trees and to encourage regeneration or restoration where vegetation is modified.

Blocks of public land such as this have values for nature conservation and recreation. Where near roads, they allow public access to the river or stream, especially where access along the public land water frontage is difficult. The land manager may provide facilities for activities such as camping on stream-side reserves in areas where conflict with nature conservation or water production values is minimal.

Stream-side areas are discrete public land parcels, separate and distinct from the linear public land water frontages described earlier in these recommendations. It is intended that public land water frontages adjacent to or within a stream-side reserve be managed by the authority responsible for that reserve.

Stream-side areas

Recommendations

G5—G32 That the following stream-side areas be used in accordance with the general recommendations for natural features reserves outlined above

and to

(vii) provide opportunities for more intensive recreation such as camping at the discretion of the land manager if this does not conflict with the maintenance of the water quality of the adjacent stream

(viii) provide a buffer zone for protection of water quality

(ix) maintain the character and quality of the local landscape

(x) provide grazing, at the discretion of the land manager, if this use does not conflict with the maintenance of the water quality of the adjacent stream or with (ii), (iii), (v), (vi), (vii), and (viii) above

and that

(xi) timber harvesting, apiculture and gravel extraction not be permitted.

Table 18

STREAM-SIDE AREAS

Recommendation	Parish (P) or Township (T)	Description	Area (ha)	Notes
Existing stream-side areas				
G 5	P WYNDHAM	CA 10B,10C,10E	13.67	
G 6	P KILLINGWORTH	CA 70B,70C,72C	40.14	
G 7	T YARCK	CA 30B,30C SEC B	2.70	
G 8	P YEA	CA 216C	2.51	
G 9	P YEA	CA 61B	13.55	
G 10	T TOOLANGI	CA 18A	1.20	

(continued)

Table 18 (continued)

Recommendation	Parish (P) or Township (T)	Description	Area (ha)	Notes
Existing stream-side areas (continued)				
G 11	P GRACEDALE	CA 32A,32B SEC 1	6.00	
	Note: The diverse floodplain vegetation communities and the stand of Eucalyptus camphora should be protected.			
G 12	P GRUYERE	CA 14C	1.10	
G 13	P BUNYIP	CA C	5.67	
G 14	P BITTERN	CA 83C,83D,83E	1.24	
	Note: It is recommended that the existing streamside area be extended to the coastal reserve by addition of the adjoining public land water frontage.			
New stream-side areas				
G 15	T GOBUR	CA 4 SEC 11; CA 11,12		
		SEC 15; CA 10,14,15 SEC 22	5.10	Godfrey Creek, Gobur
G 16	P KILLINGWORTH	CA 38B	7.78	Killingworth Road, Goulburn River
G 17	T TAGGERTY	CA 4 SEC 11	0.41	Acheron River, Township of Taggerty
G 18	T GRANTON	CA 3,4 SEC M	1.34	Acheron River, Granton
G 19	T HEALESVILLE	CA 1 SEC O	0.63	Watts River, Healesville
G 20	P YUONGA	CA 14E	5.52	Dee River, Millgrove
G 21	P BEENAK	CA 58P1	2.00	*Little Yarra River, Powelltown*
G 22	T NOOJEE/	CA 16A,16B SEC 1/		
	P NEERIM/	PART CA 160G/		
	P NOOJEE EAST	CL at river junction	5.00	LaTrobe and Loch Rivers, Noojee
G 23	T NOOJEE	CA 6 SEC 7	4.50	LaTrobe River, Noojee
G 24	P NARREE WORRAN	CA 27A,27B SEC C	0.06	Monbulk Creek, Belgrave Heights
G 25	P BUNYIEP	ADJ CA 92A	37.89	Cannibal Creek, Longwarry North
G 26	P DROUIN WEST	CA D,E	3.30	Picnic Point Reserve, Tarago River
G 27	P DROUIN WEST/	CA 18C/		
	P JINDIVICK	CA 51A,51B,PART CA 51C	0.81	Tarago River, Robin Hood
G 28	P NEERIM/	CA 98N,98P,98Q PART 72A/		
	P JINDIVICK	CA 11P, PART CA 9K	30.40	Tarago River, Neerim South
G 29	P POOWONG	PART CA 34L	2.40	Lang Lang River, Topiram
G 30	P MOE	CA 125A	0.40	Narracan Falls reserve
G 31	T BASS	CA 6,7,8,9,10,16 SEC 7	12.70	Bass River, Bass
	Note: This reserve has little native vegetation and requires restoration.			
G 32	T KORUMBURRA	CA 4B,9B,11B. PART 4A SEC S	16.30	Ritchie Reserve, Coal Creek, Korumburra
	Note: Significant vegetation here should be protected.			

HERITAGE RIVERS

Arising from Council's final recommendations in 1991 following the Special Investigation of Rivers and Streams, sections of several rivers in the Melbourne Area District 2 have been afforded heritage river status and have since been scheduled under the *Heritage Rivers Act* 1992. These are the Howqua, Big, Thomson and Aberfeldy Rivers within the Central Highlands as well as the Goulburn and Yarra Rivers.

The recommendation below confirms the Council's earlier recommendations for these heritage rivers, amended, where relevant, by the *Heritage Rivers Act* 1992. They are included in this natural features reserves chapter as there are broad similarities between the general recommendations above and the heritage rivers recommendations, in terms of the principles to be applied to their uses and management. Particular sites along these rivers have highly significant values and these are to be protected under the management plans to be prepared under the Act. These areas are not reserves as such. The Act provides protection for their values as an overlay. The underlying tenure is unchanged.

Heritage Rivers

Recommendation

G33 That

(i) the heritage river areas along the Goulburn, Howqua, Big, Yarra and Thomson Rivers be used in accordance with

(a) approved recommendations A1—A17, A3, A4, A5, A13 and A14 of the Rivers and Streams Special Investigation (see Appendix V)

and

(b) the provisions of the *Heritage Rivers Act* 1992

and that

(ii) the heritage river area along the Aberfeldy River be used in accordance with the provisions of the *Heritage Rivers Act 1992*.

Goulburn River

The heritage river corridor extends downstream from Lake Eildon and beyond the study area boundary to the Murray River. While much of the adjoining land has been modified, the public land along the section of the river in the study area retains a range of significant values, as follows:

* a diverse assemblage of native fish species
* Macquarie perch habitat
* recreational fishing - especially for trout from Eildon to the Yea River
* canoe-touring opportunities
* cultural heritage sites
* significant scenic landscapes downstream from Molesworth
* floodplain wetlands

Yarra River

From Warburton to Warrandyte, the heritage river corridor takes in the river and its adjacent public land frontages, and displays the following important values:

* significant scenic landscapes from Yarra Glen to Warrandyte
* botanical values - Buxton gum and tussock grassland near Spadoni's Reserve (see Recommendation C33); mountain swamp gum and manna gum riparian woodland at Everard Park (see Recommendation G11); box-stringybark woodlands from Yering Gorge to Warrandyte
* zoological values - important (although incomplete) wildlife corridor for its full length
* white-water canoeing opportunities from Homestead Road to Jumping Creek Reserve
* river blackfish and Macquarie perch habitat
* highly valued for trout-fishing
* geological/geomorphological sites of significance, particularly an abandoned high-level meander at Watsons Creek and a gravel terrace at Crooked Creek

Other matters concerning the Yarra River are referred to elsewhere - the Parks and Waterways program in the Introduction, and possible additional water use by Melbourne Water in Chapter D - Water Production.

Thomson River

The Thomson Dam and Cowwarr Weir (outside the study area) mark the limits of the heritage river corridor, which has these significant values:

* white-water canoe-touring along the whole reach
* significant scenic landscapes for the whole corridor
* cultural heritage sites - Brunton's and Poverty Point Bridges, Horseshoe Tunnel and Coopers Creek (Recommendations F1, F2 and F19)
* fishing opportunities, especially for fresh-water blackfish
* the 'vulnerable' Australian grayling

Big River

Above Lake Eildon, the heritage river corridor

extends to the junction of Spring and Oaks Creeks, and has significant values as follows:

* habitat for the endangered spotted tree frog (see Chapter C)
* significant scenic landscapes from Oaks Creek to Lake Eildon
* recreational fishing opportunities - especially for trout
* white-water canoeing in a semi-remote setting from Frenchman Creek to the Jamieson Road bridge

Howqua River

From the study area boundary to Lake Eildon, this part of the heritage river corridor has the following important values:

* fishing opportunities - especially for trout
* Devonian fish-fossil beds
* habitat for the spotted tree frog

Aberfeldy River

The heritage river corridor lies entirely within the Baw Baw National Park. The Aberfeldy River is used for trout-fishing and is popular with car-based campers, and access in this reach also allows for a canoe-touring experience downstream from the Walhalla Road bridge. The same reach also displays the geologically notable Norton Gully sandstone.

RIVER ZONES

Streams and their frontages that are surrounded by freehold land were dealt with earlier in this chapter. Within State forest, however, streams remain part of the State forest category. In Chapter E - Timber Production and State Forest, sections of eight rivers are recommended as river zones within State forest. These are to be managed as for the 'natural features zones' along rivers, identified in several earlier Council investigations.

NATURAL AND SCENIC FEATURES

These reserves set aside land containing prominent peaks, scenic features, lookouts, geological formations or other natural features that warrant special protection. The maintenance of these features, their native vegetation and the character and quality of the landscape are the main aims of management. Levels of permitted activities such as recreation and grazing may need close control in some areas where protection of features such as significant plants may require special measures. Any road construction would be minimal and carefully planned in each reserve. Logging is not permitted.

Natural and scenic features

Recommendations

G34—G41 That the following areas with natural and scenic features be used in accordance with the general recommendations for natural features reserves outlined above

that

(vii) the Department of Conservation and Natural Resources incorporate plans for the conservation of wildlife into the management plans, where appropriate

(viii) apiculture be permitted at traditionally licensed areas

(a) except in small reserves intensively used for recreation
(b) no new sites be established

(ix) timber harvesting not be permitted

(continued)

G34—G41 Recommendations (continued)

and that

(x) any new roading be constructed only where essential for management and protection purposes and be designed to minimise effects on scenic and nature conservation values or significant exposures of geological features.

Existing natural and scenic features reserves

G34 The Paps (208 ha) CA 2 Parish of Doolam

G34 Note: Significant fauna here should be protected and use of the gravel pits reviewed by the land managers.

G35 Mount Useful (220 ha) Parish of Binnuc

In the final recommendations for the Alpine Area in 1979, Council recommended a total area of 500 ha surrounding Mount Useful, part of which is located within the Melbourne Area. This reserve falls within a site of State botanical significance for its cool temperate rainforest, and its management should take account of the need to protect this community.

G36 Westbury (3 ha) CA 15B Section F Parish of Yarragon

New natural and scenic features reserves

G37 Murrindindi River (760 ha approx) Parish of Glendale

The lower tract of the Murrindindi River is exceptionally popular for camping and picnicking, and includes the Wilhelmina Falls and Murrindindi Cascades. Several walking tracks traverse the reserve. Management of this reserve should seek to protect the unusual variety of native plants on the rocky outcrops near Wilhelmina Falls and the wide variety of well-developed riparian vegetation communities.

G38 Mount Torbreck (480 ha) Parish of Banyarmbite

This area includes Mount Torbreck with its sub-alpine woodland of snow gum as well as a fringe at least 40 m wide of the surrounding montane damp forest (alpine ash). It extends north-west to include Barnswall Plains and an adjoining peak on the Torbreck Range.

In season, the area provides for cross-country skiing, and it is also a popular bush-walking venue. The reserve contains a memorial to four RAAF airmen killed here in 1940.

G39 Mount Terrible (100 ha) Parish of Kevington

A high ridge at Mount Terrible overlooks the valleys of the Goulburn and Big Rivers. The reserve comprises the sub-alpine woodland of snow gum on the top of the ridge and a fringe, about 40 m wide, of the surrounding montane damp forest (alpine ash). The site includes a fire lookout.

G40 Steavenson's Falls (180 ha) Parish of Steavenson

The reserve contains part of the ferny Steavenson River valley, scenic waterfalls and the steep, forested slopes up to the Oxlee and De La Rue lookouts on Keppel track.

G40 Note: The area used for water supply (see Recommendation D25) should be protected.

G41 Seven Acre Rock (47 ha) Parish of Tonimbuk East

Magnificent views over the Upper Bunyip catchment forests and Western Port and Port Phillip Bays are obtained from this site, accessible via a short walk from the Bunyip Road. The area includes a valuable stand of rocky outcrop scrub community.

NEW GEOLOGICAL AND GEOMORPHOLOGICAL FEATURES RESERVES

These contain features of geological interest, and are reserved primarily to preserve these features for the public's education and enjoyment. Such areas often have recreation, nature conservation, scenic and landscape values in addition to geological features.

Geological and geomorphological features

Recommendations

G42—G44 That the following sites be used in accordance with general recommendations (i) and (vi) for natural features reserves outlined above

and that

(vii) educational and scientific study be permitted where it is compatible with (i) and (vi) above, and in ways that minimally affect the area

(viii) recreational access be permitted where this is consistent with protection of the geological and geomorphological values.

G42 Labertouche Cave (23 ha) Part CA 111G, Parish of Jindivick

This consists of a 200-m-long two-entrance cave in the valley of Labertouche Creek. It is formed in granite boulders. The multiple underground stream courses are of particular geomorphological interest, with the cave fauna also of significance.

G42 Notes:
1. The adjacent area used for water supply (see Recommendation D45) should be protected.
2. Use should be in accordance with the code of caving ethics.

G43 Britannia Creek Cave (8 ha)

Britannia Creek flows underground here, and caves have formed under granite boulders. They are of geomorphological and educational significance, demonstrating valley fill and weathering processes. The caves have at least 5 entrances and are accessible from the Britannia Creek Road. They may be used for recreation under direction. Downstream from the caves, steeply sloping granite slabs form an impressive cascade.

G44 Fossil Beach (15 ha) Parish of Moorooduc

Fossil Beach is a site of State geological/geomorphological significance, being the type-locality of a major subdivision of the Tertiary in Australia - the Balcombian Stage. It is also the type locality of other formations (the Marina Cove Sand and Balcombe Clay), and contains the best exposure of the contact surface of the Baxter Sandstone. In addition, it is a major fossil site and continues to yield important material. The outcrops are sensitive to disturbance, however, and have been affected by general recreational use and the construction of coastal and cliff stabilisation works. Although the area is used for recreation (swimming and fishing) these are not major activities.

G44 Note:
Given the significance and sensitivity of this site, Council believes that management should not be delegated.

BUSHLAND AREAS

Numerous small parcels of public land away from the Central Highlands forests carry remnants of native vegetation. This vegetation, particularly the ground flora, has often been modified from the original by grazing and invasion by weeds. The native tree species and, to varying extents, the understorey remain, and these areas provide landscape

diversity and some animal habitat, particularly in the more substantially cleared areas.

Council recommends that many of these small remnants of the native vegetation should be recognised as bushland areas. Their major uses are to maintain the distinctive Australian character of the countryside and to provide diversity in the landscape. When accessible, they may also provide some opportunities for passive recreation in relatively natural surroundings, but it is not intended that they be developed for recreation. For some, the only access is via an unused road covered by an unused-road licence, which should continue subject to the approval of the land manager. These bushland areas are generally too small to have major significance for fauna conservation, but they play an important role in maintaining local populations of many faunal species, especially birds and bats. Standing dead trees provide valuable habitat for hollow-dependent species.

Management should aim at the maintenance of the native flora, particularly the tree species. Limited gravel extraction, low-intensity grazing (where appropriate) and the cutting of small amounts of firewood and an occasional post and pole are not necessarily incompatible with this primary aim, and may be permitted by the land managers in larger reserves provided they do not affect areas with intact or diverse understorey vegetation or habitat values, are carefully planned and controlled and do not spoil the appearance of the reserves, particularly as viewed from roads, railway lines and lookout points. These uses may not be appropriate to all reserves. In some instances the land manager may have to exclude them, at least temporarily, in order to permit regeneration of native vegetation. Licences for grazing and apiculture would not be introduced to bushland areas not recently grazed or not utilised for honey production, respectively. Areas used for extraction of timber, such as farm posts and poles, and firewood, should be on a sustainable basis.

Recognising the extent of historical and indeed recent land clearing in the study area, the Council has adopted a policy of protecting isolated public land areas with remnant vegetation, by recommending them as bushland areas, if not in another category.

Bushland areas

Recommendations

G45—G246 That the following areas of bushland be used in accordance with the general recommendations for natural features reserves outlined above

and

(vii) to maintain the character and quality of the local landscape

(viii) to protect remnant areas of indigenous vegetation and areas with habitat value

and that

(ix) apiculture be permitted where currently licensed, and subject to the approval of the land manager

(x) grazing in areas not recently grazed or with an intact or diverse understorey not be permitted and in other areas be subject to:

(a) the approval of the land manager

and

(b) an evaluation of whether grazing is appropriate in each case

(xi) (a) commercial timber harvesting not be permitted

(b) extraction of posts, poles and firewood only be permitted at a low intensity and on a sustainable basis, and subject to the approval of the land manager

(continued)

G45—G246 Recommendations (continued)

(xii) gravel or stone extraction may be permitted with the approval of the land manager in the larger reserves, where this can be achieved without altering the floral, faunal and scenic values of the reserve

Table 19

BUSHLAND AREAS

Recommendation	Parish (P) or Township (T)	Description	Area (ha)
Existing bushland areas			
G 45	P DROPMORE	CA 5 SEC B	35.00
	Note: The area south of the road is now proposed as land not required for public purposes. A suitable land exchange could be considered (see Recommendation O1)		
G 46	P DROPMORE	CA 12 SEC E	125.10
G 47	P MOLESWORTH	CA 41A SEC 1	124.10
G 48	P GOBUR	CA 10C SEC B1	1.20
G 49	P MAINTONGOON	CA 11 SEC A	21.62
G 50	P LOYOLA	CA 82B	22.00
G 51	P LOYOLA	CA 85	58.48
G 52	P DELATTE/	CA 26/	
	P LOYOLA	CA 150B	164.00
G 53	P BROADFORD/	CA 131B,132C,132D, PART 131A/	
	P KERRISDALE	CA 13E SEC D	134.00
	Note: Management should aim at protecting the riparian forest and floodplain riparian woodland communities in particular.		
G 54	P YEA	EAST OF CA 91	7.00
	Note: In order to retain the native vegetation on this area, any road widening should ensure only minimal disturbance to the reserve.		
G 55	P ALEXANDRA	CA 66P	2.51
G 56	P ALEXANDRA	CA 19Q,19H,19J	29.61
	Note: The adjacent area used for a tip is not to be expanded and should be rehabilitated. There would be no objection to establishment of a rubbish transfer station on part of that area.		
G 57	T QUEENSTOWN/	CA 1A SEC 6, CA 2A,4A SEC 7 /	
	P QUEENSTOWN	CA 8 SEC E	26.00
G 58	T QUEENSTOWN	CA 5 SEC 9; CA 18 SEC 10	21.00
G 59	T TOOLANGI	CA 42,43, 28A	33.80
G 60	P SUTTON	CA 48,48A,48C,48F	68.35
	Note: This area adjoins the Yering Gorge pump station. It has good representation of grassy dry forest, which should be protected.		
G 61	P TARRAWARRA	CA 19B,19C,19D	8.45
	Note: If the pine plantation is harvested, the area should be revegetated with indigenous species.		
G 62	P GRUYERE/	CA 123A/	
	P TARRAWARRA	CA 10A,12A NO SEC	5.60
	Note: The diverse floodplain vegetation communities should be protected.		
G 63	P MOOROOLBARK	CA 33A,33B,33D	11.80
	Notes: 1. This area has good quality, little-disturbed stands of heathy foothill forest and heathy woodland, and remnant swamp heathland communities, which should be protected in management. 2. The reserve includes the adjacent road reserve.		
G 64	T WANDIN YALLOCK	CA 18A	4.05
G 65	P WANDIN YALLOCK	CA 100A	3.15
G 66	P GEMBROOK	CA 13C,21 SEC D	7.80
G 67	P GEMBROOK	CA 115A	20.60
G 68	P GEMBROOK	CA 24A,24B NO SEC	11.14
G 69	P GEMBROOK	CA 16B SEC B	3.98
G 70	P NAYOOK/	CA 36B,36C/	
	P NEERIM	CA 9B	8.80
	Note: This reserve was established as a result of the efforts of the local community, and it has continued community association. Its recovery after the 1926 fires is of note.		
G 71	P PAKENHAM	CA 149A,149B	11.30

(continued)

Table 19 (continued)

Recommendation	Parish (P) or Township (T)	Description	Area (ha)
G 72	P PAKENHAM	CA 200A	2.01
G 73	P NAR-NAR-GOON	CA 17T	4.35
G 74	P NAR-NAR-GOON	CA 132H	3.33
G 75	P NAR-NAR-GOON	CA 19M,19N	3.58
G 76	P NAR-NAR-GOON	CA 132L,132M	7.88
G 77	P JINDIVICK	CA 116R,122C,122G,122H	60.00
	Note: This area should be managed to protect its important faunal values.		
G 78	P JINDIVICK	CA 87D,87E	3.58
G 79	P NEERIM EAST	CA 33B	22.00
G 80	P MOONDARRA	ADJ CA 3 NO SEC	35.00
G 81	P KOO-WEE-RUP EAST	CA 49 SEC U	0.82
G 82	P DROUIN WEST	CA 72B,72C,72D	14.10
G 83	P DROUIN WEST	CA 64B,66A,146A&B,147B	7.40
G 84	P DROUIN WEST	CA 130A,130B,130C	1.57
G 85	P DROUIN WEST	CA 50D	2.68
G 86	P TANJIL EAST	CA 7H	28.30
G 87	P TANJIL EAST	PT CA 7G SEC C	14.00
	Note: This land is within the site of the proposed Anderson Creek overburden dump, and may be required for coal-related development in the future. Accordingly, it should be temporarily, not permanently reserved.		
G 88	P MOOROODUC	CA 30B	0.50
G 89	P MOOROODUC	CA B2	6.02
G 90	P BITTERN	CA 34D	5.62
G 91	P ALLAMBEE EAST	CA 14B,14F,14H,14D	2.14
	Note: The riparian forest and associated wet forest vegetation should be protected.		
G 92	P WARRAGUL	CA 117H,117J; CL ADJ CA 117C	7.30
G 93	T TRAFALGAR	CA 11 SEC 14	5.85
G 94	P BALNARRING	CA 66H,66J	2.65
G 95	P BALNARRING	CA B3 SEC 78	4.05
	Note: There is a need to rationalise the track network.		
G 96	P BALNARRING	CA 31A	6.68
G 97	P CORINELLA	CA 212F,31A	6.40
	Note: This reserve encompasses the unused portion of a cemetery reserve.		
G 98	T GRANTVILLE	CA 9 SEC C	27.38
G 99	P KONGWAK	CA 25S,25W,25T	14.80
New bushland areas			
G 100	P KOBYBOYN	CA 7E SEC C	1.25
G 101	P DROPMORE	CA 8B SEC A	3.76
G 102	P GOBUR	CA 40A	12.67
G 103	P MERTON	CA 80F	10.00
G 104	P MERTON	CA 6F	1.51
G 105	P MAINTONGOON	WILSONS CA 19C,19D,21B,37B SEC A	910.00
G 106	P MAINTONGOON	RUSHBURY CA 31, 31B SEC B	420.00
G 107	P MAINTONGOON	ADJ CA 29A SEC B	9.03
G 108	P MAINTONGOON	TEHANS CA 14D, 14E SEC A	500.00
G 109	P LOYOLA	CA 132D	2.00
	Note: The area includes the former Griffiths Limestone Quarry which displays the contact between the limestone lens and surrounding Early Devonian sandstone, and associated fossil fauna		
G 110	P BROADFORD	CA 135E	0.56
G 111	P BROADFORD	CA 190C	0.50
G 112	T REEDY CREEK	CA 7A SEC 7	0.59
G 113	P KERRISDALE	CA 10A SEC C	9.23
G 114	P GHIN GHIN	CL WEST OF CA 18A	1.05
G 115	T GHIN GHIN	ALL CL IN SECS 5,6,7,8	2.02
G 116	P YEA	CA 40D	0.25
G 117	T YEA	CA 4,5 SEC 29	15.90
G 118	P WHANREGARWEN	CA 75A, PART 75B, ADJ ROAD AND RAIL RESERVES	6.30
	Note: This area could provide a camp site on the suggested Hume and Hovell Trail [see Recommendation J14(vi)]		

(continued)

Table 19 (continued)

Recommendation	Parish (P) or Township (T)	Description	Area (ha)
G 119	P EILDON	CA 57 SEC B	117.48
G 120	P HOWQUA	CA 52B	2.34
G 121	P HOWQUA	CA 67,67A	4.26
G 122	P HOWQUA	CA 109D	2.01
G 123	P CLONBINANE	CA 14A SEC A	1.76
G 124	P FLOWERDALE	CA 34A NO SEC	3.01
G 125	P YEA	ADJ CA 213,217H	22.00
	Note: This area is a densely vegetated road reserve with wildlife corridor and scenic landscape values.		
G 126	P YEA	CA 215M3	14.80
G 127	P YEA	CL ADJ CA 196,258	2.50
	Note: 1. This area is part of a road reserve no longer required following a road realignment. 2. Indigenous vegetation should be protected.		
G 128	T PHEASANT CREEK	CA 10,11,12 SEC B	1.23
G 129	P KINGLAKE	CA 21D	1.42
G 130	P KINGLAKE	CA 38B	0.10
G 131	T KINGLAKE EAST	CA 25--32,33,35,36	8.35
G 132	P BURGOYNE	CA 47A	0.25
G 133	P BURGOYNE	CA 49B	4.01
G 134	P KINGLAKE	CA 75C	1.00
G 135	T MARYSVILLE	CA 10A SEC F	9.15
G 136	T ELTHAM	WEST PT REC RES SEC 9	4.88
	Note: Faunal values of this reserve should be protected.		
G 137	T ELTHAM	CA 1B SEC 15	0.60
G 138	P NILLUMBIK	CA 1C SEC 4	1.00
G 139	P NILLUMBIK	CA 3A	1.03
G 140	P NILLUMBIK	CA 8A SEC XXI	0.70
G 141	P GREENSBOROUGH	CA 101 SEC E	4.86
	Note: If the pine plantation is harvested, the area should be revegetated with indigenous species.		
G 142	P NILLUMBIK	ADJ CA 8A SEC 2	0.40
G 143	P NILLUMBIK	CA 1A SEC 8A	1.68
G 144	T PANTON HILL	CA 21,22	0.81
G 145	T PANTON HILL	CA 37,42A,48	2.50
G 146	P GREENSBOROUGH	CA 94A,67A,3OC SEC D	4.01
	Note: The floral, faunal and habitat corridor values of this reserve should be protected.		
G 147	P GREENSBOROUGH	CA 72B SEC C	0.50
	Note: Indigenous vegetation should be protected.		
G 148	P QUEENSTOWN	CA 5 SEC F	4.71
G 149	P QUEENSTOWN	CA 57A SEC C	0.50
G 150	T SMITHS GULLY	CA 50A	0.46
	Note: In mangement, pest plants should be removed but the indigenous vegetation protected.		
G 151	P SUTTON	CA 46C	1.00
G 152	P SUTTON	CA 75C	0.50
G 153	P YERING	CA B2 SEC 4	116.55
	Note: While modified, this area (Spadoni's Paddock) has high potential for eventual restoration of the Eucalyptus viminalis-E. ovata riparian woodland of the Yarra floodplain. The adjoining Spadoni's Reserve has fragmentary remnants of floodplain woodland and floodplain wetland vegetation. Council considers that, in Spadoni's Paddock, existing legal use may continue, but that the area should be progressively revegetated. The revegetation proposal excludes the area occupied by the gun club.		
G 154	P TARRAWARRA	CA 29B NO SEC	0.40
G 155	P TARRAWARRA	PT CA 45P NO SEC	9.50
	Note: Public access to and other uses in this reserve are restricted.		
G 156	P TARRAWARRA	CA 2A SEC A	2.30
G 157	P GRACEDALE	CA 30B SEC 2	2.01
G 158	P GRACEDALE	CA 118B	2.85
	Note: This area should continue to be managed by the Zoological Board of Victoria.		

(continued)

Table 19 (continued)

Recommendation	Parish (P) or Township (T)	Description	Area (ha)
G 159	P GRACEDALE	CA 69A	1.87
G 160	P GRACEDALE	CA 7J,7K SEC C	8.00
G 161	P GRACEDALE	ADJ CA 54A	1.50
G 162	T WARBURTON	CA 113	4.72
G 163	P MONBULK	CA 5A SEC F	0.31
G 164	P MONBULK	CA 4A,4B,7A SEC G	7.97
G 165	P MONBULK	CA 10,10A SEC D	4.89
G 166	P MONBULK	CA 10A SEC E	2.93
G 167	P MONBULK	PART CA 4 SEC C	0.72
G 168	T OLINDA	CA 12 SEC A	0.78
	Note: Part of this area is used as a car park for the adjoining National Rhododendron Gardens. Council is aware that an alternative site for the car park is being considered.		
G 169	P MONBULK	CA 22A	0.40
G 170	P MONBULK	CA 14B SEC H	4.77
G 171	P MONBULK	CA 52B SEC C	5.58
G 172	P MONBULK	CA 67A,95A SEC A	1.51
	Note: The understorey requires restoration.		
G 173	T WANDIN YALLOCK	CA 8,8A,8B	0.85
G 174	P WOORI YALLOCK	ADJ CA 74	1.50
G 175	P NANGANA	CA 80B	1.00
G 176	P WOORI YALLOCK	ADJ CA 29	1.25
G 177	P WOORI YALLOCK	CA 61E	3.75
G 178	P WOORI YALLOCK	CA 38E	0.81
G 179	P GEMBROOK	CA 103A	74.36
	Note: Use of the western section by the Scout Association may continue, subject to no further clearing of vegetation.		
G 180	P BEENAK	CA 70,70F,70E,72A	123.38
G 181	T BRITANNIA CREEK	CA 1A,4 SEC 4	1.70
G 182	T BRITANNIA CREEK	CA 2 SEC 6	5.85
G 183	P BEENAK	CA 50B	3.92
G 184	T POWELLTOWN	CA 5,6A SEC G	0.50
G 185	P NARREE WORRAN	PART CA 70K	1.75
G 186	P NARREE WORRAN	ADJ CA 33 SEC B	0.80
G 187	P NARREE WORRAN	CA 33A SEC B	1.62
G 188	P NARREE WORRAN	PART CA 43,44,44A	2.50
G 189	P NARREE WORRAN	CA 38A SEC B	3.50
G 190	P NARREE WORRAN	PART CA 70F NO SEC	24.03
G 191	P NARREE WORRAN	CA 113A	1.98
G 192	P NARREE WORRAN	LONG POCKITT RES. PART CA 70G AND ADJ ROAD RES.	0.74
	Note: This area has native vegetation that has been restored to good condition by local residents, and has significant local conservation values.		
G 193	P NARREE WORRAN	PART CA 37,37A	12.50
G 194	P NARREE WORRAN	MYANOOK BUSH RETREAT CA 36A SEC A	6.90
	Note: This reserve was established as a result of the efforts of local residents, who continue to maintain and enhance its nature conservation values.		
G 195	P NARREE WORRAN	PART CA 35 SEC A	11.76
G 196	P NARREE WORRAN	CA 34B SEC A	0.50
G 197	P NARREE WORRAN	CA 22A SEC A AND ADJ CROWN LAND	1.00
G 198	P NARREE WORRAN	PART CA 44 SEC A	2.36
G 199	T EMERALD	CA 1A SEC B	1.45
G 200	T EMERALD	CA 5E SEC A	1.90
	Note: A local BMX club has constructed and operates a BMX track within this reserve. This use may continue, subject to avoiding impact on the health and vigour of the overstorey.		
G 201	P GEMBROOK	CA 43E	3.25
G 202	P GEMBROOK/ T COCKATOO	WRIGHT (AVONSLEIGH) FOREST	161.00
	Notes: 1. Operations will be required in the implementation of strategic fire protection plans. (Notes continued overleaf.)		

(continued)

Table 19 (continued)

Recommendation	Parish (P) or Township (T)	Description	Area (ha)
G 202 (continued)			
	2. The Puffing Billy Railway easement is not included in this reserve.		
	3. Purchased public land adjoining the railway, and forming a bushland link to the Emerald Lake Reserve is included.		
	4. The stand of mature Banksia spinulosa is to be protected.		
G 203	P GEMBROOK	CA 71B,93C	2.00
G 204	P GEMBROOK	CA 41 SEC B	29.60
	Notes:		
	1. This was part of a large reserve vested in the Zoological and Acclimatisation Society last century. Its historical associations should be recognised by the land managers.		
	2. The wet forest vegetation should be protected.		
	3. Existing recreation uses may continue on part of the reserve.		
G 205	P GEMBROOK	CL EAST OF CA 32,32A	3.20
G 206	P NEERIM	CA 6A	2.80
G 207	P NEERIM/	CA 165B/	
	T NOOJEE	CA 3A,20 SEC 3	51.30
G 208	P NEERIM	CA 174B	1.00
G 209	P NEERIM	CA 4, 106G	7.40
G 210	P NEERIM EAST	CA 7C SEC A	5.26
G 211	P TANJIL	CA 6B	3.50
G 212	P BUNYIP	CA 36A	0.10
G 213	P YANNATHAN	CA 94A	1.80
	Note: The gravel dump in the northern part should be removed and native vegetation planted.		
G 214	P LONGWARRY	CA 47B	2.00
G 215	T DROUIN	CA 26 SEC 12	1.84
G 216	P ALLAMBEE EAST	CA 18F	1.00
G 217	P YARRAGON	CA 33A of D	0.50
G 218	T COALVILLE	CA 2--9,18--26 SEC 1; CA 1,2, 7-19 SEC 5	2.70
G 219	T COALVILLE	CA 4,5,6 SEC 7	22.90
	Note: G218, G219 - the historical associations of the Coalville township should be recognised by the land managers.		
G 220	P WANNAEUE	PT CA 31B,32E	10.70
G 221	T DROMANA	CA 13,15 SEC A	15.75
G 222	T OSBOURNE	CA 43A SEC A; CA 17A,8A,42A, 42B SEC B; CA 7A SEC 1	14.50
G 223	T RED HILL SOUTH	CA 14 SEC A; CA 31,32,33 SEC B	1.66
G 224	P KANGERONG	CA 24C	4.85
	Note: There is a need to restore the understorey of this reserve and to this end, grazing should be controlled. This will involve exclusion of stock at least in the the initial phase of rehabilitation.		
G 225	P BALNARRING	CA 7D	5.56
G 226	P MOOROODUC	CA 90A,91C	18.80
	Note: This area requires improved management. DCNR has prepared a management plan for this area, the aims of which are supported.		
G 227	P TYABB	CA 3C	10.11
	Note: Council is aware of a proposal to establish an astronomical observatory on part of this reserve. This recommendation would not necessarily prevent the construction of an observatory. A detailed proposal would need to be considered by the land managers.		
G 228	T CRIB POINT	WEST PT REC. RES. SEC 2	2.30
G 229	T CRIB POINT	CA 15,15A,16A SEC 2	0.60
G 230	P FRENCH ISLAND	CA 63E NO SEC	4.05
G 231	T GRANTVILLE	CA 10 SEC C	2.50
G 232	P CORINELLA	CA 172B	4.61
G 233	P FINGAL	CA 34A	2.02
	Notes:		
	1. This area was previously recommended for inclusion in the Cape Schanck-Arthurs Seat Regional Park.		
	2. The land managers should remove the pine tree seedlings invading this reserve from the roadside.		
G 234	P FLINDERS	ADJ CA 14 SEC B	3.25

(continued)

Table 19 (continued)

Recommendation	Parish (P) or Township (T)	Description	Area (ha)
G 235	T VENTNOR	CA 13 SEC 8; WITHIN SEC 4,5,6,7,14	21.10
	Note: Part of this reserve requires revegetation.		
G 236	T NEWHAVEN	CA 43A NO SEC	42.80
	Notes:		
	1. This area was previously recommended as a wildlife reserve.		
	2. The land managers should restore natural water levels.		
	3. Grazing and hunting are not permitted.		
G 237	T WONTHAGGI	PARTS CA 46 SEC 54A, CA7 SEC 3C	7.26
G 238	T WONTHAGGI	CA 1,2 SEC 97 CA 20L,20M,20N,20P SEC 100	45.84
	Notes:		
	1. This area includes an adjoining section of the former station ground, managed by the Public Transport Corporation. While vegetated with mature pine trees with a grassy understorey, this area provides a link to 'Guide Park' and is also within a subsidence hazard zone.		
	2. The southern margin of the adjoining golf course which retains remnant vegetation, and the adjoining 'Guide Park' reserve, a proposed future access point, are included in this reserve.		
G 239	T WONTHAGGI	CA 13 SEC 61	6.09
	Notes:		
	1. The extraction of sand within the existing pit may continue until 1997 or until economic resources are exhausted (whichever is sooner) at which time the pit is to be rehabilitated.		
	2. Aboriginal middens, the permanent spring, and remnant natural heathland vegetation should be protected.		
G 240	T WONTHAGGI	CA 43,44 SEC 101; CA 4L SEC 117; CA 1 SEC 102	8.80
G 241	T WONTHAGGI	CA 5 PART CA 6 SEC 26	1.15
G 242	T WONTHAGGI	CA 3,4,5 SEC 110; CA 15,16 SEC 111; CA 22 SEC 112	6.26
G 243	T WONTHAGGI	CA 7,11,12 SEC 34	1.27
G 244	T WONTHAGGI	PART CA 1 SEC 75	2.70
G 245	T WONTHAGGI	NE CA 8 SEC 8; SW CA 9 SEC 80	2.00
	Note: This area includes the adjoining unused road reserve.		
G 246	P WONTHAGGI	STH. PART CA 34 C	3.18

H. COASTS

Melbourne Area, District 2 includes the western coastal lands of Mornington Peninsula, above low-water mark of Port Phillip Bay, the Bass Strait coastline from Point Nepean to Cape Paterson and the Western Port coastline. It also includes the sea-bed of Western Port and the State territorial waters, which extend to 3 nautical miles (5.5 km) seaward.

In November 1991, the government directed the Land Conservation Council to carry out an investigation of marine, coastal and estuarine areas of the State and to make recommendations on the protection of significant environmental values and the sustainable use of those areas.

The area under review in the Marine and Coastal Special Investigation extends from the Victorian off-shore territorial limit to approximately one kilometre inland from high-water mark. It includes the land (terrain, and overlying water) affected by marine, estuarine and coastal processes, as well as all islands surrounded by marine and estuarine waters. Land extending about one kilometre inland from high-water mark on Phillip and French Islands is also included. The descriptive report for the investigation was published in June 1993.

The focus of the investigation is marine ecosystems, covering issues relating to the protection and/or sustainable use of marine resources along the Victorian coast, including that within Melbourne Area, District 2 and will include consideration of the extensive intertidal flats of Western Port. Issues relating to the coastal land, on the other hand, particularly those of a local nature, are covered in these recommendations. There may be a need to review some of these recommendations if new information becomes available during the course of the Marine and Coastal Special Investigation.

Victoria's coastline, particularly that around Port Phillip Bay and Western Port, forms a significant public resource having value for utility, recreation and the conservation of natural, cultural and historical values and sites.

Coastal reserves fringing Port Phillip Bay and Western Port rank among the State's primary coastal recreation resources; some three million people live nearby. Western Port is also readily accessible from the rapidly expanding growth corridors to the east and south-east of Melbourne. The main recreational activities here include swimming, fishing, boating, sailing, scuba-diving and snorkelling, picnicking, sightseeing, relaxing, camping and caravanning.

A number of navigation aids, piers, jetties and marinas are located along the shore and the Department of Defence has a major establishment on Commonwealth land at Crib Point.

The open and sheltered waters and wetlands of the coast, Western Port and other areas such as the Balcombe Creek estuary, near Mornington, support important habitat for a wide diversity of water-birds and waders. They are among the most important areas in Victoria for international migratory waders and sea-birds, such as shearwaters, skuas, albatrosses, prions and petrels, including the white-faced storm petrel.

Planning and management

Council believes that management plans prepared for the coastal reserves should provide for a range of recreational uses, recognise and protect valuable wildlife habitat, particularly for birds, and also ensure the protection of sites of conservation, historical or cultural significance.

In formulating 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. In some instances coastal engineering works such as breakwaters and sea walls are depriving beaches of sand - resulting in severe beach erosion.

The Department of Conservation and Natural Resources (CNR) is responsible for managing the majority of the foreshore region of the study area. The Department may delegate management of sections of the coastal reserve to Committees of Management. These committees, which may consist of elected members of the public or be the local municipal council, generally focus their work on the more-developed foreshore areas. The role, number and boundaries of Committees of

Management are presently being reviewed by CNR.

The Port of Melbourne Authority manages ports and has responsibilities in areas designated as 'associated ports'. Areas currently used for port purposes are discussed in Chapter M. Council is of the opinion that those coastal areas that are not currently required for port purposes, but that have high capability for such use, should be managed as part of the coastal reserve until they are required for port development.

For the coast and inshore waters of Port Phillip Bay, the Department of Planning and Development is responsible for overseeing the preparation of management plans and the issue of consents. Proposals to carry out works, change uses or plant or remove vegetation within the coastal reserve of the Bay require the approval of that Department, which, in turn, is required to consult CNR and other relevant agencies to ensure, as far as practicable, that their views are reflected in any consent.

The Coastal Management and Co-ordination Committee (CMCC), set up under the *Crown Land (Reserves) Act* 1978, has responsibility for overseeing the preparation of management plans and the issue of consents on coastal reserves outside Port Phillip Bay. These include within Western Port, including French and Phillip Islands, and the coastal reserve from San Remo to Cape Paterson.

The government has made a commitment to establishing an integrated approach to planning and management of the coast, including public involvement. The CMCC is to be replaced by a Coastal and Bay Management Council. A discussion paper was released on this matter by the Minister for Conservation in early 1994.

In addition, CNR and the various Committees of Management are required to ensure that their management of coastal reserves is consistent with State-wide and regional coastal strategies, such as *A Coastal Policy for Victoria* (September 1988). Other relevant policies that have been published include *Making the Most of the Bay* - a plan for the protection and development of Port Phillip and Corio Bays (November 1990) - and *Western Port Bay Strategy* - a strategy plan for the protection and development of Western Port, Victoria (October 1992).

COASTAL RESERVE

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, nature conservation reserves, sites for navigation aids or major ports) would not be included in the coastal reserve.

COASTAL RESERVE

Recommendations

H1,H2 That the coastal reserve shown on Map A be used to:

(i) provide opportunities for informal recreation for large numbers of people, and also for recreation related to enjoying and understanding nature

(ii) protect and conserve natural coastal landscapes, ecosystems and significant geomorphological, archaeological and historical features for public enjoyment and inspiration and for education and scientific study

(iii) ensure the protection and conservation of important aquatic and terrestrial fauna and flora

(iv) provide opportunities for fishing and facilities for boating, together with the necessary navigation aids

that

(v) the area be zoned in order to provide for the range of uses outlined above

(continued)

H1,H2 Recommendations (continued)

(vi) the special features described below be protected

(vii) the area be managed according to policies developed by the Coastal Management and Co-ordination Committee or its successor

(viii) the following principles be recognised during preparation of policies for the coastal reserve:

(a) new roads should not be sited along the coast; rather, they should be located far enough inland to avoid damaging sensitive environments or impairing the scenic qualities of the coastal landscape

(b) any major coastal development projects (such as jetties, marinas, mining, seawalls, reclamation and non-maintenance dredging) should be subject to detailed environmental studies and public consultation prior to commencement of work by the body proposing such development

(c) occupation of coastal public land by individuals or organisations should be phased out, and no new occupation leases should be granted; certain coast-oriented uses such as yacht clubs and surf clubs could be permitted, subject to conditions laid down by the managing authority

(d) when camp-sites and car-parks are to be established on the coastal reserve, the management authority should avoid locating these on sensitive areas or areas of importance for nature conservation or of archaeological significance; consideration should be given to relocating some existing camp-sites and car-parks

and that it be permanently reserved under Section 4 of the *Crown Land (Reserves) Act* 1978 and managed by the Department of Conservation and Natural Resources.

The coasts of Bass Strait and Port Phillip Bay, and sandy beach sectors within Western Port

Recommendation

H1 That the area indicated on Map A be used in accordance with the general recommendation for coastal reserves outlined above

and that
(ix) the seaward boundary be low-water mark.

Intertidal mudflat sectors of Western Port

Recommendation

H2 That the area indicated on Map A be used in accordance with the general recommendation for coastal reserves outlined above

and that
(ix) the seaward boundary be 150 m seaward from high-water mark.

Notes:
1. Within Western Port, Recommendation H1 includes sandy beaches on Phillip Island.
2. Recommendation H2 specifies that the coastal reserve over the intertidal mudflats should extend

(continued)

H1,H2 Recommendations (continued)

a nominal distance of 150 m seaward of high-water mark to facilitate jurisdictional responsibility by Committees of Management. This includes 3 small areas on French Island. Two of the areas on French Island (one of which contains the Tankerton Jetty, the replacement of which is in progress) facilitate their management by a Committee of Management. The third is the barge landing site near the former McLeod Prison Farm.

3. With respect to Recommendation H1,H2(v) above, a mechanism for the zoning of coastal reserves, which accounts for the identification of zone categories and special features, will be addressed in Council's Marine and Coastal Special Investigation.

4. With respect to Recommendations H1,H2(viii)(c) above, private structures on the coastal reserve, such as at Lang Lang Beach, should be removed as a matter of priority, in accordance with the Land Conservation Council's long-standing policy for phasing out private occupancies, and in accordance with the policies for this area approved by the government following publication of the final recommendations for the Melbourne Study Area in 1977. Structures, such as those at Lang Lang Beach, are visually intrusive, restrict public access, use and enjoyment of the beach area, may cause or aggravate erosion and constitute an exclusive use of a limited public resource.

5. Council is aware that unlicensed grazing occurs, principally between San Remo and Kilcunda, where the freehold/coastal reserve boundary is unfenced. Management of these areas should ensure that stock is confined to private land and that grazing of the reserve ceases by December 1995.

6. Freehold land extends down to high-water mark at Sunnyside, Safety Beach and the Point King area along the Port Phillip Bay section of the coast, at West Head, Sandy Point, Tyabb foreshore (part extends offshore), Tenby Point, Coronet Bay and the 'Punch Bowl' (east of San Remo) and short sections between Kennedy Point and San Remo (in Western Port). At these locations the coastal reserve extends no further inland than the high-water mark.

7. Council considers that the number of structures in the camping area at Kilcunda should be kept to a minimum and, where possible, they be screened by vegetation. If the opportunity arises, the caravan park should be relocated.

Notes on sections of the coastal reserve and schedule of special features to be protected

The significance of all geological and geomorphological sites along the Victorian coast has recently been reviewed. Most of those listed below are considered to be of at least State significance; many more are of regional and local significance.

Port Phillip Bay

Sites of geological and geomorphological significance:

* Mount Martha - a raft of sedimentary rock that was not absorbed by the intruding magma and a series of sites of interest, including one of the few Victorian granitic shore platforms
* Point Macarthur - a cemented band in calcarenite interpreted as indicating a higher Holocene sea level

Sites of botanical significance:

* Portsea to Dromana - coast banksia woodland (particularly the mature banksia overstorey) and coastal dune scrub
* Mount Martha to Mornington - coastal dune scrub, coast banksia woodland and orchid populations

Sites of zoological significance:

* Mount Martha - populations of the uncommon common scaly-foot
* Bird habitat at Balcombe Creek, Rosebud foreshore and Sorrento

Sites of historical significance:

* Sorrento (Sorrento pier, Sorrento Park, kiosk and pier, steam-tram terminus and the band pavilion)
* Mornington (Mornington pier)

Flinders to Sandy Point

Sites of geomorphological significance:

* Point Leo to East Creek - features displaying different sea-level stages
* Merricks Creek sand spit is also geomorphologically interesting and supports remnant vegetation

Stony Point to Crib Point

Some facilities on the foreshore at Stony Point are located on road reserves and 'station ground'; these areas all form part of the coastal reserve and should be reserved as such.

Council's recommendations in 1977 incorporated the foreshore between Stony and Crib Points within the coastal reserve but also provided for the future development of port facilities. Subsequently, the former Public Works Department undertook a land purchase program and an extensive area is now public land. However, this area is likely to become surplus to future port requirements.

While some of the land previously proposed for port development is disturbed, the balance retains a substantial cover of remnant vegetation including manna gum woodland that (east of Point Road) forms part of a larger area of coastal habitat considered to be of regional zoological significance.

Uncertainty remains as to the need and location of new port facilities in Western Port. To provide flexibility for any future proposal for port development, while protecting the intrinsic values of the land, Council has separately identified the harbour depot area at Stony Point and the jetty easement at Crib Point as services and utilities (port) reserves and placed the remainder in coastal reserve (see Map G and the discussion on port development options in Chapter M - Services and Utilities).

Site of botanical importance:

* Stony Point - site of mangrove regeneration

Crib Point to Yaringa

This sector of Western Port has high value for port purposes. Relevant planning policies state that the development of this deep-water resource should be sympathetic with the protection and maintenance of the sensitive ecosystem of Western Port. The sites proposed for port development in this area are described in Chapter M - Services and Utilities.

Much of the foreshore adjoining Hastings township was originally saltmarsh and has been subject to landfill with refuse. Little development has taken place on the site other than for recreation facilities and the 500-berth Western Port Marina. Recent works, including mounding and tree-planting, have been undertaken in accordance with a landscape concept plan under a management plan being prepared by the Shire of Hastings. The plan also proposes the development of a mangrove interpretation centre and associated walkways and an indigenous 'botanical garden' on the coastal reserve.

The Hastings Family Leisure Centre, Hastings Park and the tennis and netball courts, bowling greens and associated car-parking areas are not included in this recommendation for coastal reserves (see Chapter J - Community Use Areas).

Sites of botanical importance:

* valuable remnants of sand heathland, swamp scrub and coastal saltmarsh, as well as diverse orchid populations, which may include the vulnerable green leek-orchid
* record of the rare tiny arrowgrass

Site of zoological significance:

* the manna gum open forest and woodlands here, together with the fringing swamp paperbark and saltmarsh/mangrove zone, provide habitat for 11 native mammal species, including one of the few sites in the State where the New Holland mouse has been recorded and the uncommon white-footed dunnart; in addition, 127 native bird species, including 9 significant species and the uncommon southern emu-wren, 8 species of reptile, including the rare swamp skink and 7 species of amphibian have been found here

Site of historical significance:

* Jack's Beach tan pit

Heritage Cove

A large parcel of land lying between the townships of Crib Point and Hastings was originally purchased by a private company for industrial purposes but was sold when it became surplus to the company's requirements. The land has been subject to a number of development proposals, the last under the name of 'Heritage Cove'. While all of this land is freehold, the agreement entered into under the Heritage Cove proposal included the transfer into public ownership of a large parcel adjoining the coastal reserve. Most of this land supports remnant native vegetation, including

saltmarsh, fringing melaleuca scrub and, in places, manna gum woodland.

The agreement was adopted by all parties, and was incorporated into the relevant planning scheme amendment. However, it was not implemented before the development company ceased business. The status of the agreement remains unclear, but the mortgagees are investigating the development of the balance of the land.

The Council believes that the vegetated land, if it comes into public ownership, should be included in the coastal reserve.

North shore, Western Port

Much of the northern coastline of Western Port is in the City of Cranbourne (see Appendix II). Below high-water mark a strip 150-m wide is included in a proposed fauna and flora reserve (see Recommendation C40).

Lang Lang Beach to San Remo

A number of private structures located on the coastal reserve at Lang Lang Beach originated as holiday shacks, but are increasingly being used as semi-permanent accommodation. Council endorses the policy that the occupation of coastal public land by private individuals or organisations should be phased out.

Sites of geological and geomorphological significance:

* Corinella - a raised beach indicating a sequence of fresh-water, marine and intertidal sediments that record the Holocene sea-level history of the region

Sites of historical and cultural significance:

* Aboriginal archaeological sites at Settlement Point, Corinella and Cobb Bluff
* the old settlement site at Corinella and nearby Settlement Point - associated with the first 'permanent' European settlement in Victoria (note - the known archaeological sites are on freehold land)
* remnants at Queensferry of a former jetty, possibly associated with a sawmill of the 1870s at Bass River

Phillip Island

The coastal reserve includes the following adjoining areas:

* two small blocks at Ventnor
* Cowes caravan park
* the existing Cowes West Bushland Reserve - this reserve supports mature swamp paperbark and includes a fire dam. Plans are being considered for a new public boat ramp on the adjoining foreshore - this would have the advantage over the existing Cowes boat ramp in that it would not be subject to extensive sand movement.

San Remo to Powlett River

Council believes there is some merit in the suggestion received in a number of submissions that a coastal walking track should be established in this vicinity.

National Electricity maintains a testing station on the cliff top at Kilcunda to assess the corrosion resistance of products used on sub-transmission and distribution supply networks.

Sites of geological and geomorphological significance:

* between Griffith Point and Kilcunda - a cliffed, calcareous sandstone coast with shore platforms and arches
* the extensive saltmarsh and fresh-water swamps of the Powlett River floodplain are also interesting

Site of botanical importance:

* this section of coastline supports a variety of relatively weed-free coastal vegetation communities

Site of zoological significance:

* the rare *Antechinus minimus* has been recorded near the mouth of the Powlett River, as has the endangered orange-bellied parrot, which uses this area for feeding

Sites of historical significance:

* a wooden trestle bridge and the dismantled Nyora to Wonthaggi railway at Kilcunda
* relics associated with the early mining of black coal in the Kilcunda area

Wonthaggi

Much of the northern section of this coastline comprises beach and dune systems; further south, it is cliffed and fronted by reefs. Little

of the area is disturbed and the coastal vegetation communities remain relatively weed-free. Part of this reserve is known locally as the 'William Hovell Flora and Fauna Reserve'.

The recently declared Bunurong Marine Park lies at the eastern end of the study area (see Chapter A - Parks). In the draft management plan for this park, the Department of Conservation and Natural Resources proposed that the park should incorporate the corresponding section of the foreshore reserve to form a marine and coastal park and in order to integrate its management with the marine section.

Council will consider the values of the off-shore areas during the Marine and Coastal Special Investigation.

The small size, condition, absence of either known species of significance or land types not otherwise represented in the parks system and the extent of development at Cape Paterson would mitigate against the coastal area being considered as a park in its own right. Nevertheless, this section of the coastline should be managed to protect the nature conservation values of the intertidal rock platforms and the sub-tidal reef environment (presently part of the Bunurong Marine Park), as well as to ensure that recreational access is controlled.

SCENIC COASTS

In its final recommendations for the Melbourne Study Area in 1977, Council designated two sectors of the coastline as 'scenic coast' in which planning and management were to 'give special emphasis to protecting their outstanding natural landscape qualities'. A scenic coast was defined as a coastline of outstanding beauty that remains in a relatively unspoilt state.

Council believes that several stretches of the coastline within the study area are outstandingly beautiful and that it is important to protect their natural landscape qualities. In its review of the 'scenic coast' designation, however, the Council recognised that the areas are not necessarily restricted to the public land component of the coastal environment. It now believes that adequate recognition of the intrinsic values is already provided through the specific parks and reserves recommended along the coastline, through the land-use aims for coastal reserves and through complementary action on other land. Coastal scenic values will be further discussed in the Council's current Marine and Coastal Special Investigation.

COASTAL WATERS

The coastal waters of the study area encompass the intertidal region and extend to the off-shore territorial limit (5.5 km) of the State of Victoria and include the waters of Western Port.

Council's current Marine and Coastal Special Investigation is covering issues relating to the protection and sustainable use of marine resources within Melbourne Area, District 2 and includes the extensive intertidal flats of Western Port. Accordingly, no recommendations for coastal waters are included in this document.

The Council's recommendations for the Marine and Coastal Special Investigation will take into account such issues as:

* protection of the natural environment and features of cultural significance
* provision for controlled exploitation of natural resources, including the sustainable use of fish
* aquaculture activities
* provision for the use of the area for a diversity of recreational and educational purposes
* provision of the navigational and safety aids and associated facilities necessary for shipping and boating.

WESTERN PORT WILDLIFE MANAGEMENT CO-OPERATIVE AREA

In recognition that some areas have values for wildlife conservation that overlap with capabilities for other uses, the Council, in its 1977 final recommendations for the Melbourne Area, recommended that most of the northern part of Western Port and the waters off the southern shore of French Island, between Rhyll and Newhaven and between the Bass River outlet and Reef Island, be declared 'wildlife management co-operative areas'.

Council noted that these areas (indicated by hachure on Map A) have particular value for wildlife because of their special characteristics. The mangroves and seagrass flats, for example, support many forms of life and provide shelter and breeding grounds for juvenile and adult fish. They also play an important role in the cycling of nutrient materials and energy for the

whole bay. However, the waters are also used for recreation and for commercial and industrial purposes.

The 1977 recommendation required that a management plan be prepared and agreed to by those government departments with responsibilities for the area in order to protect the wildlife values. The Council also noted that research was in progress at the time to identify areas that have outstanding wildlife values or are in need of special protection, that these will be considered for reservation as marine reserves when more information is available and that parts of some wildlife management co-operative areas may eventually be included in these marine reserves.

Since 1977, substantial new information has been documented about the region's wildlife and other nature conservation values. The area has been listed on the Ramsar Convention as 'wetlands of international importance especially as waterfowl habitat'. It is also covered by two other international agreements concerning migratory bird species - JAMBA (with Japan) and CAMBA (with China).

As yet, the recommended wildlife management co-operative areas have not been implemented. Preliminary drafts of management plans have been prepared, but none has been finalised. A number of government agencies have responsibilities over the areas but, because they remained as unalienated Crown land, none has overall responsibility. As a result, and in the absence of an agreement between all affected parties, protection of wildlife values cannot be assured precedence over any other activity that may be proposed.

As noted previously, issues relating to the coastal area of Melbourne Area, District 2, particularly those of a local nature, will be covered during the present review; those relating to the protection and sustainable use of marine resources will be addressed during the Marine and Coastal Special Investigation.

In the interim, the Council endorses its 1977 recommendation that the areas 'be used for the conservation of wildlife and for commercial and recreational activities'. Council is of the view, however, that the nature conservation values of the areas, and particularly the wildlife values, are of such significance that they should be included in land use categories where their protection is the principal goal of management. The most appropriate form of protection, the appropriate range of uses and the boundaries will be considered as part of the Marine and Coastal Special Investigation.

The Council also believes that the near-shore areas and channel access to the Warneet, Tooradin and Corinella foreshores should remain subject to the provisions recommended for a wildlife management co-operative area. That is, in order to protect the wildlife values associated with these areas, the Department of Conservation and Natural Resources should prepare management plans in consultation with the appropriate government departments with responsibility for various activities associated with either the sea-bed or waters of the respective areas, and submit the plans to them for agreement.

SANDY POINT

Commonwealth land at Sandy Point on the eastern Mornington Peninsula is part of the Australian Defence Force's HMAS *Cerberus* training facility. HMAS Cerberus consists of a number of buildings, dwellings, training grounds and a dredged port facility. The southern portion, Sandy Point, contains one of the few remaining substantial areas of relatively undisturbed native vegetation on the peninsula.

The range of vegetation communities represented here includes coastal dune scrub, coastal banksia woodland, coastal grassy forest, coastal heathland and swamp scrub.

The area is used mainly for training exercises without vehicles and is managed in a manner largely consistent with the maintenance of its nature conservation values.

Council believes that, in recognition of the area's important nature conservation values, the State Government should discuss the future use of this area with the Commonwealth Government, with a view to permanent protection of those values.

In accordance with the Western Port Bay Strategy, prepared by the Westernport Regional Planning and Co-ordination Committee and endorsed by the government in October 1992, the Department of Defence is preparing a management plan for Sandy Point in consultation with the Department of Conservation and Natural Resources. That plan will address the management of environmental values and use of the area.

I. ALPINE RESORTS

The *Alpine Resorts Act* 1983 established the Alpine Resorts Commission (ARC) and includes the following Alpine Resorts on a schedule to the Act:

Mount Hotham
Falls Creek
Mount Buller
Mount Stirling
Mount Baw Baw
Lake Mountain
Mount Donna Buang
Mount Torbreck

The last four listed fall within Melbourne Area, District 2.

Council's final recommendations for the Melbourne Study Area in 1977 included the following comment: 'The Council considers that snow sport development should be continued on Lake Mountain rather than any development take place on Mount Torbreck; and that developments on the Baw Baw plateau be confined to the vicinity of the current resort area'.

In reviewing the uses and values of the scheduled resort areas in the current study, the Council appreciates that the growth and potential of cross-country skiing and other snow activities at Lake Mountain and Mount Baw Baw since 1977 are such that they have become, in scale, virtually a new industry with a legitimate claim to the use of public land - where it can be accommodated subject to maintenance of environmental values.

In its 1983 final recommendations, following the Alpine Area Special Investigation, the Council noted that cross-country or Nordic skiing involved few facilities and had little impact on the environment. The sport then utilised either marked tracks comprising pole lines, which normally delineate the route between particular destinations and usually weave between trees, or unmarked areas in which skiing is not confined to established tracks. In some cases, small over-snow vehicles (not grooming machines) are used to compact the snow surface on marked tracks.

Cross-country skiing has changed in recent years and some new techniques, such as 'skating', require special facilities such as machine-groomed trails. To provide sufficient clearance for the grooming machine and to provide enough room for two sets of tracks for people using the traditional 'diagonal stride' method as well as a track to accommodate skiers using skating and freestyle techniques, these trails usually comprise a 4-m- to 5-m-wide corridor. Some removal of trees and some benching (earthworks) and drainage management may be necessary to achieve the required standard and provide for both user safety and the range of skiing techniques.

In view of the potential environmental impact of constructed ski trails, the Council believes that guidelines or a code of practice for the construction and maintenance of ski trails throughout the Victorian snow country, whether within the alpine resorts, parks or State forest is essential.

The *Conservation, Forests and Lands Act* 1987 provides for the Department of Conservation and Natural Resources (CNR) to be directly involved in any activities affecting vegetation and soils on public land in the State's alpine areas, regardless of land status. This Act requires the submission by a public authority of a plan of works, prior to the commencement of any works involving soil and vegetation disturbance above 1220-m elevation, to the Secretary of CNR for comment on any necessary measures to be taken for the protection of land, waters and wildlife.

As the State's expert authority in the development and operation of cross-country ski trails for a range of skiing styles, and to assist field personnel, the Commission has developed 'Field Guidelines for the Development and Maintenance of Cross Country Ski Trails' (June 1992). The guidelines recognise the significant changes in the nature of the sport and the increased patronage, complies with appropriate standards for skier safety and recognise the need to minimise environmental disturbance.

Council believes that they provide the basis for environmental protection during trail development and maintenance of cross-country ski trails and that, in accordance with the

Conservation, Forests and Lands Act 1987, any proposed modifications to the guidelines should be referred to CNR for approval. The Council also believes that similar guidelines should apply to the construction and maintenance of down-hill ski-runs.

Guidelines for ski-trail works

Recommendation

I1 That any works for ski-trail development and maintenance be in accordance with guidelines agreed to by both the Department of Conservation and Natural Resources and the Alpine Resorts Commission and, in accordance with the requirements of the *Conservation, Forests and Lands Act* 1987, any modification to the guidelines be referred to the Department of Conservation and Natural Resources for approval.

Notes:
1. This recommendation applies to both down-hill skiing and cross-country skiing - on both groomed and ungroomed trails.
2. The *Conservation, Forests and Lands Act* 1987 provides for the submission by a public authority of a plan of works, prior to the commencement of any works involving soil and vegetation disturbance above 1220-m elevation, to the Secretary of the Department of Conservation and Natural Resources for comment on any necessary measures to be taken for the protection of land, waters and wildlife.

MOUNT BAW BAW

Previous recommendations

The 1997 final recommendations in for the Baw Baw National Park included the recommendation that:

* no further villages be developed on the plateau
* no skiing facilities be developed on the Thomson side of the plateau
* the Nordic ski trails (St Phillack Loop Trail and the Tullicoutty Cup route) associated with the Baw Baw Alpine Resort be maintained

Council's 1977 recommendations for the alpine resort set aside 180 ha to include 'the land directly affected by recreation and commercial development in the Baw Baw Ski Village'. In 1980, on acceptance of the recommendation, the government revised the boundary to ensure that the resort area included the village, parking areas, ski runs, chairlifts and services (water supply and sewerage), as well as areas on which additional ski runs could be located.

The boundary between the resort and the adjoining national park in the vicinity of the Village Loop Trail remained uncertain, however. The alignment shown on the Certified Plans for the Baw Baw National Park differs from that shown for the Mount Baw Baw Alpine Resort, and both differ from the boundary utilised by both the Proposed Management Plan for the Baw Baw National Park and the draft Mount Baw Baw Resort Strategy Plan. Accordingly, as part of this review, the Council is proposing that the boundary should follow the Village Loop Trail (see Recommendation I2 below) as well as providing for a small extension to the resort to include a proposed new ski lift.

The section of the existing Village Loop Trail in the vicinity of Pudding Basin follows a drainage line. This trail provides a summer walking route and, as a result, sphagnum areas in the drainage line are being damaged and the path is eroding. The Council is therefore recommending that this portion of the trail be re-routed to avoid the drainage line (see Recommendation I3).

Following the Wilderness Special Investigation, the Council recommended in 1991 that the identified remote and natural attributes of certain areas be 'maintained and protected to ensure that these attributes are not diminished when decisions that may affect them are being made, and in the development of management plans, while still providing for existing permitted uses'.

Council delineated an area of 6500 ha on the Baw Baw plateau - within the Baw Baw National Park - as a 'remote and natural area'. for which the identified attributes are:

* absence of vehicular tracks
* virtual absence of structures
* essentially natural condition
* opportunities for self-reliant recreation, including snow-based activities

The *National Parks (Wilderness) Act* 1992 has placed this area on Schedule 6 of the *National Parks Act* 1975. It surrounds the eastern part of the Mount Baw Baw Alpine Resort. Under that *Act*, the Director must ensure that, in a remote and natural area:

(a) no new roads or tracks for vehicles are constructed
(b) existing roads or tracks for vehicles are not widened or upgraded in any way so that they can carry increased traffic or heavier vehicles
(c) no new structures are constructed
(d) no new facilities are installed
(e) no new works are carried out that will adversely affect the natural condition of appearance of the area

['Works' includes excavation and earthworks and the destruction, removal or lopping of vegetation.]

Proposals by the Alpine Resorts Commission

The ARC considers the Mount Baw Baw resort to be important for novice and intermediate skiers in the near-Melbourne area, and as having the potential to assist in spreading the peak visitor levels being experienced at Lake Mountain, which, in the 1991 winter season, amounted to 170 000 visitor-days.

In the 1991 winter season, some 50 000 visitor-days were spent at the Mount Baw Baw resort. There were about 36 000 visitor-days in the 1992 season and in 1993, a particularly poor season, about 14 000. Currently, the resort has a comfortable carrying capacity of 1960 visitors per day. Proposed development works for the resort are expected to increase this capacity to 5200 visitors, with bed capacity increasing from 695 to 945.

The ARC proposed expansion of the resort boundary and/or sought access into the Baw Baw National Park, particularly to provide for increased opportunities for cross-country skiing on prepared, machine-groomed trails. The Commission also sought expansion of the resort into the Park in the vicinity of Neulyne Plain to provide for a new ski lift for down-hill skiing.

Mount Baw Baw Alpine Resort

Recommendations

I2 That the south-eastern boundary to the Mount Baw Baw Alpine Resort follow the Village Loop Trail.

I3 That the Alpine Resorts Commission and the Department of Conservation and Natural Resources, together, identify a suitable alignment for the Village Loop Trail in the vicinity of Pudding Basin, in the general vicinity of the existing trail but re-aligned to overcome the erosion and other environmental damage, and that, once that alignment is established, it become the boundary between the Resort and the Park.

Note:
The boundary between the resort and the park is 20 m on the park side from the outer edge of the Village Loop Trail. This would also apply to the realigned section of the trail.

I4 That the Mount Baw Baw Alpine Resort indicated on Map A and comprising 415 ha, including the area encompassed by Recommendations I2 and I3 above, continue to be reserved as an Alpine Resort under the *Alpine Resorts Act* 1983 and managed by the Alpine Resorts Commission.

Addition to the Mount Baw Baw Alpine Resort

Mount Baw Baw itself falls within the alpine resort and the southern and south-eastern slopes of the mountain have high potential for development as ski-fields but have their lower slopes in the Baw Baw National Park park - in the vicinity of Neulyne Plain. The ARC proposed the extension of the boundary of the

Resort here to enable development of new down-hill ski runs.

The Council's recommendation is that the resort area be expanded by approximately 10 ha to provide for facilities for a new chairlift and new groomed down-hill runs near Neulyne Plain, subject to a number of conditions, including an Environmental Effects Statement (EES). The EES process would address the biological significance and other values of the area and, if necessary, indicate necessary modifications to the boundary or the project as a whole.

Addition to the Mount Baw Baw Alpine Resort

Recommendation

I5 That the area of approximately 10 ha (indicated on Map A) be added to the Mount Baw Baw Alpine Resort to include proposed new down-hill ski run facilities near Neulyne Plain, subject to:

(i) the preparation of an Environmental Effects Statement for the proposed chairlift and associated down-hill ski runs in accordance with the provisions of the *Environmental Effects Act* 1978, which takes into account:

(a) current and projected increases in visitor use of the down-hill ski runs and lifts

(b) the extent to which the capacity of the existing down-hill skiing facilities can be improved and the capacity of proposed facilities within the existing resort area

(c) a demonstrated need to expand the lifting and ski run capacity of the resort

(d) the formation of a consultative committee, incorporating representatives from key agencies, the proponent and interest groups from the wider community, to guide the preparation of the Environmental Effects Statement

(ii) concurrent with (i) above, the preparation of an amendment to the Local Chapter of the Shire of Narracan Planning Scheme.

Note:
If the Environmental Effects Statement shows that the proposal is environmentally acceptable, those down-hill runs which are also acceptable would determine the limits of the extension of the resort in the vicinity of Neulyne Plain. This area would then need to be excised from the Baw Baw National Park and added to the Resort. The total area would be of the order of 10 ha; Map A broadly indicates its location.

Alpine Resorts Commission proposal to provide managed, groomed cross-country ski-trails within the National Park

In response to the proposed recommendations, the ARC reiterated its belief that opportunities for cross-country skiing close to Melbourne are limited and, to meet the growth in demand for this activity, additional developed ski trails should be planned in the Mount Baw Baw area. It had previously noted that the Baw Baw plateau (within the park) provides opportunity for an integrated trail network that services a variety of terrain for all skier levels, techniques and preferences. The distance from the existing resort boundary that such a trail network would extend would be dictated by the availability of suitable terrain and the economic distance (about 1 km) that the grooming machines can range from the works centre.

In order to provide for skiers wishing to experience self-reliance in undeveloped natural environments, the marked ski trails associated with the Baw Baw National Park are currently neither machine-groomed nor packed.

The Council believes that the existing resort facilities at Mount Baw Baw provide an ideal base for cross-country skiing, and this use should be encouraged. It notes that the existing Baw Baw resort offers some limited opportunity for new groomed trails, although slopes here are generally too steep.

However, the Council considers that there should be no expansion of the Baw Baw resort to provide for further machine-groomed cross-country skiing areas. Further, it has recommended that no development of machine-groomed cross-country ski-trails should occur within the Baw Baw National Park. Consideration of the need for new machine-groomed cross-country skiing areas should take account of the existing facilities and proposed developments at all resorts in the State and the intrinsic values of their environments.

This decision is based on the sensitivity to disturbance of the heathlands on the Baw Baw plateau, the need to protect the natural, scientific and educational values of the park and the fact that, regardless of where they are positioned, the trails of the dimension and alignment required for the grooming machines would require some clearing of snow gum and would involve earthworks.

Earthworks and the removal of vegetation would diminish the attributes of remoteness and naturalness of the Baw Baw plateau, which the Council recognised in its recommendations following the Wilderness Special Investigation.

Nevertheless, the Council considers that provision should be made for additional opportunities for cross-country skiing along marked tracks (including snow-packing or track-setting as required for safety) within the Baw Baw National Park in the vicinity of the resort. It notes that pole lines already exist between the Mount Baw Baw resort and Mount St Gwinear (within the park). Such tracks are compatible with Council's recommendations (in the Wilderness Special Investigation) concerning 'other areas with remote and natural attributes'.

Development outside the Mount Baw Baw resort

Recommendation

I6 That no development of machine-groomed cross-country ski-trails be permitted outside the area of the Mount Baw Baw Alpine Resort determined by these recommendations.

LAKE MOUNTAIN

Previous recommendations

In its 1977 recommendations for the Melbourne Study Area, the Council set aside 2400 ha as the Lake Mountain State Park. The recommendation included that: 'the area continue to be developed as a day-visitor area for snow sports such as snow play, cross-country skiing and limited down-hill skiing'. Its boundary generally corresponded with the 1220-m contour and included most of a 396-ha area set aside in 1971 under the *Forests Act* 1958 as an alpine reserve.

The government in 1978 approved the recommendation for the State park but action to formally reserve the area did not occur. Subsequently, the alpine reserve was expanded (to about 590 ha) and placed on the schedule to the *Alpine Resorts Act* 1983. The predecessors to CNR continued to manage and develop the reserve until 1987, when it was declared an alpine resort and transferred to the Alpine Resorts Commission. The resort includes the access road, and visitor and car-parking facilities and incorporates the Lake Mountain summit and Snowy Hill.

Most of the existing 28-km system of developed cross-country ski trails developed in association with the resort is actually located outside the resort and within the area recommended in 1977 as park. This land is managed by the Department of Conservation and Natural Resources as if it were a park, in accordance with the government's acceptance of the Council's 1977 recommendations.

Proposals for resort development

In 1990, the then Department of Conservation and Environment and the ARC jointly released for public comment a draft management and development plan that described development proposals for both the resort and the adjoining (park) land. The draft plan attempted to respond to an overcrowding situation, experienced on an average of 12 days each year, by increasing the on-mountain facilities and separating cross-country skiing and snow-play activities. The proposed developments included a new snow-play and summer picnic and walking area below the summit of Lake Mountain - which included vehicular access and parking, shelter, toilets and eating facilities, improvement of facilities at Gerratys, extension of ski trails, the establishment of a

new ski trail circuit and biathlon facilities on Snowy Ridge (between Snowy Hill and Arnold Gap) and renovation of facilities at Cascades, Arnold Gap and Snowy Hill car-parks. These works would have increased the visitor capacity of the resort from 4200 to about 8000 per day.

The draft plan has not been approved, although CNR and the ARC have now reached general agreement about extensions to the ski-trail system and upgrading of car-parks and other facilities.

In its submission to the descriptive report, the ARC sought designation of the whole of the previously recommended park as a resort on the basis that management of the main visitor centre and the trail network should be with the one agency, which it believes would increase investor confidence, and that the Commission required secure tenure before it was feasible to further invest in trail development to meet demand.

Uses and values of the area

In the proposed recommendations, Council noted that the Lake Mountain area is ideally located as a day-visitor area for large numbers of people pursuing snow-play and cross-country skiing activities, especially from Melbourne. The Council also noted that demand is likely to continue to increase in the future, but that there is a limit to the ability of the area to sustain expansion of the trail network and full capacity may be reached in the next few years. The importance of the area for summer recreation was also noted.

Skiing and snow-play facilities at Lake Mountain have been significantly upgraded and the area has experienced an increase in winter visitation from 70 000 in 1982 to 145 000 in 1986 (prior to its management by the Alpine Resorts Commission), and to a high of 200 000 in 1990. In 1991, visitation was some 182 000 and 151 000 in 1992. The poor season in 1993 attracted only 35 000 visits. Excessive patronage has forced closure of the gate on four days each winter between 1989 and 1992. The ARC considers Lake Mountain to be the fastest-growing ski area in Australia. The Ski Industry Association of Australia believes that, of the 2000 or so visitors on an average day, some 40% would be classed as snow-players.

The expansion in patronage here has been accompanied by an increase in commercial activities servicing the recreational use, such as ski hire, transport, food and accommodation, a significant amount of which is located at Marysville. The local economy relies heavily on the snow-based activities at Lake Mountain.

The Lake Mountain area also has very significant nature conservation values, which are described in detail in the preamble to the recommendation for the Ash Ranges National Park. It is notable for the high diversity of plant species within a relatively small area as well as a number of significant species. Its bog and heath communities display a unique ecology associated with the successional stages. The area supports several faunal species of significance.

Lake Mountain holds much of its botanical value in common with the Baw Baw National Park, except for the apparently unique feature of the ecology of its alpine bog communities referred to above. Its geomorphology, however, and its land systems differ markedly from those of the Baw Baw plateau.

It was on the basis of values such as these along with the recreational values that the Council recommended in 1977 that the area become a State park. When preparing the proposed recommendations, the Council envisaged that Lake Mountain and the nearby Cumberland area, with its rainforests and big trees, would become a major visitor focus of the Ash Ranges National Park.

Management of the area

Since the Lake Mountain Alpine Resort was transferred to the ARC in 1987, management of the land comprising the originally proposed Lake Mountain State park has been divided between the Commission and CNR. The resort area currently includes the access road, car-parks and other visitor facilities, while most of the developed ski trails are situated outside the resort boundary and are on land managed by CNR.

Difficulties with respect to the co-ordinated management of the Lake Mountain area have arisen as a result of this division of responsibilities and differences in management philosophy. Consequently, the Council is of the opinion that both the environmental and recreational values of the area have suffered.

For this reason, Council holds firmly to the view that the area should be managed by a

single authority, with a clear direction to maintain and enhance both the environmental and recreational values of the area.

Proposed recommendations

In the proposed recommendations, the Council re-affirmed its recommendations of 1977 that the whole area, which includes the current Lake Mountain Alpine Resort, should be reserved as a park, in order to provide year-round management of both the recreational use of the area (summer and winter) and its significant conservation values. On the basis of the above values, the Council proposed that the whole area should be included as part of the Ash Ranges National Park to be managed by CNR.

In recognition of the specialist skills of the ARC in ski-resort development and operation, the Council proposed that the Commission manage the winter recreation facilities and services by arrangement with the park manager. This would include the development and maintenance of the trails during the summer months. However, as the area is much more than a ski resort and the conservation significance of Lake Mountain and summer recreational values of the area also require specialist management all year round, the Council proposed that the whole area should be managed by CNR.

The proposed recommendations thus supported the continued use of the area for skiing and did not prohibit further development of ski trails or infrastructure.

Response to proposed recommendations

In its response to the proposed recommendations, the ARC proposed that, essentially, land above the 1300-m contour and encompassing the existing resort and ski-trail network at Lake Mountain (but extending north only as far as Boundary Hut), as well as further minor areas at Gerratys and Snowy Hill car-parks, should be added to the existing alpine resort. This would encompass an area of some 1650 ha. The ARC has advised that the proposed development near the Lake Mountain summit will not be pursued at this stage and the design capacity of the area will be reduced from the previously planned 8000 to 6000 persons per day. New public and commercial facilities will be proposed for the Gerratys area, as well as some additional car-parks at Snowy Hill if required. Further, CNR and the ARC have agreed in principle on the routes of the proposed new ski trails (totalling about 13 km), subject to on-ground evaluation and assessment of potential impacts on flora and fauna by CNR. The assessment process includes an evaluation of the capability of the soil to withstand disturbance associated with trail development and use and surveys of the flora, fauna and other natural values of the area. The ARC was also considering the provision of recreational opportunities during the summer months.

Following modification to account for the variations mentioned above, the Draft Management and Development Plan will be forwarded to the Ministers for Conservation and Environment and Natural Resources for approval.

A number of other respondents to the proposed recommendations were of the opinion that, if the Lake Mountain area became part of the park, as proposed, visitation to the area would diminish and commercial activity would be unduly constrained. On the other hand, some people believe that to enhance the status of the area to a national park would encourage greater visitation.

Final recommendations

Council is of the view that Lake Mountain and the nearby Cumberland area, with its large mountain ash trees and rainforest, provide an important recreational focus to the recommended Ash Ranges National Park and, regardless of the land status, people will continue to visit the area for snow-play, to ski, to walk, for nature study and for sightseeing, and should be encouraged to do so.

Because of the high conservation values of Lake Mountain, Council reaffirms its recommendation that those areas supporting the principal nature conservation values be incorporated into the Ash Ranges National Park (see Recommendation A12) and that the ultimate responsibility for their management should reside with the body that is responsible for park management.

However, the Council also recognises the very significant values of the Lake Mountain area for skiing and snow-play activities and that trail development and improvement have proceeded under the current tenure, accompanied by increased visitation. The Council also accepts that the area can support large numbers of skiers in winter and that, in recognition of the CNR and ARC agreement in

principle over the routes of new ski trails and improved infrastructure, development of the additional machine-groomed cross-country trails in the park would be appropriate, subject to on-ground assessment of any environmental impact associated with trail alignment. This may necessitate some re-alignment.

Two of the proposed new trails fall within the recommended new park, the others are within the recommended boundary to the resort.

The Council reiterates its belief that both the winter recreation can be enhanced and the significant conservation values can be protected at Lake Mountain, provided the planning for recreational development recognises that significant and sensitive sites and off-site effects must be avoided. This can be achieved by the implementation of a management and development plan similar to that previously prepared, but with appropriate amendments following agreement between the ARC and CNR. That plan must identify a zone within the park where the ARC may undertake trail development and management, consider the siting of new ski trails and other developments and the assessment of their environmental effects and outline the application of the 'Field Guidelines for the Development and Maintenance of Cross Country Ski Trails'. Integral to the agreement should be a process of dispute resolution.

Accordingly, and to facilitate appropriate ski-related developments, the Council recommends that the existing boundary to the Lake Mountain Alpine Resort be adjusted to incorporate the existing and proposed commercial facilities and car-parks, access road and the proposed biathlon course on Snowy Ridge, and that the modified area be scheduled under the *Alpine Resorts Act* 1983 as an alpine resort to be managed by the ARC. The eastern boundary should include the proposed Gerratys to Snowy Hill and proposed biathlon ski trails and is intended to exclude from the resort as many as possible of the areas containing alpine bog and rainforest communities. Also excluded is the summit of Lake Mountain. The actual boundary will be determined when the alignments of the ski trails are finalised, but would encompass an area of about 465 ha.

In this way the ARC would retain responsibility for the commercial development within the resort while CNR retains responsibility for the park, with the ARC undertaking development and management of the ski trails according to the approved plan.

Lake Mountain

Recommendations

I7 That the area of the Lake Mountain Alpine Resort be amended to that indicated on Maps A and D (see Note 1) and be reserved as an alpine resort under the *Alpine Resorts Act* 1983 and managed by the Alpine Resorts Commission.

I8 That the balance of the existing Lake Mountain Alpine Resort be deleted from the Schedule to the *Alpine Resorts Act* 1983 and be included in the recommended Ash Ranges National Park (see Recommendation A12), to be managed by the Department of Conservation and Natural Resources.

I9 That:

(i) the Lake Mountain portion of the recommended Ash Ranges National Park that contains the existing developed ski trails and where further trail development may take place be zoned accordingly to allow for on-going management and maintenance of existing ski trails and for further trail development [see Note 2, Map D, and Recommendation A12(xiii) - Ash Ranges National Park]

(ii) further new major works at Lake Mountain may take place:

(a) following finalisation and adoption of a development and management plan for the area that is agreed to jointly by the Alpine Resorts Commission and the Department of Conservation and Natural Resources

(b) in the area identified in I7 above as the Lake Mountain Alpine Resort (car-parks, amenity buildings and ski trails as required)

(continued)

I9 Recommendation (continued)

(c) within the Ash Ranges National Park for ski trails only, and only within the zone identified in I9(i) above

(iii) the adopted development and management plan be binding on both the Department of Conservation and Natural Resources and the Alpine Resorts Commission

(iv) the Alpine Resorts Commission implement the skiing-oriented development and management activities in the zoned portion of the park in accordance with the agreed development and management plan

(v) interpretation facilities for both the park and the resort be established in the resort

and that

(vi) any new proposals for major developments in the Lake Mountain area, beyond those described in the approved development and management plan, should be subject to the Environmental Effects Statement process.

Notes:
1. The recommended Lake Mountain Alpine Resort covers some 465 ha. Its western boundary remains as a 100-m offset from the main entrance road except on the western sides of the Snowy Hill and Gerratys car-parks, where it follows the 1260-m contour (to permit expansion of the car-parks). Much of the boundary on the eastern side will be determined by the proposed routes of the Gerratys to Snowy Hill ski trail and the Snowy Ridge biathlon trail - the boundary being offset 20 m from the outer edge of the trails, except that a 100-m buffer is also provided around the eastern side of the Gerratys car-park and snow-play area and the Snowy Hill snow-play area (see Map D).
2. The zone within the park in which development and management of ski trails may proceed is indicated on Map D and extends north from the alpine resort to Boundary Hut and lies above the 1300-m contour [see also Recommendation A12(xiii)].

MOUNT DONNA BUANG

Mount Donna Buang is situated on the divide between Badger Creek (part of the Maroondah water supply catchment system) and the Yarra River.

It is the closest and most accessible site to Melbourne for snow-play, although snow cover in the area is unreliable and of only 60 or fewer days duration per year.

Facilities on the summit include toilets, a shelter and gas barbecues; other facilities are located on the access roads. There is no commercial development.

The area formed part of the Yarra Valley Multi-purpose Park (A29) in the Land Conservation Council's final recommendations for the Melbourne Study Area in 1977 and was zoned for intensive recreation. The recommended zoning of the Yarra Valley Multi-purpose Park, outside the water supply catchments, was approved by the government.

Mount Donna Buang forms an important recreational component of the recommended Ash Ranges National Park (see Recommendation A12). It is therefore recommended that the Mount Donna Buang area be deleted from the Schedule to the *Alpine Resorts Act* 1983 and included in the recommended Ash Ranges National Park.

Mount Donna Buang

Recommendation

I10 That the Mount Donna Buang area be deleted from the Schedule to the *Alpine Resorts Act* 1983, and be included in the recommended Ash Ranges National Park (see Recommendation A12).

MOUNT TORBRECK

Council's 1977 final recommendations for hardwood production in the Melbourne Study Area provided for particular values to be protected within the areas of reserved forest by means of reserves under section 50 of the *Forests Act* 1958 or by management prescription. Specifically, it recommended that 'the scenic features and environs of Mount Torbreck should be maintained' (1977 Recommendation E10 - Rubicon Forest).

Although the area is included on the schedule to the *Alpine Resorts Act* 1983, no commercial development has taken place there and its remote nature would make such development expensive.

In recognition of the intrinsic values of Mount Torbreck and, consistent with Council's recommendations for similar areas across the State, it is now proposed to set the area aside as a natural and scenic features reserve under the *Crown Land (Reserves) Act* 1978 (see Recommendation G38)

Mount Torbreck

Recommendation

I11 That the Mount Torbreck area be deleted from the Schedule to the *Alpine Resorts Act* 1983 and be reserved under Section 4 of the *Crown Land (Reserves) Act* 1978 as a natural features reserve (see Recommendation G38).

J. COMMUNITY USE AREAS

All public land is utilised either directly or indirectly for the benefit of the community. Council has recommended that the bulk of public land be available for some form of direct use by the public, notably for education or recreation, both of which are consistent with most of Council's land use categories. The areas recommended in this chapter are those where education, recreation or other community use is the primary land use goal.

This chapter is divided into four sections - education, recreation, parkland and gardens and buildings in public use. Respectively, these areas include land used for environmental education, recreation areas such as sports grounds, local parks and formal gardens and buildings such as community halls and schools. These are discussed separately below.

COMMUNITY USE AREAS

Recommendations

J1—J29 That these areas be used for education, recreation or other community purposes

that

(i) appropriate facilities be provided

(ii) where relevant, and except where not compatible with the above, features of cultural significance, natural surroundings and the character and quality of the local landscape be maintained or restored

(iii) unless specified below, harvesting of forest products, hunting and 'stone' extraction (as defined in the *Extractive Industries Act* 1966) not be permitted

and that they be permanently reserved under section 4 of the *Crown Land (Reserves) Act* 1978 and managed by the Department of Conservation and Natural Resources, except where otherwise specified.

EDUCATION AREAS

Public land provides opportunities for a wide range of educational activities. Such activities include informal nature study and appreciation or more formal education programs run by schools, tertiary institutions or other educational bodies.

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

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

Council, realising that public land provides excellent opportunities for studies of a wide range of environments, has recommended that almost all public land (including parks, nature conservation reserves, natural features reserves and State forest) be available for educational uses. Council believes that in most situations educational studies can take place without conflicting with the primary use for which an area is set aside. Indeed in some cases it is the manipulation of the land for 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 uses as, unless this is consciously done, such environments will tend to be changed by other uses. In these areas education would be the primary use and other uses would only be permitted when not in conflict with that.

Activities permitted there that may not be appropriate elsewhere would include long-term studies collection of biological material, biomass studies and the establishment of growth plots. Education areas may also provide opportunities to demonstrate techniques of erosion control and the restoration of native vegetation and stream conditions to a more natural state.

In selecting land for this use, the Council has sought to provide areas:

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

No one organisation 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. Minimum facilities such as toilets and shelters may be required at each site, and it may be desirable to have accommodation either on the area or at some nearby locality. Whether or not accommodation facilities are located on the education area will depend on its proximity to other areas of educational value in the region and also on the availability and location of existing accommodation. In forested areas accommodation and other permanent facilities should only be provided where adequate safeguards against fire can be made.

The Council believes that management plans for education areas should be prepared by the Department of Conservation and Natural Resources (CNR). Planning and implementing the education aspects together with co-ordinating the use of areas, should be done in consultation with the Directorate of School Education, with other user groups in the education system and with community bodies that have an interest in environmental education.

Some of the education areas previously recommended by Council have received little use to date. However, as knowledge of their role has expanded and interpretative material has become available, usage is increasing. A number already receive significant use, especially those closely associated with developed camps, such as the Kinglake West and Castella Education Areas. An excellent student guide has been published for the Andrews Hill Education Area.

In addition to those that have been formally designated for educational use, other areas are, or will be, used for environmental education. The most notable within State forest is the Toolangi Forest Discovery Centre (opened in February 1994). This centre provides school education programs and forest interpretation programs to allow first-hand experience of the management and use of forests. The development will include the creation of a demonstration forest in the adjacent mountain ash regrowth. Another area of State forest, at Rubicon, is used by a local Aboriginal community in conjunction with Camp Jungai - an enterprise that operates educational camps to demonstrate traditional Aboriginal culture.

Other education and interpretation facilities and programs are operated within national and State parks, Healesville Sanctuary, Snobs Creek hatchery and (by Melbourne Water) at some water catchment areas.

Education areas

Recommendations

J1—J10 That the areas listed below and shown on Map A be used in accordance with the general recommendations for Community Use Areas outlined above and to provide opportunities for students of all ages to:

(continued)

J1—J10 Recommendations (continued)

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

(v) compare the ecosystems within education areas with other nearby natural and modified systems

(vi) observe and practise methods of environmental analysis, and the field techniques of the natural sciences

(vii) conduct simple long-term experiments aimed at giving an understanding of the changes occurring in an area with time.

Notes:
1. The Council considers that the former Kinglake education area (previously M8 in Council's 1977 recommendations) has poor access, which causes problems with respect to visitor safety in the fire season - a factor that detracts from its value as an education area. It is recommended for incorporation into the abutting Kinglake National Park. The area receives little educational use.
2. Council notes that ecologically sensitive fire management of the vegetation communities, especially heathlands, heathy woodlands and foothill forests, will be necessary to maintain the high-quality and species-rich botanical values of the Tonimbuk Education Area (J4). Students from Deakin University, Rusden Campus, are carrying out botanical, zoological and soil surveys and compiling a geographic information system database for this area.
3. The Crossover Education Area (previously M12) is now recommended for addition to the Crossover Regional Park. While it was used for education in the past, it has not received much use in recent years, and many of its attributes are also represented in Fumina South Education Area. It will still be available for environmental education purposes within the park.
4. The former Tanjil Education Area (previously M14) is now mostly inundated by the waters of the Blue Rock Reservoir. Council, in its final recommendations for the Hill End Special Investigation (January 1983), included this area within a water production reserve (now D12).
5. Several of the above areas abutting national or State parks have been included in the *National Parks Act* 1975 schedules. It is not intended that they be re-reserved under the *Crown Land (Reserves) Act* 1978.
6. Glenewart, formerly an education zone within A29 - the Yarra Valley Multi-purpose Park in Council's 1977 recommendations, is now recommended for sale - refer to Chapter O.

Existing education areas

J1 Kinglake West (280 ha)

J1 Notes:
1. Parts of this area were inadvertently included with lands vested in the Victorian Plantations Corporation. These should be divested, with public access to the area and its use for educational purposes maintained in the interim.
2. Late Silurian to Early Devonian sediments exposed in Collins' Quarry here contain a rich and abundant fossil fauna.

J2 Andrews Hill (210 ha)

J3 Castella (50 ha)

J4 Tonimbuk (250 ha)

J5 Fumina South (173 ha)

J5 Note: The uncleared recreation reserve adjoining CA 20, Parish of Fumina, should be included.

J6 Boggy Creek (160 ha)

J7 Gembrook (65 ha) (formerly an education zone within recommendation A29 - Yarra Valley Multi-purpose Park)

J8 Hoddles Creek (285 ha) (as for Gembrook)

New education area

J9 Lang Lang (20 ha)

This former bushland reserve occurs on a southern Victorian coastal plains land type otherwise unrepresented in Council's education area system. It has a range of vegetation types, is readily accessible, is well located with respect to other land types, is large enough to prevent over-use and is located such that wildfire hazard, erosion and pollution are minimised. In particular, it would allow study of the composition and dynamics of the now-depleted sand heathland and coastal grassy forest communities and of the rehabilitation of adjacent degraded sand pits. The area includes a camp operated by the Scout Association of Australia with a large number of buildings and other structures. The camp - a long-standing one - is regularly used and serves a regional community.

Lang Lang Education Area

Recommendation

J9 That:
(viii) scouting activities be permitted, subject to

(a) any additional buildings being confined to the existing developed area, and
(b) protection of riparian areas

and that
(ix) camping activities be strictly controlled in order to minimise disturbance to the natural environment.

Note:
Those parts of the former rubbish tip and sand pits on the western edge of the reserve should be rehabilitated. Those sections west of the road should be included in the adjacent recreation reserve.

Other existing area used for educational purposes

Woorabinda

Recommendation

J10 That the area of 49 ha indicated on Map A and listed below be used for those purposes approved by the government following publication of the final recommendations for the Latrobe Valley Special Investigation in October 1987

and that current tenure and management continue.

Notes:
1. This area is under lease from Generation Victoria to the adjoining Camp Woorabinda.
2. This was Final Recommendation H7 in the Latrobe Valley Special Investigation.

Additional area to be used for educational purposes

Recommendations

J11 That the area shown on Map A and described below be used for educational purposes

and that current tenure and management continue.

Notes:
1. This area was formerly an education zone in A29 - the Yarra Valley Multi-purpose Park in Council's 1977 recommendations.
2. The farm is the subject of a sharefarming agreement.

J11 Haining Farm (65 ha)

Managed as an operating dairy farm, the area provides an educational program for school groups. The Department of Conservation and Natural Resources manages it and it is on Schedule 3 to the *National Parks Act* 1975.

RECREATION

The term recreation includes the multitude of different activities that people undertake during their leisure time, both indoors and outdoors. It is an intrinsic feature of our way of life and has numerous and diverse social benefits. Participation in recreation and the provision of opportunities for it are also of economic benefit, forming the basis of our tourist industry. With increasing population and increasing availability of leisure time, the demand for recreational venues is also increasing.

Outdoor recreation is of particular interest to Council, as the public land of the study area provides important opportunities for it. Most public land is available for recreational use of some sort and the variety of reserves recommended by the Council provides for a range of recreational opportunities. While specific reserves have not been set aside for each form of recreation, most activities can be accommodated somewhere on public land.

Throughout, these recommendations refer to the many forms of outdoor recreation in a number of ways.

* Formal recreational activities include all organised 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 recreation through enjoying 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 particular recreational needs. Examples are playing organised sport, bush-walking and water-skiing.
* 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, the Port Phillip foreshore and parts of the Dandenong Ranges would be considered to be intensively used.

In view of the sustained 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 most public land should be available for recreational uses of some sort. Council could not, however, make recommendations covering in detail all the forms of recreation currently pursued on public land. These include activities such as swimming, bush-walking, camping, orienteering and rogaining, canoeing, fishing, hunting, fossicking, picnicking, horse-riding, boating, trail-bike-riding and pleasure driving. Council believes that activities such as these can be accommodated on public land, without detriment to other values, and 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). It has left the details, including the appropriate zoning and level of each activity, to the land and water managers. Council has not specified whether permitted uses may be carried out by private individuals, members of organised clubs, or by participants in commercial tours; other than that managers should provide a balance between commercial tours and other recreational groups.

Recreation activities vary in their requirements for types of land, size of area and site location. They also differ in their impact on the land and on other activities (including other forms of recreation).

All recreational activities have an impact to some extent on the environment and on other people, depending on the interaction of such factors as:

* the nature of the recreational activity
* the intensity of use of an area, as measured by the number of participants, size of group and the frequency, timing and duration of the use

* the sensitivity of the environment to change
* the degree of management intervention to make the environment less sensitive to recreational impacts

Generally, any one activity pursued at a low level of intensity in appropriate conditions poses little threat to the environment and seldom conflicts with other activities. With increasing level of use, however, conflicts and problems can arise, particularly that of damage to the environment and interactions between recreational activities.

Council therefore believes that the land and water managers should aim at managing 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 its primary purposes), while at the same time avoiding unnecessary restrictions. Managers provide recreational opportunities, while maintaining different 'settings' where differing levels of recreational use are encountered.

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, where the level of use is high or where special natural and cultural features require protection.

The involvement of peak recreation groups in the planning process is likely to lead to the early identification of key issues and facilitate the development and implementation of management strategies and codes of conduct. Such groups can also assist in the systematic documentation of recreation resources and in the development of acceptable methods of identifying and evaluating these. Consideration should be given to providing the resources and infrastructure needed to enable community organisations to become active partners in the decision-making process.

Six particular forms of recreation that may require specific consideration by the land manager, whether now or in the future, are further discussed below. Alpine resorts are discussed in Chapter I.

Motorised recreation

Much outdoor recreation depends on motor vehicles or watercraft. Conventional cars, four-wheel-drive vehicles or motorcycles 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 - when they are driven in competitive rallies or in adverse but challenging road conditions - as a source of recreation in themselves.

Most visitors to the area use two-wheel-drive vehicles and keep to the major through routes. Others use four-wheel-drive vehicles or motorcycles to gain access to more isolated areas via the secondary system of tracks. The track system was constructed mainly for timber harvesting, forest management and fire protection. The roads are frequently rough and sometimes steep and are seldom designed to cope with increasing use by recreation vehicles. Consequently, even legal use of roads can pose maintenance problems for the land manager. Authorities responsible for their construction and maintenance on public land may close roads temporarily or permanently when traffic exceeds their physical capacity, for safety reasons, or when use by vehicles is in conflict with the area's primary uses. Erosion hazard areas may be proclaimed according to the provisions of the *Land Conservation (Vehicle Control) Act* 1972 and its regulations, enabling strict control.

If the increased recreational use of roads is to be catered for, adequate funding should be provided for road maintenance, otherwise deterioration leading to erosion is inevitable. Council notes that a levy has been placed on the registration fees of four-wheel-drive vehicles, the proceeds of which are designated for track maintenance.

A number of four-wheel-drive clubs have acknowledged the need for restrictions on motorised recreation in certain areas and during some periods of the year. Clubs are often actively involved in track clearing in remote areas, and have assisted in rubbish removal and restoration of huts and other areas. Some clubs have search and rescue units. Clubs also inform and educate participants about the proper use of four-wheel-drive vehicles and the environmental consequences of improper use. The 'Tread Lightly' program run by the Victorian Association of Four-Wheel-Drive Clubs Federation has such objects. Authorities should continue to promote responsible attitudes to the use of four-wheel-drive vehicles and trailbikes, in conjunction with user groups and the general public.

Growing numbers of people are becoming involved in recreational touring on public land. Motor vehicles, including motorcycles, may only be used by licensed drivers on public land if they are registered, and only on tracks formed for the passage of vehicles having four or more wheels. Driving off such roads or tracks is prohibited on all public land, whether in parks, State forest or other reserves. Some exceptions are provided for in the *Act*.

Forest areas are used for competitive events such as formal car rallies and motorcycle trials. These have the potential to accelerate road damage, disturb wildlife and jeopardise the enjoyment and safety of other forest users. Strict standards imposed by CNR and the regulations made by organising bodies such as the Confederation of Australian Motor Sports or the Australian Cycle Union assist in reducing their impact. They are often run at night and roads are temporarily closed to public use. The Council considers that such events could continue, subject to restriction of vehicular movement to defined tracks and to the implementation of rehabilitation works where necessary.

Another form of motorised recreation involves use of watercraft such as speed and jet boats, houseboats, dinghies, hovercraft and jet skis. They may be used to tow a water-skier, for pleasure cruising, for sightseeing and, most commonly, for fishing.

The issues of boat wakes, induced erosion, turbidity, noise and disturbance of sensitive areas require management attention to ensure the areas chosen are capable of sustaining the use of powered watercraft and to reduce conflict with other environmental and recreation values.

Marinas

The increasing use of Port Phillip Bay and Western Port for recreational boating has resulted in a corresponding demand for berth sites for watercraft.

Since Council's 1977 recommendations, the government has approved the development of a large marina at Hastings and the redevelopment of small ones at Yaringa and Newhaven and assessed Environmental Effects Statements for proposals at Sorrento and San Remo.

Council is aware of recent suggestions that additional marinas be developed, with a number of sites under consideration. Several sites involving coastal reserves and adjoining off-shore land have been identified through bay-wide planning strategies and a two-stage planning process established. Council intends to consider the issue of marinas in detail in its current Marine and Coastal Special Investigation.

Hunting and target-shooting

Public land in the study area offers opportunities for the hunting of game species, such as sambar deer, as well as for vermin such as rabbits and foxes.

Sambar deer are found throughout much of the forested lands to the east of Melbourne. Many hunters consider this - the largest deer found in Australia - to be the premier game species.

The two most common forms of deer-hunting practised are stalking, which is the most popular and hunting with hounds - both forms involving the use of firearms. Other hunters use bows and arrows. Under the *Wildlife (Game) Regulations* 1976, No. 2, hunting of Sambar is permitted year-round, although in practice most deer-hunting is undertaken during the cooler months, when the success rate is higher.

Neither hunting nor the use of firearms, other than in a few specific instances, is permitted in national parks. Nor are they permitted in most State parks, nature conservation reserves, reference areas, education areas, licensed water frontages, a number of minor reserves or land in and around built-up areas (see Note 4 to recommendation F1 - Walhalla).

Deer-hunting is also currently forbidden in the Central Highlands Sanctuary, an extensive area - some 223 000 ha - between Healesville and Eildon. Like all of the sanctuaries originally declared prior to the *Wildlife Act* 1975, this provides protection for 'game' (including deer) as well as 'native game' (such as certain native ducks).

Council does not believe that it is still necessary, or desirable, to set aside areas of public land for the protection of sambar deer. With respect to the provision of sanctuaries for other game species, some 36% of the current Central Highlands Sanctuary has been recommended by Council for inclusion in parks or nature conservation reserves where hunting is not permitted. Accordingly, the Council recommends revocation of the Sanctuary (see Chapter E).

In effect, that recommendation will mean that an additional 146 500 ha of public land will become legally available for the hunting of deer.

The use of firearms for non-hunting purposes, such as target-shooting, is permitted in formal rifle and pistol-shooting ranges. Rifle ranges are controlled by the Commonwealth government. An inspector of rifle ranges operating from the Defence Department inspects and licenses Victorian ranges and establishes their safety requirements. Full-bore ranges are generally established on Crown land under permissive occupancy to the Commonwealth.

While Queen's/King's Shoots and other competitions have been held since last century, from the late 1950s the emphasis changed from military training to international competitive sport and full-bore and small-bore disciplines were developed for competition in world championship and Olympic events.

Some 28 shooting ranges currently exist within the Melbourne Area, District 2, or in nearby areas. These comprise 9 full-bore, 6 small-bore, 8 gun club and 5 pistol club ranges. A further 4 small-bore, 2 gun club and 3 pistol ranges are located in the metropolitan area.

The former Merrett (Williamstown) Rifle Range was used by 14 shooting clubs, military forces and police. There is substantial demand for a large full-bore range to replace Merrett and provide for target-shooting sports. In a 1984 report, 18 sites for such a range (on public and private land) were considered and three are real possibilities. Most were on the plains west and north of Melbourne. The strict criteria, and planning and amenity factors, make the search difficult.

A new full-bore range opened last year on private land at Bacchus Marsh, catering for some of the demand.

Council has recommended that existing ranges on public land continue to be available for shooting sports. In addition, subject to the provisions of the *Firearms Act* 1958, State forest is also available for shooting.

Horse-riding

No estimates are currently available on the numbers of horse-riders using public land in the study area, as many of the activities are undertaken by individuals and small groups with no club or commercial associations.

It is a popular activity throughout the area and involves day trips and overnight trips with camping. Bunyip State Park and the recommended Kurth Kiln regional park are heavily used for horse-riding and specific tracks are used in the Kinglake and Dandenong Ranges National Parks and the Cathedral State Park.

Council believes that the use of horses could be permitted within appropriate parts of the park system, but that the details should remain with the land manager.

It may be necessary to place conditions on the time, location and the manner in which horse-riding can be undertaken in order to minimise conflicts with other park users, to prevent the spread of weeds and to protect environmental values. It may also be necessary to prohibit this activity in particularly sensitive areas.

Overseas research and local evidence have identified environmental effects of horses that include the spread of weeds track erosion, overgrazing at specific sites and trampling of vegetation.

The Bicentennial National Trail - a horse-riding trail between Healesville and Cooktown (Queensland) - traverses the Central Highlands.

Recreational fossicking

Most commonly, recreational fossicking involves metal-detecting and gold-panning and is a popular recreational activity in parts of the study area. Most fossickers seek gold, but there is also interest in gemstones. Fossicking is often focused in and along creeks and rivers, as their alluvial processes concentrate the heavy gold and gemstones and the running water assists fossicking by allowing wet panning and sieving and removing mud that may obscure the colour of precious and semi-precious gems.

To fossick or search for gold and gemstones, participants require a Miner's Right or Tourist Fossicking Authority under the *Mineral Resources Development Act* 1990. It entitles the holder - and in the case of a Tourist Fossicking Authority, those accompanied by the holder - to search for minerals on both Crown land and (with the owner's permission) private land. Specific conditions apply to the search for minerals on land held under a mining licence. In common with other exploration and mining activities, fossicking is excluded by legislation from reference and

wilderness areas, and in general from national and State parks.

Activities under a Tourist Fossicking Authority or Miner's Right are restricted to the use of non-mechanical hand tools. The use of explosives, the removal or damage of any trees or shrubs and the disturbance of an Aboriginal place or object are prohibited.

Eductor dredges are portable, floating devices used for dredging the gravel of watercourses for gold and tin. Since November 1990, their use has not been permitted in Victoria. The Parliamentary Environment and Natural Resources Committee has completed an inquiry into eductor dredging, and its report recommended that such dredging continue to be prohibited in Victoria.

Long-distance trails

Over the past decade, the development of long-distance trails has attracted increasing interest. These cater for walkers only, for horse-riders and walkers or for vehicle-based users. Some have a historical basis, coinciding with the route of an early European explorer or early transport route. Others provide a convenient route connecting places, or through areas of landscape interest.

Trails have usually been established in response to proposals put forward by an enthusiastic interest group. Such groups may work with the relevant land managers to develop and maintain the trail. The tracks are based, to some extent, on existing access.

Within the study area a number of trails have been established. The first and perhaps most well-known is the Alpine Walking Track, developed by the Federation of Victorian Walking Clubs in partnership with the former Forests Commission. It is now maintained and managed by CNR and provides a marked trail from Walhalla, across Mount Baw Baw and the Thomson River catchment, then over the Victorian Alps to the New South Wales border. Most of the trail is designed for experienced and well-equipped bush-walkers, as it crosses some of Victoria's most rugged and exposed country and is comparatively remote from main roads and habitation. 'Link tracks' connect to Woods Point (via McMillan's Track), to Lake Eildon (via the Howqua Track) and to Warburton (via the Upper Yarra Track). Appendix VI specifies guidelines for management of public land adjoining the Alpine Walking Track.

Other tracks in the study area include: part (from Healesville via Marysville and Mount Bullfight to Knockwood) of the Bicentennial National Horse-riding Trail between Melbourne and Cooktown in Queensland; Upper Yarra Track linking Warburton to Mount Whitelaw; Two Bays walking track across Mornington Peninsula; Coppin's Track along Sorrento back beach and its extension towards Cape Schanck; the Walk Into History track in the Yarra Forest between Powelltown and Warburton (see Recommendation F15); and Wirilda Track along Tyers River from Tyers West to Moondarra Reservoir.

Tracks proposed in submissions include a coastal walking track between San Remo and Cape Paterson, tracks around Wonthaggi and the establishment of a Victorian sector of a Hume and Hovell trail.

Hume and Hovell trail proposal

In late 1824 Hamilton Hume and William Hovell travelled through this region in the final stages of their journey from Sydney towards Western Port, with six men, horses and bullocks. Their route through the study area started on 2 December 1824 near Merton. They walked over Puzzle Range and camped on Home Creek between Merton and Kanumbra. Following Home Creek downstream, they crossed the Goulburn River near Molesworth. On 4 December they went across the Yea River south of Yea, followed Boundary Creek to Scotts Creek, then along the ridge south-west from Junction Hill before camping, probably on Break O'Day Creek. After the next night on King Parrot Creek they attempted to find a route through the upper Wallaby Creek catchment. They failed owing to the steep, stony ground and thick brush, naming Mount Disappointment as it did not offer passage or give them a view of the south coast. After returning to King Parrot Creek they travelled north, to near Strath Creek, then west towards Mount Piper, camping on Sunday Creek at Broadford. They continued upstream along Sunday Creek then south down Merri Creek Valley, reaching the coast at Corio Bay on 16 December.

Their trip has had several enduring characteristics. Firstly, their glowing reports of 'excellent land'...having 'the best soil' differed from Surveyor-General John Oxley's views that the land around Western Port was 'useless for all the purposes of civilised man', and encouraged the establishment of the Port

Phillip Association. The colony later established (1835) by that Association became Melbourne.

Secondly, various features named by Hume and Hovell, including Goulburn River, King Parrot Creek, Mount Disappointment, Sunday Creek and Mount Piper, are still associated with their trip.

Thirdly, their route across the Great Dividing Range near Wallan is basically that now followed by the Hume Freeway, the current main link between Sydney and Melbourne.

In New South Wales their route has been recognised by the development of the Hume and Hovell Walking Track traversing 372 km from Yass to Woomargama. Investigation of a similar concept is now proposed for Victoria. This would involve both densely forested public land and substantially cleared open farmland. The trail would primarily be a walking route, with appropriate overnight camp-sites, although several of the historical camp-sites would be accessible by vehicle. Existing public land along the general route includes a section of the disused Tallarook to Mansfield Railway (Merton to Yea), road reserves, river and stream frontage reserves, Kinglake and Mount Disappointment State forest and a Melbourne Water catchment (Wallaby Creek). At the time of the centenary of their trip, in 1924, a network of commemorative cairns was established. These could be included along a trail route.

The long-distance trails referred to above are compatible with a range of land use categories and can facilitate appropriate use and appreciation of public land. There is a need to ensure that they avoid environmentally sensitive and unsafe areas, and that the responsibility for their maintenance is well defined. Ongoing monitoring is also required as to their compatibility with other public land values. Separate trails, where possible, may be necessary to avoid incompatible uses on a single trail. Where trails are re-routed, adequate information should be provided to prospective users, including on-ground temporary signs.

Recreational use by organised groups

Organisations such as schools, clubs, youth groups and private companies involved in outdoor recreation have a valuable role in improving community access to public land and they may also contribute to the economy of the local region. Moreover, they may provide hire equipment, transport, skilled instruction and interpretation of the environment in which the activity takes place and set models for appropriate codes of conduct.

Organised activities may involve frequent use, or large numbers of people - both participants and, for competitive events, spectators. This may lead to overcrowding of some areas, localised environmental impacts at regularly used sites and demands for exclusive access to particular venues - a demand Council believes in general to be inappropriate.

Several operators have been granted permits for commercial adventure tours within the public land of Melbourne Area, District 2. The tours offered cover a wide range of activity and may last for one day, a week-end or up to a week.

The impact of commercial tours or similarly structured activities on natural systems and their compatibility with other user groups do not necessarily differ from those of any other forms of similar recreational use. Impacts are associated rather with the size of the groups, frequency of use and the behaviour of individuals.

Codes of practice for recreational activities

Many recreational organisations have developed, and encouraged their members to follow, voluntary codes of practice. Codes outline socially and environmentally responsible behaviour, beyond that simply required by regulations. Codes provide for the maintenance of the resource on which the recreational activity depends, and harmony with those following the same or different recreational activities or with other users of the area. They also assist other users to understand the way some recreational activities are pursued. Their success is measured by the extent to which they are followed, so they need to be regularly promoted. In general, only a small proportion of the people engaging in a recreational activity belong to a formal recreational organisation, so codes need to be widely promoted to ensure that they reach all participants.

Providing for a range of recreational experiences

Outdoor recreation activities are undertaken in a variety of settings, which vary according to the level of access, facilities, use and

management. Settings reflect the physical, biological, social and management features of an area. Camping, for example, takes different forms in various settings, from readily accessible highly developed camp-grounds accommodating large numbers of people, through designated camp-sites with few facilities to remote areas without facilities. Some activities - such as swimming, caving and skiing - may also have specific physical or environmental, including seasonal, requirements. Few forms of recreational activity are totally dependent on a single setting, although many are considerably enhanced by a particular one.

The factors interacting to form the settings for recreation experiences in turn determine the range of recreation opportunities available. These concepts have led to the planning method known as the 'Recreation Opportunity Spectrum', which managers use, together with other recreation planning techniques, to help them identify and manage impacts of proposals.

Although it may be desirable to provide for all appropriate recreation activities across the full range of settings, the nature of the land and population of a region mean that not all settings can be provided in all areas. Developed settings providing large camping or picnic areas and catering for high levels of use often occupy municipal or private land. Few areas contain remote recreation settings, even on public land and there is a trend for activities to encroach into them.

In some cases recreation may be a primary use of public land; where it is a subsidiary use then it should be allowed where it can be accommodated without detriment to the other values, in accordance with the following recommendations.

Recreation

Recommendations

J12 That:

(i) public land continue to be available for a wide range of recreational uses

(ii) the type, intensity and patterns of recreational use:

(a) not exceed the capability of particular areas to sustain that use

(b) not conflict with the primary management aim of the respective area

(iii) planning ensure:

(a) a range of recreational settings is maintained

(b) special attention is given to the cumulative impact of small changes that may affect recreational settings

(c) compatibility of recreational activities is considered

(d) that use by large groups, whether private, commercial, or institutional, is consistent with (i), (ii), and (iii) (a) to (c) above

(iv) codes of practice be developed by the management authority in conjunction with appropriate groups, and that they be widely distributed and promoted to encourage responsible recreational use

(v) to facilitate planning, key recreational groups be encouraged to assist the development of methods that identify:

(a) the significance of recreational resources

(continued)

J12 Recommendation (continued)

(b) the impacts that may result from the use of that resource

(c) the management options that reduce these impacts

(vi) community awareness and appropriate use of recreational resources be encouraged through the preparation and publication of information about these resources

(vii) vehicular use of roads within the meaning of the *Land Conservation (Vehicle Control) Regulations* 1972 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

and that

(viii) land managers endeavour to provide some areas (for example disused gravel pits) for off-road vehicular use and instruction on land under their control.

Notes:
1. Relevant peak recreation groups and the Department of Arts, Sport and Tourism should be involved in the planning process, in the preparation of codes of practice and in the dissemination of educational material.
2. The development of codes is not considered a substitute for the routine enforcement of existing regulations controlling (for example) littering, firearm use, pets or unseemly behaviour.

Recreation areas

J13 That the areas listed in Appendix VIII (some of which are indicated on the maps) be used in accordance with the general recommendations for Community Use Areas outlined above

and

(iv) for organised sports (team sports, horse-racing, golf etc.) and informal recreation (picnicking, camping, etc.) as permitted by the land manager

and that

(v) existing use as a rifle, pistol or clay target range, or for other shooting sport, may continue

(vi) indigenous vegetation be conserved where possible

(vii) grazing be permitted at the discretion of the land manager.

Note:
In particular, native vegetation in the south part of the Noojee recreation reserve, and the Dromana recreation area's wildflower reserve, should be protected.

Recreation trails

J14 That the recreation trails referred to above be used in accordance with the general recommendations for Community Use Areas outlined above

and

(iv) for walking, horse-riding and cycling as appropriate and as permitted by the land manager

that

(v) the guidelines in Appendix VII for management of areas adjoining the Alpine Walking Track be applied

(continued)

J14 Recommendation (continued)

and that

(vi) (a) the Department of Conservation and Natural Resources investigate and determine the feasibility of a Hume and Hovell trail, to eventually link with the New South Wales section

(b) the most appropriate route and associated stopping points be determined following consultation with interested groups, including local municipalities and adjoining land-owners (see Note).

Note:
The identified Hume and Hovell trail need not follow the exact route taken by the explorers. Instead, nearby road reserves, stream frontages and other public land could be used.

Disused railways with recreational value

Several disused railway lines in this region have high capability for recreation - for bicycle or walking tracks, linear parks, or nature trails - and for conservation of remnant vegetation.

Of particular note is the Lilydale to Warburton railway reserve, with recreation use also being a primary value of the Erica section of the Moe to Walhalla railway and, in a special sense, the Baxter to Mornington and Coldstream to Healesville lines. Another disused railway, the Bittern to Red Hill South branch line, has been mostly purchased by the Shire of Hastings, which manages it primarily for passive forms of recreation. Other disused railways may also have recreational value, including those recommended as historical and cultural features reserves (see Chapter F) and some of those recommended as uncategorised public land pending the application of a detailed public planning process (see Chapter N).

Disused railways with recreational value

Recommendations

J15—J18 That the areas described below be used in accordance with the general recommendations for Community Use Areas outlined above

and

(iv) for informal recreation (walking, cycling, horse-riding, etc.) as permitted by the land manager and/or for use as a recreational railway

that

(v) the track formation, embankments, bridges and other remnant features of the former railway be retained wherever possible

(vi) indigenous vegetation be conserved where possible

(vii) grazing be permitted at the discretion of the land manager and, where relevant, appropriate access across the reserve be provided for movement of stock

and that they be retained as public land.

J15 Lilydale to Warburton railway reserve (185 ha)

This railway was declared surplus to operational needs in 1984 (having been closed in 1964) and, following strong community representations, it was agreed that those parts required for recreational use and development be transferred to and managed by CNR. A planning process was subsequently established, which involved extensive public consultation and culminated in the approval of

a management plan in 1988. This provides for recreational use to be the primary purpose of the reserve.

The reserve has high capability for walking, cycling and horse-riding. Its average width is 40 m and it extends some 38 km. The line passes through the rapidly developing townships of the Upper Yarra Valley as well as tracts of undulating and floodplain farmland. Some sections of the reserve retain indigenous vegetation in good condition.

J15 Notes:
1. The reserve contains a number of sections of native grassland communities that will require active management.
2. The former Yarra Junction railway station has been included in a separate historic and cultural features reserve - (see Chapter F).

J16 Erica section of the Moe to Walhalla line

The few remaining parts of this railway reserve, together with adjoining public land, provide a link between the Erica town centre and the railway corridor through adjoining State forest to the Thomson River and the Walhalla Historic Area and township. These more easterly sections of the former line have, in parts, been developed for walking access and already receive a significant level of use.

J17 Baxter to Mornington branch line

The Mornington Station ground was sold after this branch line was closed. The remainder of the line is being developed by the Mornington Preservation Society, a community-based group that operates from a station yard and workshop at the former Moorooduc Station. It is proposed for use as a tourist railway.

J18 Coldstream to Healesville line

Although closed to service, this line retains its track and has been redeveloped as the Yarra Valley Tourist Railway. The community-based group running this railway operates a motorised trolley service between Healesville and Yarra Glen and is based at the former Healesville Station ground.

Emerald (Puffing Billy) Railway (see Recommendation F4)

PARKLANDS AND GARDENS

Victoria has a long tradition of establishing parklands and gardens. Many have been developed by local communities who have strong attachments to such areas. Some have been developed as formal botanical gardens, while others are private gardens that have been acquired by the Crown. Ornamental plantations and arboreta have also been developed.

Community parks offer a place for children to play, and for adults to relax or walk. All the parklands and gardens provide opportunities for informal and passive forms of recreation, while many also have important landscape, historical and aesthetic values.

The Dandenong Ranges include a number of gardens and arboreta of particular interest. By the turn of the century the area had become a place the wealthy retreated to, to escape the summer heat of the Melbourne plains. Formal gardens were often an integral part of the grounds, but they were very expensive to maintain and many have now been subdivided and replaced by urban development, or burnt out in bushfires. Remnants of this era continue, however, and smaller gardens have been established.

Several of these gardens are now within the public land estate - in particular, the George Tindale Memorial, Pirianda, National Rhododendron and Alfred Nicholas Memorial Gardens and Ferny Creek Horticultural Society Reserve - and are open to the public.

Parklands and gardens

Recommendations

J19 That the areas listed in Table 20 below (some of which are indicated on the maps), be used in accordance with the general recommendations for Community Use Areas outlined above

(continued)

J19 Recommendation (continued)

and
(iv) as gardens, community parkland or ornamental plantations

that
(v) the conservation, scientific, educational and historical values of botanic gardens be protected

and that
(vi) they be available for public use for passive open space recreation, appreciation and education, as determined by the land manager.

Note:
Where these retain indigenous vegetation it should be protected.

Table 20

PARKLANDS AND GARDENS

Parish (P) or Township (T)		Description	Area (ha)
T	ALEXANDRA	CA 3 SEC 21A	6.48
T	ALEXANDRA	CA 5A SEC 65A	0.73
T	ALEXANDRA	CA 8C SEC 65A	0.08
T	DIAMOND CREEK	CA 2 SEC 10	0.29
T	DIAMOND CREEK	ADJ CA 1 SEC 1	0.05
T	DROMANA	CA 1,3 SEC 1A	1.08
T	DROUIN	CA 22,23,24 SEC 12	0.50
P	DROUIN WEST	CA 86A	0.31
P	EILDON	CA 5F	1.28
P	EILDON	CA 5D	2.66
T	ELTHAM	ADJ CA 9--15 NO SEC	4.86
T	HEALESVILLE	CA 2 SEC 7	3.81
T	JAMIESON	CA 1A SEC 11	0.06
P	KEELBUNDORA	CA 16G	2.51
T	KORUMBURRA	CA 6 SEC L	0.10
T	KORUMBURRA	PART CA 49,49A SEC 6	6.00
T	KORUMBURRA	CA 26 SEC Q	1.00
T	KORUMBURRA	PART CA 45 SEC R	7.76
T	KORUMBURRA	CA 6 SEC L	0.10
T	LILYDALE	CA 11 SEC 10	1.48
P	MONBULK	CA 14B SEC G	13.30
	Alfred Nicholas Memorial Gardens		
	Note: The indigenous vegetation of this area and its value as a wildlife link should be maintained.		
P	MONBULK	R.J. Hamer Arboretum	-
	Note: This area has important scenic values.		
P	MONBULK	CA 33 SEC G	2.40
P	MONBULK	CA 3,8,9,10 SEC O	41.13
	George Tindale Memorial Gardens		
P	MONBULK	CA 2B,2C SEC G	11.92
	Ferny Creek Horticultural Society Reserve		
P	MONBULK	CA 38,39 SEC C	7.97
	Pirianda Gardens		
T	MORNINGTON	CA 2A,2B SEC 5	0.41
P	NEERIM	CA 175C	0.10
T	NOOJEE	CA 17,18 SEC 3;	2.05
		CA 24,25 SEC 1	
P	SCORESBY	PART CA 72F	0.09
T	SEVILLE	CA 30A	0.56
T	SORRENTO	CA 11 SEC 2	4.35
T	TRAFALGAR	CA 16 SEC 11	0.98
T	WONTHAGGI	CA 4A SEC 117	0.30
T	WONTHAGGI	CA 36 SEC 117	1.95
T	WONTHAGGI	CA 19,20 SEC 66	0.49
T	WONTHAGGI	CA 17 SEC 47	0.55
T	WONTHAGGI	CA 5A SEC 20	0.34
T	WONTHAGGI	CA 3 SEC 7	0.31
T	WONTHAGGI	CA 19 SEC 9	0.25
T	WONTHAGGI	CA 10 SEC 3B	3.97
T	WONTHAGGI	CA 6 7 8 SEC 32	0.32
T	YARRAGON	CA 26 SEC 10	0.49
T	YEA	CA 12,12A SEC 14	0.43
William Ricketts Sanctuary			
P	MOOROOLBARK	CA 14,15A; PT CA 6,7,8,13	
	Notes:		
	1. This area has indigenous vegetation that is of value as a wildlife habitat link to adjoining areas, and should be protected.		
	2. The Victorian Conservation Trust is the committee of management for this area. If in future management responsibility reverts to the Crown, consideration should be given to adding the area to the adjoining Dandenong Ranges National Park.		

Reservoir parks

Several formal picnic areas have been developed over the years by Melbourne Water at water storages constructed as part of Melbourne's water supply system. Most are located adjacent to the storage but outside the relevant catchment, and provide for an intensity of recreational use not permitted in the catchments or in conservation reserves. They include formal lawns and plantings, picnic and toilet facilities, walking tracks and lookouts. Some have native bushland areas. Following a restructure of Melbourne Water, these areas are to be managed separately by Melbourne Parks and Waterways.

Reservoir parks

Recommendations

J20—J27 That the following reservoir parks be used in accordance with the general recommendations for parklands and gardens above

and that they continue to be managed by Melbourne Parks and Waterways.

J20 Sugarloaf (456 ha)

Most of the immediate catchment to this storage is included, for recreational purposes only. Sailing is permitted on much of the reservoir via Gate 11, and other access points lead to Ridge and Saddle Dam picnic areas. Water from Sugarloaf is fully treated, and the whole catchment is part of Melbourne Water's water supply responsibilities.

J21 Maroondah (126 ha)

The Maroondah Reserve parkland, picnic and barbecue areas and adjoining bushland towards Sawpit Creek, containing walking tracks, are included.

J22 Upper Yarra (70 ha)

This park includes the area west of the dam spillway, between the Yarra River and the Upper Yarra aqueduct.

J23 Silvan (30 ha)

Picnic and barbecue areas adjoin Stonyford Road.

J24 Thomson (12 ha)

The area has fireplaces, picnic tables and toilets and an outlook over the dam wall and storage.

J25 Cardinia (247 ha)

Sailing is permitted on Aura Vale Lake, and the park includes Bob's, Henley and Crystal Brook picnic areas and Duffy's Lookout.

J26 Tarago (29 ha)

The park comprises the picnic area beside the wall, and bushland adjoining the Tarago River downstream from the reservoir.

J27 Devilbend (5 ha)

Picnic tables and barbecues have been established on both sides of Graydens Road.

Healesville Sanctuary (31 ha)

The Sir Colin MacKenzie Zoological Park - Healesville Sanctuary - has an important and established role in providing the opportunity to view Australia's unique fauna, for Victorians and for many visitors. It also provides major educational and recreational services associated with the faunal displays, and carries out research and conservation programs - in particular, the captive breeding programs for several endangered species.

Healesville Sanctuary

Recommendation

J28 That the Healesville Sanctuary be used in accordance with the general recommendations for Community Use Areas above

that

(iv) it be available for public use for passive recreation, appreciation and education, where appropriate and as determined by the managers

and that it continue to be managed by the Zoological Board of Victoria.

Note:
This area includes Lake Corranderrk and the adjoining plantations of trees used to feed the Sanctuary's koala population.

BUILDINGS IN PUBLIC USE

Public buildings are used for a wide range of community uses, including education, recreation and tourism. They may have a single purpose, such as for museums or libraries, or multi-purposes such as public halls and schools, which have various associated facilities and are increasingly used by the community. These buildings are distinguished from those used as public offices (and categorised as Services and Utilities) by their use by a cross-section of the community, whereas public offices are largely used by the employees of departments or authorities.

Many older public buildings constructed as Mechanics Institutes and court houses may now be utilised for other public uses. They may provide a focus for community activities, such as shows, dances and markets. Many such buildings, in addition to having value as venues for other activities, have historical or aesthetic values in their own right. Those with the most significant historical values have been included as historic and cultural features reserves - (see Chapter F).

Shire Councils are often appointed as committees of management for Crown reserves and buildings under the *Crown Land (Reserves) Act* 1978. This delegation of management is a common and appropriate procedure, unless sensitive environmental or community values require direct departmental management. CNR remains as the general manager in most cases and it is that role the management recommendations refer to.

Public buildings may be sub-let to particular groups on a commercial or semi-commercial basis. As community needs change over time, buildings or sites no longer used for their original primary purpose should be assessed for their cultural heritage values and capabilities for other community or public uses. In some instances it may be appropriate to consider their reclassification.

Buildings in public use

Recommendation

J29 That the buildings listed in Appendix VIII (some of which are indicated on the maps) and their surrounding sites be used in accordance with the general recommendations for Community Use Areas outlined above

and

(iv) for schools, public halls, kindergartens, libraries, museums, galleries, war memorials, tourist facilities or other public uses

that

(v) should a building or site no longer be required for its primary designated use, it be assessed for its cultural heritage values and capability for other public uses, as part of the process of consideration for re-classification outlined in Chapter N

and that they continue to be managed by the relevant department or agency.

K. PLANTATIONS

PLANTATION PLANTING GUIDELINES

In its final recommendations for the Melbourne Study Area in 1977, the Council provided a set of guidelines for the establishment of softwood plantations. These guidelines were based on the principle that the impact that large plantations of softwood have on the natural environment can be reduced by retaining selected areas of native vegetation and by adhering to catchment prescriptions.

Most of these principles are now incorporated in the Code of Forest Practices for Timber Production (CFP) which was ratified by Parliament in May 1989 and applied to all Crown land.

In recent years controls have been put in place to encourage the retention of native vegetation in the State. Further, as a result of ratification in October 1993 of Amendment S13 to the *Planning and Environment Act* 1987, which is applicable to all planning schemes in Victoria, the CFP now applies to all private land used for commercial timber production, including the establishment of plantations.

Whereas the Code states that native forest must not be cleared to provide land for State softwood plantations, Amendment S13 limits the degree to which native vegetation may be removed for the establishment of plantations on private land. It specifies that the provisions of the Amendment do not apply if the native vegetation comprises regeneration less than 10 years old on previously cleared land, is a proclaimed noxious weed (or bracken) or if the extent of non-native species (as ground cover or numbers of species) exceeds that of native species.

The CFP specifies that plantation design must take into account the following principles.

* Existing riparian and other native vegetation within a minimum distance of 20 m from permanent streams, swamps and bodies of standing water must be retained. Where previous clearing has extended to the banks of permanent streams, a strip of species native to the area should be established (taking care to minimise land disturbance) or allowed to regenerate to ensure adequate stream protection, except where the Forest Management Plan allows alternative species to be planted.
* New plantations must be confined to areas with ground slopes generally less than 30^{o}, with lower slope limits being applied in areas of high erosion hazard. Where existing plantations are growing on slopes greater then 30^{o} they may be replanted with commercial plantation species where soils are stable and erosion hazard is low.
* Sites on public land known to contain significant populations of rare or endangered species or vegetation types, and other areas of conservation significance, together with an appropriate reserved strip around the site, must be excluded from planting.
* Strategic areas may be designated to be maintained as cleared fire-breaks.
* Boundary margins must be retained as prescribed for State forest by the Department of Conservation and Natural Resources (CNR) or by planning provisions for other land.
* Landscape values must be maintained on public land where careful assessment and planning has identified areas of high landscape sensitivity.

Other sections of the CFP provide for environmental protection during harvesting operations.

Provided the provisions now in place in Victoria for retention and protection of native vegetation remain, the Council endorses the provisions of the Code of Forest Practices for Timber Production as it applies to hardwood and softwood plantations.

In addition, the consent of National Electricity should be sought before establishing a plantation within 20 m of a power line.

VICTORIAN PLANTATIONS CORPORATION

The Victorian Plantations Corporation was established under the *State Owned Enterprises Act* 1992. Through additional powers conferred under the *Victorian Plantations Corporation Act* 1993, the Corporation is

responsible for the establishment, maintenance and management of timber plantations on land managed by or vested in it. It became operational on July 1st, 1993.

Public land vested in the Corporation is listed on a schedule to the 1993 Act. The Corporation may also purchase land in its own right. The majority of the lands vested in or managed by the Corporation support softwood plantations, although the schedule also includes hardwood plantations in the Strzelecki Ranges in South Gippsland. All the plantation areas were previously the responsibility of CNR.

Portions of the vested lands include remnant native forest - generally along streams, on steeper slopes or along plantation margins, although some of the vested lands may also include larger blocks of native vegetation that may have nature conservation or landscape value. It is important that these areas are protected and the Council considers that such protection can be achieved through the CFP. The Council therefore believes that the VPC should be treated as any other landholder with respect to the establishment and maintenance of plantations.

Tracks through some of the vested lands may be used to gain access to adjoining areas for recreation or may themselves be used for pleasure driving. Opportunities for such recreation should continue to be provided.

HARDWOOD PLANTATIONS

The Timber Industry Strategy (TIS) in 1986 discussed the environmental value of reforestation programs. The Strategy noted that the establishment of native hardwood plantations on cleared land in strategic locations by both the government and private industry was of particular interest. Management of the plantations would be for intensive wood production, with the purpose of relieving pressure on native forests for wood production.

Whereas the Council maintains that the production of pulpwood from State forests should (with the exception of silvicultural or salvage works) be tied to the harvesting of sawlogs in integrated operations (see Recommendation E2), it is of the view that harvesting of plantations need not necessarily be sawlog-driven.

Victoria's State hardwood plantation estate currently totals about 10 840 ha, of which a net area of about 7500 ha is in the Strzelecki Ranges. Few such plantations occur on public land in the study area, although small areas at Childers and Allambee - on the western edge of the Strzelecki Ranges - were planted with mountain ash in the 1940s and additional areas of former softwood plantations here are being planted or seeded with hardwood species.

APM Forests Pty Ltd (a subsidiary of Australian Paper - which was recently formed by the merger of Australian Paper Mills and Australian Pulp and Paper Manufacturers) owns and leases extensive areas for hardwood plantations outside the study area in the Strzelecki Ranges and near Maryvale. The company also recently established blue gum plantations on Generation Victoria land in the catchment to Anderson Creek, north of Yallourn.

Some people have suggested that greater emphasis should be placed on creating ash eucalypt plantations to reduce the need for harvesting native forests. Australian Paper considers that few additional areas of freehold land that are technically suitable for ash eucalypt plantations can be found in Victoria. Most of the suitable land in the State is public land, where restrictions on the clearing of native vegetation inhibit the development of plantations.

SOFTWOOD PLANTATIONS

Victoria's softwood plantation estate covers some 226 400 ha, comprising about 109 400 ha of State plantations and some 117 000 ha of private. About 1800 ha of the State softwood plantations were established under the School Endowment Plantation Scheme.

Victoria has the highest level of private investment in plantations in Australia, representing about 48% of the total area, compared with the national average of 28% under private ownership. About 72% of the private plantations in the State are owned by three companies. The largest holding - by APM Forests Pty Ltd in central and south Gippsland - amounts to some 42 000 ha.

Sawlog supplies from State plantations are expected to double in the next 10 years and to treble within 30 years.

Chapter E - Timber Production and State Forest - discusses the expansion of softwood timbers into the traditional markets of hardwood sawn timber and the respective roles

of both hardwoods and softwoods in the future of the timber industry in general.

Eight softwood sawlog management areas have been identified in the State. Three - Latrobe, Benalla/Mansfield and Central - overlap with the study area.

On the basis that there are insufficient resources to enable the expansion of all plantation areas to sizes sufficient for each to support large integrated industries, the TIS identified plantation establishment targets for each of the softwood management areas. The aim was to concentrate plantation establishment in areas where a minimum of planting would support large-scale integrated industries and where the government has commitments to supply wood under legislative agreements, and to consolidate smaller-scale plantation projects to a size suitable to supply a viable sawmilling and timber-preservation industry. The impact of that strategy was to consolidate future plantation establishment in the north-east of the State and the Latrobe Valley.

Table 21 indicates the extent of softwood plantations in the study area.

Table 21

SOFTWOOD PLANTATION AREAS
(Melbourne Area, District 2)

Location	Gross area (ha)	Net area (ha)	Period planted	Management area
Eildon (Delatite Arm)	2 780	1 932	1959—1968	Benalla/Mansfield
Kinglake West	1 440	1 116	1970s	Central
Buxton, Taggerty and Narbethong	4 360	3 714	1970s	Central
Loch Valley	1 360	989	1960—present	LaTrobe
Neerim East and Shady Creek	1 500	1 202	1972—1985	LaTrobe
Moondarra	790	621	1969—1973	LaTrobe
Allambee and Childers	1 310	568	1975—present	LaTrobe
Total	13 540	10 142		

Notes:
1. These areas represent 14%, 100% and 13% of the government's target plantation area for the Latrobe, Central and Benalla/Mansfield Management Areas, respectively.
2. The figures refer only to those plantations within the study area and do not include plantations under the control of authorities other than the Victorian Plantations Corporation and CNR.
3. Not included in the figures is a small plantation at Narbethong, which will be returned to native vegetation following harvesting of the pines.

Source: Gross areas measured from VPC schedule maps; balance derived from Forest Resources Information and Yield Regulation, No. 10 - Plantation Area Statement; CNR

Under the TIS, the plantations in the Central Management Area would remain at the current area of about 4900 ha for the supply of sawlogs. On its own, this area is insufficient for a large-scale sawmilling industry.

Similarly, the plantations beside the Delatite Arm of Lake Eildon, now controlled by the Victorian Plantations Corporation, were not to be expanded. They form part of the consolidated Benalla/Mansfield—Ovens—Upper Murray Management Areas.

The major industries currently based on this resource include an integrated pulp mill and sawmilling complex at Myrtleford (Australian Forest Industries - a division of Bowater-Scott Australia Ltd) a pulp mill at Albury (Australian Newsprint Mills Ltd) and a particle-board plant at Benalla (Monsbent Pty Ltd). Supplies of materials to these companies are by long-term agreement. The complex at Myrtleford draws some softwood sawlogs and veneer logs from the Delatite area.

Additional areas of softwood plantation in the Latrobe Management Area will provide part of the raw material for a major expansion of pulp- and paper-making by Australian Paper and the sawmilling industry in the Latrobe Valley. The *Forests (Wood Pulp Agreements) Act* 1974 guarantees Australian Paper (previously APM) increasing supplies, reaching 100 000 cu.m per year in 1999/2000, and 200,000 in 2004.

In the 1991/92 period, State plantations supplied some 69 000 cu.m of the total of 695 000 cu.m of pine pulpwood received by the Maryvale pulpmill.

The State's plantation resource is intended to complement the large private plantation resources in the Latrobe Valley so that these together ensure wood flows to allow the integrated industries to operate at internationally competitive levels.

The State softwood plantation resource in the study area contributes to the sustainable yield of softwood timber from the Latrobe and Benalla/Mansfield Management Areas.

Periodic thinning of plantations to remove weaker and poorly formed trees maximises the production of veneer logs and sawlogs. Trees felled in the thinning operations may be used to produce small sawlogs, fencing timbers (and other products that utilise roundwood) and pulpwood.

As well as timber production, many plantations have other important uses.

* A substantial part of the Narbethong plantation is managed to demonstrate the growth potential of a range of exotic coniferous species. This plantation also includes popular picnic sites.
* Many camping facilities have been provided throughout the plantation beside the Delatite Arm of Lake Eildon and are in very heavy demand throughout summer. This plantation and the adjacent native forests of Eildon State Park provide settings for considerable recreational opportunities, mostly water-based.
* Some of the plantations are heavily used for such activities as trail-bike-riding along roads and formed tracks.

A few timber-processors use softwood timber produced within the study area and have processing plants located within it. The sawmills located at Narbethong and Crossover are examples.

Plantations within the study area provide a small proportion of the requirements for large industrial developments producing a wide range of timber products at locations that include Benalla, Myrtleford, Albury and the Latrobe Valley.

Some areas recommended by the Council for softwood plantation establishment in 1977 were not planted. These are located at Mount Robertson (Kinglake), in the Acheron Valley and at Mount Carmel near Moe. More recent information indicates that the land at Mount Robertson is, at best, marginal for softwood production and should not be used for that purpose. It now appears that the additional softwood plantations in the Acheron Valley are no longer required.

In 1982, at the request of the government, the Council conducted a special investigation of the Hill End area in order to make recommendations on the best use of the land, including the extent to which it might be used to fulfil the government's commitments to increased softwood establishment and to replacement of land acquired from APM.

Subsequently, in 1983, the Council recommended that some 1410 ha net at Harold Creek, 1480 ha net at Good Hope Creek and 780 ha net at Serpentine Creek could be used for softwood plantation establishment if the government decided that forested public land should be available for that purpose.

Following the change of government in 1982, the policy with respect to using forested public land for softwood plantations was changed so that no further areas of public land carrying native forest were available for softwood production. The result was that the Council's recommendations for additional plantations on public land in the Hill End area were not accepted and the land still remains under native forest.

As an alternative to using forested public land, the government was exploring strategies whereby softwood supply commitments may be met by plantations developed by private companies on freehold land, private farm forestry (through the introduction of a plantation sharefarming scheme) and the purchase of suitable land by the State for plantation purposes. The Council supports such proposals in appropriate areas.

In the years following those recommendations, emphasis on the establishment of new plantations, particularly in the Latrobe Region, has changed from softwood to hardwood. This has occurred largely because APM is using an increasing amount of hardwood pulp in its paper-making processes.

Forest areas

In its recommendations in 1977, the Council noted that the establishment of softwood plantations constitutes a major change from any natural ecosystem that they replace.

Adjacent areas of vegetated public land that have nature conservation and/or landscape values therefore play an important role in maintaining local balance in land use. These areas are also important for protecting the softwood resource from fire. Accordingly, the Council designated these areas as 'forest area'.

Forest areas could be used for:

* conservation of fauna and flora and the preservation of scenic values
* protection of the adjacent area of softwood plantation
* low-intensity hardwood production, recreation, education, forest grazing, honey production and mining, where these activities do not conflict with conservation and preservation of natural and scenic values
* protection of water supply and catchment areas

The uses of forest areas differ little from those of State forest in general, particularly those areas of State forest that are not highly timber-productive. Accordingly, in these recommendations, the Council has included the previously recommended forest areas within the broader category of State forest (see Chapter E) and has referred to the need to protect landscape values in the near vicinity of plantations.

PLANTATIONS

Recommendations

Plantations vested in the Victorian Plantations Corporation

K1 That:

(i) the existing plantations, indicated on Map A, be used to produce forest products and to provide other goods and services and opportunities for education and recreation where appropriate and compatible with the primary use

(ii) assessment of proposals for the establishment, tending and harvesting of plantations on land vested or owned by the Victorian Plantations Corporation be based on the same definitions and principles that apply to private landholders under Amendment S13 to the *Planning and Environment Act* 1987, which applies to all planning schemes in Victoria

(iii) wood production from plantations not be constrained by the necessity to produce sawlogs

and that

(iv) the habitat of the Narracan burrowing crayfish be protected (see Note 8).

Notes:

1. These areas have been vested in and are managed by the Victorian Plantations Corporation and total about 10 760 ha.
2. The total area of plantations stated in Note 1 above includes about 70 ha (net) of hardwood plantations. These are not identified separately from softwood plantations on the map.
3. Council is aware that it may be necessary to amend the *Victorian Plantations Corporation Act* 1993 to ensure the provision and management of non-plantation values, such as recreation.
4. Where parcels of native vegetation (as defined in Amendment S13 to the *Planning and Environment Act* 1987) have been included within the boundaries of land vested in the Victorian Plantations Corporation, these and any special floral, faunal or landscape values they contain would

(continued)

K1 Recommendation (continued)

4. (continued) be retained and protected under the provisions of the Code of Forest Practices for Timber Production.
5. The above recommendation excludes the part of the West Kinglake Education Area that has been vested in the VPC. Council considers that this area should be removed from the Schedule to the *Plantations Corporation Act* 1993 and reserved under the *Crown Land (Reserves) Act* 1978 as a Community Use (Education Area) Reserve; see also Chapter J.
6. The recommendation also excludes a small area of existing softwood plantation at Narbethong (not indicated on the map), which is to be returned to native vegetation following harvesting.
7. The recommendation does not refer to the Australian Paper's hardwood plantations in the Anderson Creek catchment (see Recommendation K5 below). Nor does it refer to the 420 ha of softwoods established by Australian Paper on land owned by the Latrobe Region Water Authority (Gippsland Water) in the catchment to the Moondarra Reservoir (see Recommendation E8).
8. The watercourses and adjoining slopes within the Childers and Allambee plantations provide habitat for the Narracan burrowing crayfish, which is of limited distribution in south Gippsland. Council notes that protection of this species is required under the provisions of the *Flora and Fauna Guarantee Act* 1988.

Delatite plantation

K2 That the softwood plantations at the Delatite Arm of Lake Eildon, indicated on Map A and totalling about 2780 ha, be used to produce forest products and to provide other goods and services and opportunities for education and recreation where appropriate and compatible with the primary use.

Note:
Excluded from the above recommendation is the Delatite Arm Reserve - a popular camping area along the shores of Lake Eildon - for which separate regulations apply.

Planned plantations no longer required

K3 That the land at Mount Robertson and in the Acheron Valley (Central Management Area) and at Mount Carmel (Latrobe Management Area), recommended for softwood production in 1977 in the final recommendations for the Melbourne Area but not planted, be State forest and not be used for softwood production.

K4 That the land at Harold Creek, Good Hope Creek and Serpentine Creek (Latrobe Management Area), recommended for softwood production in 1983 in the Council's final recommendations following the Hill End Special Investigation but not planted, be State forest and not be used for softwood production.

Anderson Creek - land for agriculture or forestry

In August 1986, the Council was directed to investigate land surplus to the requirements of the former State Electricity Commission (SEC) and certain areas of uncommitted public land in the Latrobe Valley. Part of the area covered by that Latrobe Valley Special Investigation now falls within the Melbourne Area, District 2.

The ensuing final recommendations (published in October 1987) included provision for possible plantations on some 1470 ha of land at Anderson Creek within the Parish of Tanjil East, which the SEC identified as not required at that time, but which will be required for coal-related development, principally the dumping of overburden, in the future.

Council's recommendation for this area, accepted by the government, included that:

* it be available for agriculture or forestry under lease from the SEC until required for coal-related development softwood plantations not be established on the land unless there is a reasonable expectation

that it will not be required for coal-related development for at least 15 years following expiration of then-existing leases

* the land not be considered for softwood plantations until following expiration of the then-existing leases.'

The successor to the SEC, Generation Victoria (see Chapter M), has indicated that the Anderson Creek area may be required for the dumping of overburden from open-cut mining operations some 30 years from now, at the earliest. Accordingly, APM Forests Pty Ltd has been permitted to establish hardwood (blue gum) plantations over much of this land as part of the electricity industry's contribution to greenhouse 'credits' and as a source of wood fibre for Australian Paper.

Generation Victoria has sought flexibility in the future use and tenure of the Anderson Creek land, including the ability to sell it to a private (or privatised) body.

Anderson Creek

Recommendation

K5 That the area of 1470 ha at Anderson Creek, indicated on Map A be available for agriculture or forestry until required for coal-related development.

Notes:
1. See also Recommendation O3.
2. This recommendation would not preclude the sale of this land to a privatized government body or a private body.
3. In the event that softwoods are planted here, Generation Victoria will determine the appropriate fire protection measures in consultation with the Department of Conservation and Natural Resources.
4. Plantations should not be established on land overlying the Esso-BHP oil pipelines and the Gas and Fuel Corporation natural gas pipeline, which pass through here.

SCHOOL PLANTATIONS

Throughout the study area, numerous small areas of public land have been set aside for school endowment plantations as part of various schools' educational resources.

The plantations were initially established to instil, through community involvement, a love of forests and an appreciation of their value. Many of them are well suited for regular use as a teaching resource of this nature. It is expected that this use will increase as courses embracing various aspects of environmental science are developed.

Many school plantations are of radiata pine, and are used by the schools to provide amenities through revenue raised from the sale of produce. In some cases these plantations have not been very successful in providing revenue, as the sites proved unsuitable for economic growth, the plantations were too small, or the location too far from processing centres to allow economic harvesting. In some instances, radiata pine plantations have failed because of poor management.

Council believes that all the existing school plantations should be assessed in order to establish their value as a teaching resource.

Those that are not now needed or that are unsuitable for teaching purposes for some reason, such as their location, should be terminated. Those planted to radiata pine that have limited value as a teaching resource although satisfactory for wood production may continue to be used for such production, but should be reviewed when the pines are harvested.

Unused sand or gravel pits, or cleared areas such as former school sites, require rehabilitation or revegetation. Council considers that, in some instances, such areas could be used as school plantations.

Their rehabilitation not only could be used to demonstrate various aspects of environmental science but also could provide an opportunity to involve pupils in projects that are clearly in the public interest.

School plantations

Recommendations

K6 That areas set aside for school plantations be primarily used as a teaching resource and utilised to foster awareness and knowledge of the trees and other living organisms that comprise a forest.

Note:
This recommendation does not exclude the use of school plantations as a means of raising revenue for schools. Such use, however, should be secondary to the educational use.

K7 That the value of each existing school plantation as a teaching resource or for revenue production be assessed by the Department of Education - in consultation with the Department of Conservation and Natural Resources

and that the use of those considered unsuitable or no longer required be terminated.

K8 That new school plantations be established on public land only for educational purposes and where their establishment allows the rehabilitation or reforestation of cleared or eroded areas.

L. EARTH RESOURCES

During the development of its recommendations for the Wilderness Special Investigation (published in November 1991), the Council undertook a major review of its policy relating to the exploration and extraction of minerals, petroleum and groundwater. Given that the revised policy concentrated on wilderness areas, it considered that a wider-ranging review of its policy was timely, given the development of new legislation, changes to exploration and mining techniques and changed community perceptions regarding the protection of significant conservation values. Accordingly, Council developed a provisional revised policy, which it published for comment in the proposed recommendations for Melbourne Area, District 2. A range of views was put forward in submissions and discussions. Council has subsequently considered further revisions to its policy, but is yet to resolve some issues of detail. In the interim, the provisions relating to exploration and extraction of earth resources, as set out in existing State legislation, prevail.

Exploration and extraction of stone

Materials covered by the definition of 'stone' in the *Extractive Industries Act* 1966 (including rock, gravel, clay, sand and soil) are widespread in the State. There is a strong community demand for new and better roads and buildings, and so for the materials necessary for their construction. Most of these materials are provided from private land, but public land is also an important source - particularly for road-making material - and industry believes it could become more important in the future.

Council is concerned by the complexity of legislation and procedures governing extraction of stone. (For example, the Roads Corporation and municipal councils are not bound by many provisions of the *Extractive Industries Act* 1966.) It maintains that a number of problems need to be addressed.

* A review of existing legislation and procedures should be carried out to enable more rational use of the stone resources of the State.
* The government should provide adequate resources for the reclamation of old extraction sites on public land.

Principles and Guidelines

Poorly planned and located excavations can affect surrounding lands through noise, dust, unsightliness, and erosion and can diminish the value of the land. With care, however, these effects can be avoided or minimised. In this context, Council believes that the following principles and guidelines should be taken into account:

1. Consultation should continue between the land manager, the Department of Energy and Minerals and the other relevant authorities with respect to the procedures to be adopted for the exploration and extraction of stone on public land. Any operations on public land should continue to be subject to the approval of the land manager. In all cases, the procedures that are established should apply to municipal councils, the Roads Corporation and other public authorities as well as to commercial operators. To ensure this, the relevant Acts may have to be amended.

   The Council endorses the system established under the *Extractive Industries Act* 1966 that seeks to ensure that, before work commences, funds are available for progressive and final reclamation of any excavation or operation.

2. Provision should be made to enable acceleration of the rehabilitation of all existing extraction areas on public land.

3. Royalties for materials extracted from public land, including site rental when appropriate, must be more closely related to the market value of the material. This would eliminate any temptation to use public land purely on the grounds of the nominal royalties sometimes levied in the past.

4. No sites for the extraction of stone should be opened in areas that the land manager, in consultation with the Department of Energy and Minerals, considers to be of greater value for other uses, including aesthetic or nature conservation values. The advice of the Department should also be sought as to the desirability of

proposed excavations, having regard to alternative sources of stone.

5. Extraction of stone should generally be concentrated on the fewest possible sites in an area, recognising the need for appropriate competition between suppliers. Depending on the quality and type of material, any one site should be substantially worked out and where possible reclamation ensured before work at a new site commences. The type of excavation to be carried out should be that with the lowest environmental impact consistent with the effective use of the resource. In general, and where the nature of the resource permits, excavations for stone should be deep and limited in area in preference to shallow excavations over a wide area. The extraction of granite sand occurring as shallow deposits in the weathered profile should be discouraged unless 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.

6. Where an application for the removal of stone from a stream-bed is considered, the land manager should take particular care to ensure that the operations will not directly or indirectly cause erosion of the bed or banks, or undue pollution of the stream. In addition to the arrangements outlined above for extraction of stone, the land manager should also consult with the relevant water supply and conservation authorities, and should consider the scenic and recreation values of the area. Alternative sources with a lower environmental impact should be used where they are available. The environmental effect of extraction may be reduced if alluvial stone is obtained from properly managed quarries on the river terraces, rather than from the present stream-bed.

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

Sand

For many years, Melbourne's principal source of building sand has been the Heatherton/Dingley area, but this resource is nearing exhaustion. More recent supplies have come from the Cranbourne and Langwarrin areas and these, although also being depleted, are likely to last for about 10 years.

Most of the current supplies are derived from freehold land, but some areas have become unavailable not necessarily due to exhaustion of the resource but due to urban development of the supply area or restrictions arising from planning controls.

As transport costs form a significant component of the delivered price of the sand, a resource relatively close to the Melbourne market is sought. New resources are therefore likely to be sought from further east and south-east of greater Melbourne. Consequently, the southern part of the study area is becoming the focus of interest and four main areas of potential supply have been identified - Gurdies/Grantville/Lang Lang, Inverloch/ Ellerside and sites north of both Yarragon and Yallourn.

Although these areas of interest encompass both public and freehold land, current tenements and applications focus on Crown land, probably because public land is considered to be more readily accessible than freehold land.

The Gurdies/Grantville/Lang Lang area covers some 18 400 ha, about 10% of which is public land. It is the closest to Melbourne and is subject to the most detailed resource assessments. The total resource is estimated at 330 million tonnes, equivalent to between 35 and 50 years' supply. Use of the resource here is constrained to some extent by planning controls, problems with a high water table and conflict with flora and fauna values.

Recommended by the Council in 1977 and ratified in these recommendations, The Gurdies and Grantville Nature Conservation Reserves

(see Recommendations C15 and C14 respectively), together with the adjoining stone reserves (Recommendation L1) cover the bulk of the public land in this vicinity.

Current extractive industry leases and/or applications exist at Grantville, The Gurdies and Lang Lang. Most of the applications and existing extraction operations are located on freehold land. The stone reserve in the Gurdies area is currently held under extractive industry licences; the upper batter slopes here are highly visible and require rehabilitation. The northern portion of the stone reserve at Grantville is now included in a services and utilities reserve (see Chapter M). For a parcel of public land overlying the sand resource between Lang Lang and Nyora, however, the Council in 1977 set aside portion as a stone reserve and the balance as "uncommitted land" - land to be retained as public land and maintained to meet future demands. Following review of the values of the public land at Lang Lang, including the location, nature and extent of the sand resource, the Council proposed that the western part of the area be reserved as a nature conservation reserve and the balance as an earth resources reserve. Part of this area now falls within the recently declared City of Cranbourne and is therefore no longer within the Council's jurisdiction (see Appendix II).

Land for coal-related development

The Council's Final Recommendations for the South Gippsland Area District 2 (1982) identified extensive areas to be managed by the former State Electricity Commission (SEC) for the production of brown coal and associated necessary developments. Where the land was not immediately required, the Council recommended that it be used to:

* provide for existing uses and produce those goods and services required by the community, including agriculture and forestry, where this can be done without seriously reducing the long-term ability of the land to meet future demands for coal production and associated developments

* maintain natural features of the land, where appropriate, until such time as it is required for the winning of brown coal and related activities

* provide sand and gravels where such deposits are located within coal-production areas, prior to development of the coalfields, in view of the shortage of deposits of sand and gravels suitable for road-making and general construction purposes in the Latrobe Valley.

This recommendation was approved by the government. A small portion of such land in the vicinity of Yallourn North extends into Melbourne Area, District 2 (see Recommendation L2 below).

In 1986 the Land Conservation Council was requested to undertake a special investigation into the future use of certain lands in the Latrobe Valley. These areas included some owned by the former SEC within Melbourne Area, District 2, in the vicinity of Anderson Creek.

In its final recommendations following the Latrobe Valley Special Investigation, published in October 1987, the Council recommended that most of the land owned by the former SEC and required for the Anderson Creek overburden dump be available for agriculture or forestry under lease until required for coal-related development.

This matter is discussed in Chapters K, Plantations, and O, Land Not Required for Public Purposes.

EARTH RESOURCES

Recommendations

Stone reserves

L1 That the areas listed in Table 22, totalling 208 ha and shown on Map A, continue to be used for the extraction of stone in accordance with the principles and guidelines outlined in this chapter and, if not already reserved for this purpose, be temporarily reserved under section 4 of the *Crown Land (Reserves) Act* 1978, with management plans prepared by the Department of Conservation and Natural Resources.

(continued)

L1 Recommendation (continued)

Notes:
1. Road-making materials are extracted from many other areas of public land through the study area. As they are usually short-term surface workings they have not been indicated on the map accompanying these recommendations. However, such sites should be subject to the principles and guidelines outlined in this chapter, especially in relation to their rehabilitation.
2. Materials covered by the definition of 'stone' in the *Extractive Industries Act* 1966 include rock, gravel, sand, clay and soil.

Table 22

STONE RESERVES

Parish (P) or Township (T)		Description	Area (ha)
P	CORINELLA	CA 97B,97D	23.04
P	CORINELLA	PART CA 187B	100.00
P	HOWQUA WEST	CA 99G	0.50
P	HOWQUA WEST	CA 99E	10.54
P	JINDIVICK	CA 111F	24.50
P	KANGERONG	CA 7D	11.76
P	LOYOLA	CA 76C,76D	12.63
	Note: The pistol club may continue to use part of this area.		
P	MAINTONGOON	CA 14B SEC A	10.52
P	NEERIM EAST	CA 47E	1.57
P	WONTHAGGI	PART CA 26H, and adjacent land in the Township of Wonthaggi	6.90
	Note: This area, located within the land subject to recommendation F20(c), may be used as a temporary stone reserve, and following rehabilitation it could be considered for addition to the adjoining reserve.		
P	WOOLAMAI	CA 27M	5.89

Land for coal-related development

L2 That the area of 15 ha indicated on Map A continue to be used for those purposes approved by the government following publication of the final recommendations for the South Gippsland Area, District 2, in November 1982.

Lang Lang

The resource here comprises a fine, high-quality silica sand used for glass-making. The area has been worked continuously since 1952 and an estimated 15 years' supply remains. The site includes buildings and a number of facilities for processing the sand. Stands of native vegetation have been retained within the area under extractive industry tenements, principally in the north. The land is being progressively rehabilitated and planted with indigenous species following extraction.

Lang Lang Sand Extraction

Recommendation

L3 That the area of 250 ha shown on Map A continue to be used for the extraction of sand in accordance with the principles and guidelines outlined in this chapter and be temporarily reserved under Section 4 of the *Crown Land (Reserves) Act* 1978, with management plans prepared by the Department of Conservation and Natural Resources

and that riparian and wetland plant communities be protected.

M. SERVICES AND UTILITIES

Many services are provided on, and many utilities occupy, public land. They include: transport - roads, railways and ports; electricity and gas installations; communications and survey fixtures; municipal buildings and services; public offices, hospitals, police stations and courthouses; water supply and sewerage services; cemeteries; and other services and utilities.

These recommendations and the maps do not specifically identify many of the small areas used for these purposes, as no change of use is proposed. It is intended that for such areas existing legal uses and tenure should continue.

In past investigations, Council has recommended several different categories for areas used for the services and utilities now referred to in this chapter. Recommendations for roads were contained in 'Roadside Conservation'. Public land used for other services and utility purposes and reserved was in the 'Utilities and Survey' category; if in townships but unreserved it was recommended as 'Township Land'; outside townships, unreserved land used for these purposes was categorised as 'Other Reserves and Public Land; and water supply pipelines, aqueducts, treatment works etc. were included under 'Water Production' recommendations. This chapter aims at simplifying that complexity.

In the absence of firm planning proposals, accompanied by the necessary detailed information, it is not possible for the Council to provide for future requirements of land for services and utilities. The use of land for these purposes will be considered when the need arises.

Agencies concerned with provision and installation of facilities such as communications equipment, transmission lines, ports, pipelines, major water-supply projects or roads are requested to submit proposals - involving occupation agreements or the setting aside of sites on public land - to the appropriate land managers at an early planning stage. Indeed, many agencies are doing this. It assists in achieving co-ordinated planning, and perhaps avoids the necessity for costly resurveys.

Many public land areas used for services and utilities are reserved for their specific purpose, often temporarily, under the *Crown Land (Reserves) Act* 1978. In the following recommendations it is not proposed that these areas be permanently reserved, in contrast with other categories earlier in these recommendations. The nature of some of the services and utility uses is that they are temporary. In such cases, the recommendations below provide for each area's values to be assessed, prior to reclassification.

SERVICES AND UTILITIES

Recommendations

M1,M3,M4,M6—M19,M21 That, subject to any specific additional recommendations below:

(i) existing reserves and easements used for public services and utilities continue to be used for those purposes

(ii) new services or utility sites and easements or lines not be sited in or across reference or wilderness areas, and wherever possible not in or across national, State, regional or marine parks, marine reserves or nature conservation reserves

and that

(iii) should a public land area or building and site used for service or utility purposes no longer be required for its primary designated use, it be assessed for its natural, recreational and cultural heritage values, and capability for other public uses, as part of the process of consideration for reclassification outlined in Chapter N.

Roadside conservation

The primary purpose of road reserves is obviously to provide for communication, transport and access. However, vegetation along the road verges can have particularly high conservation, recreation and landscape values, especially in agricultural districts where most of the native vegetation has been cleared. Geological features exposed in roadside cuttings are a useful adjunct to more detailed work involved in mapping the geology of an area and are often used as an educational resource.

Nature conservation

Vegetation on roads is important for nature conservation because in some parts of the State it often contains the only remnants of the region's indigenous plant associations. Such remnants are valuable for preserving species with restricted distribution and genetically interesting variants of more widespread species. They are often useful in land studies as they may permit the original pattern of the vegetation to be pieced together. They also provide valuable habitat - particularly in tree hollows - for some native animals. In particular, certain road reserves in the north-west of the study area provide habitat for the rare squirrel glider, and the vulnerable grey-crowned babbler is found in several Mornington Peninsula road reserves.

Remnant vegetation along road reserves also has special significance as corridors permitting birds to move through the countryside on annual migration, or in search of food or nesting sites. While some roads retain wide strips of native vegetation, many are mostly cleared or otherwise greatly altered. Valuable remnants of vegetation growing on the verges of some roads should be protected where possible. Of particular note is the vegetation along roadsides in the Seymour—Goulburn Valley, middle Yarra Valley and Mornington Peninsula areas. Often these open roads and road reserves contain the great majority of trees in the landscape.

The *Arthur Rylah Institute for Environmental Research, Technical Report Series* No. 11, September 1984, 'Conservation of Roadsides and Roadside Vegetation', gives a comprehensive review of values, methods of assessment and management of roadsides for the purposes of nature conservation. A Roadside Assessment Manual (Scott 1990) explaining how to carry out roadside assessments has been prepared for the Roadsides Conservation Committee, which comprises representatives from various interest groups and government departments.

Eight municipalities in the study area are presently assessing the conservation values of roadsides within their respective shires, under the auspices of the Roadsides Conservation Committee. These assessments use a three-tiered classification system (high/medium/low conservation value), forming the basis of a municipality-wide roadside management plan. Only one formal assessment, for the Shire of Hastings, has reached draft form. Where such assessments designate roadsides to be of high conservation value, agencies managing roads should recognise these. In addition, many vegetated roadsides make a contribution to the local scenic landscape and provide some habitat.

Accumulation of fuel along roadsides is a fire hazard of concern to fire-control authorities and in some areas is reduced by burning off during cool weather. This burning off sometimes conflicts with scenic and conservation values and the Council believes that it should be restricted to strategically important areas and kept to the minimum consistent with efficient fire protection. The Roadsides Conservation Committee has prepared a set of guidelines that provide for both conservation and fire protection.

Roadside trees can also play an important role in mitigating the effects and extent of dryland salting. These trees, the only ones remaining in some areas, play a vital part in the interception of saline subsurface moisture.

Recreation and landscape

In rural districts, vegetation along roads is often a major component of the landscape, breaking the monotony of cleared paddocks and accentuating the contours of the land. It provides a pleasant, variable environment for driving, and shady areas for rest and relaxation. The Council believes that as much of this vegetation as possible should be retained when roads are being upgraded. Planning for a major upgrading should consider the feasibility of purchasing a strip of

private land in order to preserve good stands of roadside vegetation.

Management

Responsibility for the management of roadside vegetation is vested in various authorities, depending on the status of the road. The most important roads of the State (highways, tourist and forest roads and freeways) declared under the *Transport Act* 1983 are completely under the control of the Roads Corporation (9000 km). Main roads (14 500 km) are also declared, but are controlled jointly by the Roads Corporation and local municipal councils. Vegetation on unclassified roads (about 98 000 km of mostly minor roads) is under the care and management of municipal councils, although it is owned by the Crown. The Department of Conservation and Natural Resources (CNR) has the control of vegetation on unclassified roads that pass through or adjoin State forests. (Note: these figures are for all Victoria.)

Back roads

With increasing population and use of cars, a tendency has developed for through-roads in the study area to be continually upgraded. Tree-lined back roads with gravel surfaces on narrow alignments are becoming increasingly uncommon. Yet for many people such roads best fulfil their need for contact with rural environments. The Council believes that a conscious effort must be made to maintain the character of these roads, particularly when upgrading or realignment is being considered.

Road reserve management guidelines

Landscape, recreation and conservation values can best be protected by observing the following guidelines. The Council recognises that the bodies responsible for the construction and maintenance of roads are already implementing many of these. The Roads Corporation, for example, plants large numbers of trees adjoining their major works.

* When improvements to a road are being carried out, trees and shrubs on the road reserve should be disturbed to the minimum extent consistent with the safe and efficient design and use of the road.

* Major works to realign minor roads carrying trees and shrubs should not be undertaken unless clearly warranted by the nature and volume of the traffic carried and the managers of adjacent public land should be consulted regarding such works.

* Where realignment of a road results in a section of the old road being cut off, wherever possible that section should not be sold, but used as a recreation and rest area or incorporated into an adjacent appropriate reserve.

* Where pipelines or overhead wires are to follow a road carrying trees and shrubs in a rural district, every effort should be made to locate the easements on private land alongside the road if this is already cleared, rather than clearing roadside vegetation to accommodate them.

* Council recognises the need for clearing or pruning vegetation close to power lines to reduce the associated fire risk, but recommends that Electricity Services Victoria consult CNR regarding the manner in which it can reduce the risk posed by vegetation, while at the same time reducing the environmental impact to a minimum.

* Road-making materials should not be taken from road reserves unless no suitable alternative sources are available. Any such removal should be done so as to ensure a minimum disturbance of the native vegetation and the disturbed area should be rehabilitated - where possible with vegetation indigenous to the area.

* Burning off, slashing or clearing of roadside vegetation should be kept to a minimum consistent with providing adequate fire protection. In many cases appropriate works on adjoining freehold land can achieve the desired level of protection.

* Weeds and vermin on roads should be controlled by means that do not conflict with the uses given above.

* The various road management authorities, when planning to upgrade roads that have heavy recreational use, should give due consideration to recreational requirements and give priority along such roads, when funds are available, to the development of roadside recreational facilities.

* Gravelled and unsurfaced roads can be key contributors to erosion and stream pollution. The managers of such roads should maintain a crowned surface and place culverts with stable outlets at regular intervals.

* On soils of moderate to high erosion hazard, road management authorities should ensure that pre-planning, design, construction and funding of roads cater adequately for erosion prevention and control. Advice should be sought from CNR.

* The purchase of cleared freehold land for road construction purposes should be considered as an alternative to clearing stands of native vegetation in the road reserve.

Roads

Recommendation

M1 That road reserves throughout the study area be used in accordance with the general recommendations for Services and Utilities outlined above for transport, communications, access, surveys and utilities

that the guidelines above be observed in order to protect roadside landscape, recreation and conservation values

and that, where roadside conservation assessments have been carried out, the results be recognised and applied by municipalities and government agencies managing roads.

Specific roadside conservation sites

Recommendation

M2 That when widening or realignment of roads is proposed, sites of geological, archaeological, historical, habitat or botanical significance that may be affected be investigated and every effort made to retain and preserve them.

Note:
Sites are listed in the schedule at the end of this chapter.

Unused roads

When the State was being surveyed, a Crown road reserve provided access to each block. Many of these reserves have never been used as roads, and they are usually held by the occupiers of the adjoining land under an unused-road licence, often for grazing.

Guidelines for unused road reserves

* The clearing of native trees and shrubs other than noxious weeds should continue to be clearly prohibited in the conditions of unused-road leases or licences.

* A condition permitting public use of leased or licensed unused roads should be written into the leases or licences where necessary to provide practical access to public land.

* Unused roads or easements should not be alienated if there is any likelihood that they will have value for future traffic, nature or landscape conservation, recreation or other public use.

In November 1993 the government announced a changed policy in relation to use of unused road reserves. Under the new policy farmers may be able to enter into long-term leases for or purchase of unused roads within their properties. Council considers that the above guidelines should continue to apply. In some cases it may be appropriate for road reserves to be sold subject to conservation covenants.

Unused roads

Recommendation

M3 That unused road reserves be used in accordance with the general recommendations for Services and Utilities outlined above

and that the above guidelines for unused-road reserves continue to apply.

Railways

Railways played a major role in the economic and social development of the Melbourne Area, District 2, but now only the high-usage lines remain open. The District contains sections of the passenger and freight lines - North Eastern (Wodonga), Gippsland (Sale) and South Gippsland (Leongatha) Railways - as well as the suburban lines from Watsonia to Hurstbridge, Mooroolbark to Coldstream, Upper Ferntree Gully to Belgrave and Baxter to Stony Point.

Various former railway lines have been closed, and these are referred to in Chapters N - Uncategorised Public Land, F - Historic and Cultural Features Reserves and J - Community Use Areas.

Railways can also have other important values, and the following guidelines aim in particular at protecting native vegetation present.

* Where isolated remnants of the original vegetation remain on land associated with railways, every effort should be made to protect that vegetation consistent with management practices.
* While Council recognises the need for clearing or pruning vegetation close to railway lines for reasons of safety and fire prevention, the Public Transport Corporation should consult CNR regarding the manner in which it can reduce the risk posed while at the same time reducing the environmental impact to a minimum.
* Burning off, slashing or clearing of railside vegetation should be kept to a minimum consistent with providing adequate safety and fire protection. Particular care should be taken with the use of herbicides.
* Weeds and vermin on land associated with railways should be controlled by means that do not affect non-target species.

Railways

Recommendation

M4 That railways continue to be used in accordance with the general recommendations for Services and Utilities outlined above

and that landscape and conservation values of railway alignments be protected by observation of the above guidelines.

Significant sites along railways

Strips of vegetation along railway lines can have particularly high conservation and landscape values, especially in agricultural districts where most of the vegetation has been cleared. They often contain remnants of the original vegetation and can serve as habitat corridors for native fauna. It is proposed that sites with significant stands of remnant vegetation be protected under public authority management agreements between the Public Transport Corporation and CNR.

Railway structures can also have historical significance. Although the places listed below are still in use, they should be managed in a way that does not compromise their historical integrity.

Geological features exposed in railway cuttings are a useful adjunct to more detailed work involved in mapping the geology of an area and are often used as an educational resource.

Significant sites along railways

Recommendation

M5 That, wherever possible, important sites along railway lines be protected.

Note:
Sites are listed in the schedule at the end of this chapter.

Ports

Western Port has high value for port purposes. Its deep water in the western entrance and North Arm (minimum depth 14.3 metres) is highly significant in a State and national context for deep-draught shipping. Hastings has considerable areas of flat land suitable for port and port-related industrial development. These values have been recognised and protected in the government's Statement of Planning Policy No. 1, and subsequent reports and are discussed in the draft of the 'Hastings Port Industrial Area - Land Use Structure Plan', released in February 1994. These documents also state the need for port development to be linked to protection and maintenance of the sensitive ecosystem of Western Port, reflecting the conclusions of the Western Port Bay Environmental Study and State Environment Protection Policy No. W28.

The existing channel provides deep-water access to wharves at Crib Point and Long Island jetties and at the Broken Hill Proprietary Co Ltd (BHP) facility, formerly Lysaghts, all of which adjoin extensive areas of land zoned for port-related use. BHP has rights to reclaim areas of sea-bed to the north of its existing wharf (shown on Map A as not being public land) and the government has the option to purchase 50% of it (see Note 2 to Recommendation M6). Two on-shore areas, between Stony Point and Crib Point and between the BHP area and the Yaringa Boat Harbour, are zoned as proposed port-purposes reserve under the Shire of Hastings' Planning Scheme. Parts not already in public ownership have been subject to re-purchase.

Since Council's 1977 recommendations, the Western Port Bay Environmental Study sites of significance documents and the Victorian Ports Land Use Plan (draft final report 1991) have contributed to knowledge of the values and uses of this area.

About 90% of the Port of Hastings' cargo is presently bulk liquids and the Ports Land Use Plan does not expect this to change over the next 20 years. It is proposed to re-commission the Crib Point jetty for use for unloading imported crude oil. The government recently approved a Shell - Mobil oil storage plant on the site of the former British Petroleum refinery. This will use the Crib Point jetty.

The Ports Land Use Plan suggests that options be kept open for future general cargo facilities. It also concludes that the Long Island Point and Crib Point Jetties should be used for handling crude oil, gas and petroleum products, with an option of a Bass Strait single-point mooring to be investigated if very large crude-oil carriers are proposed for the port, and that the steel trade should continue to operate from the two BHP jetties.

With respect to future general cargo port needs, the report describes three possible sites - Old Tyabb, Tyabb and Crib Point - but argues that it is difficult to justify the retention of all three in view of the 20-year trade outlook. It concludes that the Crib Point site is the least attractive, mainly because of the traffic impact on residential areas; the Tyabb site has long-term strategic importance for large-scale port development beyond the next 20 years; and the Old Tyabb site is the best site for initial development, being cheapest to develop and least environmentally sensitive. However, it may be restricted by risks associated with the adjacent fractionation plant. The report states that the last two sites should be retained for potential port development; its preferred port boundary includes undefined land areas at Long Island Point, Crib Point, Stony Point and the Old Tyabb site; and it recommends that the government should continue to purchase land adjacent to the Tyabb site as this becomes available. The Tyabb site is mainly within the BHP reclamation area.

The proposed emphasis of future port needs will generally avoid environmental values at Hastings Bight, including Sandstone Island and the 'Heritage Cove' foreshore, Woolleys Beach, Crib Point foreshore and north of

Yaringa. However, the site retained at Tyabb for possible long-term development is associated with a range of high conservation values, as follows:

* botanical values: valuable stands of sand heathland, swamp scrub and coastal salt-marsh remain, and a diverse ground flora
* zoological values: the manna gum open forests and woodlands, swamp paperbark and saltmarsh/mangrove zone provide habitat for 11 native mammal species (including one of few sites in the State where the New Holland mouse has been recorded), 127 native bird species (including the uncommon southern emu-wren), and 8 reptile and 7 amphibian species (although it has been classified as a site of State significance, about half of it is in private ownership)
* geological/geomorphological values: the coastline, with its broad saltmarsh zone and variable mangrove fringe, is of State geomorphological significance as a major site for the study of the role of mangroves in coastal sedimentation

The Western Port Bay Strategy (WRPCC 1991) recommends that any future major port works within the declared 'reclamation area' be subject to environmental assessment under the *Environmental Effects Act* 1978, and that the foreshore areas north of The Bluff be considered for conservation and passive recreation, rather than port purposes. A review of the Hastings Port Industrial Land Use Plan is expected to consider this.

After considering the above, and to ensure flexibility for the future, Council proposes that the harbour depot area at Stony Point, the Jetty easement at Crib Point, the Long Island Point Jetty and Old Tyabb foreshores be recommended for port purposes, and that the Tyabb foreshore south of Iluka Road, Yaringa, be retained within the Coastal Reserve, although Council recognises its value for future port development in the longer term. Should a major port development option be pursued, the area between Stony Point and Crib Point should also be considered, in the light of the environmental sensitivity of the Tyabb foreshore.

Ports

Recommendation

M6 That the following areas be used in accordance with the general recommendations for Services and Utilities above, and be available for port development:

(a) the harbour depot area at Stony Point
(b) the Jetty easement at Crib Point
(c) the Long Island Point Jetty
(d) Old Tyabb foreshore

Notes:
1. In the long term, if there is a need for additional port land, Council considers that the Tyabb foreshore south of The Bluff and the less environmentally sensitive area between Stony and Crib Points should be considered as possible sites. Any proposed port development should be subject to Environment Effects Act procedures.
2. Council is aware that the government has an option to purchase 50% of the 'reclamation area' and believes that it should take up that option.

ELECTRICITY AND GAS

Various electricity and gas installations are located on public land, including the fringes of the Yallourn/Yallourn North power station and open cuts, transmission lines, terminal stations, gas pipelines etc. In particular, the identified future overburden dump at Anderson Creek north of Yallourn lies in the Melbourne Area, District 2. Recommendations for this area were made in the Council's 1987 Latrobe Valley Special Investigation report. Refer also to Recommendation F7 for the Rubicon Valley historic and cultural features reserve, which includes the operating Rubicon—Royston hydro-electricity generation stations, and to Recommendations G96, J11, J15, K5, N1 and O3 in this report.

In May 1994, the government announced the restructure of the electricity supply industry in which Generation Victoria will move towards operating as a holding company as successor to the SEC in electricity production. Another body, National Electricity, is now responsible for high-voltage distribution. Recommendations M7 and M8 apply to both organisations, and to Gas and Fuel Corporation installations, as appropriate. Distribution of 'domestic' level power, at voltages less than 60kv, is the responsibility of Electricity Services, Victoria.

Electricity and gas

Recommendations

Note:
Many existing installations are too small to show on Map A.

M7 That existing easements and installations be used in accordance with the general recommendations for Services and Utilities outlined above, and for their designed purpose.

M8 That new power lines, pipelines and other electricity and gas installations be planned in accordance with the general recommendations for Services and Utilities outlined above

and that

(iv) they be planned to minimise disturbance to public land and protect the values associated with that land

(v) they not be sited on public land without the agreement of the land manager

(vi) new pipelines and power lines follow existing easements wherever possible (this may require widening of some easements)

(vii) utilities such as power lines and pipelines, wherever possible, not be located alongside waterbodies or wetlands.

Notes:
1. National Electricity holds a block at Coldstream for a future terminal station. This 30-ha site has relatively intact cover of red stringybark and messmate shrubby foothill forest with a shrub and native grass understorey. It is of regional botanical significance, being in an area with little remnant vegetation, and is also part of a larger site of regional zoological significance, with the eastern small-eyed snake, delicate skink, swamp wallaby and a diverse variety of bird species recorded. The Council considers that this block should be managed as a natural features reserve until required as a terminal station; and that if part of the block is not required for the terminal station, it should be retained as a natural features reserve.
2. Another National Electricity block is held at North East Tyabb for the proposed Pearcedale terminal station. Council proposes that, north of Bungower Road, part of the area should be included as a services and utilities area for this purpose, while that part retaining native vegetation be added to the adjacent nature conservation reserve (Recommendation C4O). Most of the east part is recommended as land not required for public purposes (O1), and the area south of Bungower Road is also recommended for addition to the nature conservation reserve.
3. The Gas and Fuel Corporation holds land at Bittern between Stony Point Road and the coastal reserve. Council proposes that the strip of remnant vegetation on the east side should be added to the coastal reserve (see Recommendation H2), while the remainder is recommended as a services and utilities area. Council considers that the two areas of remnant vegetation on the west boundary should also be retained.
4. A proposed 300-MW undersea power interconnection between Tasmania and the mainland - Basslink - has been proposed for construction at the turn of the millennium. Six possible cable landing sites have been identified, including four in the Melbourne Area, District 2 - west of Wonthaggi, north of Flinders, the south-east end of French Island and near Tyabb. No decision on the route has been made, although sites west of Wonthaggi and around Cape Liptrap (not in the Melbourne Area, District 2), were considered preferable to others in feasibility studies.

COMMUNICATIONS, SURVEY AND NAVIGATION

Telecommunications

Communications installations include underground conventional and optical fibre cables, towers with microwave dishes, mobile-telephone receiving and transmitting structures, various radio masts and satellite dishes.

Telecommunications installations

Recommendations

M9, M10 That existing or proposed communications installations on public land be used or planned in accordance with the general recommendations for Services and Utilities outlined above.

M9 Existing installations

M10 That, in relation to proposed installations,

(iv) where public land is proposed to be used for new Australian and Overseas Telecommunications Corporation Ltd (AOTC) towers and cable alignments, these be planned and sited to minimise disturbance to that land and to protect the values associated with the land

(v) the agreement between the Commonwealth and State governments - that AOTC will consult with State agencies and act in accordance with State planning processes - be implemented in relation to proposals affecting public land

(vi) the minimum area necessary for access to and maintenance of communications installations be temporarily reserved or remain as unreserved Crown land with appropriate lease or licence arrangements

(vii) where other forms of public land tenure apply, the utility involved has the right to occupy a minimum area around the installation and provide lines of sight, and the right to obtain access to the area

and that

(viii) (a) communications towers and installations proposed by other agencies (for example CNR, National Electricity, Police and Emergency Services) be located at existing sites and on existing structures wherever possible, to minimise the number of separate hilltop clearings, intrusive structures and access tracks

(b) AOTC and other users permit access to all new facilities by other users on a co-tenancy or sub-tenancy basis.

Survey stations and navigation aids

Permanent survey marks and trigonometric stations form part of Victoria's geodetic reference system. They are numerous and widespread. Navigation structures on the coast and in navigable waters are crucial for safe shipping and recreational boating.

Survey stations and navigation aids

Recommendation

M11 That survey stations and navigation aids be used in accordance with the general recommendations for Services and Utilities outlined above

(continued)

M11 Recommendation (continued)

that
(iv) the minimum area necessary for

(a) survey purposes around trigonometrical/geodetic stations; and

(b) access to and maintenance of navigation aids

be temporarily reserved on public land where it would otherwise remain as unreserved Crown land

(v) where other forms of public land tenure apply, the appropriate government agency has the right to occupy a minimum area around the station or aid and provide lines of sight, and the right to obtain access to the area

and that
(vi) where new technology (such as the global positioning system) renders existing survey or navigation installations obsolete, such structures, unless of historical significance, be removed and sites, access tracks and lines of sight be restored with indigenous vegetation.

MUNICIPAL BUILDINGS AND SERVICES

Shire offices and other municipal buildings providing services, such as infant welfare and kindergartens, are often located on public land, as are municipal depots and tips.

Municipal Buildings

Recommendation

M12 That existing legal use and tenure continue for areas that are at present reserved and used for municipal buildings, services and operations such as offices, depots, infant welfare centres, or kindergartens

and that they be used in accordance with the general recommendations for Services and Utilities outlined above.

Rubbish tips

Refuse-disposal sites are scheduled premises under regulations of the *Environment Protection Act* 1970, and thus are subject to the requirement for Environment Protection Authority (EPA) Works Approvals and Licences. Management of such sites should be in accordance with the EPA's 'Siting and Management of Landfills Receiving Municipal Wastes' policy.

Recommendation

M13 That areas authorised for use as tips be used in accordance with the general recommendations for Services and Utilities outlined above

that
(iv) existing legal rubbish tips (including those approved by the relevant authorities but not yet operating) continue to be available for disposal of rubbish

(continued)

M13 Recommendation (continued)

(v) areas used on a temporary basis for rubbish disposal or sanitary depots, whether legal or illegal, be fully rehabilitated, at the expense of the users, where known

and that

(vi) within areas reserved as rubbish tips, disposal of waste be confined to small sections of the site at any one time, and that steps be taken to prevent the dumping of garbage other than in the designated areas.

Notes:

1. Alexandra Tip is located on an area of 3.08 ha abutting (on 3 sides) the Alexandra Bushland Reserve, now natural features reserve G56, and the McKenzie Nature Conservation Reserve (C7). In its 1977 recommendations Council noted that the tip was not to be expanded, and that the area should be eventually rehabilitated. This recommendation was approved. The tip is still in use although it only has about 12 months' space remaining. A rehabilitation plan has been prepared. The Alexandra Shire Council would still prefer to expand the tip into the natural features reserve, but it has also been assessing several alternative sites. The Land Conservation Council's view remains the same as in 1977, but in addition there would be no objection to the establishment of a rubbish transfer station at the present site.
2. French Island Tip - this area is also a source for road-making materials. The Council considers that the extraction of road-making materials should be permitted, but should be integrated with planning for rubbish disposal.

Grantville regional refuse-disposal area

The Shire of Bass has operated gravel pits in the northern part of the Grantville gravel reserve for a number of years. Most of these pits are worked out, although additional resources occur. In recent years the Shire has established a landfill operation as part of the rehabilitation of former pits. The landfill has been based on the disposal of refuse from the Grantville area. Recently the Shire of Phillip Island and Borough of Wonthaggi have, together with CNR, proposed that the northern half of this reserve be made available for refuse disposal, providing for an estimated 19-year life, with new sites to be investigated elsewhere to service needs in the longer term. The sand and gravel reserves of the existing pit in this area are considered to have a life of about 3 years.

Grantville refuse area

Recommendation

M14 That the northern part of the Grantville gravel reserve be used in accordance with the general recommendations for Services and Utilities outlined above and as a regional refuse-disposal site

that

(iv) further extraction of sand and gravel resources be permitted

(v) extraction be integrated with planning for future refuse disposal

(vi) stands of remnant vegetation be retained, especially in areas forming a buffer to adjoining land uses

and that the area be temporarily reserved, and the landfill and extraction operations managed in a unified manner under the direction of the Department of Conservation and Natural Resources and the Environment Protection Authority.

Note:

There is a need to rehabilitate the highly visible upper batter slopes.

HOSPITALS, PUBLIC OFFICES AND JUSTICE

Public offices and other buildings under the following recommendation are those that provide the base for provision of services to the public and a workplace for public sector employees. However, they are not widely used for community activities, as distinct from the buildings in public use (see Recommendation J24).

Hospitals, public offices and justice

Recommendation

M15 That existing legal use and tenure continue for areas and buildings as listed in Appendix VIII that are at present reserved and used for hospitals, other institutions, public offices, court houses, police stations or prisons

and that they be used in accordance with the general recommendations for Services and Utilities outlined above.

Note:
The following buildings in particular are of historical interest: Mansfield Court House; Lilydale Court House; Wonthaggi State Public Offices; and Wonthaggi Court House.

WATER AND SEWERAGE SERVICES

The following recommendations apply to public land areas with: water or sewerage pipes, channels, structures etc. used to convey water or sewage; storages that are part of the reticulation system; storages of water not used for domestic consumption; drainage or flood-protection structures; watering points; or sewage treatment and disposal. Areas used for water-harvesting and associated bulk storage are referred to in Chapter D - Water Production.

Water and sewerage services

Recommendation

M16 That the following areas, as listed in Appendix VIII

(a) off-river water storages, service basins, water towers, water treatment and other water supply installations and channels

(b) storages not used for domestic or industrial consumption

(c) areas used as watering points for travelling stock, or for fire-fighting, roadworks or other purposes requiring access to water

(d) areas used for sewage treatment or disposal

be used in accordance with the general recommendations for Services and Utilities outlined above

that

(iv) where they have nature conservation, recreation or cultural heritage values, these be protected where this does not conflict with the primary use

and that these and their associated reserves remain under existing tenure and control unless otherwise stated.

(continued)

M16 Recommendations (continued)

Note: Council supports a proposed land exchange at Marysville to provide an area for establishment of sewage treatment works (see Recommendations E1 note 3 and 01).

Melbourne Water pipelines/aqueducts

Olinda Creek pipeline

North of the Silvan Reservoir, Melbourne Water holds land along Olinda Creek for the purposes of the Silvan to Preston main, Silvan to Olinda conduit and Silvan to Mount Waverley main. The underground pipelines replace a now-disused aqueduct. While most of the corridors of both pipelines are cleared, their margins retain stands of natural vegetation. The existing pipelines lie between the Olinda Creek water frontage and the recommended addition to the Dandenong Ranges National Park.

O'Shannassy Aqueduct

The Silvan Reservoir is linked to the O'Shannassy and Upper Yarra reservoirs, the latter by pipe but the former still partly by open aqueduct. Sections of the aqueduct may be replaced by pipelines along alternative routes, and may be declared surplus to Melbourne Water's requirements. Parts retain native vegetation and, if surplus, would contribute to park accessibility, recreational and historic values, if the section from Cement Creek to the Don Valley Road were added to the Ash Ranges National Park (see Recommendation A12). The section west of Don Valley Road to the Coranderrk Aqueduct junction would not be required for public purposes, in the Council's view, and it would be for Melbourne Water to decide its future use.

Between Wandin Yallock and Silvan Reservoir, parts of the aqueduct have important remnants of native vegetation within the adjacent semi-cleared farmland. Parts of the aqueduct there could provide a habitat corridor and opportunities for recreational activities.

While these areas are required for water supply, they should continue to be used as recommended below.

Melbourne Water pipelines/aqueducts

Recommendation

M17 That the above pipelines and aqueducts be used in accordance with the recommendations for Water and Sewerage Services outlined above

and that

(v) remnant vegetation be protected

(vi) the Olinda Creek pipeline section adjoining the Dandenong Ranges National Park be managed in consultation with the managers of that park

(vii) should the O'Shannassy aqueduct be decommissioned as a water supply facility, that section abutting and linking elements of the Ash Ranges National Park and extending to Don Road be added to the park.

Notes:
1. Melbourne Water should decide the future of the remainder of the aqueduct.
2. Between Wandin Yallock and Silvan Reservoir, sections of the aqueduct could provide a habitat corridor and recreation opportunities.

Drains and retarding basins

Some waterways such as those around Koo-Wee-Rup have been built as drains, and several retarding basins have been constructed in the study area to provide for flood protection in regional drainage.

Recommendation

M18 That drains and retarding basins be used in accordance with the recommendations for Water and Sewerage Services outlined above

and

(v) (a) to facilitate regional drainage and flood protection

(b) for grazing or recreation at the discretion of the managing authority, where appropriate.

CEMETERIES

The following recommendations apply to cemeteries in current use that may also have other particular values. Infrequently used cemeteries often contain relatively undisturbed native vegetation, and old cemeteries may have cultural or historical values. Refer also to Recommendations F36 and F37. Not all cemeteries have been assessed for their historical significance.

Recommendation

M19 That the areas reserved and used for cemetery purposes listed in Appendix VIII be used in accordance with the general recommendations for Services and Utilities outlined above

and that

(iv) where part of a cemetery reserve is unused, indigenous vegetation be retained and protected

(v) cemetery managers seek the advice of the Department of Conservation and Natural Resources as to the appropriate management of the values referred to in (iv) above.

Notes:
1. Council considers that cemeteries that have not been assessed for their historical significance should be so assessed.
2. Gembrook Cemetery - part of this cemetery reserve carrying native vegetation has now been recommended as a natural features reserve (G205). Limited expansion of the existing cemetery area would be permitted. Further expansion should be on freehold land.

Significant sites in cemeteries

M20 That the historical values of the following cemeteries be protected

Aberfeldy	Ferntree Gully	Korumburra	Matlock	Tyaak
Allambee	Gaffney Creek	Lilydale	Narracan	Woods Point

OTHER UTILITY USES

Recommendation

M21 That other public land areas used for depots of public authorities, Country Fire Authority stations, markets, abattoirs, saleyards or other services and utility uses not specified in previous recommendations, whether reserved for that purpose or unreserved, continue to provide these uses in accordance with the general recommendations for Services and Utilities outlined above.

(continued)

M21 Recommendation (continued)

Note:
1. The Shire of Alexandra requires a depot site at Marysville. The existing Department of Conservation and Natural Resources depot site may have sufficient space to accommodate the Shire's needs.
2. Snobs Creek previously had a wildlife reserve along the stream for several kilometres upstream from the Departmental fish hatchery. The section in State forest has now been recommended as a river zone (see Chapter E). The Council resolved that the downstream area including the hatchery should be a Services and Utilities area.
3. This recommendation includes the Department of Agriculture's Institute of Plant Sciences - potato research station at Toolangi.

SCHEDULE OF VALUES TO BE PROTECTED

Sources of the following include the unpublished 'Survey of the Relic Vegetation of Victorian Railway Reserves' by Frood (1985), 'Register of Australian Historic Bridges' by O'Connor (1983), 'Historic Sites in the Melbourne East Study Area' - report by Supple *et al*, (1989), 'Sites of Botanical Significance in the Land Conservation Council Melbourne District 2 Study Area' - report by Moorrees and Molnar (1992), 'Sites of High Conservation Value for Fauna within the Melbourne 2 Study Area' - report by Lumsden (1992) and the Melbourne Study Area Final Recommendations (LCC 1977), 'An Assessment of Geological Sites of Natural Estate Significance in the Central Highlands of Victoria' - report by Cochrane and Shaw (1993).

Kilmore, Broadford, Yea, Alexandra and Mansfield areas

Historical site

* Marysville Road - historical timber-girder bridge over Wilks Creek, with stone abutments, built about 1900

Nature conservation

* North Eastern Railway between Donnybrook and Beveridge - only known occurrence of the endangered small pepper-cress *(Lepidium hyssopifolium)*

* North Eastern Railway between Beveridge and Wandong - *Themeda* and associated *Danthonia*, *Poa* and *Phragmites* grassland communities, herbs and shrubs, including a number of significant species; also the swamp habitat in good condition, including a recorded site of the vulnerable striped legless lizard *(Delma impar)* and the suspected rare Australasian bittern *(Botaurus poiciloptilus)*

* Strath Creek—Broadford Road reserve west of Tyaak township - rich ground flora

* Graptolite fossil site on Dairy Creek Road

* Cuttings and quarries along the Warburton—Woods Point Road (Yarra Track) between Fifteen Mile and McAdam Hill expose a series of Palaeozoic rocks and provide insight into the diverse stratigraphy and palaeontology.

* Road cuttings along the Marysville—Cambarville Road expose a series of sections of strata providing the most complete geological picture of the Acheron Cauldron.

Recreation sites and landscape

* Molesworth lagoon - roadside picnic spot

Diamond Valley, Eltham, Healesville, Lilydale, Sherbrooke and Upper Yarra areas

Historical sites

* Yarra Junction to Powelltown Road - remnant embankments, cuttings and track formation of the former tramway

* Bridge over Yarra River at Woori Yallock - built in 1927, this 120-metre-long bridge is concrete with timber supports and buttresses

* Hurstbridge to Arthurs Creek Road - historical concrete arch bridge over Diamond Creek built in 1917 (known as 'Monash Bridge')

* Eltham to Yarra Glen Road - historical brick arch bridge built about 1890 over the Maroondah Aqueduct at Yarra Glen

Nature conservation

* Rodger Road reserve, Panton Hill - stand of grassy dry forest that includes several regionally significant species

* Road reserves in the Coldstream to Yarra Glen district - eight sites containing the rare Yarra gum *(Eucalyptus yarraensis)*

* Yering disused rail reserve - a remnant kangaroo grass (*Themeda triandra*) community with swamp gum (*Eucalyptus ovata*) and various wattles

* Tarrawarra Road reserve - remnant stand of the lowland form of snow gum *(Eucalyptus pauciflora)*

* Warburton Highway/Old Gippsland Road - good-quality, undisturbed stand of heathy foothill forest/heathy woodland

* Road reserve at Kilsyth South - relatively intact remnants of heathy forest as well as examples of swampy riparian forest and swamp scrub

Recreation sites and landscape

* Mount Dandenong Tourist Road

Pakenham, Buln Buln and Narracan areas

Historical sites

* The railway stations at Trafalgar and Yarragon have been assessed as architecturally important

Nature conservation

* Gippsland line between Beaconsfield and Pakenham - remnant native vegetation, including kangaroo grass communities

* Gippsland line between Pakenham and Tynong - kangaroo grass communities, some with melaleucas

* Gippsland line between Trafalgar and Yallourn - communities of *Themeda/ Leptospermum/Lomandra* spp.

* Erica—Walhalla Road at Coopers Creek - exposure of the Early Devonian Boola Formation of sandstone containing fragments of Cambrian rocks and revealing contacts with underlying and overlying stratigraphic units.

Flinders, Mornington, Hastings and Cranbourne areas

Historical sites

* Stony Point Railway station - assessed as important architecturally

* Old Mornington Road - historical stone arch bridge built in 1865 over Kackeraboite Creek at Mount Eliza

Nature conservation

* South Gippsland Railway between Clyde and Tooradin - kangaroo grass communities and the rare daisy *Helichrysum* sp. aff. *acuminatum*

* Browns Road/Jetty Road, Rosebud South; Humphries Road, Mt Eliza; Cannons Creek Road, Cannons Creek - populations of the vulnerable grey-crowned babbler

Recreation sites and landscape

* Gembrook to Pakenham roadside environs

Phillip Island, French Island, Bass, Wonthaggi and Korumburra areas

Historical sites

* Lang Lang, Loch and Korumburra Railway Stations

Recreation sites and landscape

* Phillip Island Road - roadside environs

N. UNCATEGORISED PUBLIC LAND

Some small areas of public land in the study area that are used for grazing, camping and other purposes have not been specifically mentioned in these recommendations. Others, both reserved and unreserved, receive little active use at present, even though they might once have been reserved for some specific purpose.

These areas may not have outstanding values; however, they have potential for public or departmental use, or uses that would complement other areas. Accordingly, they should remain in the public land estate, and are recommended below as uncategorised public land.

In townships, public land is currently used for a wide range of purposes. In the same way as it has dealt with land outside townships, Council has made specific recommendations for township land to be set aside for natural features reserves, community use reserves (particularly recreation areas, parkland and gardens and buildings in public use) or services and utilities. Those recommendations are included in the appropriate chapters.

Other areas of public land in townships should remain as uncategorised public land - to be used, if required, for township purposes in the future.

Council intends that existing legal uses and tenure of these small areas of public land should continue, and that those not currently used for any particular purpose should be used in a way that will not preclude their future commitment to some specific public use.

The area between Koo-Wee-Rup and Pakenham contains very little public land, and some of the largest parcels are recreation reserves. Roadsides are commonly bare and, given that this was formerly swampland, the surrounding landscape has few trees in general. Several of the recreation reserves have become disused, and now consist of grazed paddocks bounded by rows of trees. These may have community uses, or could be considered for revegetation, perhaps as part of regional revegetation schemes. Council considers that at present they should be recommended as uncategorised public land, to allow assessment by the Department of Conservation and Natural Resources (CNR) as to whether they should be retained or ultimately sold.

Substantial landholdings were purchased by Melbourne Water for the Watsons Creek dam scheme. Much of this land is now surplus to Melbourne Water's requirements. Recommendations C48 and C49 apply to parts of the land. Map F shows these areas, and other Melbourne Water land for which no specific recommendations are made.

UNCATEGORISED PUBLIC LAND

Recommendations

N1 That

(i) public land other than that recommended for specific uses, and listed in Appendix IX, be uncategorised public land to meet future public purpose requirements

and that

(ii) existing legal use and tenure continue except where such use will preclude the future use of these areas for public purposes.

Notes:
1. Recommendation N1 applies to other areas for which there is no specific recommendation, but not listed in Appendix IX.
2. This recommendation includes the Wallaby Creek Lodge and farms within land managed by Melbourne Water which forms a buffer to the Wallaby Creek water supply catchment.

Crib Point

The coastal foreshore reserve between Stony and Crib Points was included in Council's 1977 recommendations jointly as Coastal Reserve and Utility Reserve. Since those recommendations, the former Public Works Department purchased numerous blocks abutting the reserve. Under planning scheme controls, the area is zoned 'Proposed Port Purposes Reserve'. Although 14 small lots remain in private ownership, most of it is now public land. As is discussed in Chapter M, this area may become surplus to future port requirements. It may also in the future be part of a buffer zone to possible industry on the former BP refinery site immediately to the north. That site has been sold and may be used for storage of imported crude oil, with deep-water access from the existing jetty to the north.

Virtually all of the area north of Governors Road has been disturbed by development works, and is subject to regular slashing; however, it retains areas with weed-free heathy and grassy woodlands with some important ground flora species. This land is now proposed to be recommended as uncategorised public land.

Crib Point

Recommendation

N2 That the land at Crib Point shown on Map G be used in accordance with the general recommendations outlined above for land not required for public purposes.

Notes:
1. This area is subject to a continuing port land use planning process.
2. Where possible, the botanical values of the heathland should be maintained.

Revegetation

The reduction and deterioration of tree cover in some rural areas of the State is causing increasing and widespread concern. Clearing - to establish pasture and crop lands - has been the initial cause of this reduction. The gradual decline and ultimate death of remaining trees, however, is emerging as a major problem in some areas.

Soil compaction by stock, excessive use for timber, attacks by insects, parasites and other pathogens, exposure to winds, salting of the soil, erosion and natural senescence among ageing trees are all possible causes of the decline. The prevention of natural regeneration by grazing or other practices exacerbates the problem.

Increasing soil salinity (resulting in the degradation of grazing and crop country), loss of shelter for stock and for wildlife and diminished aesthetic value are all consequences of this decline. Although difficult to express in monetary terms, it results in economic loss.

The large numbers of landholders joining Landcare and other programs involving tree-planting show that these issues are recognised and are being addressed.

In parts of the study area, several small parcels of public land carry little or no natural vegetation. In many cases they have been reserved for specific purposes, although not used for them, and have been continuously licensed to the adjoining landholders. Over time they have been cleared and integrated with the surrounding farmlands. In other cases the reserves can still be recognised by the native vegetation, but, for a number of reasons, the tree cover has declined.

Where tree decline is becoming a problem or where native trees are greatly reduced in number, Council recommends that some small areas of public land be used for the re-establishment of locally indigenous tree species.

Following successful revegetation, some of these areas could serve as examples to the rural community of the effectiveness of such vegetation schemes.

Revegetation areas

Recommendation

N3 That

(i) the areas indicated on Map A and listed in Table 23 below be used to foster the re-establishment of locally indigenous tree species

and that

(ii) when revegetation is complete, they be considered for reservation as natural features reserves.

Table 23

AREAS FOR REVEGETATION

Parish (P) or Township (T)	Description	Area (ha)
P ALEXANDRA	CA 36D	1.25
P ALEXANDRA	CA 91C	2.51
P BROADFORD	CA 141K	4.01
P DARNUM	CA 88J	4.10
P DOOLAM	CA 36J,36H	2.51
P FINGAL	ADJ CA 6	1.92
P GHIN GHIN	CA 53B	0.50
P KOBYBOYN	CA 11A SEC C	3.26
P KONGWAK	CA 25P	4.00
P MERTON	CA 77A,77B,77C,83D	9.62
P WHANREGARWEN	CA 14C	1.00
P WOORI YALLOCK	CA 42C	4.50
T YEA	CA 6A,6B,SEC A	4.02
P YEA	CA 52G	1.00

Crown land assessment and classification process

In the mid 1980s, the Government initiated a process of Crown land assessment (external to the Land Conservation Council process) to classify Crown land across the State as either 'public' land or 'government' land. 'Public' land in this classification is broadly similar but not identical to public land under the *Land Conservation Act* 1970; for example, it can include Crown land in cities and rural cities.

'Public' land is managed by CNR. It is characterised by its use for public benefit and for the protection of its intrinsic values, including conservation, historical, recreation, resource production, community or strategic values. The principal direction of management is to conserve these values.

'Government' land is managed by the Department of Finance, and includes land leased for commercial purposes or for departmental operational use, and land that could be sold into freehold ownership.

The process involved identification of values - both 'public' land and dollar values, followed by review by an interdepartmental committee. Land in some of the Council's public land use categories was automatically classified as either 'public' land - such as parks and conservation reserves - or 'government' land - such as land for agriculture - while other categories required full assessment.

The assessment procedure (since 1991) involves government agencies and statutory authorities identifying land surplus to operational requirements, after consulting with municipalities. The Department of Finance then inserts advertisements in the *Government Gazette* and newspapers listing these properties.

Council, as the public land planning body, considers that the process for identification and disposal of Crown land should involve adequate consultation with municipalities and local interest groups (for example, community, recreation and conservation groups) and include an opportunity for public comment. Further, if Council's recommendations, following its full statutory process, provide for retention of a block as public land or for alienation (sale), then it is inappropriate for a subsequent process to reverse this, unless specifically provided for by the Council.

These recommendations contain provisions in several land use categories for such subsequent processes to be applied - under Community Use Areas (buildings in public use), Services and Utilities and Uncategorised Public Land.

In the future, land in certain categories may no longer be required for public purposes or public uses and values may still be able to be maintained if the parcel is sold. Such decisions should be made on a case-by-case basis, and with the involvement of CNR (or other land manager), the local municipality and the community.

Proposals to sell public land currently recommended as Uncategorised Public Land, Services and Utilities and Community Use Areas (buildings in public use) should be considered under the following process.

* Land that is identified as not being required for the purpose for which it was set aside, or for which no obvious use exists, should be assessed for its public land values.
* If significant public land values exist it should be considered for re-categorisation by CNR, and reserved appropriately.
* CNR should either directly manage the land or seek expressions of interest from the community and the local municipality for use of the land and protection of the identified values.
* Alternatively, the land could be sold subject to protection of the public land values - for example, listing on the Historic Buildings Register, or application of conservation covenants. Such action may be appropriate where the values are of local or regional significance.
* Where relevant, the Department should investigate the feasibility of a land exchange with adjoining land-owners and the municipality.
* If it is decided to dispose of the land, CNR and the Department of Finance should advertise the intention to dispose of the land, both locally and State-wide, identifying the parcel concerned, its values and the mechanism for protection of those values.
* The community should have 30 days in which to comment on the proposal, and any comments should be considered before any decision is made to proceed with the disposal.
* Sale of land should be discussed with the local municipality to ensure that planning provisions are met and orderly marketing of land is achieved.

In most previous Council investigations, provision has been made for the sale of Crown land. In this investigation numerous small land parcels have been recommended for sale or exchange in Chapter O - Land Not Required for Public Purposes.

Crown land assessment and classification

Recommendation

N4 That, in relation to land classified as Uncategorised Public Land, Services and Utilities and Community Use Areas (buildings in public use) that is apparently surplus to requirements, an assessment of public land values be undertaken by the Department of Conservation and Natural Resources and, following full consultation (in accordance with the procedure outlined above) with the relevant municipal council, the community in general and other relevant land managing agencies, these areas be considered for re-categorisation, exchange or disposal.

Note:
It is intended that this recommendation apply to the whole State, not just this study area.

Disused railways

The first railways in Victoria were built in the 1850s, with the first in the Melbourne Area, District 2, being the north-eastern line to Wodonga - begun in 1867. In 1877—88 a Gippsland trunk line was built to Moe. An 'octopus' of new lines was built across the State in the 1880s, including the South Gippsland Railway, lines on the Mornington Peninsula and the Thorpdale, Tallarook to Mansfield and Warragul to Neerim South Lines.

After 1892 coal railway lines were constructed, the most notable being the Nyora to Wonthaggi line. In the early 1900s lines were extended into the higher country including, in response to the expense of broad-gauge lines, a number of narrow-gauge lines. With the advent of road transport, and declines in rural population and rural industry, the extension of the railway network ceased in the study area by 1922. Railway lines then entered a period of closures, particularly after World War II.

Council does not believe it is necessary for all disused railway reserves to be retained in the public domain to reflect their historical values and their role in the development of the State.

Sections of the surplus railway lines and structures have significant historical values and these have been recommended as 'historic and cultural features reserves' (see Chapter F). Others have particular recreation values, and these are referred to in Chapter J - Community Use Areas.

The remaining sections of the surplus lines have a range of values, including less-significant historical, recreation and nature conservation values, and capability for pastoral land use. They have been recommended as 'uncategorised public land' and are subject to the following planning process agreed to by the former Ministers for Conservation and Environment and Transport.

This process involves the setting up of local advisory committees who make recommendations, in the form of management plans, to the Ministers for endorsement. The committees are required to seek expressions of interest from agencies, groups and persons as to the future use of these lines. Such future use could involve retention of the lines in public ownership or the sale of all or part.

Planning has been completed for the Lilydale to Warburton line. It is nearing completion for the Nyora to Wonthaggi line and has begun for some of the lines in the north of the study area.

Railways in current use are included in the Services and Utilities category (see Chapter M).

Most disused railway lines within the study area have in recent times been declared surplus by the Public Transport Corporation. They are as follows.

Tallarook to Mansfield, and Alexandra

This line has a range of historical, recreational and conservation values, some of which are subject to other recommendations (see Chapters F and J). The section from Yea to Cathkin and on to Alexandra is of particular note. The planning process (see above) has started for this line, and expressions of interest have been received. Conservation and recreation values of the line have been highlighted in that process, and use of part for a 'Hume and Hovell' walking track is supported.

Moe to Thorpdale

Most of the line has been sold, except where it coincides with or abuts the public land water frontage reserve on Narracan Creek.

Coldstream to Healesville

This line is operated as a tourist railway and has been recommended as a community use area - see Chapter J.

Baxter to Mornington

Except for the Mornington station ground, which has been sold, the line is operated as a tourist railway and has been recommended as a community use area - see Chapter J.

Bittern to Red Hill South

The line has been sold. Most has been acquired by the Shire of Hastings, which is progressively developing it as a linear park for walkers and horse-riders.

Korumburra to Outtrim, and Koo-Wee-Rup to Strzelecki

Most of these lines has been sold, other than three isolated sections, none of which is known to have any special historical, recreational or nature conservation values.

Nyora to Wonthaggi

The section between Anderson and Wonthaggi has been recommended as part of a historic and cultural features reserve - see Recommendation F20. A management plan process is in progress.

Belgrave to Gembrook

The Puffing Billy railway has been recommended as a historic and cultural features reserve - see Recommendation F4.

Lilydale to Warburton

A government-supported planning process has culminated in the approval of a management plan, which proposes that most of the railway be used for recreation purposes. It has been recommended as a community use area - see Recommendation J15.

Warragul to Noojee

This disused railway has been mostly sold. The remaining public land sections are included in a historic and cultural features reserve (Noojee trestle bridge - Recommendation F16) and a community use area (Noojee station ground - Recommendation J19).

Moe—Walhalla line

Part of the line traverses State forest and most of the remainder is sold. That section in public ownership near Erica, together with nearby Crown land, provides opportunities for a recreation access route from that town to the Thomson River and Walhalla. Council has recommended that the Erica section of the line be classified as a 'community use area'.

Disused railways

Recommendation

N5 That disused railways be used in accordance with the general recommendations for Uncategorised Public Land, until completion of the planning process outlined above.

Inappropriate townships

Some townships, although gazetted, either have never been settled or have been largely abandoned. These include former mining or milling townships in State forest, and townships in agricultural areas where the main settlement site has shifted. Council considers that some such townships are no longer appropriate.

Crown land in some of these townships supports native vegetation in either an undisturbed condition or, in the case of partially developed and subsequently abandoned townships, as regrowth. In other cases they exist as cleared paddocks.

It would be preferable for such former townships to be assessed by the land managers, and the following guidelines considered:

* where a former township is entirely public land, it be rescinded and included with the surrounding public land
* where a former township is largely public land, and freehold land parcels have been effectively abandoned, the township be rescinded and public land blocks included with the surrounding public land
* where a former township is largely freehold land but is clearly not a township according to current land use, the township be considered for annullment. Landowners should be consulted
* sites with features of potential historical significance should be assessed. Former township names can be retained as localities on maps, and with signposts on site. Former townships on public land with strong historical associations could be retained, but be subject to regulation that prevents re-establishment of settlement
* in all cases, local government should be consulted.

O. LAND NOT REQUIRED FOR PUBLIC PURPOSES

The era of large-scale alienations of Crown land for agriculture is past. The Council recommends that no additional large areas of public land be developed for agriculture in the study area. However, in reviewing public land for this investigation, and as a result of Crown land assessments carried out by the Department of Conservation and Natural Resources (CNR) (see Chapter N), some areas have been provisionally identified by Council as not being required for public purposes. They could be considered for alienation, subject to an appropriate process, as outlined in Chapter N, involving the relevant municipalities.

Council believes that, where possible, land available for alienation should be exchanged for parcels of freehold land that contain important values, in order to bring that land into public ownership or to add to the integrity, viability or ease of management of reserves.

Council's criteria for assessing land exchanges (see Appendix X) provide that a proposed land exchange, for it to be recommended, must result in the enhancement of the public land estate's value to the community.

Some of the areas listed in Table 24 are in agricultural areas. It is intended that this land, if alienated, should form additions to present farms, rather than be developed as new units. Other areas are in townships, and would be available for urban purposes.

LAND NOT REQUIRED FOR PUBLIC PURPOSES

Recommendations

O1,O3,O4 That the areas listed in Table 24 be considered for alienation or for exchange for freehold land, subject to the guidelines specified in Appendix X.

Table 24

LAND NOT REQUIRED FOR PUBLIC PURPOSES (Recommendation O1)

Parish (P) or Township (T)	Description	Area (ha)	Parish (P) or Township (T)	Description	Area (ha)
P ACHERON	CA 43D3	0.50	P DOOLAM	CA 36F	2.48
T ALEXANDRA	CA 10,10A SEC 33	0.07	P DOOLAM	CA 27D	0.75
P ALEXANDRA	CA 56F 56K	0.50	P DROPMORE	CA 6,7 SEC B	15.80
T ALEXANDRA	PART CA 5 SEC 47	0.16	P FINGAL	CA 29A	0.81
P ALEXANDRA	CA 30V	0.50	T FLINDERS	PART CA 43	0.20
T ALEXANDRA	CA 6 SEC 49	0.08	P FRENCH ISLAND	PARTS CA 13 14B	63.00
T ALEXANDRA	CA 2A SEC 51	0.22	P FUMINA NORTH	T. Tanjil Bren	4.10
P ALEXANDRA	CA 51A	1.00	T GARFIELD	CA 15A,15B,15C	0.25
P BEENAK	CA 63F	2.89	P GRACEDALE	CA 37B	0.33
P BOOROLITE	CA 10C SEC A	2.01	P GRACEDALE	CA 128B	0.10
P BRANKEET	CA 49C	1.25	P GRACEDALE	CA 54D SEC B	0.19
P BROADFORD	CA 155E	0.81	P JEETHO WEST	CA 48D 48E	0.82
P BUNYIP	CA 85B	0.20	P JINDIVICK	CA 59H	0.30
T COALVILLE	CA 16–19 SEC 3	0.34	T KINGLAKE EAST	PART CA 6A	0.01
T COALVILLE	CA 3,4,5,7,10–13 SEC 2	0.56	P KOO-WEE-RUP	CA IG,IF SEC H	1.11
T COALVILLE	CA 16 SEC 1	0.06	P KOO-WEE-RUP EAST	CA 26B SEC M	0.85
T CORA LYNN	CA 16A SEC 1	0.27	P KOO-WEE-RUP EAST	CA 48A SEC R	0.35
	CA 10L SECT		T KORUMBURRA	CA 5 SEC G	0.78
T CORA LYNN	CA 14F SEC F	0.32	T KORUMBURRA	CA 1A SEC 4	0.09
T CRIB POINT	CA 22-25 SEC 4	1.13	T KORUMBURRA	CA 2 SEC 4	0.36
T CRIB POINT	CA 20 SEC 2	0.12	P LOYOLA	CA 79B	0.50
P DOOLAM	CA 40A	0.75	T MAINDAMPLE	CA 14 SEC 12	0.04

(continued)

O1 Recommendation (continued)

Table 24 (continued)

Parish (P) or Township (T)	Description	Area (ha)	Parish (P) or Township (T)	Description	Area (ha)
T MAINDAMPLE	CA 1 SEC 5	0.20	P SCORESBY	PART CA 15A	1.20
T MANSFIELD	CA 1H SEC 32	0.09	P SWITZERLAND	CA 2B	1.00
T MANSFIELD	CA 9A NO SEC	0.07	T TAGGERTY	CA 2B SEC 13	0.20
T MARYSVILLE	CA 25 SEC 1	4.00	P TANJIL	CA 34A,34B	7.42
P MERTON	CA 41C	3.40	P TANJIL EAST	PART CA 18K SEC A	26.00
P NANGANA	CA 43K	0.07	P TANJIL EAST	CA 18H,18J SEC A	30.00
P NAR NAR GOON	CA 12A, 12B NO SEC	1.74	P TONIMBUK EAST	PART CA 12A SEC C	8.00
P NARRACAN	PT CA 4S NO SEC	39.06	P TONIMBUK EAST	PART CA 6A SEC C	2.80
P NARRACAN SOUTH	CA 13A	1.00	P TONIMBUK EAST	PART CA 89 NO SEC	1.20
P NARREE WORRAN	CA 127	16.00	P TONIMBUK EAST	PART CA 10 SEC B	1.20
P NEPEAN	SOUTH OF CA 89	0.20	T TRAFALGAR	CA 16B SEC 11	0.12
P NEERIM	CA 162B	1.00	T TRAFALGAR	CA 6A SEC 5	0.24
P NEERIM	CA 164R	3.10	P TYABB	PARTS CA 28H, 28J, 28P	26.00
P NEERIM	CA 164L	0.20	P WANDIN YALLOCK	CA 22A	0.95
P NEERIM	CA 36H	0.07	P WANNAEUE	PART CA A	8.27
P NEERIM	CA 82E	1.00	T WESBURN	CA 36 SEC A	0.39
P NEERIM	CA 86C 86D	0.20	T WESTBURY	CA 1D SEC 3	0.21
P NEERIM	CA 87A	0.10	T WESTBURY	CA 1C SEC 3	0.18
P NEERIM	CA 98A1	1.00	P WHANREGARWEN	CA 44E	3.26
P NILLUMBIK	WITHIN CA 16 SEC 2	0.81	P WINDHAM	CA 21K NO SEC	0.25
P NILLUMBIK	ADJ CA 1 SEC 2	0.75	P WINDHAM	CA 21G NO SEC	0.25
P NILLUMBIK	NW OF CA2 SEC 2	0.81	P YARCK	CA 64G	0.50
T NOOJEE	PART CA7 SEC 7	1.00	T YARRAGON	CA 8 9 SEC 5	2.11
T NOOJEE	CA 9 SEC 3	0.10	P YEA	CA 52H	0.25
T NOOJEE	CA 19 SEC 3	0.50	P YEA	CA 214D	0.75
P PHILLIP ISLAND	CA 72A	1.21	P YEA	CA 258A	6.27
P POOWONG EAST	CA 29D	0.51	T YEA	CA 12A SEC 8	0.18
T REEDY CREEK	CA 1B SEC 1	0.45	T YEA	CA 12 SEC 28	0.78
T REEDY CREEK	CA 2A,2B.2C.2D SEC 1	0.45			

Glenewart

In 1974, the government purchased this area from the prominent conservationist Dr A.G. Scholes and vested it in the Victorian Conservation Trust, with the intention that it would be used for environmental education. A residential field studies centre was planned to be built and operated by the (then) Environmental Studies Association of Victoria. In 1980 financial considerations led to that plan being abandoned, and the area was transferred to the former Lands Department (now CNR) for management. It now receives very little use, and it is considered not to have sufficient conservation or community values to justify continued public ownership.

Given this and the proximity of other areas available for environmental education (see chapter J), Council considered that Glenewart could be either sold, subject to conservation covenants, or exchanged for other land. It would be appropriate if the proceeds from any sale were used for environmental education purposes or for improvements to other properties formerly owned by Dr Scholes and now held by the Victorian Conservation Trust.

Parish of Gracedale CA4 SEC C 130 ha 'Glenewart'

Notes:
1. This area may be either sold subject to conservation covenants or exchanged for other land.
2. Proceeds from the sale of Glenewart could be used for environmental education or improvements to other former Scholes properties.

(continued)

O1 Recommendation (continued)

Former McLeod Prison Farm

This site was previously included in the French Island State Park. Council now recommends that the former prison and surrounding cleared farmland could be alienated. Because it abuts the area now recommended as a national park, however, Council considers the land should not be subdivided, that covenants on title or other instruments should be put in place to make this clear, and that the preferred uses are largely for agriculture and tourist-related development.

Parish of French Island PART CA 33 SEC O (274 ha)

Land exchanges

Township of Marysville PART CA 13 NO SEC (27ha)

Notes:
1. Council intends that the area should be made available for the proposed Marysville sewerage works (see recommendation M16) and that an equivalent area of freehold land should be transferred to the Crown in exchange.
2. Due to the urgency of this proposal, implementation of the exchange is being carried out by revocation of the existing approved recommendation for the area.

Parish of Warburton CA 20B (13.4 ha)

Note:
Council intends that this land should be made available in exchange for at least an equivalent area of freehold land, which is to be added to State forest.

Parish of Wandin Yallock CA 62A (3.6 ha)

Note:
Council intends that this area be considered for exchange for freehold land adjoining Woori Yallock Creek to provide potential habitat for helmeted honeyeaters.

Parish of Kangerong CA 1, PARTS CAs 3B AND 8A, SEC 3 (57.5 ha)

Note:
Council intends that this area be considered for exchange for land owned by the Shire of Flinders adjoining the Arthurs Seat State Park.

Parish of Nepean PART CA 42A (0.4 ha)

Note:
These areas of public land, containing refuse hoppers managed by the Shire of Flinders, could be considered for exchange for other municipal land to assist in the consolidation of the boundaries of parks in the Shire.

Silvan No. 2 Reservoir Site

Melbourne Water purchased the land as a part of a possible reservoir site, but it is now surplus to Melbourne Water's requirements. One section has been recommended for addition to the Dandenong Ranges National Park (see Recommendation A6) while others have been modified, including an area leased for many years for flower production. It is proposed that the modified areas be included with land not required for public purposes, with a setback from Olinda Creek. Legal access to areas north of the creek would be required to be established. The forested parts of the Melbourne Water land should be retained and added to the adjoining park.

Recommendation

O2 Silvan No. 2 Reservoir Site

That (i) the area of 31 ha shown on Maps A and B be available for alienation

(ii) land within 50 m of the north bank of Olinda Creek be retained and included in the Dandenong Ranges National Park

and that

(iii) legal access be provided to land to be alienated north of Olinda Creek.

Anderson Creek

In the recommendations of the Council's Latrobe Valley Special Investigation (October 1987), the former State Electricity Commission identified several areas that were not currently required, but which will be required for coal-related development in the future. One of these is a large parcel (1470 ha) on Anderson Creek, which includes the site of a dump for over-burden resulting from open-cut development.

The Council's recommendations in 1987 provided that this area be available under lease for use for agriculture or forestry, until required for coal-related development. The successor to the SEC, Generation Victoria, has sought flexibility in the future use and tenure of the Anderson Creek land, including the ability to sell it to a private (or privatised) body.

Anderson Creek

Recommendation

O3 That the area of 1470 ha at Anderson Creek, indicated on Map A, be available for agriculture or forestry until required for coal-related development.

Notes:
1. See also Recommendations K5 and G87.
2. This recommendation would not preclude the sale of this land to a privatised government body or a private body.
3. A substantial part of this area has recently been established as hardwood plantation.

Wonthaggi

The township area of the Borough of Wonthaggi contains extensive areas of public land. Much of this falls into three groups:

* public purposes
* open space/recreation
* other uses, including dwellings, car-parks, business premises and vacant blocks

In these recommendations Council has allocated land primarily on the basis of existing use. Land has been classified as not required for public purposes where it is presently used for private purposes, has no obvious public use or is particularly suitable for urban or agricultural development.

A list of these blocks follows. Of particular interest is a large block, CA 1, Sec 75, on the eastern edge of the township, which has the potential to be subdivided to provide a substantial supply of residential land.

From a town planning perspective, a 10- to 15-year land bank of suitably zoned land, based on current building permits or lot sales, would be considered desirable. Such a land bank exists at Wonthaggi at present. The majority of land being made available to date is freehold. Although the public land's unavailability has not inhibited development of the town, it has caused it to grow in a particular direction. The most recent subdivision has been to the north, with the development of areas in the east, closer to the town centre, restricted. While the land bank is presently adequate, the Crown

land at the east of the town will have an important part to play in its future development.

Those areas at Wonthaggi with public land values - carrying historical sites or remnant vegetation, or used for formal recreation or municipal purposes - have been referred to in separate recommendations elsewhere in this report. The land referred to below could be made available for urban use, and in a few cases for industrial or commercial subdivision. The Borough Council has commented that, in the disposal of public lands, options for future green belts and public open-space requirements should be retained.

Wonthaggi

Recommendation

O4 That the areas at Wonthaggi listed in Table 25, and shown on Map C, be made available for alienation subject to:

(i) liaison with the Borough of Wonthaggi (responsible for the detailed planning for future land use in the areas)

(ii) liaison with the Department of Planning and Development (with respect to possible public housing opportunities)

(iii) release of the land being ordered, with priority given to land within or contiguous with the existing urban area

and

(iv) the guidelines below.

* All plans are to be consistent with any strategic plans for the township.
* Remnant vegetation is to be retained.
* Areas subject to subsidence hazard are not to be intensively developed.
* Public access links should be provided between the main blocks of retained public land (where appropriate, utilising unused roads with remnant vegetation).
* Provision is to be made for local amenity open-space areas.

Table 25

LAND AT WONTHAGGI FOR ALIENATION

Description	Area (ha)	Description	Area (ha)	Description	Area (ha)
Land in the Parish of Wonthaggi		CA 2 SEC 33	0.10	CA 7 SEC 56B	0.10
CA 26F	29.89	CA 3 SEC 33	0.10	CA 8 SEC 56B	0.10
CA 26G	25.00	CA 4 SEC 33	0.10	CA 28 SEC 56B	0.10
WEST PART CA 34C	3.00	CA 5 SEC 33	0.10	CA 29 SEC 56B	1.00
Land in the Township of Wonthaggi		CA 6 SEC 33	0.10	CA 30 SEC 56B	0.10
CA 30 SEC 2	0.09	CA 7 SEC 33	0.10	CA 31 SEC 56B	0.10
CA 3 SEC 3C	6.01	CA 30 SEC 49	0.03	CA 32 SEC 56B	0.10
PART CA 7 SEC 3C	3.80	CA 31 SEC 49	0.10	CA 33 SEC 56B	0.10
CA 14A SEC 5	0.13	CA 36 SEC 54A	0.07	CA 34 SEC 56B	0.10
CA 7 SEC 31	0.18	CA 28 SEC 55	0.20	CA 16 SEC 60	0.08
CA 10 SEC 31	0.18	CA 27 SEC 56A	0.11	CA 3 SEC 63	0.25
CA 11 SEC 31	0.18	CA 28 SEC 56A	0.11	CA 4 SEC 63	0.36
CA 12 SEC 31	0.18	CA 3 SEC 56B	0.10	CA 5 SEC 63	0.25
CA 13 SEC 31	0.18	CA 4 SEC 56B	0.10	CA 6 SEC 63	0.20
CA 14 SEC 31	0.18	CA 5 SEC 56B	0.10	CA 7 SEC 63	0.20
CA 1 SEC 33	0.26	CA 6 SEC 56 B	0.10	CA 8 SEC 63	0.20

(continued)

Table 25 (continued)

Description	Area (ha)	Description	Area (ha)	Description	Area (ha)
CA 9 SEC 63	0.20	CA 1 SEC 70	0.10	CA 7 SEC 98	0.08
CA 10 SEC 63	0.20	CA 3 SEC 70	0.10	CA 8 SEC 98	0.08
CA 11 SEC 63	0.20	CA 4 SEC 70	0.10	CA 52 SEC 98	0.09
CA 12 SEC 63	0.20	CA 5 SEC 70	0.10	CA 53 SEC 98	0.09
CA 12 SEC 64	0.10	CA 17 SEC 70	0.10	CA 72 SEC 98	0.65
CA 13 SEC 64	0.10	CA 18 SEC 70	0.10	CA 73 SEC 98	0.03
CA 14 SEC 64	0.10	CA 19 SEC 70	0.10	CA 74 SEC 98	0.03
CA 15 SEC 64	0.10	CA 20 SEC 70	0.10	CA 06 SEC 100	0.09
CA 16 SEC 64	0.10	CA 6 - 27 SEC 72	3.00	CA 20K,J,H,D, G,Q,R SEC 100	5.67
CA 17 SEC 64	0.10	CA 1 - 12 SEC 74	3.00		
CA 1 SEC 69	0.10	PART CA 1 SEC 75	77.66	CA 23 SEC 100	0.33
CA 2 SEC 69	0.10	CA 1,3,4 SEC 86	1.14	CA 25 SEC 100	0.33
CA 3 SEC 69	0.10	CA 6A,11 SEC 86	1.21	CA 14A SEC 107	0.56
CA 17 SEC 69	0.10	PART CA 8 SEC 86	11.42	CA 4H SEC 117	0.30
CA 18 SEC 69	0.10	CA 15 SEC 86	1.80	CA 4J SEC 117	0.21
CA 19 SEC 69	0.10	CA 1 SEC 89	0.81	CA 4K SEC 117	0.19
CA 20 SEC 69	0.10	CA 2 SEC 89	0.94		

P. DEFENCE FORCE AND OTHER TRAINING

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

Under the regulations to the *Defence Act* 1903, the Minister for Defence may declare an area of public land to be a military training area, but only with the consent of the State authority responsible for the management of the land. The managing authority may also impose conditions of use on particular areas and these must be observed. Provisions for compensation for damage to assets or land also exist. No public land in Victoria is currently designated for military training purposes, however.

Exercises involving navigation and training with conventionally tyred vehicles and on foot conflict little with land management aims and may even be permitted in some parks and other reserves. However, strict controls must be imposed on the use of heavy vehicles. Such controls may concern the area used and/or the nature of the use.

The Australian Army has conducted military training exercises in State forest and parks in an area extending from the Big River catchment to Cathedral State Park, in the Murrindindi River catchment, in the Kinglake National Park and in the Tallarook State Forest. Activities undertaken included adventure training, navigation, bushcraft, communications and infantry exercises. Vehicular use involved three to five four-wheel-drive vehicles and two to three 2.5- or 5-tonne trucks. Pyrotechnics and blank ammunition may be used in specific areas.

Many organisations, including the Victoria Police, the State Emergency Service, Outward Bound, cadet groups, outdoor adventure operators and some community groups, also provide training programs in search and rescue, survival and outdoor skill techniques. Where such an exercise is proposed, it should be undertaken in a manner consistent with the requirements placed on other users. That is, it should be subject to compatibility with the management aim of the respective areas.

DEFENCE FORCE AND OTHER TRAINING

Recommendation

P1 That public land continue to be available for training in search and rescue, survival techniques, outdoor skills and similar activities, at the discretion of the land manager, to the extent consistent with the management aims of the respective area.

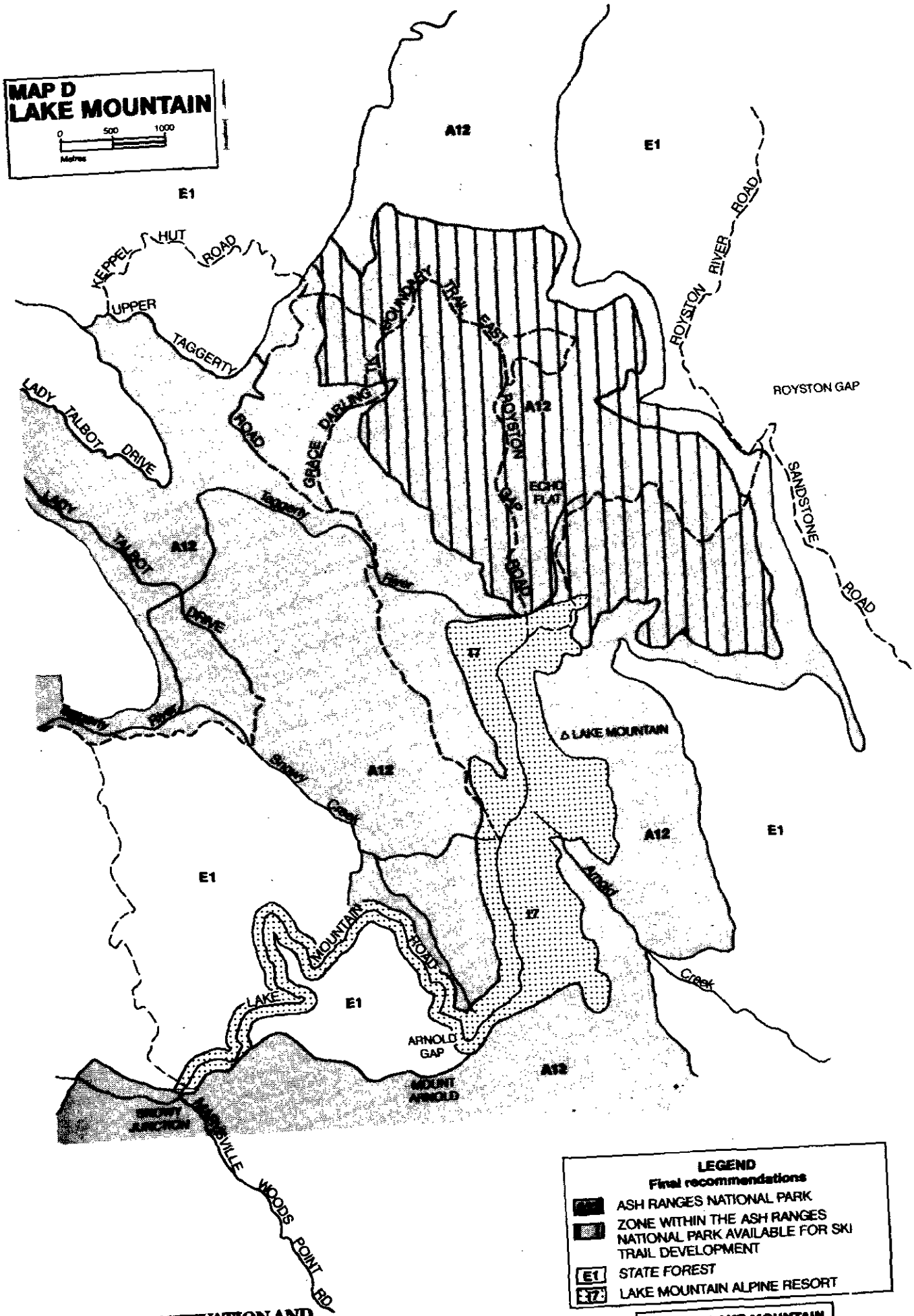
P2 That, where military training is conducted on public land:

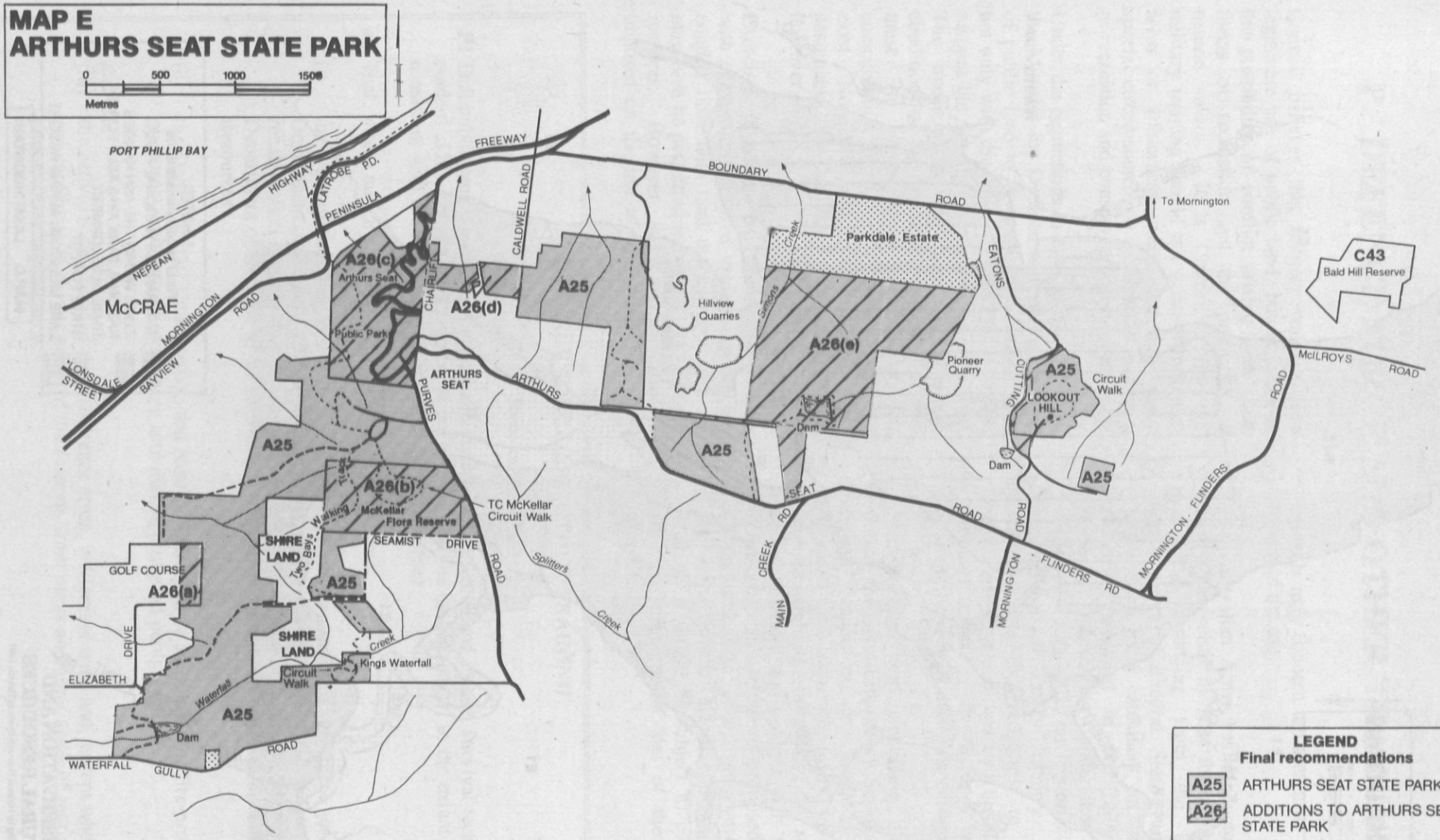
(i) the types of activities, and their timing and location, be subject to agreement between the Department of Defence and the Department of Conservation and Natural Resources, and rehabilitation of areas damaged by military exercises be undertaken at the expense of the Department of Defence to the satisfaction of the Department of Conservation and Natural Resources

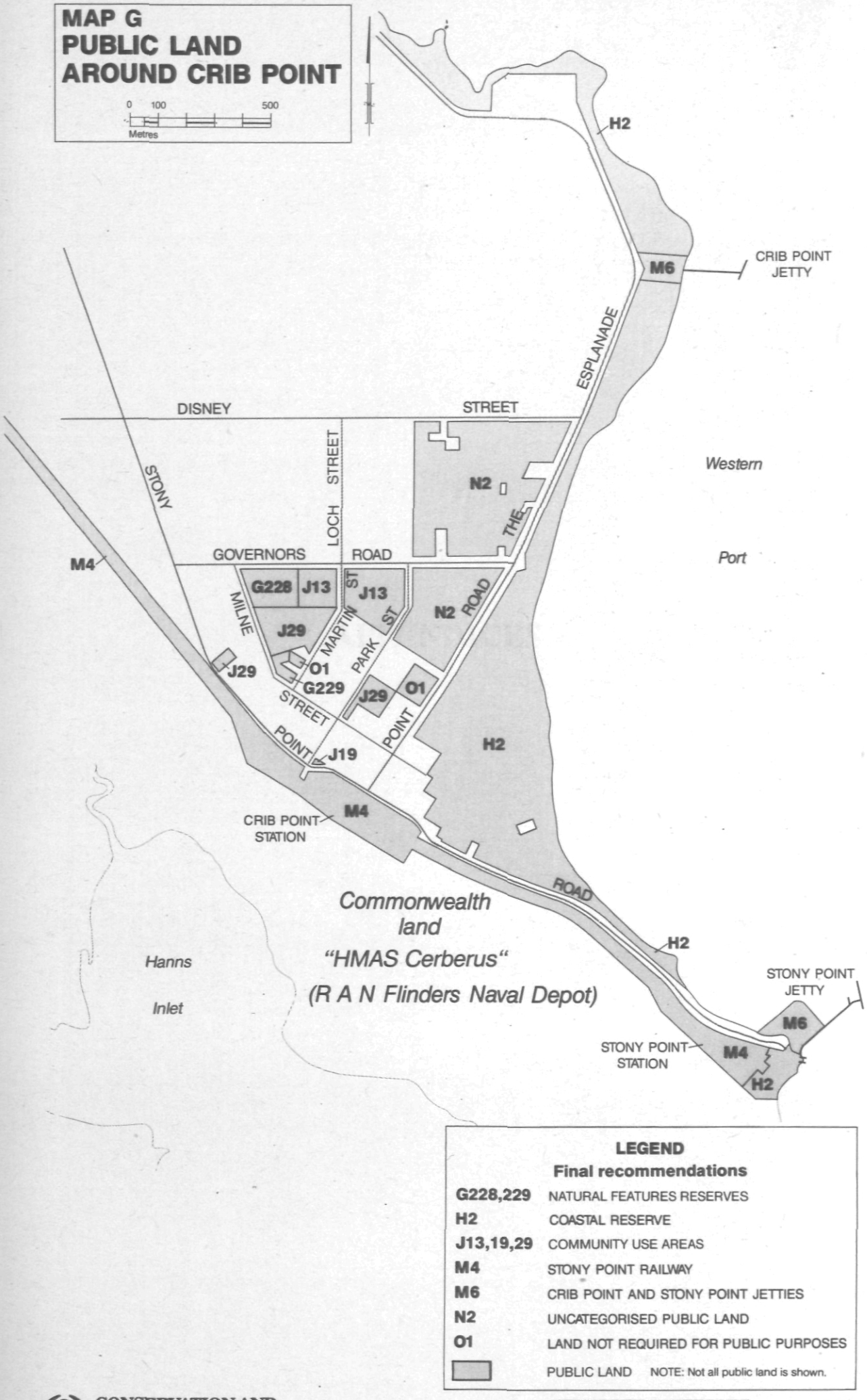
(ii) the Department of Conservation and Natural Resources be consulted (for fire-protection purposes) with respect to training activities in protected public land

and that

(iii) the activities be excluded from reference areas, wilderness areas and, except where it does not conflict with the purposes of the reserve, from parks and other areas of recreation and conservation significance.


MAP D
LAKE MOUNTAIN
0 500 1000
Metres
A12
E1
KEPPEL HUT ROAD
UPPER TAGGERTY
LADY TALBOT DRIVE
GRACE DARLING ROAD
BOUNDARY TRAIL EAST
ROYSTON GAP
ROYSTON RIVER ROAD
SANDSTONE ROAD
ECHO FLAT
LAKE MOUNTAIN
MOUNTAIN ROAD
LAKE
ARNOLD GAP
MOUNT ARNOLD
WOODS POINT RD
LEGEND
Final recommendations
ASH RANGES NATIONAL PARK
ZONE WITHIN THE ASH RANGES NATIONAL PARK AVAILABLE FOR SKI TRAIL DEVELOPMENT
STATE FOREST
LAKE MOUNTAIN ALPINE RESORT
MAP D LAKE MOUNTAIN
CONSERVATION AND NATURAL RESOURCES


MAP E
ARTHURS SEAT STATE PARK
0
500
1000
1500
Metres
PORT PHILLIP BAY
HIGHWAY
LATROBE PD.
PENINSULA
FREEWAY
NEPEAN
McCRAE
MORNINGTON ROAD
LONSDALE STREET
BAYVIEW
CHARLIE
CALDOWELL ROAD
BOUNDARY
ROAD
To Mornington
Parkdale Estate
Creek
EATONS
C43
Bald Hill Reserve
A26(c)
Arthurs Seat
Public Park
A26(d)
A25
Hillview Quarries
Simpsons
A26(e)
Pioneer Quarry
CUTTING
A25
LOOKOUT HILL
Circuit Walk
McILROYS
ROAD
ARTHURS SEAT
PURVES
ARTHURS
Dam
A25
Dam
A25
A25
A26(b)
McKellar Flora Reserve
TC McKellar Circuit Walk
SHIRE LAND
Two Bays Walking Track
SEAMIST
DRIVE
ROAD
SEAT
ROAD
CREEK
RD
MAIN
MORNINGTON
FLINDERS
RD
MORNINGTON FLINDERS
ROAD
GOLF COURSE
A26(a)
A25
Splitters
Creek
DRIVE
SHIRE LAND
Creek
Kings Waterfall
ELIZABETH
Circuit Walk
Waterfall
A25
Dam
ROAD
WATERFALL
GULLY
LEGEND
Final recommendations
A25
ARTHURS SEAT STATE PARK
A26
ADDITIONS TO ARTHURS SEAT STATE PARK
C43
NATURE CONSERVATION RESERVE
UNCATEGORISED PUBLIC LAND
CONSERVATION AND NATURAL RESOURCES
Cartography by Natural Resource Systems Branch 1994
MAP E ARTHURS SEAT



CONSERVATION AND NATURAL RESOURCES
Cartography by Natural Resource Systems Branch 1994

MAP G CRIB POINT

APPENDICES

Appendix I

LIST OF SUBMISSIONS

Appendix I(a): SUBMISSIONS RECEIVED FROM INTEREST GROUPS AND OTHER ORGANISATIONS

Organisation	1st Sub number	2nd Sub number
Government Departments and Agencies		
ALPINE RESORTS COMMISSION	152	886
AUSTRALIAN HERITAGE COMMISSION		1020
CENTRAL GIPPSLAND FOREST MANAGEMENT AREA ADVISORY COMMITTEE	L12	
DEPARTMENT OF BUSINESS AND EMPLOYMENT		1018
DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES	L97	L60
DEPARTMENT OF ENERGY AND MINERALS		L32
DEPARTMENT OF MANUFACTURING AND INDUSTRY DEVELOPMENT	264	
ENVIRONMENT PROTECTION AUTHORITY	179	232
GAS AND FUEL CORPORATION OF VICTORIA (Natural Gas Division)		25
HISTORIC MINING SITES ASSESSMENT COMMITTEE		1022
LATROBE REGION WATER AUTHORITY	L1	715
LATROBE REGIONAL COMMISSION		597
MARYSVILLE WATER BOARD	220	
MELBOURNE WATER	180	1034
MINISTER FOR MANUFACTURING AND INDUSTRY DEVELOPMENT	L87	
PORT OF MELBOURNE AUTHORITY		701
PUBLIC TRANSPORT CORPORATION	13	1021
ROYAL BOTANIC GARDENS		1042
RURAL WATER CORPORATION	252	1017
STATE ELECTRICITY COMMISSION OF VICTORIA	235	862
TIMBER INDUSTRY COUNCIL	250	
TOURISM VICTORIA		L48
UPPER YARRA VALLEY AND DANDENONG RANGES AUTHORITY	141	124
VIC ROADS		877
WESTERNPORT REGIONAL PLANNING AND CO-ORDINATION COMMITTEE	165	452
Municipal Councils		
CITY OF BAIRNSDALE		L70
LATROBE VALLEY REGIONAL ORGANISATION OF COUNCILS		L68
SHIRE OF ALEXANDRA	1	343
SHIRE OF AVON	L7	
SHIRE OF BASS		523
SHIRE OF BROADFORD	147	
SHIRE OF BULN BULN	L6	
SHIRE OF ELTHAM	L129	486
SHIRE OF FLINDERS	L10	
SHIRE OF HASTINGS	140	454
SHIRE OF HEALESVILLE	204	
SHIRE OF NARRACAN	144	886
SHIRE OF PAKENHAM		26
SHIRE OF ROSEDALE	L13	21
SHIRE OF SHERBROOKE		404
SHIRE OF SOUTH GIPPSLAND	L11	
SHIRE OF TRARALGON	221	
SHIRE OF UPPER YARRA		1100
SHIRE OF WINCHELSEA	L14	
SHIRE OF YEA	280	
Academic Institutions		
AUSTRALIAN NATIONAL UNIVERSITY (Department of Forestry)	234	
Conservation Groups		
AUSTRALASIAN NATIVE ORCHID SOCIETY (Victorian Group)		459
AUSTRALIAN CONSERVATION FOUNDATION	203	365
AUSTRALIAN WILDLIFE PROTECTION COUNCIL		1032
BEND OF ISLANDS CONSERVATION ASSOCIATION		1030
BROADFORD ENVIRONMENTAL ACTION MOVEMENT INC.		500
BUNDOORA ACTION GROUP		829
BUSHCARE INC. (Berwick/Pakenham Group)		1064

Appendix I(a) (continued)

Organisation	1st Sub number	2nd Sub number
CAULFIELD ENVIRONMENT GROUP	192	146
CHANDLER HILL PARKCARE GROUP		624
CONCERNED RESIDENTS OF EAST GIPPSLAND		510
CONSERVATION COUNCIL OF VICTORIA		847
CROYDON CONSERVATION SOCIETY		1042
DONCASTER AND TEMPLESTOWE CONSERVATION SOCIETY		1044
FIELD NATURALISTS CLUB OF VICTORIA (Botany Group)		680
FRIENDS OF BALUK WILLAM BUSHLAND		577
FRIENDS OF CRANBOURNE BOTANIC GARDENS		833
FRIENDS OF FRENCH ISLAND STATE PARK	150	819
FRIENDS OF KINGLAKE NATIONAL PARK		888
FRIENDS OF OLINDA FOREST		807
FRIENDS OF SASSAFRAS CREEK		891
FRIENDS OF SHERBROOKE FOREST		136
FRIENDS OF THE EARTH	168	717
FRIENDS OF THE HELMETED HONEYEATER INC.	301	955
FRIENDS OF THE TALLAROOK RANGES INC.	297	
GEELONG ENVIRONMENT COUNCIL INC.		1098
HEALESVILLE HERITAGE WATCH	L15	1015
HUGHES CREEK GROUP		831
INDIGENOUS FLORA AND FAUNA ASSOCIATION		961
KNOX ENVIRONMENT SOCIETY INC.		24
LATROBE VALLEY FIELD NATURALISTS	24	46
MARINE AND COASTAL SOCIETY	302	
MARINE RESEARCH GROUP	304	
MEANDER		1087
MONTROSE ENVIRONMENTAL GROUP		700
MT EVELYN ENVIRONMENT PROTECTION AND PROGRESS ASSOCIATION		806
NATIONAL THREATENED SPECIES NETWORK		910
NATIONAL TRUST OF AUSTRALIA (VICTORIA)		L15
NORTH EAST BUSHLAND ENVIRONMENT COUNCIL		161
PASCOE VALE FIELD NATURALISTS CLUB	23	856
PHILLIP ISLAND HOODED PLOVER STUDY GROUP		5
ROUND THE BEND CONSERVATION CO-OPERATIVE LTD		928
SAVE THE DANDENONGS LEAGUE INC.	225	986
SEYMOUR ENVIRONMENT GROUP	237	976
SHERBROOKE LYREBIRD SURVEY GROUP		57
SOUTH EASTERN AREA RESIDENTS ASSOCIATION INC.		827
SOUTH GIPPSLAND CONSERVATION COUNCIL (Inverloch Branch)		676
SOUTH GIPPSLAND CONSERVATION SOCIETY INC. (Bass Valley and Districts Branch)	L94/124	918
SOUTH GIPPSLAND CONSERVATION SOCIETY INC.	231	
SOUTH GIPPSLAND CONSERVATION SOCIETY INC. (Mirboolarra Branch)		844
SOUTH GIPPSLAND CONSERVATION SOCIETY INC. (Leongatha Branch)		958
SOUTHERN PENINSULA TREE PRESERVATION SOCIETY		716
UPPER BEACONSFIELD CONSERVATION GROUP		965
UPPER GOULBURN FIELD NATURALISTS CLUB		607
UPPER YARRA CONSERVATION SOCIETY INC.	286	1079
UPWEY REGIONAL ACTION GROUP FOR THE ENVIRONMENT		779
VICTORIAN NATIONAL PARKS ASSOCIATION	258	1011
WARRANDYTE ENVIRONMENT LEAGUE		618
WARRINGAL CONSERVATION SOCIETY INC.		L10
WEST GIPPSLAND PEACE AND ENVIRONMENT GROUP		815
WESTERNPORT & PENINSULA PROTECTION COUNCIL INC.		795
WILDERNESS SOCIETY		944
WILDERNESS SOCIETY (Diamond Valley Branch)		588
Industry Groups		
A. LEWIS AND CO PTY LTD	279	
ALEX DEMBY TIMBER CO.	228	1003
AUSTRALIAN FOREST INDUSTRIES	222	
AUSTRALIAN PAPER MANUFACTURERS	268	939
AUSTRALIAN SKI AREAS ASSOCIATION LTD		L29
BAW BAW SKI TOWS PTY LTD		1076
BIOSIS RESEARCH PTY LTD		1014

Appendix I(a) (continued)

Organisation	1st Sub number	2nd Sub number
CENTRAL DEVELOPMENT CORPORATION INC.	L18	
CHRISTMAS HILLS PROGRESS ASSOCIATION		1045
CONSTRUCTION, FORESTRY, MINING AND ENERGY UNION (Forestry Division)		935
DROUIN WEST SAWMILL PTY LTD	242	
EMERALD TOURIST RAILWAY BOARD	246	1
FIELD NATURALISTS CLUB OF VICTORIA		983
FOREST PROTECTION SOCIETY (Victorian State Office)		1047
FOREST PROTECTION SOCIETY		1194-1944
FOREST PROTECTION SOCIETY (Central Gippsland Branch)	151	1047
HORSE RIDING CLUBS ASSOCIATION OF VICTORIA INC.		L35
J.L. GOULD SAWMILLS PTY LTD	246	932
LAKE MOUNTAIN SKI HIRE		637
LAKE MOUNTAIN SKI SCHOOL AND MARYSVILLE SKI HIRE		1036
LEBONY PTY LTD		812
MARBUT GUNNERSEN PTY LTD	270	1091
MARYSVILLE AND DISTRICT TOURIST PROGRESS ASSOCIATION	L120	1152
MARYSVILLE CARAVAN PARK		505
MCCORMACK TIMBERS PTY LTD	245	931
MONBULK PRODUCE CAMBARVILLE SAWMILLERS	263	
MORAN LOGGING COMPANY	266	
MUNIDUE OUT-BACK APIARIES	17	
NEVILLE SMITH TIMBER INDUSTRIES PTY LTD	306	
O'SHEA AND BENNETT SALES PTY LTD	284	
OAKGROVE LOGGING CO.	36	
PHILLIP ISLAND PENGUIN RESERVE		1051
PROSPECTORS AND MINERS ASSOC OF VICTORIA INC.	217	
PROSPECTORS AND MINERS ASSOC OF VICTORIA INC.	218	
PUBLIC LAND COUNCIL OF VICTORIA		883
RYAN AND MCNULTY PTY LTD	281	
SKI INDUSTRIES ASSOCIATION OF AUSTRALIA LTD		460
SYNDICATED CENTRAL GIPPSLAND LOGGING PTY LTD	185	
TIMBER MERCHANTS ASSOCIATION	273	
TIMBER TOWNS VICTORIA		1062
TIMBER PROMOTION COUNCIL	274	
TOOLANGI FOREST CAMP	176	651
VICTORIAN APIARISTS ASSOCIATION INC	L19	573
VICTORIAN ASSOCIATION OF FOREST INDUSTRIES	247	1046
VICTORIAN CHAMBER OF MINES		867
VICTORIAN FARMERS FEDERATION		1023
VICTORIAN FARMERS FEDERATION (Peninsula Branch)		1024
VICTORIAN SKI ASSOCIATION		887
YARRA VALLEY AND DANDENONG RANGES TOURISM BOARD INC.		1072
Recreation Groups		
AMTRA MOTORCYCLE TRAIL RIDERS ASSOCIATION	19	L17
ASTRONOMICAL SOCIETY OF FRANKSTON INC.		L71
AUSTRALIAN BOWHUNTERS ASSOCIATION (Bow Hunting and Defence Sub-committee)		943
AUSTRALIAN DEER ASSOCIATION INC. (Victorian State Executive)	249	868
AUSTRALIAN SKI FEDERATION		884
AUSTRALIAN/VICTORIAN BIATHOLON ASSOCIATION		905
BAW BAW SKI ASSOCIATION		908
BAYSIDE BUSHWALKING CLUB INC.		921
BIRD OBSERVERS CLUB OF AUSTRALIA	195	1078
BOROONDARA BUSHWALKERS INC.		313
CAEX BUSHWALKING CLUB		936
CAULFIELD RIFLE CLUB		1008
DANDENONG RANGES FOUR WHEEL DRIVE CLUB		866
DANDENONG VALLEY BUSH WALKING CLUB		881
DEER STALKERS CLUB		971
ELTHAM HORSE TRAILS ADVISORY SUB-COMMITTEE		L89
EMERALD BMX CLUB		L30
FEDERATION OF VICTORIAN WALKING CLUBS INC. (Mornington Penin. Walking Tracks Committee)		683
FEDERATION OF VICTORIAN WALKING CLUBS INC.	188	790

Appendix I(a) (continued)

Organisation	1st Sub number	2nd Sub number
GISBORNE BUSHWALKING CLUB INCORPORATED		408
KOOROONGOORA ROCKHOUNDS	L116	53
LEONGATHA RIFLE CLUB		114
LOCKSLEY BUSHWALKING CLUB		1093
MANSFIELD PISTOL CLUB		966
MAROONDAH BUSHWALKING CLUB	183	926
MELBOURNE BUSHWALKING CLUB INC.		121
MELBOURNE CRICKET CLUB (Shooting Section)		1074
MELBOURNE NORDIC SKI CLUB		794
MELBOURNE WALKING CLUB INC.		842
MELBOURNE WOMEN'S WALKING CLUB		443
MELTON BUSHWALKERS INC.		604
METROPOLITAN DISTRICT RIFLE ASSOC INC.		710
MT BULLFIGHT SKI CLUB		850
OUTDOOR ACTIVITIES GROUP	240	1019
PAJERO FOUR-WHEEL-DRIVE CLUB OF VICTORIA	L88	
PENINSULA BUSHWALKING CLUB		882
PENINSULA FOUR-WHEEL-DRIVE CLUB INC.		879
RANGE ROVER CLUB OF AUSTRALIA (Victorian Branch)		892
RECREATIONAL FISHERIES COUNCIL OF VICTORIA	L86	
RECREATIONAL PUBLIC LAND USER GROUPS INC.		929
ROYAL AUSTRALIAN ORNITHOLOGISTS UNION		625
SHOOTING SPORTS COUNCIL OF VICTORIA	L114	942
SKI TOURING ASSOCIATION OF VICTORIA		L39
SOUTH GIPPSLAND DISTRICT RIFLE CLUBS ASSOC		632
SOUTH GIPPSLAND FOUR-WHEEL-DRIVE CLUB INC.		671
SPORTING SHOOTERS ASSOCIATION OF AUSTRALIA (Victoria Branch)	L110	941
VICTORIA ASSOCIATION OF FOUR WHEEL DRIVE CLUBS	276	933
VICTORIA RIFLE ASSOCIATION INC.		373
VICTORIAN CANOE ASSOCIATION INC.		962
VICTORIAN FIELD AND GAME ASSOCIATION INC.		1004
VICTORIAN INTERNATIONAL RIFLE CLUB		532
WAVERLEY GEM CLUB OF VICTORIA INC.	L119	
WESTERNPORT FIELD AND GAME ASSOCIATION INC.		554
WONTHAGGI RIFLE CLUB		658
YARRA VALLEY FOUR-WHEEL-DRIVE CLUB INC.		497
Other interest groups		
ALP GREEN NETWORK	296	881
AUSTRALIAN LABOUR PARTY (Wonthaggi Branch)		L40
BOX HILL NORTH PRIMARY SCHOOL	269	
CADET UNIT TINGIRA	L8	
CUMBERLAND MEMORIAL SCENIC RESERVE (Committee of Management)		516
FREDK. LADNER PTY LTD	276	
FRENCH ISLAND COMMUNITY ASSOCIATION INC.		665
HEALESVILLE TOURIST PROMOTION ASSOCIATION		49
LAKE MOUNTAIN COMMITTEE OF MANAGEMENT		945
LAKE MOUNTAIN SKI PATROL		888
MIRBOO LOCAL ADVISORY COMMITTEE		969
NORTH RIDING COMMUNITY ACTION GROUP	294	
TONIMBUK LEASEHOLDERS ASSOCIATION		368
WARBURTON ADVANCEMENT LEAGUE INC.	L90	L19
WILD PUBLICATIONS PTY LTD		1031

Appendix 1(b): SUBMISSIONS FROM INDIVIDUALS

Name	Initials	1st Sub number	2nd Sub number
ABBEY	H.W.		603
ABBOTT	C.	1110	
ABRAMS	N.	20	
ADAMS	A.	759	
ADAMS	D.	782	
ADAMS	D.	785	
ADAMS	E.	885	
ADAMS	G.	786	
ADAMS	H.	745	
ADAMS	J.	765	
ADAMS	N.	760	
ADAMS	P.	746	
ADAMS	T.	965	
ADAMS	V.J.&H.M.	292	
ADAMSON	R.		982
AGIUS	L.		948
AGUIRRE	J.	794	
AIRS	K.& L.		887
AITKEN	S.		609
AITKIN	V		372
ALAPONT	F.		463
ALBERT	W.I.		655
ALBERT	W.M.		984
ALDOUS	D.	561	
ALDOUS	D.R.	1250	
ALEN	J.	483	
ALEXANDER	C.A.	1225	
ALEXANDER	J.		433
ALEXANDER	P.		160
ALGER	R.L.		122
ALLEN	A.L.	153	
ALLEN	G.B.		251
ALLEN	L.		662
ALLEN	P.		1109
ALLEN	R.		28
ALLEN	T.		1110
ALLSOP	G	L103	
ALLSOP	P.	10	
ALSTON	J.	1006	
AMIS	A.	241	
AMIS	A		660
ANDERSON	G.	982	
ANDERSON	P.	149	
ANDERSON	W		446
ANDRAWARTHA	M	307	
ANGLISS	M.		804
ANKADIUSZ	N.		314
ANSELL	R.		571
ANTON	S	450/L20	
ANTONIO	J.		1070
ANTROBUS	S.	597	
APPLEYARD	B.	434	
APPLEYARD	G.	308	
APPS	T.	567	
APPS	T.	L21	
AQUILINA	B.A.		233
ARCHIBALD	G.		253
ARCHIBALD	K.		75
ARCHIBALD	P.		954
ARMISTEAD	C.	585	
ARNOTT	F.	3	
ARNOTT	I.A.		708
ARTHUR	R.	1187	
ASHBY	M.	271	1007
ASHLIN	A.	633	
ASHLIN	P.	454	
ASHWORTH	D.W.&V.F.		L52
ASKEW	S.	478	
ASLING	G.	1013	
ASTON	D.G.	309	
ASTON	K.	485	
ATKINS	M.		288
ATKINSON	R.& J.	L108	
ATKINSON	T.	310	
ATWELL	K.A	88	
ATWELL	M.	427	
ATWELL	S.	428	
AULDIST	M.		1006
AUSTIN	V	411	
AVERY	F.	637	
BADALASSI	R.& V.		2069
BAIEKLT	R.	642	
BAILEY	A & R		533
BAILEY	A R.		1136
BAILEY	J.		960
BAILLIE	R.		45
BAIRD	J.		245
BAIRD & SWAN	B. & A.	25	
BAITZ	L.	L3	44
BAKER	I.		909
BAKER	J.	1039	
BALAMBE	G.	311	
BALASSO	G.		356
BALCOMBE	A.F.	409	
BALCOMBE	A J	628	
BALDWIN	M.	950	
BALFOUR	G		1145
BALFOUR	M.	398	
BALLANTINE	D	40	
BALLANTYNE	T.	913	
BANNON	Y.	914	
BANTICK	K.	107	
BARAKE	J.B.		599
BARAKE	J.M.		600
BARBARINO	A.	1072	
BARBER	D.	877	
BARBER	R.	838	
BARBOUR	S.	442	
BARKER	R.	413	
BARKER	S	710	
BARKER	S.	1128	
BARKER	W.		234
BARNES	T.		489
BARNETT	R.		1009
BARRET	G.	61	
BARRINGTON	S.		673
BARRY	G.		694
BARTLETT	P.	767	
BASSETT	T.R.		875
BASTIN	G.		626
BATEMAN	B.		393
BAUM	D.	819	
BAXTER	A.		315
BAXTER	E.		925
BAXTER	G.S.	689	
BAXTER	J.C.		1146
BAXTER	K.	193	
BEACH	C.	39	
BEACH	G.	41	
BEAM	P.		197
BEASLEY	I.	397/995	
BEASLEY	M.	891	
BEASLEY	R.	890	
BEAUGET	M.		147
BEAVIS	G.J.	L23	
BEAVIS	V.J.	L24	
BEBBINGTON	D.	108	
BECHAZ	C.	312	
BECKMAN	J.		1178
BECKMAN	J.		1179
BECKMAN	S.		1181
BECKMAN	T.		1180
BEDGGOOD	A.E.	645	
BEDGGOOD	B.	646	
BEDI	G.	1209	
BEEDELL	V.	1240	
BEER	B & K.	16	32
BELCHER	L.	653	
BELL	A	313	
BELL	D.	869	
BELL	J.	870	
BELL	R.L.	314	
BELL	T.	809	
BELLENGER	P.	1196	
BELLINGHAM	S.		155
BELLMAN	K.	862	
BELLMAN	R	872	
BELSKYS	D I		617
BENNETT	B.		396
BENNETT	C.	315	
BENNETT	C.		537
BENNETT	G.		539
BENNETT	J.	1054	
BENNETT	J.M		593
BENNETT	L.	851	
BENNETT	M.	L25	
BENNETT	M.	1129	
BENNETT	R G.	316	
BENNETT	S.	858	
BENTLEY	B.	631	
BENTON	M & L.		109
BEONARSKI	S.	497	
BERNARDO	S.		235
BERTUNA	R.		338
BERYL PHILLIPS	D.		657
BEZENCON	R.E.	1067	
BIBBY	A.M.		481
BIGGS	E.		641
BIGGS	G.R.	545	
BILL	R.		220
BILNEY	F.C.		441
BINGHAM	R		535
BIRTLES	C.		L56
BISHON	S.		895
BLACHIE	R.	317	
BLACK	M		98
BLACKARD	M.		340
BLACKER	D.		568
BLACKIE	G A	491	
BLACKIE	G.E.	488	
BLACKIE	K	490	
BLACKIE	L.	489	
BLACKMAN	K.J.	L5	
BLACKWELL	I		772
BLACKWOOD	D.	136	
BLACKWOOD	G	668	
BLACKWOOD	J.M	659	
BLACKWOOD	N.	657	
BLACKWOOD	P.	660	
BLAIK	J.H	635	
BLAKE	A	516	
BLAKE	L	L26	
BLAKE	R.		62
BLICK	G R.	1043	
BLOOM	B		1027
BLOOM	G	724	
BLOYE	T.	166	
BLUNDELL	M.W		135
BOAG	A		389
BOAG	C.		475
BOAG	J		467
BOAG	P.		468
BOAG (JNR)	P		391
BOAG (SNR)	P.		390
BOLTON	C	1247	
BONTICK	D.	89	
BONTICK	J.	90	
BONTICK	K	91	
BOON	S.	1175	
BORRMAN	K H.		998
BOTT	R		594
BOTTOMLEY	P L		123
BOULTER	R.	984	
BOURCHIER	W.	537	
BOURKE	J. & P.	318	
BOWEN	T	272	548
BOWMAN	F		67
BOULTON	D	1002	

Note: Not all submissions and letters received by Council are listed in this appendix. Those with no name or where the Council's acknowledgement of submission or mailed copy of proposed recommendations was returned by Australia Post, are not included.

Name	Initials	1st Sub number	2nd Sub number
BOWREY	D.		255
BOYCE	W.A		676
BOYNES	G.		256
BRADLEY	P.		1111
BRADWIN	F.		227
BRADY	M.	636	
BRASHER	B.	319	
BRAUSGROVE	B.	466	
BRAUSGROVE	W.	469	
BREADEN	A.		54
BREEN	J.		257
BREW	B.	696	
BRIDGES	J.	1131	
BRIDGES	S.	1097	
BRIGGS	N.		611
BRIGGS	R.	732	
BRISTOW	G.		457
BRITTON	L.	621	
BRITTON	R.	622	
BROADBENT	C.	661	
BROADBENT	T.	662	
BROCKWAY	Y.	755	
BRODIE	T.G.	778	
BROOK	R.		156
BROOKS	G.	L27	
BROOKS	S.	460	
BROUGHTON	K.		150
BROUGHTON	K.R.	1113	
BROWN	A.	1217	
BROWN	B.	564	
BROWN	D.		640
BROWN	G.	320	
BROWN	J.		663
BROWN	K.	321	
BROWN	Q.	795	
BROWN	R.	643	
BROWN	S.	322	
BROWN	S.	323	
BROWN	S.G.	161	
BROWN	V.L.		519
BROWNSCOMBE	H.	527	
BRYANT	G.R.		335
BUCK	S.M.		699
BUCKINGHAM	L.H.		1112
BUCKLEY	S.	1070	
BUCKNELL	G.A.		136
BUDD	M.	109	
BUETTNER	H.		74
BUETTNER	V.		129
BUFFONI	R.		236
BUIDEN	G.		206
BULLOCK	G. & I.	L98	
BURKE	P.		L6
BURKE			1170
BURLOCK	S.		758
BURRELL	G.		L62
BURTON	H.	445	
BURZESE	J.		1156
BUTCHER	S.	1194	

Name	Initials	1st Sub number	2nd Sub number
BUTLER	W.	1060	
BUTTRESS	M.		316
BUXTON	N.	647	
BYATT	M.	904	
BYRNE	R.		139
BYSOUTH	C.		94
BYSTERSKY	G.		1171
CADDY	B.	963	
CADDY	H.	547	
CADDY	N.	549	
CADDY	R.	551	
CADDY	V.	560	
CAINE	P.	227	636
CAIRNS	D.	616	
CAIRNS	L.	615	
CAIRNS	M.	617	
CALDWELL	G.		12
CALLEPY	T.		990
CALLINAN	B.		97
CAMBELL-SMITH	N.		675
CAMPBELL	G.	463	
CAMPBELL	I.	L28	
CAMPBELL	J.	295	
CAMPBELL	S.	324	
CANTWELL	K.	1000	
CARDILINI	M.	1089	
CARDILINI	R.	1090	
CAREY	B.		729
CARROLL	M.		76
CARROLL	T.		L37
CARRUTHERS	A.	975	
CARTER	L. & N.		174
CASE	R.	229	L18
CASEY	D.		30
CASEY	W.T.		230
CASHMORE	B.	256	
CATO	B.	1180	
CATOMORE	A.		169
CAULFIED	B.		904
CELAR	S.		429
CERINI	T.		202
CHADWICK	I.	325	
CHALLIS	T.		1090
CHALMERS	C.	813	
CHALMERS	G.	810	
CHALMERS	J.	811	
CHALMERS	J.	812	
CHAMINGS	P.F.		33
CHANDLER	R.		1113
CHAPPELL	B.	L96	9
CHARLTON	M.	1181	
CHARLWOOD	E.	949	
CHIPPINDELL	R.	42	
CHRISTIAN	F.	698	
CHRISTIAN	G.	926	
CHRISTIAN	L.	843	
CHRISTIAN	T.	181	
CHRISTODOULOU	G.,A.& V.		826
CHRISTODOULOU	N.		435

Name	Initials	1st Sub number	2nd Sub number
CHRISTOPHER	C.	807	
CHRISTOPHER	G.	977	
CHRYSTIE	G.S.	98	
CHRYSTIE	J.	97	
CHURCHYARD	A.	11	23
CHURCHYARD	J.& R.		522
CLARIDGE	G.		364
CLARK	G.	1094	
CLARKE	A.		654
CLARKE	A.& M.		981
CLARKE	S.J.	326	
CLAYTON	W.	881	
CLIFFORD	I.G.	419	
CLINCH	C.	967	
CLOSE	M.	1261	
CLOSTER	N.	938	
CLOSTER	R.	937	
COBB	G.		708
COBB	L.		721
COBB	P.	110	
COCKSHUTT	J.	752	
COCKSHUTT	R.	731	
CODE	E.	174	
COINCH	W.	758	
COLE	A.	1093	
COLE	B.	705	
COLE	B.	1177	
COLE	F.D.	699	
COLE	G.	1174	
COLE	H.	737	
COLE	J.	704	
COLE	J.	727	
COLE	L.	706	
COLE	L.	726	
COLEMAN	N.	463	
COLES	R.		1157
COLLER	G.	111	
COLLIE	W.		398
COLLIER	J.	887	
COLLINS	B.	L101	
COLLINS	D.& B.	328	
COLLINS	N.	969	
COLLINS	R.		517
COLLINSON	M.H.		602
COMRIE	R.	945	
CONNELL	M.	1191	
CONNELLY	K.	1019	
COOK	A.D.		566
COOK	K.	479	
COOK	K.	L30	
COOK	N.	L29	
COOK	R.		L5
COOPER	D.	855	
COOPER	G.		646
COOPER	G.A.	L113	
COOPER	R.		699
COPLEY	C.		1013
CORCORAN	S.T	257	
CORNWALL	B	536	

Name	Initials	1st Sub number	2nd Sub number
CORRIGAN	M.		66
COTO	T.		957
COTTER	M.		L61
COUPER	G,G,K&J.		777
COURTNEY	S.		972
COX	E.		501
COX	G.		317
COX	H.J.	663	
COX	I.& K.	891	
CRAIG	S.A.	230	L14
CRAIGIE	W.G.	187	
CRANAGE	L.O.		464
CRANE	A.		258
CRANE	H.	190	
CRAWFORD	D.G.	526	
CRAWFORD	H.	300	
CRAWSHAW	C.	960	
CRAWSHAW	J.		259
CRIPPS	B.		L46
CRIPPS	W.	L106	
CRITCHLEY	B.		152
CROFT	S.		950
CROFT	G.& E.	613	
CROPLEY	T.	492	
CROSBIE	J.	1046	
CROSBIE	P.	1053	
CRUTCHFIELD	R.W.	329	
CULETTO	M.		1189
CULICAN	C.	L31	
CULLING	D.	1023	
CULTON	B.	1057	
CULTON	D.	1126	
CULTON	J.	33	
CULTON	R.I	1056	
CUMBERLAND	L.	1092	
CUMBERLIDGE	R.B.	1172	
CUMING	R.		1025
CUNNINGHAM	D.		88
CUNNINGHAM	J.	850	
CUNNINGHAM	K.	595	
CUNNINGHAM	L.	568	
CUNNINGHAM	T.	675	
CURL	D.		570
CURRY	C.		572
CURTIS	V.		524
CUZENS	S.	112	840
CYGANOWSKI	P.		260
DALDY	S.	1262	
DALE	D.	L112	
DALLIMORE	D.		559
DALTON	G.	1204	
DANCKART	I.	1071	
DANIELS	B.	839	
DAPOS	D.		1048
DARBY	K.J.	452	
DARBY	R.	455	
DARMODY	J.		1147
DAVEY	W.		1154
DAVID	R.I.		660

Name	Initials	1st Sub number	2nd Sub number
DAVIES	G.	1236	
DAVIES	G.		59
DAVIS	A.E & K.M		997
DAVIS	K.		722
DAVIS	P.	460	
DAWSON	A.	1286	422
DAWSON	C.	67	
DAWSON	L.	1285	
DAWSON	M.J.		708
DEACON	K.		1102
DEAN	A.	1195	
DEAN	B.& W.	331	
DEAN	S.		L23
DEENEN	D.P.		595
DEENEN	H.W.		518
DEERING	J.F.		529
DEL FRATE	P.		271
DEMBY	J.	1136	
DEMBY	K.	1135	
DEMLOY	M.	927	
DEMPHER	S.G.	1260	
DEMPSEY	J.	565	
DENNEHY	L.	1171	
DENNEHY	M.	1102	
DENNEHY	R.	1170	
DENNEHY	S.	1104	
DENNIS	T.		630
DENNSHY	L.	1150	
DENT	R.	67	
DENTON	*P.*		*769*
DESCHEPPER	C.	606	
DESZCZ	A.P.		480
DESZCZ	R		31
DEUTSCH	J		346
DEUTSCH	V.J.		436
DEW	S.	159	
DICKENSON	E.	398	
DICKIE	T.F.&L.D.		29
DICKINSON	A	1036	
DICKINSON	L.	1029	
DICKS	G.	332	
DIGHT	B.	966	
DIN	*K*		*261*
DINOVITSER	A.		262
DOBINSON ET AL	S.C.		526
DOERY	E.		879
DOHON	J.		237
DOIG	G.J.		424
DOLAN	J.		264
DOLS	E.		801
DONAHOE	D	333	
DONATELLI	T.		L24
DONKIN	C.	L33	
DONNAN	J		265
DONOGHUE	S.J		613
DOUGLAS	A.&L.		L65
DOUGLAS	D.M.& R	212	
DOUGLAS	R	1079	
DOW	M.		542

Name	Initials	1st Sub number	2nd Sub number
DOWLING	D.		494
DOWLING	R.	563	
DOWN	S.	L93	
DOWTON	P.	493	
DOYLE	K.M.	31	
DRAIN	L.	1139	
DREW	D.		318
DREW	P.		439
DRUCE	B.J.		286
DRUMMOND	D.		849
DRUMMOND	M.		1094
DUBOUT	P.	134	
DUBOUT	P.		916
DUFF	C.	686	
DUFFIN	P.		821
DUFFY	B.J.		1057
DUGGLEBY	B.	209	
DUMPER	B.	334	
DUNBAR	R.P		1060
DUNCAN	G.J.	L89	219
DUNCAN	T.	1141	
DUNGEY	B.		356
DUNN	J.		688
DUNN	M.		685
DUNNE	J.	917	
DUNNE	J	952	
DUNNE	P.	742	
DUNSTON	B.	1068	
DUNSTON	J.	43	
DUNSTAN	*M.*	*44*	
DUNSTAN	M.	45	
DURAND	J	517	
DURHAM	G.A.		639
DURYEA	L.	590	
DUZEL	I.Y.		837
DWIGHT	D.		723
DWYER	M		350
DYE	I & L.		L55
DYKE	G.	335	
DYKE	K.		1053
EALEY	E H.M.		732
EAMES	I		951
EAVES	*D.M*	*960*	
EDDY	D.		1165
EDDY	J.	469	
EDDY	J.& E.	577	
EDWARDS	J.		878
EDWARDS	J.	700	
EDWARDS	J.	762	
EDWARDS	J.A.		400
EDWARDS	R	946	
EHRENBERG	I F.		544
EICHLER	J.	232	1033
EIGNER	R.	964	
ELAND	J.& K.		709
ELDER	*D*	*526*	
ELDER	G.	544	
ELKI	R.A.	955	
ELLIOTT	M.	L95	

Name	Initials	1st Sub number	2nd Sub number
ELLIS	C.T.		814
ELLUL	S.J.		587
ELNIN	R.	923	
ELNORE	P.		L21
ELTHAM	L.	196	
ENDACOTT	N.D.		976
ENGLEITNER	S.		581
EREMIN	I.		858
ERYFI	P.I.	715	
EVANS	J.M.		669
EVANS	M.		267
EVANS	S.	1212	
EVERY	K.R.		913
EWERT	G.	99	
EWERT	N.	100	
EXTON	G.	101	
EXTON	S.	102	
FAHROLDIN	M.A.	211	
FALKENBERG	L.	400	
FALKENBERG	R.	525	
FALKENBERG	R.P.	401	
FALLS	P.	586	
FALLS	S.	473	
FALSO	T.		268
FANKHAUSER	C.		95
FARR	A.		224
FARRELLY	S.	972	
FASHAM	I.& B	617	
FEHLBERG	D.	1017	
FEIL	*P.*	*1014*	
FENNESSY	M.A.		319
FENSHAM	P.	189	
FERGUSON	W.		705
FIEDEL	A.	548	
FIELD	C.		101
FIELDING	N.J.	399	
FINDLAY	M.J.	902	
FINGER	M.		977
FISCHER	J.	826	
FISKE	E.	46	
FISKE	J	47	
FISKE	N	48	
FISKE	*R.*	*49*	
FITZGIBBON	C	719	
FITZPATRICK	D		37
FITZPATRICK	J.	1161	
FITZPATRICK	K		1043
FLAHIVE	M.		983
FLEMING	P.		979
FLENTJE	L.M.		269
FLETCHER	A.	L121	
FLOROS	H.		471
FOEGER	J.		402
FOGARTY		L34	
FOLEY	A.L		623
FOOT	E.	446	
FOOTS	S.	L35	
FORBES	H.		182
FORCIER	G.A	1300	

Name	Initials	1st Sub number	2nd Sub number
FORD	A.		111
FORSTER	D.G		186
FOUN	M.		270
FOX	A.		638
FRANCIS	M.		418
FRANDSEN	B.	756	
FRANDSEN	B.	761	
FRANDSEN	R.	738	
FRANKISH	D.	939	
FRANKLIN	P.J.		438
FRANKSTON	P.	1088	
FRASER	D.B.&J.A.	34	
FRASER	I.A.	L36	
FRASER	L.	158	
FRASER	M.	421	
FRASER	P.		336
FREE	E.C.		320
FREEDMAN	C.		644
FREEDMAN	E.V.	1185	
FRENCH	C	829	
FRENCH	D.	827	
FRENCH	H.	764	
FRENCH	J.J.	1232	
FRENCH	K	828	
FRENCH	S	830	
FRESHWATER	V		528
FRITZ	K.		410
FROST	G.M		1071
FULFORD	L.	906	
FULFORD	*M*	*907*	
FULLER	C.	1189	
FULLER	D	959	
FULLER	E.J		272
FUME!	F.& L.		L51
FURBOROUGH	R.	1245	
FURROWS	W		462
FURST	P.	L122	
FURZE-MORRISH	L	882	
FUSSELL	R.	675	
FYVIE	J		273
GAETANO	L		238
GALE	A.H.	182	35
GALE	*K.H*		*416*
GALL	G	1065	
GALLIEUR	P.	1291	
GAMBLE	A	909	
GAMBLE	N	910	
GANGI	R.		1000
GANNON	M.	449	
GARCIA	M		354
GARDINER	A		633
GARDINER	C		696
GARDINER	P		695
GARDINER	T		553
GARLAND	K.& S		592
GARLICK	*R.*		*922*
GARRETT	D.		992
GASCOYNE	D.		118
GATES	A.	569	

Appendix 1(b) (continued)

Name	Initials	1st Sub number	2nd Sub number
GATES	L.	598	
GATES	P.	566	
GAY	T.		469
GENTLE	S.	131	
GEORGAS	H.		437
GEORGE	M.	50	
GERBES	A.	768	
GERUM	A.		274
GIBBONS	P.		275
GIBBS	N.J.G.		423
GIBSON	M.		733
GIBSON	R.	259	
GIGLIOTTI	J.		749
GILBERT	T.		677
GILES	H.P.H		160
GILES	K.J.		737
GILES	M.R.		850
GILES	R.L & C.L		791
GILES	T.	436	
GILHAM	R.	513	
GILLBEE	I.		79
GILLHAM	A.		18
GILLIGAN	T.		514
GILLSON	J.		394
GILMOUR	C.	L37	
GINN	M.J.	1267	
GLOVER	F.	539	
GOBOLJOS	J.		1114
GODELL	R.	714	
GODENZI	H.J.	523	
GODENZI	M.	894	
GODFREY	R.		1115
GOHEISS	T.	L51	
GOLDYN	S.		456
GOLIN	A.		116
GOMEZ	F.		993
GORDAM	C.	1169	
GORDAM	D.	1166	
GORDAM	L.	1146	
GORDAM	N.	1103	
GORDAM	N.	1142	
GORDON	N.	601	
GORDON	R.		41
GOSS	J.	596	
GOUGH	B.		L38
GOULD	G.K.		591
GOULD	R.		768
GOULD	W.	498	
GRAF	P.	199	L44
GRAF	T.	262	
GRAHAM	M.	51	
GRAHAM	R.	52	
GRAHAM	R.		204
GRAINGER	J.	92	
GRAINGER	P.	93	
GRAINGER	S.A.	94	
GRAK		1258	
GRATION	G.	720	
GRAVOLIN	M		952

Name	Initials	1st Sub number	2nd Sub number
GRAY	A.		100
GRAY	I.F.	437	
GRAY	T.		681
GRAYDEN	L.		811
GREALY	R.P.		1193
GREATOREX	R.	579	
GREEN	A.	754	
GREEN	A.J.	584	
GREEN	B.	709	
GREEN	B.	580	
GREEN	C.	901	
GREEN	F.	757	
GREEN	G.	758	
GREEN	L.	753	
GREGSON	R.	846	
GREIG	M.		22
GRETTON	C.		576
GRIFFITHS	J.		58
GRIGG	N.R		521
GROSS	D. & N.		223
GROUNDS	M.N.		50
GROVER	K.		956
GRUNDELL	M.		874
GRUNDY	G.		530
GULBIS	A.		196
GUNNERSEN	P.R.	275	
GUY	M.		360
GUY	C.W.		793
GUZZARDI	C.		64
GYMER	I.	1050	
GYMER	J.	1052	
HAGEN	J.	721	
HAGEN	M.	711	
HAGEN	M.J.	L92	
HAGEN	W.	713	
HAGGARD	G.	1124	
HAILE	B.		520
HAINES	G.		736
HAJDES	J.	743	
HALL	A.		822
HALL	D.C.	425	
HALL	M.	L109	
HALL	S.	990	
HALLAM	H.	515	
HALLAM	R.	514	
HAMMANN	G.		707
HAMPTON	I.		L34
HANCOCK	G.		453
HANLEN	J.		229
HANLEY	J.F.	681	117
HANLON	T.M.		278
HANNON	A.	831	
HANNON	J.	796	
HANRAHAN	C.	808	
HANSON	G.	718	
HANSON	G.	750	
HANSEN	K.	944	
HAPKE	U.		279
HARDY	M.		673

Name	Initials	1st Sub number	2nd Sub number
HARE	B.J.		276
HARE	D.		1116
HARKER	J.		730
HARLEY	D.	148	1039
HARLEY	K.		321
HARRIS	A.		108
HARRIS	A.W.	457	
HARRIS	G.	433	
HARRIS	J.	164	
HARRIS	M.		L66
HARRIS	N.J.	678	
HARRIS	R.	614	
HARRIS	R.	1193	
HARRIS	S.		277
HARRIS	T.A.		1137
HARRISON	G.	423	
HARRISON	I.		692
HARRISON	J.		608
HARRISON	M.& E.	136	73
HARRISON	R.		1026
HARROW	T.	113	
HASLER	H.J		975/L64
HASTHORPE	C.	1016	
HATCHELL-BROWN	J.	680	
HATTERSLEY	M.S.		141
HAU	W.C.& B.		359
HAWKEN	R.	482	489
HAWKINS	K.	441	
HAWKINS	N.	175	
HAWTHORNE	R.	53	
HAY	B.	833	
HAY	B.	1162	
HAY	B.	1164	
HAY	L.	1165	
HAY	M.		622
HAY	R.	1163	
HAYCRAFT	J.	54	
HAYMAN & YOUNG	P.& J.	L38	
HAYWOOD	D.		934
HAYWOOD	K.	114	
HAZELMAN	G.		1049
HEARN	C.W.	576	
HEATHCOTE	A.B.		164
HEATHCOTE	I.		766
HEATHER	G&M		776
HEBBARD	I.		964
HEBBLE	A.	426	
HEENAN	L.	418	
HEGGIE	V.		222
HELD	L.		1117
HELD	M.		1116
HEMPENSTALL	P.	L39	
HENDERSON	G.	987	
HENDY & WAITE			832
HENGSTEBERGER	I.C.		762
HENLEY	J.	L40	
HENRY	A.	666	
HENRY	P.	1063	
HERBERT	T.		849

Name	Initials	1st Sub number	2nd Sub number
HERDMAN	R		696
HERITAGE	R.F.	667	
HERON	J.		906
HERON	J.	475	
HERON	J.	503	
HERON	R.	456	
HERON	S.		171
HERON	W.		590
HERROD	P.		260
HESKETH	L.	277	1067
HEWITT	B.		846
HIAM	T.		414
HIBBERT	N.	439	
HIBBUT	D.	337	
HICKMAN	J.		3
HIGGINS	P.		6
HIGHAM	J.		L25
HILEY	M.		796
HILL	A.	693	
HILL	D.C.		4
HILL	G.		64
HILL	G.	707	
HILL	I.	931	
HILL	M.		415
HILL	M.	777	
HILL	N.	769	
HILL	R.		781
HILL	R.	592	
HILL	R.	593	
HILL	S.	1030	
HILL	T.		643
HILLIER	I.	890	
HINCHCLIFFE	D.	1138	
HINCHCLIFFE	J.F.	1082	
HINCHCLIFFE	R.	1081	
HINGSTON	L.		910
HINKLEY	S.		856
HINTON	J.		1081
HIPWELL	P.A.		1105
HIPWELL	W.A.		1119
HIRST	A.		802
HIRST	C		706/810
HOCKING	G.L.	448	
HOCKING	G.M.		803
HODGES	J.		897
HODGSON	B.	1095	
HODGSON	C.	1147	
HODGSON	G.	1114	
HODGSON	J.	1099	
HODGSON	J.	1111	
HODGSON	J.	1152	
HODGSON	P.	1105	
HODGSON	T.	1112	
HOGAN	K.F.		L31
HOLCROFT	R.		703
HOLGATE	K.		71
HOLLAND	R.A		1029
HOLLOWAY	B		199
HOLMES	M.R		583

Name	Initials	1st Sub number	2nd Sub number
HOOK		205	
HOPPNER	C.	1173	
HORAN	B.	L41	
HORAN	C.	L42	
HORAN	T.	L43	
HORN	T.		113
HORT	B.	1066	
HOSKIN	C.	115	
HOULT	A.	*840*	
HOULT	J.	841	
HOWARD	S.		870
HOWE	J.		120
HOWELL	B E.	L115	
HOWES	M.D.		189
HOWIE	D.	648	
HUDDLE	R.		797
HULETT	P		659
HUMMER	C.		130
HUMMER	C.		131
HUMMER	D		132
HUMPHREYS	T.& B.	55	
HUNT	B.	392	
HUNT	R.		353
HUNTER	B.	1107	
HUNTER	B. & S.		179
HUNTER	D.		1167
HUNTER	J.	1144	
HUNTER	J.R	160	
HUNTER	K.	1130	
HUNTER	L		1188
HUNTER	S.	1108	
HUNTER	S	1115	
HUNTER	T.	1096	
HURLE	P	554	
HURLEY	A.	447	
HUSSEY	D.		281
HUSTON	S.		750
HUTCHISON	S	1045	
ILGRIACOU	G.		380
IMPELLUSO	S		282
INGLEFINGER	L	1027	
INGLEFINGER	*R*	*1026*	
INGRAM	B.		119
INGRAM	M.		885
INGRAM	R M.		541
INIFER	L J	674	
IVORY	L.		283
IZZARO	P.		144
JABLONSKI	J.		378
JACENKO	R.		579
JACENKO	S		578
JACK	G	1098	
JACKSON & ALEXANDER	M.& H		830
JAEGER	D.		34
JAEGER	*M.*		*1155*
JAGGINS	M T	1188	
JAMES	G C.	974	
JAMES	K	1034	
JAMES	T.	1038	

Name	Initials	1st Sub number	2nd Sub number
JAMIESON	S.	116	
JANKOVIC	A.		284
JAPPIE	A.N.		1103
JAPPIE	B.C.		1121
JARMAN	T.		165
JEFFREY	D.	557	
JELINEK	A.	167	39
JENKIN	P.		474
JENKINS	*A.*		*1001*
JENKINS	G.G.		17
JENKINS	S.		753
JENNER	G		1004
JENNINGS	A.W.	339	
JENSEN	D.	654	
JENSEN	R.	655	
JESBIN	N.	925	
JESSUP	Z.		133
JEWELL	G.	921	
JOHNSON	H.R.		835
JOHNSON	P.		104
JOHNSON	P.	994	
JOHNSTON	J.	69	
JOHNSTON	N.	70	
JOHNSTONE	P.		1065
JOHNSTONE	P C.		845
JOLLY	G.		322
JONES	A.		349
JONES	B.	L44	
JONES	B.W.		285
JONES	D. & E.		286
JONES	G.	991	
JONES	G.	1055	
JONES	M.E	627	
JONES	P.	541	
JONES	P.		1945
JONES	R.		987
JONES	S		780
JONES	S H		1139
JONGEBLOED	M.	486	
JOVAS	I.		357
JUBB	J.		168
JUPP	*P.*		*412*
JURIC	R		440
KABOLLE	D.	943	
KAEHLER	J.W	900	
KALLISTA	T		898
KANICKY	G	847	
KANICKY	L	883	
KAPPLER	J.		686
KARAMBALIS	J	879	
KASTRATI	S		724
KATGERT	C.	56/1064	
KATGERT	D	57	
KATGERT	S	58	
KATGERT	*S*	59	
KAY	G		884
KEAN	R		834
KEE	A		1182
KEARNEY	K J.		432

Name	Initials	1st Sub number	2nd Sub number
KEE	D.		1164
KEE	K.	504	1163
KEE	M.		1185
KEEBLE	N.		1089
KEIPERT	J.		287
KELDERMAN	G.	1201	
KELLEN	J.	103	
KELLOW	J.	435	
KELLS	*J*	*560*	
KELLS	S.	566	
KELLY	B.		1166
KELLY	G.	1047	
KELLY	H.	35	
KELLY	H.& C.M.	145	
KELLY	K.F.	887	
KELLY	T.	673	
KEMLELL	J H.	634	
KEMP	B.H.		473
KENNEDAY	G.		1005
KENNEDY	M.	748	
KENNEDY	M.	L104	
KENWRIGHT	P.G.		L26
KERR	A.	L45	
KERR	G.J.		288
KERR	K.		551
KERR	M.		550
KERR	S.	1106	
KERR	S.		552
KEYS	J.		383
KILLEEN	S.	142	
KILLEEN	R.	650	
KINE-WILL	P. & J.	129	
KING	K.		239
KING	T.	117	
KINHMANN	H J.	385	
KIRCHIN	B.D		959
KIRLEY	A	867	
KIRLEY	A.	L47	
KIRLEY	B.	L48	
KIRLEY	J G.	820	
KIRLEY	K	L49	
KIRLEY	*M.*	*823*	
KIRLEY	P.	806	
KIRLEY	R.	822	
KIRLEY	T.	L50	
KIRLEY	V	821	
KIRLEY	W	L52	
KIRLEY	Z C	L53	
KLAT	P.		401
KLEINEKE	K		323
KLOOZER	D.		L18
KLYN	R		1120
KNAGGS	M.		508
KOGELMAN	G.		413
KONOUT	*V.*		*744*
KOMODROMOU	N.		370
KOMPA	J		596
KOOP	K P		924
KOSCHADE	T J		362

Name	Initials	1st Sub number	2nd Sub number
KOSNAR	G.	340	
KOUNIS	P.		352
KOVACS-JUDD	P.A.		103
KRAFT	C.	5	
KRAFT	J.	4	
KRANT	D.	775	
KREWSE	M.	118	
KRYGSMAN	M.	293	
KULUNDZIC	T.		1138
KUPPERS	P.	988	
KUSZNER	S.		386
LACH	M.S.		615
LAKELAND	J.		1085
LANDER	E R.		485
LANGFORD	G	1197	
LAPPEN	S.	1075	
LARAGY	C	8	
LARAGY	C.		11
LARKIN	C		994
LARKIN	J.		741
LAVERTY	P.	897	
LAVRYSSEN	S	1290	
LAW	K.P		763
LAW	T.	137	42
LAW	T.		L63
LAWSON	W		20
LAY	C.J.	553	
LAY	D		527
LAY	J H	290	511
LAY	S.J.	581	
LEARY	P	L128	
LEE	D.N	7	
LEED	G.	543	
LEEHANE	C	119	
LEEHANE	K	120	
LEEHANE	P	121	
LEEHANE	S	122	
LEES	A		556
LEES	N.		557
LEES	S		558
LEESON	G		464
LEESON	*G*	*123/594*	
LEESON	R		742
LEESON	V	124	
LEESON	W		L7
LEGG	A J		148
LEGG	D		157
LENDARO	G		240
LENG	M	254	
LENNANE	R	891	
LENZI	R		648
LEVITT	K		693
LEWIS	A	L54	
LEWIS	B	1080	
LEWIS	G.		371
LEWIS	G	487	
LEWIS	N		447
LEWIS	P.	989	
LICATA	J		740

Appendix 1 (b) (continued)

Name	Initials	1st Sub number	2nd Sub number
LIE	L.	600	
LINDENMAYER	D.		L9
LINDSEY	B.	216	L2
LINDSEY	B.		1104
LINDSEY	J.,J.& R.		852
LINEHAN	J.		128
LINEHAM	M.		115
LINEHAM	P.		407
LINES	D.C.		1096
LINES	S.	172	
LINES	*S.*		*80*
LITTLEJOHN	A.		917
LITTLEJOHN	D.	1025	838
LITTLEJOHN	J.M.		530
LITTMAN	P.A.		482
LLOYD	J.W.		704
LLOYD	R.	874	
LOCK	L.		887
LOFT	J.		185
LOFTUS HILLS	L.		58
LOMBARD	J.	1200	
LONG	B.	1134	
LONG	B.		743
LONG	*E.C.*		*1068*
LONG	J.	386	
LOOKER	B.		746
LOORHAM	M.		431
LORIMER	G.S.		820
LOUEY	E.	202	1056
LOVASS	N.A.		1149
LOVASS	N.D.		1145
LOVEDAY	J.M.	1059	
LOVERIDGE	R.	1223	
LOW	A.		*448*
LOW	M.		269
LOWNDES	R.L.		1083
LOWRY	*P.M.*		*198*
LOWRY	I.	892	
LUCER	B.		290
LUCKMAN	A.	207	
LUKE	J.	343	
LUMSDEN	S.		996
LUTMAN	S.A.	408	
LUWITH	H.		137
LYNCH	D.	1205	
LYNEL	N.	440	
MABIC	I.		*347*
MABIC	Z.		351
MACDONALD	C.		241
MACDONALD ET AL	*J.*	*L16*	
MACDONALD	W.		996
MACEWAN	M.		291
MACFARLANE	M.		L43
MACKAY	W.G.		1002
MACKINTOSH	C.	998	
MACKLIN	L.K.	349	
MACPHERSON	P.	970	
MADDEN	S.L.		L22
MADELEY	G & P	233	38

Name	Initials	1st Sub number	2nd Sub number
MAGDA	D.	1231	
MAHOMED	N.		738
MAHONEY	G.	886	
MALCOLM	J.	60	
MAMONTOV	B.		547
MANGEN	C.		L67
MANGION	A.		1140
MARGETTS	*F.*	*963*	
MARION	R.	1237	
MARNELL	C.E.	1229	
MARR	A.J.		446
MARSHALL	D.	825	
MARSHALL	D.	1202	
MARSHALL	J.	403	
MARSHALL	M.	477	
MARSHALL	M.	836	
MARSHALL	P.	763	
MARSHALL	P.J.	157	
MARSHALL	R.M.		670
MARSHALL	W.	771	
MARSHNER	*T.*		*112*
MARTIN	G.	982	
MARTIN	G.		859
MARTIN	J.	L58	
MARTIN	K.D.	223	970
MARTIN	N.	574	
MARTIN	P.	L59	
MARTIN	P.	L60	
MARTIN	T.	1182	
MARTIN	W.		711
MARTINI	G.	125	
MARTINO	C.	14	
MARTYN	J.	L125	
MASON	*G.*	*L61*	
MASON	M.	530	
MASON	P.	L62	
MASSINGTON	C.	L102	
MASTERS	A.	533	
MASTERS	B.	L63	
MASTERS	L.	532	
MATHEWS	C.	679	
MATHEWS	J.	664	
MATHEWS	P.W.	191	
MATHEWS	S.	677	
MATHIESON	P.	973	
MATTERS	J.	282	1028
MAUDE	*L.*	*350*	
MAXWELL	A.	146	
MAXWELL	B.	668	
MAXWELL	*M.L.*	*1255*	
MAY	L.		207
MAY	M.	261	
MAY	R.		725
MAY	S.		799
MAY	T.		1055
MAYALL	J.E.		720
MAYALL	P.		341
MCBAIN	D.		151
MCCAFFERTY	B	344	

Name	Initials	1st Sub number	2nd Sub number
MCCALLUM	R.	265	
MCCANN	R.		1122
MCCARTHY	R.	346	
MCCARTNEY			1173
MCCARTNEY	B.		*1172*
MCCONACHY	G.	701/637	
MCCONARCHY		1127	
MCCONVILLE	*P.*		387
MCCORMACK	K.J.		1123
MCCORMACK	L.D.	966	
MCCOTTER	A.		66
MCDIARMID	D.	470	
MCDIARMID	P.	432	
MCDONALD	C.	656	
MCDONALD	R.	570	
MCDONALD	R.A.	L55	
MCDONALD	S.	1288	
MCEWAN	*G.*		890
MCFADZEAN	E.	404	
MCFARLANE	R.	1244	
MCGARRY	P.	346	
MCGENNISKEN	D.	1012	
MCGILL	A.		1174
MCGILL	B.A.		823
MCGILL	C.		1176
MCGILL	J.		746
MCGILL	S.M.		1175
MCGUIRE	A.	799	
MCHARDY	P.J.		225
MCINNES	K.G.	236	940
MCINNES	*R.*	*508*	
MCKANE	B.		713
MCKECHNIE	M.		1124
MCKEE	L.	671	
MCKERRACHER	B.		212
MCKINLEY	P.		149
MCKINNELL	R.	618	
MCLEAN	I.		192
MCLEISH	L.	1128	
MCLEOD	D.	L123	
MCLEOD	K.	L56	
MCLEOD	K.& M.		923
MCMAHON	A.		43
MCMAHON	G.		773
MCMAHON	G.	347	
MCMAHON	J.		242
MCMAHON	*K.*		*68*
MCMAHON	R.	L57	
MCMAHON	S.	348	
MCMAHON	*S.*	*500*	
MCMANIS	T.J.		374
MCNABB	E.G.		575
MCNABB	J.W.	L107	27
MCNABB	S.	L99	
MCNAMARA	K.	1035	
MCNAMARA	P.J.		809
MCPHERSON	R.	*1153*	
MCQUISTON	K.		586
MCSINTY	S	L126	

Name	Initials	1st Sub number	2nd Sub number
MEASSIC	I.		85
MEDLEY	M.		988
MEER	G.	1003	
MELVILLE	D.	893	
MEMBREY	*D.*	512	
MENZ	P.	126	
METZGER	A		324
MEYERS	A.R.		355
MEYERS	C.	1091	
MIANI	W.		467
MICAH	J.	582	
MICAH	P.J.	518	
MICAH	R.	351	
MICAH	S.	583	
MICAH	*W H & M E*	*519*	*714*
MICARI	J.		562
MICHELMORE	F.J.		754
MIGLAS	*E. & S.*		99
MIKOLIC	I.		1073
MILDREN	A.	873	
MILDREN	E.B.	905	
MILDREN	M.	876	
MILES	J.	896	
MILES	L.	897	
MILKINS	A.J.		325
MILKINS	P.A.	L116	
MILLARD	R.		712
MILLER	*A.*		*625*
MILLER	A.		783
MILLER	C.J.F.		781
MILLER	*K.& V.*	*548*	
MILLER	M.		492
MILLER	P.J.		776
MILLINER	A.		292
MILLINER	B.J.		214
MILLS	B.		545
MILLS	G.	542	
MILNER	J.		108
MILNER	P.		845
MILS	K.L	540	
MILTON		*L64*	
MISSEN	T.D.		620
MITCHELL	A.	26	
MITCHELL	*B.*	747	
MITCHELL	C.		490
MITCHELL	G.A.		1086
MITCHELL	J.		36
MITRAKAS	T.		582
MITSIOS	P.		534
MOBNEY	D.	1149	
MOHANOS	J.		106
MOKHTAR	R.		221
MOLENBERG	M.	864	
MOLLISON	*M.*	*402*	
MOLONEY	D.	685	
MOLONEY	D.	1151	
MOLONEY	G.	1101	
MOLONEY	I.	683	
MOLONEY	J.P		419

Name	Initials	1st Sub number	2nd Sub number
MOLONEY	P.T.	884	
MOLONEY	T.	1100	
MOODY	C.	291	755
MOON	G.	807	
MOONEY	R.	712	
MOOR	K.	818	
MOORE	I.		574
MOORE	J.R.		461
MOORE	L.B.	645	
MOORE	M.J.	352	
MOORE & ROLLAND	E.& J.		893
MORAN	G.	32	
MORECHAL	A.		949
MORGAN	L.	104	
MORGAN	T.		177
MORGAN	T.		718
MORGAN	W.G.		1101
MORLEY	D.	1022	
MORRIS	I.		393
MORRIS	J.A.		361
MORRIS	N.G.	267	
MORRIS	N.W.	1207	
MORRIS	P.	239	1040
MORRISSEY	E.		504
MORRISSEY	J.		525
MORRISSEY	M.		503
MORRISSEY	S.		502
MORTER	C.	919	
MOSLEY	J.G.		974
MOULTON	G.	431	
MOULTON	M.	353	
MOULTON	P.	354	
MOULTON	P.S.	355	
MOWAK	A.		499
MULLER	B.	781	
MULLER	G.	957	
MUMFORD	H.	L65	
MURATORE	C	779	
MURATORE	J.	717	
MURATORE	K.	780	
MURATORE	P.	716	
MURGIA	G.	27	
MURMANE	B.S.	357	
MURPHY	M.& C.	505	
MURRAY	B.		107
MURRAY	D.J.		1169
MURRAY	H.	283	
MURRAY	H.		16
MURRAY	J.		326
MURRAY	N.R.		L58
MUSGROVE	L.	1084	
MYER	W.	814	
MYLIUS	C.R.		216
NADENBOUSCH	R.		1056
NAME ILLEGIBLE		1208	
NAME ILLEGIBLE		1214	
NAME ILLEGIBLE		1216	
NAME ILLEGIBLE		1219	
NAME ILLEGIBLE		1220	

Name	Initials	1st Sub number	2nd Sub number
NAME ILLEGIBLE		1221	
NAME ILLEGIBLE		1224	
NAME ILLEGIBLE		1227	
NAME ILLEGIBLE		1228	
NAME ILLEGIBLE		1233	
NAME ILLEGIBLE		1234	
NAME ILLEGIBLE		1235	
NAME ILLEGIBLE		1243	
NAME ILLEGIBLE		1246	
NAME ILLEGIBLE		1251	
NAME ILLEGIBLE		1253	
NAME ILLEGIBLE		1256	
NAME ILLEGIBLE		1258	
NAME ILLEGIBLE		1263	
NAME ILLEGIBLE		1264	
NAME ILLEGIBLE		1265	
NAME ILLEGIBLE		1270	
NAME ILLEGIBLE		1271	
NAME ILLEGIBLE		1274	
NAME ILLEGIBLE		1275	
NAME ILLEGIBLE		1276	
NAME ILLEGIBLE		1277	
NAME ILLEGIBLE		1278	
NAME ILLEGIBLE		1279	
NAME ILLEGIBLE		1283	
NAME ILLEGIBLE		1287	
NAME ILLEGIBLE		1289	
NAME ILLEGIBLE		1295	
NAME ILLEGIBLE		1296	
NAME ILLEGIBLE		1298	
NAME ILLEGIBLE		915	
NAME ILLEGIBLE			1135
NAME ILLEGIBLE			1143
NAME ILLEGIBLE			449
NAME UNKNOWN		228	
NAME UNKNOWN		393	
NAME UNKNOWN		620	
NAME UNKNOWN		1032	
NAME UNKNOWN		870	
NAME UNKNOWN		494	
NANUT	V.		190
NASH	P.		672
NAZIKIAN	H		215
NEEDHAM	K.		195
NEEDHAM	A.		1077
NEILSON	C.		430
NELSON	M.L.		294
NENN	J.	219	
NEW	S.		295
NEWELL	P.& I.	993	
NICHOLS	K.		201
NICHOLS	P.M.	872	
NICOLOULEAS	C.		728
NIGHTINGALE	M.	749	
NIKOLAJEN	P	649	
NORMAN	E.C.	358	
NORTON	P.	197	
NOTLEY	C.		739
NOVAK	D.		1106

Name	Initials	1st Sub number	2nd Sub number
NOVAK	P.		1107
O'BRIEN	J.		483
O'BRIEN	P.	1058	
O'CONNOR	J.	424	
O'CONNOR	N.		1080
O'NEILL	G.	L68	
O'NEILL	P.	L67	
O'NEILL	R		1126
O'NEILL	S.	933	
O'RYAN	K.	576	
O'SULLIVAN	J.	1120	
O'SULLIVAN	R.	1087	
OCHOA	J.		451
OFFICER	C.	169	
OGILVIE	D.		605
OGILVIE	H.G.	154	389
OLDHAM	B.D.	1206	
OLDHAM	B.L.	1199	
OLIVER	E.		911
OLLINGTON	B.		509
OLLINGTON	L		426
ONDRIK	S.		1125
ORANGE	T.		102
ORCHARD	S.	848	
ORCHARD	W.	638	
ORMEROD	M		612
ORR	N	884	
OSTIRGAARD	E.R.		536
OUDE-MEILINK	E		184
OWSIANKO	C.		327
PADGET	C.		642
PAGE	J.		217
PAGE	L.	484	
PAGE	N.W.		77
PAIGE	J.		296
PALMER	R	859	
PALMER	J.	860	
PARCE	S		748
PARISI	M.		851
PARISI	R.& P.		1153
PARKER	A.		420
PARKER	A.		1196
PARKER	J.	71	
PARKER	L	72	
PARKER	M	1272	
PARKES	K	632	
PARKINSON	J & K.	L106	
PARKINSON	M.	105	
PARKS	T		813
PARSONS & SCARLETT	R F & N H		L42
PASCOE	C.		L8
PASSARIN	J.		569
PATERSON	G.	736	
PATFORD	K.D.		243
PATTERSON	A.	739	
PATTERSON	S.	723	
PATTINSON	J.& L M	580	
PATTON	T.		968
PAYNE	P.		244

Name	Initials	1st Sub number	2nd Sub number
PEACHEY	J.	L70	
PEACOCK	K	935	
PEACOCK	P.	934	
PEAKE	G.	868	
PEARCE	D S.		167
PEARCE	G.	1011	
PEARCE	K.		334
PEARN	D.		172
PEARSON	B.	499	
PEARSON	B.		477
PEARSON	S.		382
PECK	J.	1076	
PECK	J.	1159	
PECK	L	1077	
PECK	R.	1167	
PECK	V.	1160	
PEDDLESDEN	H		1088
PEDERSON	H.		757
PEEMOELLER	E.		L27
PEIRCE	S	12	
PELZER	K		902
PEMBERFAI	J	1293	
PENNY	O.	213	
PENROSE	J.	940	
PEPPERELL	L.M		194
PERDRISAT	N.		769
PERGL	G		1097
PERRY	P W	238	
PETERS	D.	127	
PETERS	G	128	
PETERS	L.M		900
PETERSEN	G	285	967
PETERSON	J	930	
PHELAN	G.J.		628
PHILLIPS	B	1156	
PHILLIPS	D.B	133	
PHILLIPS	H	171	
PICKNELL	S	979	
PIERCE	G	868	
PIERSON	W		379
PIGRAM	G		690
PILGRIM	G.		880
PILLA	J.		1190
PILLA	L.		1191
PILLA	S.		1192
PITCHER	A E		1127
PITCHER	J	703/741	
PITTOCK	J		L45
PITTS	M		342
PITTS	S.		344
PLACE	J		734
PLATT	K	6	411
POCKLINGTON	A		818
POCOCK	D.		635
POLIZZI	A		245
POLLOCK	J.		63
POLOMATO	N		841
POLONIATO	L		629
POLYEN	Z.		555

Name	Initials	1st Sub number	2nd Sub number
POON	L.	629	
POPE	R.	22	
POPLAR	B.M.	1210	
PORTER	L.	1137	
PORTMAN	G.& L.	182	
POSTILL	J.	575	
POTTAGE	D.		1068
POTTER	G.		488
POTTER	L.M.	73	
POTTER	M.	74	
POTTER	S.W.	75	
POULTON	C.		1038
POWER	R.F.		801
POWES	P.		385
PRATT	G.	1024	
PRATT	I.R.		876
PRATT	J.& J.		560
PRATT	R.	571	
PRENDERGATH	K.		470
PRESTON	J.		427
PRESTON	M.	695	
PRICE	B.		653
PRICE	S.		397
PRICE	S.	9	298
PRIESTLY	D.	283	775
PRIOR	R.		805
PRITCHARD	G.& D.	359	
PRITCHARD	R.	1222	
PRITCHETT	L.	130	
PROVAN	A.	155	
PRYOR	D.F.		512
PRZESTASZEWSKI	T.	420	
PUMPA	J.	572	
PURDAM	M		752
PURVIS	J.		585
PURVIS	V.	210	
QUINLAN	E.	299	84
RADFORD	C.	625	
RADFORD	K.& P.	623	
RADFORD & DUNCAN	M.& D.	626	
RAJSKI	W.		479
RALPH	E.M.	360	
RALPH	P.J.O.		442
RALPH	R.	381	
RAMM	T.	462	
RANDALL	R.	729	
RAPPOLD	G.B.		894
RARMS	D.		328
RASTALL	C.	793	
RATCLIFFE	J.	76	
RATCLIFFE	J.	77	
RATCLIFFE	K.	78	
RATCLIFFE	S.	79	
RATHBONE	A.		406
RATTEN	B.	382	
RAWSON	D.	1001	
RAYMOND	O.	163	
RAYMOND	O.H.	405	
READ	D.J		14

Name	Initials	1st Sub number	2nd Sub number
READ	P.		299
READ	P.L.	95	
READWIN	V.J.		183
REDMAN-HEATH	D.		756
REED	M.	80	
REED	W.	81	
REES	L.		173
REES	T.H.		375
REEVES	S.	406	
REICHARDT	E.		598
REID	A.	861	
REID	A.		785
REID	C.	986	
REID	T.	363	
REILLY	J.M.	224	
REISS	F.E.		213
RENDELL	J.	790	
RENNICK	M.		143
RENNICK	S.	303	383
REXHEP	A.	603	
REYNOLDS	M.		760
RHODES	R.		209
RICARDO	J.	656	
RICH	M.		549
RICHARDS	A.	612	
RICHARDS	C.	1004	
RICHARDS	D.		159
RICHARDS	L.		1158
RICHARDSON	A.	260	843
RICHARDSON	S.	1218	
RICHARDSON	S.G.		903
RICKARD	L.	1196	
RIDDELL	V.D.		69
RIDGWAY	B.	287	
RIDGWAY	B.		145
RIORDAN	D.J.		1150
RITCHIE	R.	298	
ROBBEN	G.		691
ROBBINS	J.		989
ROBERTON	N.	788	
ROBERTS	P.	364	
ROBINSON	B.	805	
ROBINSON	B.	869/929	
ROBINSON	G.	936	
ROBINSON	G.& B.	912	
ROBINSON	H.		300
ROBINSON	J.	726	
ROBINSON	M.	365	
ROBINSON	M.A.		337
ROBINSON	T.	961	
RODIER	B.		855
ROGERS	B.		52
ROGERS	C.	1192	
ROGERS	D.	1118	
ROGERS	D.		376
ROGERS	F.M.		182
ROGERS	P.	1073	127
ROGERS	S.	1121	
ROGERS	W	1088	

Name	Initials	1st Sub number	2nd Sub number
ROGOWSKI	Y.		831
ROHDE	H.	L8	
ROLLANDIN	R.		770
ROMERO	F.		246
RONALD	W.		759
RONALDS	P.	367	
ROSE	G.		907
ROSS	S.D.		569
ROTE	N.& L.	200	
ROWDEN	J.	985	
ROWE	G.	941	
ROWE	T.	728	
ROWLER	S.	1294	
ROWLEY	H.		747
ROY	P.		205
ROY	S.		301
RUDGE	C.	485	
RUNDALL	R.	956	
RUS	J.		1128
RUSSELL	C.		247
RUSSELL	R.	476	
RUTHBERG	C.	644	
RUUCEVICH	L.	911	
RUUCEVICH	M.	908	
RYAN	B.		231
RYAN	T.		167
SAAMANTHA & ERRALS		L100	
SABADA	M.		L13
SADLER	G.		191
SAGEBREACHL	J.	932	
SALKELD	A.		947
SALKIN	P.		154
SANDERS	R.J.	407	
SARKOZI	F.		329
SASADEUSZ	C.		226
SAUNDERS	B.	619	
SAUNDERS	D.	1048	
SAUNDERS	J.	1049	
SAVAGE	R.	429	
SAWERS	A.J.	669	
SCAMMELL	V.	903	
SCANTLEBURY	D.		585
SCHAETZEL	G.		616
SCHELLEN	W.	461	
SCHELTEN	H.	368	
SCHINNER	P.		403
SCHMIDT	E.	803	
SCHMOLLING	M.	1069	
SCHOLZ	L.J.		1159
SCHOLZ	M.E.		1160
SCHOLZ	T.A.		1161
SCHOLZ	T.J.		1162
SCHWAB	K.	173	
SCICLUNA	C.G		249
SCOTT	A.		90
SCOTT	A.		175
SCOTT	K.		47
SCOTT	M.		546
SCOTT	O.	289	

Name	Initials	1st Sub number	2nd Sub number
SCOTT	P.		507
SCOTT	R.		472
SCOTT	W.	369	
SEITANIDIS	P.		392
SEM	R.	708	
SHADDOCK	G.A.	18	
SHANNON	S.	471	
SHARP	A.R.		1082
SHARP	J.		L3
SHARP	L.		1083
SHAVE	E.		563
SHAW	N.	206	
SHEAHAN	J.		774
SHEPHERD	F.		302
SHEPHERD	R.		1054
SHERLOCK	J.V.		L41
SHERRITT	M.A.		960
SHIEL	M.		564
SHIELDS	M.		303
SHURETY	J.		1129
SIDDLE	P.	502	
SIEBERT	R.		456
SIERINS	S.		496
SIGHT	V.A.	464	
SIGNOROITO	T.		465
SIGNOROTTO	B.		381
SILVERI	L.& D.	L4	L167
SILVESTER	B.	538	
SILVESTER	D.	L71	
SILVESTER	D.	L73	
SILVESTER	G.	615	
SILVESTER	J.	135	
SILVESTER	R.	531	
SILVESTER	R.	L72	
SILVESTER	S.	472	
SIMMONDS	F.		476
SIMMONS	M.N.		991
SIMMS	B.		930
SIMPSON	P.		48
SIMS	F.	82	
SINCLAIR	L.B.		661
SIRRUT	G.		946
SISSON	J.	L74	
SKEELS	C.	466	
SKINNER	D.	999	
SKINNER	J.& D.		901
SLEE	K.J.	2	7
SLOAN ET AL	S.E.	184	
SLOCOMBE	S.	1183	
SLOMAN	B.		218
SMITH	A.		1163
SMITH	C.G	177	920
SMITH	C.P		906
SMITH	D.		1095
SMITH	D.R.&S.A.	370	
SMITH	G.		1016
SMITH	H.E.	196	89
SMITH	J.	587	
SMITH	K.		1188

Name	Initials	1st Sub number	2nd Sub number
SMITH	K.L.		1108
SMITH	L.		999
SMITH	L.C.	507	
SMITH	M.	410	2
SMITH	M.		1130
SMITH	M.		80
SMITH	N.		142
SMITH	R.	1010	
SMITH	R.		1164
SMITH	R.		248
SMITH	S.	997	
SMITH	T.		339
SNEDDON	J.	895	
SNELLGROVE	T.		919
SNIDER	P.		824
SNODGRASS	G.	722	
SNODGRASS	J	734	
SNYDERS	R		170
SOKOL	G		1050
SOMMERVILLE	K.		8
SOUTH	J	899	
SPARK	D.		584
SPARK	P.		671
SPEECHLEY	R.		15
SPENCE	B.	201	
SPENCE	M		912
SPICER	G.C.		178
SPONG	D.	857	
SPRINGALL	F.& R.		L33
STAATS	A.		914
STAFFORD	A.	96	
STAFFORD ET AL	M	251	
STALLARD	M.	676	
STANLAKE	S.		304
STEEL	S.		387
STEG	K	871	
STEPHEN	R.M.	170	417
STEPHENS	M B.	L9	
STEPHENS	A.	824	
STEPHENSON	A.		13
STEVENS	A B		163
STEVENS	A M	616	
STEVENS	B	651	
STEVENS	J.		450
STEVENSON	D	288	
STEVENSON	D A	371	
STEVENSON	D F		938
STEVENSON	J		763
STEVENSON	J.D	372	
STEVENSON	K.	373	
STEVENSON	M.G.	374	
STEVENSON	M.G.		853
STEVENSON	S.L	375	
STEVENSON	T M	376	
STEWART	B.		305
STEWART	G	377	
STEWART	J.R.	1211	
STILBORN	R.A.	168	19
STILLWELL	E.	L75	

Name	Initials	1st Sub number	2nd Sub number
STODDART	D.	378	
STOLL	J	509	
STOLL	J D.	510	
STOLL	K	306	
STOLL	T.	658	
STORIE	S	379	543
STORIE	S.	380	
STRICKLAND	G.		1075
STUART	P.		306
STUART	S.	1021	
STUCHLY	P.	789	
STUTCHBERY	M		684
SUMNER	J.		973
SUND	M.	1062	
SUNDERLAND	S.	602	
SUTHERLAND	A.		702
SUTHERLAND	K.		110
SUTTON	M		486
SVENSSON	J.		70
SWALE	A G.	415	
SWALES	G.		228
SWAN	A M.	215	827
SWIFT	L		L53
SYKES	G	1009	
SYKES	J.		1092
SZEPOS	M	898	
SZKIRKA	M		L4
SZUBA	D.		377
SZUBA	J		506
TACON	J.		817
TASKIS	H.		498
TAYLOR	G		425
TAYLOR	J.	243	
TAYLOR	K E		181
TAYLOR	P.		491
TAYLOR	R		937
TAYLOR	V.		1177
TEMPLE	J.	L76	
TEMPLETON	P & T	624	
TESTA	S S	522	
TEUMA	C.		65
THALLER	R		388
THE HOUSEHOLDER		1031	
THE HOUSEHOLDER		1037	
THE HOUSEHOLDER		1122	
THE HOUSEHOLDER		1157	
THE HOUSEHOLDER		1215	
THE HOUSEHOLDER		206	
THE HOUSEHOLDER		391	
THE HOUSEHOLDER		394	
THE HOUSEHOLDER		416	
THE HOUSEHOLDER		630	
THE HOUSEHOLDER		692	
THE HOUSEHOLDER		791	
THE HOUSEHOLDER		800	
THE HOUSEHOLDER		948	
THE HOUSEHOLDER			1151
THE HOUSEHOLDER			211
THE HOUSEHOLDER			348

Name	Initials	1st Sub number	2nd Sub number
THE HOUSEHOLDER			421
THE HOUSEHOLDER(1)			564
THE HOUSEHOLDER			565
THE HOUSEHOLDER(2)			567
THE HOUSEHOLDER			784
THIES	A.W.		40
THIRNING	T.		333
THOMAS	R.		1131
THOMAS	R.M.		78
THOMAS	W.	414	
THOMPSON	J.L		786
THOMPSON	J.R		1037
THOMPSON	M.D.		896
THOMPSON	R.	381	
THOMPSON	R.G		782/857
THOMPSON	T.		787
THOMSON	B.J		1055
THOMSON	J	978	
THOMSON	R	1190	
THORN	I.	774	
THORNE	J.M		345
THORNTON	J.	854	
THORNTON	P.	853	
TIRANT	L		395
TJEPKEMA	P	866	
TOIVONEW	G.		93
TOIVONEW	P.		428
TOMKINS	G W	496	
TONETTI	O		330
TONKIN	R	L77	
TONKIN	B.H.	L127	915
TOOHEY	D J		792
TORMEY	L	1158	
TOSKAS	K		727
TOWERS	C & E.		889
TOWNSEND	C	L2	
TOWNSEND	C.		816
TOWNSEND	S.E		882
TRAILL	B	255	
TRAYNOR	S	1184	
TRELOAR	D	1119	
TRELOAR	R.	1085	
TREWHELLA	L.J		852
TREWIN	G	535	
TREWIN	P	534	
TRINHAM	M		1061
TRUCCOLO	P.		478
TRUMAN	G.		L54
TRUSCOTT	I.		848
TSAOUSSI	J		91
TSAVASILIS	S		1132
TUCKER	D W		455
TUCKER	M		614
TUNSTALL	G	835	
TURNER	H L		250
TURNER	M		331
TURNER	M		L28
TURNER	R M		81
TURPIN	M		689

Name	Initials	1st Sub number	2nd Sub number
TURTON-LANE	E J	481	
TWITE	A.	1155	
TWITE	I	1154	
TYERS	B M		307
TYLER	K.	L91	
TYMINSKI	L.R		166
TYRRELL	R.	954	
TZIKAS	G.		444
UREN	C.	1074	
VAGUE	M.		176
VAN BAALEN	A.	495	
VAN BAALEN	C	436	
VAN DE VEN	M	15	
VAN DEN DOLDER	A J	417	
VAN DEN DOLDER	W	552	
VAN DER BURGT	M.	852	
VAN DIJLE	S L		283
VAN DYKE	S		332
VAN GEMERT	J		854
VAN PRAET	J.		297
VANDER BURGT	D	611	
VANNI	O	28	
VANNI	S.	29	
VANNI	W.	30	
VARIOUS (30 employees Marbut Gunnersen Pty Ltd			1012
VELLA	G.	976	
VENEMAN	W	383	
VENNIX	L	384	
VENUTO	G.	958	
VERHAEGH	J		647
VICKERS	A	609	
VICKERS	R	608	
VIGGERS	K.		L11
VIOS	J.	1132	
VIRGIN	D G		536
VIVIAN	E.	573	
VIVIAN	E A	1257	
VOGEL	J.	1179	
VORNNELL	J	474	
WADE	R	996	
WADE	S	682	
WAGNER	R		72
WAIN	G. & S	106	
WAIN	R	639	
WAIXEL	G	1166	
WALKER	A J	1117	
WALKER	J	1238	
WALKER	J.		764
WALKER	J.C.		731
WALKER	P	L78	
WALKER	R.		726
WALLACE	M		674
WALLACE	T F		927
WALLBRIDGE	J.	863	
WALLING	R	L111	
WALTERS	B		1099
WALTERS	D L		308
WALTERS	K		55

Appendix 1(b) (continued)

Name	Initials	1st Sub number	2nd Sub number
WARBURTON	S.		580
WARD	D.	947	
WARD	J.S.		395
WAREHAM	A.	559	
WARHURST	G.P.	L80	
WARING	P.		309
WARREN	P.J.	1140	
WASHFOLD	K.	665	
WAT	G.		1133
WATERS	S.D.		92
WATKINS	G.	1020	
WATSON	C.	1116	
WATSON	R.J.W.	422	
WATTS	J.M.		98
WATTS	M.	942	
WAYMAN	J.		51
WEALANDS	D.R.		126
WEAVER	H.	804	
WEBB	A.	194	
WEBB	D.	865	
WEBBER	R.	951	
WEBSTER	A.J.	366	
WEBSTER	R.		434
WEEKS	S.	784	
WEEKS	M.	783	
WELLS	C.		203
WELLS	G.		125
WELLS	M.		310
WELSH	H.		L36
WENDT	D.		531
WENDT	P.		619
WENTWORTH	S.	178	
WESCOTT	G.C.		1068
WESLEY	C.V		406
WESLEY	J.		408
WEST	G.		L47
WEST	J.		61
WEST	J.F.	83	
WEST	K.A.	84	
WESTBURY	D.	832	
WESTBURY	K.	834	
WESTERN	J.		L12
WESTON	G.		836
WEZLOK			1144
WHARRIE	B.		513
WHEELER	D.		158
WHITE	C.		87
WHITE	G.	971	
WHITE	K.	1015	
WHITE	K.E.		1134
WHITE	W.		153
WHITEMAN	P.H.	143	
WHITMORE	B.	387	
WHITTY	A.& M.	1175	
WICKINS	B.	981	
WIEGEL	K.	1242	
WIGG	K.	338	
WIGG	R.	388	
WIGHT	C.		771
WILLIAMS	A.	156	
WILLIAMS	B.		82
WILLIAMS	D.	37	
WILLIAMS	E.T.	1006	621
WILLIAMS	G.	85	
WILLIAMS	N.		36
WILLIAMS	R.		193
WILLIAMS	S.	86	
WILLIAMS	S.	792	
WILLIAMS	W.	38	
WILLIAMSON	A.	L82	
WILLIAMSON	A.S.	610	
WILLIAMSON	G.	L81	
WILLIAMSON	R.	604	
WILLIS	A.		953
WILLIS	M.C.		869
WILLOUGHBY	G.	21	
WILSMORE	C.A.	844	
WILSON	A.		534
WILSON	C.		210
WILSON	D.J.		767
WILSON	E.	444	
WILSON	J.		828
WILSON	J.L.		1142
WILSON	L.	139	
WILSON	M.D.		1141
WILSON	T.	918	
WINNING	D.		800
WINTER	S.	876	
WIRRICK	M.& J.	L117	
WITHERS	A.		540
WITNISH	C.	740	
WITTEVEEN	H.C.		134
WOELTJES	R.	992	
WOJEINSKI	L.	132	
WOOD	A.E.		697
WOOD	C.	L83	
WOOD	D.	L84	
WOOD	R.		206
WOODBURN	C.M.		200
WOODHOUSE	G.	555	
WOODHOUSE	G.	1259	
WOODS	E.	924	
WOODS	W.G.		1052
WOODWARD	S.	390	
WOOLLARD	P.B.	849	
WOOLLETT	J.M.		985
WOOLMORE	W.		606
WOON	K.		493
WOOTON	B.		312
WOOTTON	R.M.		311
WORRELL	A.F.		1186
WORRELL	L.A.		1187
WORTHINGTON	P.	599	
WOZNIAK	J.	652	
WRIGHT	K.		515
WRIGHT	D.		751
WYKES	E.A.	214	
WYND	G	735	
YATES	K.	1005	
YUGOVIC ET AL	J.		1010
YOUNG	C.	589	
YOUNG	D.B.		561
YOUNG	G.& F.		L20
YOUNG	G.E.F.		399
YOUNG	J.	586	
YOUNG	M.		872
YOUNG	P.		719
YUILLE	D.	L85	
YULE	E.M.		146
ZACHER	C.	605	
ZAUNER	L.		563
ZIELINSKI	E.		384
ZOMER	R.		L50
ZOMER	S.		L49
ZWIERLEIN	E.		735

Appendix II

COUNCIL'S PROPOSALS FOR PUBLIC LAND NOW INCLUDED IN CITIES

Council's intentions are that these areas be used in accordance with the general recommendations for the appropriate category, subject to any additional comments below. Refer also to the published proposed recommendations.

RURAL CITY OF SEYMOUR

C. NATURE CONSERVATION RESERVES

Horseshoe Lagoon (40 ha) (existing reserve)

Notes: 1. A camping area in the south-east corner of this reserve should be excised.
2. A land exchange which would consolidate wetlands on the north side of the reserve should be investigated.

Hughes Creek (110 ha) (existing reserve)

Hughes Creek frontage addition to Hughes Creek (40 ha)

A representative example of river red gum floodplain riparian woodland located in an area where many other similar stands have been cleared or severely disturbed. This is an addition to the existing Hughes Creek reserve, which represents grassy dry and herb-rich foothill forests.

Tallarook (1.7 ha)

In this area, the Tallarook 'wildflower sanctuary', 121 native species have been recorded. This site retains a good example of red stringybark/red box grassy dry forest with a diverse and intact understorey.

Mill Creek (25 ha)

A representative example of riparian forest that extends downstream from the Tallarook State forest to Pulpit Rock. The significance of this site derives from the clearing or severe disturbance of similar vegetation communities in the area.

D. WATER PRODUCTION

Goulburn River diversion (Mid-Goulburn Regional Water Board)
Falls Creek Reservoir (Mid-Goulburn Regional Water Board)

E. STATE FOREST

Tallarook State forest

Values to be protected:
. Population of eastern grey kangaroos in Tallarook forest.
. Landscape values of the forested escarpments as viewed from the Hume and Goulburn Valley Highways.

F. HISTORIC AND CULTURAL FEATURES RESERVE

Seymour Court House (0.2 ha)

G. NATURAL FEATURES RESERVES

Public land water frontage reserves - various

- **Goulburn River** (various values - see main report)
- **Hughes Creek**
  Note: There are needs to improve water quality and to aim at increasing responsible camping behaviour.
- **Dabyminga Creek**
- **Stewarts Creek**
- **Boundary Creek**
- **Woolshed Creek**

Stream-side areas

T. Seymour	CA 6B Sec L	1 ha
P. Tarcombe	Wicket Hill Road	18.5 ha
P Traawool	East of Falls Creek Reservoir	1.86 ha

Natural and scenic features

P. Traawool	CA 40B Pulpit Rock	3.3 ha

Bushland areas

P. Avenel	CA 8A,8B Sec 18A	3.64 ha
P. Avenel	CA 14A Sec 18A	3.68 ha
T. Tallarook	CA 10 Sec 9	25.00 ha
T. Tallarook	South Part CA 7B Sec 10	3.54 ha
T. Tallarook	CA 2 Sec 1	0.20 ha
T. Tallarook	CA 1,1A,2 Sec 10	0.13 ha
P. Tallarook	CA 89 C Sec 1	2.51 ha
T. Seymour	CA 6A Sec L	1.84 ha
P. Mangalore	CA 22A Sec B	13.17 ha
P. Tarcombe	CA 2E Sec 3	5.90 ha
P. Tarcombe	CA 45A Sec 1	0.30 ha
P. Tarcombe	CA 43B Sec 1	11.79 ha
P. Tarcombe	CL West of CA 24 Sec 1	15.00 ha

J. COMMUNITY USE AREAS

Recreation Areas

T. Tallarook	North Part CA 7B Sec 10	8.30 ha
P. Tallarook	CA 14B,16A Sec 1	75.00 ha
T. Seymour	CA 1B,1D, Sec U	9.89 ha

Parklands and gardens

T. Seymour	CA 28D Sec W	1.04 ha
T. Seymour	CA 5,6,7,8 Sec V	13.42 ha

Buildings in public use

T. Tallarook	CA 3,4,5,6 Sec 2	0.90 ha
T. Seymour	Part CA 12 Sec C	0.52 ha

M. SERVICES AND UTILITIES

Transport

Historic values to be protected:

- North Eastern Railway at Seymour - historic metal girder bridge over the Goulburn River dating from 1872.
- Seymour Railway Station buildings - assessed as very important architecturally.

Communications, survey and navigation

P. Traawool	CA 3E Trig point	2.01 ha

Hospitals and public offices

T. Seymour	CA 1A Sec C	0.16 ha
T. Seymour	Part CA 12 Sec C	0.20 ha
T. Seymour	CA 1B Sec C	0.28 ha

Water and sewerage

P. Traawool	Adj CA 7F	1.25

Cemeteries

T. Tallarook	CA 47E Sec C	4.10 ha
P. Tallarook	CA 53A	4.01 ha

Other

P. Tallarook	CA 52B, 52C	1.00 ha

N. UNCATEGORISED PUBLIC LAND

P. Ghin Ghin	CA 1A	7.28 ha
P. Mangalore	CA 16K	0.50 ha
P. Seymour	CA 2 Sec W	5.68 ha
T. Meringo	CA 4—9 Sec 1	1.10 ha
T. Meringo	CA 2—5 Sec 2	1.18 ha
T. Meringo	CL West of Sec 1, 2, 5 and CA 66B	10.00 ha
P. Tarcombe	CA 2D SEC 3	0.50 ha
P. Worrough	CA 19E	2.00 ha

Revegetation areas

P. Tallarook	CA 78F Sec 1	22.21 ha

O. LAND NOT REQUIRED FOR PUBLIC PURPOSES

P. Avenel	CA 10A Sec 18A	3.09 ha
P. Avenel	CA 32B Sec 18A	2.26 ha
T. Seymour	CA 48A	0.08 ha
T. Seymour	CA 48C	0.04 ha
T. Seymour	CA 10A Sec W	0.04 ha
P. Tarcombe	CA 26 Sec 2	2.01 ha
P. Tarcombe	CA 50C Sec 1	0.50 ha

C. NATURE CONSERVATION RESERVES

Langwarrin (214 ha). CA 51C, Parish of Langwarrin

Examples of coastal grassy forest and sand heathland. Sites that were previously disturbed (about 20% of the area) have largely regenerated and the area is considered to be of State botanical significance.

The area's importance for fauna is enhanced by the remnant areas of sand heathland. Both the vulnerable swift parrot and the endangered New Holland mouse have been recorded here.

This reserve was owned by the Commonwealth at the time of Council's 1977 recommendations. It was acquired by the State government and reserved as a flora and fauna reserve.

The reserve was used for military encampments in the late 1880s. Some construction works were undertaken, mainly in the west, during World War I, but the majority was removed in 1921. The area has subsequently been little used other than for occasional bivouacs and army reserve training.

The site retains a number of artefacts from the period of military occupation, including evidence of the military camp, a water reservoir, and rifle-range butts and target pits which give the area State historical significance.

Langwarrin

C(vii) That artefacts of historic significance be protected, subject to the removal of environmental hazards.

Notes
1. This reserve excludes the small-bore rifle range - set aside as a Community Use Area
2. The mature non-indigenous trees associated with the old military camp are an integral part of the area's historical context but are a seed source of environmental weeds that compromise the nature conservation values.
3. A recovery plan for the swift parrot is in preparation.

North Western Port

CAs 1A, 5A, 5B, 6C, 10B, 10C, 10D, 10E and 11E, Parish of Koo-Wee-Rup; CAs 95K, 101C, 111A, No Sec, Parish of Sherwood; CAs 2B and 2C, No Sec and CA 4A Sec D, Parish of Yallock; CA 100 Parish of Langwarrin.

These parts of this recommended Nature Conservation Reserve are in Cranbourne - see recommendation C40.

North Western Port

C(vii) the reserve boundaries be defined and stock excluded from the reserve

(viii) no more levee banks be permitted on public land and the manager liaise with adjacent landholders with respect to the management of existing levee banks

Lang Lang

Part of the recommended Lang Lang nature conservation reserve - CA 77K Parish of Lang Lang - is in the City of Cranbourne - see recommendation C41.

D. WATER PRODUCTION

Bunyip River diversion - Koo-Wee-Rup (Melbourne Water)

G. NATURAL FEATURES RESERVES

Public land water frontage reserves

- **Cardinia Creek** (various)
- **Lang Lang River** (various)
- **Yallock Creek** (various)

Bushland areas

P. Lang Lang	CA 78J	11.01 ha
P. Lang Lang	CA 44B, 44C	2.02 ha
P. Lang Lang	CA 78K	23.03 ha
P. Langwarrin	CA 32A	2.02 ha
T. Warneet	CA 33 34 Sec A	2.46 ha
T. Warneet	Part CA 53 Sec	1.40 ha
P. Yallock	CA 10N,10Q No Sec	13.90
Note: Use as the Bayles Fauna Park may continue		
P. Yannathan	CA 60 D	10.12

H. COASTS

Coastal reserves - Cannons Creek, Warneet, Blind Bight, Tooradin, south of Lang Lang River

J. COMMUNITY USE AREAS

Recreation areas

Cranbourne Racecourse

T. Cranbourne	CA 21H No Sec	44.72 ha

Cranbourne Training Centre

P. Cranbourne	CA 17A	94.59 ha
T. Cranbourne	CA 21E No Sec	0.62 ha
T. Cranbourne	CA 21F, 21G No Sec	28.07 ha
P. Koo-Wee-Rup	CA 47, 49B	11.45 ha
P. Langwarrin	CA 1A SEC B	17.31 ha
P. Lang Lang	CA 13C	0.15 ha

Lang Lang recreation area and rifle range

P. Lang Lang	CA 78F, 78H, 78L	20.94 ha

Langwarrin small-bore rifle club

P. Langwarrin	CA 51B	0.84 ha
T. Warneet	CA 56, 57 Sec J	9.13 ha
P. Yallock	CA 171	8.84 ha

Parklands and gardens

T. Cranbourne	CA 21C NO SEC	0.89 ha
P. Yallock	CA 10M NO SEC	0.50 ha

Cranbourne Botanic Gardens (334 ha)

This area south of Cranbourne was selected as the site for an extensive native flora gardens, managed in conjunction with the Royal Botanic Gardens. It contains a 200-ha 'bushland sanctuary' of remnant vegetation, with extensive, representative and relatively undisturbed examples of *Eucalyptus radiata* coastal grassy forest, *Leptospermum myrsinoides/E. pryoriana* sand heathland, *Melaleuca squarrosa/Gahnia sieberana* wet heathland and *Leptospermum juniperinum* swamp sedgeland.

Other zones in the annex are: an arboretum of about 100 ha, being established on former farmland along the southern boundary; a landscaped 30-ha botanic garden of native but not indigenous species, being established on an area mined for sand in the north-west; and 10 ha with a research area of selected native (but not indigenous) species (such as Australian *Proteaceae*) on a sand-mined area adjacent to the arboretum. The vegetated sections contain some 84 species considered as 'rare' in the Melbourne or Western Port areas. Three wetlands in the north were recently assessed as significant. The endangered New Holland mouse may still be present here, and the painted honeyeater and grey goshawk have been recorded.

One possible route of a proposed four-lane Cranbourne bypass road is a short distance north of the unmade Ballarto Road reserve, which is inside the northern boundary of the Gardens. The proposed route would lie partly within the area being developed as the Australian Native Garden, and would cross an important wetland. Construction of the road would necessitate re-design of part of the Australian Native Garden and require the removal of natural *Eucalyptus pryoriana* woodland and the road's proximity would necessarily reduce the amenity of this garden. The wetland has been assessed as being of State significance for both flora conservation and wildlife habitat. The road would require a 40-m causeway or bridge, significantly modifying a section of wetland. The potential effect of road construction on sub-surface flow, the primary source of water for the wetlands, is also of concern.

Given these potential impacts, the Council considers that the Cranbourne bypass road proposal should be the subject of an environment effects statement, so that the ultimate decision on the proposal may be taken in the light of full information on the effects.

Cranbourne Botanic Gardens

J That the Cranbourne Botanic Gardens be used in accordance with the general recommendations for Community Use Areas outlined above

and to

(iv) conserve and protect the indigenous plant and animal communities in the bushland sanctuary area

(v) protect the Gardens' scientific and educational values

(vi) provide for nature observation and appreciation, and passive recreation, as determined by the managers

and that they continue to be managed by the Royal Botanic Gardens Board.

Note:
The proposed Cranbourne bypass route along Ballarto Road through the Gardens should be the subject of an environment effects statement.

Buildings in public use

P. Cranbourne	CA 71E	1.62 ha
T. Cranbourne	Part CA4 Sec 4	0.42 ha
T. Cranbourne	CA 11, 12 Sec 2	1.01 ha
T. Cranbourne	CA 11B No Sec	0.40 ha
P. Yallock	CA 10R No Sec	0.28 ha

M. SERVICES AND UTILITIES

Transport

Nature conservation values to be protected:

- South Gippsland Railway between Clyde and Tooradin - *Themeda* communities and the rare daisy *Helichrysum* sp. aff. *acuminatum*
- The plains grassy woodland and wetland vegetation communities of the heavy soil plains, particularly adjacent to the South Gippsland Railway between Dandenong and Cranbourne, are also of note.

Electricity and gas

P. Eumemmerring	Part CA32	12.50 ha
P. Langwarrin	Part CA59	20.83 ha
P. Lyndhurst	Part CA5 and 6	50.50 ha
P. Lyndhurst	SW Part of CA44	40.00 ha

Municipal

T. Cranbourne	CA 32 No Sec	1.50 ha

Hospitals and public offices

T. Cranbourne	CA 11, 11C No Sec	0.44 ha
P. Yallock	CA 3F No Sec	

Water and Sewerage

P. Koo-Wee-Rup	CA 13 Sec K1	5.76 ha

Drains, including Bunyip Main Drain, lower sections of Cardinia Creek, Toomuc Creek and Lang Lang River.

Cemeteries

T. Cranbourne	CA 19B No Sec	4.05 ha
P. Lang Lang	CA 78E	6.07 ha

Other

T. Cranbourne	CA 11A No Sec	0.19 ha
T. Warneet	PT CA 53 Sec B	
T. Warneet	CA 1 Sec K	3.27 ha
P. Yallock	CA 10P No Sec	0.10 ha

N. UNCATEGORISED PUBLIC LAND

P. Cranbourne	CA 61A	5.27 ha
P. Cranbourne	Adj CA 72 B	0.19 ha

P. Koo-Wee-Rup East	CA 1A-1G Sec V	8.37 ha
Note: This former recreation reserve may have community uses or could be considered for revegetation.		
P. Koo-Wee-Rup East	CA 6A 15C Sec V	1.22 ha
P. Koo-Wee-Rup	CA 31A No Sec	0.81 ha
P. Koo-Wee-Rup	CA 9A Sec J	2.05 ha
P. Koo-Wee-Rup	CA 1A Sec 1	3.07 ha
P. Koo-Wee-Rup	CA 14A Sec T	0.10 ha
P. Koo-Wee-Rup	CA 30A Sec J	0.20 ha
P. Yallock	CA 3E No Sec	0.02 ha
P. Yallock	CA 3H No Sec	0.25 ha
P. Yallock	CA 123 A	0.20 ha
P. Yannathan	CA 60E	4.05 ha

O. LAND NOT REQUIRED FOR PUBLIC PURPOSES

P. Koo-Wee-Rup	CA 3 Sec K1	0.51 ha

Appendix III

ECOLOGICAL VEGETATION CLASSES AND FLORISTIC VEGETATION COMMUNITIES

ECOLOGICAL VEGETATION CLASS	FLORISTIC VEGETATION COMMUNITY	CHARACTERISTIC SPECIES (trees and shrubs)		CHARACTERISTIC SPECIES (ferns, herbs, grasses, sedges)	
		Botanical Name	Common Name	Botanical Name	Common Name
	Treeless Alpine Vegetation				
Dry Sub-alpine Shrubland	Dry Sub-alpine Shrubland	*Pultenaea muelleri* *Olearia phlogopappa* *Orites lancifolia* *Helichrysum secundiflorum*	Mueller's Bush-pea Dusty Daisy-bush Alpine Orites Cascade Everlasting	*Asperula gunnii* *Carex breviculmis* *Celmisia asteliifolia* *Danthonia nudiflora* *Oreomyrrhis eriopoda*	Mountain Woodruff Short-stem Sedge Silver Daisy Alpine Wallaby-grass Australian Carraway
Damp Sub-alpine Heathland	Damp Sub-alpine Heathland	*Asterolasia trymalioides* *Epacris petrophila* *Grevillea australis* *Helichrysum hookeri* *Orites lancifolia*	Alpine Star-bush Snow Heath Alpine Grevillea Scaly Everlasting Alpine Orites	*Empodisma minus* *Asperula gunnii* *Poa hiemata* *Podolepis robusta*	Spreading Rope-rush Mountain Woodruff Soft Tussock-grass Alpine Podolepis
Wet Sub-alpine Heathland	Wet Sub-alpine Heathland	*Richea continentis* *Epacris paludosa* *Baeckea gunniana* *Epacris breviflora* *Olearia algida*	Candle Richea Swamp Heath Alpine Baeckea Drumstick Heath Mountain Daisy-bush	*Astelia alpina* *Sphagnum* spp. *Gentianella diamensis* *Empodisma minus* *Nertera granadensis*	Alpine Astelia Sphagnum Mountain Gentian Spreading Rope-rush Matted Nertera
Sub-alpine Woodland	Sub-alpine Woodland	*Eucalyptus pauciflora* *Pultenaea muelleri* *Oxylobium alpestre* *Tasmannia xerophila* *Trochocarpa clarkei*	Snow Gum Mueller's Bush-pea Alpine Oxylobium Alpine Pepper Lilac Berry	*Stylidium graminifolium* *Oreomyrrhis eriopoda* *Gonocarpus montanus* *Viola hederacea* *Asperula gunnii*	Grass Trigger-plant Australian Carraway Mat Raspwort Ivy-leaf Violet Mountain Woodruff
Montane Dry Woodland	Montane Dry Woodland	*Eucalyptus dives* *Eucalyptus rubida* *Eucalyptus radiata* *Cassinia aculeata* *Olearia erubescens* *Daviesia ulicifolia*	Broad-leaf Peppermint Candlebark Narrow-leaf Peppermint Common Cassinia Moth Daisy-bush Gorse Bitter-pea	*Pteridium esculentum* *Dianella tasmanica* *Poa sieberiana* *Stellaria pungens* *Lomandra longifolia* *Tetratheca ciliata*	Austral Bracken Tasman Flax-lily Grey Tussock-grass Prickly Starwort Spiny-headed Mat-lily Pink-bells
	Montane Forests				
Montane Damp Forest	Montane Damp Forest	*Eucalyptus delegatensis* *Eucalyptus cypellocarpa* *Eucalyptus radiata* *Coprosma hirtella* *Daviesia mimosoides* *Polyscias sambucifolia*	Alpine Ash Mountain Grey gum Narrow-leaf Peppermint Rough Coprosma Blunt-lear Bitter-pea Elderberry Panax	*Acaena novae-zelandiae* *Poa ensiformis* *Leptinella filicula* *Parahebe derwentiana* *Lagenifera stipitata* *Viola hederacea*	Bidgee-widgee Sword Tussock-grass Mountain Cotula Derwent Speedwell Common Lagenifera Ivy-leaf Violet

Appendix III (continued)

ECOLOGICAL VEGETATION CLASS	FLORISTIC VEGETATION COMMUNITY	CHARACTERISTIC SPECIES (trees and shrubs)		CHARACTERISTIC SPECIES (ferns, herbs, grasses, sedges)	
		Botanical Name	Common Name	Botanical Name	Common Name
Montane Wet Forest	Montane Wet Forest	*Eucalyptus nitens*	Shining Gum	*Dicksonia antarctica*	Soft Tree-Fern
		Eucalyptus delegatensis	Alpine Ash	*Blechnum wattsil*	Hard Water-fern
		Acacia Frigescens	Forest Wattle	*Histiopteris incisa*	Bat's-wing Fern
		Oleria phlogopappa	Dusty Daisy-bush	*Polystichum proliferum*	Mother Shield-fern
		Nothofagus cunninghamii	Myrtle Beech		
Montane Riparian Thicket	Montane Riparian Thicket	*Leptospermum grandifolium*	Mountain Tea-tree	*Blechnum penna-marina*	Alpine Water-fern
		Nothofagus cunninghamii	Myrtle Beech	*Carex appressa*	Tall Sedge
		Wittsteinia vacciniacea	Baw Baw Berry	*Libertia pulchella*	Pretty Grass-flag
				Blechnum wattsii	Hard Water-fern
				Hydrocotyle hirta	Hairy Pennywort
Cool Temperate Rainforest	Cool Temperate Rainforest	*Nothofagus cunninghamii*	Myrtle Beech	*Dicksonia antarctica*	Soft Tree-fern
		Atherosperma moschatum	Southern Sassafras	*Blechnum wattsii*	Hard Water-fern
				Polystichum proliferum	Mother Shield -form
				Grammitis billardieri	Common Finger-fern
				Hymenophyllum spp.	Filmy Ferns
Wet Forest	Wet Sclerophyll Forest	*Eucalyptus regnans*	Mountain Ash	*Dicksonia antarctica*	Soft Tree-fern
		Acacia dealbata	Silver Wattle	*Cyathea australis*	Rough Tree-fern
		Bedfordia arborescens	Blanket-leaf	*Australina pusilla*	Shade Nettle
		Olearia argophylla	Musk Daisy-bush	*Clematis aristata*	Mountain Clematis
		Pomaderris aspera	Hazel Pomaderris	*Polystichum proliferum*	Mother Shield-fern
		Lomatia fraseri	Tree Lomatia	*Asplenium bulbiferum*	Mother Spleenwort
Damp Forest	Damp Sclerophyll Forest	***Eucalyptus cypellocarpa***	**Mountain Grey Gum**	***Culcita dubia***	Common Ground-fern
		Eucalyptus obliqua	Messmate	*Viola hederacea*	Ivy-leaf Violet
		Pomaderris aspera	Hazel Pomaderris	*Cyathea australis*	Rough Tree-fern
		Coprosma quadrifida	Prickly Coprosma	*Clematis aristata*	Mountain Clematis
		Pimelea axiflora	Bootlace Bush	*Geranium potentilloides*	Cinquefoil
		Acacia verticillata	Prickly Moses	*Lepidosperma elatius*	Tall Sword-sedge
	Riparian Vegetation				
Riparian Thicket	Riparian Thicket	*Leptospermum lanigerum*	Woolly Tea-tree	*Blechnum nudum*	Fishbone Water-fern
		Melaleuca squarrosa	Scented Paperbark	*Dicksonia antarctica*	Soft Tree-fern
				Gahnia sieberiana	Red-fruit Saw-sedge
				Carex spp.	Sedges
				Sticherus lobatus	Spreading Fan-fern
Riparian Forest	Riparian Forest	*Eucalyptus viminalis*	Manna Gum	*Blechnum nudum*	Fishbone Water-fern
		Acacia melanoxylon	Blackwood	*Carex appressa*	Tall Sedge
		Prostanthera lasianthos	Victorian Christmas-bush	*Isolepis inundata*	Swamp Club-sedge
		Acacia dealbata	Silver Wattle	*Polystichum proliferum*	Mother Shield-fern
		Pomaderris aspera	Hazel Pomaderris	*Rubus parvifolius*	Small-leaf Bramble
		Coprosma quadrifida	Prickly Coprosma	*Dicksonia antarctica*	Soft Tree-fern

Appendix III (continued)

ECOLOGICAL VEGETATION CLASS	FLORISTIC VEGETATION COMMUNITY	CHARACTERISTIC SPECIES (trees and shrubs)		CHARACTERISTIC SPECIES (ferns, herbs, grasses, sedges)	
		Botanical Name	Common Name	Botanical Name	Common Name
Riparian Forest	Swampy Riparian Forest	*Eucalyptus ovata*	Swamp Gum	*Gahnia sieberiana*	Red-fruit Saw-sedge
		Acacia melanoxylon	Blackwood	*Gratiola peruviana*	Brooklime
		Pomaderris aspera	Hazel Pomaderris	*Blechnum minus*	Soft Water-fern
		Melaleuca squarrosa	Scented Paperbark	*Phragmites australis*	Common Reed
		Leptospermum lanigerum	Woolly Tea-tree	*Lepidosperma elatius*	Tall Sword-sedge
				Dicksonia antarctica	Soft Tree-fern
	Foothill Forests				
Herb-rich Foothill Forest	Herb-rich Foothill Forest	*Eucalyptus radiata*	Narrow-leaf Peppermint	*Microlaena stipoides*	Weeping Grass
		Acacia dealbata	Silver Wattle	*Pteridium esculentum*	Austral Bracken
		Cassinia aculeata	Common Cassinia	*Asperula scoparia*	Prickly Woodruff
		Eucalyptus globulus ssp. *bicostata*	Eurabbie	*Gonocarpus tetragynus*	Common Raspwort
		Eucalyptus viminalis	Manna Gum	*Cymbonotus preissianus*	Austral Bear's-ears
		Eucalyptus rubida	Candlebark	*Viola hederacea*	Ivy-leaf Violet
Shrubby Foothill Forest	Shrubby Foothill Forest	*Eucalyptus obliqua*	Messmate	*Pteridium esculentum*	Austral Bracken
		Eucalyptus radiata	Narrow-leaf Peppermint	*Tetrarrhena juncea*	Forest Wire-grass
		Acacia mucronata	Narrow-leaf Wattle	*Viola hederacea*	Ivy-leaf Violet
		Pultenaea juniperina	Prickly Bush-pea	*Gonocarpus tetragynus*	Common Raspwort
		Eucalyptus sieberi	Silver-top	*Lomandra longifolia*	Spiny-headed Mat-rush
		Goodenia ovata	Hop Goodenia	*Platylobium formosum*	Handsome Flat-pea
Heathy Foothill Forest	Heathy Foothill Forest	*Eucalyptus consideniana*	Yertchuk	*Gahnia radula*	Thatch Saw-sedge
		Eucalyptus sieberi	Silver-top	*Tetrarrhena juncea*	Forest Wire-grass
		Leptospermum continentale	Prickly Tea-tree	*Xanthorrhoea minor*	Small Grass-tree
		Hakea sericea	Bushy Hakea	*Dampiera stricta*	Blue Dampiera
		Pultenaea gunnii	Golden Bush-pea	*Goodenia lanata*	Trailing Goodenia
		Amperea xiphoclada	Broom Spurge	*Pteridium esculentum*	Austral Bracken
Valley Forest	Valley Forest	*Eucalyptus melliodora*	Yellow Box	*Microlaena stipoides*	Weeping Grass
		Eucalyptus macrorhyncha	Red Stringybark	*Dichondra repens*	Kidney-weed
		Eucalyptus polyanthemos	Red Box	*Adiantum aethiopicum*	Common Maidenhair
		Eucalyptus goniocalyx	Long-leaf Box	*Poa morrisii*	Soft Tussock-grass
		Eucalyptus radiata	Narrow-leaf Peppermint	*Gonocarpus tetragynus*	Common Raspwort
		Exocarpos cupressiformis	Cherry Ballart	*Acaena novae-zelandiae*	Bidgee-widgee
Heathy Dry Forest	Heathy Dry Forest	*Eucalyptus dives*	Broad-leaf Peppermint	*Xanthorrhoea* spp.	Grass-trees
		Eucalyptus cephalocarpa	Mealy Stringybark	*Dianella revoluta*	Black-anther Flax-lily
		Epacris impressa	Common Heath	*Lomandra filiformis*	Wattle Mat-lily
		Monotoca scoparia	Prickly Broom-heath	*Stylidium graminifolium*	Grass Trigger-plant
		Brachyloma daphnoides	Daphne Heath	*Chionochloa pallida*	Silvertop Wallaby-grass
		Daviesia leptophylla	Narrow-leaf Bitter-pea	*Hovea linearis*	Common Hovea

Appendix III (continued)

ECOLOGICAL VEGETATION CLASS	FLORISTIC VEGETATION COMMUNITY	CHARACTERISTIC SPECIES (trees and shrubs)		CHARACTERISTIC SPECIES (ferns, herbs, grasses, sedges)	
		Botanical Name	Common Name	Botanical Name	Common Name
Grassy Dry Forest	Dry Sclerophyll Forest	*Eucalyptus macrorhyncha*	Red Stringybark	*Poa sieberiana*	Grey Tussock-grass
		Eucalyptus goniocalyx	Long-leaf Box	*Hydrocotyle laxiflora*	Stinking Pennywort
		Eucalyptus polyanthemos	Red Box	*Cheilanthes austrotenuifolia*	Green Rock Fern
		Acacia dealbata	Silver Wattle	*Senecio quadridentatus*	Cotton Fireweed
		Cassinia aculeata	Common Cassinia	*Danthonia pilosa*	Velvet Wallaby-grass
		Hibbertia obtusifolia	Grey Guinea-flower	*Gonocarpus tetragynus*	Common Raspwort
Rocky Outcrop Shrubland		Seven Acre Rock and Ben Cairn			
		Eucalyptus cypellocarpa	Mountain Grey Gum		
		Eucalyptus sieberi	Silver-top		
		Callistemon pallidus	Lemon Bottlebrush		
		Eriostemon myoporoides	Long-leaf Wax-flower		
		Cathedral Range			
		Prostanthera rotundifolia	Round-leaf Mint-brush		
		Eriostemon verrucosus	Fairy Wax-flower		
		Callistemon pallidus	Lemon Bottlebrush		
		Strath Creek Falls			
		Acacia mearnsii	Black Wattle		
		Helichrysum semipapposum	Clustered Everlasting		
		Themeda triandra	Kangaroo Grass		
	Plains Vegetation				
Box Woodland	Box Woodland	*Eucalyptus microcarpa*	Grey Box	*Danthonia* spp.	Wallaby-grasses
		Acacia paradoxa	Hedge Wattle	*Stipa* spp.	Spear-grasses
Plains Grassy Woodland	Plains Grassy Woodland	*Eucalyptus camaldulensis*	River Red Gum	*Themeda triandra*	Kangaroo Grass
		Acacia implexa	Lightwood	*Danthonia* spp.	Wallaby-grass
		Acacia mearnsii	Black Wattle	*Microlaena stipoides*	Weeping Grass
		Acacia paradoxa	Hedge Wattle		
		Acacia pycnantha	Golden Wattle		
Plains Grassland				*Themeda triandra*	Kangaroo Grass
				Convolvulus erubescens	Pink Bindweed
				Schoenus apogon	Common Bob-sedge
				Calocephalus citreus	Lemon Beauty-heads
				Acaena echinata	Sheep's Burr
				Danthonia caespitosa	Common Wallaby-grass
Floodplain Riparian Woodland	Floodplain Riparian Woodland	*Eucalyptus camaldulensis*	River Red Gum	*Poa labillardieri*	Common Tussock-grass
		Acacia dealbata	Silver Wattle	*Isolepis* spp.	Club-sedges
		Hymenanthera dentata	Tree Violet	*Juncus* spp.	Rushes
		Callistemon sieberi	River Bottlebrush	*Phragmites australis*	Common Reed
		Leptospermum obavatum	River Tea-tree	*Triglochin procera*	Water-ribbons

Appendix III (continued)

ECOLOGICAL VEGETATION CLASS	FLORISTIC VEGETATION COMMUNITY	CHARACTERISTIC SPECIES (trees and shrubs)		CHARACTERISTIC SPECIES (ferns, herbs, grasses, sedges)	
		Botanical Name	Common Name	Botanical Name	Common Name
Grassy Wetland				*Amphibromus nervosus*	Veined Swamp Wallaby-grass
				Danthonia duttoniania	Brown-back Wallaby-grass
				Eleocharis acuta	Common Spike-sedge
				Eleocharis pusilla	Small Spike-sedge
				Poa labillardieri	Common Tussock-grass
				Glyceria australis	Australian Sweet-grass
Wetland Complex				Deep, permanent billabong	
				Lemna spp.	Duckweed
				Azollo spp.	Azolla
				Eleocharis sphacelata	Tall Spike-sedge
				Myriophyllum spp.	Milfoils
				Triglochin procera	Water-ribbons
				Typha orientalis	Cumbungi
				Phragmites australis	Common Reed
				Juncuss spp.	Rushes
				Shallow, seasonal billabong	
				Eleocharis acuta	Common Spike-sedge
				Persicaria decipiens	Slender Knot-weed
				Alternanthera denticulata	Lesser Joy-weed
				Agrostis avenacea	Common Blown-grass
				Centipeda spp.	Sneezeweeds
				Floodplain wet flat	
				Phragmites australis	Common Reed
				Bolboschoenus medianus	Marsh Club-sedge
				Carex fascicularis	Tassel Sedge
				Calystegia sepium	Large Bindweed
				Poa labillardieri	Common Tussock-grass
	Heathland Vegetation				
Heathy Woodland	Heathy Woodland	*Eucalyptus obliqua*	Messmate	*Stipa muelleri*	Wiry Spear-grass
		Eucalyptus radiata	Narrow-leaf Peppermint	*Themeda triandra*	Kangaroo Grass
		Eucalyptus cephalocarpa	Mealy Stringybark	*Deyeuxia quadriseta*	Reed Bent-grass
		Hakea spp.	Hakeas	*Gahnia radula*	Thatch Saw-sedge
		Banksia spinulosa	Hairpin Banksia	*Gonocarpus tetragynus*	Common Raspwort
		Leptospermum continentale	Prickly Tea-tree	*Poa australis* spp. agg.	Tussock-grass
Wet Heathland	Wet Heathland	*Eucalyptus cephalocarpa*	Mealy Stringybark	*Empodisma minus*	Spreading Rope-rush
		Leptospermum continentale	Prickly Tea-tree	*Baumea tetragona*	Square Twig-sedge
		Melaleuca squarrosa	Scented Paperbark	*Tetraria capillaris*	Hair-sedge
		Hakea nodosa	Yellow Hakea	*Selaginella uliginosa*	Swamp Selaginella
		Sprengelia incarnata	Pink Swamp-heath	*Gleichenia dicarpa*	Pouched Coral-fern

Appendix III (continued)

ECOLOGICAL VEGETATION CLASS	FLORISTIC VEGETATION COMMUNITY	CHARACTERISTIC SPECIES (trees and shrubs)		CHARACTERISTIC SPECIES (ferns, herbs, grasses, sedges)	
		Botanical Name	Common Name	Botanical Name	Common Name
Swamp Heathland	Swamp Heathland	*Melaleuca squarrosa*	Scented Paperbark	*Gahnia sieberiana*	Red-fruit Saw-sedge
		Helichrysum rosmarinifolium	Rosemary Everlasting	*Blechnum minus*	Soft Water-fern
				Gleichenia spp.	Coral-ferns
				Centella cordifolia	Centella
				Restio tetraphyllus	Tassel Cord-rush
				Villarsia reniformis	Running Marsh-flower
	Sand Heathland	*Leptospermum myrsinoides*	Silky Tea-tree	*Gahnia radula*	Thatch Saw-sedge
		Leptospermum continentale	Prickly Tea-tree	*Drosera* spp.	Sundews
		Monotoca scoparia	Prickly Broom-heath	*Hypolaena fastigiata*	Tassel Rope-rush
		Epacris impressa	Common Heath	*Cassytha glabella*	Slender Dodder-laurel
		Banksia marginata	Silver Banksia	*Lepidosperma concavum*	Sand-hill Sword-sedge
		Aotus ericoides	Common Aotus	*Xanthorrhoea* spp.	Grass-trees
	Coastal Heathland	*Leptospermum continentale*	Prickly Tea-tree	*Gahnia radula*	Thatch Saw-sedge
		Allocasuarina pusilla	Dwarf Sheoke	*Schoenus brevifolius*	Zig-zag Bog-sedge
		Allocasuarina paludosa	Scrub Sheoke	*Gonocarpus teucrioides*	Germander Raspwort
		Melaleuca squarrosa	Scented Paperbark	*Lepidosperma* spp.	Sword-sedges
		Banksia marginata	Silver Banksia	*Xanthorrhoea minor*	Small Grass-tree
	Coastal Grassy Forest	*Eucalyptus radiata*	Narrow-leaf Peppermint	*Acrotriche serrulata*	Honey-pots
		Eucalyptus pryoriana	Coast Manna Gum	*Themeda triandra*	Kangaroo Grass
		Allocasuarina littoralis	Black Sheoke	*Microlaena stipoides*	Weeping Grass
		Leptospermum continentale	Prickly Tea-tree	*Gahnia radula*	Thatch Saw-sedge
		Acacia paradoxa	Hedge Wattle	*Pteridium esculentum*	Austral Bracken
	Dry Coast Complex				
	Coastal Dune Scrub	*Leptospermum laevigatum*	Coast Tea-tree	*Spinifex sericeus*	Hairy Spinifex
		Leucopogon parviflorus	Coast Beard-heath	*Tetragonia implexicoma*	Bower Spinach
		Correa alba	White Correa	*Cakile maritima*	Beach Rocket
		Olearia axillaris	Coast Daisy-bush	*Rhagodia candolleana*	Seaberry Saltbush
		Acacia sophorae	Coast Wattle	*Isolepis nodosa*	Knobby Club-sedge
		Melaleuca lanceolata	Moonah	*Lepidosperma gladiatum*	Coast Sword-sedge
	Coastal Banksia Woodland	*Banksia integrifolia*	Coast Banksia	*Clematis microphylla*	Small-leaved Clematis
		Eucalyptus pryoriana	Coast Manna Gum	*Pteridium esculentum*	Austral Bracken
		Leptospermum laevigatum	Coast Tea-tree	*Rhagodia candolleana*	Seaberry Saltbush
		Acacia sophorae	Coast Wattle	*Lomandra longifolia*	Spiny-headed Mat-lily
		Melaleuca ericifolia	Swamp Paperbark	*Tetragonia implexicoma*	Bower Spinach
	Coastal Tussock Grassland	*Calocephalus brownii*	Cushion Bush	*Poa poiformis*	Blue Tussock-grass
				Acaena novae-zelandiae	Bidgee-widgee
				Isolepis nodosa	Knobby Club-sedge
				Dianella revoluta	Black-anther Flax-lily
				Dichondra repens	Kidney-weed

Appendix III (continued)

ECOLOGICAL VEGETATION CLASS	FLORISTIC VEGETATION COMMUNITY	CHARACTERISTIC SPECIES (trees and shrubs)		CHARACTERISTIC SPECIES (ferns, herbs, grasses, sedges)	
		Botanical Name	Common Name	Botanical Name	Common Name
	Wet Coast Complex				
	Coastal Saltmarsh	*Avicennia marina*	White Mangrove	*Sarcocornia quinqueflora*	Beaded Glasswort
				Sclerostegia arbuscula	Shrubby Glasswort
				Suaeda australis	Austral Seablite
				Distichlis distichophylla	Australian Salt-grass
				Samolus repens	Creeping Brookweed
				Triglochin striata	Streaked Arrow-grass
	Swamp Sedgeland			*Schoenus brevifolius*	Zig-zag Bog-sedge
				Lepidosperma longitudinale	Pithy Sword-sedge
	Swamp Scrub	*Melaleuca ericifolia*	Swamp Paperbark	*Samolus repens*	Creeping Brookweed
		Acacia verticillata	Prickly Moses	*Disphyma crassifolium*	Rounded Noon-flower
		Leptospermum continentale	Prickly Tea-tree	*Selliera radicans*	Shiny Swamp-mat
				Lepyrodia muelleri	Common Scale-rush
				Cassytha pubescens	Downy Dodder-laurel

Note: The term 'floristic vegetation community' has been superseded by the term 'ecological vegetation class'. The former term is used here to provide continuity with the terminology used in the Council's resources report and proposed recommendations for Melbourne Area District 2.

Appendix IV

PHYSICAL AND CHEMICAL WATER QUALITY

Percentage of non-metropolitan population receiving water which did not meet WHO (1984) guideline values between 1984 and 1989.

Parameter	Guideline values	Percent population	Health significance	Aesthetic
Acidity	> 8.5 pH	< 1%		*
	< 6.5 pH	2%		*
Colour	> 15 True Colour Units	43%		*
Turbidity	> 5 Nephelometric Turbidity Units	9%		*
Total Dissolved Solids	> 1000 mg/L (1500 Ec)	< 1%		*
Hardness	> 500 mg/L	< 1%		*
Chloride	> 250 mg/L	2%		*
Sodium	> 200 mg/L	2%		*
Iron	> 0.3 mg/L	80%		*
Manganese	> 0.1 mg/L	< 1%		*
Nitrate	> 10 mg/L (Nitrogen)	< 1%	*	
Aluminium	> 0.2 mg/l	51%		*
Cadmium	> 5 Ìg/L	NIL	*	
Copper	> 1 mg/L	< 1%		*
Zinc	> 5 mg/L	NIL		*
Lead	> 50 Ìg/L	< 1%	*	
Trihalomethanes	> 30 Ìg/L (Chloroform)	64%	*	
Pesticides	> Various	NIL	*	

Reference

Department of Conservation and Environment (1992). Drinking Water Quality, Victoria 1984-1989. Water Resource Management Report Series No 77. (Department of Conservation and Environment: Melbourne.)

Appendix V

RECOMMENDATIONS FOR HERITAGE RIVERS

The following recommendations arising from the Council's Rivers and Streams Special Investigation (June 1991) have been approved by the Government. They have been amended to reflect the provisions of the *Heritage Rivers Act* 1992.

VICTORIAN HERITAGE RIVERS

Recommendations

VHR3,4,5,13,14 That the river corridors described below be designated Victorian heritage rivers, and be used:

(a) to protect natural, scenic, cultural heritage, and recreational values, with particular attention to the recommendations for specific river corridors listed below

(b) to provide opportunities for landscape appreciation and education, except where this conflicts with (a) above

(c) to provide for a range of recreation opportunities as permitted in accordance with land status, unless otherwise specified in these recommendations

(d) in accordance with the policy recommendations in Chapter F of the Rivers and Streams *Special Investigation Final Recommendations* 1991

that

(e) where indicated below, the river corridors be retained free from impoundments, artificial barriers, or structures that impede the passage of in-stream fauna, unless approved by the Governor in Council

(f) (i) any new water diversions from the mainstream or tributaries upstream of the lowest point on each Victorian heritage river not significantly impair the existing values identified in the river descriptions below, unless approved by the Governor in Council

(ii) where detailed environmental and recreational flows have been established, they should be retained

(iii) where detailed investigations to establish the environmental water requirements of Victorian heritage rivers have not been undertaken, these investigations should be completed in any review of water allocations in existing regulated systems

(iv) Victorian heritage rivers be given priority in investigations undertaken to establish appropriate environmental water requirements in existing regulated systems

(g) existing water quality be maintained, or where degraded be progressively improved - where opportunities allow - in accordance with the protection of the values and uses specified

(h) timber-harvesting not be permitted in Victorian heritage river corridors, except where specified for particular rivers below

(i) (i) where currently permitted, and at the discretion of the corridor managers, public land within the Victorian heritage river corridors continue to be available for grazing, except where this would prevent revegetation of the banks and frontage reserves, or cause bank erosion, degradation of water quality, or damage sites of cultural significance

(continued)

Victorian Heritage Rivers (continued)

(ii) priorities for revegetation be developed in accordance with the process proposed for public land water frontage reserves (see Recommendations in Appendix V)

(iii) grazing be strictly controlled or excluded either temporarily or permanently by the land managers from areas found to have important plant or animal communities that would be significantly impaired by continued grazing

(j) (i) in carrying out road reconstruction and maintenance, relevant authorities take particular care with drainage, spoil disposal, and batter stabilisation, so that as far as possible sediment does not reach streams, causing siltation and turbidity

(ii) in siting new roads and tracks, locations parallel and close to stream-courses be avoided and crossings minimised

(k) (i) where currently permitted, use of public land along streams for bee-keeping continue

(ii) where investigations show that the presence of commercial honey-bees is causing land management problems or adversely affecting river values at specific sites, hives be relocated temporarily or permanently

(l) exploration and mining be permitted in Victorian heritage river corridors, except where land status excludes these activities, and subject to:

(i) existing Council policy that areas of particular value and sensitive to disturbance be identified and excluded from mining and from forms of exploration inappropriate to the protection of values

(ii) conditions ensuring that operations, discharges, treatment, and tailings have no adverse impact on the identified values or water quality

and that they be protected under the *Heritage Rivers Act* 1992, and managed as specified for each river.

Notes:

1. The corridors have been mapped based on the present stream location. Should the river course change markedly, the following applies:
   * the new course becomes part of the corridor, on the basis of streamflow continuity. Where this course bisects freehold allotments, the bed and banks are not Crown land (that is, in most cases, public land). Where the course forms the boundary of a freehold allotment, the bed and banks are public land. In all cases, the use, flow, and control of all water is the right of the Crown.
   * the old course retains its existing tenure, and all values present require protection.

2. The Gippsland Water Strategy has been developed by the Department of Conservation and Natural Resources. Its aims are to protect high value areas, promote sustainable catchment and waterway management, and provide a balanced allocation of water to off-stream users and the environment. The Thomson River, and other rivers in Gippsland, are included in the Strategy.

VH3 *Howqua River*

That the 60 km river corridor from the junction of the North and South Branches to Lake Eildon be used in accordance with general recommendations VHR3,4,5,13,14 (a) to (l) above

that

(m) (i) the corridor be retained free from impoundments, artificial barriers, or structures that impede the passage of in-stream fauna, unless approved by the Governor in Council

(continued)

VH3 - Howqua River (continued)

(ii) any new diversions of water only be permitted if their volumes, timing, and offtake do not significantly impair fish habitat conditions or canoeing quality, or reduce scenic landscape value, unless approved by the Governor in Council

(iii) timber-harvesting continue, where land status permits, subject to the Code of Forest Practices and local prescriptions providing for a buffer around recreation routes and destinations

that

(n) the following significant values be protected

(i) canoeing - Eight Mile Creek to Frys Hut, and the Sheepyard Flat slalom site

(ii) fishing opportunities - especially for trout

(iii) cultural heritage sites - Frys Bridge, and early settlement and mining features

(iv) Devonian fish fossil beds

(v) habitat for the spotted tree frog

(o) other recreation activities continue where permitted in accordance with land status

and that the corridor be managed by the Department of Conservation and Natural Resources, in conjunction with the Rural Water Corporation in relation to waterway management.

VHR4 Big River

That the 51 km river corridor from the junction of Spring and Oaks Creeks to Lake Eildon be used in accordance with general recommendations VHR3,4,5,13,14 (a) to (l) above

that

(m) (i) any new diversion of water only be permitted if its volume and timing, and the design of the offtake structure, do not significantly impair in-stream habitat conditions, the passage of in-stream fauna, or reduce scenic landscape value

(ii) the volume and timing of any new diversion be such as to not significantly impair canoeing quality, but that if such impairment is likely, an economic assessment of the relative social benefits and costs be carried out

(iii) timber-harvesting not be permitted in the corridor, but be permitted in the remainder of the valley, subject to application of the visual management system to minimise impacts on the scenic landscape viewed from the river and strategic vantage points

(iv) the Big River four-wheel-drive track not be upgraded, in order to limit use and maintain the current range of recreational opportunities

(v) if possible, the shallow quarries along the Jamieson Road be relocated and the sites reclaimed

that

(n) the following significant values be protected

(i) habitat for the spotted tree frog

(ii) scenic landscapes along the Big River from Oaks Creek to Lake Eildon

(continued)

VHR4 - Big River (continued)

(iii) fishing opportunities - especially for trout

(iv) the canoe resource in a semi-remote setting from Frenchman Creek to Jamieson Road Bridge

(o) other recreation activities continue where permitted in accordance with land status

and that the corridor be managed by the Department of Conservation and Natural Resources, in conjunction with the Rural Water Corporation in relation to waterway management.

Notes:
1. In any review of these recommendations, the need to divert water from within the corridor to augment Melbourne's water supply should be considered.

2. The Goulburn system of which the Big River is a tributary is at present fully committed. Council is concerned that the diversion of water from the Big River may limit options for the future provision of an environmental water requirement for the Goulburn.

3. As part of the State Water Resources Plan, preliminary studies of potential diversion sites on the upper reaches of the Big, Black, and Upper Goulburn Rivers have been initiated by the Department of Conservation and Natural Resources. They cover archaeology, mining heritage, fauna, landscape assessment, and fish-flow requirements.

VHR5 Goulburn River

That the 430 km river corridor from below Lake Eildon to the Murray River be used in accordance with general recommendations VHR3,4,5,13,14 (a) to (l) above

that
(m) (i) the corridor be retained free from further impoundments, artificial barriers, or structures that impede the passage of in-stream fauna, unless approved by the Governor in Council (see Note 1)

(ii) any new diversions of water only be permitted if their volumes, timing, and offtake do not significantly impair wetland, riverine forest, or native fish habitat conditions, or reduce scenic landscape value, unless approved by the Governor in Council (see Note 2)

(iii) timber-harvesting be permitted in the lower Goulburn forests below Murchison, subject to the Council's principles and guidelines for river red gum harvesting operations

(iv) grazing continue where it is currently permitted, subject to the discretion of the land manager, but that in areas where surveys identify a risk of degradation through loss of biological values or bank instability, licences be reviewed (see Notes 3 and 4)

(v) the impact of firewood harvesting on flora and fauna values be assessed, and subject to the assessment be permitted at the discretion of the manager

that
(n) the following significant values be protected

(i) areas with an intact understorey in river red gum open forest/woodland, and yellow box and grey box woodland/open forest communities (see Note 5)

(continued)

VHR5 - Goulburn River (continued)

(ii) areas of habitat significance for vulnerable or threatened wildlife including squirrel gliders, large-footed myotis, barking march frogs, barking owls, and brush-tailed phascogales

(iii) native fish diversity and Murray cod habitat below Goulburn Weir by providing water conditions conducive to seasonal spawning (see Note 6)

(iv) Macquarie perch habitat above Goulburn Weir

(v) fishing opportunities - especially for trout from Eildon to Yea River, and native species below Goulburn Weir

(vi) canoeing - Eildon to Goulburn Weir

(vii) cultural heritage sites listed above

(viii) scenic landscapes - from Molesworth to above Seymour, and from below Seymour to Echuca

(o) other recreation activities continue where permitted in accordance with land status

and that the corridor be managed by the Department of Conservation and Natural Resources in conjunction with the Rural Water Corporation, the Mid-Goulburn River Management Board and other relevant waterway authorities in relation to waterway management.

Notes:
1. The Goulburn River has required bed and bank stabilisation measures in the past, and Council is aware of the existence of various works and of continuing needs.
2. The flow regimes of the Goulburn River are modified, and the present system is fully committed. Council is concerned that re-allocation of water within and from the Goulburn River basin for off-stream use could preclude the provision of an environmental water requirement for the Goulburn.
3. Some limited areas of the public land water frontage are cultivated or used for horticulture. While these are considered inappropriate uses of frontages, they may be continued at the discretion of the corridor managers, but should be subject to review.
4. In accordance with recommendations VHR3,4,5,13,14(f)(iii) and (iv), a review of water allocations in the Goulburn system should include consideration of the environmental water requirements of Murray cod and the diverse community of other native fish, the riverine forests and adjoining wetlands, and the ability of the Rural Water Corporation to provide appropriate water conditions.
5. Submissions identified bank instability as a problem associated with rapid river falls at the completion of a flow release.
6. Council is aware of a proposal to construct a hydro-electric scheme at the Eildon Pondage Weir. These recommendations would not prevent this.

VHR13 Thomson River

That the 64 km river corridor from below the Thomson Dam to Cowwarr be used in accordance with general recommendations VHR3,4,5,13,14 (a) to (l) above

that

(m) (i) the corridor be retained free from further impoundments, artificial barriers, or structures that impede the passage of in-stream fauna, unless approved by the Governor in Council

(continued)

VHR13 - Thomson River (continued)

(ii) no new diversions of water from the Thomson River corridor be permitted, unless approved by the Governor in Council

(iii) any new diversions from tributary streams entering the corridor upstream from Cowwarr Weir only be permitted if their volumes, timing, and offtake do not significantly impair canoeing quality or native fish habitat, or reduce scenic landscape value

(iv) the committee established to review releases from the Thomson Dam assess the level of adequate environmental water requirement, and ensure this is provided

(v) the canoeing quality of downstream releases be optimised within allocation agreements (consistent with the protection of in-stream biological values)

(vi) timber-harvesting in the Thomson Valley outside the corridor be subject to application of the visual management system, to minimise impacts on the scenic views from the river and strategic vantage points

that

(n) the following significant values be protected

(i) canoeing - Thomson Dam to Cowwarr Weir

(ii) scenic landscapes along the Thomson River for the whole reach

(iii) cultural heritage sites

(iv) fishing opportunities, especially for freshwater blackfish

(v) Australian grayling habitat, by not creating barriers to migration below the designated corridor, and by maintaining water quality, flow, and in-stream habitat conditions

(o) the relatively natural mainstream condition be protected

(p) other recreation activities continue where permitted in accordance with land status

and that the corridor be managed by the Department of Conservation and Natural Resources, in conjunction with the Rural Water Corporation and Melbourne Water (in relation to river flows) and the Latrobe Region Water Authority (in relation to waterway management).

Note:
The committee established to review releases from the Thomson Dam is convened by the Division of Water Resources.

VHR14 Yarra River

That the 103 km river corridor from Warburton to Warrandyte be used in accordance with general recommendations VHR3,4,5,13,14 (a) to (l) above

that

(m) (i) any new impoundments, artificial barriers, or structures that impede the passage of in-stream fauna, or diversions of water from the river, only be permitted if their volumes, timing, and offtake do not significantly impair fish habitat conditions, canoeing quality, or scenic landscape value

(continued)

VHR14 -Yarra River (continued)

(ii) programs to revegetate and restore frontages be continued, or developed according to priorities that take account of the identified values

that

(n) the following significant values be protected

(i) scenic landscapes from Yarra Glen to Warrandyte

(ii) botanical values

(iii) zoological values

(iv) canoeing - Warburton to Warrandyte

(v) river blackfish and Macquarie perch habitat

(vi) fishing opportunities, especially for trout

(vii) geological/geomorphological sites of significance

(o) other recreation activities continue where permitted in accordance with land status

and that the corridor be managed by the Department of Conservation and Natural Resources in conjunction with Melbourne Water.

Notes:
1. The Yarra River corridor lies within a broader valley area which in 1982 was given a 'classified' status by the National Trust, in recognition of its cultural, natural, recreation and scenic values.
2. A number of arrangements are currently in place which specify minimum flows in the Yarra. These are a 73 ML per day at Millgrove (set in 1974) and 245 ML per day at Warrandyte (set in 1984). These flows were set to meet specific requirements at those times, but at present the environmental water requirements have not been determined.
3. A project to investigate the effects of different flow levels on the environment and water quality has been jointly development by the Environment Protection Authority, Melbourne Water and the Upper Yarra Valley and Dandenong Ranges Authority. The implementation of this project awaits adequate resources.

References

Land Conservation Council (1991). Rivers and Streams Special Investigation - Final Recommendations. (Land Conservation Council: Melbourne.)

Heritage Rivers Act 1992 (Act No 36/1992 ; Proclaimed 8 September 1992 except for S.20).

Appendix VI

GUIDELINES FOR PROTECTION OF THE ALPINE WALKING TRACK

Because of its national significance as a bushwalking route, the Alpine Walking Track (AWT) and its immediate environs should be managed in a way that affords the greatest protection to the natural environment.

Council considers that on and adjacent to the AWT a principal management aim should be to preserve the immediate foreground views as seen from the track. For this reason, it believes a visual corridor should be preserved along the track wherein changes to the natural systems are kept to a minimum. The width of this corridor will vary from place to place according to local circumstances such as topography and vegetation type. For instance, in steep terrain supporting dense forests, the visual corridor will be narrower than in relatively flat, open country. Council believes that, in general, the visual corridor would rarely exceed 50 m from either side of the track.

Within the visual corridor Council considers that:

* logging should not be permitted

* log or fuel dumps should not be permitted

* new roads and earthworks should not be permitted where a viable alternative exists

* erection of structures not used in conjunction with the track, such as sheds, transmission poles, ski-tows, and the like, should not be permitted (this provision is not meant to inhibit the maintenance of existing huts nor the construction of new huts or shelters for the use of walkers)

Furthermore, management authorities should consult relevant user groups, especially bushwalking organisations, on any proposals that could have an impact on the AWT and its immediate environs.

As well as protection of the immediate environs of the AWT, Council is also aware of the concern of bushwalkers for the maintenance of the magnificent vistas as seen from many parts of the track. It is this scenic quality that adds greatly to the experience of walking the AWT.

Council believes it is impracticable to prohibit all activities that alter the natural landscape within the extensive areas that can be seen from the AWT. Management techniques can be employed to greatly minimise the visual impact of such activities, however. In particular, the Department of Conservation and Resources has established a Visual Management System, which can assist in reducing the visual impact of timber-harvesting and other operations. The broad-scale planning level of the Visual Management System has been applied to all State forests adjacent to the AWT. Council believes that this system should be integrated into the forest management operations in these areas.

(The above is an extract from the Council's final recommendations for the Alpine Area Special Investigation, 1983).

Appendix VII

COMMUNITY USE AREAS

Recreation Areas
(Recommendation J13)

Parish (P) or Township (T)	Description	Area (ha)
T ABERFELDY	SOUTH-EAST OF CA 6 SEC 1	0.41
T ALEXANDRA	CA 14,15,16 SEC 65A	1.28
T ALEXANDRA	CA 6 SEC 39	4.60
P ALEXANDRA	CA 26D	5.28
T ALEXANDRA	CA 5 SEC 39	0.16
T ALEXANDRA	CA 9,10,11,12,13,17,18 SEC 65A	9.68
T BALNARRING BEACH	CA 10A,10B & UNUSED ROAD	0.85
T BALNARRING BEACH	CA 9A	2.10
T BASS	CA 14,15 SEC 7	15.27
P BITTERN	CA 17E	4.05
P BITTERN	CA 34C	4.59
P BITTERN	CA 100B,101A	62.88
P BITTERN	CA 110C	4.05
P BITTERN	CA 22A	104.63
T BONNIE DOON	CA 3,3A-E,4,4A-C SEC 9	3.37
P BUNYIP	CA 9A	8.96
T BUNYIP	CA 2 SEC 13	1.45
T BUNYIP	CA 1A SEC 1	0.88
P BUNYIP	CA 12H	11.78
T BUNYIP	CA 16,17 SEC 14	8.75
T BUNYIP	CA 3 SEC 13; CA 1–8 SEC 14	1.22
T COALVILLE	CA 4 SEC 1A	0.94
T CORA LYNN	CA 19D,19E,19F,19G SEC 1	0.89
T CORA LYNN	CA 19A,19B,19C SEC 1	12.76
T CORINELLA	CA 14C,14D	0.20
P CORINELLA	CA 212C,212D,212E	24.06
T COWES	CA 7,8,9,10,17,18,19,20 SEC 9	0.80
T CRIB POINT	PART CA 1 SEC 2	2.00
T CRIB POINT	CA 18 SEC 3	4.38
T DIAMOND CREEK	PART CA 2 SEC 10	0.20
T DROMANA	CA 1 SEC 2A	1.38
P DROUIN WEST	CA 53A,53B,53C	43.40
T ELTHAM	Eltham Lower Park	18.60
T EMERALD	CA 11A SEC A	0.60
T FLINDERS	CA 1A,1B,1C SEC 3	0.87
T FLINDERS	CA 6B,6C	5.90
T FLINDERS	CA 21,21A	25.97
P FLOWERDALE	CA 17E	4.52
P FRENCH ISLAND	CA 5C	2.27
P FUMINA	CA 95A	1.00
P FUMINA NORTH	CA 47,48,62	0.77
P GEMBROOK	CA 9A SEC D	7.39
P GEMBROOK	CA 19B NO SEC	3.01
P GEMBROOK	CA 1B SEC D	0.28
P GEMBROOK	CA 19C NO SEC	0.17
P GOBUR	CA 6	22.33
P GOULBURN	CA 14 of 5	2.17
T GRANTVILLE	CA 9 SEC B	9.10
P GREENSBOROUGH	CA 24B SEC C	1.85
T HASTINGS	CA 7,7A,8,8A SEC 21	14.52
T HASTINGS	CA 1,1A SEC 19	2.03
T HASTINGS	CA 22 SEC D	0.38
T HASTINGS	CA 18 SEC D	3.16
T HASTINGS	CA 6 SEC A	3.54
T HEALESVILLE	CA 10 SEC A	0.13
T HEALESVILLE	CA 1A,1B SEC Q	1.07
T HEALESVILLE	CA 3,6,7 SEC 7	8.80
T JAMIESON	CA 1,4 SEC 12	0.19
T JAMIESON	CA 5,6 SEC 29	3.13
T JAMIESON	CA 2 SEC 12	0.01
P KANGERONG	CA 28H	25.34
P KEELBUNDORA	CA 28F	0.25
P KEELBUNDORA	CA 16 G	2.51
P KEVINGTON	CA 1 of 4	6.27
P KINGLAKE	CA 14C, 14E	3.51
T KINGLAKE EAST	PART CA 6A	2.04
P KOO-WEE-RUP EAST	CA 34 SEC U	6.07
T KORUMBURRA	CA 4A SEC 1	0.24
T KORUMBURRA	CA 17 SEC 4A	3.52
T KORUMBURRA	PART CA 49,49A SEC 6	6.00
P. KORUMBURRA	CA 1H SEC 9	3.35
	Korumburra Gun Club	
P LANG LANG	PART CA 90B (WEST OF ROAD)	8.70
P LANG LANG	CA 90A	57.34
P LANG LANG EAST	CA 118G,118H	6.98
T LILYDALE	CA 3 SEC 13	0.60
T LILYDALE	CA 11 SEC 12	0.36
T LONGWARRY	CA 12 SEC 4	0.33
T LONGWARRY	CA 6,7,8,9,10,11 SEC 15	7.29
P LONGWARRY	CA 99D	2.55
T LONGWARRY	CA 35 SEC 3	0.24
P LOYOLA	PART CA 76C,76D	1.00
T MAINDAMPLE	CA 1 SEC 6	1.50
T MANSFIELD	CA 16 SEC 30; CA 13 SEC 32	3.30
T MANSFIELD	CA 14 SEC 29	2.63
T MARYSVILLE	CA 9 SEC E	0.24
T MARYSVILLE	CA 5 10 SEC E	1.34
P MOE	CA 131G,131H,131F	4.00
T MOLESWORTH	ADJ CA 5 SEC B	4.02
P MONBULK	CA 11 SEC O	34.29
T MONBULK	CA 12,15(PART) SEC 3	3.55
P MOONDARRA	CA 4H,4J,4K,4L,4L1 SEC B	9.74
P MOOROODUC	CA 58A	1.25
P MOOROODUC	CA B1	56.81
P MOOROOLBARK	CA 76D	1.53
T MORNINGTON	CA 8A,B,C,D SEC 1	19.74
T NARBETHONG	CA 5 SEC 20	3.95
P NARREE WORRAN	PART CA 4 SEC C	2.81
P NARREE WORRAN	CA 49A NO SEC	5.89
T NEERIM	CA 14C ,4D,14F	4.08
P NEERIM	CA 81A	3.90
P NEERIM EAST	CA 22A SEC E	3.85
P NEPEAN	CA 96G,96H,96F	0.87
T NEWHAVEN	CA 43 NO SEC	5.25
T NOOJEE	CA 8,9 SEC 7	4.29
T NOOJEE	CA 22A SEC 1	0.19
T NYORA	CA 15 SEC 2	4.40
T OLINDA	CA 26,27 NO SEC	2.26
T OSBOURNE	CA 19A SEC B	0.97
T OSBOURNE	CA 21 SEC 2	0.81
P PAKENHAM	CA 53A	4.52
T PANTON HILL	CA 16A,16B 16C	1.43
P POOWONG	CA 7A,7B,7C,7D	4.77
T POOWONG	CA 7A SEC 3	0.04
T POWELLTOWN	CA 5 SEC A	3.98
T QUEENSTOWN	CA 1 SEC 4A	1.18
P QUEENSTOWN	PART CA 40B,40C SEC C	12.72
T SAN REMO	CA 25A	0.32
T SEVILLE	CA 31B	3.54
T SORRENTO	CA 16A	2.35
T STRATH CREEK	CA 6 SEC D	0.37
P TANJIL	CA 50A	2.66
P TANJIL	CA 20C	2.80
P TANJIL EAST	WEST OF CA 13D SEC C	4.73
P TARRAWARRA	CA 26 SEC B	15.62

(continued)

Parish (P) or Township (T)	Description	Area (ha)
P TARRAWARRA	CA 23B,23C SEC B	54.53
T TOOLANGI	CA 1B	3.13
T TOOLANGI	CA 3B	0.70
T TRAFALGAR	CA 6B,6C SEC 10	1.12
P TYABB	CA 4,5,6 SEC A	13.75
T VENTNOR	SEC 12	3.04
T VENTNOR	CA 14 SEC 8	0.30
P WANNAEUE	CA 11A	2.00
P WANNAEUE	PART CA 31B,31G,32E	65.64
P WARBURTON	CA 6B SEC B	1.25
P WARRANDYTE	ADJ CA 11A	0.25
P WARRANDYTE	ADJ CA 11A	2.00
T WESTBURY	CA 2D SEC 3	0.47
T WILLOW GROVE	CA 9A SEC A	2.83
T WONTHAGGI	CA 39 SEC 117	0.09
P WONTHAGGI	CA 47B (NORTH SECTION)	35.81
P WONTHAGGI	CA 26D	13.54
T WONTHAGGI	CA 3 SEC 102	4.55
T WONTHAGGI	CA 3A SEC 102	0.05
T WONTHAGGI	CA 4 SEC 102	8.11
T WONTHAGGI	CA 5 SEC 102	2.80
T WONTHAGGI	CA 5 SEC 86	1.91
T WONTHAGGI	CA 11 SEC 51	2.38
T WONTHAGGI	CA 1A SEC 55	0.10
T WONTHAGGI	CA 2 SEC 4	0.46
T WONTHAGGI	CA 3 SEC 117	61.43
T WONTHAGGI	PART CA 5,5A SEC 3C	9.78
P WOOLAMAI	CA 106G	24.83
P WOORI YALLOCK	CA 1B	2.24
P WOORI YALLOCK	CA 67C	2.36
P YANNATHAN	CA 101B	2.40
T YARCK	CA 16 SEC B	1.85
T YARRAGON	CA 12A,13 SEC 11	4.52
P YARRAGON	CA 29A SEC B	0.40
P YARRAGON	CA 15C,15D, NO SEC	4.00
P YEA	CA 18A SEC 1	54.45
T YEA	CA 1 SEC 7	3.04
T YEA	PART CA 3 SEC 12	0.61
T YEA	CA 3B,3C,3D,3E,3F SEC 12	1.65
P YERING	CA B4 SEC 4	15.60
	Note: The model aero club may continue at the discretion of the land manager.	
P YUONGA	CA 9A	25.00
	Launching Place Rifle Range	

Buildings in Public Use (Recommendation J29)

Parish (P) or Township (T)	Description	Area (ha)
T ALEXANDRA	CA 5B SEC 65A	0.07
T ALEXANDRA	CA 3 SEC 6	0.19
P ALEXANDRA	CA 107E	0.11
T ALEXANDRA	CA 3 SEC 54	0.38
T BASS	CA 1,2 SEC 1	0.72
T BASS	CA 5,6 SEC 6A	1.14
P BEENAK	CA 79A1,79A2	0.23
T BEVERIDGE	CA 16A NO SEC	2.02
P BITTERN	CA 111C	2.76
P BITTERN	CA 17G,17F	2.76
P BURGOYNE	CA 41H	0.10
P BURGOYNE	CA 52A	0.50
P BUXTON	CA 7B,7C	1.51
P CORINELLA	CA 212G,212H	3.07
T CORINELLA	CA 2 SEC 19	0.20
T CRIB POINT	CA 22,23,24,25,30 SEC 4	2.20
T CRIB POINT	SEC 2	9.55
T CROSSOVER	CA 9A	0.81
P DARNUM	CA 89D	0.40
T DIAMOND CREEK	CA 1 & ADJ CA SEC 1	0.66
T DROMANA	CA 1 SEC 13	0.08
T DROMANA	CA 2 SEC 1A	0.14
T DROMANA	CA 1 SEC 17	0.40
T DROUIN	CA 13B,13C SEC 7	1.13
P DROUIN WEST	CA 4A	2.02
P DROUIN WEST	CA 101D	0.14
P DROUIN WEST	CA 156A	0.21
P DROUIN WEST	CA 101E	0.14
T EMERALD	UNUSED RD ADJ CA 5C SEC A	0.48
T EMERALD	CA 11B SEC A	0.20
T EMERALD	CA 4A,4R SEC A	1.44
T EMERALD	CA 5B SEC A	0.20
P FRENCH ISLAND	CA 9A SEC M	1.62
P FRENCH ISLAND	CA 5B NO SEC	0.97
P GEMBROOK	CA 1A SEC D	0.45
P GEMBROOK	CA 9D SEC D	0.17
P GRACEDALE	CA 117D	2.00
P GRACEDALE	CA 112A	0.40
T GRANTVILLE	CA 11 SEC C	0.20
T HASTINGS	CA 6A,6B SEC 21	1.01
T HEALESVILLE	CA 15 SEC D	2.05
T HEALESVILLE	CA 4 SEC 7	0.27
P JINDIVICK	CA 59F	0.37
P JINDIVICK	CA 6A	0.30
P JINDIVICK	CA 59G	2.60
P KANGERONG	CA 28E,28G	14.43
T KILCUNDA	CA 35A SEC 2	2.09
P KINGLAKE	CA 75N	0.75
T KINGLAKE CENTRAL	CA 10	0.80
T KINGLAKE EAST	CA 34	3.56
P KOBYBOYN	CA 7D SEC C	0.75
P KONGWAK	CA 25Q	1.50
O KOO-WEE-RUP	CA 46B SEC J	0.73
P KOO-WEE-RUP EAST	CA 32A SEC V	1.02
P KOO-WEE-RUP EAST	CA 69B SEC B	4.05
P KOO-WEE-RUP EAST	CA 9A SEC C	0.81
T KORUMBURRA	CA 16D,16E SEC 4	0.90
T LILYDALE	ADJ CA 2B SEC 8	0.06
T LILYDALE	CA 9 SEC 10; CA 5--11,14 SEC 3	1.12
T LILYDALE	CA 1A,1B SEC 11	0.81
T LONGWARRY	CA 11 SEC 4	0.37
P LONGWARRY	CA 99E	2.60
P LONGWARRY	CA 99F	0.20
P LONGWARRY	CA 88A	3.16

(continued)

Parish (P) or Township (T)	Description	Area (ha)
T LONGWARRY	CA 12A-C 15-17 OF 4/1,2,16	1.62
T MANSFIELD	CA 17 SEC 30	0.83
T MARYSVILLE	CA 11 SEC E	0.86
T MERTON	CA 6C,6D SEC 3	2.76
T MERTON	CA 7 SEC 4	0.31
P MOE	CA 82F	1.00
T MOLESWORTH	ADJ CA 3 SEC C	1.47
T MONBULK	CA 13,14,15(PART) SEC 3	0.66
T MONBULK	CA 16 SEC 3	0.81
P MONBULK	CA 1C SEC H	1.38
P MOOROOLBARK	CA 33C	2.51
P MOOROOLBARK	CA 35D	1.25
P NAYOOK	CA 58B	2.61
P NEERIM	CA 164M	0.01
P NEERIM	CA 36G	0.40
P NEERIM	CA 82D	0.10
T NEERIM	CA 14E	0.17
P NEERIM	CA 9A	0.50
T NEERIM	CA 12A & ADJ CA 12A	0.01
P NEERIM	CA 21F	0.07
P NEERIM EAST	CA 22B SEC E	0.20
P NEERIM EAST	CA 20A SEC E	0.81
T NEWHAVEN	CA 42 NO SEC	1.52
T NEWHAVEN	ADJ CA 43A NO SEC	0.56
T NEWHAVEN	CA 20 NO SEC	1.98
T NOOJEE	PT CA 7 SEC 7 (EAST PART)	1.00
T NYORA	CA 29A,29B,29C SEC 6	0.93
T NYORA	CA 31A SEC 4	0.80
T OLINDA	CA 28,29(PART) SEC A	1.18
T OLINDA	PART CA 30 SEC A	0.25
T OLINDA	CA 29(PART) SEC A	1.21
P PAKENHAM	CA 40B1	0.20
P PAKENHAM	CA 34B	0.10
P POOWONG EAST	CA 17B	0.20
P POOWONG EAST	CA 28A	0.01
T POWELLTOWN	CA 9 SEC F	1.93
T POWELLTOWN	CA 8A SEC D	0.15
T QUEENSTOWN	CA 1B SEC 4A	0.12
T QUEENSTOWN	CA 1A SEC 4A	0.16
T QUEENSTOWN	CA 12 & 13 SEC 2	0.69
T RED HILL SOUTH	CA 1 SEC B	0.15
T REEDY CREEK	CA 4,4A SEC 1	0.70
T ROSEBUD	CA 15 SEC 1	0.13
T RYE	CA 2 SEC 6	0.82
T RYE	ADJ CA 9 SEC 4	0.20
P SCORESBY	PART CA 72F	0.09
P SCORESBY	CA 10A SEC A	0.40
T SEVILLE	CA 87A,87B,87C	1.12
T STRATH CREEK	CA 3,4 SEC C	0.75
T STRATH CREEK	CA 1,1A SEC C	0.37
P SUTTON	CA 75B	1.25
T TAGGERTY	CA 2 SEC 15	0.10
T TAGGERTY	CA 3,5 SEC 15	1.75
P TANJIL	CA 20D	0.80
P TANJIL EAST	CA 13E SEC C	0.13
P TONIMBUK EAST	CA 6 SEC C	0.25
T TOOLANGI	CA 2A	0.81
T WALHALLA	CA 28	0.10
P WALLAN WALLAN	CA 1B SEC A	2.01
P WANDIN YALLOCK	CA 44A2	1.15
P WANDIN YALLOCK	CA 122B	2.51
P WANDIN YALLOCK	CA 122A	0.08
P WARBURTON	CA 7F	0.14
P WARRANDYTE	ADJ CA 9C NO SEC	0.81
P WARRANDYTE	CA 11D	0.31
T WHISKEY CREEK	CA 31	0.20
T WILLOW GROVE	CA 4 SEC A	0.20
T WONTHAGGI	CA 37 SEC 117	1.61
T WONTHAGGI	CA 35 SEC 117	7.71
T WONTHAGGI	CA 2 SEC 102	2.02
T WONTHAGGI	CA 42 SEC 1	0.10
T WONTHAGGI	CA 3 SEC 4	0.47
T WONTHAGGI	CA 4 SEC 4	0.12
T WONTHAGGI	CA 5 SEC 4	2.43
T WONTHAGGI	CA 1 SEC 7	1.26
T WONTHAGGI	CA 2 SEC 7	0.57
T WONTHAGGI	CA 20 SEC 9	0.48
T WONTHAGGI	CA 1A SEC 9A	0.07
T WONTHAGGI	CA 38 SEC 117	6.14
P WOODBOURNE	ADJ CA 6A SEC 1	0.81
T WOODS POINT	CA 2A SEC 9	0.06
T WOODS POINT	CA 16 SEC 21	0.12
T WOODS POINT	CA 1A,1B,4 SEC 11	0.83
P WOORI YALLOCK	CA 14E	2.02
P WOORI YALLOCK	CA 67D	2.02
P YANNATHAN	CA 44E	0.80
P YARCK	CA 10D SEC A	0.25
T YARCK	STATE SCHOOL	0.78
T YARRA JUNCTION	CA 24A,24,25,26	1.60
T YARRAGON	CA 13 SEC 9	0.49
T YARRAGON	CA 10B SEC 10	0.22
P YARRAGON	CA 1 NO SEC	1.00
P YARRAGON	CA 3A NO SEC	2.00
T YEA	CA 6 7 SEC 10	1.27
T YEA	PART CA 3 SEC 12	0.83
T YELLINGBO	CA 1	0.12
T YELLINGBO	CA 5	0.62
P YUONGA	CA 5G	1.86
P YUONGA	CA 5E	0.16
P YUONGA	CA 5H	0.09

Appendix VIII

SERVICES AND UTILITIES

Hospitals, Public Offices and Justice (Recommendation M15)

Parish (P) or Township (T)	Description	Area (ha)	Parish (P) or Township (T)	Description	Area (ha)
T ALEXANDRA	CA 1 SEC 59	1.01	P NAR-NAR-GOON	CA 43B NO SEC	0.26
T ALEXANDRA	CA 5,6 SEC 52	1.40	P NAR-NAR-GOON	CA 43D NO SEC	0.10
T ALEXANDRA	PART CA 5 SEC 47	0.63	P NARREE WORRAN	CA 40B SEC B	0.10
T ALEXANDRA	CA 11 SEC 36	0.64	P NEERIM	CA 84B	0.50
T BUNYIP	CA 12,12A ,12B SEC 8	1.96	T OLINDA	CA 20A NO SEC	0.12
T BUNYIP	CA 11 SEC 10	0.50	T RED HILL SOUTH	CA 2,3 SEC B	0.36
T BUNYIP	CA 3A SEC 2	0.11	T SAN REMO	CA 12B SEC A	0.17
P BURGOYNE	CA 13A SEC A	0.25	T SAN REMO	CA 10B SEC A	0.54
T COWES	CA 12B SEC 8	0.14	P SCORESBY	CA 63C1	1.42
T COWES	CA 12A SEC 8	0.66	T SORRENTO	CA 10A SEC 2	0.09
T COWES	CA 13 SEC 6	0.09	T SORRENTO	CA 9 SEC 2	0.18
T COWES	CA 16,17 SEC 6	0.32	P WANDIN YALLOCK	CA 141D	0.17
T DIAMOND CREEK	CA 3,4 SEC 14	0.36	P WANDIN YALLOCK	CA 81A	0.25
T DROMANA	CA 3 SEC 19	0.11	P WANNAEUE	CA 13C	2.76
T DROMANA	CA 7A SEC D	0.10	T WARBURTON	CA 6B	0.11
T DROUIN	FORMER POLICE STATION	0.26	T WONTHAGGI	CA 5 SEC 8	0.10
P EILDON	CA 5E	0.20	T WONTHAGGI	CA 8A SEC 8	0.14
T FLINDERS	CA 1 SEC 6	0.20	P WONTHAGGI	CA 32D	0.09
P GRACEDALE	CA 37D	2.02	T WONTHAGGI	CA 9A SEC 8	0.20
P GRACEDALE	CA 4A SEC 2	3.67	T WONTHAGGI	CA 44(PART) SEC 54A	2.08
P GREENSBOROUGH	CA 84A SEC E	0.18	T WONTHAGGI	CL IN SEC 44	1.71
T HASTINGS	CA 2A SEC 13	0.08	T WONTHAGGI	CA 2 SEC 10D	0.54
P JEETHO WEST	CA 30B	0.10	T WONTHAGGI	CA 4 SEC 10D	0.94
P KEELBUNDORA	PART CA 16C,16E	75.00	T WONTHAGGI	CA 1 SEC 10D	0.96
Note: The government recently announced the development of a new suburb in the Larundel - Gresswell Hospital Grounds (see Recommendation C31 also).			T WONTHAGGI	CA 23,24 SEC 101	0.03
			T WONTHAGGI	CA 34A SEC 54A	0.67
			T WONTHAGGI	CA 3 SEC 10D	0.62
T LILYDALE	CA 12,13 SEC 3	0.28	T WONTHAGGI	CA 5 SEC 10D	4.19
T MANSFIELD	CA 1G,1F,1B SEC 32	0.50	T WOODS POINT	CA 2A SEC 24	0.71
T MANSFIELD	CA 13 SEC 29	0.83	T WOODS POINT	ADJ CA 2 & 3 SEC 18	0.20
P MOONDARRA	CA 4Q,4R,4V,4W,4Y SEC B	0.75	P YARRAGON	CA 11C	2.00
T MORNINGTON	CA 7B PART 7A SEC 2	0.45	T YEA	CA 12 SEC 8	0.23
P NAR-NAR-GOON	CA 43A NO SEC	0.77			

Water and Sewerage Services (Recommendation M16)

Parish (P) or Township (T)	Description	Area (ha)	Parish (P) or Township (T)	Description	Area (ha)
P BRANKEET	CA 9A	1.00	P NAR-NAR-GOON	UNUSED ROAD ADJ CA 134A2	1.00
T CORA LYNN	CA 2A SEC 1	0.27			
P DARNUM	CA 57C	3.00	P NARREE WORRAN	PART CA 66A,71A	4.21
P EILDON	CA 2C	4.56	P NEERIM EAST	CA 3B SEC A1	1.00
P FUMINA NORTH	CA 73	0.15	T NEWHAVEN	CA 41 NO SEC	0.15
P KANGERONG	CA 28F	4.01	T OLINDA	PART CA 30 SEC A	0.05
T LONGWARRY	CA 3A,5A SEC 14; CA 7A SEC 13	1.00	P SCORESBY	PART CA 63,63A	12.00
			P TARRAWARRA	CA 45P,45P1	25.60
P LOYOLA	CA 49A	4.16	P TARRAWARRA	PART CA 37B	0.00
T MARYSVILLE	CA 23 SEC 4	3.51	T WARBURTON	CA 10B	0.02
T MARYSVILLE	CA 13 NO SEC	24.00	P WARBURTON	CA 206A	0.25
Note: This area is proposed for use as part of the Marysville sewerage scheme. An associated land exchange for a similar area is under consideration by the Department of Conservation and Natural Resources and the Mid-Goulburn Regional Water Board.			T WONTHAGGI	CA 1 SEC 109	3.12
			T WONTHAGGI	CA 2 SEC 26	2.91
			P WONTHAGGI	CA 26C,26E,26M	16.91
			T YARRA JUNCTION	CA 42A	0.75
			T YARRA JUNCTION	CA 1A,14A	1.00
P MOE	CA 10 SEC B2	0.83	P YEA	CA 43C	0.75
			P YEA	CA 202A	0.57
			T YEA	CA 1,2 SEC 38	2.73

Cemeteries
(Recommendation M19)

Parish (P) or Township (T)	Description	Area (ha)	Parish (P) or Township (T)	Description	Area (ha)
T ABERFELDY	SOUTH OF CA 3 SEC 1	0.40	P NANGANA	CA 31B	1.76
P ALEXANDRA	CA 32M	2.26	P NAR-NAR-GOON	CA 135A	0.77
T ALEXANDRA	CA 4 SEC 29	0.79	P NARRACAN SOUTH	CA 14J	2.00
P BEENAK	CA 83C	1.97	T NEERIM	CA 14G	1.21
P BITTERN	CA 129E	4.43	P NEERIM EAST	CA 36C SEC C	0.50
T BONNIE DOON	CA 13 SEC 9	1.26	P NEPEAN	CA 90A	3.27
P BROADFORD	CA 145W	1.20	P NILLUMBIK	CA 3C SEC 2	2.23
P BURGOYNE	CA 8G	2.01	T NYORA	CA 9 SEC 7	3.35
P CORINELLA	CA 175A,175B,175C	4.61	T OSBOURNE	CA 3A SEC A	8.04
T DIAMOND CREEK	CA 2 SEC 6	0.81	T PAKENHAM	CA 1A	2.02
T DROMANA	CA 12,13 SEC D	3.78	T POOWONG	ADJ CA 25 SEC 3	2.02
T DROUIN	CA 8A SEC A	4.05	P QUEENSTOWN	CA 1A,1B SEC B	2.05
P DROUIN WEST	CA 50C	50.60	T RYE	CA 3 SEC 6	1.62
T ELTHAM	ADJ CA 1,2,2A SEC 13	6.00	T SAN REMO	CA 26 SEC A	4.05
T FLINDERS	CA 5	2.89	P TANJIL	CA 15D	2.00
P FRENCH ISLAND	CA 4A SEC M	2.02	P THORNTON	CA 6D,6E	1.88
P GEMBROOK	CA 32A SEC B	0.73	P TYABB	CA 76D	2.26
P GOBUR	CA 10D SEC B1	2.01	P WARBURTON	CA 49A SEC B	5.27
T HEALESVILLE	CA 12 SEC 6	3.69	P WARBURTON	CA 97B	1.21
P JAMIESON	CA 11 of 14	2.02	T WESBURN	CA 236	2.02
T KORUMBURRA	CA 6A SEC 7A	6.91	T WONTHAGGI	CA 13A SEC 58	8.09
T LILYDALE	CA 2B SEC 8	1.02	T WOODS POINT	CA 1 SEC 25	8.02
P MANSFIELD	CA 24C,24D	3.01	P WOOLAMAI	CA 19A,19B	2.31
T MARYSVILLE	CA 21 SEC 4	3.08	P YANNATHAN	CA 44C,44D	1.73
T MERTON	CA 20 SEC 1	2.01	P YARCK	CEMETERY RESERVE	2.01
P MOE	CA 1A SEC B	4.05	T YARRAGON	CA 1 SEC 2	4.72
P MOE	CA 164E	3.50	P YEA	CA 31C	6.07
P MOLESWORTH	CA 1E SEC 5	4.77	T YEA	CA 6C SEC A	5.55

Appendix IX

UNCATEGORISED PUBLIC LAND

Parish (P) or Township (T)	Description	Area (ha)
T ALEXANDRA	CA 8 SEC 47	0.20
T ALEXANDRA	CA 5 SEC 12	0.10
T ALEXANDRA	CA 2A SEC 13	0.11
T ALEXANDRA	CA 17A SEC 67	0.19
P ALEXANDRA	CA 30L	0.75
P ALLAMBEE EAST	CA 59A,59B,59C	1.19
Note: This block is used occasionally for school camping.		
P ALLAMBEE EAST	CA 10E,10H	1.28
P BALNARRING	CA 88C	0.75
T BASS	CA 9 SEC 6A	1.00
T BEVERIDGE	CA 62A NO SEC	0.80
T BEVERIDGE	CA 61,62 NO SEC	8.98
P BILLIAN	CA 3B SEC B	1.00
P BITTERN	C.L IN CA 88	1.00
T BONNIE DOON	CA 4B SEC 8	0.15
P BROADFORD	CA 135D	0.50
P CLONBINANE	CA 33H, 33J	12.67
T CORA LYNN	CA 17A,17B,17C SEC F	1.88
T CORA LYNN	CA 14G SEC F	2.00
P CORINELLA	CA 167A	1.28
P CORINELLA	CA 155H	0.76
P CORINELLA	CA 106B	1.79
P CORINELLA	CA 83A	0.20
T CORINELLA	CA 3A,3B,3C,4A,5A SEC A	0.96
P DELATITE	CA 52A,52B	1.25
P DERRIL	CA 11C	2.89
P DERRIL	PART CA 4 SEC A	22.00
T DIAMOND CREEK	CA 1 & 2 SEC 14	0.19
P DOOLAM	CA 106B1,106B2	1.25
T DROMANA	ADJ CA 5 SEC E	1.75
T DROUIN	CA 20 SEC 12	0.25
P FLOWERDALE	CA 22F NO SEC	1.76
P FLOWERDALE	CA 17D NO SEC	0.50
P FLOWERDALE	PART CA 8A SEC B	5.80
P FUMINA	ADJ CA 20	2.82
P FUMINA	CA 62B	0.43
P GEMBROOK	CA A11C SEC B	0.10
P GEMBROOK	CA 76A SEC G	0.25
P GEMBROOK	CA A10A SEC B	0.23
P GEMBROOK	CA 73	6.07
P GHIN GHIN	ADJ CA 59	1.00
T GOBUR	CA 1 2 3 SEC 8	0.13
T GOBUR	CA 4 5 SEC 13	0.25
T GOBUR	CA 11 SEC 14	0.11
T GOBUR	CA 1,2,3 SEC 1	0.22
T GOBUR	CA 1,2,3,4 SEC 10	0.32
T GOBUR	CA 2,5,6 SEC 9	0.15
P GOBUR	CA 16J	26.47
P GRACEDALE	CA 34J SEC 2	0.10
T GRANTON	CA 1 SEC M	1.91
T GRANTON	CA 7–9 11–19 SEC J	0.66
T GRANTON	CA 11–13 16–18 SEC H	0.61
P GREENSBOROUGH	CA 23B SEC C	3.84
T JAMIESON	CA 6 SEC 19	0.28
T JAMIESON	CA 8 SEC 28	0.21
T JAMIESON	CA 7,8,9 SEC 22	0.70
T JAMIESON	CA 6 SEC 12	0.35
P JINDIVICK	CA 59E	3.30
P JUMBUNNA	CA 51D	0.51
P JUMBUNNA	CA 28B	0.17
P JUMBUNNA EAST	CA 41E NO SEC	1.21
P KANGERONG	CA 2,3,6B PARTS 3B, 8A, SEC 3	54.40
T KILCUNDA	CA 3B	2.20
T KILCUNDA	CA 17A SEC 2	0.20
T KILCUNDA	CA 29 SEC 2	2.61
P KILLINGWORTH	CA 66B	0.75
P KINGLAKE	CA 73E	4.01
T KINGLAKE EAST	CA 18	0.81
P KONGWAK	CA 25J	0.99
P KOO-WEE-RUP	CA 43A SEC J	0.25
P KOO-WEE-RUP	CA 1H,1J SEC H	5.20
P KOO-WEE-RUP	CA 11A SEC T	0.16
P KOO-WEE-RUP	CA 33A SEC H	1.54
P KOO-WEE-RUP	CA 48A,48B SEC I	0.12
P KOO-WEE-RUP	CA 1K SEC H	0.20
P KOO-WEE-RUP EAST	CA 40A SEC D	0.16
P KOO-WEE-RUP EAST	CA 69E SEC B	6.50
P KOO-WEE-RUP EAST	CA 1A SEC M	2.50
T KORUMBURRA	CA 16C SEC B	0.98
T KORUMBURRA	CA 5 SEC G	0.78
T KORUMBURRA	PART CA45 SEC R	6.30
P KORUMBURRA	CA 10A	0.40
T LONGWARRY	CA 10 SEC 2	0.20
T MERTON	CA 8 SEC 4	0.81
P MOE	CA 147C	1.00
P MOE	CA 101D	4.00
P MOE	CA 24A	0.10
P MOE	CA 32A	1.79
P MOONDARRA	CA 12E NO SEC	2.30
P NAR-NAR-GOON	CA 95D NO SEC	2.30
Note: This former recreation reserve may have community uses or could be considered for revegetation.		
T NARBETHONG	CA 5 SEC 15	1.18
P NARREE WORRAN	CA 48C	26.24
Notes: 1. This block - the former gun club at Lysterfield - adjoins municipal land. It would be preferable if future use of these areas were planned jointly. 2. Remnant vegetation should be retained.		
P NARREE WORRAN	CA 37A,42A,42B SEC B	8.30
P NEPEAN	CA 43A	1.00
P NEPEAN	CA 146A,146C	0.08
P NILLUMBIK	ADJ CA 14J SEC 3	0.40
P NILLUMBIK	CA 5F SEC 18	0.12
P PAKENHAM	CA 14	0.81
P PAKENHAM	CA 14A	1.00
P POOWONG EAST	CA 29B	0.57
P POOWONG EAST	CA 29D	0.51
T REEDY CREEK	CA 1A SEC 7	0.40
T SAN REMO	CA 10E SEC A	0.68
P SCORESBY	PART 40 ACRE PADDOCK	10.00
T SEVILLE	CA 61	0.80
T SMITHS GULLY	CA 46A	0.40
T SMITHS GULLY	CA 50B	0.30
P SUTTON	CA 47C	1.51
P TANJIL EAST	CA 10A,10B PT 11C 13C SEC C	3.59
P TANJIL EAST	PART CA 13C SEC C	24.29
P TONIMBUK EAST	CA 88T SEC C	3.01
P TYABB	PART CA 2	64.75
P TYABB	CA 32A & CA EAST OF 32	8.00
P WALLAN WALLAN	CA 3B SEC K	3.51
P WANDIN YALLOCK	PARTS CA 39B,39C, 124A SEC B	55.00
Notes: 1. Remnant vegetation should be protected. 2. Any future water treatment facilities should be built on the former quarry site and associated disturbed areas.		
P WANNAEUE	CA 31E NO SEC	0.70
P WHANREGARWEN	CA 75C	1.50
P WINDHAM	CA 20D,20E,20L NO SEC	5.00
P WINDHAM	CA 116C	1.25
P WINDHAM	CA 112K NO SEC	0.25
P WINDHAM	CA 54D	2.01
P WINDHAM	CA 2B,10F,12C,119D	50.66
P WINDHAM	CA 123D	1.51
T WONTHAGGI	CA 6 SEC 3C	10.85

(continued)

Parish (P) or Township (T)	Description	Area (ha)
T WONTHAGGI	CA 48 SEC 54A	6.30
Note: Further assessment of historical, natural and potential open space values is required.		
T WONTHAGGI	CL WEST OF SEC 34	2.50
T WONTHAGGI	CA 70 - 74 SEC 98	0.41
P WONTHAGGI	CA 41E	0.77
P WONTHAGGI	CA 26J	3.50
Note: Further assessment of historical, natural and potential open space values is required.		
T WONTHAGGI	PART CA 6 SEC 26	5.56
Note: Given the quantity of public land at Wonthaggi recommended for potential urban subdivision, the Council believes this area should be retained in public ownership.		
T WONTHAGGI	CA 6,7,8 SEC 32	0.31
P WONTHAGGI	CA 26H (WESTERN & N.E. PART)	88.00
Note: A program of revegetation is required		
T WONTHAGGI	CA 8–14 SEC 33	0.93
Note: Further assessment of historical, natural and potential open space values is required.		
T WONTHAGGI	STHN SECT. CA 1 SEC 109	1.30
T WONTHAGGI	CA 3,4 SEC 26	1.44
P WONTHAGGI NORTH	CA 91B	0.06
P WOODBOURNE	CA 4C SEC C	3.25
T WOODS POINT	C.L IN SEC 4	0.11
Y WOODS POINT	CA 4 SEC 19	0.10
P WOOLAMAI	CA 90F	3.33
P YANNATHAN	CA 44B	5.10
Note: This former recreation reserve may have community uses or could be considered for revegetation.		
P YARCK	CA 46B	5.52
P YARCK	CA 53D,53C	7.50
P YARRAGON	CA 17A of E	0.81
P YEA	CA 90F	4.27
P YEA	CL IN CA 146A	0.41
P YEA	CA 144D	0.50
T YEA	CA 1A SEC 18	0.81
P YUONGA	ADJ CA 18	0.25

Appendix X

GUIDELINES FOR LAND EXCHANGE PROPOSALS

The following list includes matters that should be taken into account (with respect to both the freehold land and the public land proposed for exchange) when assessing such proposals.

Conservation values

* significant or rare plants, or diverse flora
* important fauna habitat
* representative areas of land or vegetation types, particularly examples of land or vegetation types that are not contained in existing reserves
* scenic or landscape features
* historical associations
* sites of geological significance

Resources

* hardwood timber
* sites suitable for softwoods
* gravel or stone
* minerals
* water supply

Soil conservation and catchment protection

* existing erosion
* soil and site characteristics, such as soil group (type), land slope, soil erodibility, soil depth, or site drainage
* proximity to streams or storages in water supply catchments
* use of water in storages

Uses

* informal recreation, or sites providing access into other public land for recreation
* timber production
* education
* utilities

Efficiency of land management

* manageability of land, with respect to boundaries or shape
* proximity to existing reserves
* accessibility from existing roads
* undesirable effects on adjacent land, such as boundary irregularities, inliers of freehold land surrounded by public land, need for relocation of tracks, increased risk of fire, effects of erosion or weed problems
* areas of public land made a available for freehold land use should in general be added to an existing, adjacent landholding

Additional public costs

* provision of new roads, utilities, or other services
* establishment costs for surveying, fencing, and access
* land restoration costs for cleared or eroded areas

The Council considered that, having assessed proposed land exchanges using the above criteria, for any land exchange to be recommended, it must result in the enhancement of the value to the community of the public land estate.

The financial arrangements for any exchange proposal approved by the Government would be determined by the Valuer-General and the land managing department.