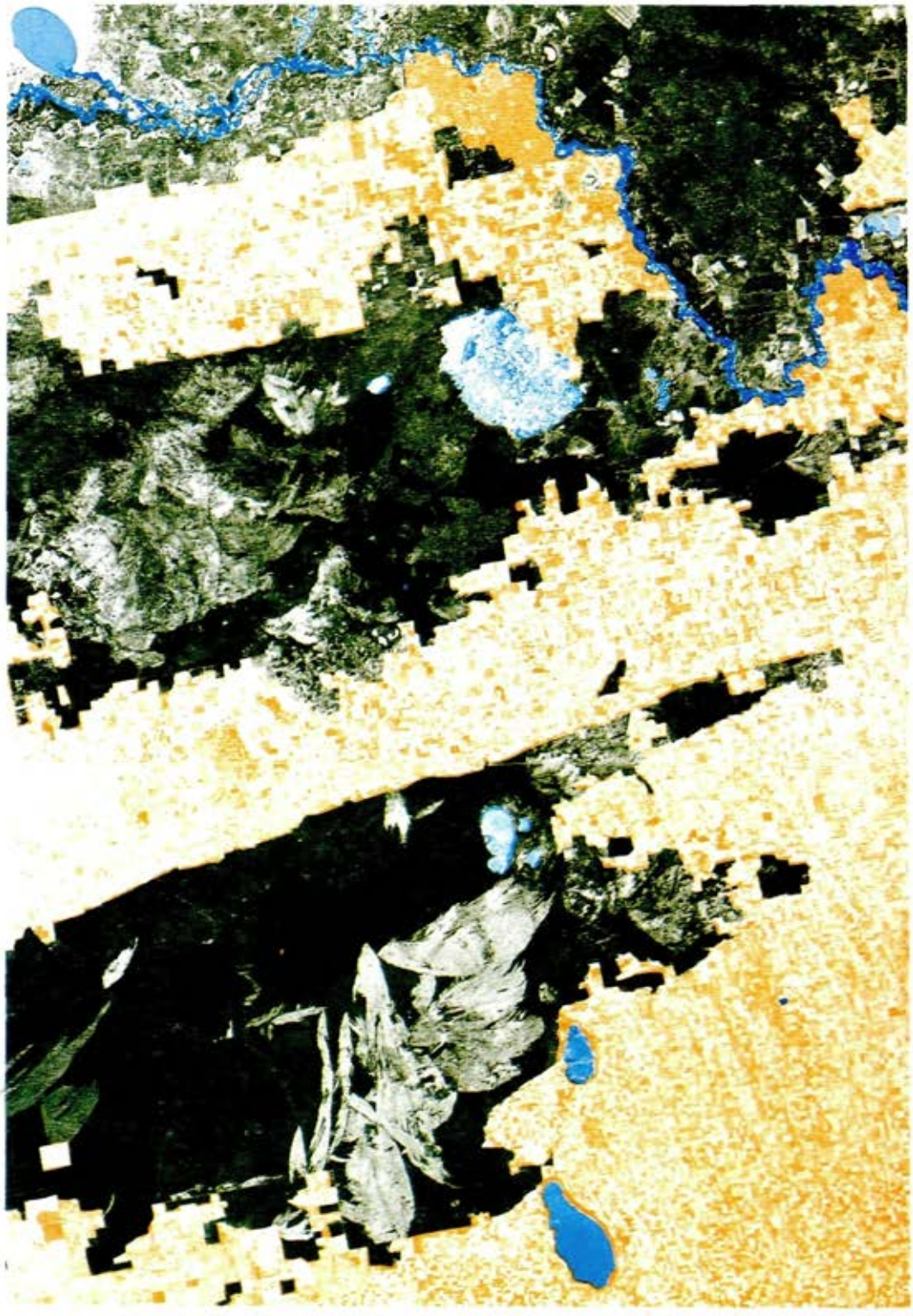
MALLEE AREA

REVIEW

PROPOSED RECOMMENDATIONS



LCC LAND CONSERVATION COUNCIL

Erratum

Map 15

Please replace the key to Map 15 with the following:

LAND PROPOSED FOR EXCHANGE

CONSERVATION COVENANT

PUBLIC LAND RECOMMENDED FOR ALIENATION

LAND CONSERVATION COUNCIL
Government of Victoria
Fourth Floor, 464 St. Kilda Rd. Melbourne, Victoria 3004
Phone: (03) 267 1311 Fax No. (03) 267 5896

Reference:

PROPOSED RECOMMENDATIONS

MALLEE AREA REVIEW

Submissions Invited

These Proposed Recommendations are published to allow all who are interested in the use of the public land under investigation in the Mallee Area, Review, the opportunity to comment by making written submissions to the Land Conservation Council.

All such submissions must reach the Secretary no later than **Monday, 21 November 1988.** These submissions will be considered by the Council before Final Recommendations are made on the future use of public land in the study area. It is suggested that persons wishing to make a confidential submission should first contact the Chairman of the Land Conservation Council.

Yours sincerely,

S. M. Whitty

SANDRA M. WHITTY
Secretary

MALLEE AREA

REVIEW

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SEPTEMBER 1988

LAND CONSERVATION COUNCIL
Fourth Floor, 464 St. Kilda Rd. Melbourne. Victoria 3004
Phone: (03) 267 1311
Government of Victoria

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Cover:

Landsat image of the western portion of the Mallee

Landsat imagery provided by the Australian Centre for Remote Sensing, Division of National Mapping, Department of Administrative Services.

Jean Gordon Government Printer Melbourne

Contents

Introduction

The Land Conservation Council was established by the *Land Conservation Act* 1970. As one of its three functions, it makes recommendations to the Minister for Planning and Environment with respect to the use of public land, in order to provide for the balanced use of land in Victoria. Notices showing the boundary of the Mallee study area and advising that an investigation was to be carried out were published in the *Victoria Government Gazette* of 19 June 1985 and in local and other Victorian newspapers in June 1985. A descriptive resources report was published on 26 November 1987.

Submissions

Following the publication of the report, the Council received 201 submissions on the future use of public land. Individuals, associations, companies, and local and State government bodies, representing a wide cross-section of the community, made helpful submissions covering possible forms of land use for the district. In addition, discussions have taken place with many individuals and groups, both in the Mallee and in Melbourne prior to the formulation of the recommendations.

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

Availability of submissions

All submissions received by the Council are available for inspection at the Council's office, 4th Floor, 464 St Kilda Road, Melbourne.

Report contents

This report contains the Council's proposed recommendations concerning the use of public land in the Mallee area. The recommendations in the text are grouped under major headings, such as Parks, State Forest, and so on. Accompanying the text is a pair of maps at the scale of 1:250 000 which cover the whole study area and give a broad view of the recommended land uses. More detailed maps show the location of recommended land uses in the vicinity of Mildura and some of the areas recommended for agriculture (by alienation). Additional information on boundaries is held by the Land Conservation Council.

Land uses

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 part of the range of land types found in the study area); flora reserves and flora and fauna reserves for areas of value for conservation of representative plant communities and habitat; and wildlife reserves for sites containing valuable faunal habitats. Substantial areas are recommended as State forest.

Where demands from competing uses vie for a given area of land, it is not 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 demands. 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. Our knowledge of many resources (for example, minerals) and of the distribution and ecology of plants is very imperfect. 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 demands for resources on public land may require alteration or modification of these recommendations, which are based on the best information presently available.

Table 1 summarizes the recommendations in terms of the major forms of use.

It is important to realize that each primary use has a number of compatible secondary uses. In addition to nominating the best uses for the

Table 1: Public Land Use

Land use categories	*Area (ha)*	*Percentage of all land covered by these recommendations*	
		All land	*Public*
National parks	943 550	22	57
State park	1 870	< 1	< 1
Regional parks	10 860	< 1	1
Wilderness area	113 500	3	7
Reference areas	34 310	1	2
Wildlife reserves	25 260	1	2
River Murray reserve	11 540	< 1	1
Agriculture—alienation	29 440	1	2
—research/education	1 517	< 1	< 1
Flora and flora and fauna reserves	45 670	1	3
Education areas	2 700	< 1	< 1
Bushland reserves	15 770	< 1	1
Scenic and streamside reserves	33	< 1	< 1
Mineral and stone reserves	8 315	< 1	< 1
Water supply and drainage reserves	7 300	< 1	< 1
State forest	411 800	10	25
Lake reserves	4 540	< 1	< 1

Notes:

1. The study area covers a total of 4 323 000 ha, of which 1 670 000 ha is public land.
2. Other land uses collectively make up the balance.
3. Figures are rounded.

land, the recommendations indicate what is considered to be the most appropriate form of tenure for the land and the most appropriate management authority.

Significance of the Victorian Mallee

The term 'mallee' is used to describe a wide range of vegetation communities and it is clear that species composition varies considerably between south-eastern Australia and Western Australia. In fact, quite marked differences exist between the New South Wales and Victorian mallees.

Altogether, about three-quarters of Australia's mallee vegetation has been cleared, mainly for agriculture. Sizeable areas still exist in New South Wales and Western Australia, but these are subject to grazing by stock and the vegetation structure and botanical composition have been considerably modified by this grazing and by altered fire regimes. As animal habitat, mallee is changed in a major way.

At the time of European settlement, mallee is estimated to have covered about 10·4 million ha of the Murray–Darling Basin, with around 4·2 million ha of that total occurring in Victoria. A continuous belt extended from southern New South Wales and north-western Victoria to the eastern edge of the Flinders Ranges in South Australia.

In Victoria, mallee vegetation (including semi-arid woodlands) originally occupied some 19% of the State. Approximately one-third of this original 1·6 million ha remains as public land, mostly within the Big Desert and Sunset Country blocks. The remainder has been alienated and subtantially cleared for agriculture. The public land portion of the Victorian mallee comprises about 15% of the former extent of Murray–Darling mallee vegetation.

In South Australia, virtually the only uncleared mallee occurs in conservation reserves. In New South Wales, while only a relatively small

proportion of the original mallee has been physically cleared, much of that in the south-west of the State has suffered disproportionately through heavy grazing, and most uncleared mallee is highly modified and still grazed by domestic stock. An embargo on the clearing of mallee in south-western New South Wales was lifted in May 1988.

Some 12% of the original area of mallee in the Murray–Darling Basin is included in existing conservation reserves (New South Wales 3%, South Australia 5·5%, Victoria 3·5%). The significance of the Victorian mallee is therefore very high as it provides the only opportunity to further protect relatively unmodified examples of mallee vegetation in south-eastern Australia.

In the Victorian context, the Mallee region makes an important contribution to the range of natural environments occurring in the State. The Mallee environment differs markedly from the outstanding natural values of the Alpine and East Gippsland areas of the State, but it has equally significant nature conservation values that are an important component of Victoria's natural heritage.

Unfortunately, however, there is very little representation on public land of the once-extensive mallee environments on heavier (clayey) soils. These were among the first areas to be alienated as they were more favourable for agriculture.

New information

The Council is aware that many changes in demand for the use of public land cannot be foreseen, and that the value of environmental resources will change as exploration, research, and technology progress. For these reasons, the Council believes that periodic reviews of public land use in the State are desirable, and it must be expected that areas will be re-allocated or adapted to meet changed demands.

Since the publication of the Council's Final Recommendations for the area in 1977, considerable new information about the Mallee 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

Until recently, few surveys of the natural resources in the Mallee had been undertaken, and the available information covered only part of the study area.

No vegetation mapping or detailed descriptions of the plant or animal communities were undertaken for the Council's original investigation of the Mallee area, and discussion was limited to a very general description of the component species of the major structural forms. 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 base for future land-use decisions.

The Department of Conservation, Forests and Lands undertook a major study to determine the nature and location of the plant communities on public land in the Mallee area and to prepare a floristic map of the region. Interpretation of aerial photographs and Landsat images was undertaken as well as a co-ordinated sampling of the vegetation types by botanists and analysis of the information to determine the vegetation communities.

In all, some 1300 individual plots (quadrats) were included in the analysis. No such intensive investigation of a large expanse of semi-arid vegetation has been undertaken elsewhere in Australia.

The Council employed other botanists to provide information on the nature and status of the vegetation on the small blocks of public land within the predominantly agricultural region as well as the vegetation on the floodplain of the Murray River. Information from these studies has been integrated with that compiled by the Department of Conservation, Forests and Lands.

Concurrent with the vegetation survey, the National Parks and Wildlife Division of the Department undertook surveys of the fauna of the region. The habitat of most species of native fauna is strongly vegetation-dependent, and the plant communities identified in the flora survey were used to describe the major faunal habitats.

Approximately 1000 species of native plants have now been recorded for the study area and, of these, some 200 are regarded as rare or endangered. More than 100 distinct floristic

sub-communities have been described and these have been combined to form 30 major communities. Several of these communities are rare, with 15 of them accounting for less than 10% of the vegetation on public land.

Furthermore, only 20% of the vegetation on public land is within a conservation reserve and several communities (sand-plain grassland, gypseous-plains grassland, gypseous-rise woodland, alluvial-plain shrubland and alluvial-rise shrubland) are unreserved at present.

The Council considers that the reserve system should include adequate representation of all plant communities, and this has been an important consideration in the additional areas proposed for parks and other reserves.

The protection of native fauna depends on the availability and protection of suitable habitat. The Mallee area includes a range of habitats for native animals and supports a number of significant faunal assemblages as well as rare or notable species.

Three small terrestrial mammals have been recorded since 1974 as a result of increased survey work and the use of new trapping techniques. The Mallee ningaui was first captured in Victoria in 1977, and the paucident planigale was found in 1985 during the survey for this review. The little pygmy-possum was identified as occurring in the Mallee in 1977; previously this animal was confused with the western pygmy-possum.

Recent surveys have also clarified the distribution and identity of several other species, including a number of bats.

The mammalian fauna of the Mallee area is distinctive in at least the following three respects.

- Many species known here either do not occur elsewhere in the State (red kangaroo, Mallee ningaui, paucident planigale, and Mitchell's hopping mouse) or are limited to this and closely related areas (silky mouse, western pygmy-possum, and greater long-eared bat).
- More species have disappeared from the study area since European settlement than from any other part of Victoria.
- The composition of the fauna within historical times differs distinctively from that in the rest of the State. Families well represented include the Dasyuridae (carnivorous marsupials comprising eight species), the Macropodidae (kangaroos, wallabies, and rat-kangaroos—six species), and the Muridae (rodents—seven species). The Phalangeridae and Petauridae (large possums and gliders—two species), however, are poorly represented in comparison with southern Victoria. The diversity of bats (families Emballonuridae, Molossidae, and Vespertilionidae—twelve species) is similar to that in other parts of Victoria, but the species composition differs.

The relatively hot and dry environment of the study area supports a distinctive element of Victorian avifauna that comprises mallee-dependent birds such as the malleefowl, red-lored whistler, mallee emu-wren, and black-eared miner and the typically inland species such as the inland dotterel, grey falcon, white-winged fairy-wren, and crimson chat.

Altogether, some 300 bird species have been recorded in the Mallee with more than 75% of these known to presently breed in the area. Particularly prominent groups, both in numbers and diversity, are the raptors, parrots, and cockatoos throughout the Mallee and, in the Big Desert, the honeyeaters.

In the south-east, the extensive Kerang wetlands provide habitat for many water-birds and waders, while along the Murray many hollow-dependent species, including the regent parrot, live and breed in the large old river red gums.

Widespread clearing of mallee and *Callitris-Casuarina* woodland has resulted in the severe decline and near extinction of some bird species. These include the malleefowl, black-eared miner, magpie goose, kori bustard, western whipbird, and spotted bower-bird.

The conservation status of birds in the Mallee is currently threatened by—

- existing and increasing isolation and fragmentation of populations, leading to potentially disastrous genetic consequences for some species
- degradation of remaining natural habitat by introduced grazing mammals, and modified fire regime
- pesticide accumulation in the food chain

- egg collectors, wild-bird fanciers and dead-bird traders
- introduced carnivores

The 77 species of reptiles currently recognized in the Mallee represent nine families. These comprise three fresh-water tortoises (family Chelidae), nine geckos (Gekkonidae), nine legless lizards (Pygopodidae), seven dragon lizards (Agamidae), three goannas (Varanidae), 22 skinks (Scincidae), eight blind snakes (Typhlopidae), one python (Boidae), and 15 venomous snakes (Elapidae). This far exceeds the number found in any other Victorian region.

The Mallee contains 19 vertebrate species regarded as 'significant' as well as a further eight that are 'notable' and for many of these there is inadequate habitat protection. Knowledge about the Mallee fauna is still far from complete and further research is required so that effective protection and conservation can be achieved.

Land systems

Information on land systems for the Council's initial investigation of the Mallee area was based largely on the 1963 report 'A Study of the Land in North-western Victoria' by J. N. Rowan and R. G. Downes.

By using more detailed aerial photography than was previously available, topographic maps, and recent geomorphic data, verified by some field checking, a greater degree of resolution of the land systems for the area has been achieved.

Land systems across the State have recently been standardized so 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 900 land systems have been identified for Victoria. The Mallee area contains 42, of which only 14 are represented in the existing parks. A further 14 are very small or have little or no representation on public land. Some of these, however, have limited representation in other areas set aside for conservation, such as wildlife and flora reserves. Land systems in the Mallee vary greatly in their susceptibility to different erosion hazards. The potential for deterioration can be increased or decreased, depending upon the management regime applied.

Wilderness

A survey of wilderness quality conducted in 1987 (Preece and Lesslie) indicated that the largest areas of highest wilderness quality in south-eastern Australia are centred around the Big Desert and Sunset Country; the largest area being the Big Desert Wilderness.

The survey used four indicators to assess wilderness quality and focused on two major attributes of wilderness—remoteness and naturalness:

- remoteness from settlement—that is, from settled (cleared) land or points of permanent occupation
- remoteness from access—that is, from constructed vehicle access routes
- aesthetic naturalness—the degree to which the landscape is free from the presence of the permanent structures of modern technological society
- biophysical naturalness—the degree to which the natural environment is free of biophysical disturbance caused by the influence of modern technological society.

The results of the survey support the findings of an inventory of wilderness in Victoria conducted in the late 1970s (Feller *et al,* 1979).

Other information

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

Major land-use issues and recommendations

A number of important issues regarding the use of public land have arisen during this review and indeed, the review was brought forward in response to community concern about the clearing of public land for agriculture and the lack of detailed ecological information about the region.

Wildlife corridors and the black-eared miner

Concern expressed early in 1985 over the clearing of Mallee land for agriculture (especially in some areas that formed corridors between major blocks of public land) and the lack of detailed ecological information for much of the public land in the region led to the Council's current review. The government also decided not to proceed with the allocation of land recommended by the Council in 1977 for cultivation leases, as well as some of the areas recommended for alienation, until comprehensive flora and fauna surveys had been undertaken. Elimination of the corridor between the Sunset Country and the Annuello block was regarded as a further fragmentation of faunal habitat, particularly for species such as the black-eared miner, which now occurs in this area in very low numbers. Past clearing and fragmentation of habitat has favoured the closely related yellow-throated miner, which has invaded new areas and hybridized with the black-eared species, resulting in the near extinction of the latter. The Council acknowledges the importance of such corridors and has recommended their retention and protection. It has also endeavoured to minimize further fragmentation of public land.

Limited cultivation leases

In its 1977 final recommendations (Recommendation F1) the Council identified some 73 200 ha that could be alienated for agriculture. Much of this land had been cleared, fenced, and cultivated in good faith in the expectation that it would eventually be alienated, although in a few cases unsuitable land was cleared and some areas were cleared without permission. The Council took into account the necessity to rationalize public land boundaries and many of the scattered parcels were not recommended for sale; instead, areas for development were consolidated where possible, principally in the Parishes of Wymlet and Kia, north of Ouyen. Most of this land has now been alienated and cleared under Improvement Purchase Leases.

A further 34 000 ha were approved for Limited Cultivation Leases (then Recommendation F2) in 1977, but concentration on the alienation of F1 areas and the need to develop management plans for the cultivation areas has delayed the implementation process and, to date, none have been issued. Council acknowledges the concern that has been expressed in the region that cultivation licensees have been substantially disadvantaged in comparison with those who were able to purchase land outright. The main reasons for this have been non-implementation of the previous recommendations, lack of secure tenure, controls on clearing, and the belief that much of the F2 land is similar in nature to the F1 areas.

As part of this review, the Council commissioned a group of consultants (McGowan International and Australian Biological Research Group) to provide detailed information on the F2 areas and has obtained further information from discussions and submissions. As a result the Council has adopted a number of guidelines to deal with the areas and these are set out in Chapter F, Agriculture. In general terms, however, Council is recommending that all areas under cultivation licence that were cleared prior to 1988 be alienated, except for some that form corridors between major blocks of public land. In line with the broad thrust of the Council's recommendations that no further areas of native vegetation be cleared and that disturbed areas be rehabilitated, those portions of the F2 blocks that are vegetated would remain in public ownership, subject to the need to rationalize public land—private land boundaries.

Grazing on public land

Grazing of native forage on public land has been an important factor in the agricultural development of Victoria. In the early days considerable time was required to clear and develop land, and the native pastures on that cleared land had limited productivity. Public land grazing was therefore an important source of income for many farmers.

The situation is different now. As a result of modern technology and management, much of the freehold land is cleared and sown to crops and improved pastures. The general importance of grazing on public land has declined, although it remains important to some farmers and is occasionally used in times of emergency when feed is scarce on the farms. At the same time, community attitudes towards the public lands have changed, and many

people now expect these to be used and managed in a way that will conserve the natural ecosystems.

At present the native forage on more than 500 000 ha of public land in the Mallee is grazed under annual licences issued under the *Land Act* 1958 or, in the case of the forests along the rivers and streams, under agistment rights or annual licences issued under the *Forests Act* 1958. Such grazing is usually an adjunct to farming on freehold land, but some of the holders of large licences do not have freehold land.

In its Final Recommendations for the Mallee in 1977, the Council stated its belief that the grazing of public land carrying native vegetation could continue at a low intensity. In addition, it considered rabbit control, reclamation of damaged areas, and the fencing out of some areas for regeneration to be essential if public land were to be managed as a community asset. In 1977 it recommended the granting of long-term grazing licences where appropriate, but none have yet been issued in the Mallee area.

In 1987, the Land Conservation Council commissioned ACIL Australia Pty Ltd to conduct a study of the larger areas of public land in the Mallee that are used for grazing, to provide information on the way they are used and their condition. Some 40 separate licence areas of 1000 ha or more were investigated; these are licensed to less than 20 individual enterprises.

The grazing of domestic stock may produce several effects that reduce the land's potential for a number of future uses, especially those involving nature conservation and recreation.

Council is also aware of the concern among graziers in the Mallee regarding the long period of uncertainty with respect to the future of public-land grazing and the problems this has created in terms of financial decision-making and effective management of the licensed areas. It is recognized that, with few exceptions, grazing licences have been managed in accordance with government policy and in co-operation with departmental officers, based on the best available information.

However, in the light of new information, the Council now believes that grazing is incompatible with the protection and maintenance of important conservation values, in particular those associated with the native grasslands, woodlands, and chenopod shrubland communities in the region. It has therefore recommended that, apart from the riverine woodlands, grazing be phased out of the other large blocks of public land by 1999. This is discussed in detail in Chapter F, Agriculture, and the sequencing of the phase-out is shown on Map D. The grazing phase-out is also part of the broad Council aim to maintain and improve the native perennial overstorey and understorey vegetation to reduce the wind erosion and salinity hazards associated with public land. The government is funding programs on private land to control these hazards, and Council believes that the management of public land should complement those efforts on freehold land.

Council acknowledges that the phase-out of grazing imposes responsibility for management of these areas on the Department of Conservation, Forests and Lands and that to achieve the object of protecting important conservation values the Department will require a significant increase in resources to control vermin (particularly rabbits) and noxious weeds. The problem is one of total grazing pressure, involving domestic stock, vermin such as rabbits and goats, and native fauna such as kangaroos. A co-ordinated management effort is required by the Department, which has shown that—with sufficient resources—it can achieve the required level of control.

Salinity

Salinity has been recognised by the government as the single greatest threat facing Victoria's environment. The study area contains some of the worst-affected land in the State.

Extensive clearing of trees and the introduction of large-scale irrigation are the main factors that have contributed to rising groundwater levels, the primary cause of salinity. The problem has been further exacerbated by the change from deep-rooted native perennial plants to shallow-rooted annuals.

A recent study by the Department of Conservation, Forests and Lands, indicates that, between 1972 and 1987, a total of 246 000 ha of predominantly native forest has been cleared from public and private land in the State, an

average rate of 16 000 ha per year. Some 209 000 ha of this is from freehold land. Taking into account reforestation programs, which on public land balance the rate of clearing, the average loss of forest cover from freehold land is 11 000 ha per year, mostly in western Victoria.

In the department's Mildura region, which is included within the Mallee area, the net loss from public land over the period was some 5 000 ha, reflecting clearing under improvement purchase leases and cultivation licences and a gradual deterioration of licensed grazing areas; on freehold land, the net loss of forest cover here was almost 29 000 ha.

The Council recognises the important role of the public land in reducing the effects of salinity and supports a co-ordinated approach on both private and public land to resolve the problem. It has made several recommendations about salinity in Chapter O, Water Supply and Drainage, and other recommendations take into account the need for the use and management of public land to complement the efforts of government and the community to control salinity on private land.

Rivers, wetlands, and environmental flows

Regulation of natural water supplies for irrigation and stock and domestic use, combined with the establishment of extensive agricultural areas, has changed the nature of many of the Mallee's streams and wetlands. While some of these changes might have benefited some native plants and animals, others have made the region's wetland areas less suitable as habitat for native species.

Although water regulation and distribution works have altered wetland conditions in a number of circumstances, the Rural Water Commission, in co-operation with the Department of Conservation, Forests and Lands, has attempted to preserve and enhance wildlife habitat wherever practicable.

However, concern is growing about the environmental condition of streams and wetlands in the Mallee, especially the Wimmera and Murray River systems. The Council believes that the need to improve conditions in these streams is urgent and that additional water should be allocated for environmental purposes (see Chapter O, Water Supply and Drainage).

Exploration and mining

The Council's policy with respect to exploration and mining is that public land other than reference areas and other areas as determined by the government continue to be available, subject to a number of principles and guidelines.

This policy is based on the government's responsibility to establish the existence and extent of the State's mineral resources. It is also related to the fact that, without detailed knowledge of specific proposals for exploration and mining, it is not possible to ascertain whether such activity would be compatible with the maintenance of environmental values.

The Council's policy therefore includes the following important principle.

> 'Some areas of land surface—because of their inherent instability or special public significance (for example, community assets or areas with important scenic, archaeological, historical, recreation, or nature conservation values)—warrant permanent or temporary exclusion from exploration and/or extraction of minerals. The Department of Industry, Technology and Resources and the land manager should together determine these areas.'

This process may not be working satisfactorily as there is considerable concern about the damage to areas of public land with significant conservation values and about the standard of rehabilitation in some areas. An objective assessment of these matters would be helpful in the debate. The mining industry has also expressed concerns regarding the difficulties being experienced in gaining access for exploration and mining on public land.

Currently, the government is reviewing the *Mines Act* 1958 and it would be appropriate for the Council to review its policy at this time and provide input to the legislative review.

Present government policy precludes exploration and mining in national parks unless it had commenced prior to the area being scheduled as a park. Furthermore, the State Conservation Strategy notes that 'in parks and reserves set aside primarily for the protection of natural ecosystems, no further mining, forestry, grazing or other commercial activities will be allowed.'

Council acknowledges that, although its current policy is generally in support of exploration and mining in parks and other reserves, government policy could exclude these activities from large areas of the Mallee that are proposed for inclusion in the park and reserve system. Notwithstanding the Council's general policy on exploration and mining, it is recommending that extraction of salt and gypseous material should be excluded from flora and fauna reserves, particularly in the eastern Mallee where the few parcels of public land are relatively small in area.

Apiculture

Apiculture is an important industry on public land in the Mallee for honey production and the overwintering of hives. Horticultural and agricultural enterprises also benefit from the apiculture industry, as the bees are used for pollination of fruit and seed crops.

Although apiculture has been regarded as compatible with most other uses of public land, some evidence suggests that introduced bees have an impact on the natural environment and may compete with native fauna for nectar and nesting and roosting sites and that honey bees are less species-specific during foraging, with the result that cross-pollination may lead to hybridization between native plant species. The Council considers that further research is required into these matters.

Two other problems cause concern: the industry develops new tracks in mallee and heathlands; and feral bees occur around popular tourist destinations. Council believes that these should be closely monitored by the Department of Conservation, Forests and Lands.

The Council is recommending that no new bee sites be established on public land, pending the results of further research into the impacts of feral honey bees (see Chapter F, Agriculture).

Broombush harvesting

Mallee broombush (*Melaleuca uncinata*) is harvested from extensive areas—primarily in the Big Desert—to produce broombrush panels used for fencing, feature panels, and shadehouses. Five commercial licensees operate in the Mallee, supplying markets in Adelaide and, to a lesser degree, in Melbourne.

Although there is some concern as to the biological impacts of broombush harvesting—particularly on animals requiring mature broombush—its major impact is the proliferation of tracks intruding progressively into previously untracked parts of the Mallee, compromising nature conservation and wilderness values.

The industry has been operating without detailed information about the available resource and sustainable level of harvesting and without adequate supervision. Reorganization of the industry and improved supervision is now under way, as is an assessment of the broombush resource in the Mallee.

Council believes that the industry should be confined to specific areas within the Big Desert. Harvesting should be conducted in accordance with the guidelines specified in these recommendations and, following assessment, harvesting levels should be based on the annual sustainable yield from available areas. Between its proposed and final recommendations Council will review the use of the eastern portion of the Big Desert, which is currently available for broombush harvesting, following up-to-date assessments in this area.

Another project under way at present is investigating the proposal to cultivate broombush on private land. Council supports this initiative and has recommended that if it is economically and technically feasible to do this, broombush harvesting should be phased out from public land.

Proposed recommendations

In formulating its recommendations the Council has considered all the available information from a wide range of sources and has taken into account the various issues raised above. All the information on natural resources in the area was evaluated bearing in mind their significance on a State-wide basis. Aspects such as representation of land systems and major land types, vegetation communities, fauna, and wilderness areas were considered, as well as the State-wide and south-eastern Australian significance of the Mallee with respect to nature conservation, and the protection of wilderness quality. Other important issues related to land protection and the need to reverse the current trend towards the long-term deterioration of public land values.

In the light of that evaluation, the Council now proposes to extend the existing reserve system in order to incorporate the full range of nature conservation values represented in the Mallee.

Major extensions to the Wyperfeld National Park and a large national park covering most of the Sunset Country and extending north to include Lindsay Island on the Murray River are proposed. A new State park, a regional park, and several new reserves set aside to protect flora and fauna are also recommended.

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 emphasize 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 other legitimate uses such as the harvesting of forest produce and mineral extraction.

Another important aim is to maintain the community's high regard for our conservation reserve system in Victoria by ensuring that this is representative and viable, and contains those areas that are outstanding or particularly significant.

The Council recognizes that many areas of public land in the Mallee that are not included in new or existing 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 two-thirds of all public land, it is of utmost significance as floral and faunal habitat. The government has placed greater emphasis than ever before on the protection of other values outside the reserve system and this is reflected in the aims of the State Conservation Strategy in relation to such areas. These 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 semi-arid vegetation and faunal habitats in south-eastern Australia and the need to maintain or restore an adequate vegetation cover to large areas of public land to minimize the risk of wind erosion and increasing salinity.

Many woodland areas and land adjacent to saline shrublands and boinkas in the Mallee have suffered a dramatic decline in vegetative cover. Overstorey trees are senescent and regeneration is virtually non-existent. Perennial native understorey shrubs and grasses are being replaced by annual exotic species. These changes need to be reversed to ensure reduction of the contribution public land makes to the salinity problem in the Mallee. This requires restoration of both the perennial overstorey and understorey species on these disturbed areas.

Wind erosion has long been of concern in the Mallee. Semi-arid lands, such as those occurring here, tend to erode when soils are exposed to strong winds. The main reasons for this are that the soil surface is only weakly bound by humus and is frequently dry.

The more susceptible lands are those with east–west or irregular sand dunes in the drier north and the Big Desert, many of which still occur on public land. These usually comprise deep infertile sands. Soils in the south-east of the study area are more stable due to their higher clay fraction, but they can be badly affected when poorly managed, particularly during droughts. Erosion becomes significant where the projected ground cover of standing vegetation is less than about 25 per cent.

Given the high risk of wind erosion associated with the larger blocks of public land, it is important to protect and, where possible, enhance the existing vegetation cover on these areas and minimize activities that disturb that cover. This includes minimizing the impact of fires, which can also expose large areas to the risk of wind erosion.

Council considers that the usual provisions for State forest, described in the Council's more recent recommendations for land use in other parts of the State, do not adequately address the significance of those parcels of public land in the Mallee that are not included in parks and reserves and away from the Murray River. It is recommending that these be designated as 'Protected Mallee Lands'. and be managed primarily to conserve and enhance their natural values, to protect the native vegetation cover where necessary, and to restore disturbed areas. Accordingly, activities including grazing and production of timbers, such as posts, poles and green firewood, would not be permitted and would be phased out. Extraction of other forest produce, including honey, may be compatible in certain areas and could be permitted to continue at the discretion of the land manager.

Public land and the Aboriginal people

The Aboriginal people occupied and used the Mallee long before white settlement and their descendants 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. The evidence to date suggests that occupation was centred on the river systems, although numerous sites have been identified in the drier mallee areas and further studies are needed in order to prepare a comprehensive register of sites. The Council believes that such studies should be carried out in association with the flora and fauna surveys conducted by the Department of Conservation, Forests and Lands. In addition, it is important that a detailed oral history of Aboriginal culture and history of the area be prepared as soon as possible, before valuable information is lost forever.

While government departments employ some Aboriginal people, prospects do exist for additional employment in the government sector, particularly in connection with the establishment of interpretive facilities.

The Council welcomes the commitment of the Department of Conservation, Forests and Lands to public participation in the preparation of management plans. It suggests that special attention be given to the involvement of the Aboriginal community particularly with respect to the protection and management of sites of particular significance.

The Department of Conservation, Forests and Lands

The Department of Conservation, Forests and Lands was formed in 1984 by amalgamating the Forests Commission, National Parks Service, Fisheries and Wildlife Division, Department of Crown Lands and Survey, Soil Conservation Authority, and part of the central administration of the Ministry for Conservation.

The primary role of the Department is to manage Victoria's public land so as to ensure that its resources are protected and used properly, and to care for the State's water catchments and assist landholders to conserve soil, fauna and flora, and general amenity.

Head Office, located in Melbourne, consists of seven Divisions, four of which are functional arms—now known as the National Parks and Wildlife Division, Fisheries Division, Lands and Forests Division and the Land Protection Division. This last Division comprises staff formerly in the Soil Conservation Authority, the Vermin and Noxious Weeds Destruction Board, and the tree-growing extension group within the Forests Commission.

The functional arms are responsible for policy development and the preparation of State-wide plans and programs, technical standards, guidelines and prescriptions, and for monitoring implementation in the regions.

Public land management is implemented by the Regional Management Division in accordance with the approved annual programs and the guidelines and technical standards provided by the Head Office functional groups.

The State has been divided into 16 regions and each regional group is responsible for the management of public land in that region, irrespective of whether an area is national or State park, State forest, or some other reserve set aside for a particular form of community use. Management plans will be prepared by staff from the regions and functional arms working together.

Particular attention has been given to fire-prevention and suppression. Fire-protection services for public land are provided and co-ordinated by the Regional Management Division. The amalgamation provides significant additional benefits: direct involvement of much larger forces of staff and employees in prevention and suppression; and better co-ordinated and more readily available support forces of manpower and equipment. All these elements collectively enable more effective fire-prevention and fire-suppression programs to be achieved on the public lands of the State.

Under the *Conservation, Forests and Lands Act* 1987, the Director-General of the Department of Conservation, Forests and Lands assumed the statutory responsibilities of such bodies as the Forests Commission (under the *Forests Act* 1958), the Soil Conservation Authority (under the *Soil Conservation and Land Utilization Act* 1958), and the Vermin and Noxious Weeds Destruction Board (under the *Vermin and Noxious Weeds Act* 1958). Although the various functional arms of the Department exercise particular responsibilities, their roles in the administration, planning, and management of public land are closely interwoven and consequently reference in the text will be to the Department rather than to specific sections.

General recommendations

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

The Council wishes to stress the need for adequate management and protection of public land, as it has made its recommendations on the assumption that sufficient manpower and finance will be provided for the appropriate management. Unless these resources are provided, the Council's recommendations cannot be effectively implemented. Council emphasizes that vermin and noxious weeds pose problems in the management of public land in the Mallee area. Finance and staff are required to research and implement methods of control of pest species. Council therefore recommends:

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

Following Council's proposal that additional arrangements be made for protecting public land from fire, an amendment to the *Forests Act* 1958 has created the designation 'protected public land', which may include public land that is not State forest or national park. The amended Act provides for the protection from fire of all three categories. The role of providing fire-prevention and fire-protection services has now been assumed by the Department of Conservation, Forests and Lands.

Under the provisions of the *Forests Act* 1958 and notwithstanding anything to the contrary in any other Act, fires in every State forest and national park, and on all protected public land, must be suppressed. This includes, for example, all areas included in the schedules to the *National Parks Act* 1975.

In the event of fire in any State forest, national park, or area of protected public land, powers of entry are provided under both the *Forests Act* 1958 and the *Country Fire Authority Act* 1958. Decisions as to the most appropriate course of action required to suppress the fire and as to the most appropriate equipment to be used, are the responsibility of the Department of Conservation, Forests and Lands.

The two organizations that carry out fire prevention and suppression in rural Victoria—namely, the Department of Conservation, Forests and Lands and the Country Fire Authority—have closely co-ordinated arrangements for mutual co-operation. The Council acknowledges that the control and suppression of fires in the Mallee rely heavily on the manpower and machinery resources of the volunteer fire brigades in the region.

The Council recommends:

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

Council recognizes that parts of the Mallee area have potential with respect to future mineral exploration and mining operations.

The Council recommends:

III That mineral exploration licences held over the area continue except in so far as they affect Reference Areas.

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

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

The Council also recognizes that in some cases existing legislation will have to be amended in order to effectively implement the recommendations in this report. It is aware that this may result in a delay, perhaps of several years, before some of its recommendations can be implemented. It is concerned that, where implementation of the recommendations would involve a change of land tenure, management efficiency could be reduced during the delay period. The Council believes that the government should direct that the intent of the recommendations should be followed until they are implemented.

The following recommendations concern the implementation of recommendations:

V That the present legal status and management responsibilities for public land continue until the resources required to implement the recommendations are available.

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

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

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

IX That, where areas of public land are not specifically referred to in these recommendations, present legal uses and tenure continue.

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.

In contrast to the rest of Victoria, the Mallee retains large areas that are essentially natural and contain examples of the landscape and flora and fauna virtually undisturbed by human activities since European settlement. Such lands are a valuable part of our heritage and must be dedicated for nature conservation and 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 semi-natural condition reserved because of its scenery, floral and faunal content, historical interest, or other features, which is used by the public primarily for open-space recreation and education'. This definition encompasses many different types of parks; 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 needed to clarify the main purposes for which each one is created, and will help 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.

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

Park categories

National park

> An extensive area of public land of nation-wide significance because of its outstanding natural features and diverse land types, set aside primarily 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. Interpretive 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.

State park

> 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. Interpretive services would be provided. Development of facilities would be limited to a very small portion of the park. Activities would largely consist of sightseeing and the observation of flora, fauna, and other natural features. State parks recommended by the Council are intended to complement the national parks so that together they form a State-wide system.

Regional park

> 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 stone extraction or timber harvesting—may be permitted where they are compatible with the primary use.

Park management

Council recognizes 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. In all parks the suppression of fires remains the responsibility of the Department of Conservation, Forests and Lands.

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 the Department of Conservation, Forests and Lands.

The two organizations that share the duty of fire-prevention in rural Victoria—namely, the Department of Conservation, Forests and Lands and the Country Fire Authority—have closely co-ordinated arrangements for mutual co-operation.

Control of vermin and noxious weeds within parks will continue to be the responsibility of the Department of Conservation, Forests and Lands, and will be carried out in accordance with plans prepared by the Department.

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

An essential aim in the reservation of an area as a park is to provide for the enjoyment of the public, 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 photography, bird-watching, nature study, etc., but also for activities such as scenic driving and touring using the tracks through rugged terrain and into isolated areas as well as the system of formed roads. Because of its network of roads and tracks, the region has particular value for motorized recreation. The Council considers that the park system should continue to contain a series of linked roads, mainly of four-wheel-drive standard, available for use by licensed vehicles in order that extended touring throughout the area is possible. However, as well as this system of linked roads, other subsidiary tracks should be maintained for community use.

The Council points out, however, that the existing system of seasonal road closures, for reasons such as safety and erosion hazard, should continue, after consultation between the managing authorities and user groups.

Dispersed camping occurs throughout the area in association with many outdoor recreational activities. The Council considers that large areas should remain available for dispersed or bush camping within the park system. That is, in these areas, users should be allowed to camp where they choose rather than be restricted to camping sites delineated by the managing authority.

Parks in the Mallee

In 1977, the Council recommended the enlargement of the Wyperfeld and Hattah Lakes National Parks, the establishment of the Pink Lakes State Park, and the establishment of two regional parks—in all, covering some 201 700 ha.

Wyperfeld National Park, on the eastern fringe of the Big Desert, contains examples of the irregular and east-west trending dunes of the desert and a chain of (usually) dry lakes on the floodplain of Outlet Creek—the northern extension of the Wimmera River. Within this

park, the river red gum forests and black box woodlands on the floodplain, slender cypress pine and buloke woodlands bordering the lower reaches of the floodplain, mallee scrub, and heathlands provide habitats for a wide variety of faunal species as well as being an important recreational resource.

Hattah–Kulkyne National Park receives a very high visitor use, much of which is based on the fresh-water lakes, which provide stark contrast to the nearby mallee and woodlands endemic to this semi-arid environment. This park is one of only three established world biosphere reserves in Victoria.

On the southern margins of the Sunset Country, Pink Lakes State Park is centred on a group of picturesque pink salt lakes. It includes samphire flats, woodlands growing on copi rises, fields of mallee-clad irregular dunes, and grasslands. Visitor use of this park is rapidly increasing.

Lake Albacutya is the focus of a regional park that, when the lake is full, is intensively used by local people and tourists for picnicking, swimming, boating, fishing, and hunting. The Murray–Kulkyne Regional Park, included with the Hattah–Kulkyne National Park in a world biosphere reserve, borders the Murray River and is highly popular for river-based recreation and camping.

New park proposals

In formulating its recommendations for major nature conservation reserves in the Mallee, the Council evaluated all the information on the natural resources in the area, bearing in mind their significance in a State-wide and south-eastern Australian context. Representation of important features and values in the existing park system was also taken into account.

Council is now proposing the establishment of a major new national park that includes the Pink Lakes State Park and incorporates the Sunset Country and Lindsay Island, embracing some 610 000 ha. Although licensed grazing occurs in some 20 per cent of this proposed park, these areas include some of the most significant and vulnerable vegetation communities and faunal habitat.

The recommendations also include a large extension to the Wyperfeld National Park and a new State park and regional park. In total, the proposed additions to the park system in the Mallee comprise more than 745 000 ha and increase the area within parks here to some 956 000 ha.

The large additions will provide representation in the park system of native plant and animal communities of the semi-arid environment of south-eastern Australia as well as those that are unique in Victoria, many of which are currently inadequately protected. They give recognition to the outstanding nature conservation and recreational values of the Mallee. Each addition to the park system is discussed further below.

The recommendations concerning national parks require the phasing out of stock grazing, and this is discussed in detail in Chapter F—Agriculture.

The Council is aware that many of the new park proposals contain areas that are disturbed by grazing of domestic stock, rabbits, and native fauna and past land management practices, such as timber harvesting. Considerable resources will be needed to bring the rabbit population down to acceptable levels and to foster adequate revegetation of these disturbed areas.

NATIONAL PARKS

Wyperfeld National Park

Recommendation

A1 That the area of 95 970 ha, shown on Map A, continue to be used for those purposes approved by the government following publication of the final recommendations for the Mallee area in May 1977.

Additions to the Wyperfeld National Park

Several areas are proposed for addition to the existing Wyperfeld National Park. These contain features and attributes that add to or enhance the values already found in the park. The particular attributes of each are described below. As well as the recommendations below that apply to all proposed additions, specific recommendations also apply to each of them.

Recommendations

A2–A4 That the areas indicated on Map A and described below be used to:

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

(ii) conserve and protect natural ecosystems

(iii) apiculture be permitted on existing, licensed, sites pending the outcome of research into the ecological impacts of this industry

(iv) harvesting of forest products not be permitted

(v) legal access continue to be available to freehold land enclosed within the park

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

and that they be included in a schedule to the *National Parks Act* 1975 and be managed by the Department of Conservation, Forests and Lands.

Western addition

Topography and land systems

Relatively high irregular sand dunes interspersed with sand-plains and closely spaced east–west dunes make up the major topographic features of the Big Desert and comprise the two main land systems (IPRc3 and EPRc3 respectively). Further topographic diversity is provided by rocky outcrops of Parilla Sand and broad swales of less permeable sands among the east–west dunes.

The proposed addition to the Wyperfeld National Park extends its representation of these major land systems—particularly of the irregular sand dunes, which comprise more than half of the Big Desert. It also adds broad sand-plains of the central Big Desert, which were previously under-represented in the park.

Vegetation

Three sites of botanical significance that also complement the park's representation of Big Desert environments are incorporated here. The northern portion contains the largest remnant of scrub-pine (*Callitris verrucosa*) woodland in the Mallee. The large size of the individual plants and limited species composition of this woodland indicate its great age—an unusual occurrence given the fire history of mallee scrub.

A number of natural water soaks occur along the northern fringe of the Big Desert. These would have been important to Aborigines utilizing the resources of the dune-fields. A number of stone artefacts have been found at several of them. Two of the soaks (Majorlock and 12-mile) are included in this park addition and associated with them are small stands of pine–buloke woodland and a stand of black mallee-box (*Eucalyptus porosa*). Both of these plant communities are now limited in extent on public land, being associated with soils with good agricultural potential; the latter is poorly represented in nature conservation reserves. An outcrop of Parilla Sand is also included in this addition, near Majorlock.

The largest undisturbed example of broombush mallee in the State is located in east–west dune-fields, south-west of Wirrengren Plain—only portion of which lies within the existing park. The addition ensures that the whole of this stand as well as a contiguous band of this community in the south is protected. Elsewhere, broombush is being utilised for the broombrush market.

Large, broad plains in the irregular dune-fields of Lowan Sand extending across the centre of the Big Desert support a sand-plain heath community. The botanical importance of these heathlands stems from their wide species diversity and, in spring, they flower profusely, making them scenically very attractive. These heathlands are under-represented in the existing park.

An extensive stand of red-swale mallee is included in the south. The community is much depleted in the Mallee as the heavier soils on which it is found are highly suited to agriculture. This area includes Milmed Swamp, Arnold Springs, and Chinaman Flat.

Fauna

The Big Desert supports a rich diversity of fauna; the semi-permanent water resources along the northern spring line, for instance, are extremely important to wildlife and the variety of habitats offered by the old scrub-pine,

heathlands, broombush, and red-swale mallee particularly, are valuable for their respective faunal communities.

Red-swale mallee, for example, supports four species of small mammals, malleefowl, the southern scrub robin, and a number of significant and notable reptiles, including the skink *Ctenotus brachyonyx*, the burrowing legless lizard *Aprasia inaurita*, and the coral snake.

Mallee heath, on the other hand, supports six species of small mammal and is utilised by a remarkable diversity of honeyeaters. Other important bird species here include the red-lored whistler (rare within an extremely restricted range in Australia), mallee emu-wren, slender-billed thornbill, and southern scrub robin. The reptile fauna include the only known occurrence of the earless dragon *(Tympanocryptus lineata)* in mallee vegetation, the dragon *Amphibolurus norrisi*, the common scaly-foot, the very rare legless-lizard *Aprasia aurita*, Rosenbergs goanna, the skink *Ctenotus brooksi*, the bardick, Masters snake, and the small burrowing snake *Unechis spectabilis*.

Other species of particular interest found here include western pygmy-possum (an uncommon species in Victoria, which depends on heaths, mallee-heaths, and broombush communities), silky mouse (which is also heath-dependent), Mitchell's hopping-mouse, Mallee ningaui, which is restricted to mallee with a porcupine grass *(Triodia sp.)* understorey, and malleefowl. The regent parrot, another significant bird species for Victoria, also utilizes the mallee eucalypts as a major source of food.

Wilderness values

Portions of the Big Desert were recognised by Preece and Lesslie as having high wilderness quality. The largest is contained within the Big Desert Wilderness Area. Two other large areas, one between the Milmed and Chinaman Well Tracks and the other immediately north of the Milmed Track and including the broad sand-plain heaths, fall within the proposed addition to the park. Because of their undisturbed nature, these areas have high conservation and recreational value, and they should be managed to maintain and enhance their wilderness values. Smaller areas are located south of the Chinaman Well Track and outside the park addition. These fall within one of the three semi-arid wilderness areas identified in the 1979 inventory of wilderness in Victoria by Feller *et al.*

Other

Portions of this area are accessible by four-wheel-drive routes, including the relatively popular Milmed Track, but much is suited to more remote, non-mechanised recreation. The area offers the 'outback' experience in less than a day's drive from Melbourne and the wide variety of native plant and animals found here are increasingly popular for nature study and photography, particularly the extensive heathlands.

Recommendation

A2 That the area of 159 380 ha, shown on Map A, be added to the Wyperfeld National Park and be used in accordance with the general recommendations outlined above and to:

(i) protect sites of archaeological importance

(ii) protect areas of high wilderness quality

and that

(iii) dispersed camping continue to be permitted where this is consistent with the aims of management

(iv) grazing not be permitted.

Other additions to Wyperfeld National Park

A number of small parcels of public land, listed in the schedule below, adjoin the eastern portion of the Wyperfeld Park and have conservation and recreational values that would complement those of the park.

Recommendation

A3 That the areas totalling 6570 ha, listed in the following schedule and shown on Map A, be added to the Wyperfeld National Park and be used in accordance with the general recommendations outlined above

and that

(i) grazing, where it is currently licensed, be phased out by 1 July, 1990.

Schedule of additions

A3 (a) 2640 ha in the Parishes of Tyamoonya and Nypo.
This area is currently part of the Lake Albacutya Regional Park, but does not receive the high recreational use for which that park is set aside. It contains an unusual occurrence of yellow gum woodland with a porcupine grass understorey, stands of slender cypress pine and buloke, as well as black box woodland and river red gum forest on the floodplain. Regent parrots, bush thick-knees, and wedge-tailed eagles nest here. Its addition to the Wyperfeld National Park would rationalise the boundary between the two parks and recognizes the conservation emphasis of management that the land should receive.

A3 (b) 900 ha, being Allotments 12 and 13, Parish of Wyperfeld.
This long-unburnt area contains a range of intact Big Desert floral communities associated with the east—west sand dunes. It is readily accessible by two-wheel-drive vehicles.

A3 (c) 1630 ha, being Allotments 9 and 9B, Parish of Dattuck, and allotments 8 and 8A, Parish of Yallum.
This incorporates a section of the now-disbanded Hopetoun-Patchewollock railway and extends the Wyperfeld Park boundary to the Hopetoun-Patchewollock Road. It contains loamy-sand mallee, tea-tree scrub, and scrub-pine woodland.

A3 (d) 20 ha in the south of Allotment 56, Parish of Patchewollock
and

A3 (e) 110 ha, being the southern portion of Allotment 46, Parish of Baring.
These areas abut the north-eastern section of the park and rationalize the boundary between the park and land proposed for alienation.

A3 (f) 1270 ha, being Allotments 30 and 38 and parts of Allotments 43 and 44, Parish of Baring.
This area straddles one of the main access routes to the northern end of the Wyperfeld Park. It is in a relatively natural state and contains a good example of loamy sand mallee—a community prevalent in much of the eastern part of the present park but somewhat less accessible to conventional vehicles.

Pine Plains

In its 1977 Final Recommendations, Council noted that the recreational, scenic, and nature conservation values of Pine Plains were outstanding and that the area should eventually be added to the Wyperfeld National Park. It also indicated that the pattern of agricultural use here is likely to gradually reduce the nature conservation values of the area, in particularly the wildlife habitats on the grassy plains and pine ridges.

The Pine Plains area includes the terminal lakes of the Wimmera River system and as such is of considerable geomorphological interest. In contrast with the salt lakes at the termination of Tyrrell and Lalbert Creeks, Lake Agnes and Wirrengren Plain are fresh-water herbfields, although their flooding frequency is probably now much diminished. Chapter 0—Water Supply and Drainage—discusses the frequency of flooding of the Wimmera River and Outlet Creek system and the issue of provision of environmental flows in the system to assist in the rehabilitation of the riparian vegetation here.

The lake-bed herbfields form open plains that support a small but distinctive fauna, with the adjacent mallee and ecotonal areas providing additional habitat. Woodlands of buloke in the north and east of this addition are of major importance to the pink cockatoo, a species of limited occurrence in Victoria and highly susceptible to disturbance. The white-browed treecreeper also depends on the pine-buloke woodlands here. This bird has suffered massive decline in numbers with the loss of its preferred habitat. Both the regent parrot and peregrine falcon have also been observed feeding in this area.

The nature conservation values of Pine Plains are continuing to diminish through progressive death of the woodland species and as grazing pressure (from both domestic stock and rabbits) continues to suppress regeneration.

Recommendation

A4 That the area of 24 980 ha shown on Map A be added to the Wyperfeld National Park and be used in accordance with the general recommendations outlined above

and that

(i) the number of stock being run on the area be reduced to an equivalent of one dry sheep to 10 ha, based on the areas currently in use, at the time of acceptance by government of the recommendations, but no later than 1 December 1989

(ii) grazing be phased out of the area according to the schedule in Chapter F—Agriculture, but no later than 1 July 1996.

Note:

The Wyperfeld National Park and the proposed additions have potential for heavy mineral sands (Parilla Sands), which are currently being investigated elsewhere in the Mallee. Areas in the west have potential for gold and base metal mineralization. A petroleum exploration permit is also current for most of the Big Desert, including the existing park and proposed extensions.

Hattah–Kulkyne National Park

Recommendations

A5 That the area of 46 160 ha, shown on Map A, continue to be used for those purposes approved by the government following publication of the final recommendations for the Mallee area in May 1977.

Note:

In its 1977 recommendations, the Council noted that this area had suffered the worst rabbit infestation in Victoria. Enormous resources have been and continue to be used to control the pest. An intensive plan for rabbit control has been in operation here since 1981 and it is expected that this will achieve an acceptable level of control within areas of the park that are fenced against re-infestation.

However, the high population of western grey kangaroos here also imposes severe grazing pressure on the natural vegetation—inhibiting revegetation programs and limiting habitat for other fauna. This population is sustained by food sources, which previously had been kept low by the rabbit population, and the availability of water.

Council believes that the over-riding consideration here is the protection and maintenance of the total plant and animal community. To achieve this it may be necessary to cull the kangaroo population in the park. Otherwise park values will continue to suffer and the periodic events in which a large proportion of the kangaroo population perish will also continue. It must be recognised that human impact has had a major effect in bringing about such events and it has been necessary to impose a high level of management to overcome these problems. Part of that management involves the control of population numbers of certain native species, such as the grey kangaroo, until something approaching the natural balance is achieved once more.

The Department of Conservation, Forests and Lands has experimented with a variety of methods to control kangaroo numbers.

A5 (*a*) That, in order to protect and maintain the important conservation values in this park, effective control measures, which could include culling, be imposed to reduce the kangaroo population to a level that ensures the re-establishment and maintenance of the natural system.

Murray–Sunset National Park

This new national park incorporates the existing Pink Lakes State Park, the Wymlet flora and fauna reserves, and the Raak flora reserve. It extends from the South Australian border and the Murray River in the west and north-west, takes in the Sunset Country, and links with the Hattah–Kulkyne National Park in the east. The new park encompasses a broad range of environments, providing representation of the Murray Basin mallee of south-eastern Australia as well as the riparian vegetation of the Murray River, which contrasts sharply with the semi-arid vegetation through which the river flows.

Topography and land systems

The Sunset Country and the Lindsay Island area embrace a variety of topographic features, each of which is expressed in the land systems identified for the region. The new park incorporates all the major land systems described below, many of which are either not represented or only partially represented in existing major conservation reserves.

Lindsay Island in formed by an anabranch system of the Murray River and includes the Lindsay River, Mullaroo and Toupnein Creeks, and a large number of billabongs and wetlands. Other topographic features here include meanders, meander scrolls, channel-bordering dunes, terraces, and natural levees. These all form part of the floodplain land system (Ffc2).

South of Lindsay Island, the park includes Lake Wallawalla, which is filled periodically when the Lindsay River floods. East of the lake, its associated lunette (land system Lf3) is one of very few such structures on public land in the State; two other lunettes are located in this park west of Lake Wallawalla. The proposed park also includes representation of the higher terrace (Pf2), of which, again, very little remains as public land. This terrace is above the general level of flooding but is thought to be a relict floodplain of Pleistocene age.

South of this higher terrace, the land surface rises some 20 m to an elevated plain carrying subdued calcareous east-west dunes (land system RPEfc2). This land system is used extensively for agriculture and is occupied by the Millewa croplands; the portion remaining as public land is confined principally to the far north-west of the Mallee area.

The undulating plains of the western Millewa included in the park comprise calcareous earths (PREfcl2)—which, in South Australia particularly, are extensively cleared for agriculture. These plains are associated with small saline areas and gypseous (copi) dunes (PYfz2) derived from the evaporative basins of the Noora depression.

Relatively subdued, closely spaced, east-west calareous dunes comprise the northern half of the Sunset Country. In the west, calcrete (limestone concretions) are evident in the loamy soil (EPfcl2), while in the north-east the limestone is absent (EPfc2). Across the centre, the soils are sandier and the dunes more evident (EPRcf2 and EPcf2). The loamy soils are used extensively for agriculture in South Australia and the east Millewa. Little of the sandier soil (EPcf2 and EPRcf2) is used for agriculture except towards the fringes of the better wheat country near Berrook, Wymlet, and Annuello.

Siliceous dunes form the southern half of the Sunset Country. Fields of high irregular dunes (Berrook Sands) have formed throughout this band (IPc2 and IPRc2) and, in the east, are encroaching on the flat, saline Raak Plain.

Closely spaced east-west dunes comprise most of this siliceous dune-field and again, in the west, limestone is evident in the soil profile (EPcl2); limestone (calcrete) ridges also occur here. These soils support agriculture at Berrook and in South Australia. However, agriculture occupies very little of the siliceous sands without limestone (EPRc2 and EPc2), which also comprise the Big Desert dune-fields. There is some representation of these siliceous dunes in the southern portion of the Hattah-Kulkyne National Park.

A series of sand-plains (Pfc2) has formed across the centre of the Sunset Country dune-fields, aligned with the Danyo Fault. It is presumed that these plains, which include the Sunset, Mopoke, and Last Hope Plains, formed as sand was blown over saline depressions or boinkas.

In the east, saltpans (Pz2) and associated sand-plains (Pcz2) have formed in the Raak depression. All these sand-plains are currently used for licensed grazing. Gypseous dunes (PYfz2) also occur here and more extensively in the south around the Pink Lakes. Mining operations are concentrated on the gypsum deposits in the Raak Plains; the current mining tenements are excluded from the park.

Other geomorphologically interesting areas here include Rocket Lake, the active Berrook dune-front encroaching on the Raak Plain, the Raak Plain itself, Pink Lakes (of State significance), and the ferruginised sandstone outcrops (probably used by Aborigines as a source of ochre) such as those on the edge of the Raak Plain. Limestone ridges outcropping near Berrook add both botanical and geomorphological interest as do an outcrop of Parilla Sand in the south-west and a band of silcrete—known as 'Rock Holes'—presumed to be an Aboriginal watering place.

Vegetation

The vegetation types in the Mallee and their distribution are determined by soil types and the availability of moisture.

River red gum and black box, for instance, require more water than is provided by rainfall in the northern Mallee and depend on flood-waters. Upstream, in the Nyah and Barmah forests, extensive areas are frequently inundated and river red gum has established over the broad floodplain. In the Lindsay Island system, however, the main channels are more incised and there is much greater surface relief than in some of the upstream locations. The frequently flooded area is consequently much more restricted and river red gum is usually found only on the lowest terraces, immediately adjoining watercourses and water bodies.

Black box–chenopod woodlands occur on the intermediate terraces of the floodplain, where the increased elevation substantially reduces the frequency and duration of flooding. These woodlands occupy much of Lindsay Island. The highest terraces carry treeless chenopod shrublands (alluvial plain and alluvial rise shrublands).

The only occurrence of chenopod shrubland in Victoria is in the north-western Mallee. Although this community is substantially disturbed in certain areas, that portion included in the park is in better condition than elsewhere on this land system in Victoria or the adjoining States. The presence of riverine species in the semi-arid north-west of the State provides valuable biological contrasts, enhanced by the rapid transition into woodlands and mallee scrub on the ridge to the south of the floodplain.

The western portion of Lindsay Island has greater topographic diversity than the east and so contains a wider variety of plant species, although the eastern portion contains more extensive *Sporobolus* grasslands on its lower-lying areas. These grasslands are uncommon in South Australia and do not occur in the lower reaches of the Darling River in New South Wales.

The Darling River appears to have influenced plant dispersal in the area—as suggested by the presence of twiggy emu-bush (*Eremophila polyclada*) and hairy Darling pea (*Swainsona greyana*) here, but not elsewhere on the Murray River floodplain above the Darling confluence.

To date, investigations on Lindsay Island and the adjacent public land around Lake Wallawalla have established the presence of more than 20 significant plant species, such as the Murray lily—Victoria's largest native flower. Thirteen of these plants are classified as rare and a further two, bignonia emu-bush (*Eremophila bignoniiflora*) and erect pepper-cress (*Lepidium pseudopapillosum*), are at risk of extinction under current land uses.

With 95 per cent of the State's native grassland communities eliminated or grossly modified, the sand-plain grasslands found at Sunset, Mopoke, and Last Hope Plains are of State-wide significance. The grasslands of the Sunset Plains have shown considerable improvement since the exclusion of grazing in the 1982 drought. Extensive work is required, however, throughout all the plains areas as well as the woodlands to reduce the impact of grazing pressure from all herbivores—native, domestic, and feral—particularly on the regeneration of the woodland species—pine, belah, sandalwood, and cattlebush—associated with these plains.

Gypseous plains grasslands and gypseous rise woodlands are not yet represented in conservation reserves. Both are degraded by past land management and long-term grazing pressures. These rare plant communities, threatened with extinction by continued grazing pressure, are included in the north-western part of this proposed park.

Extensive stands of *Eucalyptus cyanophylla* grow on the low east-west calcareous dunes in the west of the proposed park. This eucalypt is limited in distribution in Australia to here, south-eastern South Australia, and south-western New South Wales; agricultural activities in the other States mean that the Victorian community is of high conservation significance.

In the west, the influence of limestone in the soil profile has produced uncommon subcommunities of both shallow-sand mallee and chenopod mallee and, to date, 20 significant plant species have been identified in this portion of the park. These include the rare *Acacia colletioides, Cheilanthes lasiophylla* (a fern growing on a rocky ridge in the south-west), *Dodonaea hexandra, Helipterum polygalifolium, Stuartina hamata,* and *Zygophyllum crenatum.*

The prostrate annual forb *Phlegmatospermum eremaeum*, found here, is vulnerable Australia-wide.

Sunset Country subcommunities of broombush mallee and red-swale mallee are included in the north central part of this proposed park and a diverse chenopod shrubland grows under mallee near Last Hope Tank. Chenopod mallee, particularly, and the shallower sand and loamy sand mallees have been extensively cleared for agriculture, enhancing the importance of those samples included in the park.

Representation of the Raak Plain has been included in the north-eastern portion of the park. Saline shrubland is growing here in probably the most diverse saline and gypseous environment in the State. Although a number of the significant plant species occur on similar soils within the existing Pink Lakes Park, at least eight additional ones are found on the Raak Plain; these include the rare twin-flower saltbush (*Dissocarpus biflorus*), elacanth (*Elachanthus glaber*), wiry glasswort (*Halosarcia lylei*), and the three-winged saltbush (*Maireana triptera*).

Associated with *Eucalyptus gracilis* in chenopod mallee communities in the north-eastern extremity of the proposed park are stands o the rare spiny goose foot (*Rhagodia ulicina*) an the vulnerable silvery emu-bush—*Eremophila scoparia*. Because of extensive clearing of chenopod mallee soils for agriculture, these species are becoming seriously threatened. The endangered swainson pea (*Swainsona stipularis*)—which is susceptible to grazing—is also located here.

The proposed park's representation of the semi-arid environment of south-eastern Australia and its contiguous nature, large size, and wide diversity of plant communities make it a biological reserve of national importance.

Fauna

Faunal species dependent on the wide variety of plant communities here are similarly varied and include a distinctive representation of the fauna of inland Australia. Many of the important ones are mentioned below and, as the park contains the habitat of several others, the potential for the identification of further species is high.

The chestnut-crowned babbler, pied butcher bird, and tessellated gecko are found on the floodplain in the north as well as a fauna unique in Victoria and confined to the alluvial shrublands: inland dotterel, an apparently undescribed species of legless lizard, and the paucident planigale and curl snake—all being important and notable species.

Other important, notable, and significant species include the barking owl and bush thick-knee, which have been reported from Lindsay Island; also, when it contains water, Lake Wallawalla provides excellent waterfowl feeding and breeding habitat.

The Sunset Country supports significant vertebrate species such as the red kangaroo and greater long-eared bat (sand-plain grasslands), the distinctive fauna of the margins of the saline areas and *Ctenotus brachyonyx* of the dune-fields. The black-eared miner has, to date, been found at four sites in dune-fields of the northern Mallee, three of which are located in the park.

The contrasting vegetation at the interface between the east–west dune-fields of the northern section of the park and the high, irregular dunes of the south with the Raak Plain provides a particularly rich diversity of habitat.

A wide range of raptors breed in this area, including the wedge-tailed and little eagles, black-shouldered kite, and collared sparrowhawk, while the copi plains support the notable species rufous calamanthus. The only Victorian records of the small skink (*Hemiergis millewae*) have been made in the porcupine grass of the deep-sand mallee community in the south of the proposed park. The rare red-lored whistler has been found in the southern dune-fields here and malleefowl nests occur in a number of locations. The western pygmy-possum and the fat-tailed dunnart have been found in the south-west.

The regent parrot uses the area extensively, using hollows in the river red gums of the floodplain and feeding in the mallee areas.

Wilderness values

The area between the Sunset, Underbool, Pheeny and Millewa South Bore tracks included in the park comprises a tract of predominantly irregular dunes of the Berrook dune-field, which has not been accessed and

which, because of its isolation, has high conservation significance. It has been identified by Preece and Lesslie as having high wilderness quality, and is also one of the three semi-arid wildernesses identified by Feller *et al.* This area should be managed to maintain and enhance its wilderness value.

Other

The park contains a number of important archaeological sites, including several on lunettes and dunes above the floodplain that are suffering damage by grazing stock. One of these sites has been dated at some 3500 years.

Historical artefacts indicating the efforts at early development of the Mallee include the cypress-pine log tank remains at Trinita and the Nowingi–Rocket Lake railway formation—both ranked highly by the Council's consultant on historic sites. 'Taparoo' homestead and the Millewa South Bore site also reflect their history, as does the grid of tracks in the west Millewa installed in preparation for its subdivision for agriculture.

This park straddles the Sturt Highway and, where it abuts the Calder Highway, links with the Hattah–Kulkyne National Park.

Access throughout the park is facilitated by an extensive track system; on the riverine plain this is more suited to dry weather and is principally suitable only for four-wheel-drives away from the more heavily used areas. The portions at Pink Lakes, Wymlet, Trinita, along the Sturt Highway, at points along the South Australian border, and Millewa ensure that tourists in conventional vehicles can enjoy some of the park's attributes at any time.

The existing Pink Lakes park is increasing in popularity for camping and nature study as public awareness of Victoria's 'outback' increases; considerable numbers of people visit the Raak Plains and Rocket Lake. Camping away from the more popular sites also occurs throughout the area and many excursions have been conducted here by field naturalists and other nature-study groups. It is highly popular for the observation of parrots.

Recreation in the north is based on the water bodies but the whole area is of increasing interest for nature study. River transport provides good access to the Murray River and lower Lindsay River portions of the park. The Lindsay River provides probably the best inland fishing waters for native fish species in the State.

Recommendation

A6 That the area of 610 450 ha, shown on Map A, be used to:

(i) provide opportunities for recreation and education associated with the enjoyment and understanding of natural environments
(ii) conserve and protect natural ecosystems
(iii) protect sites of archaeological and historical importance
(iv) protect areas of high wilderness quality

that

(v) apiculture be permitted on existing, licensed sites pending the outcome of research into the ecological impacts of this industry
(vi) legal access continue to be available to freehold land and the gypsum mining site enclosed within the park
(vii) dispersed camping continue to be permitted where this is consistent with the aims of management
(viii) the number of stock being run on the area be reduced to an equivalent of one dry sheep to 10 ha (based on the areas currently in use) at the time of government acceptance of the recommendations, but no later than 1 December 1989
(ix) grazing be phased out of the park according to the schedule in Chapter F—Agriculture, but no later than 1 July 1995, except in the existing Pink Lakes State Park where it will be removed in 1989
(x) hunting and the use of firearms not be permitted
(xi) harvesting of forest products not be permitted
(xii) salt harvesting not be permitted

and that the area be included in a schedule to the *National Parks Act* 1975 and be managed by the Department of Conservation, Forests and Lands.

Notes:

1. Council in 1977 recommended harvesting of salt from Lakes Crosby and Kenyan—within

the Pink Lakes State Park; this is now considered to be an inappropriate use of those lakes.

2. The underlying pre-Cainozoic sedimentary rocks have potential for oil and gas, and a petroleum exploration permit is current for the southern half of the Sunset Country. In the west of the proposed park there is potential for gold and base metal mineralisation. The area also contains gypsum and salt deposits.

3. Some parts of this proposed park, particularly the grasslands, woodlands, and shrublands, are heavily disturbed by past land use practices and grazing pressure. The rabbit populations here are high and considerable resources will be required to achieve an acceptable level of control and maintenance.

4. Council is aware that in the region of the Lindsay River there is input of highly saline water to the Murray River and that salinity-mitigation works may be considered as part of the general strategy to combat salinity levels in the Murray River. No firm proposals have been forwarded, however, and the Council considers that any proposals, if put forward after the completion of this review, should not compromise the values of this part of the park.

STATE PARK

It is proposed to include the existing Pink Lakes State Park in the new Murray–Sunset National Park.

Leaghur State Park

Topography and land systems

Located on the floodplain of the Loddon River in the higher-rainfall zone of the study area, this park provides representation of a land system (Ffc3—floodplain) that, away from the Murray River, is poorly represented on public land.

Vegetation

The grassy woodland subcommunity of black box wetland is very uncommon and restricted in the region. It comprises the major vegetation type of the park, and is poorly represented elsewhere in conservation areas that are not subject to extensive alteration to water regimes or quality.

Periodic flooding has produced a range of age classes in the black box, from young regrowth to old mature trees. Small areas of mallee, buloke, and yellow gum also occur here, and a stand of river red gum is located adjacent to Lake Meering.

Significant plant species within the proposed park include trim flat-sedge (*Cyperus concinnus*), long eryngium (*Eryngium plantagineum*), smooth minuria (*Minuria intergerrima*), and swamp buttercup (*Ranunculus undosus*).

Fauna

The presence of old trees here and the periodic flooding making it an important breeding area for waterfowl and it is a refuge area for a range of other species, such as the eastern grey kangaroo.

Other values

Many of the old trees carry scars derived from Aboriginal activities.

The proposed park is readily accessible from a main road. In association, Lake Meering and the Leaghur forest are popular venues for boating, fishing, picnicking and camping.

Recommendation

A7 That the area of 1870 ha, shown on Map B, be used to:

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

(ii) conserve and protect natural ecosystems

(iii) protect sites of archaeological importance

that

(iv) apiculture be permitted on existing, licensed sites pending the outcome of research into the ecological impacts of this industry

(v) dispersed camping continue to be permitted where this is consistent with the aims of management

(vi) grazing be phased out by 1 July, 1990

(vii) timber harvesting not be permitted

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

(ix) the use of Lake Meering for the storage and distribution of water for irrigation and domestic purposes continue to be undertaken by the Rural Water Commission in consultation with the park management authority and integrated with park management to protect its values

and that the area be included in a schedule to the *National Parks Act* 1975 and be managed by the Department of Conservation, Forests and Lands.

REGIONAL PARKS

Lake Albacutya Regional Park

Recommendation

A8 That the area of 7990 ha, shown on Map A, continue to be used for those purposes approved by the government following publication of the final recommendations for the Mallee area in May 1977.

Note:

Portion of the existing regional park is proposed for inclusion in the Wyperfeld National Park (see Recommendation A3 (*a*)).

Addition to Lake Albacutya Regional Park—Ross Lake

This proposed addition includes Ross Lake and the 2·5-km stretch of Outlet Creek that links Ross Lake and Lake Albacutya. It carries a range of vegetation types, including savannah mallee and savannah woodland, black box woodland, river red gum forest, and lake-bed herbfield.

Mature river red gum and black box trees here and along Outlet Creek provide important faunal habitat as well as acting as a corrider for the movement of, particularly, birdlife. A pair of bush thick-knee is known to reside in the area.

The pattern of use here is very similar to that of Lake Albacutya: boating, fishing, duck-shooting, picnicking and camping when the lake contains water; shooting, picnicking and camping when dry [it last contained water in 1980]. These uses and its management would be complementary to those of Lake Albacutya.

Recommendation

A9 That the area of 470 ha, shown on Map A, be added to the Lake Albacutya Regional Park and be used to:

(i) provide opportunities for informal recreation for large numbers of people

(ii) protect and conserve the natural ecosystems to the extent that this is consistent with (i) above

and that

(iii) the existing pattern of legal recreational use be permitted to continue

(iv) current legal use for low-intensity grazing be permitted under agistment at the discretion of the land manager subject to strict controls that ensure that the natural vegetation does not sustain long-term damage

and that it be permanently reserved under section 4 of the *Crown Land (Reserves) Act* 1978 and managed by the Department of Conservation, Forests and Lands.

Note:

The managing authority should zone the park to provide for its various uses, similar to the zoning of Lake Albacutya.

Murray–Kulkyne Regional Park

Recommendation

A10 That the area of 1550 ha, shown on Map A, continue to be used for those purposes approved by the government following publication of the final recommendations for the Mallee area in May 1977.

Additions to the Murray–Kulkyne Regional Park

Tarpaulin and Retail Islands abut the existing regional park, but the current main channel of

the Murray River has essentially isolated them from the Victorian side. Nevertheless these islands are readily accessible by boat and, when the river is sufficiently low, by land from the New South Wales side. They have considerable potential to reduce some of the recreational pressure from the present park.

Tarpaulin Island has a high diversity of river red gum and black box plant communities that include examples with chenopod understoreys.

Recommendation

A11 That the areas totalling 530 ha, and shown on Map A, be added to the Murray–Kulkyne Regional Park and be used to:

(i) provide opportunities for informal recreation for large numbers of people

(ii) protect and conserve the natural ecosystems to the extent and this is consistent with (i) above

that

(iii) the existing pattern of legal recreational use be permitted to continue;

and that they be permanently reserved under section 4 of the *Crown Land (Reserves) Act* 1978 and managed by the Department of Conservation, Forests and Lands.

New regional park

Green Lake

Located within 10 km of the township of Sea Lake, Green Lake is highly popular for recreation and a number of facilities have been developed here based on its recreational use. The area is also popular for passive pursuits away from the lake, such as picnicking and nature study, and numerous tracks provide access.

Vegetation surrounding the lake includes savannah mallee, pine–buloke woodland, and black box–chenopod woodland, which supports a variety of native fauna.

The lake receives channel-outfall water from the Wimmera–Mallee Stock and Domestic Water Supply System and this function should continue.

Recommendation

A12 That the area of 330 ha, shown on Map B, be used to:

(i) provide opportunities for informal recreation for large numbers of people

(ii) protect and conserve the natural ecosystems to the extent that this is consistent with (i) above

and that

(iii) the existing pattern of legal recreational use be permitted to continue

(iv) current legal use for low-intensity grazing be permitted under agistment at the discretion of the land manager, subject to strict controls that ensure that the natural vegetation does not sustain long-term damage

(v) Green Lake should continue to receive channel-outfall water

and that it be permanently reserved under section 4 of the *Crown Land (Reserves) Act* 1978 and managed by the Department of Conservation, Forests and Lands.

B. Wilderness area

In its final recommendations for the Mallee published in 1977 the Council set aside some 114 000 ha in the western part of the Big Desert as Victoria's first designated Wilderness Area. The area has since been scheduled under the *National Parks Act* 1975, along with the Avon Wilderness in the Alpine area. Such areas provide opportunities for solitude and unconfined forms of recreation in unmodified natural environments.

The wilderness experience involves the perception of being part of nature, of an environment unaltered by human intervention, of isolation, and of being exposed to the challenge of the elements.

The main elements of the appeal of wilderness are:

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

Uses and management

Wilderness use may include such activities as canoeing, hiking, rock-climbing, caving, fishing, and cross-country skiing. Vehicles (other than those essential for management), timber production, grazing and mining would be excluded from wilderness areas.

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

Wildfires, however caused, must be prevented from threatening life, property, and natural resources in the State, and the measures necessary to control them must be taken in a wilderness area as in any other. Some pre-suppression measures such as maintenance of fire access tracks and protective burning will be required, at least in areas of strategic importance for fire control. Prevention and suppression of fires remains the responsiblity of the Department of Conservation, Forests and Lands.

Vehicular use of existing tracks, where they occur, should not be permitted except for essential management operations. By careful maintenance, many tracks can continue to be passable for fire-fighting, rescue, and management vehicles, without clearing all vegetation. Construction of helipads may be an alternative to maintaining all of an extensive track system.

Users of wilderness areas must be prepared to face difficult and challenging conditions, and Council stresses the need to bring to the attention of the public the potential hazards associated with the use of these areas. In general, the lack of vehicle access and the remote location of these areas should ensure that the users are self-reliant and capable of looking after themselves.

Wilderness in the Mallee

The Big Desert Wilderness was identified by Feller *et al* in 1979 as one of the 12 areas in the State with high wilderness values. Two others in the Mallee, one in the central Big Desert and the other in the Sunset Country, were also identified as having high wilderness values, although those of the former have been modified over the last 10 years by the development of tracks and other activities associated with bee-keeping and broombush harvesting.

In their 1987 survey of wilderness quality in Victoria, Preece and Lesslie expressed it as a continually varying parameter determined by the four indicators mentioned in the introduction. For mapping purposes, the continuum of this quality was divided into classes. The areas of highest wilderness quality indicated by this survey roughly coincide with the three identified by Feller *et.al.*, and these are complemented by larger ones that, although lower down on the scale of the continuum, also retain high wilderness quality.

The Council endorses its previous recommendation for the Big Desert Wilderness and is recommending that the two other areas of high wilderness value be included in extensions to the Wyperfeld National Park and the proposed Murray-Sunset National Park.

Adjoining conservation parks in South Australia, if managed to complement the Big Desert Wilderness, could substantially increase its effective size. Council believes that the government should hold discussions with its South Australian counterpart to investigate this possibility.

The State Conservation Strategy lists as one of its goals 'to preserve remaining areas of high wilderness quality'. In accordance with these goals, the Council has been requested by the government to carry out a special investigation to identify those areas that should be set aside as wilderness and to make recommendations on the uses permitted there. The areas described above will be included in that State-wide investigation.

Public land bordering the Big Desert Wilderness provides an important buffer against activities that would conflict with the use of the wilderness. Its depth from the Murrayville track, for instance, reduces the intrusiveness of vehicular movement and noise. Other conflicting activities would similarly be buffered—the depth depending on the activity. It may also be necessary to exercise careful vermin and noxious weed control in the buffer, to ensure that adjoining land is not threatened by pest species from within the area, and conversely that these do not invade the area from outside. The Council's special investigation of wilderness in the State would also provide guidelines for the management of the buffers.

Recommendations

B1 That the area of 113 500 ha, shown on Map A, continue to be used for those purposes approved by the government following publication of the final recommendations for the Mallee area in May 1977.

B2 That the government enter into discussions with the South Australian government with a view to reaching agreement on the sympathetic management of conservation parks adjoining the Big Desert to ensure that its wilderness values are protected and its effective size is increased.

B3 That public land surrounding the wilderness be managed as a buffer, with the depth to be determined by the land manager depending upon the particular uses permitted.

C. Reference areas

Reference areas are tracts of public land containing viable samples of one or more land types that are relatively undisturbed and that are reserved in perpetuity. Those concerned with studying land for particular comparative purposes may then refer to such areas, especially when attempting to solve problems arising from the use of land. 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 listed here is based on current knowledge of the land types in the study area, and additional areas may be needed as better information on ecology and land use problems becomes available.

Relocated Reference Areas

C1 Millewa

Fencelines divide the existing reference area into three parcels. Relocation rationalizes the boundary of the reference area to the existing fencelines. Grazing of this area will cease when this activity is removed from the proposed Murray-Sunset National Park that surrounds it.

C2 Lake Wallawalla

The existing site lies close to a well-used road (Mail Road) and its environs are frequently used by people driving to Lindsay River. The area is severely degraded by rabbits and stock.

The new site encompasses the same land systems as the original—the red-brown duplex soils of the higher alluvial plains (Pf2)—but adds a lunette (Lf2) and portion of the present floodplain of the Murray River (Ffc2). Represented vegetation types are expanded to include black box-chenopod woodland in addition to the original alluvial plain and alluvial rise shrubland. Protection can be achieved by the closure of a management track and the removal of licensed grazing from the proposed Murray-Sunset National Park that surrounds the reference area.

C8 Sunset

Originally delineated for the Central Mallee land system, refinements of both the land systems and vegetation information indicate that, while the reference area represents one of the major land systems of the Sunset Country, the predominant vegetation type is a subcommunity that, although of botanical interest, is atypical of the region. The reference area is also divided by a well-used north-south track, which provides ready access into the Sunset Country, and a lesser east-west track.

By retraction of the reference area from the west and expansion eastwards, conflict with unregulated access is avoided; major vegetation types, including shallow-sand and east-west dune mallees are represented, while the area still contains elements of the Sunset Country subcommunities of broombush mallee and red-swale mallee.

Recommendations

C1–C3 That the reference areas listed below be relocated to the sites indicated on Map A and be used for those purposes approved by the government following publication of the final recommendations for the Mallee area in May 1977.

C1 Millewa (630 ha)

C2 Lake Wallawalla (1060 ha)

C3 Sunset (8650 ha)

Unchanged Reference Areas

Recommendations

C4–C10 That the areas listed below, and indicated on Map A, continue to be used for those purposes approved by the government following publication of the final recommendations for the Mallee area in May 1977.

C4 Chalka Creek (400 ha)

C5 Kia (990 ha)

C6 Purnya (1090 ha)

C7 O'Sullivan Lookout (1910 ha)

C8 Lake Jerriwirrup (400 ha)

C9 Dattuck (1500 ha)

C10 Telopea Downs (2500 ha)

Additional Reference Areas

Recommendations

C11–C17 That the areas described below and shown on Map A:

(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

(ii) be surrounded by a buffer, 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, firewood-cutting, 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, Forests and Lands.

C11 Morkalla (990 ha)
Land systems: scattered east-west calcareous dunes with calcareous earths and shallow loams over copi on the northern plains (PYfz2; PREfcl2).
Vegetation: grassland, saline shrubland, gypseous rise woodland, chenopod mallee, savannah woodland, and savannah mallee.

C12 Settlement Road (2580 ha)
Land systems: closely spaced east-west calcareous dunes on plains and depressions in the north with shallow, red, duplex soils—used for agriculture in South Australia and the Millewa (EPfcl2; EPRfc2).
Vegetation: shallow-sand mallee including *E. cyanophylla*, chenopod mallee, east-west dune mallee.

C13 Berrook (2580 ha)
Land systems: irregular and east-west siliceous dunes including sandy mottled duplex soils with limestone—used for agriculture in South Australia and Berrook (EPcl2; IPc2).
Vegetation: chenopod mallee, shallow-sand mallee, dunes and swales of deep-sand mallee.

C14 Rocket Lake (2950 ha)
Land systems: closely spaced east–west calcareous dunes of predominantly fine (EPfc2) and coarse (EPcf2) sediments; scattered east–west calcareous dunes with grey clays (PEfc2).

Note:

The soils comprising the finer sediments are extensively cleared for agriculture in the east Millewa.

Vegetation: chenopod mallee, shallow-sand mallee, east–west dune mallee.

C15 Mt Crozier (2010 ha)
Land systems: irregular and east–west siliceous dunes and clay plains—very few of the latter remain as public land (Pfc2; IPc2; EPc2).

Vegetation: includes chenopod mallee, shallow-sand mallee, dunes and swales of deep-sand mallee, and pine-buloke woodland, but its principal representation is for sandplain grassland.

C16 Broombush (1600 ha)
Land system: closely spaced east–west siliceous dunes (EPRc3).
Vegetation: principally broombush mallee, as well as red-swale mallee, shallow-sand mallee-heath.

C17 Rudd Rocks (2470 ha)
Land system: irregular siliceous dunes (IPRc3).
Vegetation: sandplain heath, sandstone-rise broombush.

D. Wildlife Reserves

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

Animal habitats are generally described in terms of vegetation communities, although other characteristics—such as vegetation structure, ground cover, water depth, salinity, rock outcrops, and hollow trees—are also important. In the study area seven major animal habitat types have been identified, comprising dune-fields of the Big Desert and Sunset Country and those with underlying sandstone ridges, lunettes and ridges, boinkas, alluvial terraces, and riverine plains, and the agricultural and urban habitats.

The Floristic Vegetation map of the study area illustrates the diversity of habitats and shows that no single community covers an extensive uninterrupted area, but rather that each community or habitat tends to be repeated over a wide area as part of a complex mosaic. This pattern is largely determined by the availability of water, soils, and physiography.

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

Council considers that wildlife conservation is an important consideration in the management of the entire area and that management plans should make provision for the conservation of wildlife. This is especially important for animals that are essentially restricted to a particular habitat for feeding and breeding. The regent parrot, for instance, favours nesting sites in large, old, and dying river red gums near permanent water that are within 20 km of mallee vegetation.

Human activites that modify the natural environment have resulted in changes in the distribution and abundance of many species and some species have become extinct. These changes have depended upon the nature and severity of the modification, the particular habitat requirements of the species, and its adaptability to change.

The precise effects on many species, however, are not well documented. The Council considers that further research into the ecological requirements of species is necessary to determine the effects of various land management practices, particularly those where management is oriented towards more competitive uses such as timber production, forest grazing, and intensive recreation. The results of such research may mean the modification of management practices in some areas if wildlife values are to be adequately considered.

Although some forms of land use are compatible with wildlife conservation, it is necessary to set some areas aside specifically for their conservation, and for developing wildlife conservation techniques.

In all wildlife reserves the responsibility for the suppression of fires remains with the Department of Conservation, Forests and Lands, and fire-prevention measures will be carried out where necessary.

Progressive redefinition of those uses that are applicable to 'wildlife reserves' around the State has meant that this category is in most cases more appropriate for watercourses and wetlands that provide specialized habitat for large flocks of birds, fish, crustaceans, and some mammals. They may also be important elements of the scenery of the region and may be used for agricultural water supplies or drainage, or harvested for salt when dry.

These areas may be selected for conservation of species that the community harvests or directly utilizes. They may contain the habitat of endangered species, have specialized breeding grounds or a high species diversity, or be of educational or scientific interest. They may also be selected because of their ecological significance for (or regional representation of) a species or faunal association, or for their value as a stop-over for migratory or nomadic species.

A number of the areas recommended in 1977 as wildlife reserves are important for the conservation of both flora and fauna, and the harvesting of any element of the ecosystem may be inappropriate. Where relevant, these areas are now proposed for flora and fauna reserves where the hunting of game species is not permitted.

The importance of wetlands in Victoria is recognised in the State Conservation Strategy and through the draft wetlands conservation statement. Council considers that the Department of Conservation, Forests and Lands should be consulted in the management of wetlands that are now used for the distribution and storage of water and for the disposal of saline water (see Recommendation O—Water Supply and Drainage).

Existing reserves

Recommendations

D1, D2, D7–D12 That the areas listed below, and indicated on Maps A and B, continue to be used for those purposes approved by the government following publication of the final recommendations for the Mallee area in May 1977.

D1 Kings Billabong (2140 ha)

D2 Lakes Powell and Carpul (680 ha)

D7 Lake Lalbert (750 ha)

D8 The Marshes (southern portion—1480 ha)

D9 Dartagook (450 ha)

D10 Stevenson Swamp (90 ha)

D11 Lake Murphy (230 ha)

D12 Lake Yando (90 ha)

Note:

D3–D6, D13, and the northern part of D8 (Top Marsh, the adjacent black box wetland, and Yassom Swamp) are proposed for redesignation as flora and fauna reserves.

Additions to existing wildlife reserves

Recommendations

D14–D16 That the areas indicated on Map B and described below be added to the existing wildlife reserves and be used:

(i) primarily to conserve the habitat of native fauna associated with wetlands

and

(ii) for public recreation (including hunting in season as specified by the manager) and education where this does not conflict with the primary aim

that

(iii) grazing be permitted where it contributes to specified management goals

(iv) utilization or disposal of water be permitted at the discretion of the managing authority

and that they be permanently reserved under section 4 of the *Crown Land (Reserves) Act* 1978 and managed by the Department of Conservation, Forests and Lands.

D14 25 ha, comprising the floodway between Lake Powell and Bonyaricall Creek, Parish of Nenandie (for addition to D2—Lakes Powell and Carpul).
Integrating the management of the floodway with the existing reserve will assist with control of water movement in this area.

D15 215 ha, being portion of Sheepwash Creek, Parish of Dartagook (for addition to D9—Dartagook Wildlife Reserve).
This watercourse extends the floodplain habitat of the Dartagook reserve.

D16 165 ha, being portion of the Avoca River course downstream of Sandhill Lake (for addition to D8—The Marshes Wildlife Reserve).

Extensive lignum swamps in this section of the watercourse are important habitat for waterfowl.

New wildlife reserves

Recommendations

D17–D30 That the areas indicated on Maps A and B and described below be used:

(i) primarily to conserve the habitat of native fauna associated with wetlands

and

(ii) for public recreation (including hunting in season as specified by the manager) and education where this does not conflict with the primary aim

that

(iii) grazing be permitted where it contributes to specified management goals

(iv) utilization or disposal of water, and the harvesting of salt and other minerals, be permitted at the discretion of the managing authority

and that they be permanently reserved under section 4 of the *Crown Land (Reserves) Act* 1978 and managed by the Department of Conservation, Forests and Lands.

D17 1240 ha, being Mullroo Creek and environs, Parish of Wallpolla. With more than 10 km of frontage to the Murray River and a large number of wetlands, this area is highly valuable to waterfowl. The aquatic values are enhanced by a range of plant communities, including broad *Sporobolus* grasslands, river red gum forest, black box–chenopod woodland, and alluvial-plain shrubland.

D18 15 000 ha, being the eastern part of Lake Tyrrell. The extensive plant communities—saltbush grasslands and samphire shrublands—on the margins and islands support an outstanding example of a distinctive and significant fauna. Species of note include the birds—white winged fairy-wren, rufous calamanthus, crimson chat, and orange chat, the earless dragon *Tympanocryptis lineata* (one of only three populations known in Victoria), and *Morethia adelaidensis,* a skink. Some of the islands are inaccessible and not grazed by domestic stock, their habitat values are therefore high.

Viewed from a number of vantage points around the lake and from the air, Lake Tyrrell is an outstanding scenic feature of the Mallee. It is also a major geomorphological feature, being the largest salt lake in Victoria, and includes other features such as the development of transverse gypsum dunes on the lake-bed. The lunette associated with the lake displays important phases of the geological history of the region, although only a small portion occurs on public land.

Note:

Council is aware that the perimeter of the lake is used for the annual 'Mallee Rally'. It considers that this sporting event can continue subject to strict controls—particularly to prevent vehicle movement away from the defined route—and to ensure that rehabilitation works, where necessary, are a condition of use of the area.

D19 24 ha, being the Water Reserve adjacent to Allotment 22, Parish of Kinabulla.

Intact black box woodland complements natural wetland.

Note:

Tank 0170 is surrounded by this reserve.

D20 230 ha east of Allotment 40, Parish of Murnungin and east of Allotment 39, Parish of Wangie.

Black box woodland and two wetlands on the floodplain of Lalbert Creek provide important faunal habitat—particularly when flooded.

D21 95 ha, being Lake Mannaor, Parish of Boga.

This deep fresh-water lake fills from the Lake Boga channel.

D22 560 ha west of Lake Tutchewop, Parish of Boga.

In those years when the Avoca River is in high flood, the area provides high-quality feeding and breeding habitat for waterfowl and waders.

D23 800 ha, being Cullens Lake and the reserve to the north, Parish of Dartagook.
The lake receives water from Kangaroo Lake at the request of the Department of Conservation, Forests and Lands or from high floods. It is rated highly for its habitat and wildlife values.

D24 43 ha, adjacent to Scotts channel, being the eastern portions of Allotments 3B and 2A and the northern portion of Allotment 1, section B, Parish of Dartagook.
This comprises portion of the wetland upstream of Little Lake Charm, which provides wildlife habitat.

D25 390 ha, being Duck Lake and the wetland to the south, Parish of Dartagook.
The wide, muddy shores of these saline wetlands receive very high use by wading birds.

D26 120 ha, being Lake Elizabeth, north of Allotment 13, Parish of Meran.
Although degrading from a fresh-water to a saline wetland, it provides a feeding area for water birds and is used for duck-shooting.

D27 40 ha, being Pelican Lake, north of Allotment 1, Parish of Meran.
A brackish wetland, it receives channel overflow and seepage and is degrading; used by large numbers of waterfowl.

D28 70 ha, being Lake Wandella, west of Allotment 12, Parish of Meran.
Although degrading from a fresh-water to a saline wetland, it provides a feeding area for water-birds and is used for duck-shooting.

D29 140 ha, being the public land portions of Great Spectacle, Little Spectacle, Round and Tobacco Lakes, and Little Lake Meering, Parish of Meering West.
Despite alteration by water management, these wetlands are in good condition and provide habitat for large numbers of waterfowl.

D30 170 ha, south of Allotment 37, Parish of Leaghur.
Portion of a braided stream, it contains a remnant example of floodplain vegetation comprising sparse black box and lignum; used by quail and waterfowl.

E. River Murray Reserve

Public land in the immediate vicinity of the River Murray on both the Victorian and New South Wales sides has significant scenic, recreation, historical, and conservation values.

In association with the river, these lands provide a significant natural attraction for people wishing to engage in river-based recreation in an essentially natural environment, and provide an outstanding scenic landscape. A wide range of recreational activities is pursued on and adjacent to the river. Camping in secluded spots or adjacent to the many sandy beaches is very popular, as too is fishing, walking, nature study or in many cases just relaxing by the river. Swimming, house-boating, canoeing, rafting, and water skiing are also very popular pastimes. The enjoyment derived from various activities depends in large measure on the maintenance and protection of the 'riverine corridor': that is, the river itself and the treescape environment adjacent to it. Along the river the many sites of historical significance include pumping stations, punt landings and localities associated with the riverboat era. Many archaeological sites of significance—such as Aboriginal middens and canoe trees—also occur and others will undoubtedly be identified.

The river red gum forests, along with the many billabongs and floodways, provide feeding and breeding habitat for many species of native animals; they have particular significance in the conservation of such species as the regent parrot, which has specific nesting requirements. In addition, the numerous impressive river red gum trees epitomize the Australian riverine landscape.

Management and use of public land adjoining the Murray can affect:

- the degree of streambank erosion
- the flood mitigation capabilities of the land
- the maintenance of the riverine landscape
- water quality
- conservation and protection of flora and fauna
- preservation of historical and archaeological sites
- the recreational opportunities that the river and adjoining forest offer.

To conserve and protect the many values and capabilities of this land and to maintain the riverine corridor, Council proposes the establishment of the River Murray Reserve, which, together with equivalent areas set aside in the Murray Valley and North-eastern areas, creates a reserve along the entire length of the Murray River in Victoria.

The proposed River Murray Reserve would follow the river and include major anabranches that are used as alternatives to the main stream. It would include the existing 60-metre-wide Public Purposes Reserve and, in some locations, additional areas of reserved and unreserved Crown land considered necessary to maintain the treescape and the river environment.

Management of the River Murray Reserve should be directed toward enhancing the scenic, recreation, and nature conservation values, protecting historical and archaeological features and providing opportunities for a diversity of recreation activities in an essentially natural riverine environment. It will be necessary to co-ordinate the management of this reserve with that of the Murray-Kulkyne Regional Park.

In addition, Council believes that the reserve should be zoned in order to provide for the range of permitted uses recommended below.

In a number of sections, the River Murray Reserve comprises only a relatively narrow strip of public land immediately abutting private land. Here it consists of the existing 60-metre-wide Public Purposes Reserve, and in some cases, additional small areas of unreserved Crown land.

Usually the public land in these narrow sections is licensed for grazing to the adjoining landholder under the terms and conditions of a water frontage licence. Where such licences are issued, recreational uses such as walking, fishing, and nature observation should be permitted, while activities such as camping, lighting of fires, hunting, or using vehicles should be prohibited. This conforms with the recommendations made for similar water frontage areas throughout the State (see the section on water frontages in chapter J, Rivers and Streams).

A number of licensed pump sites, pumpline sites, and regulators associated with water management and use occur within the reserve and the use of these facilities would continue. However, Council believes that more stringent guidelines should be applied to the overall appearance of these structures, particularly at pump sites so that the impact of these sites on the scenic riverine environment is minimized.

The Council considers that the authorities responsible for the re-issue of these licences should place certain conditions on the appearance of the sites in order to avoid the proliferation of unsightly structures along the river.

New South Wales land adjoining the River

The land in New South Wales abutting the River Murray has characteristics, values, and uses similar to those of the proposed River Murray Reserve and it would be desirable if this land could be managed in a manner compatible with the management of the River Murray Reserve.

Under section 26 (d) of the New South Wales *Water Act*, removal of trees within 20 m of the bank of the Murray River (or indeed any other stream) requires the approval of the Catchment Areas Protection Board. Removals are restricted to:

- trees that threaten to fall naturally into the stream
- trees that endanger persons or property
- selected trees, the removal of which will benefit the general stand vigour

Prompt and careful removal of heads or other parts of trees that fall into the river as a result of any felling is strictly enforced.

Recommendation

E1 That the areas indicated on Maps A, B and C be used to:

(i) protect the natural and scenic values

(ii) conserve native flora and fauna

(iii) allow flood mitigation

(iv) protect streambanks from erosion

(v) provide opportunities for informal recreation

that

(vi) limited extraction of timber products be permitted only from those areas indicated on the maps and where it is consistent with (i) and (ii) above (the areas shown on the maps do not include the existing 60-metre Public Purposes Reserve)

(vii) apiculture be permitted on existing, licensed sites pending the outcome of research into the ecological impacts of this industry

(viii) hunting be permitted at the discretion of the land manager where this is compatible with the zoning plan and the use of adjoining public land

(ix) stock access to water and grazing be permitted under agistment in floodplain forests and woodlands at the discretion of the land manager where this is compatible with the zoning plan and subject to strict controls that ensure that the natural vegetation does not sustain long-term damage

(x) dispersed camping adjacent to the river be permitted at the discretion of the land manager where this is compatible with the zoning plan

(xi) use of existing licensed pump and pump-line sites be permitted to continue

(xii) operations for the maintenance of bank stability and public safety continue to be permitted

(xiii) current legal access continue to be provided

(xiv) in narrow sections of the reserve subject to grazing under licence, recreational activities such as walking, fishing and nature observation be permitted as outlined in Recommendation J1—Public Land Water Frontages (these sections consist of the existing 60-metre wide Public Purposes Reserve plus, in some instances, small areas of currently unreserved Crown land)

and that the reserve be zoned in order to provide for the range of uses outlined above and be permanently reserved under section 4 of the *Crown Land (Reserves) Act* 1978 and be managed by the Department of Conservation, Forests and Lands.

Note:

That portion of the proposed reserve at Liparoo—immediately upstream of the Hattah–Kulkyne National Park—supports a remarkable spider fauna, which includes an undescribed genus in a new family, a tropical species at its southern-most known locality in Australia, and two species previously only found in Madagascar. It is probable the recommendation for at least part of this area may be modified to protect the habitat of these species as well as the habitat of the tessellated gecko, which is also found here.

F. Agriculture

Agriculture is a major form of land use throughout the 43 230 sq. km of the Mallee area. About 31 000 sq. km (72%) comprise freehold land, principally used for dryland cropping and grazing. In addition, grazing licences cover more than 5000 sq. km of the public land, and a further 132 sq. km are licensed for cultivation.

Cultivation licences

Prior to formulating its recommendations in 1977, the Council examined the use of public land held under the then-existing grazing and cultivation tenures. Subsequently, Council recommended that the cleared and developed parts of most of the leases and licences should continue to be used for agriculture—either through alienation or under a special Limited Cultivation Lease.

The Council also took into account the necessity to rationalize public land boundaries. Many of the parcels of licensed land were in scattered blocks, some extended into the proposed Hattah-Kulkyne National Park, and others included land that, although rolled or even cleared in preparation for ploughing, contained soil types considered unsuitable for development. Areas for development were consolidated where possible—principally in the Parishes of Wymlet and Kia (north of Ouyen).

On the advice of the (then) Soil Conservation Authority, areas designated for cultivated agriculture were divided into two groups based on the inherent hazard to soil deterioration. Those allotments in which less-productive land with high erosion or salting hazard are interspersed with good agricultural land were recommended as Limited Cultivation Leases.

Some 73 200 ha of land were identified in 1977 for alienation (F1), representing—at that time—about 4% of the total area of public land. A further 34 000 ha were approved for Limited Cultivation Leases (then designated as Recommendation F2).

By the commencement of this review, most of the land for alienation had been allocated for that purpose and clearing had commenced. The rate of clearing accelerated in May 1985, as land became available through the alienation process—resulting from the Council's previous recommendations —and as the financial situation improved.

Limited Cultivation Lease areas were to be considered next, followed by the grazing licences. The necessity to develop management plans for both cultivation leases and grazing licences has delayed action on granting the long-term grazing licences and this is discussed later in this chapter. At present, productivity and stocking levels have been estimated for the existing grazing and cultivation licensed areas.

During the course of this review the Council has sought further advice from government agencies, community groups, and individuals about the most appropriate way of dealing with F2 land.

In addition, during 1987, the Council commissioned McGowan International Pty Ltd, in association with Australian Biological Research Group Pty Ltd, to investigate those parcels of land recommended for Limited Cultivation Leases, and the cultivated public land near Robinvale, to determine: the stability of the land used for agriculture; the dependence of the licensees on these areas; and the extent and nature of the indigenous vegetation present. The majority of the areas carry indigenous vegetation to varying degrees—one is completely uncleared. The consultants observed that in most cases the land had been maintained in a sound condition. Some licensees had halted land degradation processes, although problems still exist in other areas.

Public land south of Robinvale, in the Parishes of Bumbang and Toltol, was recommended in 1977 to be held for possible future extension of the Robinvale irrigation settlement. The demand for land at that time depended largely on the availability of water for allocation from the Murray River. It is now improbable that large new allocations of water will be made.

The consultants that investigated the F2 areas also provided detailed information about the Robinvale land. Most of this land is under dryland agriculture and is substantially modified. Council considers that it should be dealt with in a manner similar to the F2 land

and that those areas currently under cultivation should be made available for alienation or exchange.

Other areas of cultivated public land have been brought to the Council's attention. For the purposes of these recommendations the following guidelines for F2 areas refer also to the Robinvale land and other parcels of cultivated public land.

Licensee's degree of dependence on the cultivation blocks varies considerably. For instance, one licensee is wholly dependent on the licensed area, whereas other parcels have not been cleared and are not contributing to the farming enterprises.

Council recognises that the Department of Conservation, Forests and Lands has the responsibility to effectively manage activities such as grazing and cultivation on public land and believes that resources should be made available to effect good land management, including rehabilitation and vermin and noxious weed control.

Concern has also been expressed in the region that F2 licensees have been disadvantaged, in comparison with those land-owners who were able to purchase F1 land, because of a lack of secure tenure, controls on clearing, and non-implementation of Council's previous recommendations for F2 land. As indicated above, in 1977 certain F2 areas were not made available because they contained less-productive land with significant hazards, interspersed with good agricultural land. In these cases the Council has now endeavoured to rationalize boundaries so that good agricultural land can be alienated.

However, since 1977, certain F2 land has been identified as having important conservation values that warrant their retention as public land.

With these matters in mind, the Council has adopted several criteria in making its recommendations for the F2 areas—that:

- further clearing of substantial areas of native vegetation not be permitted
- land currently used for cultivation under licence be alienated, provided it does not have important conservation values—which would include those that form part of a wildlife corridor
- where required, erosion-prevention clauses be included in the title to land made available for alienation and areas with high erosion or salting hazard be retained in public ownership and, if necessary, rehabilitated.

As a result, the following policy guidelines have been established:

(*a*) All F2 land that was uncleared as at 1 January 1988 (including areas previously rolled and now regenerating) should be retained as public land, except for some small areas that may need to be alienated to rationalise public land/freehold land boundaries. Fencing costs associated with such proposals would need to be considered, although existing fences could be used in some cases, or relocated at the time of fence replacement

(*b*) All F2 areas with important conservation values, including those that form part of significant wildlife corridors, should be retained. In some cases a phase-out period, temporary access to other areas, or an exchange of land may be appropriate

(*c*) If an area to be alienated contains parcels of native vegetation that are considered important to retain, but are difficult to reserve separately, provisions for their protection should be inserted as a covenant on the title to the land when it is alienated

(*d*) Subject to (*b*) above, all F2 land that was cleared as at 1 January 1988 should be made available for alienation with erosion-prevention clauses where deemed necessary by the Land Protection Division of the Department of Conservation, Forests and Lands. Conversely, where there is an unacceptable risk of erosion, the land should be retained as public land and rehabilitated

(*e*) The areas made available for alienation should be disposed of in a manner similar to that used for F1 land and, where appropriate, first right of refusal should be given to the current licensee.

Policy guideline (*c*) proposes that pockets of native vegetation occurring on land proposed for alienation, where the location of the vegetation would pose difficulties for separate reservation, need provisions for their protection inserted as a covenant on the title to the land before it is alienated. In Victoria, conservation covenants may be undertaken through the *Victorian Conservation Trust Act* 1972 and, once registered on the title to land, these covenants are binding on future owners.

The recommendations provide for the exchange or alienation of about 18 415 ha of the total area of land previously recommended as F2 (34 000) in the Mallee. A number of other areas that are cleared and grazed or cropped, including those near Robinvale, are also recommended for exchange or alienation. The 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 the land into public ownership or to add to the integrity, viability, or ease of management of reserves. Specific proposals for land exchanges are listed under recommendation F2 below.

By ensuring that stands of native vegetation are either excised from an allotment that is to be alienated or are covered by a protective covenant on the title to the land, all areas of extant native vegetation other than isolated trees or small pockets remain protected.

Further extension of agriculture

Most of the land in the Mallee that is well suited to dryland cropping and grazing is already in production. There is scope for substantial increases in the productivity on the currently cleared freehold land through application of improved soil management techniques and the introduction of plant varieties.

The remaining public land is considered marginal for agriculture and, as indicated by recent information, has important conservation values. The Council therefore firmly believes that no further substantial areas of public land in the Mallee should be cleared for agriculture.

Areas for exchange or alienation

Recommendations

F1 That the areas totalling about 29 100 ha, listed in Table 2 below, be used for agriculture, and that they be made available for exchange for freehold land or alienation.

Note: With respect to section 5 (3) of the *Land Conservation Act* 1970, the Council recommends that alienation should be effected under the provisions of the *Land Act* 1958.

Table 2: Land for exchange or alienation (recommendation F1)

Parish (P) or Township (T)	Description (see note 1 below)	Area (ha)	Comments
Areas previously recommended for limited cultivation lease:			
Baring (P)	Parts of CAs 1 and 2	375·0	
	Part of CA 23	275·0	
	Part of CA 46	145·0	See Map 1
Baring North (P)	Part of CA 11	165·0	See Map 2; conservation covenant
Berrook (P)	CAs 6, 10, 15–19, 26, 29, 30, 36 and 37, and parts of CAs 1, 2, 5, 8, 11, 14, 22–25, 31, 32, 34, 35, 38 and 39	8 730·0	See Map 3; conservation covenants apply to dunes supporting native vegetation within CAs 10, 36, 37 and 38
Boolungal (P)	North-east of CA 16—Parish of Burnell	250·0	See Map 4; conservation covenant
Burnell (P)	North of CAs 16 and 19	770·0	
	CA 15 and part of CA 16	530·0	
Dattuck (P)	Part of CA 23	60·0	
Gnarr (P)	Part of CA 40	115·0	See Map 5
	Parts of CAs 32 and 32A	55·0	See Map 6
Liparoo (P)	Northern part of CA 11	110·0	
Mamengoroock (P)	CA 17 and parts of CA 18	285·0	
	CA 10 and part of CA 6	345·0	

Table 2: Land for exchange or alienation (recommendation F1)—*continued*

Parish (P) or Township (T)	Description (see note 1 below)	Area (ha)	Comments
Manya (P)	Part of CA 21	180·0	
	CAs 25 and 26	705·0	
	Part of CA 28	115·0	
Narrung (P)	Part of CA 10	175·0	See Map 7
Patchewollock (P)	CA 55A and part of CAs 56 and 59	550·0	See Map 8
Patchewollock North (P)	Part of CA 2	120·0	See Map 9; conservation covenant
	Part of CA 9	100·0	See Map 14
Pier-Millan (P)	Parts of Ca 14	180·0	See Map 10
Pirro (P)	Parts of CAs 1A and 3	270·0	See Map 11
	Part of CA 6	290·0	See Map 12; conservation covenant
	CA 20 and the reserve to its west, and parts of CAs 2, 4 and 22	1 090·0	See Map 11; conservation covenant
	Part of CA 69	310·0	
Purnya (P)	Parts of CA 6	150·0	See Map 13
Timberoo (P)	Part of CA 50	80·0	See Map 14
Tullilah (P)	Part of CA 21	210·0	See Map 15; conservation covenant
Tyalla (P)	Part of CA 5	260·0	
Warrimoo (P)	CA 7 and the southern part of CA 8	675·0	See Map 16; conservation covenant
Wathe (P)	CA 15	295·0	
Winnambool (P)	CA 28	285·0	
Woornack (P)	Part of CA 32	165·0	
Other areas			
Bannerton (T)	CAs 1–3, 11, 15, 16, 18–20, section A, and CAs 1 and 5, no section	32·6	See Map 17
Baring (P)	Eastern part of CA 44	81·5	
Boorongie (P)	Water Reserve within CA 3	5·0	
Bumbang (P)	CAs 4, 5, 7–9, and 11–16; parts of CAs 7A, 10, 21; and part of public land west of CA 11	3 815·0	See Map 17
Carool (P)	Parts of CAs 1, 2, 9 and 10, Parish of Carool; western part of CA 7, Parish of Nowingi; parts of CAs 33 and 34, Parish of Raak; and CA 55, Parish of Nurnurnemal	1 865·0	See Map 18
Cocamba (T)	CA 1A, section 1	1·0	
Danyo (T)	Crown land north-west of sections 3, 4 and 5	60·0	
Duddo (P)	Recreation Reserve adjacent to CA 14	11·0	
Galah (T)	CAs 1, 2, section 1 and the disused road adjoining section 1	1·7	
Gerahmin (P)	North of CA 42	3·5	
Goyura (T)	CAs 4, 7, 9, and 16–19, section 1; CAs 5–10 and 15, section 2; CAs 1–4, 7, 8, 14–16, and 18–20, section 3; and CAs 12 and 13, section 4	3·0	
Karrawinna (T)	Part of CAs 1–6 and CA 7, section A; part of CAs 1–6 and CAs 7–20, section B; CAs 7, 9–21, section C; CAs 1–3, section E; CAs 1 and 2, section D; and the southern part of the Water Supply Reserve and land to its south	45·0	
Kia (P)	Water Reserve within CA 14A	6·0	
Kiamal (T)	CA 6, section 3	0·4	
Kulwin (P)	Water Reserve adjacent to CA 29	39·0	Note: Contains tank 0101
Lianiduck (P)	West of CAs 22 and 24	81·0	
Mildura (P)	CA 11, section 49, Block E	4·6	
	CAs 9 and 10, section 67, Block E	8·1	
	North-east of CA 3, section 80, Block E	6·8	
	North of CA 2A (Ranfurley Way), Portion 11, Block E	1·3	
	CA 689B, section 48, Block E	2·5	
	CA 3, section 75, Block E	4·0	
	West of CA 21, section 48, Block E	1·4	
	CA 120C of A	1·6	
	CAs 2, 4, 5 and 7, section 65, Block E	16·2	
Moah (P)	Western part of CA 25	33·0	
Nyang (P)	Gravel Reserve adjacent to CA 25	2·0	

Table 2: Land for exchange or alienation (recommendation F1)—*continued*

Parish (P) or Township (T)	Description (see note 1 below)	Area (ha)	Comments
Olney (P)	CAs 4, 8 and 9; and parts of CAs 5, 7, 10, 17 and 18	1 882·0	Conservation covenant applies to all dunes supporting native vegetation
Ouyen (P)	Quarry reserve within CA 26	5·0	
Paignie (P)	Crown land north-east of CA 10	24·0	
Panitya (T)	Crown land west of the Recreation Reserve and south of CA 8A, section 1	15·0	
Patchewollock (P)	Disused rubbish tip and sanitary depot	2·0	
Patchewollock North (P)	South of CA 26	24·0	
Pier-Millan (P)	Crown land adjacent to CA 37	131·0	
	Crown land adjacent to CA 34A	2·0	
Pirlta (T)	Crown land north of the Recreation Reserve Parish of Merrinee	16·2	
Timberoo (P)	Crown land adjacent to CAs 4, 14 and 15	19·0	
Toltol (P)	CAs 8, 19, 22A, 23, 30 and 31, and parts of CAs 20, 21, 22, 24, 25 and 29	1 915·0	See Map 19
Torrita (T)	CAs 10, 11 and the adjoining disused road reserve	1·0	
Tyalla (P)	Reserve, being part of CA 19B	13·1	
Waitchie (P)	Water Reserve adjacent to CAs 46 and 47	22·5	
Wirribibial (P)	Water Reserve adjacent to CA 5	13·0	
Woatwoara (P)	CA 5	42·1	
Worooa (P)	Stone Reserve, being CA 13A	3·0	
Wortongie (P)	North of CA 17	8·3	
Wyperfeld (P)	Part of CA 16	90·0	See Map 20
	Parts of CAs 1 and 18	325·0	See Map 20; conservation covenant applies within CA 1
Yallum (P)	CA 8A	27·0	

Notes:

1. The cadastral descriptions of land employs the following abbreviation: CA—Crown Allotments.
2. Most of the larger areas listed for alienation are indicated on the maps. Many areas within townships, however, are too small to be mapped at the scales employed and the reader should refer to the appropriate cadastral map. Maps 1 to 20 at the rear of this report provide details of those areas where alienation is part of an allotment only and where the subdivision may be complex, or indicate those areas of remnant native vegetation that should be protected under a conservation covenant. In all cases detailed plans of the areas to be alienated are held by the Council.
3. Council has proposed the revocation of a number of townships; these are listed under Recommendation Q3. Where the public land within these townships carries no extant native vegetation and is not otherwise required for government purposes, it is included in Table 2. It is intended that the titles to these allotments should be amalgamated to form additions to present farms, not sold as individual lots. Recommendation Q2 lists public land associated with other townships, which may be used for urban purposes—including alienation if necessary.

Areas for land exchange

Recommendations

F2 That the areas totalling 340 ha and described below be made available for exchange for freehold land

(*a*) 300 ha (approximately), being the eastern portion of Allotment 7, Parish of Nowingi, be made available for exchange for Allotments 66 and 67, Parish of Nurnurnemal, and that Allotments 66 and 67 be made a bushland reserve (see Map 18)

(*b*) 40 ha (approximately) in the southern portion of Allotment 49A, Parish of Timberoo, be made available for exchange for a similar area of freehold land in the north of Allotment 5, Parish of Patchewollock North, and this area be used to widen the biological corridor between the Bronzewing flora and fauna reserve (G37) and public land to the west (see Map 14).

Grazing on public land

Grazing of native forage on public land has been an important factor in the agricultural development of Victoria. In the early days, when the length of time required to clear and develop land and dependence on native pastures limited the productivity of freehold land, it was an important source of income for many farmers.

The situation is different now. As a result of modern technology and management, much of the freehold land is now cleared and sown to productive improved pastures. The general importance of grazing on public land has declined, although it remains important to some individual farmers, and has been used in times of emergency when feed is scarce on the farms. At the same time, community attitudes towards the public lands have changed, and many people now expect these to be used and managed in a way that will conserve the natural ecosystems.

At present the native forage on a large proportion of the public land in the Mallee is grazed under annual licences issued under the *Land Act* 1958 or, in the case of the forests along the rivers and streams, under agistment rights or annual licences issued under the *Forests Act* 1958. Such grazing is usually an adjunct to farming on freehold land, but some of the holders of large leases and licences do not have freehold land and grazing may be the only source of income.

In its final recommendations for the Mallee in 1977, the Council stated its belief that the grazing of public land carrying native vegetation could continue at a low intensity. In addition, it considered rabbit control, reclamation of damaged areas, and the fencing out of some areas for regeneration to be essential if public land were to be managed as a community asset.

The issue of a licence over public land only gives the licensee the right to use the specified resource (fodder, in the case of grazing) that is located on public land; it does not offer exclusive occupancy. A lease, on the other hand, gives the lessee a legal interest in the land itself and is usually interpreted as offering exclusive occupancy of the land. In all cases, the lessee or licensee is required to control vermin and noxious weeds.

Most of the grazing licences issued in the 1930s in the Mallee were on an annual basis and renewal occurred merely by the licensees paying the annual rentals. In the 1950s and 1960s, 21-year grazing leases were issued to about 40 licensees. As these came up for renewal in the years immediately prior to the Council's 1977 final recommendations, the then Department of Crown Lands and Survey converted them to annual licences so as not to prejudice subsequent government decisions. This conversion to annual licences continued after the recommendations, to achieve consistency of the licensing system.

Although the Council in 1977 recommended the granting of long-term grazing licences where appropriate, none have yet been issued in the Mallee area. In implementing the Council's recommendations, the then Department of Crown Lands and Survey gave priority to alienating those areas indicated.

It has subsequently been suggested that leases and longer-term licences generally tend to lead to the agricultural use becoming the dominant management goal of the land rather than the protection and preservation of the intrinsic values. A licence, however, is considered to be a sufficiently flexible form of tenure to manage grazing on public land.

In the extensive dryland areas of public land in the Mallee, control of grazing by annual licence has serious shortcomings, as inadequate limits are placed on stocking rates and the licensees have no security of tenure. There is a tendency to overstock some licensed areas, especially in dry years. In the past, 21-year leases gave reasonable security of tenure, but little supervision of the lessee's management took place, particularly with respect to stocking rates, and in many places vegetation and soils deteriorated.

In 1987, the Land Conservation Council commissioned ACIL Australia Pty Ltd to conduct a study of the larger areas of public land in the Mallee that are used for grazing. This provided information on the way they are used and their rangeland (agricultural) condition. Some 40 separate licence areas of 1000 ha or more were investigated; these are licensed to less than 20 individual enterprises, however.

The recent flora and fauna surveys and grazing exclosure plots indicate that grazing pressure (the total influence of domestic and feral stock, rabbits and, in places, native herbivores) is having a dramatic and detrimental effect on the quality and quantity of native vegetation, and hence faunal habitat, and is reducing public land's potential for a number of future uses, especially those involving nature conservation and recreation.

There are indications that, as their diets are similar, the greatest damage to the vegetation occurs when sheep and rabbits graze together. In addition to competing with each other for the same species, their different grazing patterns in combination markedly increase the intensity of grazing on some species. Sheep, being larger animals, are able to graze coarser, taller vegetation which is usually avoided by rabbits. However, once the plants are reduced in height, and growth of young foliage stimulated, the rabbits find the plants attractive and begin to compete with sheep for this herbage. Constant grazing by both animals may continue until the plant's death.

Seedling and sucker regeneration of the dominant woody species of the woodlands has been severely affected, as all are palatable to stock. In the vast majority of occurrences of pine-buloke woodland, the currently existing mature trees are probably regrowth from the period prior to European settlement of the region. As these trees die (usually as a result of wildfire or being blown over by wind storms as stand density, and hence protection, diminishes) and grazing pressure continues, the woodlands are converted to open grassy woodlands and finally, once all the trees are gone, to depauperate grasslands of exotic species.

Understorey species in the mallee woodlands and grasslands are also being adversely affected. Native perennial grasses are under most stress from grazing during late summer and autumn. The cool-season rains that follow promote the growth of annuals (mostly exotic species including weeds), which tend to exclude the less opportunistic perennial grasses. In the following summer, the annuals set seed and die and grazing pressure is again concentrated on the remaining native perennials. In this way, the native species with diverse, seasonal, native herbs give way to an unstable layer of annual exotic grasses and herbs. These may be dense in the spring of a good year, but disappear to leave the soil exposed to erosion in dry years.

From recent work conducted in 1988 by Westbrooke, and others, it appears that the regeneration of many woodland trees and shrubs depends upon distinct climatic episodes comprising several consecutive years of good rainfall and relatively mild summers. If regeneration that establishes during these periods is not protected from intensive grazing pressure (including rabbits, goats, and kangaroos as well as domestic stock), very few seedlings or suckers will survive.

Significant reductions in plant cover have occurred in the chenopod (saltbush) shrublands of the higher terrace along the Murray River and the Raak Plains. The herbs and grasses growing between the saltbushes provide most of the grazing during late winter and early spring while the saltbushes are browsed. However, the saltbushes become the principal diet in summer and the drier years.

Loss of vegetative cover due to grazing pressure here has exposed light topsoils that are highly susceptible to sheet and wind erosion. Subsequent removal of the topsoil has exposed clayey subsoils that are difficult to revegetate. These effects are most obvious near stock watering points, such as billabongs and the anabranches of the floodplain.

Grasses and other palatable herbs are uncommon in the main vegetation communities of the deep infertile sands and these communities are little affected by grazing and, although included in some grazing licences, are not used. Soils of intermediate fertility, such as those carrying chenopod mallee, shallow-sand mallee, east-west dune mallee, and loamy sand mallee, contain more palatable understorey species and, depending on the availability of water, these are grazed to varying degrees.

Where grazing pressure is high, little regeneration of shrub species is occurring. Seedling regeneration of mallees occurs only rarely and competition from mature plants or suppression through grazing may be factors in this, although indications are that good spring and summer rainfalls are also required for successful seedling recruitment.

In the longer term, as the extant mallees senesce, it could be expected that these areas, too, would degrade to exotic grasslands.

Given the existing condition of the threatened vegetation communities, a decision needs to be made now on whether grazing or conservation is the primary aim of management. Any delay in this decision could result in the loss of these communities from substantial areas of public land in the next few years.

The primary aim of the Council is to make recommendations on the balanced use of public land in the Mallee that ensure that public land values are protected. The Mallee contains the best examples of the remaining uncleared semi-arid vegetation in south-eastern Australia and the object of land use decisions is to preserve and, where necessary, foster the rehabilitation of disturbed communities.

With this in mind, the Council adopted the following guidelines in preparing its recommendations regarding grazing on public land.

- Those portions of the licenced areas that are rarely or never used for grazing should be excluded from the licence immediately.
- Grazing should be eliminated as soon as practicable from areas identified as having high conservation values.
- If grazing is to be phased out of other areas over a longer term, the areas and the phase-out period should be specified.
- Those areas where it is considered that grazing is a use compatible with the general goal of protecting public land values should also be identified.
- Where grazing may continue, it will be necessary for the managing authority to closely control stock numbers and to exclude grazing for appropriate periods to allow regeneration in favourable conditions. Such control should also be exercised over stock numbers during the phase-out periods. This will require a greater degree of supervision by the Department of Conservation, Forests and Lands.

As a result of the Council's recommendations, which provide for major extensions to the park system and the designation of 'protected Mallee lands', grazing is to be phased out from substantial areas of public land. Accordingly, the only areas where grazing may continue in the long term would be outside nature conservation reserves on the riverine plain. The proposal for 'protected Mallee lands' is discussed in Chapter S—State Forest.

The Council considers that the implementation of the policy to remove licensed grazing from nature conservation reserves and protected Mallee lands should take into account the needs of individual licensees and the time required to make alternative arrangements as well as the need to foster regeneration of native vegetation.

The intensity of stocking of public land grazing areas varies across the Mallee. There is little information about desirable stocking levels on native vegetation in Victoria. A study of grazing plots in the western Millewa has indicated that about one sheep per 8 ha, allied with strict rabbit control, could maintain a vegetative cover and facilitate erosion control. This information, however, was based on a sustainable agricultural enterprise rather than an operation that would ensure the long-term survival of native vegetation—including understorey species.

In South Australia, native grasslands have traditionally supported one sheep to 13 ha and woodlands one to 17 ha—again on an agricultural basis. It is understood that these levels apply in a lower-rainfall area than is the case in Victoria.

On the basis of the above information, Council considers that, in the interim, the intensity of stocking on all licensed public land grazing areas above the Murray River floodplain should be immediately reduced to one dry-sheep equivalent (dse) to 10 ha.

In order to eventually remove grazing from all nature conservation reserves and protected Mallee lands, the Council also proposes a staged phase-out, which recognises the need to remove grazing but also takes account of the level of dependence of individual licensees. A schedule of the phase-out of grazing follows the recommendations and should be read in conjunction with Map D.

Artificial water reservoirs (channel-fed and catchment-fed tanks) have been constructed throughout the Mallee to provide water for grazing stock. In some cases these have become redundant through the provision of reticulated water supplies. These reservoirs support not only domestic stock but also feral animals, such as rabbits and goats, and artificially high levels of native herbivores. Council believes that, with the termination of grazing from nature conservation reserves and protected Mallee lands, these reservoirs should be filled-in or otherwise made inoperative.

Recommendations

F3 That:

(i) with the exception of those areas included in nature conservation reserves, grazing be permitted under agistment in floodplain forests and woodlands at the discretion of the land manager subject to strict controls of stocking levels and management regimes that ensure that the natural vegetation does not sustain long-term damage, and that regeneration of native species is fostered and particularly sensitive areas are protected

(ii) licensed grazing areas, and portions of them that are rarely or not presently used for grazing of domestic stock, be excluded from the licences on government acceptance of the recommendations

(iii) the level of stocking on all licensed public land grazing areas above the current floodplain of the Murray River be reduced, on government acceptance of the recommendations, to an equivalent of 1 dse to 10 ha

(iv) grazing be terminated on the currently used licensed grazing areas indicated on Map D according to the schedule in Table 3

(v) meanwhile, until termination of grazing is achieved, grazing be under annual licences and the land manager determine appropriate stocking levels, at or below that stated in (iii) above, and introduce management regimes that ensure the regeneration of native plant species and protection of particularly sensitive areas

(vi) the land manager ensure that the licensees carry out adequate vermin and noxious weeds control on all licensed grazing areas, including those where a phase-out period applies.

and that

(vii) on termination of a licence, artificial water reservoirs be made inoperative.

Table 3: Schedule for removal of grazing

Areas (see Map D)	Date
1	On government acceptance of the recommendations but no later than 1 December 1989
2	1 July 1990
3	1 July 1991
4	1 July 1992
5	1 July 1993
6	1 December 1994
7	1 July 1995
8	1 July 1996
9	1 December 1997
10	1 July 1998
11	1 July 1999

Note: Public land grazing is also affected by flora and flora and fauna reserves and by considerations concerning protected Mallee lands (see Chapter S).

Council acknowledges that, with the termination of licensed grazing, the Department of Conservation, Forests and Lands will require a significant increase in resources to control vermin (particularly rabbits) and noxious weeds. This factor has been a determinant of the timed removal of grazing from the areas indicated on Map D. A total of some 200 000 ha of land within the areas from which grazing is to be removed will require the additional work. However, it is believed that, with the efficient use of resources and the development of techniques applicable to the scale of the problem, as well as the flexibility to capitalise on disasters to the rabbit population, such as drought, an effective rabbit-control program could be implemented.

Research farms

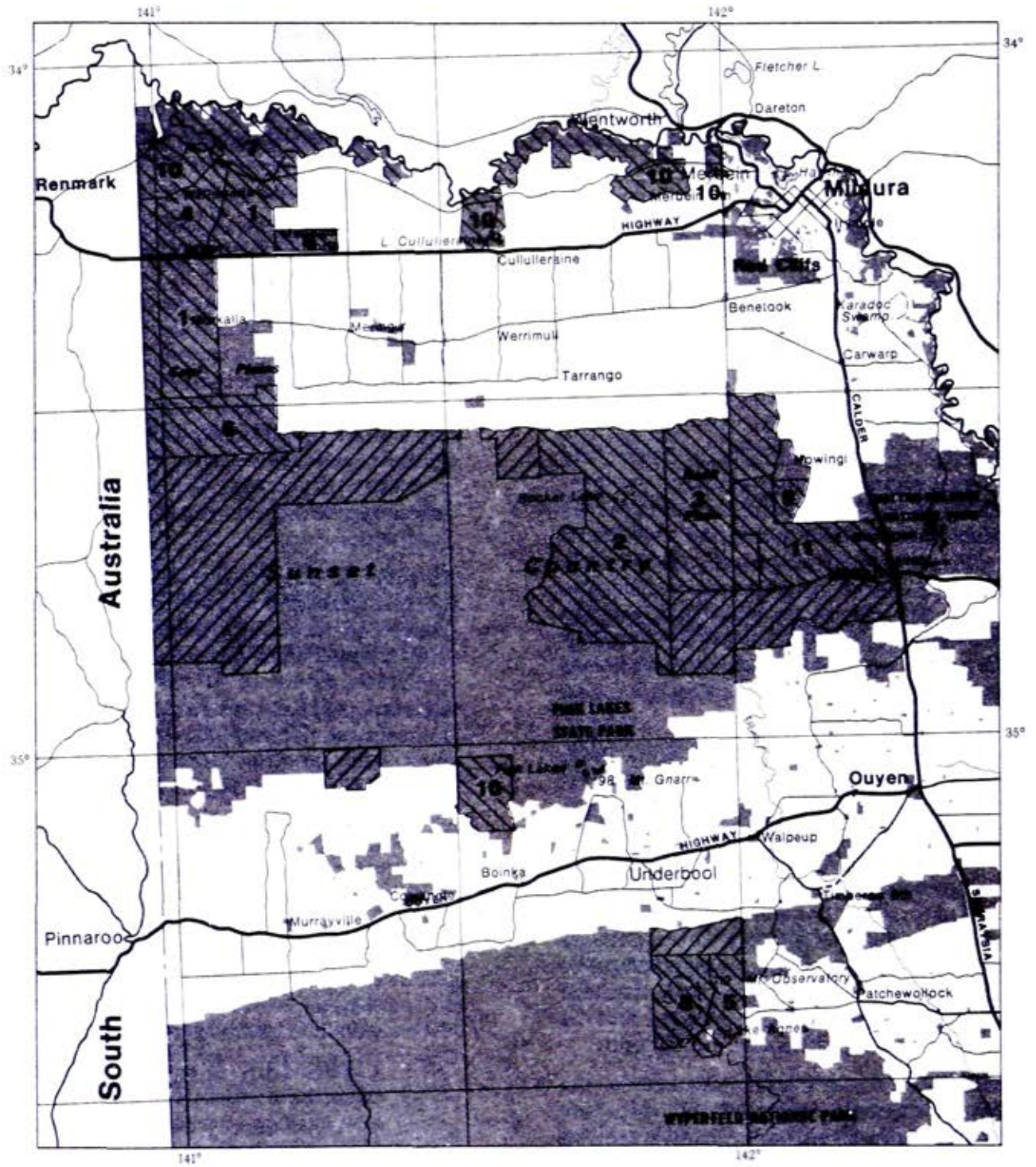
The Department of Agriculture and Rural Affairs' Mallee Research Farm at Walpeup occupies 1036 ha of public land and the Sunraysia Horticultural Centre occupies 81 ha, while the Irymple Technical School operates a school farm on 90 ha of public land in the Parish of Mildura. The Council proposes no change in the use of these areas.

In addition, the Mildura TAFE College is seeking access to land in the west of the Parish of Mildura for dryland cropping as part of its curriculum. The area is already cleared and cropped and Council has no objection to this proposal.

SCHEDULE FOR REMOVAL OF GRAZING

PROPOSED RECOMMENDATIONS

Mallee Area - Review



LEGEND

Unused portions of licensed grazing areas

Staged removal of grazing from area currently used [for details refer to Recommendation F3]

Public land

1 : 1 000 000

10 0 10 20 30

Kilometres

Land Conservation Council
Victoria

Cartography by Thematic Mapping Unit
Division of Survey and Mapping
Department of Property and Services

MAP D

F4 That the areas totalling 1207 ha, shown on Maps A and C, continue to be used for agricultural research and education purposes as approved by the government following publication of the final recommendations for the Mallee area in May 1977.

F5 That the area shown on Map C, totalling 310 ha and being east of Allotment 6, section C, Parish of Mildura, be used for agricultural education by the Mildura TAFE College under licence from the Department of Conservation, Forests and Lands.

Apiculture

The public lands of the Mallee, and especially the Big Desert, are important to the bee-keeping industry because of the range of nectar-producing plants here that flower at different times throughout the year as well as the region's mild winter climate. These provide a favourable situation for both honey production and the overwintering of hives. Apiarists can bring their hives to full strength during winter prior to moving them to sites that provide for late spring and summer honey production.

Currently some 300 bee sites, held by about 100 licensees, are located in the Mallee area. Of these, about 90 sites are permanent. It is estimated that the study area provides about one-third of Victoria's honey crop. In addition, bees provide pollination services for a number of agricultural and horticultural crops and the availability of properly prepared bee colonies early in the flowering season is important to the future expansion of these crops. Artificial feeding of hives is possible—at a cost—but the need for access to public land will continue.

Under the Council's recommendations, the only areas specifically excluded from apiculture are reference areas. However, because vehicles and bee sites are not permitted in the Big Desert Wilderness, apiculture is also excluded from the bulk of this area.

It is the current policy of the management of conservation reserves such as national parks and flora and fauna reserves that apiculture, where it is a traditional use of the area, may continue, However, concern has been expressed that honey bees are an exotic species that use a resource (nectar) in competition with the native fauna and that their non-species-specific foraging may lead to hybridisation between native plant species. In addition, feral bee colonies occupy tree hollows throughout the Mallee and may have displaced native fauna by reducing available nesting and roosting sites. Apiculture may therefore be inappropriate in these reserves.

The potential effects of honey bees on native flora and fauna have been investigated for some 10 years, but results are at present generally inconclusive and may not be applicable to the feral bee population. A major environmental effect, however, stems from the proliferation of tracks made by bee-keepers into extensive areas of the Big Desert. The Council considers that the network of tracks on public land should be planned and rationalized to minimize the number of tracks and prevent their inappropriate location, such as over sensitive sand dunes.

In addition, the presence of hive and/or feral bees in recreation areas is causing increasing concern in the Mallee—particularly during the drier months when the bees aggressively seek moisture wherever it may be available. Relocation of some bee sites may be necessary to overcome this conflict, and the problem of feral bees may be monitored and control programs initiated if required.

Recommendations

F6 That research be initiated by the government into the ecology of introduced honey bees in the natural environment and their impacts on native flora and fauna and, pending the outcome of this research, no further sites on public land be permitted.

F7 That tracking to existing bee sites be rationalised where necessary, with any new tracking be subject to the approval of the land manager.

F8 That the Department of Conservation, Forests and Lands continue to monitor the problem of feral bees on public land and, where necessary, initiated control measures.

F9 That the industry in association with the government, commence investigations into the feasibility of establishing bee farms on freehold land.

G. Flora reserves and flora and fauna reserves

In addition to the floristic and wildlife values of the parks that have been recommended in the Mallee area, a number of areas contain native vegetation with considerable floristic importance. Others are important not only for their floral values but also because of the significance of wildlife populations and habitat they contain.

Council has recognised the special conservation significance of these areas and has accordingly recommended their reservation as flora reserves or flora and fauna reserves. They are set aside primarily to conserve species that may be rare or endangered, and also other plant associations and animals that have particular conservation significance. Timber production from these areas would not be permitted.

In all such reserves, suppression of fires remains the responsibility of the Department of Conservation, Forests and Lands. Appropriate fire-prevention measures will be carried out where necessary as will the control of vermin and noxious weeds.

Some of the flora and flora and fauna reserves (existing and proposed) include salt pans and/or gypsum deposits (including copi rises). These reserves are set aside to protect plant and animal communities, some of which depend on the saline or gypseous soils. Extraction of these materials or alteration of soil profiles could be inimical to the preservation of these species.

Given the limited extent of public land in the eastern Mallee and the relatively small sizes of the reserves, it is considered that the harvesting of salt or gypseous material should not be permitted in flora or flora and fauna reserves. The availability of these resources elsewhere should be investigated.

Existing flora and flora and fauna reserves

Recommendations

G1–G3, G6–G33, G35 That the flora and flora and fauna reserves, totalling 1165 ha and indicated on Maps A, B, and C, continue to be used for those purposes approved by the government following publication of the final recommendations for the Mallee area in May 1977

except that

(i) grazing not be permitted

(ii) extraction of salt or gypseous material not be permitted

and that

(iii) apiculture be permitted on existing, licensed, sites pending the outcome of research into the ecological impacts of this industry and subject to management requirements.

Notes:

1. Flora and fauna reserves G4, G5, and G34 are now included in the proposed Murray–Sunset National Park.

2. The tenement for the mining of copi in the Towan Plains reserve (G22) has expired and operations here are confined to removal of stockpiles and site rehabilitation.

Redefinition of wildlife reserves to flora and fauna reserves

For several areas recommended in 1977 as wildlife reserves, the harvesting of one of the elements of the ecosystem, such as plant species or animals, is not appropriate. Further, recent studies have indicated that both the floral an faunal values are of biological significance. Accordingly, it is proposed to redefine these areas as flora and fauna reserves.

Recommendations

G36–G40 That the areas indicated on Maps A and B and described below to be used to:

(i) conserve native plants and animals

that

(ii) apiculture be permitted on existing, licensed, sites pending the outcome of research into the ecological impacts of this industry and subject to management requirements

(iii) passive recreation such as nature study and picnicking be permitted

(iv) grazing not be permitted

(v) extraction of salt or gypseous material not be permitted

(vi) harvesting of forest products not be permitted

(vii) hunting and the use of firearms 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 Forests and Lands.

G36 Wandown—1590 ha (previously D3)

G37 Bronzewing—12415 ha (previously D5)

Note:

This reserve incorporates an area east of the Sunraysia Highway that was not part of the original wildlife reserve.

G38 Wathe—5600 ha (previously D4)

G39 Red Bluff—8800 ha (previously D6)

G40 Wandella—1060 ha (previously D13)

Additions to existing flora and fauna reserves

Recommendations

G41–G48 That the areas indicated on Maps A and B and described below be added to the existing flora and fauna reserves and be used to:

(i) conserve native plants and animals that

(ii) apiculture be permitted on existing, licensed, sites pending the outcome of research into the ecological impacts of this industry and subject to management requirements

(iii) passive recreation such as nature study and picnicking be permitted

(iv) grazing not be permitted

(v) extraction of salt or gypseous material not be permitted

(vi) harvesting of forest products not be permitted

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

and that they be permantently reserved under section 4 of the *Crown Land (Reserves) Act* 1978 and managed by the Department of Conservation, Forests and Lands.

G41 63 ha, being all Crown land within the Township of Yarrara except that used for utility purposes (for addition to G1).

Note:

This addition does not include the existing public hall, its access road, and the railway station area.

G42 124 ha, being the eastern portions of Allotments 24 and 25, Parish of Toltol (for addition to G8).

G43 59 ha, being portion of the Township of Bannerton, Parish of Toltol (for addition to G9).

G44 48 ha, being public land in the south of the Township of Torrita, Parish of Nyang (for addition to G13).

Note:

This recommendation does not include the existing tip site.

G45 48 ha, being four areas within the Township of Walpeup, Parish of Walpeup (for addition to G14).

G46 13 ha east of Allotment 29, Parish of Patchewollock (for addition to G17)—a regenerating stand of *Hakea leucoptera.*

G47 8 ha, being the disused railway reserve adjoining Allotment 17, Parish of Patchewollock (for addition to G18).

G48 305 ha, south of Allotment 46, Parish of Turoar (for addition to G22).

Notes:

1. The existing reserve and the proposed addition contain copi rises, which carry a characteristic plant community including rare gypsophiles (those that depend on gypseous soils). One such species—*Stipa nullanulla*—is vulnerable in Victoria and threatened elsewhere in Australia. Other species here include the rare *Calandrinia volubilis,* which is associated with disjunct stands of *Halosarcia nitida* and *Bromus arenarius* on the saline flats.

Large, old mallees on the copi rises contain hollows that are important nesting areas for bats, parrots, and tree martins, and the diversity of the plant communities—from salt-tolerant shrubs on the salt pans to chenopod mallee on the rises—provides valuable feeding and breeding areas. The value of the area is enhanced by the lack of other substantial areas of native vegetation nearby.

2. A mining tenement application for the extraction of copi applies to this area. Further information is being sought about the nature, extent, and location of both the copi resource and the floral and faunal values, with the view

of identifying those areas that may be available for gypsum mining.

G49 170 ha, being part of Allotment 29, Parish of Chillingollah (for addition to G28).

Note:

This area is currently used for cropping and will require revegetation.

New flora and fauna reserve

Recommendation

G50 That the area indicated on Map B and described below be used to:

(i) conserve native plants and animals

that

(ii) apiculture be permitted on existing, licensed, sites pending the outcome of research into the ecological impacts of this industry and subject to management requirements

(iii) passive recreation such as nature study and picnicking be permitted

(iv) grazing not be permitted

(v) extraction of salt or gypseous material not be permitted

(vi) harvesting of forest products not be permitted

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

and that it be permanently reserved under section 4 of the *Crown Land (Reserves) Act* 1978 and managed by the Department of Conservation, Forests and Lands.

G50 1960 ha, being Allotments 15C, 16, and 16A, Parish of Bael Bael (295 ha), and the adjacent Yassom Swamp, Top Marsh, and adjoining black box wetland. The wetlands here are important breeding areas for waterbirds and the grassland to the south is growing on red duplex soils of the higher alluvial plains of the Avoca River system. Very little of these grasslands and soil types remains as public land and, although disturbed, this area is an important representation. The grasslands are also the habitat of the plains wanderer—a significant bird species.

Note:

Water over-flowing from the channel running through this area has caused severe sheet erosion; this should not be permitted to recur.

New flora reserves

These reserves are significant because they contain examples of native vegetation with considerable floristic value in a natural or relatively natural state. They are set aside primarily to conserve species that may be rare or endangered, and other plant associations that are of particular conservation significance.

Recommendations

G51–G70 That the areas indicated on Maps A, B, and C and described below be used to:

(i) conserve particular species or associations of native plants

that

(ii) apiculture be permitted on existing, licensed, sites pending the outcome of research into the ecological impacts on this industry and subject to management requirements

(iii) passive recreation such as nature study and picnicking be permitted

(iv) grazing not be permitted

(v) extraction of salt or gypseous material not be permitted

(vi) harvesting of forest products 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, Forests and Lands.

G51 62 ha, being public land north-west of Allotment 48, Parish of Malloren, and within the township of Meringur.
These relatively undisturbed communities of chenopod mallee, shallow-sand mallee, east-west dune mallee, and belah woodland contain the rare and threatened species *Rhagodia ulicina* and *Eremophila scoparia.*

G52 4 ha south of Allotment 7, section C, Parish of Merbein (Map C).
To protect a stand of the vulnerable species—*Acacia melvillei.*

Note:
Nearby roadsides also support remnant stands of this species and these should also be protected. (See Chapter K—Roadside Conservation.)

G53 32 ha, being the public land portions of the Township of Yatpool.
These relatively undisturbed communities of chenopod mallee and shallow-sand mallee contain populations of the rare shrub *Rhagodia ulicina*. A subcommunity of *Eucalyptus gracilis* also occurs here on limestone soils.

Note:
The existing intermittently used rubbish tip should be closed and the site rehabilitated.

G54 980 ha, being Lambert Island, Parish of Karadoc.
In the extensive black box-chenopod woodlands and small stands of *Callitris* and river red gum, notable species include the flood-dependent herb *Ammannia multiflora* and a large colony of the endangered herb *Ptilotus nobilis*.

G55 115 ha east of Allotment 27B, Parish of Karadoc.
A reasonably intact remnant of the higher river terrace carrying alluvial-plain shrublands together with the black box and river red gum terraces descending to the Murray River afford this area significant botanical variety. The climbing herb *Calandrinia volubilis* and the subshrub *Dissocarpus biflorus*, both being rare plants usually associated with saline shrublands, are found here.

G56 465 ha, being Allotment 13, Parish of Manya.
Relatively undisturbed communities of shallow-sand mallee, broombush mallee, and red-swale mallee contain the rare or threatened species *Microcybe multiflora* and *M. pauciflora*.

G57 230 ha north of the Township of Murrayville, Parish of Danyo.
This contains a regenerating woodland of *Callitris preissii* and mallee shrublands. Rare or threatened plant species here include *Microcybe multiflora*, *Olearia passerinoides*, and *Tragus australianus*.

Note:
The reserve does not include the rifle range in the east of Allotment 14.

G58 490 ha, being Allotments 1 and 2, Parish of Koonda.
This comprises relatively undisturbed communities of chenopod-mallee, shallow sand (*Triodia*) mallee, and saline shrubland.

Note:
Harvesting of salt or minerals should not be permitted here.

G59 140 ha, being the reserve south-east of Allotment 43, Parish of Boinka, and the following land in the Township of Boinka: Allotments 1 and 3, no section; Allotments 1-6, 12, 13, 15-21, and 24, section 1; Allotments 5 and 7-19, section 2; Allotments 2-18, section 5; Allotments 1-6 and 9-16, section 6.
Examples of chenopod mallee, shallow-sand mallee and pine-buloke woodland remain relatively undisturbed.

G60 122 ha in Allotment 7, Parish of Gnarr.
The remnant belah [*Casuarina cristata*] woodland is a southern outlier of this community. This species is much depleted from its former extent, being an indicator of good agricultural soil and due to its suitability for fencing material and the continuing loss of its regeneration to grazing pressures.

G61 10 ha in Allotment 38, Parish of Kattyoong.
An intact woodland of belah (see G60) occurs here.

G62 24 ha, being Allotment 59A, Parish of Tiega.
This contains a stand of *Eucalyptus porosa*—also an indicator of good agricultural soils and now much depleted from its former extent in the Mallee.

G63 105 ha in the western part of Allotment 11, Parish of Kulwin.
The reserve comprises an isolated and relatively intact salt lake-lunette complex with the associated vegetation communities, which include savannah woodland.

Note:
Harvesting of salt or minerals should not be permitted here.

G64 45 ha south-west of Allotment 3, Parish of Geera.
A woodland of *Callitris preissii* is regenerating here, together with undisturbed mallee shrubland.

G65 35 ha north-west of Allotment 3, Parish of Narrung.
River red gum forest grows on an island bend of the Murray River with a large population of the grass *Eulalia fulva*—the extent of this species elswhere is much diminished through grazing pressures.

G66 23 ha, being Allotments 34A and 35C, Parish of Towan.
A relatively undisturbed mallee community contains *Eucalyptus behriana*, cattlebush, belah, and the vulnerable *Acacia melvillei*.

G67 20 ha, being Allotment 8A, Parish of Cannie.
A relatively undisturbed *Casuarina luehmannii* woodland and associated grassland grows on calcareous clays here. Very little of this vegetation and soil type remain as public land in the southern Mallee.

G68 15 ha west of Allotment 10, Parish of Towaninny.
Relatively undisturbed grassland again occurs on calcareous clays, very little of which remains as public land in the southern Mallee. (Dumping of agricultural waste on this land should cease.)

G69 65 ha north of Allotment 33, Parish of Towaninny.
Black box wetland occupies a well developed example of a gilgai soil—a feature that was common on Quaternary sedimentary land surfaces before ploughing became widespread.

G70 10 ha south-east of Allotment 22, Parish of Marmal.
This contains a relatively undisturbed woodland of yellow gum, black box, and buloke.

H. Education areas

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 indispensably 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, realizing that public land provides excellent opportunities for studies of a wide range of environments, has recommended that almost all public land (including parks, wildlife reserves, and 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 the educational use. Activities permitted in education areas that may not be appropriate elsewhere would include long-term studies, collection of biological material, biomass studies, and the establishment of growth plots. They 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 education areas, 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 minimize the danger that wildfires present to users
- located in proximity to other land types and to a variety of other land uses
- large enough to prevent over-use and to allow for zoning to protect areas of special value
- selected so as to minimize erosion and pollution hazard.

No one organization should have the exclusive right to use a particular education area, as it is important that students have the opportunity to visit a number of education areas in various land types throughout the State rather than visiting the one site several times. Minimum facilities such as toilets and shelters would be required at each education area, and it would be desirable to have accommodation either on the area or at some nearby locality. 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, Forests and Lands. Planning and implementing the education aspects together with co-ordinating the use of areas should be done in consultation with the Education Department, other user groups in the education system, and with community bodies with an interest in environmental education.

Existing education areas

Recommendations

H1–H4 That the areas indicated on Maps A and C and listed below to be used for those purposes approved by the government following publication of the final recommendations for the Mallee area in May 1977.

H1 **Outlet Creek** (710 ha)

H2 **Timberoo** (320 ha)

H3 **Wemen** (470 ha)

H4 **Koorlong** (680 ha)

New education area

H5 Darling Junction

Located adjacent to the Murray River, opposite the Darling River junction, this area contains Quaternary alluvium of the present floodplain and adjacent higher terrace (land systems Ffc2 and Pf2 respectively) of the Murray River. It has an elevation of 35 m and an approximate rainfall of 250 mm. It supports a vegetation of river red gum forest and woodland, black box–chenopod woodland, floodplain grassland, and alluvial-rise shrubland. The water level in the billabong (within it) is kept artificially high by Lock 10—situated below the junction of the Murray and Darling Rivers—and the resulting wetland contains a range of interesting aquatic plant species.

Recommendation

H5 That the area of 515 ha, shown on Map A, be used to provide opportunities for students of all ages to:

(i) 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

(ii) compare the ecosystems within education areas with other nearby natural and modified systems

(iii) observe and practise methods of environmental analysis, and the field techniques of the natural sciences

(iv) conduct simple long-term experiments aimed at giving an understanding of the changes occurring in an area with time

and that it be permanently reserved under section 4 of the *Crown Land (Reserves) Act* 1978, and be managed by the Department of Conservation, Forests and Lands.

I. Bushland reserves

Numerous small parcels of public land occur throughout the agricultural lands of the Mallee area. Vegetation types on them range from grasslands to woodlands and dense mallee. This vegetation, particularily the ground flora, has often been modified from the original by grazing and invasion of weeds. The native tree species remain, however, and these areas provide landscape diversity, particularly where more intensive agriculture is resulting in a gradual reduction in the numbers of trees on freehold land.

Council recommends that many of these small remnants of the native vegetation should become bushland reserves. 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 Department of Conservation, Forests and Lands. These bushland reserves are generally too small to have major significance for fauna conservation, although some may be important for migratory birds.

Management should aim at the maintenance of the native flora, particularly the tree species. Limited gravel extraction and the cutting of small amounts of firewood are not necessarily incompatible with this primary aim, provided they are carefully planned and controlled and do not spoil the appearance of the reserves, particularly as viewed from roads and lookout points. These uses may not be appropriate to all reserves. In some instances the land manager may have to exclude them, at least temporarily, in order to permit regeneration of tree species.

In all bushland reserves the supression of fires remains the responsibility of the Department of Conservation, Forests and Lands. Appropriate fire-prevention measures will be carried out where necessary. Similarly, vermin and noxious weeds will be controlled by and will remain the responsibility of the Department.

Traditionally, the Council has recommended that grazing in bushland reserves be permitted (subject to the approval of the management authority) or, in some cases, should be excluded for a period to permit regeneration of tree species.

However, many of the bushland reserves in the Mallee contain valuable remnants of the heavier soils that were preferentially cleared for agriculture, and in the eastern Mallee, particularly, these reserves are often the only areas of land remaining in public ownership. As most of the surrounding freehold land has been cleared, the bushland reserves support the only native vegetation and habitat in the area.

Many of these reserves are under pressure from native and introduced grazers, salinity, and gypsum-mining. However, in view of their strategic importance, the Council believes that grazing of domestic stock should eventually be removed, with the timing of removal to be determined by the land manager. If some bushland reserves are required for gypsum-mining in the future, the impact of mining should be kept to a minimum and the program of rehabilitation should ensure revegetation of mined areas.

Existing bushland reserves

Recommendations

I2–I10, I12–I18, I20–I26, I28–I31, I33–I42A, I44, I46–I61, I63–I69, I71–I73, I75–I144, I146–I186, I188–I201, I203–I206, I208–I211

That the bushland reserves, totalling 9800 ha and indicated on Maps A, B, and C continue to be used for those purposes approved by the government following publication of the final recommendations for the Mallee area in May 1987

except that

(i) grazing be terminated, with the timing of removal to be determined by the land manager

(ii) where gypsum-mining is permitted, the area affected be kept to the minimum necessary and all mined areas be rehabilitated and revegetated

Notes:

1. It is proposed to vary I133 by alienating the portion in Allotment 42, Parish of Gerahmin.

2. It is proposed to vary I180 by alienating that portion below the road.

3. Council considers that a land exchange proposal, involving exchange of 15·3 ha in the east of bushland reserve I192 for 10 ha of freehold to the west—facilitating ease of management of both freehold and public land and including a more intact stand of native vegetation within the reserve—should proceed.

4. The incomplete number sequence in these recommendations reflects variations such as the redesignation of some of the previous bushland reserves as flora or other reserves.

Additions to existing bushland reserves

Recommendations

I2x, I3x, I42x, I44x, I48x, I55x, I64x, I66x, I67x, I69x, I80x, I90x, I92x, I108x, I129x, I136x, I167x, I171Ax, I182x

That the areas indicated on Maps A and B, and described in Table 4 below, be added to the existing bushland reserves as indicated, and be used to:

(i) maintain the character and quality of the local landscape

that

(ii) passive recreation such as picnicking and walking be permitted
(iii) apiculture be permitted
(iv) grazing be terminated, with the timing of removal to be determined by the land manager
(v) where gypsum-mining is permitted, the area affected be kept to the minimum necessary and all mined areas be rehabilitated and revegetated

and that they be permanently reserved under section 4 of the *Crown Land (Reserves) Act* 1978 and be managed by the Department of Conservation, Forests and Lands.

Table 4: Additions to existing bushland reserves

Recommendation	*Township (T) or Parish (P)*	*Description*	*Area (ha)*	*Comments*
I2x	Bambil (T)	Crown land in sections A, B and C and CAs 1–5, no section	33·0	CAs 3–5, 8–11, 13 and 14, section B and CAs 14–16, section C require revegetation
I3x	Karrawinna (T)	CA 3, section D; Water Supply Reserve; part of CAs 1–6, section A; and part of CAs 1–6, section B	6·0	
I42x	Narung (P)	Part of CA 10	34·0	
I44x	Annuello (T)	All Crown land within the township	17·0	This excludes utilities-purposes land
I48x	Kooloonong (T)	CAs 1, 2, 11–14, 16–19, section 1; CAs 7–15, section 2; all section 3; and the State school site	7·5	
I55x	Natya (T)	CAs 1–20 and the adjacent road reserves to the north and west; CAs 22–37 and Crown land to the east; western part of the railway station	15·0	
I64x	Danyo (T)	Crown land in sections 2–5	14·0	
I66x	Tutye (P)	Reserve adjacent to CA 56	8·0	
I67x	Cowangie (T)	CA 60; Crown land within sections 4–15 (except CA 5, section 14) Racecourse Reserve, Recreation Reserve, State School Reserve	167·0	
I69x	Tutye (T)	Reserve west of section 1; reserve south of section 1; Crown land in sections 4–9; CAs 11–17, section 2; CAs 5–16, section 3; reserve south of section 4; former State school reserve south of section 8	44·0	
I80x	Tiega (T)	CAs 13A and 14 of no section	91·0	
I90x	Underbool (T)	Crown land north of the railway station; east of the State school reserve, section 9; in sections 10 (except CA 5) and 11; west of CA 26, section 6; west of section 3; and east of the Racecourse and Public Recreation Reserve; part of Crown land within the Road Reserve between sections 5 and 6	25·0	

Table 4: Additions to existing bushland reserves—*continued*

Recommendation	*Township (T) or Parish (P)*	*Description*	*Area (ha)*	*Comments*
I92x	Walpeup (P)	Crown land, being part of CA 20	7·0	
I108x	Pirro (P)	Parts of CAs 1A, 2–4, and 22	364·0	
I129x	Pier-Millan (P)	Part of CA 14	53·0	
I136x	Chinkapook (T)	Part of the State school reserve; part of Crown land south and west of the rubbish depot; Crown land west of section 3; CA 9, section 4 and CAs 10, 14, 15, 17 and 18, section 2; part of road reserve north-east of the railway station	20·0	
I167x	Kunat Kunat (P)	Part of the Timber and Drainage Reserves adjacent to CA 16 and to CAs 5A and 6A	43·0	Requires revegetation. Contains part of the adjacent golf course
I171Ax	Yaapeet (T)	CAs 12–22, section 4; CAs 8–13 and 16 section 2; CAs 1–16, section 1; CAs 1–13, section 5; and the reserve north of section 5	13·0	
I182x	Berriwillock (T)	Plantation Purposes Reserve west of section 4	10·0	

Notes:
1. On the maps, each of these additions is suffixed by the letter 'x' against the number of the reserve to which it is added.
2. A number of dams, springs, and bores, located within some of the bushland reserves, are used for fire-protection, stock water, or shire purposes and these uses should continue.

Additional bushland reserves

Recommendations

I212–I250, I252–I275 That the areas indicated on Maps A and B and described in Table 5 below be used to:

(i) maintain the character and quality of the local landscape

that

(ii) passive recreation such as picnicking and walking be permitted

(iii) apiculture be permitted

(iv) grazing be terminated, with the timing of removal to be determined by the land manager

(v) where gypsum-mining is permitted, the area affected be kept to the minimum necessary and all mined areas be rehabilitated and revegetated

and that they be permanently reserved under section 4 of the *Crown Land (Reserves) Act* 1978 and be managed by the Department of Conservation, Forests and Lands.

Table 5: Additional Bushland Reserves

Recommendation	*Township (T) or Parish (P)*	*Description*	*Area (ha)*	*Comments*
I212	Morkala (T)	All Crown land within the township	38·0	
I213	Karween (T)	All Crown land within the township	91·0	
I214	Werrimull (T)	All Crown land within the township north of the railway line; the Police Purpose Reserve, section F; CAs 4–6 and 10, section D; and CAs 1 to 13, 16 and 17, section E.	84·0	This excludes the water supply reserve
I215	Merrinee (T)	All Crown land within the township	61·0	Portions require revegetation work
I216	Tullilah (P)	Part of CA 21	28·0	
I217	Pirlta (T)	Sections 2–6 and CAs 3, 5 and 8–10, section 1; Recreation Reserve and part of the adjoining Road Reserve	37·0	
I218	Benetook (T)	Crown land within section A (except CA 25); Recreation Reserve; sections B and C and Crown land to the north	48·0	This excludes the cemetery reserve
I219	Yatpool (P)	CA33	226·0	
I220	Boonoonar (T)	All Crown land within the township	12·0	
I221	Nowingi (T)	All Crown land within the township	44·5	CA 2, section 3 contains an ironclad catchment tank of historical importance
I222	Berrook (P)	Parts of CA 24 and CA 25	171·0	

Table 5: Additional Bushland Reserves—*continued*

Recommendation	*Township (T) or Parish (P)*	*Description*	*Area (ha)*	*Comments*
I223	Manya (P)	CA 27 and part of CA 28	753·0	
I224	Panitya (T)	Crown land in section 1 (except CAs 1, 3 and 8) and adjacent Crown land	19·0	
I225	Carinna (T)	CAs 36A, 36B and 38A	0·2	This requires revegetation work
I226	Murrayville (T)	CA 9, section 19 and adjacent Crown land; Crown land within sections 8, 12, and 18; within section 3 (except CAs 20–22, and 24); the municipal purpose reserve and adjacent Crown land to the west; and Crown land west of Public Recreation and Showground Reserve	72·0	
I227	Worooa (P)	Reserve adjacent to CA 17	9·0	
I228		Bore Reserve being CA 1E; and Crown land in the south-eastern corner of CA 1	54·6	
I229	Linga (T)	CAs 1–18, section 4; CAs 2, 7–27, section 3; CAs 9–14 and 20, section 1; CAs 1–6, section 2; Crown land west of sections 1 and 2; and the Cemetery Reserve	29·0	
I230	Mamengoroock (P)	Part of CA 6	21·0	
I231	Mamengoroock (P)	CAs 4, 5 and part of CA 6	404·0	
I232	Gnarr (P)	Part of CAs 32 and 32A	29·0	
I233	Nyang (P)	Crown land, being the south-eastern corner of CA 18	1·0	
I234	Nyang (P)	Crown land north of CA 5	4·0	
I235	Galah (T)	CAs 10–17 of section 2 and the adjoining disused road	5·0	
I236	Ouyen (T)	CAs 29–33, section 16; CAs 4, 9 and 10, section 18	2·0	
I237	Ouyen (P)	Crown land east of the Departmental Water Reserve, ('Workmen's Blocks')	0·5	
I238	Kiamal (T)	Sections 2 and 4; CAs 4 and 5, section 3; CAs 1–4, 10 and 11, section 1	21·0	
I239	Woornack (P)	Part of CA 50B	9·0	This requires revegetation work
I240	Woornack (P)	Water Reserve within CA 36	5·0	
I241	Pirro (P)	Part of CA 4	34·0	
I242	Pirro (P)	Part of CA 6	23·0	
I243	Pirro (P)	Part of CA 69	113·0	
I244	Baring (P)	Part of CA 2	158·0	
I245	Baring (P)	Part of CA 2	176·0	
I246	Dattuck (P)	Crown land south of CA 2 and CA 3A	278·0	
I247	Bumbang (P)	North of Pethard Road and east of CA 2A, section C	6·0	
I248	Bumbang (P)	Part of CAs 17, 20 and 21	281·0	Portion of this area requires revegetation. Pistol club occupies the north-western corner—this use may continue
I249	Toltol (P)	Part of CA 20	200·0	
I250	Bumbang (P)	Part of CA 30	20·0	
I251		No recommendation		
I252	Winnambool (P)	Part of CA 17	12·0	
I253	Bolton (T)	All Crown land within the township	13·0	Legal access should be permitted to freehold land here
I254	Larundel (P)	Water Reserve adjacent to CA 17A	8·7	
I255	Larundel	Water Reserve adjacent to CA 16A	20·0	
I256	Manangatang (T)	CAs 1–4, section 9 and western part of Municipal Sale Yards; Crown land in section 6 and north of the Water Supply Reserve	9·0	
I257	Mittyack (T)	CAs 2 and 5, section 5; CAs 2, 15, 17 and 18, section 4; CAs 1–10, 19–21, and part of CA22, section 3; CAs 4–20, 22, 23 and CAs 3–8, section 1; and Crown land north of CA 18, section 2	29·0	
I258	Cocamba (T)	CAs 2–8 and 10–19, section 1	2·0	
I259	Piangil West (P)	CA 24	188.0	Council is aware of mining tenements over this reserve. Extraction should be concentrated in areas already denuded of woody vegetation, and any further clearing should only be at the discretion of the land manager.

Table 5: Additional Bushland Reserves—*continued*

Recommendation	*Township (T) or Parish (P)*	*Description*	*Area (ha)*	*Comments*
I260	Piangil (T)	CAs 12, 13, section 3	0·2	
I261	Miralie (T)	Crown land within section 3	1·0	
I262	Turoar (P)	Reserve adjacent to CA 24	163·0	
I263	Pier Millan (T)	CAs 3–7 and CA 10 and the disused road east of section 10	0·9	
I264	Nandaly (T)	CAs 1–6, section 1 and the unused road being part of Rowe Street	1·0	
I265	Moah (P)	CA 5A, being the Water Reserve	66·0	This area requires revegetation work
I266	Wewin (P)	Crown land north of CA 10	153·0	Council is aware of mining tenements over this reserve. Extraction from this area should be concentrated in areas already denuded of woody vegetation, and any further clearing should only be at the discretion of the land manager.
I267	Pira (T)	All Crown land within the township except the Recreation Reserve	4·5	
I268	Woorinen	CA 14, section 4 and the eastern part of the Public Recreation Reserve	9·1	
I269	Goschen (T)	All Crown land within the township except the Public Hall and Recreation Reserve	26·5	
I270	Mumbel (P)	Water reserve adjacent to CA 29	4·0	
I271	Boga (P)	State forest adjacent to CA 14, section 6; part of CA 9 and Crown land within the township of Mystic Park (except CAs 2, 2A of section 2 and the Rubbish Depot)	660·0	
I272	Boigbeat (T)	CA 2	1·8	
I273	Woomelang (T)	CAs 5–11, section 9; CAs 9–16, section 10; CA 40, section 7; part of the railway station; and CAs 9–12, section 6	16·0	This area requires revegetation work and includes the Woomelang Group School plantation. Use of the area for horse riding may continue.
I274	Curyo (T)	Part of the Public Recreation and Public Hall Reserve, Crown land in section 4; CAs 4, 12, and 13 and part of CAs 2, 7 and 11, section 2; CAs 1, 6–9, 17–22, and part of CAs 14–16, section 3	10·0	
I275	Karyrie (P)	Crown land south of CA 67	12·0	

Note:
A number of dams, springs, and bores, located within some of the bushland reserves, are used for fire protection, stock water, or shire purposes and these uses should continue.

Linear bushland reserves

Vegetation along disused railway lines and unused road reserves can have particularily 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 and corridors for native fauna.

Recommendation

I276 That unused road reserves (not shown on the maps) with extant native vegetation be used to:

(i) maintain the character and quality of the local landscape

that

(ii) passive recreation such as picnicking and walking be permitted

(iii) apiculture be permitted

(iv) grazing be terminated, with the timing of removal to be determined by the land manager

and that

(v) they be available for development for road purposes if required.

Recommendations

I277, I278 That the areas indicated on Maps A and B and described below, being disused railway reserves, be used to:

(i) maintain the character and quality of the local landscape

that

(ii) passive recreation such as picnicking and walking be permitted

(iii) apiculture be permitted

(iv) grazing be terminated, with the timing of removal to be determined by the land manager

and that they be permanently reserved under section 4 of the *Crown Land (Reserves) Act* 1978 and be managed by the Department of Conservation, Forests and Lands.

I277 The disused railway reserve from Meringur to Morkalla.

Note:

Council is aware that the Red Cliffs to Meringur railway line is being considered for closure. The section of railway line between Meringur and Morkalla has already been closed. In the event that the remainder of this line is no longer required for railway purposes, it should be considered as part of Recommendation I277.

I278 Sections of the disused railway reserve from Piangil to Yungera.

Proposals for the Hopetoun-Patchewollock line will be investigated before final recommendations are published.

J. Rivers and streams

Public land water frontages

Along a number of rivers and streams in the State, a strip of public land has been reserved between the water and adjacent public land or alienated land. In most cases, no public land water frontage adjoins land alienated before 1881, and some properties have titles that extend to the banks or even incorporate the bed and banks of a stream. Thus these streams and rivers have either no public land water frontage or a discontinuous one. The recommendations that follow do not apply to privately owned frontage.

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

Each of these authorities may delegate some of its responsibility to local bodies. The Department of Conservation, Forests and Lands may form committees of management for public purposes, while Management Boards or drainage trusts under the guidance of the Rural Water Commission may be formed in certain areas. The Department controls forest produce on public land water frontages, except where a committee of management has been formed. Public land frontages alongside artificial water storages and aqueducts are often controlled by the water supply authority that controls the water.

Adjoining occupiers often hold public land water frontages under licence for grazing purposes. Special conditions may apply to the licences—for example, to permit cultivation. The licence system has advantages in that licence-holders are required to control noxious weeds and vermin on the frontage. This control would be extremely difficult and expensive to achieve in any other way. When a frontage is held under licence, boundary fences are normally extended to the water's edge. In the past, licensees often discouraged 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, firearms, and other regulations, although it is evident that more effective policing is required, particularly at weekends. Education of the public to understand the rural environment is perhaps the best solution in the long run.

These licensed river frontages are, however, public land; they are often valuable for low-intensity forms of recreation such as walking, fishing and observing nature, and provide access to extensive lengths of streambank. Following the *Land (Amendment) Act* 1983, members of the public may "enter and remain for recreational purposes" onto licensed frontages. Licensees are required to erect and maintain a suitable means of pedestrian access to the water frontage.

This condition had not been applied to the majority of existing licences and Council believes that in some situations, for example along popular fishing streams, the provision of stiles would facilitate pedestrian access along public land water frontages and would reduce damage to fences and avoid gates being left open. Public land frontages that are unlicensed have no restriction on public access, although use of vehicles is controlled by the *Land Conservation (Vehicle Control) Act* 1973. They are, however, normally fenced off from adjacent freehold land. The landholder has no obligation to provide access through freehold land to the frontage, and nothing in these recommendations suggests that this situation should change.

The maintenance of a vegetation cover along stream banks is important in preventing soil erosion and in preserving the local landscape.

Public land water frontages are sometimes valuable for nature conservation as well, as they may provide corridors for movement of

nomadic and migratory species, or support native plants and animals that are no longer found in surrounding areas. In too many cases, however, the provisions of the relevant *Acts* have not been enforced effectively, and such public land water frontages have been progressively cleared of native vegetation. This is the case in some parts of the Mallee, and much of the remaining vegetation on frontages adjoining freehold property is in a degraded condition.

Public land water frontage reserves

Water frontage reserves are defined for the purpose of these recommendations as being all existing water frontages and other reserves or unreserved public land adjoining streams except for those areas, not currently reserved as a water frontage, that have been set aside elsewhere in these recommendations whether as part of a large reserve (such as national park or State forest) or for some special purpose (such as a flora, wildlife or streamside reserve).

Recommendation

J1 That public land water frontage reserves, some of which are indicated on the maps, continue to be used for those purposes approved by the government following publication of the final recommendations for the Mallee area in May 1977

except that

grazing be permitted at the discretion of the land manager subject to strict controls of stocking levels and management regimes that ensure that the natural vegetation does not sustain long-term damage, and that regeneration of native species is fostered and particularly sensitive areas are protected.

Notes:

1. Portions of some stream frontages, previously recommended as public land water frontage reserves, are now proposed for inclusion in other reserves. These include: Sheepwash Creek—now Proposed Recommendation D15, Outlet Creek—portion proposed as A9, and Murray River frontage—proposed for River Murray Reserve—E1.

2. Recommendations concerning the provision of environmental flows of water for those streams where the normal flows are altered by engineering works, are contained in Chapter O—Water Supply and Drainage.

Outlet Creek (Wimmera River) frontage

Public land abutting Outlet Creek has significant scenic, recreation, and conservation values.

The river red gum forests and black box woodlands here are highly significant as a biological corridor through the agricultural land between Lakes Hindmarsh and Albacutya. They allow the movement of migrant and nomadic species as well as the dispersal of the young of many species.

The Wimmera River system is characterized by great variability and unreliability of stream flow. This unreliability has been exacerbated by the diversion of some waters from the Wimmera River system into the Wimmera–Mallee Stock and Domestic Water Supply System. A discussion of environmental flows is included in Chapter O—Water Supply and Drainage.

It has been suggested that some of the water that would be saved if the Wimmera–Mallee pipeline project is implemented could be used for additional flows in the Wimmera River. This would aid stream flow, and reduce pollution and salinity problems currently being experienced in the river. The Department of Water Resources and the Department of Conservation, Forests and Lands are currently investigating the aquatic environment of the Wimmera River with a view to determining the benefits of increased flows for environmental and recreational purposes. The Council believes that improvement in river values would follow the allocation of a significant proportion of the water saved by pipelining to environmental flows in this stream.

In its final recommendations for the Wimmera Area in 1986, the Council recommended the establishment of the Wimmera River Reserve to protect the special values of this important inland river. It is proposed that the lower portion of the Wimmera River system—Outlet Creek—in the Mallee area should be managed similarly.

Outlet Creek Reserve

Recommendation

J2 That the area indicated on Map A (including the bed and banks of the stream) be used to:

(*a*) protect natural and scenic values
(*b*) conserve native flora and fauna
(*c*) provide opportunities for informal recreation, including hunting in season (where permitted by the land manager) and dispersed camping (except in areas of high significance for nature conservation)
(*d*) grazing be permitted at the discretion of the land manager subject to strict controls of stocking levels and management regimes that ensure that the natural vegetation does not sustain long-term damage, and that regeneration of native species is fostered and particularly sensitive areas are protected
(*e*) timber-harvesting not be permitted, other than firewood-gathering where this is consistent with (*a*) and (*b*) above
(*f*) sand extraction not be permitted

and that it be permanently reserved under section 4 of the *Crown Land (Reserves) Act* 1978 and managed by the Department of Conservation, Forests and Lands.

River management

River Improvement Trusts (some of which are now known as river improvement boards) are constituted under the *River Improvement Act* 1958, as amended by the *Water Acts (Amendment) Act* 1985. There are two River Improvement Trusts in the Mallee area—Avoca and Pental Island.

Improvement works in rivers are designed to maintain the carrying capacity (for water supply or drainage purposes), to protect adjoining land from flooding and erosion, to maintain the security of structures such as bridges on the flood plain, and to prevent siltation of the lower reaches by control of upstream erosion.

The works carried out include:

- erosion-prevention works on the banks—for example, planting of trees, the use of various materials for bank protection and the felling of trees that may be undermined (to prevent loss of bank material)
- clearance of waterways, by removal of snags within the bed of the channel, to maintain or improve discharge capacity

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

- Clearing of vegetation has increased run-off and reduced time of concentration of storm flows. The situation is sometimes aggravated by overgrazing and unwise cultivation in the catchment and along the river banks, accelerating soil erosion and transport of sediment to the stream. Increases in urban development—with disposal of storm water directly to streams—have also altered flow regimes.
- Regulation of stream flow by water storages and use of streams to transport water for irrigation and domestic use also change the natural flow regime.
- The construction of barriers such as road embankments and bridges, through which the river must pass, has often resulted in substantial modification of the bed and banks. Present legislation requires that all proposed replacement or new structures across waterways, flood plains, and depressions are referred to the Rural Water Commission and to the River Management Board, where one is involved, for approval.

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

Removal of snags from the centres of wide streams damages fish habitat, but the tethering of these snags against the banks may provide alternative fish habitat, as well as protecting the banks from erosion. Realigning and regrading of eroding beds and banks often removes holes and back waters of value as fish habitat and for

angling and swimming in a particular location. On the other hand, these operations, in preventing erosion, reduce transportation of silt.

River improvement works are sometimes aesthetically displeasing, particularly during construction and in the early stages after completion, but their ultimate aim is to prevent erosion and to allow re-establishment of vegetative cover along the stream banks.

River management boards are required to act within their District as defined under the *River Improvement Act* 1958. Where such Districts encompass only the stream environs, or part only of the stream, they may be able to treat only the symptoms of problems, as the causes may lie in the catchments beyond the area of their responsibility. There is thus little opportunity in the design and implementation of works for consideration of their likely impact on areas outside the Board's Districts.

The Minister for Water Resources recently established two task forces to investigate and make recommendations on stream and catchment management throughout Victoria. The first of these was appointed to review those recommendations of the Public Bodies Review Committee's Eighth Report (May 1983) that related to restructuring of River Improvement and Drainage Trusts. The Report of this task force, now accepted by the Minister, recommended adoption or modification of the Review Committee's various proposals, to provide for the formation of River Management Boards with Districts embracing the whole or at least substantial parts of complete catchments. The report also recommended the establishment of Catchment Co-ordinating Groups, representing local interests and all appropriate agencies, to strengthen consultation and co-ordination between the numerous interests in stream management, with respect to catchment land use activities which impact on stream management. These recommendations are now open to implementation if acceptable to the local community. The *Water Acts (Amendment) Act* 1985 enables implementation of these recommendations.

The second, known as the 'State of the Rivers Task Force' was established to 'examine and recommend the future technical and financial arrangements for an effective regionally-based river management system'. This task force has completed its work and its report was recently published. It examines the requirements, costs and funding arrangements for an accelerated program of catchment improvement and for a program of effective management of Crown river frontages.

The flow regimes of some rivers must of course be modified and flood plains used for agriculture, but it is appropriate to look at the principles of the natural system in seeking solutions to the problems that thus arise rather than to move further from those principles. The Council believes that the following principles should apply in determining the need for and design of river improvement works:

- Where problems in river management arise, the whole catchment should be considered in seeking a solution.
- Where flood control in a catchment is necessary, planning strategies should include consideration of ways of reducing run-off from the catchment.
- Total flood control is seldom practicable. In the case of minor flooding it may often be appropriate to take action to minimise the consequences of flooding rather than attempt to prevent it.
- An adequate vegetation cover should be maintained along stream frontages to stabilise the banks and to reduce the velocity of flood-waters as they leave and re-enter the stream course.
- Structures such as road embankments and bridges on flood plains are a variation of the natural situation, and consideration should be given in their design to their effect on the flood pattern (see Note 3 below).
- Works carried out within the bed and banks of a stream to change the alignment, gradient or cross-section should be kept to the minimum necessary.
- Consideration should be given in the design of works to maintaining or enhancing landscape values and the value of the stream for recreation and as a habitat for wildlife.

Recommendations

J3 That the assessment of the need for, and the planning and implemenation of, any

works involving changes to the beds and banks of streams incorporate the principles outlined above.

J4 That the managing authority consult the Department of Water Resources when proposals that may effect the quality or quantity of water in streams are being considered.

Notes:

1. The Rural Water Commission has formed a Standing Consultative Committee to advise the Commission on river works. This committee comprises representatives from the following: Rural Water Commission; Department of Water Resources; Conservation Council of Victoria; Department of Conservation, Forests and Lands; and Association of Victorian River Improvement Trusts. The Committee is convened by a representative of the Rural Water Commission.

2. The Standing Consultative Committee has prepared three documents that expand on the principles set out above. The first of these documents, 'Guidelines for River Management, 1979', requires plans for all works other than minor ones, together with an assessment of their environmental consequences, to be submitted to all relevant agencies for consideration prior to the commencement of works. The aim of the guidelines is to ensure an optimum balance between structural improvements on the one hand and the maintenance or enhancement of the stream's landscape values and its value as habitat for wildlife and for recreation on the other.

In 1982 the Committee prepared 'Revegetating Victorian Streams', to provide government, semi-government and local government bodies, community groups, and land-owners with information on the vegetation of stream systems, and to encourage maintenance and enhancement of the environment.

More recently (November 1983) the Committee produced 'The State of the Rivers' report in which it recommended the establishment of the second task force referred to above. This presents a general review of the state of Victoria's rivers, drawing attention to the undesirable changes in the river environment that have occurred over the past century. It develops the concept that river management works should be based on a whole catchment philosophy.

3. Information relating to the works that may be undertaken on floodplains is included in the report 'Flood Plain Management in Victoria', produced by the Victorian Water Resources Council.

4. The Rural Water Commission recently released a fourth publication 'River Management—a Glossary of Terms' to help explain the terminology of river management.

Streamside reserve

In many instances throughout the State, small blocks of public land adjoin streams but are not included in the public land water frontage.

These blocks have, where appropriate, been designated streamside reserves. 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 grassland. Every effort should be made to conserve native trees on these Reserves, where they exist, and to encourage regeneration or restoration where the vegetation has been depleted or destroyed.

Blocks of public land such as this have values for nature conservation and receation. 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 streamside reserves in areas where conflict with nature conservation values are minimal.

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

Streamside reserves are separate and distinct from the public land water frontages described earlier in these recommendations.

In the Mallee area, one such reserve has been proposed, at Culgoa near the crossing of Tyrrell Creek by the Calder Highway.

Recommendation

J5 That the area of 12 ha, shown on Map B and described below, be used to:

(*a*) provide passive recreation such as picnicking, walking, and angling

(*b*) provide opportunities for camping at the discretion of the management

authority if this does not conflict with the maintenance of the water quality of the adjacent stream

(*c*) provide a buffer zone for protection of water quality

(*d*) conserve flora and fauna

(*e*) maintain the local quality and character of the landscape

and that it be permanently reserved under section 4 of the *Crown Land (Reserves) Act* 1978 and managed by the Department of Conservation, Forests and Lands.

J5 14 ha comprising the Police Reserve and Crown land adjacent to the recreation reserve, Township of Culgoa.

Note:

This area has potential for development as a wayside stop for travellers on the Calder Highway.

K. 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 native plant associations. Such remnants are valuable for preserving species with restricted distribution and genetically interesting variants of 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 habitat (particularly in tree hollows) for some native animals, and have special significance as pathways 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 native vegetation growing on the verges of some roads should be protected where possible.

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.

Accumulation of fuel along roadsides is a fire hazard of concern to fire-control authorities and it must often be reduced by burning off during cool weather. This burning off sometimes conflicts with scenic and conservation values and the Council believes that such burning should be restricted to strategically important areas and kept to the minimum consistent with efficient fire protection.

The Roadsides Conservation Committee, which comprises representatives from various interest groups and government departments, has prepared a set of guidelines that provide for both conservation and fire protection.

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 road environment for motorists, and shady areas for rest and relaxation. The Council believes that as much roadside vegetation as possible should be retained when roads are being upgraded. If a major upgrading is being planned, the feasibility of purchasing a strip of private land should be considered in order to preserve good stands of roadside vegetation.

Salinity prevention

In those areas where dryland salting is becoming an increasing problem, roadside trees play an important role in mitigating the effects and extent of salinization. These trees, often the only remaining trees in the area, play a vital part in the interception of saline subsurface moisture.

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 (State highways, tourist and forest roads, and freeways) declared under the *Transport Act* 1983 are completely under the control of the Road Construction Authority (9000 km). Main roads (14 500 km) are also declared, but are controlled jointly by the Road Construction Authority 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, Forests and Lands 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 State to be continually upgraded. Tree-lined back roads with gravel surfaces on narrow winding 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 realigning is being considered.

Recommendation

K1 That the road reserves throughout the study area continue to be used for communication, transport, access, surveys and utilities.

A large number of used and unused road reserves throughout the Mallee still support native vegetation and frequently have high nature conservation values for a range of plants and animals. Particularly in the east, where few public land blocks remain, open roads and road reserves contain the great majority of trees in the landscape. West of Ouyen, in the central Mallee, these reserves are also important corridors for the movement of wildlife between the Big Desert and Sunset Country. In Chapter I—Bushland Reserves—the Council proposes that the vegetation on these reserves be maintained and that they be managed as bushland reserves (see Recommendation I276).

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

- When improvements to the 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 re-alignment of a road results in a section of the old road being cut off, wherever possible that section should not be sold but used as a recreation and rest area or incorporated into an adjacent appropriate reserve.
- Where a pipeline or overhead wires are to follow a road carrying trees and shrubs in a rural district, every effort should be made to locate the easements on private land alongside the road if this is already cleared, rather than clearing roadside vegetation to accommodate them.
- While recognizing the need for clearing or pruning vegetation close to power lines to reduce the associated fire risk, the State Electricity Commission should consult the Department of Conservation, Forests and Lands regarding the manner in which the risk posed by vegetation can be reduced, while at the same time reducing the environmental impact to a minimum.
- 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 areas should be rehabilitated and revegetated, where possible, with plant species native 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.
- 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 the Department of Conservation, Forests and Lands.

- The purchase of cleared freehold land for road construction purposes should be considered as an option to avoid clearing stands of native vegetation.

Unused roads

When the State was being settled, surveyors provided access to every block by means of a surveyed Crown road. Many of these have never been used as roads, and they are usually held by the occupiers of the adjoining land under an unused-road licence.

Recommendation

K2 That the following guidelines, approved by the government following publication of the final recommedations for the Mallee area in May 1977, continue to apply to unused roads:

- The clearing of native trees and shrubs other than noxious weeds should continue to be clearly prohibited in the conditions of unused-road licences.
- A condition permitting public use of licensed unused roads should be written into unused-road licenses 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 conservation, recreation, or other public use.

Roadside picnic areas

Along some roads, the reserve carries picnic areas and wayside stops. Council considers there is a need for additional areas in attractive locations, adjoining the road reserves, that could be used for relaxation and picnicking. Some picnic facilities should be provided.

Recommendation

K3 That the land management authorities establish picnic areas in suitable locations adjacent to the road reserves.

Roadside sites of habitat and/or botanical signficance

Recommendation

K4 That, when widening or re-alignment of roads is proposed, sites of geological, habitat, or botanical significance that may be affected be investigated and every effort made to retain and preserve them.

A number of important sites have been identified along road reserves and these are listed below:

- stands of *Acacia melvillei*: at the junction of the Sturt Highway and McCarthys Road—Merbein South; along the Swan Hill–Woorinen road; and along roads around Goschen
- stands of *Acacia melvillei* and *Rhagodia ulicina* beside the Lake Boga–Goschen road
- stands of *Maireana cheelii*, *Swainsona swainsonioides*, and *Brachycome readeri* along the Tresco–Bael Bael road
- a stand of *Swainsona swainsonioides* on the Bael Bael–Korrak Korrak road
- the only stand in Victoria of *Ixiolaena chloroleuca*, on the road between the Riverside golf course and Sandalong Racecourse–Mildura
- the large stand of *Sida ammophila*, south of Colignan on the Red Cliffs road
- a stand of *Sida* sp.C (limestone sida) at the junction of Koorlong Avenue and 20th Street, Cardross

Note:
The Shire of Mildura is carrying out a program of fostering the regeneration of native flora along Ranfurly Way, Morkalla Road, and Paschendale Avenue.

Sites of historical importance

Recommendation

K5 That, where items of historical significance are identified on road easements, every effort be made to preserve their historical character consistent with management practices and safety requirements.

L. Recreation

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

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

- Formal recreational activities include all organized sports and other group activities, while activities such as picnicking, fishing and hiking are grouped as informal.
- Passive recreation covers situations where the individual obtains his recreation through 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 his particular recreational needs. Examples are playing organised sport, bushwalking, 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 River Murray frontage near Mildura, Robinvale, and Swan Hill would be considered to be intensively used.

In view of the predicted increase in demand for outdoor recreation and the high capability of some public land to meet this demand, the Council, in making its recommendations, has suggested that the majority of public land should be available for recreational uses of some sort. Accordingly, it has set aside a variety of reserves that will provide for a wide range of opporunities. 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, bushwalking, orienteering, canoeing, fishing, hunting, picnicking, horse-riding, boating, trail-bike riding and pleasure driving. Council believes that activities such as these can be accommodated, without detriment to other values, somewhere on public land. Consequently, Council points out that outdoor recreation in general is an acceptable primary or secondary use of much public land (except reference areas and some water storages and their buffers) and has left the details of recreational use to the land manager.

The various recreation activities differ in their requirements for types of land, size of area, and site location. They also differ in their impact on the land and on other activities (including other forms of recreation). Generally, any one activity pursued at a low level of intensity poses little threat to the environment and seldom conflicts with other activities. With increasing intensity, conflicts and problems can arise. There is always the problem of recreation damaging the environment it seeks to use.

Council therefore believes that the land manager should aim at controlling the levels and patterns of recreational use according to the capability of the area to sustain such use without irreversible damage or significant conflict with the primary purposes of the area, while at the same time avoiding unnecessary restrictions on usage. Special care will be required in the location and management of areas zoned for intensive recreation, to prevent environmental damage. Thus, more stringent restrictions can be expected in areas where the vegetation and soils are sensitive to damage (such as on the lighter soils of the dune-fields of the Sunset Country and Big Desert) and where the natural environment or special natural features are being preserved.

Three particular forms of recreation that may require consideration by the land manager, whether now or in the future, are further discussed below.

Motorized recreation

Much outdoor recreation depends on motor vehicles. These may be conventional cars, four-wheel-drive vehicles, or motor cycles.

They may be used for touring and sightseeing, as a means of obtaining access to a particular area where other forms of recreation will be undertaken, or—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 conventional two-wheel-drive vehicles and keep to the major through routes. Others use four-wheel-drive vehicles or motor-cycles to gain access to the more isolated areas via the secondary system of roads and tracks that supplement the major ones. These tracks are frequently rough and have not been 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 unacceptable conflict with the area's primary uses. Erosion hazard area may be proclaimed according to the provisions of the *Land Conservation (Vehicle Control) Act* 1972 and regulations, enabling strict control to be enforced.

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.

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

A significant and growing proportion of the population is becoming involved in recreational touring, which depends on the use of roads on public land. Drivers of motor vehicles, including motor-cycles, who leave the roads on public land contravene the provisions of the above *Act*. (Limited exceptions are given in the *Act*.)

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

Hunting

The Kerang wetlands receive heavy use by hunters during the proclaimed Victorian duck-hunting season. The Marshes, Lake Albacutya (when it is holding water), and the many billabongs and streams of the Murray River floodplain are also popular.

Rabbit-hunting is common throughout the Mallee and may assist in controlling this pest. Foxes and feral goats in the Sunset Country and feral pigs along the Murray River are also hunted.

Youth camps

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

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

User groups have an increasing tendency to acquire freehold land for their actual camp site, while using adjacent public land for their outdoor activities, and Council believes that this trend should be encouraged. While recognizing that a variety of types of camps may be needed, Council believes that any camps permitted on public land should be properly located, constructed, and maintained. For efficient management of camps, it may be necessary for a single organisation to be given limited tenure over a minimum area at any individual camp site, under the control of the land manager. Council believes, however, that these camps should still be used as fully as possible consistent with avoiding damage to the environment.

The greater use of existing camps on public land is desirable in order to avoid proliferation of camp sites, and there is a need for co-ordination of information regarding the availability of those camps that could be used by groups who do not have tenure of their own.

Recommendations

L1 That public land continue to be available for a wide range of recreational uses where these can be accommodated without detriment to other values, and that land managing authorities aim at controlling the types, levels, and patterns of recreational use according to the capability of particular areas to sustain such use without irreversible change or significant conflict with the primary purpose of the area.

L2 That vehicular use of roads within the meaning of the *Land Conservation (Vehicle Control) Regulations* 1973 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.

L3 That the land management authorities endeavour to provide some areas for off-road vehicular use within land under their control.

Note: No recommendation is listed under L4

Existing recreation reserves

Recommendation

L5 That existing recreation reserves, some of which are indicated on the maps, continue to be used for those purposes approved by government following publication of the final recommendations for the Mallee area in May 1977.

M. Scenic reserve

Such areas are set aside to preserve scenic features and lookouts of particular significance.

Aims of management of these areas should be to maintain the character and quality of the landscape and to maintain native vegetation.

Existing scenic reserve

Recommendation

Red Cliffs

M1 That the area of 21 ha, shown on Map C, continue to be used for those purposes approved by the government following publication of the final recommendtions for the Mallee area in May 1977

except that

management of the reserve should ensure that the significant plant species found here, and their habitat, are protected.

Note:

This reserve contains the following plant species that are threatened in Victoria: *Abutilon fraseri, Jasminum lineare, Myoporum deserti, Rhyncharrhena linearis, Sida ammophila* and *S. fibulifera*, and probably *Leichardtia australis*.

N. Mineral and stone production

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

Exploration for minerals

The government has the responsibility to establish the existence and extent of the State's mineral resources. The government, in the main, meets this responsibility through the provisions in the *Mines Act* 1958 that provide the tenure under which private enterprise is encouraged at its own cost to locate new mineral deposits. When a new deposit is discovered in an area where mining is not a currently approved land use, it may be of such importance that a change of the land use is required in the State's interest. The decision on whether such a change is in fact necessary can only be made against a background of the best available knowledge of the location and extent of the particular mineral deposit. It is important therefore that the reservation of conservation areas should not automatically exclude exploration for mineral and fossil fuel resources. Attention should be directed towards ensuring that other values and interests are protected, rather than preventing exploration activities.

The protection of other values—particularly those historical values around old mine sites—should never be enforced to the point that it places human life at risk. In relation to public safety, nothing in the recommendations affects the powers of Inspectors under the *Mines Act* 1958 and the *Extractive Industries Act* 1966.

Gold

Increases in the price of gold have resulted in an upturn in mineral exploration and mining in recent years. This trend has been particularly strong in 1986 which has seen a marked demand for Miner's Rights, Miner's Right Claims, Exploration Licences, Mining Leases, Tailings Removal Licences and Tailings Treatment Licences. Known goldfields have been the focus of most activity and several former mines have been re-opened. Those involved range from the part-time hobby prospector to large mining companies, but in numerical terms, it is the former group which has experienced the most substantial growth. To a large extent, this is due to the ready availability of modern, low-cost technology in the form of metal detectors and eductor dredges which have enhanced the prospects of small operators.

Fossicking and prospecting

Fossicking and prospecting are often taken to mean one and the same thing. In mining terms a fossicker is a person who casually works over old mine workings and waste rock heaps in the hope of finding small amounts of gold or other minerals. Unlike prospecting, the term 'fossicking' has no basis in legislation under the *Mines Act* 1958. Fossicking is also accepted as a wider term that embraces not only the search for gold and minerals, but also for other items such as bottles or coins.

Prospecting is a systematic activity, defined in the *Mines Act* 1958 as 'all operations conducted for the purpose of discovering or establishing the presence or extent of mineralization or of a mineral'. It is necessary to hold an exploration licence, or a Miner's Right, before prospecting may be undertaken. Most individual miners and prospectors operate under a Miner's Right, which does not permit prospecting on private land.

Under current legislation there is a small percentage of public land in the State where prospecting under a Miner's Right is not permitted. This includes areas used for various community purposes such as golf courses, cemeteries, and flora reserves.

Council considers fossicking and prospecting to be legitimate uses of public land and as such should not be unduly restricted or regulated. There are some areas, however, where these activities may not be permitted or may require

limitation and these have been specifically nominated in the recommendations (see Chapter C—Reference Areas and Chapter O—Water Supply and Drainage).

In addition to these, there may be other limited areas of land surface that, because of their special public importance or inherent instability, warrant either permanent or temporary exclusion from fossicking and prospecting. These areas may include, for example:

- land that, if disturbed, may detrimentally affect water quality, especially where the water is used for domestic consumption
- important habitats for plant species or fauna
- important historic relics that could be damaged
- sites of high erosion hazard
- community assets such as recreation areas and water or sewerage installations
- important geological formations.

These limited areas of land surface have not been specified in the recommendations, but will be determined by the land manager and the Department of Industry, Technology and Resources together. Fossicking and prospecting, where they involve minimal disturbance to soil or vegetation, will be permitted on public land other than these limited areas and those specifically nominated in the recommendations. Areas currently exempted or excepted under existing legislation should remain so, unless otherwise specified in these recommendations or unless the land manager and the Department of Industry, Technology and Resources together determine that such exemptions or exceptions should no longer apply.

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.

The Council is concerned by the complexity of legislation and procedures governing extraction of 'stone'. (For example, the Road Construction Authority and municipal councils are not bound by many provisions of the *Extractive Industries Act* 1966.)

There is need for:

- review of existing legislation and procedures to enable more rational use of the 'stone' resource of the State
- provision of adequate resources for the reclamation of old extraction sites on public land.

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

Principles and guidelines

The terms 'exploration and extraction', referred to below, do not relate to the activities described above as prospecting under a Miner's Right and fossicking.

The Council believes that the following principles should apply.

1. Some areas of land surface—because of their inherent instability or special public significance (for example, community assets or areas with important scenic, archaeological, historical, recreation, or nature conservation values)—warrant permanent or temporary exclusion from exploration and/or extraction of 'minerals'. The Department of Industry, Technology and Resources and the land manager should together determine these areas. Consultations take place as required between officers of the Department of Industry, Technology and Resources and the Department of Conservation, Forests and Lands to determine those areas that should be excluded and the conditions under which particular areas of public land are used for exploration for, and production of, minerals and stone.
2. When tenure is issued for operations under the *Mines Act* 1958 on public land, the land manager should be consulted regarding the conditions to apply and

the supervision should be in accordance with the agreed conditions as specified in the claim, licence, or lease and with requirements of the *Act*.

3. Consultation should continue between the land manager, the Department of Industry, Technology and Resources, the Department of Conservation, Forests and Lands, 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 Road Construction Authority, and other public authorities as well as to commercial operators. To ensure this, the relevant *Acts* may have to be amended.

A system should be established that would ensure, before work commences, the availability of funds for progressive final reclamation of any excavation or operation. Provision should also be made to enable the acceleration of the rehabilitation of all existing extraction areas on public land.

5. 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.

6. The following guidelines should apply to all extraction from public land:
   (*a*) The Department of Industry, Technology and Resources should not issue leases for petroleum production or for the mining of 'minerals' unless satisfied with the program submitted by the applicant. In the case of Miner's Right claims, prior assessment is impractical and the Department should ensure the lodgement of a bond as surety is adequate for rehabilitation. Wherever practical, the Department should seek the lodgement of mining plans that show the expected post-mining state of the land and should state operating conditions to achieve an appropriate standard of rehabilitation acceptable to the land manager.
   (*b*) No sites for the extraction of 'stone' should be opened in areas that the land manager, in consultation with the Department of Industry, Technology and Resources, 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'.
   (*c*) Extraction of 'stone' should generally be concentrated on the fewest possible sites in an area, and any one site should be substantially worked out and, where possible, reclamation ensured before a new site is exploited. The type of excavation to be carried out should be that with the lowest environmental impact consistent with 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.
   (*d*) 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 '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.

(*e*) 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.

In addition to the above, approval under the *Soil Conservation and Land Utilization Act* 1958 should continue to be sought for the exploration or extraction operations for 'minerals', 'petroleum', or 'stone', where the subject land is within a proclaimed water supply catchment.

Recommendations

N1 That public land in the study area (other than reference areas and other areas as determined by government) continue to be available for exploration under licence and extraction of 'minerals', 'petroleum', and groundwater, subject to Recommendation N4 and the principles and guidelines set out above.

Note:

This recommendation does not refer to prospecting under a Miner's Right, which is covered by Recommendation N3, but does include claims registered under a Miner's Right.

N2 That public land in the study area (other than reference areas and other areas as determined by government) continue to be available for exploration for 'stone' subject to the principles and guidelines set out above.

N3 That prospecting under Miner's Right and fossicking, involving minimal disturbance of soil or vegetation, be permitted on public land other than

(i) those areas specifically excluded in the recommendations (see the chapters on reference areas and water supply) and other areas as determined by government

(ii) those areas that the land manager and the Department of Industry, Technology and Resources together may determine (see the guidelines in the section on *fossicking and prospecting*)

(iii) the areas referred to in N4 below.

N4 That those areas of public land currently exempted or excepted from occupation for mining purposes under a Miner's Right, or from being leased under a mining lease, remain so exempted or excepted unless the land manager and the Department of Industry, Technology and Resources together determine that such exemption or exception should no longer apply.

Notes:

1. Because of their relatively small sizes, it is considered that harvesting of salt or gypseous material should not be permitted from flora and flora and fauna reserves in the Mallee (see Chapter G).

2. Road-making materials are extracted from many areas of public land throughout the Mallee; these are not indicated on the maps, as most are short-term surface workings.

N5 Crystalline gypsum workings
That
(i) the existing mining tenements (totalling 2170 ha), shown on Maps A and B, continue to be used for the extraction of gypsum
(ii) all readily available gypsum be mined from the existing tenements before operations are relocated
(iii) progressive rehabilitation, including revegetation, of excavated sites, including those now disused, be undertaken to return the land surface to as near as practicable to its pre-mining condition

and that
(iv) government, in association with industry, undertake investigations to determine appropriate and effective means of rehabilitating and revegetating mined areas.

N6 Powdered and 'sugar' gypsum workings
That
(i) the existing mining tenements (totalling 285 ha), shown on Maps A and B, continue to be used for the extraction of powdered and 'sugar' gypsum
(ii) mining of powdered and 'sugar' gypsum be concentrated into areas denuded of native woody vegetation
(iii) should it be necessary to mine vegetated areas, vegetation native to the area be replanted

and that
(iv) government, in association with the industry, undertake investigations to determine appropriate and effective means of rehabilitating and revegetating mined areas.

Salt workings

N7 Lake Tyrrell
That
(i) 5 860 ha, in the western portion of Lake Tyrrell, indicated on Map B, be available, at the discretion of the land manager, for the extraction of salt
(ii) management ensure that those nature conservation values of islands within the lake and the shore-line are protected.

Note:
The balance of Lake Tyrrell is proposed as a wildlife reserve and the nature conservation values of the area are discussed in that Chapter—see Recommendation D18.

N8 That the extraction of salt from pans and lakes on lake reserves, wildlife reserves, and other parcels of public land, where not otherwise specifically excluded, be permitted at the discretion of the land manager.

Note:
The development of evaporation pans, access tracks, stack sites, and processing facilities has considerable impact on the natural values of the land. Where possible, the development on public land of permanent facilities, such as processing factories, should be discouraged.

O. Water supply and drainage

Water Supply

Most of the settled districts of the study area are supplied with water for stock and domestic purposes by the large network of earthen channels of the Rural Water Commission's Wimmera-Mallee Stock and Domestic Water Supply System that bring water from storages to the south and east. Most towns have an elevated reservoir, into which water is pumped from an earthen storage. Many of the channels and town storages are on public land, but are not shown on the maps because of their small size. The Council proposes no change in the use of these areas.

The Millewa district in the north-west of the study area is supplied from the Murray River, via Lake Cullulleraine and a storage at Bambill South (O1 and O2 respectively on Map A) and then pipelines to individual farms.

The irrigation districts along the Murray River downstream from Swan Hill draw their water directly from the river. Supplies for the irrigation districts in the Kerang region are drawn from the Torrumbarry system. This diverts water from the Murray River at Torrumbarry, east of the study area, to the Loddon River at Kerang, whence it flows through a system of natural lakes connected by channels. These are the Reedy Lakes, Racecourse Lake, Lake Charm, Kangaroo Lake, and Lake Boga. Water for irrigation and domestic use is drawn from these lakes. Other lakes receive fresh water intermittently from the water supply system. The lakes also play an important role in flood mitigation.

The lakes mentioned above, which would normally be dry for long periods, now receive assured supplies of fresh water and consequently have considerable value for recreation and nature conservation. Around Kerang, many species of water-birds use and breed in them; the Second (Reedy) Lake contains Victoria's largest colony of white and straw-necked ibis. Lake Boga and Lake Cullulleraine are used extensively for boating, swimming, and fishing. Duck-hunting is an important recreational activity on many of the lakes.

The Council proposes that the lakes and watercourses required for water supply purposes and flood mitigation continue to be so used, and that their importance for nature conservation and recreation be recognised in their management.

Access should be provided to all water supply works on public land.

Flood mitigation

While flood mitigation in the study area is not the direct responsibility of the Rural Water Commission, the operation of the Commission's water supply and drainage systems can provide some mitigation. 'Natural' flood mitigation, however, involves the use of many lakes and watercourses that are not used for water supply or drainage. It is essential that these areas continue to be available to act as natural flood pondages. Chapter J—Rivers and Streams—discusses river management.

Recommendations

Water Supply

O1–O8, O10–O12, O14, O15, That these areas, totalling 3735 ha and shown on the maps, continue to be used for those purposes approved by the government following publication of the final recommendations for the Mallee area in May 1977

O17–O20, O22 except that,

as for O18, O19, O20 and O22, management of O1, O3, O10, O12, O14, O15 and O17 by the Rural Water Commission be in consultation with the Department of Conservation, Forests and Lands.

Notes:

1. O9 (Lake Boga) is proposed as a lake reserve—Recommendation T5.

2. O16 (Lake Meering) is incorporated in the proposed Leaghur State Park—Recommendation A7.

3. Portion of O19 (Scotts Channel) is proposed for reservation as a wildlife reserve—Recommendation D24.

4. O21 (Cullens Lake) and O13 are incorporated in the proposed wildlife reserve—Recommendation D23.

5. O22 refers to the Dennying Channel in the Parishes of Paignie and Wymlet.

Public tanks and bores

The dryland farming districts of the Mallee contain many public tanks (dams) either filled from the channels of the Wimmera-Mallee Stock and Domestic Water Supply System or filled by run-off from the surrounding land.

The Rural Water Commission uses a number of tanks for regulation and flood spill purposes as an integral part of the water distribution system. Shire councils and the Road Construction Authority use some of the tanks to draw water for road-making. Authorised diverters are supplied by agreement with the Commission and, after paying a fee, draw water for various purposes other than irrigation. Other tanks are used by individuals who pay water rates on the area occupied by the Crown land reserve in which the tank is located.

Many of these public tanks also have community values. Some are currently used for recreational activities such as picnicking and yabbying, while others have potential for such use. Many provide habitat for wildlife, and public tanks also supply water for use in fire-fighting.

In 1977, the Council investigated the use of public tanks to assess current requirements and to clarify uncertainty as to the public or private status of a number of them. In assessing which tanks should be retained, the following factors were considered:

- road-making and maintenance
- fire-fighting
- the needs of landholders in fringe areas
- public use as picnic areas
- regulation of the water-supply system
- existing licensed diversions

Most of the tanks are located in water reserves, though some are on road reserves and channel easements and, in 1977, were not considered further by the Council.

In the interim, use of some areas has changed and some tanks have become redundant. Investigations are again under way to determine whether all the tanks currently filled from the Commission's channel system should continue to be filled in the future.

The usefulness and reliability of public tanks that are filled by run-off (catchment tanks) varies considerably. In Chapter F—Agriculture—Council has recommended that, with the termination of licensed grazing from nature conservation reserves and Protected Mallee Lands, catchment and channel-fed tanks there should be made inoperative (Recommendation F3).

A number of catchment tanks are included in the following list and these, too, will be investigated to determine whether they should be maintained. The list also includes a number of public bores.

Recommendations

Public tanks and bores

023–068, 070–073, 075–0100, 0102–0107, 0109–0116, 0119–0161, 0164–0169, 0171–0177, 0179–0194.

That these areas, indicated on Maps A and B, continue to be use for those purposes approved by the government following publication of the final recommendations for the Mallee area in May 1977.

except that

(i) where a tank is located within an area of public land that is recommended for other uses, the tank and any other water supply works on the land be managed by the manager of the surrounding public land in consultation with the Rural Water Commission (these tanks are shown on the maps by a blue dot adjacent to the public land)

(ii) where the tank is located on a small discrete piece of public land, it be reserved under section 4 of the *Crown Land (Reserves) Act* 1978 and be managed by the Department of Conservation, Forests and Lands, in consultation with the Rural Water Commission, except in cases where it is already vested in the Commission.

Notes:

0101 is on land proposed for alienation.

0108 is no longer filled by the Rural Water Commission—it is incorporated into flora and fauna reserve G20.

0162 and 0163 are incorporated into the proposed wildlife reserve D20 and 0170 is incorporated into proposed wildlife reserve D19.

0178 is no longer required by the Shire of Birchip, and 0117 and 0118 are no longer required by the Shire of Wycheproof.

High saline water tables are a problem throughout the irrigated lands of the Mallee. The method most commonly used to keep the water table below the plant rooting zone is the installation of sub-surface drains. While these drains prevent waterlogging and salting on the irrigated land, disposal of the saline drainage water presents a further problem. Disposal directly into the Murray River must be avoided wherever possible to keep the salinity of the river, which causes concern during the summer months, below critical levels.

Current practice is to run the drainage water into lakes and low-lying areas, which act as evaporation basins, although some areas drain directly into the river, or onto its floodplain. Water is released from some basins into the Murray River at times of high river flow, when it will be rapidly diluted.

The depressions and natural lakes used for disposal have considerable nature conservation value because they provide habitat for water-birds and waders. For example, Lake Tutchewop is noted for the migratory waders found there from time to time, while the Cardross Lakes often attract large numbers of water-birds.

As the salt content of these lakes increases over time, their value as habitat will fall until they become lifeless bodies of brine. The salt usually builds up slowly, however, and the lakes can be expected to provide useful habitat for many years.

The Council believes that the provision of wildlife habitat is an important aspect of the management of areas used for disposal of saline drainage water. The public land currently used for this purpose is shown on the maps.

Recommendations

Drainage

0197–0202, 0206–0209, 0212–0217

That these areas, indicated on the maps, continue to be used for those purposes approved by the government following publication of the final recommendations for the Mallee area in May 1977.

Note:

The total area of these reserves is 772 ha.

Drainage basins within larger blocks of public land

Recommendations

O195, O196, O203–O205, O210, O211 That the portions of these areas actually used as evaporation basins and other allotments considered necessary for water management continue to be used for those purposes approved by the government following publication of the final recommendations for the Mallee area in May 1977

and that

those areas not considered necessary as evaporation basins or for water management become part of the adjacent public land and be managed by the Department of Conservation, Forests and Lands.

Note:

In 1977, these areas were set aside as relatively large parcels of land of which the drainage basins comprise only a small part. Council considers that the areas not required as drainage basins are integral parts of the surrounding public land and should be managed as such. The total area of these reserves would now be 1160 ha.

Management in consultation

Recommendations

O218–O220 That these areas, totalling 1182 ha, continue to be used primarily for those

purposes approved by the government following publication of the final recommendations for the Mallee area in May 1977

and for the conservation of native animals and for public education and recreation where this does not conflict with the primary aim

and that they be managed by the Rural Water Commission in consultation with the Department of Conservation, Forests and Lands.

Note:

Each of these areas—Lakes Tutchewop (O218), William (O219), and Kelly (O220)—are valuable for waterfowl and waders. All three areas are included in the Ramsar listing of wetlands—principally for their value for waterbirds. These wetlands receive saline water from Barr Creek. Reduction of run-off from irrigated agricultural lands into Barr Creek by adoption of a salinity management plan, which would see improved efficiency in the use of water, would mean that the rate of increase in the salinity of these wetlands would slow.

Additional tanks

O221–O223 That the tanks listed below and indicated on Map A be used for water supply purposes

and that they be reserved under section 4 of the *Crown Land (Reserves) Act* 1978 and managed by the Department of Conservation, Forests and Lands in consultation with the Rural Water Commission, except where they are already vested in the Commission.

O221 In the north-west corner of Allotment 8, Parish of Wirmbool.

O222 In the north-west corner of Allotment 16, Parish of Wirmbool.

O223 Adjacent Allotment 18, Parish of Kenmare.

Note:

Each of these has been identified by the Shire of Dimboola as being filled by the Rural Water Commission and used regularly for municipal purposes.

Additional drainage basin

O224 Woorinen basin (245 ha)

That this area, indicated on Map B, continue to be used for the disposal of saline drainage water and, as far as is possible, for nature conservation and recreation

and that it be reserved under section 4 of the *Crown Land (Reserves) Act* 1978 and managed by the Rural Water Commission.

Drainage onto the floodplain

In a number of localities, drainage water from irrigated horticultural or agricultural crops is directed into wetlands such as on the floodplain of the Murray River. Where this currently occurs, frequent flushing of these wetlands must take place to ensure that natural values are not endangered. However, there should be no new schemes that employ this method of disposal and, where it is currently permitted, monitoring should be undertaken to ensure that salinity levels do not cause modification to the natural system. If this does occur, action should be taken to halt the process.

Recommendation

O225 That new schemes for the disposal of saline drainage water not include disposal into natural wetlands or onto river floodplains

and that

those schemes currently disposing saline water onto the floodplain be monitored for modification of the natural systems and, if this does occur, remedial action be taken.

Salinity

Salinity has been recognized by the government as the single greatest threat facing Victoria's environment. The study area contains some of the worst-affected land in the State.

Salinity, where it causes problems, is linked inextricably to groundwater behaviour. The balance between groundwater and surface water is very finely tuned and even a small increase in the amount of water filtering into the soil from the surface can cause the

groundwater level to rise. As it approaches the surface, salt is concentrated by evaporation. This increase in salt levels can damage vegetation by preventing plant germination and growth, or killing it, thereby reducing agricultural production and changing the nature of native vegetation. The loss of plants exposes the soil to wind erosion. Salt can also damage water-using appliances, pipes, and metal tanks and cause the loss of wildlife habitat and the amenity of recreational areas.

Extensive clearing of trees and the introduction of large-scale irrigation are the main factors that have contributed to the rise in groundwater levels. In irrigation areas, dissolved salts in the irrigation water can also gradually accumulate in the soil and shallow groundwaters.

Naturally occurring saline pans occupied about 88 000 ha or 2 per cent of the study area at the time of settlement. Groundwater pressures have risen as a consequence of removal of the perennial vegetation, and groundwater now discharges at the soil surface over approximately 3 per cent of the total landscape. Salt-affected areas are thought to be expanding at an annual rate that averages about 2 per cent, increasing in abnormally wet years.

The dominant vegetation over most of the area before clearing comprised mallee eucalypts. These are deep-rooted and perennial and consequently very little of the natural rainfall would have reached the groundwater. Since clearing and the introduction of shallower-rooted annuals such as wheat and medic pasture, significant amounts of rain-water have entered the groundwater system. Long fallows accentuate this accession because of the absence of transpiring vegetation.

About 90 per cent of the secondary (human-induced) salinization in the Mallee has been brought about by a general increase in the height of the regional water table.

Particularly where sand dunes have been cleared for agriculture, local groundwater systems associated with clay subsoils that have low permeability produce salinity at the foot of some of the dunes. While the immediate effects are observed at or near the recharge area or water source, it may also be contributing to the regional groundwater.

Based on 1984 estimates, dryland salting within the study area has to date caused the capital value of land to decline by more than $2 million. The annual loss in productivity is estimated to be $0·4 million.

The decline in water quality on freehold and public land is an additional cost. Salinization of the River Murray is of particular concern, not only for the study area but for the States of New South Wales and South Australia.

Parts of the Big Desert and the Sunset Country, and of the naturally saline evaporative basin plains, would be susceptible to further salinization if clearing of the native vegetation took place.

Control must be tackled on a regional basis and it is unlikely that the farmers actually affected by salinity can achieve anything of significance on teir own properties.

Preventative work—such as fencing and the planting of deep-rooted perennial and salt-tolerant species—has proved effective in controlling dune and channel seepage.

Establishment of a continuous vegetative cover to reduce surface run-off and erosion is an important factor in reclaiming bare saline soils. The mulching effect of the plant cover reduces surface evaporation and hence salt accumulation at the soil surface.

The government recently released a draft strategy for managing the salinity of land and water resources—'Salt Action'—which details the options available to it and action it proposes. The strategy suggests that evaporative basins are viable options—where appropriate, and subject to careful evaluation of environmental effects. Long-term solutions include reducing recharge and accession to the groundwater by planting trees, and other plants that require large volumes of water, in the recharge zones and adopting more efficient means of watering irrigation areas.

In formulating these recommendations, the Council has been careful to ensure that its recommendations for public land complement government and community initiatives on freehold land with respect to the salinity problem. This is reflected in the recommendations for agriculture, State forest, and wildlife as well as in the recommendations below.

Recommendations

O226 That the government continue to encourage and expand the development

of tree-growing assistance schemes, agroforestry, cropping and grazing techniques, and the use of deep-rooting plants to reduce the accession of rainfall to groundwater, thus alleviating the effects of dryland salting and improving the condition of public land.

O227 That, where possible, native vegetation be replanted, including on road reserves and isolated blocks on public land, especially in recharge areas and catchments where dryland salting is occurring.

O228 That the techniques developed to control salting be applied to salt-affected public land, where appropriate.

Water and Environmental Flows

Regulation of natural water supplies for irrigation and stock and domestic use, combined with the establishment of extensive agricultural areas, has changed the nature of many of the Mallee's streams and wetlands. While some of these changes might have benefited some native plants and animals, others have made the wetland areas of the Mallee less suitable as habitat for native species.

Although water regulation and distribution works have altered wetland conditions in a number of circumstances, the Rural Water Commission, in co-operation with the Department of Conservation, Forests and Lands, has attempted to preserve and enhance wildlife habitat wherever practicable.

Environmental flows

Water is supplied to a number of wetlands from the Rural Water Commission's distribution system according to a set of operating rules, and at a nominal price compared with normal irrigation supplies.

The question of permanent allocations of water for environmental purposes has in recent years been addressed in two major inquiries—by the Parlimentary Public Works Committee, which reported on water allocations in northern Victoria in 1982, and by the Salinity Committee, which completed that first inquiry and reported its findings to Parliament in 1984. Proposed changes to water legislation by the Department of Water Resources also address this issue.

Among other things, the Salinity Committee recommended that the annual allocation for the conservation of flora and fauna should be 25 000 ML from regulated resources and that the Department of Conservation, Forests and Lands should develop management strategies for each wetland in northern Victoria. To date, the particular wetlands involved and the volumes, charges, and conditions under which water would be supplied have not been determined.

Following a suggestion from the Rural Water Commission that, in many years, large volumes of surplus water flows would be available in excess of the 25 000 ML, the Salinity Committee also recommended that water for nature conservation should receive high priority for the use of these flows. Such surplus water for the Mallee area would be available in the Murray River.

In its Final Recommendations for the Wimmera Area (November 1986), the Land Conservation Council expressed its belief that a significant proportion of any water saved through the proposed pipelining of the Wimmera–Mallee water-supply system should be designated for environmental use in the Wimmera River.

The Department of Water Resources and the Department of Conservation, Forests and Lands are currently investigating the aquatic environment of the Wimmera River with a view to determining the benefits of increased flows for environmental and recreational purposes.

The Council believes that improvement in river values would follow the allocation of a significant proportion of the water saved by pipelining to environmental flows in this important inland river. However, there is some concern that increased volumes of water in the Wimmera River system may increase accession of water to the regional water table. Investigations will be required to develop procedures for scheduling flows.

Rather than depend on the allocation of environmental flows from irrigation or other water-supply systems, certain wetlands in the Mallee would benefit if provisions were made

to modify existing flood-mitigation works. Heywoods Lake (I42 on Map B), for instance, no longer receives flood-waters from the Murray River because of levee banks and a dam built for adjoining farmland, and the black box stands here are deteriorating.

Recreational use of water-suppply areas

Depending on the availability of supplies, surplus flows from the Wimmera-Mallee Domestic and Stock System provide water to a total of 13 lakes approved for recreational use. Six of these—Green Lake (now proposed as a regional park), Lake Lascelles, Walpeup Lake, Underbool Lake, Tchum Lake South, and the Yarriambiack Creek at Beulah—lie within the Mallee area. In some cases the local community has established facilities to service the recreational use of the lakes, and there is now an expectation that water supplies would continue to be made available.

Murray River

The construction of water storages in the upper reaches and tributaries of the Murray River has reduced the frequency and duration of floods during the winter and spring months. In addition, flows during summer and autumn are now greater than under natural conditions. There has been concern for many years that these alterations to river flow may be having an adverse effect on the regeneration and growth of river red gum and box species within forests along the river, such as the Nyah and Vinifera forests, Belsar Island, Hattah-Kulkyne, Kings Billabong, and Lindsay and Wallpolla Islands.

The impoundments in the Murray River and its tributaries and the consequent changes in both flow and thermal regimes have had a marked effect on native fish, many of which require specific minimum water temperatures and floods as triggering mechanisms for spawning and the subsequent survival of eggs and young. The gradual elimination of the great anabranch or backwater systems of the river and its tributaries by water-control schemes, including the construction of levee banks that effectively reduce the floodplain area, has reduced the extent of waters that previously provided the necessary space and food for the young of many fish species.

Fish such as Murray cod and golden perch have only reproduced in large numbers when extensive floods have occurred at spawning time.

The Rural Water Commission and the Department of Conservation, Forests and Lands are co-operating in an inter-departmental State Working Group that, since 1979, has been examining measures that may overcome the problems of reduced winter-spring flooding.

The River Murray Commission in 1986 published the results of a comprehensive survey of wetlands along the Murray River floodplain, and is currently conducting a study of riparian vegetation along the river.

Kerang Wetlands

Many of the lakes here form part of the water distribution system and now hold water for longer periods than under natural conditions. These wetlands are important as wildlife habitat, and contain some of the largest water-bird breeding areas in Victoria, especially for migratory waders and ibis. Many smaller lakes receive water only infrequently.

Lake Albacutya-Outlet Creek

The Wimmera River flows from the highlands of central Victoria into Lake Hindmarsh on the edge of the study area. In wet years, Lake Hindmarsh overflows into Outlet Creek, which then carries water to Lake Albacutya. Records show that, since the turn of the century, Lake Hindmarsh has overflowed on at least 12 separate occasions. Lake Albacutya last filled in 1975.

The course of Outlet Creek continues north from Lake Albacutya, and the river red gum and black box woodlands associated with the creek are an important feature of Wyperfeld National Park. The creek last flowed into the park between 1975 and 1977, but did not fill the whole wetland system here. Wirrengren Plain, the terminal lake in the Wimmera system, historically received water from Outlet Creek about every 20 years, but this has not occurred since about 1918.

Over the years there have been a number of proposals to increase water flow to the

downstream end of the Wimmera River system. A feasibility study carried out by the Rural Water Commission in 1980 indicated that proposals to augment supplies to Lake Albacutya were impracticable, due mainly to the large volumes of water required, the high capital cost, and the limited agricultural benefits obtainable. This, however, may change if pipelining of the Wimmera–Mallee system proceeds.

Presently, water to supply parts of the Wimmera and Mallee is transferred from storages in the Grampians via the Wimmera River and open channels to farms and urban areas. The Wimmera–Mallee water-supply system involves diversion of some waters from the Wimmera River system into the channels used to supply stock and domestic water. As a result the flow patterns of the lower Wimmera River have altered since construction of the channel system. Of the water leaving the storages, up to 75% is lost through seepage and evaporation while approximately 50% of the water reaching farm and town storages is also lost through subsequent seepage and evaporation. The current channel system is inefficient and, in addition, supplies poor-quality water with high turbidity. Seepage has also resulted in some areas of dryland salting.

To overcome these problems the Rural Water Commission has proposed a program to replace the open-channel supply system with pipes. The Eureka section of pipeline in the Lake Tyrell area of the Mallee was opened on 25 May 1988. This project involved replacement of the Eureka relift pumping station and piping of supply over an area of about 200 sq. km. It could be incorporated into a larger scheme to pipe water supplies to the rest of the system at a later date.

If the entire Wimmera–Mallee pipeline project is implemented, it will result in a considerable saving in water (approximately 70 000 ML per annum), which could be used to restore security of supply, to supply additional demand, or for environmental purposes.

Council believes that a significant proportion of any water saved should be designated for environmental use. It is evident that the vegetation communities associated with the Outlet Creek system are under considerable pressure and will continue to degrade unless alternative water management arrangements are put in place.

Recommendations

O229 That the Department of Water Resources investigate the options for supplying additional water during years of high rainfall to the Wimmera River system, which will ensure adequate watering of the lakes north of Albacutya, including Wirrengren Plain.

O230 That a high priority be given to allocating water for environmental flows in the Wimmera system should any savings in water be made as a result of pipelining a portion or the whole of the Wimmera–Mallee Stock and Domestic Water Supply System.

O231 That steps be taken to provide for adequate winter–spring watering of the River Murray forests and associated wetlands and various engineering and management solutions be pursued in order to achieve this.

O232 That water from Victoria's share of the River Murray resource be allocated specifically for winter–spring forest-watering, including portion of the currently unallocated water from the Dartmouth Reservoir.

P. Utilities and survey

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

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 survey and utilities. The use of land for these purposes will be considered when the need arises.

Government agencies concerned with provision and installation of communications equipment, transmission lines, pumped storage sites, power stations, port facilities, pipelines, roads, etc. 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. This would assist in achieving co-ordinated planning, and perhaps avoid the necessity for costly resurveys.

Recommendation

Existing utilities

P1 That the areas, some of which are indicated on the maps, currently used for public utilities, continue to be used for those purposes approved by the government following publication of the final recommendations for the Mallee area in May 1977.

Proposed new rubbish depot

An area of public land south of Robinvale, in the Parish of Toltol, has been proposed by the Shire of Swan Hill as an area for municipal purposes, including a garbage depot. Council believes that such a use is acceptable if it is adequately fenced and screened and provided dumping is controlled.

Recommendation

P2 That the area of 60 ha, being part Crown Allotment 21, Parish of Toltol, and shown on Map B, be available for municipal purposes, including the establishment of a garbage depot.

Railway land

Recommendation

P3 That, where isolated remnants of the original vegetation remain on land associated with railways, every effort be made to protect that vegetation consistent with management practices.

Over recent years about 1700 km of railway line have been closed in Victoria. All sections have been assessed by the Department of Conservation, Forests and Lands in regard to nature conservation, historical, and recreational values.

In the Mallee, the Council has proposed the establishment of linear bushland reserves to retain in public ownership extant native vegetation along the section of the now-disused railway between Morkalla and Meringur (Recommendation I277) and portions of the disused Piangil–Yungera line (I278). Proposals for the Hopetoun–Patchewollock line as well as the historical context of all railway land in the Mallee will be investigated before the final recommendations are published.

Other portions of disused railway lines could be useful for tree-growing schemes, particularly in these areas where salinity is a problem, or to develop biological corridors. They may also be useful for some forms of recreation.

An expression-of-interest procedure, managed jointly by the Department of Conservation, Forests and Lands and V/Line, is soon to be introduced. Responses will be sought from individuals and groups in local communities (including municipal councils) who would be willing to manage sections of rail reserves in ways that would help to improve the environmental values of the rail reserves.

Recommendation

P4 That disused railway land be retained as public land where it may have historical, recreational, environmental, or educational values or be used for other government or local government needs.

Survey, navigation, and communication

P5 That the minimum area necessary for survey purposes around trigonometrical stations and for access to and maintenance of navigation aids and communications installations be temporarily reserved on public land where it would otherwise remain as unreserved Crown land; and, where other forms of public land tenure apply, that the government utility involved have the right to occupy a minimum area and provide lines of sight.

Q. Township land

Public land in townships is currently used for a wide range of purposes. The Council has not generally proposed any change in use for such public land where the present use is for schools, public halls, sports grounds, and so on. In some cases, however, Council has made specific recommendations for township land to be used for bushland reserves, recreation, utilities, or water supply. These recommendations are included in the appropiate sections. In general, the Council considers that other areas of public land within townships should remain as unreserved Crown land to meet future requirements, although it has recommended that some areas be released now for urban purposes.

Recommendations

Q1 That public land in townships, other than those areas that have been specifically reserved or are listed under Recommendation Q2 below, remain as unreserved Crown land to meet future township requirements.

Q2 That the areas totalling 82 ha, listed in Table 6 below, be used for urban purposes

and that
they be made available for alienation if necessary.

Table 6: Land for Urban Purposes (recommendation Q2)

Township (T) *or Parish* (P)	*Description*	*Area (ha)*
Berriwillock (T)	CA 4D, section 4 and CA 20, section 1	0·5
Birchip (T)	CA 10, section 4	0·4
Bumbang (P)	Crown land east of CAs 5, 6 and 7, section C and to the north of Bushland Reserve 1247	54·00
Cowangie (T)	CAs 11–15, section 2 and Crown land to the east; CAs 3, 10, 11, section 3; and CA 19, section 1	2·8
Lake Boga (T)	CAs 25A and 25B	0·2
Manangatang (T)	Eastern part of CAs 19 and 20, section 4	0·4
Meringur (T)	CA 2, section E	0·2
Murrayville (T)	CAs 10 and 11 and Crown land to the south, section 11; CA 16, section 7	1·50
Nyah (T)	CAs 4 and 11, section 7 and the Stone Reserve	2·20
Ouyen (P)	Northern part of the former Racecourse Reserve	7·20
Ouyen (T)	CAs 24, and 26–29, section 16	0·5
Piangil (T)	CAs 9–11, section 4; and CAs 9 and 12, section 5	0·5
Sea Lake (T)	CA 27B, section 5	0·4
Underbool (T)	CAs 11, 16, 18 and 19, section 5, and Crown land south of CA 9, section 6	1·0
Walpeup (T)	CAs 9–16, section 5; CAs 13 and 14, section 1	1·90
Wood Wood (T)	Public Hall Reserve, section 2	0·20
Woomelang (T)	CA 18, section 9; CAs 10–13 and 15–18, section 3; all of section 4; parts of CAs 1–8, section 5; parts of CAs 11–14, section 2; parts of CAs 1–8, section 6; parts of CAs 10–13, section 1; CAs 1–8, section 10	7·50
Woorinen South (T)	CAs 10 and 11, section 4; CAs 2 and 3, section 1	0·4

Note:

At the mapping scale used (1:250 000), it is seldom possible to define the boundaries of public land in townships accurately. Reference should be made to the appropriate township plan to determine the accurate boundaries and form of reservation for those townships where public land is not shown on the map or referred to in these recommendations. Details are held by the Council.

Inappropriate townships

Some townships, although gazetted, either have never been settled or have been largely abandoned. Council considers that these townships are no longer appropriate and, following discussion with the relevant Shire Councils, has recommended their revocation.

Much of the Crown land in these townships supports native vegetation in either an undisturbed condition or, in the case of partially developed and subsequently abandoned townships, as regrowth.

Many such areas have important nature conservation values because they support remnant native vegetation in predominantly agricultural areas. They also have important landscape values.

Where appropriate, the Council has recommended that these areas be set aside as flora and fauna or bushland reserves.

Recommendation

Q3 That the townships listed in Table 7 below be revoked.

Table 7: Townships for revocation (recommendation Q3)

Township	*Parish*	*County*
Annuello	Geera	Karkarooc
Bambill	Werrimull	Millewa
Bannerton	Toltol	Karkarooc
Barrapoort	Gredgwin	Tatchera
Benetook	Benetook/Ginquam	Millewa/Karkarooc
Boigbeat	Boigbeat	Karkarooc
Boinka	Boinka	Weeah
Bolton	Myall	Karkarooc
Boonoonar	Nurnurnemal	Karkarooc
Cocamba	Cocamba/Eureka	Karkarooc
Curyo	Curyo	Karkarooc
Danyo	Danyo	Weeah
Galah	Tiega	Karkarooc
Goschen	Kooem	Tatchera
Goyura	Goyura	Karkarooc
Karawinna	Karawinna/ Murrnroong	Millewa
Karween	Kareen	Millewa
Kiamil	Kia	Karkarooc
Kooloonong	Mirkoo	Tatchera
Kulwin	Kulwin	Karkarooc
Merrinee	Merrinee	Millewa
Miralie	Piangil	Tatchera
Mittyack	Mittyack	Karkarooc
Morkalla	Morkalla	Millewa
Natya	Coonimur	Tatchera
Nowingi	Nurnurnemal	Karkarooc
Panitya	Carina	Weeah
Pier-Millan	Pier-Millan	Karkarooc
Pirlta	Benetook/Merrinee	Millewa
Pira	Tyntynder West	Tatchera
Torrita	Nyang	Weeah
Tutye	Tutye	Weeah
Yarrara	Yarrara	Millewa
Yarto	Yallum	Karkarooc
Yatpool	Yatpool	Karkarooc
Yungera	Koorkab	Tatchera

Notes:

1. Where parcels of public land within the townships to be revoked support native vegetation, the Council has recommended their reservation where appropriate as flora or bushland reserves. Where the land carries no extant native vegetation and is not required for other government purposes, Council has recommended its alienation (see Recommendation F1). It is intended that the township allotments should be amalgamated to form additions to present farms and not sold as individual lots.

2. Notwithstanding the recommendation to revoke these townships, they represent, along with those townships that are still occupied, the incentives and aspirations for the development of the Mallee. Their historical context is important and their design may reflect variations to then-existing town planning concepts to accommodate the Mallee environment. This will be investigated before the final recommendations and, if appropriate, the historical context of one or several may be recognised in some way.

R. Military 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.

Recommendation

R1 That, where military training is conducted on public land:

(*a*) the types of activities, and their timing and location, be subject to agreement between the Department of Defence and the Department of Conservation, Forests and Lands 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, Forests and Lands

(*b*) the Department of Conservation, Forests and Lands be co lted (for fire-protection purposes) with respect to training activities in protected public land

(*c*) it 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. Discussions should be held with the Department of Defence concerning alternatives to the proposed Murray-Sunset National Park and the proposed extensions to the Wyperfeld National Park for military training as this is considered an inappropriate use within the parks.

S. State forest and protected Mallee lands

State Forest

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, were in the past designated by the Council as either areas for hardwood timber production, or as uncommitted land. In the Council's final recommendations for the Alpine Area—Special Investigation, published in November 1983, it was proposed that such forested land be managed as a single unit.

The Council decided to refer to this land as 'State forest', as it believes that term best describes public land in timber production areas and uncommitted land, even though this may contain a range of vegetation types from tall mountain forests through to woodlands, mallee scrub, heathlands and swamplands. The name is used only in a descriptive sense rather than as a 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 timber is harvested, 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.

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. Many rare plants are found in State forest and, considering it occupies about two-thirds of all public land, it is 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 *Forests Act*.

The areas of State forest are confined to the Murray and Loddon River floodplains and contain river red gum forests and black box woodlands.

Protected Mallee lands

Considerable areas of public land away from the floodplain areas remain outside conservation reserves and, in the normal course of events, such areas would also be designated as State forest. Most of these areas carry mallee vegetation, but also include chenopod shrublands, woodlands, as well as a range of other communities where mallee eucalypts do not dominate.

While the major conservation values—such as viable representation of flora, fauna, and land systems—have been included in the proposed additions to the park and nature conservation reserve system, these remaining areas contain important values that the Council believes should be specifically identified and protected. Council considers that the provisions for State forest do not adequately address the significance of those parcels of public land not included in parks and reserves and away from the Murray River, and is recommending that they be designated as 'protected Mallee lands'. Such areas would be managed primarily to conserve and enhance their natural values, protect the native vegetation cover and, where necessary, restore disturbed areas.

Regional significance

Given that two-thirds of the Mallee area has been cleared, the remaining one-third on public land is crucial to the maintenance of ecosystems. It also has special significance with respect to the conservation of semi-arid vegetation and faunal habitats in south-eastern Australia.

Wind erosion and salinity

The remaining areas of public land in the Mallee also play an important role in reducing the hazards of wind erosion and salinity.

Many woodlands and land adjacent to saline shrublands and boinkas in the Mallee have suffered a dramatic decline in vegetative cover. Overstorey trees are senescent and regeneration is virtually non-existent. Perennial native understorey shrubs and grasses are being replaced by annual exotic species. These changes need to be reversed to ensure that the contribution of public land to the salinity problem in the Mallee is reduced. This requires restoration of both the perennial overstorey and understorey species on these disturbed areas.

Wind erosion has long been of concern in the Mallee. Semi-arid lands, such as those comprising much of the region, tend to erode when the soils are exposed to strong winds. The main reason for this is that the soil surface is only weakly bound by humus and is frequently dry.

The more susceptible lands are those with east-west or irregular sand dunes in the drier north and the Big Desert, much of which still occur on public land. These usually comprise deep infertile sands. Soils in the south-east of the study area are more stable due to their higher clay fraction, but they can be badly affected when poorly managed, particularly during droughts. Erosion becomes significant where the projected ground cover of standing vegetation is less than about 25%.

Given the high risk of wind erosion associated with the larger blocks of public land, it is important to protect and, where possible, enhances the existing vegetation cover on these areas and ensure that activities that disturb such cover are minimized.

Dangers include the impact of fires which can also expose large areas to the risk of wind erosion.

Biological corridors

Some areas identified as 'protected Mallee lands' form important biological corridors between major blocks of public land.

These are important in facilitating the interchange of faunal populations and reducing the likelihood of extinctions of species. Three such corridors have been identified in the Mallee area. Alienation of the link between the large parcel of land at Annuello and the south-eastern extent of the now proposed Murray-Sunset National Park was prevented immediately prior to the commencement of this review—revegetation of portions of this link is progressing.

The public land corridors linking the proposed Bronzewing and Wathe flora and fauna reserves (G37 and G38 respectively on Map A) with the eastern edge of the Big Desert include land previously designated for limited cultivation leases. Revegetation of some of these areas will be necessary. It is also suggested that portion of the previous limited cultivation lease forming part of the potential corridor between Bronzewing and the Big Desert could be exchanged for adjoining freehold land to create a wider link at the western end [see Recommendation F2 (*b*)].

Land uses

Grazing

As indicated in Chapter F, Agriculture, stock grazing is to be phased out of all the larger licences within 'protected Mallee lands' by 1999 and direct responsibility for management of vermin and noxious weeds will revert to the Department of Conservation, Forests and Lands. The Council acknowledges that this will require a substantial increase in the resources required by the Department. Grazing will be permitted to continue under annual agistment in areas of State forest—along the Murray River floodplain.

Timber production

Although currently deriving its sawlog supplies from New South Wales and private land, one sawmill has an annual licence to extract up to 2750 cu.m from the river red gum forests on public land in the Mallee area, subject to the availability of this material. Sawn products include railway sleepers and timbers for housing, landscaping, furniture and fenceposts.

River red gum forests in the Mallee area are restricted to bends and islands dispersed along the floodplain of the Murray River and cover more than 13 000 ha. Some 7000 ha of this

would be excluded from timber harvesting by prescriptions aimed at protecting sites of recreational, historical and archaeological importance and frontages to the Murray River, major rivers (anabranches), and billabongs, leaving about 6000 ha to be managed for timber production. The Department of Conservation, Forests and Lands is undertaking a resource assessment which will determine the sustainable level of timber-harvesting that these forests could support.

The impact of the Council's proposed recommendations on sustainable yield cannot be determined until the resource assessment is completed. Timber-harvesting will only be permitted in areas designated as State forest and in certain parts of the River Murray Reserve. The final recommendations will include an evaluation of their impact on the areas available for timber production.

Broombush-harvesting

Mallee broombush (*Melaleuca uncinata*) is harvested from extensive areas—primarily in the Big Desert—to produce broombrush panels used for fencing, feature panels, and shadehouses. Five commercial licensees operate in the Mallee, supplying markets principally in Adelaide and, to some extent, Melbourne.

The total allowable annual cut from the Mallee is at present 47 800 bundles (about 956 tonnes). However, the extent, location, distribution, and condition of potentially merchantable broombush stands is currently being assessed, and the vegetation surveys undertaken for the resources report for this review will greatly facilitate this assessment.

Most of the broombush being harvested now is regeneration following the 1959 wildfire. The cutters believe that, after about 20 years of age, the broombush has both the size and maturity to produce stable panels (younger stems may acquire sufficient size, but they are reported to split on drying and produce untidy and unstable bundles).

Although there is some concern as to the biological impacts of broombush-harvesting, its major impact is the proliferation of tracks intruding progressively into previously untracked parts of the Mallee, compromising nature conservation and wilderness values.

In South Australia, the government has prohibited the harvesting of broombush from public land, and planning controls there severely limit this activity on freehold.

Council recognizes that considerable areas of broombush are included in the proposed extension to the Wyperfeld National Park, and that this has reduced the resource that was potentially available for harvesting. However, the industry has been operating without any information about the available resource and without adequate supervision; cutting areas have been worked through rather haphazardly. Reorganization and restructuring of the industry has been necessary and inevitable and the Department of Conservation, Forests and Lands has commenced this task.

The Council believes that following completion of the resource assessment it will be possible for the Department to determine the allowable harvesting level from within the areas remaining available for broombush-harvesting, taking into account the desirability of establishing a sustainable industry. However, the Council also believes that the royalty for this product should reflect both the market value of broombush and the cost of administration and that there should be adequate planning and supervision of the operations. Should adequate supervision be beyond the resources of the Department, the industry should not be permitted to continue.

The areas from which harvesting may take place (indicated by diagonal stripes on Map A) are now largely accessed and, in a number of cases, the primary routes follow tracks established by the Army during its exercises. Council is concerned that future tracking within the broombush-harvesting areas should be kept to a minimum and location of stands using the floristic vegetation maps now available from the Department should help reduce the number of exploratory tracks that are made.

The Council endorses the recommendations of the Board of Inquiry into the Timber Industry (June 1985) that 'research be conducted into the economic and technical feasibility of cultivating broombush on private land'. A project is under way at present, investigating this proposal.

The Council has referred below to a number of guidelines related to broombush-harvesting that it believes should be incorporated into management plans prepared for the industry by the Department of Conservation, Forests and Lands.

- The degree of tracking into and throughout the cutting areas should be minimized by planning access routes. This planning should particularly seek to avoid the establishment of tracks over high dunes.
- All tracks, other than the main trunk routes, should be closed and rehabilitated after completion of work.
- Planning of cutting areas should recognize that wildfire could destroy at least part of the presently available resource. Alternative cutting areas should not be made available outside those indicated on the map.

Land use goals

State forest in the Mallee area has a multiplicity of uses. It is important for the protection of water resources, conservation of plants and animals, and timber production and provides many opportunities for outdoor recreation. The forests also provide honey, forage, road-making materials, and other forest products to satisfy various community needs.

Management of State forest should take into account these various values and should ensure that they can be maintained and that the range of forest products can continue to be supplied in the future. The government has prepared a Draft 'Code of Forest Practice', which seeks to:

- protect forests and their associated vegetation and fauna from damage by wildfire and from injury by biological or other agents
- conserve landscape values, wildlife habitats, and floral, historical, and other natural values
- provide a continuing supply of hardwood timber on a regional sustained-yield basis
- provide opportunities and facilities for public recreation and education
- protect water supply catchments and stream environments in general
- protect adjacent plantations from fire
- provide for agriculture, forest grazing, extraction of road-making materials, defence training, and mineral exploration and mining etc, where appropriate.

In relation to these goals, a number of principles are referred to below. These are based on harvesting prescriptions used by the Department of Conservation, Forests and Lands. In addition, certain values are listed and these should be protected by the implementation of management prescriptions.

Protection of water bodies

Adequate buffer strips—generally 40 metres wide on either side along major streams and 20 m along ephemeral watercourses and hydrologically sensitive areas—should not be logged, and where possible other operations that cause soil disturbance should not take place in them. Buffer strips 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 public land water frontage reserve along the Murray River extends to 60 m.)

Much of the State forest is situated along the Murray River and it is particularly important in mitigating the effects of flooding and regulating the flow of water in the Murray system. Some damage to these forests has already occurred due to river regulation, particularly upstream in the Barmah Forest, and this will increase unless preventative measures continue to be taken in the near future. The maintenance and protection of the river red gum forest ecosystem depend in turn on an effective winter–spring flooding regime and the absence of summer flooding. A more detailed discussion of Murray River regulation and associated forest management problems is included in Chapter O, Water Supply and Drainage.

Recreation and landscape

In planning for recreation and protection of landscape, special consideration should be given to road location and other activities carried out in the forest in areas of high landscape value.

All refuse associated with logging, mining or quarrying operations (such as tyres, drums, and disused huts) should be removed at the end of the operations.

Activities involving disturbance to the natural environment should not occur in buffer zones around popular recreation sites and beauty spots.

Nature conservation

The Council is aware that a number of uncommon or rare plants and animals occur within State forest. Where known, these are specifically referred to in the recommendations below, along with broad guidelines for management to protect them. As new information becomes available on the specific habitat requirements of other native plants and animals, it should be incorporated into management plans for State forest.

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.

Sufficient mature and veteran trees in logging areas should be retained for fauna habitat.

It may be necessary to exclude grazing from some areas, at least temporarily, in order to protect particular species or habitats. The areas of State forest contain a mosaic of wetlands and billabongs that are particularly important feeding and breeding localities for waterfowl and these should be protected to ensure their continued viability as wildlife habitat.

Archaeological and historical sites

Sites of archaeological and historical significance or interest should be identified, and the sites and their environs protected.

Recommendations

Protected Mallee lands

S1 That the areas shown on the maps be used to:

(i) conserve native plants and animals, and provide opportunities for the development of wildlife conservation techniques

(ii) protect biological corridors and other significant values described in the schedule below by the implementation of management prescriptions

(iii) maintain and, where necessary, rehabilitate native vegetation to provide improved protection from the hazards of wind erosion and salinity

(iv) provide opportunities for open-space recreation (including hunting) and education

(v) produce honey, gravel, sand, and other minor forest produce where this is compatible with (i)–(iv) above

that

(vi) mineral exploration and mining be permitted subject to the principles and guidelines outlined in Chapter N—Mineral and Stone Production

(vii) grazing of the larger blocks be phased out by 1999 in accordance with the schedule in Chapter F, Agriculture

and that they become protected Mallee lands and be managed by the Department of Conservation, Forests and Lands.

State forest

S2 That the areas shown on the maps be used in accordance with the principles outlined above to:

(i) supply water and protect catchments and streams

(ii) produce hardwood timber

(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, and other forest produce

(vi) protect the values in the areas described in the schedule below by the implementation of management prescriptions

and that they become State forest and be managed by the Department of Conservation, Forests and Lands.

Broombush-harvesting

S3 That, for those areas of protected Mallee lands indicated by diagonal stripes on Map A, broombush-harvesting be permitted:

that

(i) harvesting be confined to those areas indicated

(ii) following completion of the resource assessment, future harvesting be undertaken at a sustainable level

(iii) royalties reflect the market value of the product, the cost of supervision, and the contribution towards the research referred to in (vi) below

(iv) adequate supervision of the operations be undertaken and if this cannot be achieved, harvesting not be permitted to continue

(v) harvesting be in accordance with the guidelines listed above

and that

(vi) research be conducted into the economic and technical feasibility of cultivating broombush on private land and if this is shown to be possible, harvesting be phased out of public land.

Note:

An area in the eastern portion of the Big Desert, where broombush-harvesting is currently taking place, has not been made available for this use in these proposed recommendations. Prior to the final recommendations the Council will review the conservation values of this area as well as its potential contribution to the sustainable level of harvesting from the broombush resource.

Schedule of values to be protected in State forest and protected Mallee lands

Nature conservation

- All plant species that are included in the species list in the back of the report—Mallee Area—Review, November 1987. This report includes data from the 'List of Rare or Threatened Plants in Victoria' prepared by the Department of Conservation, Forests and Lands, and the report by A. C. Beauglehole ('The Distribution and Conservation of Native Vascular Plants in the Victorian Mallee'—1979).

- Stands of river red gum, black mallee box, black box, yellow gum, and *Callitris* and their associated fauna occurring along the spring-line on the northern fringe of the Big Desert. The area north of the Big Desert Wilderness, in particular, is significant in that all species of small mammal recorded in the Big Desert occur here, as are all species of snake. The heathlands with brown stringybark in this area support a wide range of honeyeaters and other birds; some of the best examples of long-unburnt mallee communities occur here also.

- The habitats of the significant faunal species, including Mallee ningaui, Mitchell's hopping mouse, striated grass wren, malleefowl, black-eared miner, western brown snake, and coral snake that occur in the Annuello block.

- The habitat of one of Australia's rarest butterflies (*Ogyris genovera genua*), as well as that of the desert blue butterfly (*Candalides hyacinthinus simplex*) and the cyprotus blue (*C. cyprotus*)—both also being rare species—in the south-east of the Big Desert and including the north-western fringe of Lake Hindmarsh. This area also includes a number of orchid species.

- Corridors of native vegetation that provide continuity between larger parcels of public land. These are important in facilitating the interchange of populations and reducing the likelihood of extinctions of species. Three such corridors have been identified in the Mallee area. Alienation of the link between the large parcel of land at Annuello and the south-eastern extent of the now-proposed

Sunset Country National Park was prevented immediately prior to the commencement of this review—revegetation of portions of this link is progressing. The public land corridors linking the proposed Bronzewing and Wathe flora and fauna reserves (G37 and G38 respectively on Map A) with the eastern edge of the Big Desert include land previously designated for limited cultivation leases. Revegetation of some of these areas will be necessary. Activities within them should be compatible with the retention of their capacities to act as biological corridors.

- Public land bordering the Big Desert Wilderness area provides an important buffer to activities that would conflict with the use of the Wilderness. Its depth from the Murrayville track, for instance, reduces the intrusiveness of vehicular movement and noise. Other conflicting activities would similarly be buffered—the depth depending on the activity. The smaller areas of relatively high wilderness quality outside the Big Desert Wilderness and national parks should also be protected.

- The habitat of the Kori bustard in the south-west of the Big Desert as well as the habitat of the western whipbird, believed to also occur here.

- The large parcel of public land at Cullulleraine, in which the paucident planigale was first recorded for Victoria and in which the grey falcon is known to be breeding. The tessellated gecko has also been found here.

- The habitats of the paucident planigale, long-thumbed frog, tessellated gecko, and eastern water skink on Wallpolla Island.

- The parcel of public land south of the Wyperfeld National Park and known as the 'Paradise block' contains mature mallee plant communities and malleefowl habitat. An uncleared band of native vegetation should be retained on either side of the gypsum mine in the north-west to maintain a biological link with the proposed national park addition [Recommendation A3 (b)].

- Public land east of the proposed Murray-Sunset National Park supports a resident population of red kangaroos, a population of earless dragons, and a wide range of bird species. The habitat of these and other native animal species should be protected and the withdrawal of grazing will facilitate this.

Historical sites

- Sites of significance associated with Aboriginal culture or occupation throughout State forest need to be identified and protected (management of such areas should involve the local Aboriginal community)—for instance, the sites associated with the spring line along the northern fringe of the Big Desert and mounds and scarred trees along the riverine plain, in particular Nyah forest.

- Sites of interest referred to in a report by Andrew C. Ward and Associates titled 'Mallee Area Review—Study of Historic Sites'. These include a large number of water supply facilities—tanks, bores, and pumps—as well as mine sites, cemeteries and burial sites, schools and other buildings, and saltworks. The proposed status of the public land carrying some of these artefacts will be considered before publication of the final recommendations.

T. Lake reserves

Some of the public land lakes in the Mallee are reserved for water supply or drainage (see Chapter O), but others are simply unreserved Crown land. The Council considers that, while 'public purposes' reservations have in the past served to protect particular lakes, the value of the system as a whole has not been recognised.

Both capability and current use of the individual lakes vary widely. Scenic quality varies from picturesque to barren and unattractive, and the extent to which the lakes provide opportunities for other uses—such as recreation (mainly boating and angling), wildlife conservation (particularly waterfowl), water supply, and drainage—also varies. Most of the lakes are popular for duck-hunting during the declared hunting period, but the extent of this varies according to the season. The ephemeral nature of many lakes also leads to a variation of uses and values with time on individual lakes. In some cases, a lake may dry up completely and remain as either a bare saltpan or a fertile plain that can be used for agriculture until the next wet season. The natural water levels in some lakes are manipulated—by deliberate drainage, by pumping for irrigation, or to hold surplus flood flows.

Form of reservation

In preparing its recommendations, Council has considered the various competing uses for and the capabilities of each lake separately as well as considering the system as a whole. Those lakes with high wildlife values and where wildlife conservation is the prime use have been recommended as wildlife reserves (see Chapter D); those integral to water supply and drainage are recommended accordingly (Chapter O).

Some of the lakes are recommended as lake reserves; this establishes a secure form of tenure and gives the managing authority flexibility to introduce those controls necessary to protect the values both of specific lakes (where no one value may predominate) and of the system as a whole, while providing for existing legal uses to continue. The land manager can frame and enforce regulations that are specific to a particular lake. This will ensure that proposals for use can be evaluated in relation to the capabilities of the particular lake and to the impact on the system as a whole.

Existing lake reserve

In its final recommendations for the Wimmera Area in 1986, Council proposed the delineation of a lake reserve for Lake Hindmarsh and surrounds, which included the northern section of lake frontage located in the Mallee area. This was approved by government.

Lake Hindmarsh

Recommendation

T1 That the area of 295 ha, shown on Map A, continue to be used for those purposes approved by the government following publication of the final recommendations for the Wimmera Area in November 1986.

Additional lake reserves

Recommendations

T2–T5 That the lakes described below and shown on Maps A and B be used, according to their particular capabilities, for:

(i) recreation, including hunting
(ii) nature conservation
(iii) scientific study
(iv) water supply
(v) drainage
(vi) salt-harvesting (where appropriate)

that

(vii) current legal use for low-intensity grazing be permitted under the control of the managing authority (such control may involve exclusion of grazing, at least temporarily, from some reserves)

and that they be permanently reserved under section 4 of the *Crown Land (Reserves) Act* 1978 and be managed by the Department of Conservation, Forests and Lands, in consultation with the Rural Water Commission where appropriate.

T2 Lake Coorong (730 ha), Parish of Wiall

Note:

Occasionally, excess water from the Wimmera–Mallee Stock and Domestic Water Supply System is channelled into this lake during heavy rain or difficulties in the operation of the system. This arrangement should continue.

T3 Lake Daytrap (106 ha): the salt lake adjacent to Allotments 30, 31, 36 and 37, Parish of Gerhamin

T4 Lake Wahpool (2460 ha), Parishes of Lianiduck and Moortworra

T5 Lake Boga (950 ha), Parish of Boga

Notes:

1. During World War II, Lake Boga was used as a flying-boat repair depot and a number of intact artefacts remain. The local community has undertaken restoration of a flying boat. Items of historical significance here should be preserved.

2. This lake receives water from the Little Murray River during high winter flows.

U. Other reserves and public land

Some areas of public land in the study area that are used for various purposes, such as water production, flood mitigation, grazing, camping, public utilities, and so on, 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.

The 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 purposes be used in a way that will not preclude their commitment in the future to some specific public use.

Recommendations

U1 That, for areas of public land not specifically mentioned in these recommendations, existing legal use and tenure continue

and that

where the land is not reserved for a specific purpose at present, such areas be used in a way that will not preclude their reservation in the future for as-yet-unknown public purposes.

Parish of Olney

U2 That the area on Map A, totalling 2100 ha, and held under title by the Rural Water Commission, continue to be managed by the Commission and, should it be no longer required, it be made available for alienation.

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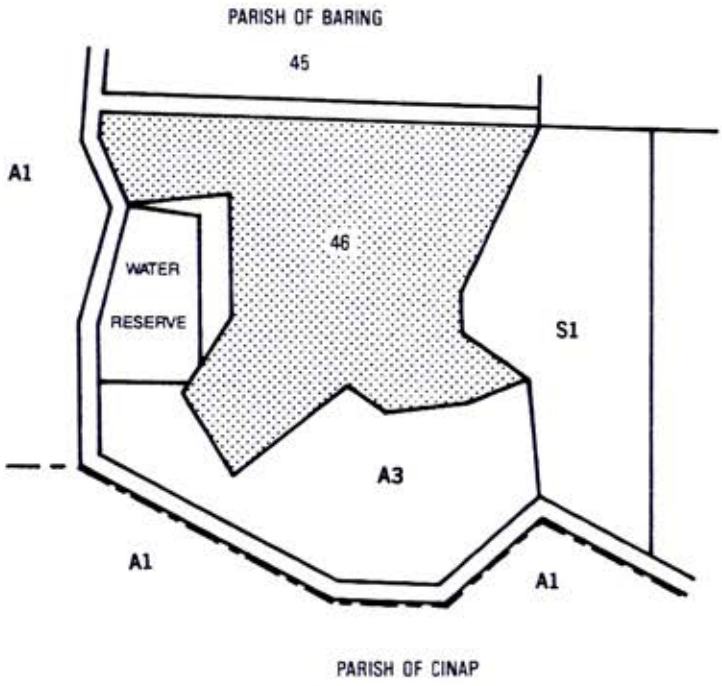
AGRICULTURE F1

MAP 1

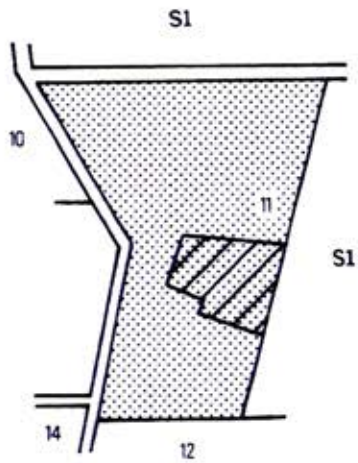
PARISH OF BARING



SCALE 1 : 30 000

PARISH OF BARING NORTH

MAP 2



CONSERVATION COVENANT

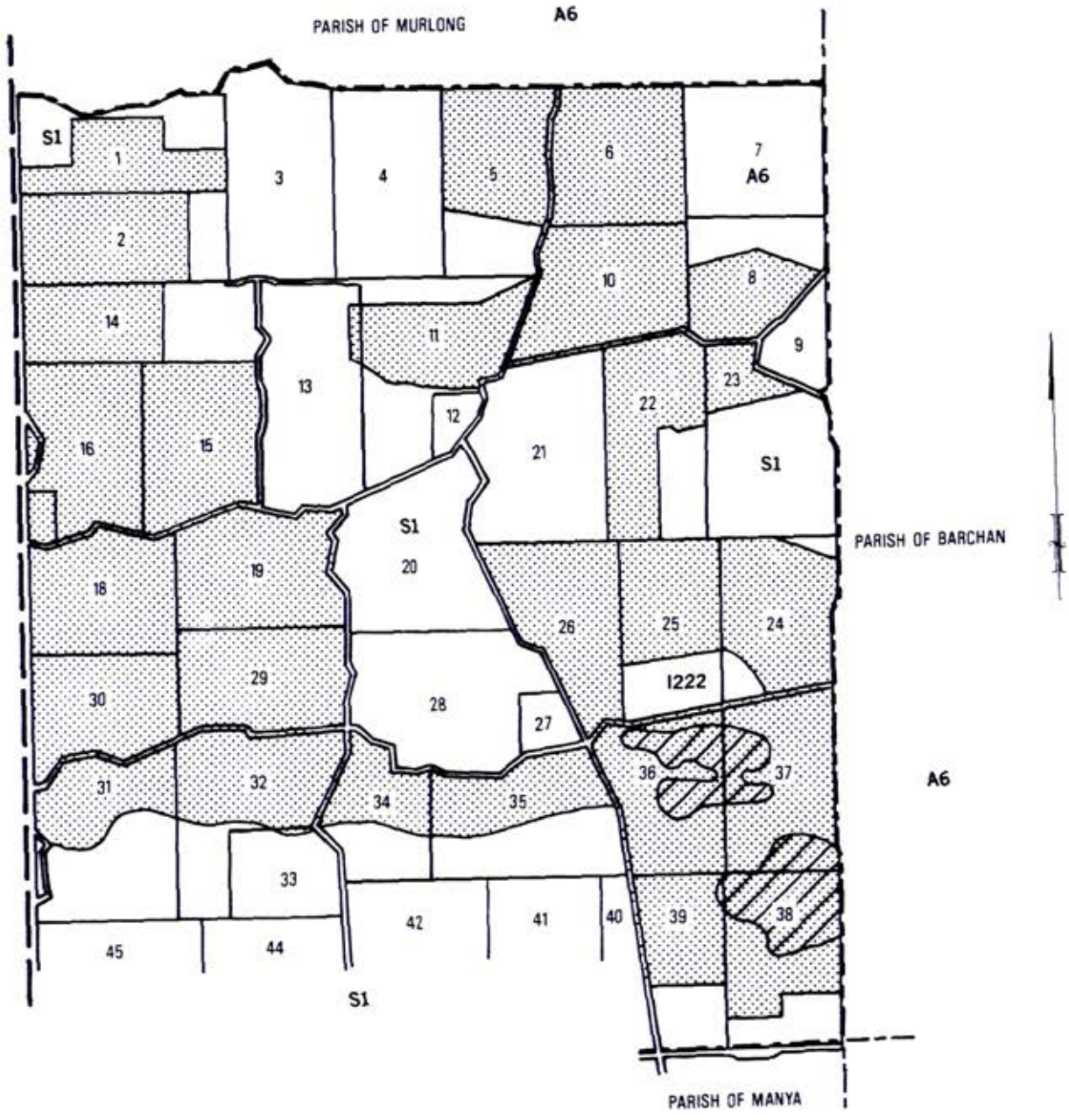
PUBLIC LAND RECOMMENDED FOR ALIENATION

SCALE 1 : 40 000

AGRICULTURE F1

MAP 3

PARISH OF BERROOK



AREAS WITHIN WHICH VEGETATED DUNES ARE TO BE PROTECTED BY CONSERVATION COVENANTS

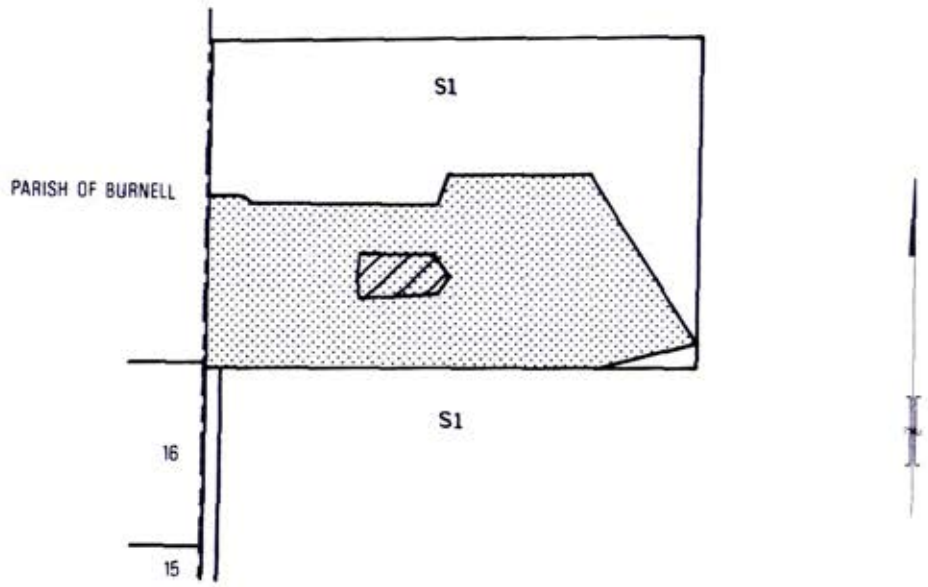
PUBLIC LAND RECOMMENDED FOR ALIENATION

SCALE 1 : 100 000

AGRICULTURE F1

MAP 4

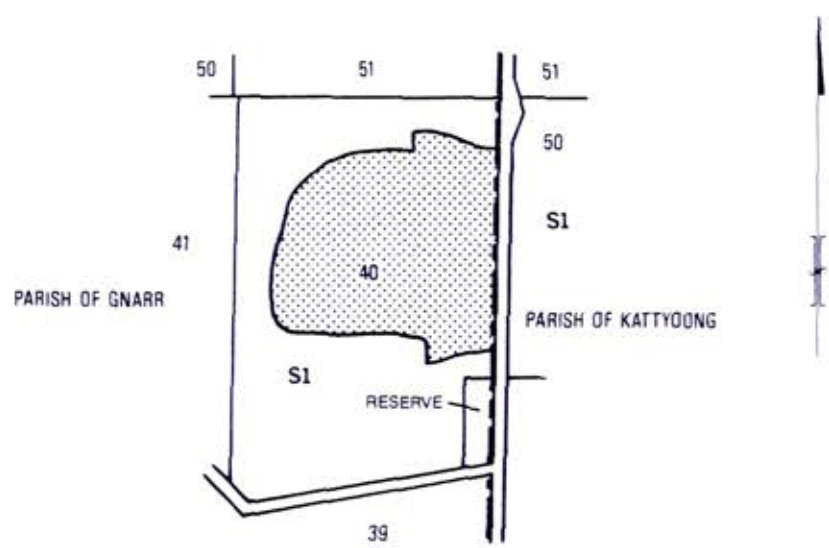
PARISH OF BOOLUNGAL



SCALE 1 : 40 000

PARISH OF GNARR

MAP 5



CONSERVATION COVENANT

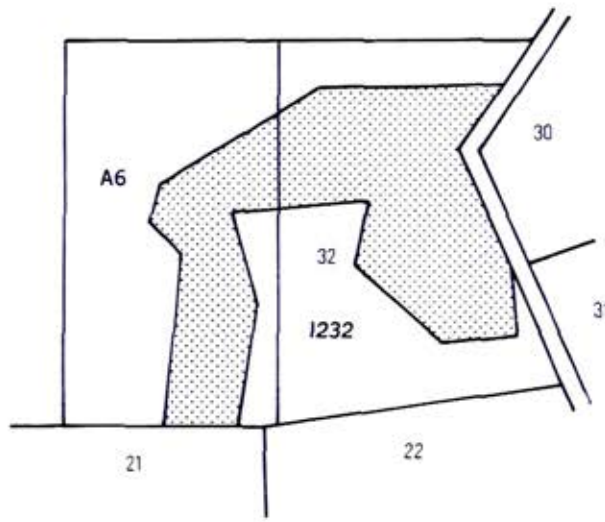
PUBLIC LAND RECOMMENDED FOR ALIENATION

SCALE 1 : 40 000

AGRICULTURE F1

MAP 6

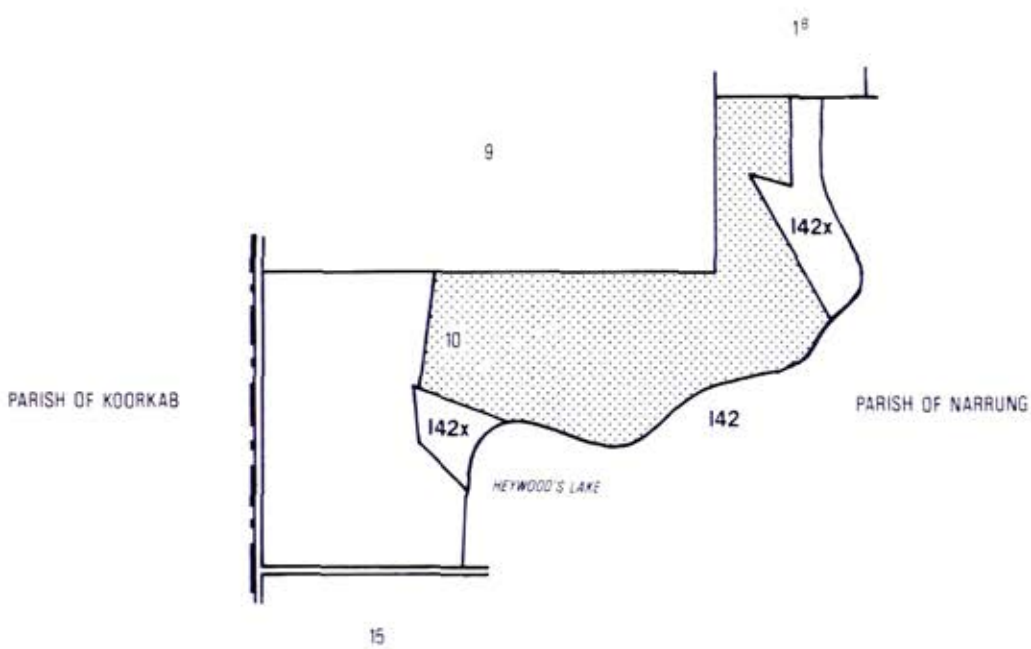
PARISH OF GNARR



SCALE 1 : 20 000

PARISH OF NARRUNG

MAP 7



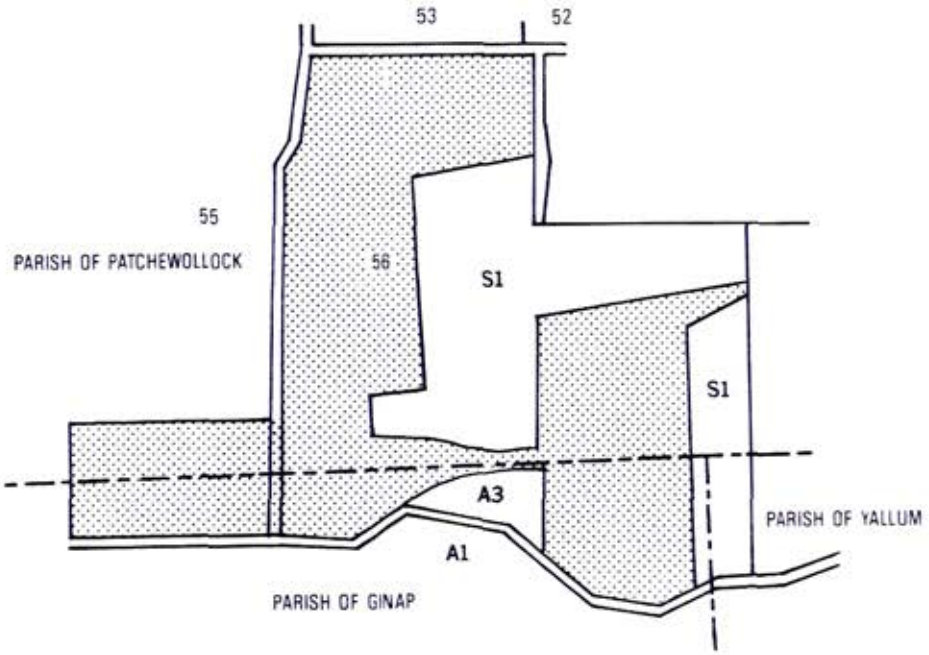
PUBLIC LAND RECOMMENDED FOR ALIENATION

SCALE 1 : 1 : 40 000

AGRICULTURE F1

MAP 8

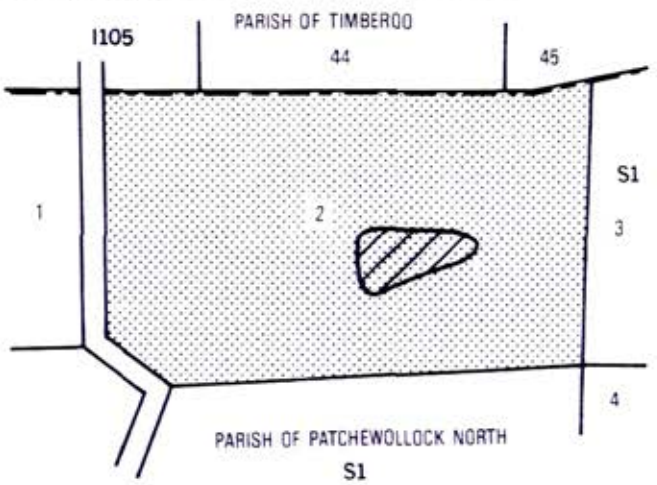
PARISH OF PATCHEWOLLOCK



SCALE 1 : 50 000

PARISH OF PATCHEWOOLOCK NORTH

MAP 9



CONSERVATION COVENANT

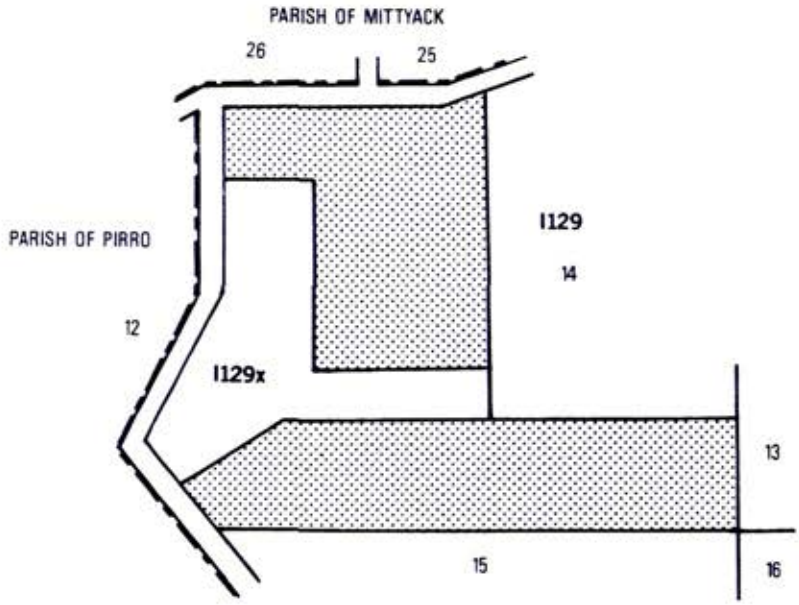
PUBLIC LAND RECOMMENDED FOR ALIENATION

SCALE 1 : 20 000

AGRICULTURE F1

MAP 10

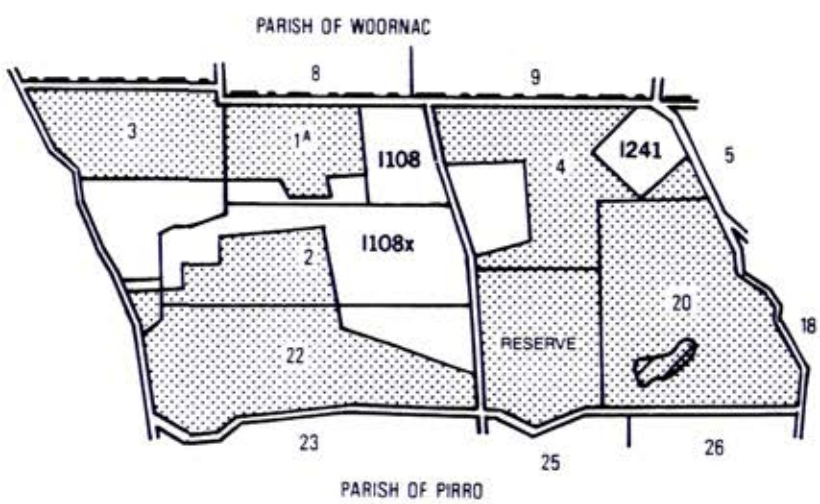
PARISH OF PIER - MILLAN



SCALE 1 : 30 000

PARISH OF PIRRO

MAP 11



CONSERVATION COVENANT

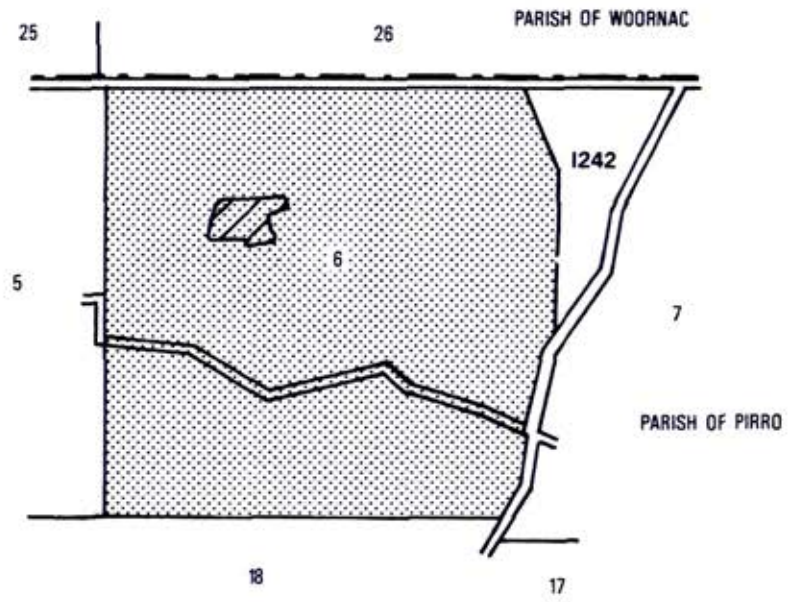
PUBLIC LAND RECOMMENDED FOR ALIENATION

SCALE 1 : 75 000

AGRICULTURE F1

MAP 12

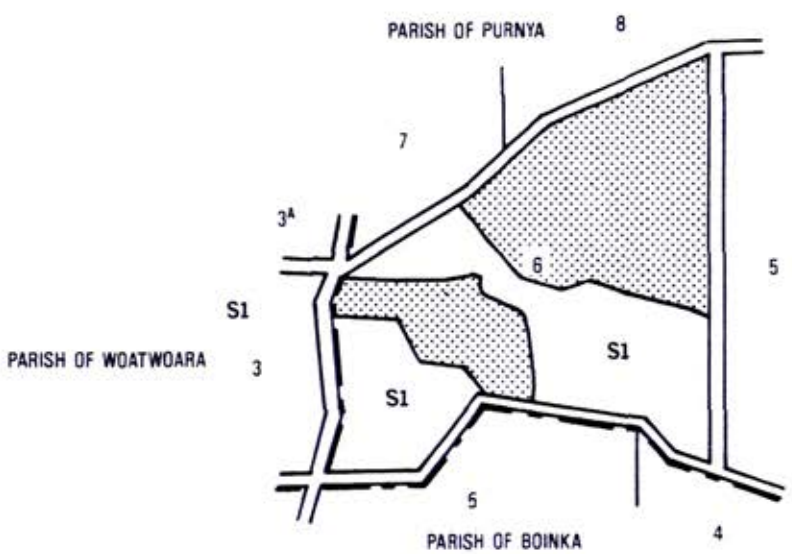
PARISH OF PIRRO



SCALE 1 : 30 000

PARISH OF PURNYA

MAP 13



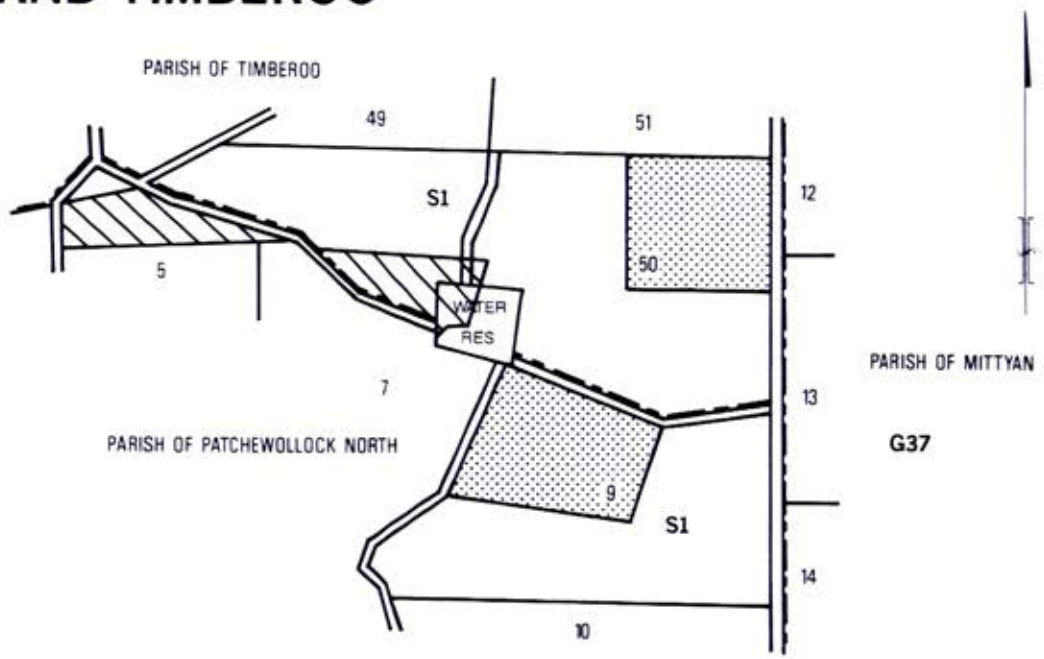
CONSERVATION COVENANT

PUBLIC LAND RECOMMENDED FOR ALIENATION

SCALE 1 : 40 000

AGRICULTURE F1 MAP 14

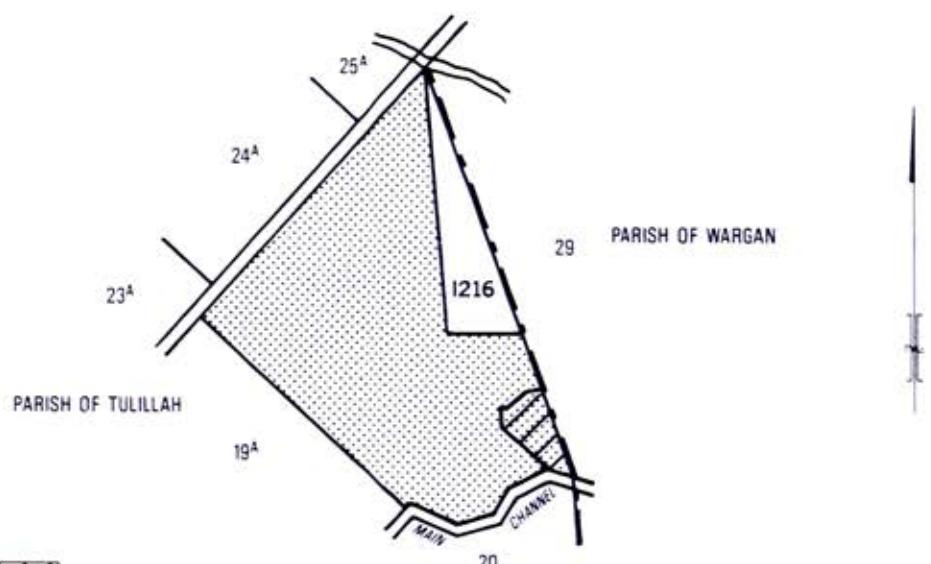
PARISH OF PATCHEWOLLOCK NORTH AND TIMBEROO



SCALE 1 : 50 000

PARISH OF TULILLAH

MAP 15



LAND PROPOSED FOR EXCHANGE

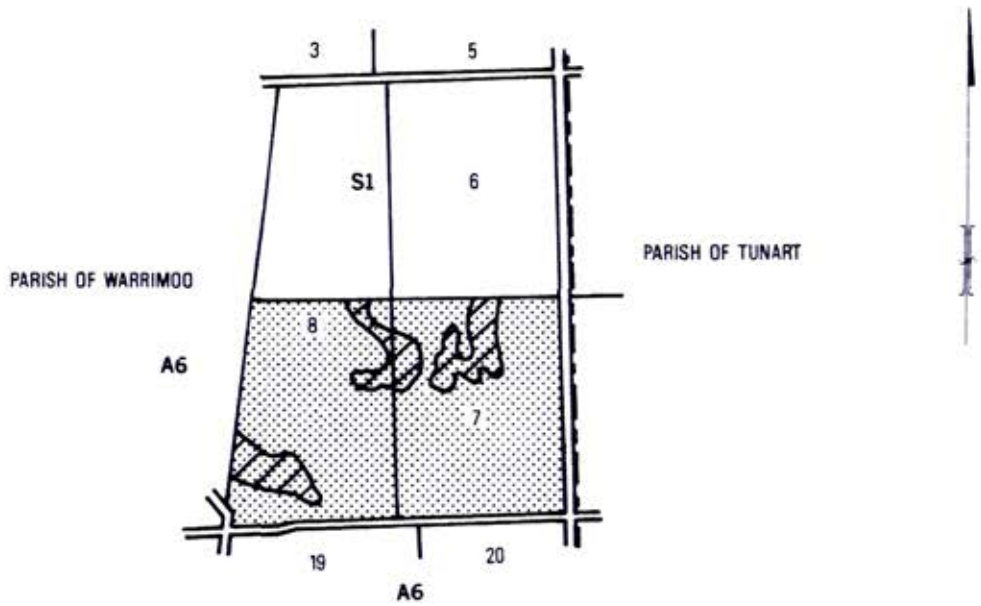
CONSERVATION COVENANT

PUBLIC LAND RECOMMENDED FOR ALIENATION

SCALE 1 : 1 : 40 000

AGRICULTURE F1 AND F2
PARISH OF WARRIMOO

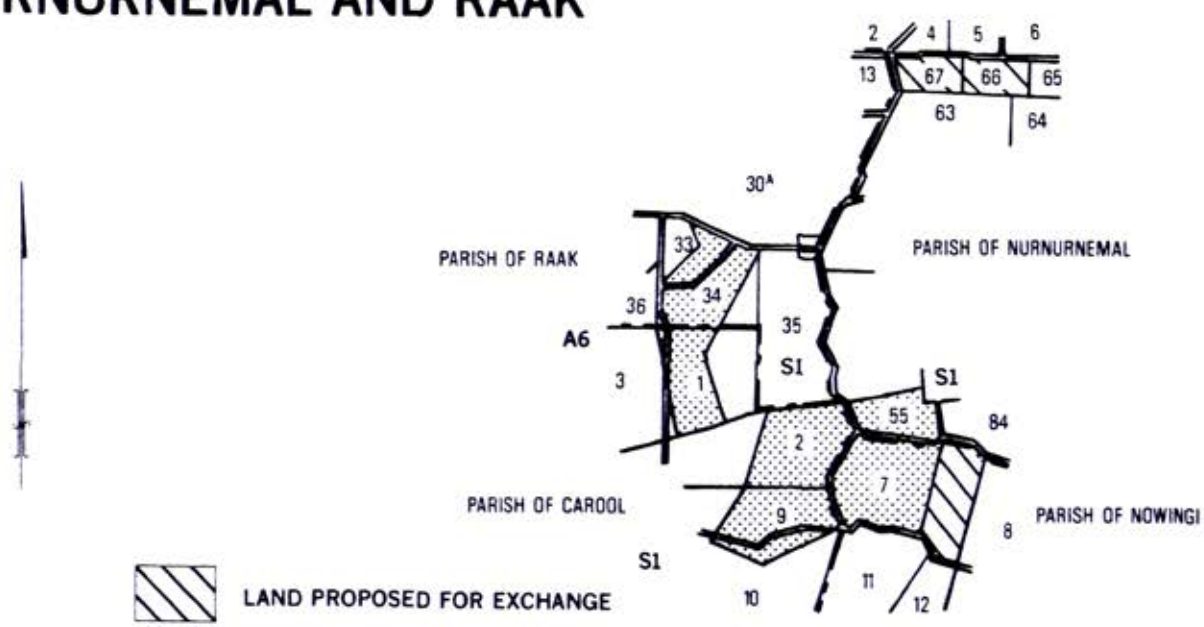
MAP 16



SCALE 1 : 75 000

PARISHES OF CAROOL, NOWINGI NURNURNEMAL AND RAAK

MAP 18



LAND PROPOSED FOR EXCHANGE

CONSERVATION COVENANTS

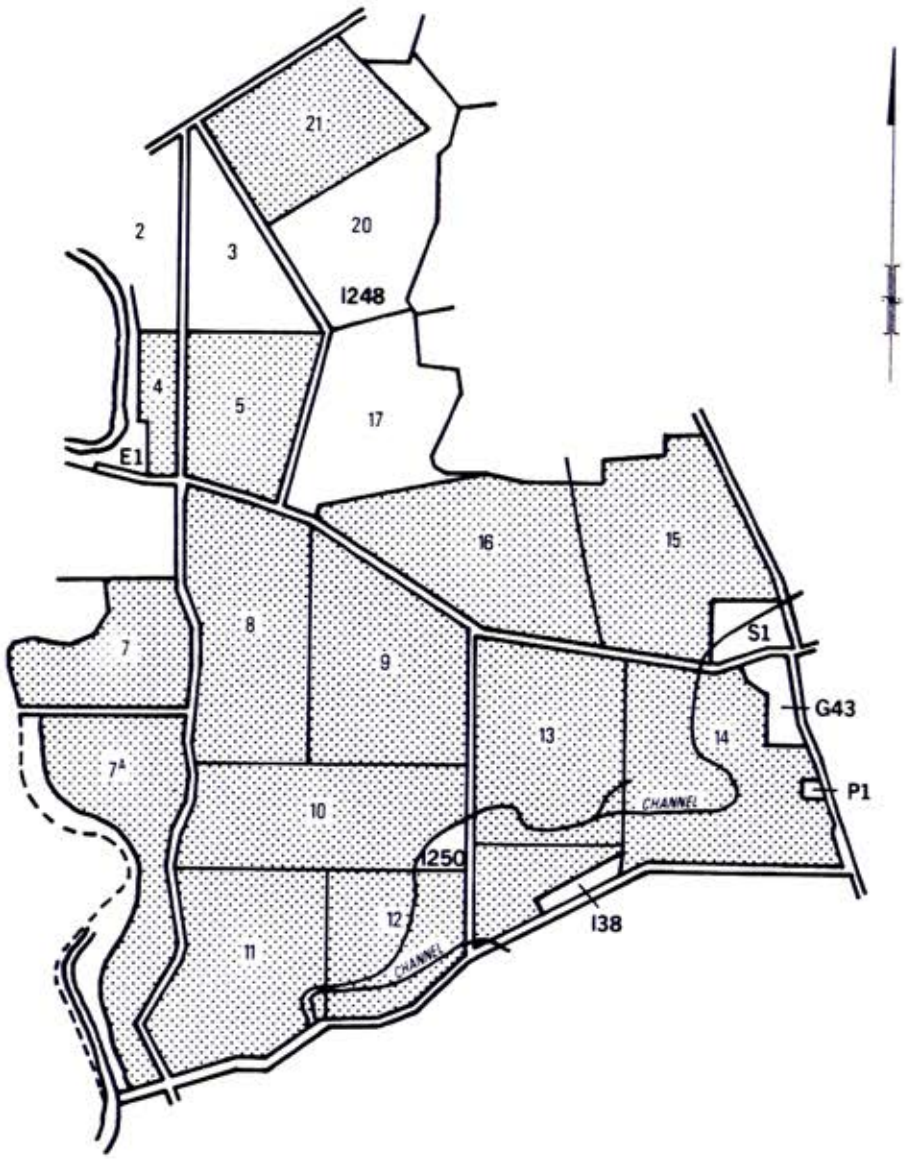
PUBLIC LAND RECOMMENDED FOR ALIENATION

SCALE 1 : 150 000

AGRICULTURE F1

MAP 17

PARISH OF BUMBANG



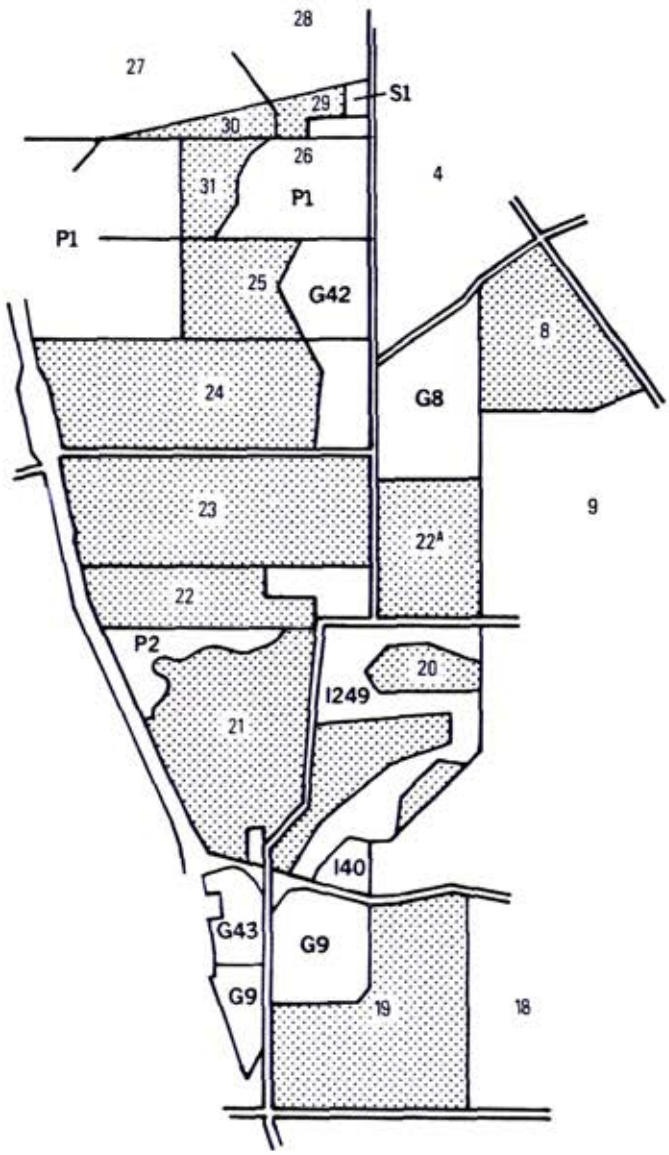
PUBLIC LAND RECOMMENDED FOR ALIENATION

SCALE 1 : 80 000

AGRICULTURE F1

MAP 19

PARISH OF TOLTOL

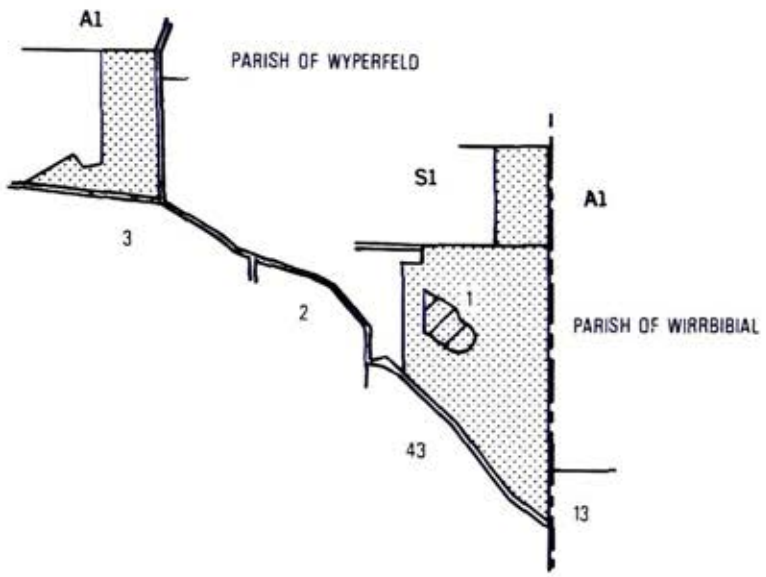


PUBLIC LAND RECOMMENDED FOR ALIENATION

SCALE 1 : 75 000

AGRICULTURE F1 MAP 20

PARISH OF WYPERFELD



CONSERVATION COVENANT

PUBLIC LAND RECOMMENDED FOR ALIENATION

SCALE 1 : 75 000