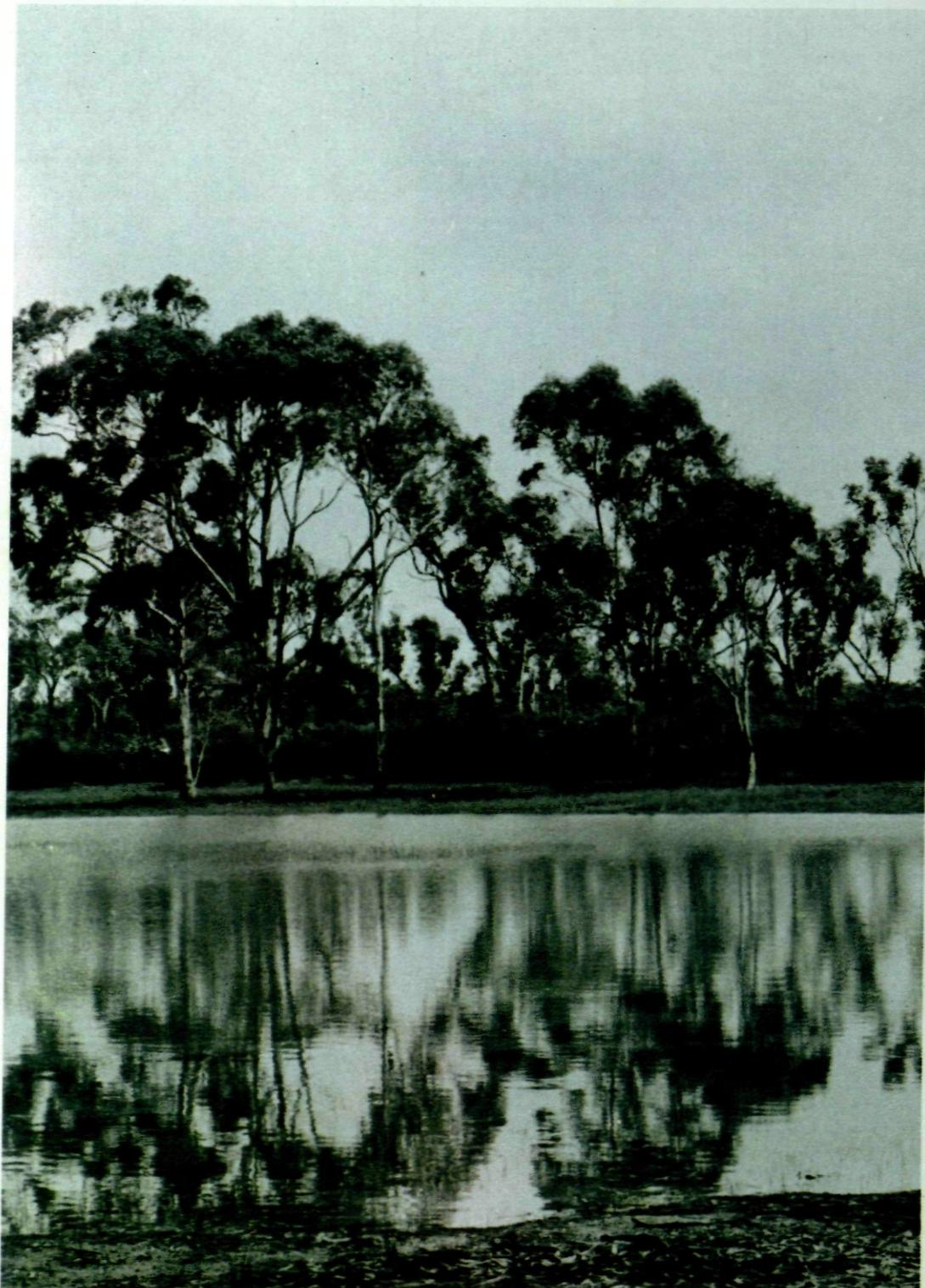


WIMMERA AREA

FINAL RECOMMENDATIONS



 LAND CONSERVATION COUNCIL

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NOVEMBER 1986



LAND CONSERVATION COUNCIL

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Government of Victoria

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Cover:

Broughton's Waterhole in the Little Desert

Photo: M. Smoljo

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Introduction

The Wimmera Investigation

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. This report contains the Council's proposed recommendations concerning the public land in the Wimmera area. Notices showing the boundary of the study area and advising that an investigation was to be carried out were published in the *Victoria Government Gazette* of 17 August 1983 and in local and other Victorian newspapers in August 1983. A *descriptive resources report* was published on 12 February 1985. Extracts from the *Land Conservation Act 1970* covering the procedure to be followed in formulating recommendations were included in the report. The Council received 117 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 the most feasible forms of land use for the district.

After considering these submissions, and having visited the study area, the Council formulated its proposed recommendations, which were published on 9 October 1985. The Council subsequently received 139 submissions commenting on these proposals. After due consideration, the Council now presents its final recommendations.

The recommendations in the text are grouped under major headings, such as Parks, State Forest and so on. The text is accompanied by a map at the scale of 1:250,000 which covers the whole study area and gives a broad view of the recommended land uses. More detailed maps show areas recommended for agriculture (by alienation). Additional information on boundaries is held by the Land Conservation Council.

Availability of submissions

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

Land uses

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

The Council recommends the establishment of a national park covering most of the Little Desert; two reference areas and an education area (covering part of the range of land types found in the study area); flora and fauna reserves for areas of value for conservation of habitat and representative plant communities; and wildlife reserves for several sites containing valuable faunal habitats. Several areas are recommended as geological, historic, and scenic reserves, and other 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 unrecognized and for which no special provisions 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. The Council is aware that review will be necessary to ensure that future land use is in the best long-term interest of the community.

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

Table 1: Public Land Use

<i>Land use categories</i>	<i>Area (ha)</i>	<i>Percentage of all land covered by these recommendations</i>	<i>Percentage of all public land covered by these recommendations</i>
National Park	124 000	7	64
State Park	13	<1	<1
Reference Areas	5 440	<1	3
Wildlife—Reserves	3 480	<1	2
—Management Co-operative Area	270	<1	<1
—Lake Buloke	8 200	<1	4
State Forest	5 900	<1	3
Flora Reserves	1 110	<1	<1
Flora and Fauna Reserves	5 520	<1	3
Geological Reserves	80	<1	<1
Historic Reserves	55	<1	<1
Bushland Reserves	3 400	<1	2
Scenic Reserves	180	<1	<1
Rivers and Streams	8 000	<1	4
Highway Parks	70	<1	<1
Education Area	1 350	<1	<1
Lake Reserves	16 200	1	8
Agriculture	1 900	<1	<1
Minerals and Stone	200	<1	<1
Revegetation Areas	450	<1	<1

Other land uses collectively make up the balance.

Figures are rounded.

An additional 190 ha of public land water frontage in the Mallee area has been recommended as part of a lake reserve.

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 eight Divisions, four of which are the functional arms—the State Forests and Lands Service, National Parks Service, Fisheries and Wildlife Service, and Land Protection Service. This last Service comprises staff formerly in the Soil Conservation Authority and 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 18 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 legislation to be introduced in the State parliament later this year, the Director-General of the Department of Conservation, Forests and Lands will assume 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 Wimmera 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 the 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.

Plans for fire prevention in areas reserved under the *National Parks Act 1975* will be developed by regional management together with the National Parks Service.

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 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 Wimmera 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.

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.

The categories are not to be confused with the existing terminology of national park, forest park, etc., which mainly denotes tenure and

the managing body rather than the intended uses. For instance, some of the present national parks are more akin in character to a State or regional park than to the national park of nation-wide significance outlined in the classification.

Park Categories

National park

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

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

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. Interpretative services would be provided. Development of facilities would be limited to a very small portion of the park. Activities would largely consist of sightseeing and the observation of flora, fauna, and other natural features. The 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 timber-harvesting, fossicking, and stone extraction—may be permitted where they are compatible with the primary use.

Park Management

It should be emphasised that the parks recommended below will be available for public use. An essential aim in their reservation 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.

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 is 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.

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

Kangaroo populations in parks vary over the years and on some occasions can pose particular problems to adjoining farmers. This happens irrespective of the classification of the public land as park, State forest, or some other form of land classification. When it occurs, the problems should be discussed with the land managers with a view to identifying the best solution. The normal provisions in the *Wildlife Act 1975* that allow farmers to control kangaroo populations on their properties under permit would continue to apply irrespective of the fact that the area adjoining their farms might be a national or State park.

Public land in this study area includes several areas of regional importance for apiculture. Where these areas are recommended as part of parks, apiculture should continue to be permitted.

Current legal access will continue to be available to freehold land enclosed by any of the recommended parks.

Under its current management policies, the Department of Conservation, Forests and Lands makes provision for community participation in the operation and management of parks, and community involvement such as this will be encouraged in the parks recommended below.

National Park

Little Desert National Park

Stretching from the Wimmera River to the South Australian border, the proposed national park (of some 124,000 ha) includes the three large blocks of public land that incorporate most of the remaining native vegetation of the Little Desert. It includes all of the existing Little Desert National Park, which covers 35,300 ha. The Little Desert land formation also extended into South Australia, but most of this section has now been cleared.

The park spans a rainfall range from nearly 600 mm per year in the far south-west to under 400 mm per year in the far north-east, and includes a range of different soil types. As a result the vegetation has marked differences across the three blocks of the Little Desert, known as the western, central, and eastern blocks.

Its diverse and significant flora and fauna cause the Little Desert, with its remnant vegetation, to be regarded as an area of high conservation significance. Its special attributes and many of its uses are described further below.

In recommending a large national park for the Little Desert, the Council is aware that this will be historic. It was the controversy over land-clearing proposals for this region in the 1960s that led to the establishment of the Land Conservation Council in February 1971 and a planning process that encouraged community participation.

Conservation of natural features

The Little Desert is the southernmost example of the aeolian dunes and sandsheets that blanket much of semi-arid north-western Victoria and extensive tracts of the rest of south-eastern Australia to the north and west. Occasionally, the underlying Parilla Sand outcrops as iron-rich sandstone ridges, which trend NNW-SSE. The higher sandhills (such as Mount Moffatt and The Sisters) and sandstone ridges (such as Mount Turner) afford extensive views of the surrounding broad scrub areas.

Variations in physiography, soil types, and climate have produced a diversity of environments and habitats throughout, and the resulting biogeographical combinations are a valuable educational resource.

Vegetation types range from large tracts of low heath in the drier eastern block to tall yellow gum woodlands on sandy clay soils in the interdune depressions of the wetter western block. They include large areas of brown stringybark woodland and open scrub on the deeper sands, and stands of mallee-broombush scrub where the sandstone ridges are at or close to the surface. There are also small patches of river red gum and black box woodland in interdune depressions and along the Wimmera River, and shrublands of mallee honey-myrtle around several claypans.

The Little Desert is renowned for its brilliant spring displays of wildflowers, including many orchids, which each year attract thousands of visitors to the existing national park in the eastern block, but fewer visitors to the less-known and less-accessible western and central blocks. More than 670 species of native plants have been recorded in the Little Desert,

representing about one-fifth of Victoria's indigenous flora.

The floristic and structural diversity and the rare and/or colourful nature of many species combine to make this park of great significance for the conservation of the State's native flora.

Woodlands of yellow gum in the western block are particularly interesting. Along the wetter southern edge some stands grade into black box or river red gum woodlands, and others have large slender cypress pines as co-dominants. Rare or significant plant species found along the southern edge include small milkwort (*Comesperma polygaloides*), pale spike-rush (*Eleocharis pallens*), pipewort (*Eriocaulon australasicum*), sweet quandong (*Santalum acuminatum*), floating bog-rush (*Schoenus fluitans*), and two sun-orchids (*Thelymitra canaliculata* and *T. holmesii*). Other parts of the western block, especially the northern edge, also contain rare or significant plants. These include peppermint box (*Eucalyptus odorata*), wedge-leaf pomaderris (*Pomaderris obcordata*), rusty-hood (*Pterostylis biseta*), quinetia (*Quinetia urvillei*), and annual spear-grass (*Stipa macalpinei*).

The central and eastern blocks also contain a number of rare and significant plants, including small darwinia (*Darwinia micropetala*), which was thought to be extinct in Victoria until it was rediscovered in the central block during the Council's investigation of the area in 1984. The population of the endangered plant whipstick westringia (*Westringia crassifolia*) at Chinaman's Flat is the only remaining occurrence in the Little Desert following a fire that appears to have destroyed the other population at Broughton's Waterhole in 1983. A population of a rare form of rusty-hood (*Pterostylis* sp. aff. *biseta*) occurs at Crowhurst Flat in the eastern block and should be protected from vehicular traffic.

Because of the diversity of habitat offered by the different vegetation types, the Little Desert supports many faunal communities, in particular a wide variety of birds and reptiles. Several mammal and bird species reach their north-western limits in the State in the yellow gum woodlands of the western and central blocks—for example, the red-necked wallaby, sugar glider, little wattlebird, and the rainbow lorikeet. The extensive heathlands of the eastern and central blocks provide an important

habitat for significant species such as the variegated fairy-wren, slender-billed thornbill, rufous calamanthus, silky mouse, and common scaly-foot.

The western pygmy possum is restricted in Victoria to the Little and Big Deserts and some surrounding shrubby woodlands, while the former represents the south-eastern limit of two reptile species characteristic of semi-arid north-western Victoria—the western blue-tongue lizard and the bardick (a nocturnal thickset snake). The Little Desert also contains an isolated population of the delicate skink, which is otherwise only found east of Melbourne. It supports considerable numbers of western grey kangaroos and these are readily observed.

Although renowned for its variety of birds, the Little Desert is most popularly associated with one—the Mallee fowl, which builds a large mound to incubate its eggs. It breeds in mature stands of mallee-broombush, and areas of this vegetation type will need to be protected from burning pending determination of the effects of the extent and frequency of burning on habitat requirements. Other characteristic birds of the Little Desert include the painted button-quail, variegated fairy-wren, crested bellbird, spotted nightjar, southern scrub-robin, shy hylacola, slender-billed thornbill, rufous calamanthus, and several species of honeyeaters.

Red Gum Swamp in the central block is a particularly important area for birds. Its tall red gums and yellow gums provide nest hollows for many species. The 74 bird species recorded in the surrounding 20 ha include the wedge-tailed eagle and yellow-billed spoonbill, which both nest in the tall gums.

It is only by including all three blocks in the park that adequate representation of all the land units, vegetation types, and wildlife habitats of the Little Desert can be achieved.

Recreation

The large areas of relatively undisturbed vegetation and the spring wildflower displays provide considerable potential for recreation. The present National Park, where facilities have been provided, attracts many thousands of visitors each year (about 19 000 visitor days were recorded in 1984–85), but few people visit the lesser-known western and central blocks.

Visitors pursue a wide variety of recreational activities, including nature study, bird-watching, four-wheel-drive touring, trail-bike riding, horse-riding, bushwalking, camping, and picnicking.

Vehicular access throughout the Little Desert is provided by an extensive system of well-signposted sandy tracks, which mostly require four-wheel-drive. Several short walking tracks have been constructed in the existing National Park.

In other national parks throughout the State, organized four-wheel-drive tours are permitted under licence. Such organized tours are already conducted in the central block and could continue in accordance with these recommendations.

The large areas of native vegetation in a remote setting make the Little Desert excellent country for bushwalking, but the lack of water limits the length of walks. As a result, four-wheel-drive touring is the most popular recreational activity outside the developed camping and picnicking areas. Destinations include places of natural interest such as Red Gum Swamp, The Crater, and Broughton's Waterhole, which is situated on an 8-ha inlier of freehold land.

Different sites in the Little Desert have different capabilities for providing long-term recreational use. Some of the places of interest can cope with large numbers of visitors and should be promoted. Others, however, are more fragile, and the best form of public use for these areas will depend upon their ability to withstand recreational pressure.

Timber

Much of the vegetative cover in the Little Desert consists of open scrub and heaths with the only tree species being stunted eucalypts such as mallees and brown stringybark, which are unsuitable for timber production. However, the scattered yellow gum stands in the western block, particularly in the southern half, are capable of yielding some timber products, although the poor form of most of the trees means that the main products obtainable would be fencing materials and firewood rather than sawlogs or sleepers.

Some timber products have been supplied over the past 100 years but no licensed extraction has occurred in the past 20 years. Recently, the

use of local timbers for fencing in the western Wimmera has declined considerably and, in the last 10 years, the majority of new farm fences have been constructed using steel pickets, treated pine, or treated sugar gum from the Wail plantations.

As previously mentioned, the western block of the Little Desert is of great importance for the conservation of flora and fauna, especially that of the yellow gum flats. Because of the significance of these vegetation communities, it is proposed that any timber products required in the future be obtained from the substantial areas of State forest available for timber harvesting immediately south of the Little Desert, in the Wimmera area and in the adjacent South-western area, District 2.

Agriculture

The sands of the Little Desert have limited agricultural potential because of their low natural fertility, low water storage capacity, and high wind erosion hazard. Moreover, the area has great importance for nature conservation. For these reasons the Council has decided against the alienation for agriculture of several areas of public land on the margins for which it has received applications.

Almost all of the Little Desert was covered by grazing leases and licences for many years, but grazing is now confined to a few areas bordering private land. The heathy vegetation present does not provide good forage, and stock grazing this type of vegetation frequently exhibit symptoms of mineral deficiencies.

Apiculture

The Little Desert is of considerable economic importance to apiarists as an overwintering refuge for thousands of colonies of bees, because of the abundance on the sand plains of desert banksia (*Banksia ornata*), which flowers in winter more or less every year. It therefore provides a vital link for beekeepers in their seasonal migration and manipulation of colonies. A large number of permanent and temporary bee sites are located in the eastern and central blocks.

Information is starting to accumulate about the competitive effects of the introduced honey bee on honeyeaters, native insects, and native flora. Studies should be commenced to investigate how South Australian findings apply to the

Little Desert. As more information becomes available, the implications for park management will need to be evaluated.

It has also been reported that populations of feral honey bees in the Little Desert are displacing native birds from nesting holes and causing problems at sites visited by tourists, such as Red Gum Swamp. This situation should be monitored and control programs initiated if required.

Fire

Because the Little Desert is very fire-prone, predominantly from lightning strikes as well as from other causes, adjoining landholders may be concerned at the possibility of fire spreading from the public land into adjoining farmlands. The most extensive vegetation types represented here are the highly flammable heaths and the low-crowned woodlands and open scrub of brown stringybark with heathy understoreys. Fires can develop rapidly under the influence of the strong winds that often occur during the hot dry summers. This problem is compounded by the lack of readily available water in summer months.

An outline of the responsibilities for fire protection on public land is included with the General Recommendations at the beginning of this report. Classification of the area as a national park does not restrict the use of any necessary fire-suppression measures.

Fire-prevention measures such as maintenance of fire-access tracks, maintenance of perimeter firebreaks, and protective burning will continue. The particular measures to be taken will be incorporated in fire-protection plans prepared and executed by the Department of Conservation, Forests and Lands. The management of the present Little Desert National Park, which has undergone regular protective burning and maintenance of tracks and perimeter breaks, illustrates the success of this policy.

Fires are a natural part of the environment in the region, and their effects are not always deleterious. Some vegetation types such as heaths have undergone relatively frequent burning in the past and contain species adapted to relatively short intervals between fires. The current burning program in the National Park is conducted with the twin aims of fire prevention and ecological management, and a

similar approach would be taken in the added areas. Research should continue into the optimum fire intervals and season of burning for the various vegetation types and faunal communities of the Little Desert, as concern has been expressed about the frequency and timing of current protective burning in the Little Desert. There is a body of research indicating that burning in early autumn produces the greatest diversity and magnitude of post-fire plant regeneration in the 'desert' areas of north-western Victoria.

Another method of fire prevention is the slashing of vegetation on perimeter firebreaks and along internal tracks. As a result of these management operations, limited quantities of broombush may become available at times and these could continue to be used by local firms for the production of brush fencing panels.

Vermin and noxious weeds

Within the recommended Little Desert National Park, vermin and noxious weeds will be controlled as a responsibility of the Department of Conservation, Forests and Lands.

Recommendation

A1 Little Desert National Park

That the area of approximately 124,000 ha shown on Map A be used to :

- (a) provide opportunities for recreation and education associated with the enjoyment and understanding of natural environments
- (b) conserve and protect natural ecosystems
- (c) protect sites of geological and historical significance

that

- (d) apiculture be permitted
- (e) legal access continue to be available to any freehold land enclosed within the park
- (f) horse-riding be permitted
- (g) recreational angling be permitted along the Wimmera River
- (h) dispersed camping continue to be permitted where this is consistent with the aims of management
- (i) the existing road network be substantially maintained

- (j) timber harvesting not be permitted
- (k) grazing not be permitted
- (l) hunting and use of firearms not be permitted
- (m) discussions be held with the Department of Defence concerning alternative areas for military training as this is considered an inappropriate use within this park

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

Notes:

1. It has been suggested that a national trail be constructed following the historic Gold Escort Route, part of which passes through the public land of the Little Desert. The land manager should investigate the feasibility of this proposal.
2. In a number of places, such as along the northern edge of the central block, this park borders sizeable areas of freehold land carrying native vegetation. Members of one land-holding group have indicated their willingness to consider re-location of the perimeter firebreak along the edge of the native vegetation on their freehold land rather than along the park boundary. However, this would require the co-operation of a number of abutting land-owners to be effective. The Department of Conservation, Forests and Lands should consult the owners of land adjoining the park in order to determine the feasibility of relocating perimeter firebreaks in this manner.
3. The Victorian government has, in co-operation with the South Australian government, recently formulated a plan for the joint management of the groundwater resources beneath a 40-km-wide zone straddling the full length of the common border between these two States. As part of this plan the Department of Industry, Technology and Resources has commenced a program of drilling and constructing piezometers from which data will be obtained to enable monitoring and management of the resource beneath the zone.

One of the piezometer sites would be located in, and another very close to, the Little Desert National Park. Council believes that any bore sites within the park should occupy the minimum area necessary, that disturbance of native vegetation should be kept to a minimum, and that as far as possible they should be located adjacent to an existing track.

State Park

Addition to Mount Arapiles-Toooan State Park

In the final recommendations for the adjoining South-western area, District 2, published in May 1982, Recommendation B1 proposed a large block of public land including Mount Arapiles as part of the Mount Arapiles-Toooan State Park.

A small parcel of public land containing Mitre Rock, which like Mount Arapiles is an outlier of the Grampians sandstones, lies immediately to the north in the Wimmera area. Council believes that this should also be added to the Mount Arapiles-Toooan State Park.

The only pure stand of grey box remaining in the Wimmera area grows at the base of Mitre Rock, and about 80 native plant species have

been recorded on and around the Rock. Rare species include a groundsel (*Senecio hypoleucus*), rock wattle (*Acacia rupicola*), and the skeleton fork-fern (*Psilotum nudum*). An interesting pale autumn-flowering form of golden wattle (*A. pycnantha*) also grows here.

Mitre Rock, which derives its name from its unusual shape, provides extensive views to the north, east, and west. To the south it is overshadowed by Mount Arapiles. The Rock is popular for rock-climbing by both tourists and local residents. This has resulted in some damage to both the Rock and the vegetation on it, which requires further investigation.

Recommendation

- A2 That the area of 13 ha shown on Map A be added to the Mount Arapiles-Toooan State Park and be used to:
- (a) provide opportunities for recreation and education associated with the enjoyment and understanding of natural environments
 - (b) conserve and protect natural ecosystems

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

B. Reference Areas

Reference areas are tracts of public land containing viable samples of one or more land types that are relatively undisturbed and that are reserved in perpetuity. 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 utilization 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 surrounded by a buffer, the width of which would vary according to the activity occurring on the adjacent land. The role of the buffer is to protect the area 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.

However, the long history of utilization in the Wimmera area has meant the choice of reference areas that are undisturbed and can be adequately buffered is extremely limited.

Recommendations

- B1- That the areas listed below and shown
B2 on Map A:
- (a) be used to maintain natural ecosystems as a reference to which those concerned with studying land for particular comparative purposes may be permitted to refer, especially when attempting to solve problems arising from the use of land
 - (b) be surrounded by a buffer, and that 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 and that
 - (c) activities (such as grazing, exploration for minerals, mining, logging, and beekeeping) that conflict with the purposes of a reference area not be permitted, and any such activities in the reference areas listed below cease when these recommendations are adopted.

Note:

Reference areas constitute the only public land in the Wimmera from which apiary sites are excluded. The Council believes that no beekeepers are affected by these recommendations.

- B1 Little Desert (West) (2,240 ha)
This comprises Recent aeolian sand (Lowan Sand) with minor exposures of

Tertiary sandstone (Parilla Sand); irregular sub-parabolic dunes with patterns of high and low relief are interspersed with sandy clay flats. Annual rainfall averages approximately 525 mm and elevation varies from 110 to 130 m. Woodland I to open scrub of brown stringybark predominates, with shrubby open scrub of yellow mallee and broom honey-myrtle on the sandstone ridges and woodland II of yellow gum on the clay flats.

To be managed by the Department of Conservation, Forests and Lands.

Note:

The section of Laidlow's Track that traverses part of this area should be closed and revegetated.

B2 Little Desert (East) (3,200 ha)

Recent aeolian sand (Lowan Sand) here forms irregular subdued sub-parabolic dunes. Approximate average annual rainfall is 425 mm, and elevation is 170 to 190 m. Vegetation consists of woodland I to open scrub of brown stringybark and open heaths.

To be managed by the Department of Conservation, Forests and Lands.

C. Wildlife

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

Animal habitats are generally described in terms of vegetation communities, although other characteristics—such as vegetation structure, ground cover, water depth, salinity, rock outcrops, and hollow trees—are also important. In the study area, animal habitats range from the low scrubs and heaths of the Little Desert to the swamps and river red gum woodlands found on the south-western Wimmera plains and along the rivers, and include the dry gum-box-bull-oak woodland habitat found on many small remnants of public land. Much of the study area is cleared for dryland farming, and this cleared land too provides important habitat for a number of species of wildlife.

The vegetation map of the study area illustrates the diversity of habitats and shows that much of the public land is concentrated in the Little Desert. Within the Little Desert no single community covers an extensive uninterrupted stretch, but rather 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 diversity of climate, 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 utilize 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 either at regular intervals or infrequently in nomadic movements. It is obvious therefore that the conservation of fauna presents many difficulties, even for those relatively few species whose life history and behaviour is understood.

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 closely restricted to a particular habitat for feeding and breeding. The Mallee fowl found in mature stands of mallee and mallee-broombush in the 'deserts' is one such animal.

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

The precise effects on many species, however, are well documented. Council has recommended elsewhere in this report that principles relating to the conservation of fauna be adopted for land uses that could significantly affect wildlife values. 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.

The many wetlands of the study area, especially those of the south-western Wimmera, provide specialized habitat for a large group of birds, fish and crustaceans, and some mammals. They are also important elements of the scenery of the region and several are used for agricultural water supplies or are harvested for salt when dry.

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

These areas may be selected for conservation of species that the community harvests. They

may contain the habitat of endangered species or they may have specialized breeding grounds or a high species diversity, or be of educational, recreational, 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.

Many of the areas being recommended as wildlife reserves are isolated blocks of public land occurring in an essentially agricultural environment. Some have been cleared of trees (at least partially), while others are well vegetated with overstorey and understorey native plants and are of value not only for the conservation of waterfowl but also for other native fauna such as sugar and feathertail gliders. The majority of these areas are grazed by stock, which could lead to some degradation of wildlife habitat and water quality. This can occur through damage or removal of vegetation cover, disturbance of soils, physical disturbance to shores, and direct water pollution. For this reason grazing may need to be permanently or temporarily excluded from some wildlife reserves in order to permit the regeneration of native tree species, to protect the habitat requirements of native fauna, or to protect water quality.

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

Recommendations

- C1-** That the areas indicated on Map A and
- C41** described below be used:
 - (a) primarily to conserve the habitat of native fauna associated with wetlands
 - and
 - (b) for public recreation (including hunting in season as specified by the managers) and education where this does not conflict with the primary aim
 - that
 - (c) grazing be permitted where it contributes to specified wildlife management goals

(d) water regimes be investigated to determine whether they can be better manipulated to improve faunal habitat

- C1** Swamp (32 ha)
Shallow fresh-water marsh fringed by river red gums, being the water reserves, allotments 3 and 4B, section 4, Parish of Leeor.
- C2** Ding-a-ding (16 ha)
Fresh-water river red gum swamp, being the water reserve, allotment 21A, Parish of Ding-a-ding.
- C3** Minimay Swamp (176 ha)
Open fresh-water thatch grass swamp surrounded by river red gum, Parish of Boorookpi and Township of Minimay.
- C4** Waurm Swamp (77 ha)
Open fresh-water swamp fringed by river red gum, being allotment 9A, Parish of Minimay.
- C5** Yarrackigarra Swamp (93 ha)
Fresh-water thatch grass swamp with river red gum, Parishes of Minimay and Boorookpi.
- C6** Swamp (42 ha)
Fresh-water black box swamp, being reserved forest north of allotment 2, Parish of Mortat.
- C7** Swamp (17 ha)
Fresh-water swamp with river red gum and black box, being Crown land north-east of allotment 31, Parish of Yarrock.
- C8** Red Gum Swamp (89 ha)
Fresh-water river red gum swamp fringed by black box and bull-oak, being Crown land east of allotment 21, Parish of Peechember. Some revegetation works are required.
- C9** Swamp (25 ha)
Fresh-water black box swamp, being the water conservation reserve north of allotment 9, Parish of Dahwedarre.

- C10** Peechember Swamp (254 ha)
Intermittent fresh-water river red gum swamp fringed by black box, containing some areas of open water in season, Parishes of Yanac-a-yanac, Mirampiram, and Peechember.
- C11** Swamp (36 ha)
Shallow fresh-water river red gum swamp with associated black box and lignum, being Crown land east of allotment 36, Parish of Mirampiram.
- C12** Dam (27 ha)
Permanent dam surrounded by woodland of grey box, yellow gum, and black box, being the water supply reserve and stone reserve south of allotment 33, Parish of Lawloit. Some revegetation works are required.
- C13** Merwyn Swamp (20 ha)
Portion of a fresh-water river red gum swamp, being Crown land south of allotment 26, Parish of Lawloit.
- Note:
This reserve contains the only Victorian occurrence of the rare club-rush *Schoenoplectus dissachanthus*, and it is recommended that grazing be phased out to protect this species.
- C14** Lake Lawloit (120 ha)
Open fresh-water swamp with reed beds, bordered by black box woodland to the south-west, Township of Lawloit.
- C15** Yanac Swamp (205 ha)
Fresh-water river red gum swamp fringed by black box, Parish of Yanac-a-yanac. Dead timber in the water provides numerous breeding hollows.
- C16** Boyeo Swamp (127 ha)
Fresh-water river red gum swamp fringed by black box, being Crown land south of allotment 210, Parish of Tarranginnie.
- C17** Tarranginnie (Hardings) Swamp (117 ha)
Fresh-water river red gum swamp fringed by black box, being Crown land east of allotment 162, Parish of Tarranginnie.
- C18** Swamp (180 ha)
Shallow fresh-water river red gum swamp, being reserved forest north of allotment 81, Parish of Koonik Koonik.
- C19** Spring (4 ha)
Shallow intermittent fresh-water lake with a fringe of river red gum, bordered by brown stringybark, being Crown land south of allotment 77, Parish of Koonik Koonik.
- C20** Goroke (250 ha)
Fresh-water river red gum swamp, being the timber reserve, allotment 61, Parish of Goroke.
- Note:
The rare plant five-part piert (*Aphanes pentamera*) occurs here and should be protected from grazing.
- C21** Nhill Swamp (71 ha)
Portion of a fresh-water river red gum and black box swamp, being the public park reserve, Township of Nhill.
- C22** Nurcounng Swamp (80 ha)
Portion of a fresh-water swamp with river red gum, being the water reserve, allotment 73, Parish of Gymbowen.
- C23** Swamp (16 ha)
Shallow fresh-water marsh containing dead timber and natural islands, fringed by black box on the west, being Crown land south of allotment 53A, Parish of Ni Ni. Some revegetation works are required.
- C24** Lake (34 ha)
Fresh-water lake with black box and river red gum, being Crown land south of allotment 5, Parish of Gerang Gerung.
- C25** Swamp (16 ha)
Fresh-water lignum swamp fringed by black box, being Crown land south of allotment 9, Parish of Watchegatcheca.
- C26** Lake Wyn Wyn (700 ha)
Large salt-water lake and surrounds, Parish of Duchembegarra. This contains the best example of salt paper-bark (*Melaleuca halmaturorum*) and

halophytic vegetation communities in the Wimmera. It is also the most important salt lake for waders in the study area and one of the most important water bodies in the State for the banded stilt (some 24,000 banded stilts were recorded here in 1983). Other birds of significance that have been recorded are the red-kneed dotterel and sharp-tailed sandpiper. Large numbers of red-capped and black-fronted plovers are often found on the lake.

Note:

In order to protect the existing halophytic vegetation and to allow regeneration of salt paper-barks and glassworts, grazing should not be permitted and a regeneration program should be initiated.

C27 Swamp (60 ha)

Shallow fresh-water black box swamp, comprising the public purposes reserve and recreation reserve east of allotment 136B, Parish of Vectis East.

C28 Swamp (20 ha)

Portion of a fresh-water river red gum swamp, being the water reserve north of allotment 99, Parish of Vectis East.

C29 Verandah Swamp (18 ha)

Shallow fresh-water marsh fringed with black box, being the camping and water reserve east of allotment 81, Parish of Wail.

C30 Clough's Waterholes (21 ha)

Fresh-water billabong fringed by river red gum and surrounded by a woodland of black box and bull-oak, being Crown land west of allotment 92, Parish of Katyl.

C31 Crow Swamp (Phillip's Dam) (15 ha)

Open fresh-water swamp with dead timber and reedy shorelines surrounded by black box woodland, being the water supply reserve west of allotment 35A, Parish of Tarranyurk.

C32 Seven Mile Dam (13 ha)

Large water supply dam fringed by black box, being the public recreation and water supply reserve north of allotment 39A, Parish of Katyl.

C33 Saw Pit Swamp (33 ha)

Fresh-water swamp with river red gum and yellow gum, being the timber reserve south-west of allotment 217, Parish of Ashens.

C34 Coorong Swamp (55 ha)

Open fresh-water swamp, comprising the public purposes reserve, pound, and water reserve, south of allotment 96E, Parish of Rupanyup. Some revegetation works are required.

C35 Mutton Swamp (33 ha)

Open fresh-water thatch grass swamp fringed by black box, being the water reserve, allotment 3, Parish of Lallat.

C36 Swamp (36 ha)

Open fresh-water swamp (becoming saline), fringed by black box, being the water reserve adjoining allotment 14E, Parish of Rich Avon East.

Notes:

1. This area should be added to the existing Avon Plains Swamps wildlife reserve in the North Central area (Recommendation C3).
2. Portion of this requires revegetation with salt-tolerant native tree species.

C37 Lake Jil Jil (17 ha)

Portion of a fresh-water lake fringed by river red gum, being the reserve for public purposes, allotment 7A, section 5, Parish of Banyenong.

C38 Swamp (29 ha)

Open fresh-water swamp with areas of tangled lignum and an adjoining woodland of river red gum and black box, being the eastern portion of the 110th section reserve, allotment 1A, section D, and unreserved Crown land to the east, Parish of Corack East.

C39 Cherrip Swamp (69 ha)

Shallow fresh-water marsh fringed by black box, comprising the water reserve and adjacent public land west of allotment 2, section F, Parish of Corack East.

C40 Swamp (23 ha)

Portion of a fresh-water black box and tangled lignum swamp, being the 102nd section reserve north of allotment 81A, Parish of Jeffcott.

C41 Wooroonook Lakes (Middle and Eastern Lakes) (215 ha)

Two large fresh-water lakes fringed by woodlands of river red gum and black box, Parish of Wooroonook.

Wildlife Management Co-operative Area

Some areas have high values for wildlife conservation as well as capabilities for other uses. Where land tenure and management are oriented towards the other uses, special consideration will need to be given to the protection of the wildlife values. This will require some modification of the aims of management and can be achieved by co-operation between the responsible authorities and the Department of Conservation, Forests and Lands.

In order to provide for the best use and management of such areas that are important also for wildlife, it is proposed that they be declared Wildlife Management Co-operative Areas under the provisions of the *Wildlife Act 1975*. A management plan for each area will be necessary in order to ensure that the wildlife values are adequately protected. The plan would maintain the jurisdiction of the respective government departments and agencies over the area and the activities that take place within it.

Recommendation

C42 Darlot Swamp (270 ha)

That the area described below and indicated on Map A be used for the conservation of wildlife, water management, grazing, apiculture, and recreational activities

that

in order to protect the wildlife values associated with it, the Department of Conservation, Forests and Lands prepare a management plan in consultation with

the appropriate government departments with responsibility for various activities associated with the area, and then submit the plan to them for agreement

that

programs be established for the training of students in the management of wetlands on farms and to demonstrate habitat management and natural tree regeneration techniques

and that it be declared a Wildlife Management Co-operative Area under the *Wildlife Act 1975*.

Darlot Swamp is a seasonal fresh-water swamp with areas of lignum fringed by black box. It supports large numbers of waterfowl when the Yarriambiack Creek floods. The Australasian shoveller, Pacific black duck, grey teal, and black swan have all been observed breeding here, and some 40 other species of bird have been observed. It is currently being developed as a wildlife reserve co-operatively between the Victorian College of Agriculture and Horticulture (Longerenong) and the Department of Conservation, Forests and Lands. The V.C.A.H. (Longerenong) uses the swamp as an integral part of its educational programs in beef cattle production.

Little regeneration of black box has taken place around the swamp and in order to allow regeneration to occur it will be necessary to remove grazing from some areas for a period. In addition, the water regime should be investigated to determine whether it can be better manipulated to improve water-bird habitat.

Lake Buloke—An Area for Co-operative Management

Lake Buloke has State-wide significance as a conservation resource, and is one of the most popular waters for duck-hunting in Victoria. For this reason, it has been included in the Wildlife chapter of these recommendations. It is also used for grazing and cropping by nearby land-owners under various leasing and licensing arrangements. Most of the area has been held under perpetual leases for many years.

The public land at Lake Buloke forms the terminal basin of the Richardson-Avon River system. It may be divided into three sections—the main basin (5,100 ha), an area to the north-east of the main basin known as 'The Overflow' (2,800 ha), and Little Lake Buloke (250 ha) to the south-west of the main basin.

Salinity and water regimes

Salinity has become an increasing problem on the public land at Lake Buloke in recent years. It represents a threat to both agriculture (by reducing crop yields and altering pasture) and wildlife (by killing eucalypts and other species). Recent research by the Department of Conservation, Forests and Lands indicates that this salinity appears to be part of a regional salting problem, but the agricultural use of the lake may contribute marginally to the problem by causing a local rise in the water table through reduced vegetative up-take of water. Water entering the lake from the Richardson River often has high salinity levels, as does the groundwater beneath the lake. The Richardson-Avon River system is not a saline water body, but in its lower reaches discharge from saline groundwater systems that have risen close to the surface often causes its initial flows into the lake to have very high salt contents. The problem is likely to become worse in the future, as the Little Lake is already badly salt-affected and this effect has spread further north into the main basin.

This problem has been compounded by the lake being inundated more frequently and for longer periods of time over recent years. Factors contributing to this could include higher-than-average rainfall, saturated water tables in parts of the catchment, use of a section of the Richardson River as part of the Rural Water Commission's channel system, and flood overflow from the Wimmera River reaching Swede's Creek (a tributary of the Richardson) via a man-made channel.

The increased frequency and length of inundation at Lake Buloke has reduced the number of years in which crops can be harvested, and reduced the area available for grazing. It has also caused the death of many eucalypts, probably in conjunction with the salinity problem.

Natural features and conservation

The main basin of Lake Buloke is mostly covered by a virtually monospecific grassland of cane grass (*Eragrostis australasica*), known locally as thatch grass, a common plant of seasonally inundated areas in inland Australia. It is the largest thatch grass-covered basin in Victoria. These grasslands are ringed by woodlands of river red gum and, in parts, black box. Many of the larger old river red gums distributed across the main basin are dead or dying. Around the edges river red gum regeneration is quite thick in places, but minimal in other localities. Death of the older trees and the amount of regeneration have probably been affected by salinity and alterations to the water regime, although it appears that cropping and grazing by stock have had some effect on regeneration.

When filled, the main basin of Lake Buloke plays host to large numbers of waterfowl of many different species. They feed on the thatch grass itself and on organisms that live among it. The grasslands are also used for roosting, and some species breed there, including swans and several species of duck. The larger old river red gums surrounding the lake provide nesting hollows for a variety of ducks, parrots, birds of prey, and cormorants, while black box trees provide nesting for cormorants and birds of prey.

Lake Buloke is used by the freckled duck, a protected species that is considered vulnerable. The Australian population is estimated to be about 20,000, and at least 230 (more than 1 per cent of that entire population) were shot at Lake Buloke on opening day in 1985. They probably constituted most of the freckled ducks present at Lake Buloke at the time. In some years, Lake Buloke is the most important wetland in Victoria for this species.

Both the main basin and 'The Overflow' provide important habitat for wading birds whenever they contain water. Significant species recorded include sharp-tailed sandpipers, red-necked avocets, black-winged stilts, and red-capped plovers, but many other wader species also use the lake. In recent years, broilgas have been observed on the western shore of the lake.

'The Overflow' is inundated less frequently than the main basin—about one year in ten on average, but more frequently in recent years. It is now largely cleared of native vegetation and used for cropping in many years. Early this century, 'The Overflow' was a black box woodland, but the trees had nearly all died by the 1950s, when substantial clearing to combat weeds and rabbits took place. Now only a few small patches of black box woodland remain. Nevertheless, waterfowl still use the area when it is inundated. Spiny lignum (*Muehlenbeckia horrida*) is present on many of the road reserves on 'The Overflow', representing the largest population known of this rare species, which is found in few other Victorian locations. Numbers have been reduced by cultivation of these road reserves.

A small area of remnant black box woodland on the north-eastern edge of 'The Overflow' has a very intact understorey, including considerable numbers of Australian box-thorn (*Lycium australe*), an uncommon species at the southern edge of its main distribution. Both spiny lignum and Australian box-thorn are scattered on the western edge of the main basin as well, where one section of road reserve also contains the rare herbs long eryngium (*Eryngium plantagineum*) and pale beauty-heads (*Calocephalus sonderi*).

The noxious weeds African box-thorn and horehound are present in remnant woodland and cleared areas on 'The Overflow' and the main basin, but are regularly controlled by the lease-holders and the Department of Conservation, Forests and Lands. They could threaten native species in the future if control is not maintained. Stemless thistles can also become a problem if the lake remains dry for several years in succession.

In order to minimize salinity in the main lake, first flows of the Richardson River are directed into Little Lake Buloke. As a result, the Little Lake has become increasingly saline in recent years. The adjacent public land has mostly been cleared and now carries mainly exotic grasses and native halophytes. It still carries a few scattered black box trees along the eastern shore, and an area of black box woodland on its western edge west of the lake. When filled, Little Lake Buloke supports considerable numbers of waders, such as black-winged stilts and red-necked avocets.

Recreation

In suitable years, more than 1 per cent of Victoria's duck population is found at Lake Buloke, which is one of the most highly regarded duck-shooting waters in Victoria. Nine species of duck are found here, eight of which may be legally shot in season.

Large numbers of hunters are attracted to Lake Buloke during the season. The number present on opening day varies greatly, but averages more than 5,000. The record number exceeds 17,000. These hunters set up camp around the shores of the lake, virtually creating a small town overnight. Local farmers assist the hunters by leaving gates open on opening day.

The influx of hunters to Lake Buloke during duck season provides a boost to the local economy of the nearby town of Donald, although it is believed locally that this effect has lessened over recent years as hunters now tend to bring most of their supplies with them.

In some years the lake contains little or no water, and hence ducks are not present. This has happened three times in the past 10 years.

Other recreational activities that take place on Lake Buloke are netting and angling for English perch (redfin), yabbing, pleasure boating, and nature study.

Agriculture

According to the Lake Buloke Landholders' Association, 36 families use the Lake Buloke area for agriculture. Most of the agricultural activity on the public land takes place under perpetual leases, although a few areas are farmed under annual grazing licences and two allotments are subject to annual permits to graze and cultivate. Perpetual leases total 95, with a rental of about 50c per hectare per year. However, the lease areas are bought at auction, probate is payable on them, and shire and water rates must also be paid. The licensees of one of the annual licences and both of the permit areas have expressed an interest in converting these to perpetual leasehold, but Council does not believe this would be appropriate.

Agricultural activity on the lake varies. When the main basin is filled, both sheep and beef cattle graze on the thatch grass around the edges. When the lake is dry the whole of the main basin is grazed. Carrying capacity is

difficult to estimate because of the integration of leased land with the home property. The major contribution is often a green pick off-season.

Most of the holdings on the main basin and 'The Overflow' have been fenced, as a provision of the perpetual leases was that land must be fenced. Prior to the issue of perpetual leases it was run as a common until 1904. Boundary fencing mainly consists of old wooden posts and newer wire mesh. In the normal course of events, as the water level rises the wire mesh is rolled up and removed or lifted up on the posts 2 or 3 metres above the ground. In some years fencing is damaged when it cannot be removed before the water rises.

On 'The Overflow', cropping takes place as often as every second year, with a fallow in the alternate years. Regular cropping also occurs on the western edge of the main basin. The crops include wheat, oats, and barley; yields fluctuate greatly, but can be very high in a good year. 'The Overflow' is also used for oil-seed crops: in some years sunflowers and rapeseed have been grown successfully, but in other years salinity has adversely affected some crops.

Cropping on the main basin involves a substantial financial risk, as rising waters may inundate a crop. It also reduces the area of thatch grass habitat and to a large extent prevents regeneration of river red gum on the areas cultivated.

Risks of flooding are much lower on 'The Overflow', which usually floods only about one year in ten. In recent years, it has been inundated more frequently, leading to changes in agricultural practices. It is uncertain what effect this may have on soil structure and fertility in the long term. Increasing salinity has caused some crop losses in recent years.

The areas leased by individuals constitute from 20 to 60% of their total holdings and in most cases form an important part of their farming operations. The operation of these leases is closely integrated with the working of home properties. The leases can be sold, and some have changed hands frequently, although many have been held by the same family for several generations.

Issues

It would seem clear that Lake Buloke and its environs have been subjected to pressures over the years that have substantially altered their physical characteristics.

The clearing of vegetation throughout the catchment has undoubtedly contributed to alterations in the inundation regime and is probably influencing the increasing salinity of the waters of the lake and the lake-bed soils.

There is thus every indication that any continuation of the trend towards increasing salinity will threaten the agricultural use of the main basin and 'The Overflow', with economic repercussions for all lease- and licence-holders. Increasing salinity would alter the ecology of the wetlands, with changes in habitat occurring as those life forms with a greater tolerance for saline environments eventually predominate.

The effects of this on ducks and other waterfowl are uncertain. However, it can be stated that if water regimes and/or salinity levels change so that river red gums can no longer survive, then breeding sites for a number of species would be lost. With increasing salinity, species on which many water birds feed could also disappear, and the value of the lake for conservation and recreation would be substantially diminished.

Past clearing and fencing on the Lake Buloke area itself, required under the conditions of the leases, have also caused changes to the structure and composition of the lake's vegetation, and in turn this could have exerted a local effect on salinity.

Over the years grazing, particularly by sheep, has apparently adversely affected the regeneration of river red gum and black box, while past water regimes and agricultural use have essentially changed the vegetative characteristics of 'The Overflow'. Cultivation around the main basin periodically causes the destruction of some areas of thatch grass and, although this seems to regenerate in the absence of cropping, recovery can be slow.

Longer-term goals

As indicated above, the environmental attributes and agricultural practices associated with the main basin, 'The Overflow', and Little

Lake Buloke differ substantially, and the longer-term land use goals need to recognize such differences.

For example, most of the highly significant conservation values are found in the main basin and the long-term use of this area should be directed towards the maintenance and enhancement of these values while attempting to ensure that the agricultural use of the area is fully consistent with this aim.

On the other hand, 'The Overflow' has lesser conservation significance, but is generally more significant as a reliable contributor to the financial returns from agricultural enterprises. Consequently, in the longer term, land use on 'The Overflow' should be oriented towards maintaining soil fertility, protecting significant plant species, and ensuring that, where possible, the value of the area as wildlife habitat supplements that of the main basin.

In the long term, depending upon the results of research, it may be found that Little Lake Buloke has the potential to play a role in minimizing the effects of saline water on the ecosystems of the main basin. A revegetation program should be commenced, with the object of increasing the value of the lake for recreation and as a habitat for wildlife. Revegetation of the area around Little Lake Buloke and the southern part of the main basin will require planting with salt-tolerant species such as salt paper-bark, several of which have been planted successfully at Little Lake Buloke.

Currently, little is known about the processes that are occurring in the catchment and consequently little can be said with certainty about the future of this important lake system. All indications, however, point to the need to establish, as a matter of urgency, a data base in order to learn more about the ecological processes influencing the lake. As information is obtained, a strategy aimed at maintaining its capability to support a diversity of uses should be developed.

Clearly then, there is a need to gain an understanding of the processes that are occurring in the catchment and the lake itself if salinity is to be halted and reversed, soil fertility is to be maintained or improved, and conservation and wildlife values are to be enhanced.

The local community has a growing awareness of the seriousness of the threats to the lake. However, to achieve the goals outlined above will require the support of all community groups with an interest in the lake as well as the close co-operation of the land-holders and government agencies.

Recommendation

C43 Lake Buloke

That the area of 8,200 ha shown on Map A be used for the conservation of wildlife and rare plants, recreational activities (including hunting in season), water management, agriculture, and apiculture, bearing in mind the special conditions that pertain to areas held under perpetual lease

that

- (a) as a matter of urgency, a research program be developed in order to gain an understanding of the processes occurring on the public land complex comprising Lake Buloke as well as in the remainder of the catchment, particularly with regard to: salinity; the effects of frequency and length of inundation of Lake Buloke; the effects of artificially constructed levee banks; regeneration of tree species; and re-establishment of thatch grass after cultivation
- (b) revegetation programs be commenced to increase the tree cover in those areas where regeneration is required, being primarily around the main basin and Little Lake Buloke but including some areas of higher ground on 'The Overflow'
- (c) grazing be removed as necessary from the Little Lake Buloke public purposes reserve to facilitate regeneration
- (d) cultivation of the road reserves described in recommendations L17 and L18 not be permitted, and cultivation of other road reserves be subject to permit from the Department of Conservation, Forests and Lands

- (e) the area of black box woodland in the eastern part of allotments 150, 151, and 152, Parish of Corack, which contains the significant plant species Australian box-thorn (*Lycium australe*) and spiny lignum (*Muehlenbeckia horrida*), continue to be protected from grazing
- (f) removal of timber (live or dead) not be permitted, other than for management purposes
- (g) cultivation on the main basin not extend into areas currently uncultivated and carrying thatch grass, with the exception that investigations may indicate a need to vary the size and location of cultivated areas
- (h) licensed netting and angling for fish continue to be permitted

and that all the area remain public land under the existing leasing and licensing arrangements and be managed by the Department of Conservation, Forests and Lands in consultation with the Rural Water Commission, the Department of Agriculture and Rural Affairs, the Lake Buloke Landholders' Association, the Avon-Richardson Catchment Improvement Scheme committee, and community groups such as the Donald History and Natural History Group.

the State. Council therefore considers that Lake Buloke and its catchment should be given a high priority for investigation, perhaps as a case study, in the salinity research program.

2. In order to carry out the above recommendations and to apply the results of research, it may be desirable to remove grazing or cultivation from some areas at certain times or to adopt other management practices. This could be achieved by agreement with lease- and licence-holders or by legislation. Assessment of rents could take loss of productive areas into account.
3. Lake Buloke is one of the favoured habitats of the freckled duck, which is regarded as rare in Victoria, and a considerable proportion of the Victorian population is sometimes found there. Despite the fact that it is a protected species, numbers can be found shot at Lake Buloke on the first day of the open season. The *Wildlife Act 1975* has provisions whereby certain measures can be taken to protect particular species and these provisions should be used as necessary to protect this rare species.
4. The rare plants spiny lignum (*Muehlenbeckia horrida*) and Australian box-thorn (*Lycium australe*) occur along many of the road reserves on 'The Overflow' and along the road reserve on the western side of the main basin, where the two rare herbs long eryngium (*Eryngium plantagineum*) and pale beauty-heads (*Calocephalus sonderi*) also occur. The managing authority should investigate methods of protecting these occurrences. Progressive fencing of road reserves or parts of road reserves may be required to enable stock to be controlled.
5. Arrangements for fire prevention and suppression will not be altered by these recommendations.

Notes:

1. The Council is aware that research into the problem of salinity in Victoria is receiving considerable attention. It points out that the extremely high value of Lake Buloke as water-bird habitat, its popularity for duck-hunting, and its importance for agriculture cause it to be of particular significance to

D. Water Supply and Regulation

Due to the absence of any significant independent surface water supplies and the unreliability of the streams that flow into the study area from the south, most of the Wimmera relies heavily on the Wimmera-Mallee Domestic and Stock Water Supply System. This System—an extensive network of dams, channels, and storages—harvests the water resources to the south and distributes them to the central and eastern parts of the Wimmera and Mallee.

The western part of the study area has large reserves of good-quality groundwater associated with the aquifer known as the Duddo Limestone. Bores here supply water for domestic, stock, and irrigation purposes.

Catchment management and use

No catchment in the Wimmera area is used solely for water production. The catchments are subject to a variety of land uses, including recreational activities, timber production, and agriculture on open farmland. None of them are proclaimed catchments.

Although there are no proclaimed catchments in the area, the waters of the Wimmera River and catchment are the subject of State Environment Protection Policy No. W-15A, which was gazetted in May 1985. This Policy outlines beneficial uses of water that are to be protected, desirable water quality standards, and the ways these standards and levels of protection will be achieved. Any developments likely to affect surface or groundwater quality must receive appropriate authorization from the Environment Protection Authority.

Flood mitigation

While flood mitigation here is not the direct responsibility of the Rural Water Commission, the operation of the Commission's water supply system can provide some mitigation. 'Natural' flood mitigation, however, involves the use of many lakes, swamps, and watercourses that are not used for water supply. It is essential that these areas continue to be available to act as natural flood pondages.

Wimmera-Mallee pipeline proposal

Presently, water to supply parts of the Wimmera and Mallee is transferred from storages in the

Grampians via open channels to farms and urban areas. 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. There has been a Ministerial undertaking to pipeline the Eureka section in the Lake Tyrell area of the Mallee. This project involves 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/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. 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.

The Wimmera River flows into Lake Hindmarsh and, in exceptionally wet periods, on to Lake Albacutya in the Mallee area via Outlet Creek. Occasionally overflows from Lake Albacutya reach a series of lakes further north in the Wyperfeld National Park. Flooding of riparian areas in these lower parts of the river system is important for the regeneration of river red gum, black box, and the uncommon three-nerve wattle (*Acacia trineura*). Historical records indicate that last century these waters reached as far north as Wirrengren Plain about every 20 years, but they have not reached that far since the early 1920s. In addition, low flows

in the Wimmera River have exacerbated pollution problems and nuisance weed infestations in recent years.

Although increased flows from water savings through pipelining would probably not be large enough to have a significant effect on water levels in the terminal lakes, considerable environmental and recreational benefits would follow from the higher water levels and more consistent flows in the Wimmera River itself. 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. Council believes that there would be many advantages in allocating a significant proportion of the water saved by pipelining to environmental flows in this important inland river system.

Recommendations

D1- D24 That in the case of the off-river storages and water supply installations, shown on Map A and listed below, or groundwater bores and channels (not individually listed), these and their associated reserves remain under existing tenure and control.

Note:
Many water installations located on public land are scattered throughout the study area. These occupy small sites and carry water towers and the like. They are not shown on Map A and Council proposes that their existing tenure and control should continue.

- D1 Jeparit Weir, Shire of Dimboola
- D2 Jeparit storages, Rural Water Commission
- D3 Antwerp Weir, Rural Water Commission
- D4 Antwerp Channel syphon, Rural Water Commission
- D5 Antwerp storages, Rural Water Commission
- D6 Dimboola Weir, Rural Water Commission
- D7 Dimboola storages, Rural Water Commission

D8 Pimpinio storages, Rural Water Commission

D9 Riverside irrigation channel syphon, Rural Water Commission

D10 Dooen storages, Rural Water Commission

D11 Jung storage, Rural Water Commission

D12 Yarriambiack Creek Weir and off-take structure, Rural Water Commission

D13 Lake Taylor Outlet Channel syphon and outfall, Rural Water Commission

D14 Pump and treatment works, Warracknabeal Water Board

D15 Lake Whitton, Rural Water Commission

Note:

Management should take into account the wildlife values of this area.

D16 Brim storage, Rural Water Commission

D17 Pump on Lake Marma, Murtoa Water Board

D18 Minyip storage, Rural Water Commission

D19 Rupanyup storages, Rural Water Commission

D20 Watchem storages, Rural Water Commission

D21 Avon Weir, Rural Water Commission

D22 Donald storages, Donald Water Board

D23 Wycheproof storages, Rural Water Commission

D24 Charlton storages, Charlton Water Board

Public Tanks

The Wimmera area contains many public tanks (dams) filled by the channels of the Rural Water Commission's stock and domestic system. Most of these tanks are located in water reserves, although some are on road reserves and channel easements.

In the early days of settlement the public tanks were the main source of water for stock and domestic use. The need for them now, however, is much reduced, due to the extension of channels to private tanks on farms and the use of road transport rather than droving to move stock.

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. Authorized 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 yabbing, while others have potential for such use. Many provide habitat for wildlife, and public tanks also supply water for use in fire-fighting.

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
- strategic location for fire-fighting
- value for wildlife habitat
- public use for recreation
- Rural Water Commission system regulation
- existing authorized diversions

Council has examined each of the 237 public tanks in the Wimmera area. After consultation with the Rural Water Commission, the Department of Water Resources, and local municipalities, the Council considers that 97 are no longer required for public purposes. The Commission will no longer supply these tanks with water except where they are used by individuals who pay water rates on the area occupied by the reserve or where it is prepared to supply water by agreement to authorized diverters. Council considers that 19 of these tanks could be made available for alienation.

The 140 public tanks that will continue to be filled because of their value to the community are mainly located within areas of public land recommended for use for other purposes. In these cases the tanks occupy a relatively small

proportion of the total area of public land, and they are shown on Map A by a blue dot placed next to the public land. Where tanks on small areas of public land are to be retained, it is recommended that all of the land become a water reserve. Council recognizes that reserves containing public tanks or traversed by channels or water-courses may, from time to time, be used for regulation of the water supply system, or for flood mitigation purposes.

Use of public tanks that are filled by run-off from the land around them (and not by Commission channels) is not referred to in these recommendations. The usefulness and reliability of these 'catchment' tanks varies considerably. Use of these tanks for fire-protection, stock water, and Shire purposes could continue.

Recommendations

D25- That the tanks listed below and shown **D157** on Map A continue to be used for community water supply purposes

and that

- (a) 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 Map A by a blue dot adjacent to the public land)
- (b) 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.

Note:

Some of these tanks are only used for road-making when a municipality is maintaining roads in the near vicinity. Those marked with an asterisk would only be filled on advance request because of pending road-making operations.

D25 On road reserve adjacent to allotment 38, Parish of Hindmarsh

- D26 In unreserved Crown land south-west of allotment 18, Parish of Hindmarsh
- D27 In the water reserve east of allotment 35C, Parish of Jeparit
- D28 Within Bushland Reserve I84
- D29 Within Wildlife Reserve C31
- D30 On road reserve adjacent to allotment 52, Parish of Katyl
- D31 Within Wildlife Reserve C32
- D32 Within Bushland Reserve I81
- D33 On road reserve adjacent to allotment 45, Parish of Dimboola
- D34 In water reserve east of allotment 85, Parish of Wail
- D35 1.4 ha north-east of allotment 25C, Parish of Wail
- D36 Within Wildlife Reserve C29
- D37 In the Township of Pimpinio, west of the railway line
- D38* In the Township of Pimpinio, east of the railway line
- D39 Within Wildlife Reserve C28
- D40 Within Wildlife Reserve C27
- D41 4 ha, being the water reserve south of allotment 75F, Parish of Wallup
- D42 On road reserve adjacent to allotment 136A, Parish of Wallup
- D43 In unreserved Crown land, west of allotment 118B, Parish of Wallup
- D44 On road reserve south of allotment 10, Parish of Wallup
- D45* On road reserve north of allotment 24, Parish of Kellalac
- D46 In State forest west of allotment 143, Parish of Kewell West
- D47 0.8 ha east of allotment 90B, Parish of Kewell West
- D48* Within revegetation area U17
- D49 4 ha, being the camping and water reserve north of allotment 116A, Parish of Kewell West
- D50 Within revegetation area U16
- D51 2 ha, being the water supply reserve north-east of allotment 132A, Parish of Kalkee
- D52* 0.5 ha, being the water reserve within allotment 102, Parish of Kalkee
- D53 On road reserve adjacent to allotment 113C, Parish of Dooen
- D54* 0.5 ha adjoining allotment 162, Parish of Kewell East
- D55 2 ha, being the camping and water reserve north of allotment 257, Parish of Jung Jung
- D56 Within revegetation area U19
- D57 Within Wildlife Co-operative Area C42
- D58 Within Bushland Reserve I91
- D59 Within Bushland Reserve I85
- D60 0.8 ha, being the tank reserve in the Township of Willenabrina
- D61 1.2 ha south-west of allotment 14A, Parish of Willenabrina
- D62 Within Bushland Reserve I86
- D63 Within Bushland Reserve I87
- D64 Within Bushland Reserve I88 (2 tanks)
- D65 6 ha, being the water reserve, allotment 2, Parish of Cannum
- D66 Within Bushland Reserve I89 (3 tanks)
- D67 On road reserve opposite allotment 44, Parish of Cannum
- D68 0.4 ha south-west of allotment 84, Parish of Cannum
- D69 Within Public Land Water Frontage Reserve west of allotment 1, Parish of Warracknabeal
- D70 On road reserve adjacent to allotment 8A, Parish of Warracknabeal
- D71 On road reserve adjacent to allotment 2, Parish of Warracknabeal
- D72 Within Streamside Reserve K3 (3 tanks)
- D73 Within Bushland Reserve I99
- D74 0.9 ha adjoining allotment 115, Parish of Werrigar
- D75 Within Bushland Reserve I100

- D76** Within Public Land Water Frontage Reserve west of allotment 42, Parish of Kellalac
- D77** On road reserve east of Sheep Hills station, Parish of Kellalac
- D78** 1.0 ha adjoining allotment 19, Parish of Beyal
- D79** 0.9 ha south of allotment 23, Parish of Beyal
- D80** Within Bushland Reserve I103
- D81** 1.8 ha adjoining allotment 5, Parish of Wilkur
- D82** Within Bushland Reserve I102
- D83** Within Bushland Reserve I101
- D84** On road reserve adjacent to allotment 119, Parish of Bangerang
- D85** On road reserve south of allotment 25, Parish of Bangerang
- D86** In the 110th section reserve adjoining allotment 13, Parish of Areegra
- D87** On road reserve west of allotment 35, Parish of Dunmunkle
- D88** 1.3 ha west of allotment 15A, Parish of Dunmunkle
- D89** Within Public Land Water Frontage Reserve adjoining allotment 40A, Parish of Dunmunkle
- D90** 1.5 ha north-west of allotment 248, Parish of Ashens
- D91** On road reserve south of allotment 71, Parish of Kewell East
- D92** 7 ha, being the water conservation reserve east of allotment 127, Parish of Kewell East
- D93** Within Bushland Reserve I97
- D94** Within Bushland Reserve I98
- D95** 3 ha, being the water reserve west of allotment 103C, Parish of Nullan
- D96** Within Wildlife Reserve C34
- D97** 14 ha east of allotment 131, Parish of Rupanyup
- D98** In State forest west of allotment 54, Parish of Marma
- D99** On road reserve adjacent to allotment 51, Parish of Marma
- D100** Within Bushland Reserve I96
- D101** 0.7 ha north-west of allotment 106A, Parish of Marma
- D102** Within Public Land Water Frontage Reserve north-east of allotment 129A, Parish of Marma
- D103** In utility area within allotment 138B, Parish of Marma
- D104** 3 ha, being the water reserve north-west of allotment 67A, Parish of Dunmunkle
- D105** On road reserve south of allotment 133, Parish of Dunmunkle
- D106** Within Public Land Water Frontage Reserve north-west of allotment 202, Parish of Lallat
- D107** Within Public Land Water Frontage Reserve, allotment 131, Parish of Lallat
- D108** Within allotment 12, Parish of Lallat (2 tanks)
- D109** Within Public Land Water Frontage Reserve south of allotment 10, section 2, Township of Rupanyup
- D110** Within Wildlife Reserve C35
- D111** Within revegetation area U23
- D112** On road reserve north-west of allotment 11, section A, Parish of Rich Avon West
- D113** 0.8 ha north-east of allotment 4, section B, Parish of Rich Avon West
- D114** On road reserve south-east of allotment 16, section C, Parish of Rich Avon West
- D115** Within Bushland Reserve I133
- D116** Within Bushland Reserve I115
- D117** 4 ha north of allotment 134, Parish of Warmur
- D118** Within Bushland Reserve I117
- D119** Within revegetation area U26
- D120** On road reserve south-west of allotment 23, Parish of Warmur
- D121** On road reserve adjacent to allotment 14, Parish of Narraport

- D122 On road reserve south of Bushland Reserve I122, Parish of Watchem
- D123 On road reserve adjacent to allotment 6, Parish of Watchem
- D124 3 ha, being the water supply purposes reserve south-east of allotment 11, Parish of Carron
- D125 On road reserve north-west of allotment 27, Parish of Carron
- D126 On road reserve south of allotment 20, section B, Parish of Laen
- D127 Within Bushland Reserve I128
- D128 0.5 ha south-west of allotment 24, section D, Parish of Laen
- D129 Within Lake Buloke Area C43
- D130 0.2 ha south-east of allotment 13, section 9A, Parish of Witchipool
- D131 In the recreation reserve (Donald racecourse), section 14, Parish of Banyenong
- D132 In the recreation reserve, allotment 9A, section D, Parish of Corack East
- D133 Within Bushland Reserve I139
- D134 Within Bushland Reserve I140
- D135 Within Bushland Reserve I141
- D136 Within Wildlife Reserve C39
- D137 Within Bushland Reserve I144 (2 tanks)
- D138 Within Bushland Reserve I147
- D139 On road reserve adjacent to allotment 61, Parish of Thalia
- D140 Within Bushland Reserve I137
- D141 On road reserve south of allotment A, Parish of Thalia
- D142 On road reserve adjacent to allotment 105, Parish of Thalia
- D143 0.8 ha, being the camping and water reserve south-east of allotment 57B, section D, Parish of Corack East
- D144 Within Bushland Reserve I155
- D145 1.2 ha adjoining allotment 2, section 2, Parish of Bunguluke
- D146 Within Public Land Water Frontage Reserve adjoining allotment 60, section A, Parish of Bunguluke
- D147 Within Bushland Reserve I156
- D148 Within Bushland Reserve I154
- D149 Within Public Land Water Frontage Reserve west of allotment 1B, section 1, Parish of Wycheproof
- D150 On road reserve adjacent to allotment 88B, Parish of Charlton West
- D151 Within Highway Park L29
- D152 On road reserve west of allotment 9A, Parish of Teddywaddy
- D153 In the water supply reserve south of allotment 28A, Parish of Doboobetic
- D154 On road reserve east of allotment 1, Parish of Yeungroon
- D155 Within revegetation area U39
- D156 In the water reserve south of allotment 4A, Parish of Narrewillock
- D157 In the water reserve east of allotment 21A, Parish of Jeruk
- D158 That the tanks listed below by filled only where they are used by individuals who pay water rates on the area occupied by the reserve, or where the Commission is prepared to supply water by agreement to authorized diverters. The tanks and surrounding areas would remain as public land.
- On road reserve adjacent to allotment 54, Parish of Tarranyurk
- Within Bushland Reserve I79
- In unreserved Crown land south of allotment 59, Parish of Dimboola
- On road reserve adjacent to allotment 50, Parish of Dimboola
- On road reserve adjacent to allotment 190, Parish of Kewell East
- In plantation reserve west of allotment 115, Parish of Kalkee
- In unreserved Crown land west of allotment 14B, Parish of Wallup
- Within revegetation area U18

Adjoining allotment 116, Parish of Kellalac

On road reserve adjacent to allotment 45, Parish of Nullan

Within Bushland Reserve I107

Within Public Land Water Frontage Reserve adjoining allotment 42A, Parish of Dunmunkle

Within Bushland Reserve I108

In allotment 174E, Parish of Bangerang

Within Bushland Reserve I104

In water reserve north-east of allotment 107A, Parish of Werrigar

In water reserve south-west of allotment 89, Parish of Kewell East

Within Flora and Fauna Reserve F19

Within Bushland Reserve I113

In water reserve west of allotment 183H, Parish of Rupanyup

Within revegetation area U24

In water supply reserve south-east of allotment 197, Parish of Rupanyup

Within Public Land Water Frontage Reserve adjoining allotment 12, Parish of Lallat

Within Public Land Water Frontage Reserve east of allotment 170, Parish of Lallat

Within Public Land Water Frontage Reserve west of allotment 61A, Parish of Dunmunkle

Within Bushland Reserve I106

Within Public Land Water Frontage Reserve west of allotment 11, Parish of Rupanyup

In unreserved Crown land south of allotment 153, Parish of Rupanyup

Within Bushland Reserve I98

Within Public Land Water Frontage Reserve, allotment 152, Parish of Dunmunkle

Within Public Land Water Frontage Reserve, allotment 146, Parish of Dunmunkle

In unreserved Crown land, allotment 116, Parish of Dunmunkle

Within Bushland Reserve I93

Within Bushland Reserve I114

In the water reserve south of allotment 125, Parish of Nullan

In water supply reserve south of allotment 77A, Parish of Rupanyup (2 tanks)

Within Bushland Reserve I132

Within Bushland Reserve I130

In the camping and water reserve, allotment 138B, Parish of Marma

In the public purposes reserve west of allotment 53, Parish of Rupanyup

Within Bushland Reserve I136

Adjacent to allotments 90A and 90B, Parish of Warmur

Within Bushland Reserve I118

Within Bushland Reserve I145

Within Wildlife Reserve C40

Within Wildlife Reserve C38

Within Bushland Reserve I143

Within revegetation area U32

Within Bushland Reserve I138

Within revegetation area U31

Within revegetation area U30

Within Bushland Reserve I135

In the water reserve west of allotment 161, Parish of Corack, being part of the Lake Buloke area C43

Within Bushland Reserve I142

In the water reserve, allotment 31B, Parish of Warmur

Within revegetation area U27

In the 110th section reserve north of allotment 78, Parish of Corack

Within Bushland Reserve I131

Within Bushland Reserve I127

Within Bushland Reserve I120

On road reserve north of allotment 15, Parish of Watchem

On road reserve adjacent to allotment 7, section 10, Parish of Witchipool

Within Bushland Reserve I129

Within Bushland Reserve I124

Within Bushland Reserve I125

Within Bushland Reserve I126

On road reserve adjacent to allotment 33, Parish of Narraport

On road reserve opposite allotment 42A, Parish of Thalia

Within Public Land Water Frontage Reserve between allotments 56 and 59, section A, Parish of Bunguluke

Within Public Land Water Frontage Reserve south-west of allotment 82, section A, Parish of Bunguluke

On road reserve north of allotment 91C, Parish of Teddywaddy

In unreserved Crown land, allotment 77B, Parish of Teddywaddy

In unreserved Crown land, allotment 45A, Parish of Coonooer West

Within Bushland Reserve I148

Within Bushland Reserve I149

In the water reserve west of allotment 36A, Parish of Doboobetic

D159-That the tanks and surrounding public land listed below and shown on Map A be made available for alienation, where the applicant is the sole user.

These tanks should only be filled where they are used by individuals who pay water rates on the area occupied by the reserve, or where the Commission is prepared to supply water by agreement to an authorized diverter.

D159 0.5 ha north-west of allotment 30, Parish of Kalkee

D160 0.4 ha north-west of allotment 47, Parish of Kalkee

D161 0.8 ha within allotment 24B, Parish of Kewell West

D162 2 ha, being the water supply reserve in allotment 195A, Parish of Jung Jung

D163 0.1 ha west of allotment 36, Parish of Cannum

D164 0.5 ha north-east of allotment 86A, Parish of Bangerang

D165 0.6 ha north-west of allotment 81, Parish of Areegra

D166 0.6 ha, being the water supply purposes reserve, allotment 1C, Parish of Areegra

D167 Within alienation area Q4

D168 0.5 ha, being the water reserve, allotment 46A, Parish of Kewell East

D169 Within alienation area Q5

D170 0.6 ha south of allotment 27, section C, Parish of Laen

D171 0.4 ha south-west of allotment 3, section C, Parish of Laen

D172 0.5 ha north-east of allotment 21, section A, Parish of Rich Avon West

D173 0.4 ha north-west of allotment 19, section B, Parish of Rich Avon West

D174 0.5 ha south-west of allotment 9, section B, Parish of Rich Avon West

D175 0.5 ha north of allotment 56, Parish of Carron

D176 0.7 ha adjoining allotment 10E, Parish of Narraport

D177 1.4 ha in the east of revegetation area U33, allotment 73, Parish of Teddywaddy (The possibility of an exchange for native bushland to the west of the revegetation area should be investigated)

E. Timber Production and State Forest

Timber production

Hardwood timber production is not a major form of land use here. The only State forests where sawlog-size timber is found are an area north of Goroke, the Marma forest, and the sugar gum plantations in the Wail forest. The sugar gum plantations have been the only source of sawlogs in the study area in recent years.

However, the durable species found in the Wimmera—such as river red gum, yellow gum, black box, and grey box—are well suited for use as railway sleepers, posts and other farm timbers, and firewood, and are intermittently harvested at low intensity for this purpose.

State forest

The large 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 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*.

Council has now resolved to apply the concept of State forest to the public land in the Wimmera area.

Existing land use categories

Hardwood areas and uncommitted land are administered under provisions of the *Forests Act 1958* and the *Land Act 1958*. In the past this has led to differences in fees for essentially the same type of licence and in some instances has resulted in the necessity to obtain two or three licences to occupy a single parcel of land.

State forest comprises a mosaic of forests of varying productivity, and the separation of land into timber production areas and uncommitted land has tended to reinforce the belief that the State's commercially productive hardwood forest is entirely located within hardwood production areas and that timber production is the sole object of management there. In fact, a significant volume of commercial timber is extracted, in conformity with Council's recommendations, from uncommitted land; at the same time, hardwood production areas are managed for a range of uses as well as for wood production.

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.

Management of State forest

The Council believes that, in the future, a unified and co-ordinated approach should be taken to the management of State forest and that it should be set aside and managed as a unit rather than administered as two classes of land of different tenure—namely reserved forest and uncommitted land. However, it will be necessary to recognize the different management requirements of areas with particular attributes within State forest.

Council has defined the areas of State forest in this 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 reserved forest. The consolidation of responsibility for issuing all

licensed occupations in State forest is an essential aspect of adopting a unified and integrated management approach. This would overcome the problems associated with the dual system of licensing that currently exists.

Following the delineation by Council of State forest and the designation of areas that have significance and need special protection or are required for particular purposes such as softwood production, management plans should be prepared. These plans should reflect the diverse values and differing capabilities of the land to support various community uses and needs. They would be developed in the light of a State-wide policy for the management of forested public land not included in parks or other specified reserves, and would take account of water production, recreation, timber production, floral, faunal, and fire-protection values.

Each management plan should also provide for the protection of significant areas designated by the Council, as well as incorporating the Council's established principles relating to timber harvesting and the provision of other resources required by the community. It should also take account of existing statutory requirements such as land use determinations. Provision should be made for a regular review of management plans for State forest. Where appropriate, the Council would continue to recommend areas of special significance to be permanently reserved for a particular purpose.

Many areas of State forest have no particularly significant features; nevertheless, although they do not currently support resources to meet known or predicted demands, they may well be required to meet as yet unspecified demands in the future. Much of this type of land has a relatively high erosion hazard and management will need to be directed towards the maintenances of the forest cover so that land options for the future are preserved.

In summary then, the Council believes a broad management strategy for State forests must be developed to provide for the carefully planned utilization of natural resources, as well as the protection of other important values. Management carried out in accordance with formal plans and the secure reservation of these lands under one form of land tenure should also provide a sound basis for the commercial utilization of resources and the long-term

maintenance and, where possible, enhancement of the diverse natural values and attributes of the forest estate.

Goals in the management of State forest

State forest in the Wimmera area has a multiplicity of uses. It is important for the protection of water supply catchments, 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 produce 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 Council believes that the broad management goals applying to State forest in this area should be incorporated into a regional 'Code of Forest Practice' and include the need 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 sustained-yield basis
- provide opportunities and facilities for public recreation and education
- protect water supply catchments and stream environments in general
- provide for apiculture, forest grazing, extraction of road-making materials, defence training, etc. where appropriate.

In relation to these goals the Council has referred below to a number of principles that should be incorporated into management plans for State forest. The principles are based on harvesting prescriptions used by the Department of Conservation, Forests and Lands.

Soil conservation and catchment protection

- Adequate buffer strips of at least 40 metres width along major streams and 20 metres 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 the buffer strips. They should, as far as practicable, be protected from fire. The width of the buffer should be determined after consideration of the sensitivity of the particular stream environment.
- All roads and snig tracks, log landings, and dumps should be designed and constructed to minimize erosion. These should be adequately drained, breached, and barred when not required, and ripped to encourage rapid regeneration.
- Intensive utilization operations should be excluded from areas of high erosion hazard and from slopes generally greater than 30°.
- Except in some mixed-species forests at lower elevations, logging operations should be restricted during winter and during and following periods of heavy rainfall; consideration should be given to closing unsurfaced logging roads during these periods. Seasonal closure of other roads will continue to be necessary because of excessive damage, erosion, or cost of maintenance, or because of extreme fire hazard.
- Forestry operations in water supply catchments should be undertaken in accordance with a 'Code of Forest Practice' and/or prescriptions and with the agreement of the Department of Water Resources or the delegated water authority.

Recreation and aesthetics

- Special consideration should be given to road location, size and shape of logging coupes, and other activities carried out in the forest in areas of high landscape value.
- Specific prescriptions should be applied to logging and other activities involving disturbance to the natural environment near major roads and walking tracks.

- 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

- Significant vegetation communities and colonies of rare or endangered plants and animals should be protected. Management plans should include details as to how they might best be protected, following consultation with specialist groups such as the National Herbarium. 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 management authority to involve local field naturalist groups or other interested parties in some of these management operations.

- Protection strips along streams and watercourses in logging coupes should be linked to other areas in which timber harvesting does not occur, in order to provide wildlife corridors.
- Some mature and veteran trees in logging areas should be retained for fauna habitat.
- All logged areas should be regenerated with tree species native to the area.
- Pesticides and fertilizers should be used with caution; no compounds that may significantly affect non-target species should be used; any compounds should be carefully applied so as to avoid damage to retained native vegetation.

Historic and archaeological sites

- Sites of historical significance or interest (such as relics of mining, logging, or early settlement) should be identified, and the sites and their environs should be protected by special prescriptions.
- Sites of archaeological significance or interest (such as scar trees, artefact scatters, or middens) should be identified, and the sites and their environs should be protected by special prescriptions.
- When historic or archaeological sites are identified, the desirability or otherwise of providing or upgrading vehicular access to each one should be considered when logging roads are being designed.

Recommendation

E1 That the areas shown on Map A be used in accordance with the principles outlined above to:

- (a) supply water and protect catchments and streams
- (b) produce hardwood timber
- (c) conserve native plants and animals, and provide opportunities for the development of wildlife conservation techniques
- (d) provide opportunities for open-space recreation (including hunting) and education
- (e) produce honey, forage, gravel, sand, and other forest produce
- (f) protect the values in the areas described in the following sections by the implementation of management prescriptions

and that they become State forest and be managed by the Department of Conservation, Forests and Lands.

Recreation

Outdoor recreation is an important use of much of the State forest in the Wimmera. It caters for a wide range of recreational pursuits such as camping, picknicking, hunting, horse-riding, fishing, nature study, and bushwalking, mainly by local people. In the Wail forest the Wimmera Forest Nursery, with its attractive gardens and demonstration plantings, attracts large numbers of visitors each year. The sections of the Wail forest along the Wimmera River and around

Barber's Lake provide a focus for local recreation, including picnicking, camping, social gatherings, four-wheel-driving, trail-bike-riding, fishing, yabbing, boating, hunting, bushwalking, and nature study. The existing tracks in State forests are of particular value for motorized recreation, and many of the other outdoor activities depend on motor vehicles. Council maintains that these tracks should continue to be available for public use.

Nature conservation

A number of rare or restricted plants and animals occur in State forest and these should be protected in accordance with Recommendation E1 (f) above.

- The Wail forest contains a wide variety of vegetation types and hence wildlife habitats. Much of it is sandy and carries brown stringybark woodland or open scrub with a heathy understorey, but in places the stringybark overstorey is absent. Many stands of yellow gum occur on clay flats among the sandhills, while picturesque forests of river red gum grow along the Wimmera River. An extensive stand of black box adjacent to the Wimmera River in the south-west is one of the largest in the study area. Slender cypress pines, some of which are large and very old, are scattered throughout the forest, occasionally in pure stands. This diversity of habitats supports a wide variety of birds—135 native birds have been recorded, including the rare bush thick-knee, and other interesting species such as the southern scrub-robin.

Management should aim at maintaining this diversity of vegetation types and habitats. The black box and slender cypress pine stands in particular need to be protected from damaging uses, including some recreation activities and extraction of forest products.

- Several areas recommended as State forest contain very little regeneration of tree species. This is especially the case in the Brynterion, Barrabool, and Marma forests, which are valuable woodland remnants. Other areas, such as the State forest between Minimay and Carpolac, contain rare plant species. In order to provide for regeneration of trees and protection of rare plant species, grazing may need to be excluded from some areas.

F. Flora Reserves and Flora and Fauna Reserves

Throughout the Wimmera area, a number of areas contain examples of native vegetation with considerable floristic importance and also provide valuable habitat for populations of native fauna.

Council has recognized the special conservation significance of these areas and has accordingly recommended their reservation as flora reserves and flora and fauna reserves.

In all such reserves, suppression of fires remains the responsibility of the Regional Management Division of the Department of Conservation, Forests and Lands. Appropriate fire-prevention measures such as maintenance of fire access tracks and protective burning will be carried out where necessary as will the control of vermin and noxious weeds. The management authority will need to investigate the most appropriate ways of protecting these reserves and adjoining areas from fire, consistent with the needs of management for conservation of flora and fauna.

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

F1- That the areas indicated on Map A and **F10** described below be used to:

(a) conserve particular species or associations of native plants

that

- (b) apiculture be permitted
- (c) passive recreation such as nature study and picnicking be permitted
- (d) grazing be phased out
- (e) hunting and use of firearms not be permitted
- (f) timber harvesting not be permitted

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.

- F1** 10 ha, being the 102nd section reserve south-west of allotment 113, Parish of Mirampiram, to be used to preserve the woodland of grey box and bull-oak and the occurrence of the rare jumping-jack wattle (*Acacia enterocarpa*).
- F2** 26 ha, being the water supply reserve north-west of allotment 135, Parish of Tarranginnie, to be used to preserve the bull-oak and yellow gum woodlands with a grassy understorey of spear-grasses and the occurrence of three-nerve wattle (*Acacia trineura*).
- F3** 582 ha, comprising allotments 74 and 77 and portion of allotment 75, Parish of Nurcoun, to be used to preserve the brown stringybark and yellow gum woodlands and the open scrub of dumosa mallee and the rare Kamarooka mallee (*Eucalyptus froggattii*). Other significant species of plants occurring here are hairy-pod wattle (*Acacia glandulicarpa*), manna wattle (*A. microcarpa*), bluebeard caladenia (*Caladenia deformis*), and coccid emu-bush (*Eremophila gibbifolia*).

Note:

This reserve includes a 9.7-ha area being portion of allotment 75, which was recently purchased by the Victoria Conservation Trust and presented to the Crown. An intact stand of the rare Kamarooka mallee (*Eucalyptus froggattii*) occurs on this area.

- F4** 25 ha, being the water reserve north of allotment 80B, Parish of Winiam, to be used to preserve the woodland of black box and bull-oak and the occurrence of the rare hairy-pod wattle (*Acacia glandulicarpa*).
- F5** 100 ha, being various areas of reserved and unreserved Crown land within the Township of Kiata, to be used to preserve the woodlands of yellow gum, black box, bull-oak, and slender cypress pine and the occurrence of a number of significant species including bottle bluebush

(*Maireana excavata*), leafy templetonia (*Templetonia stenophylla*), small milkwort (*Comesperma polygaloides*), metallic sun-orchid (*Thelymitra epipactoides*), tawny leek-orchid (*Prasophyllum fuscum*), and pale leek-orchid (*Prasophyllum occidentale*).

Note:

The area shown on Map A includes a number of small inliers of freehold land and small parcels of public land used for township purposes such as water supply and residences, which are unable to be shown at this scale. These areas will not be included in the reserve.

F6 90 ha, comprising reserved and unreserved Crown land in the Parish of Gerang Gerung and Township of Gerang Gerung, to be used to preserve the woodlands of yellow gum, bull-oak, and black box and the open scrub of dumosa mallee, parts of which have an understorey of the rare hairy-pod wattle (*Acacia glandulicarpa*).

F7 57 ha, being the water reserve north of allotment 28, Parish of Gerang Gerung, to be used to preserve the woodland of yellow gum, bull-oak, and black box with an understorey of the rare hairy-pod wattle (*Acacia glandulicarpa*) and the occurrence of the rare small milkwort (*Comesperma polygaloides*).

F8 4 ha, being the water supply reserve north of allotment 131, Parish of Ni Ni, to be used to preserve the open scrub community of bull mallee, red mallee, dumosa mallee, and slender-leaf mallee, and woodland of black box and yellow gum with an understorey of spear- and wallaby-grasses.

F9 196 ha, being the northern and eastern portions of allotment 24, Parish of Hindmarsh, to be used to preserve the sizeable relic of yellow mallee open scrub and an associated heath community, growing on a sandy lunette of Lake Hindmarsh.

F10 16 ha, being the reserve for protection of native flora and fauna, Parish of Dimboola and Township of Dimboola (known locally as the Dimboola Flora and Fauna Reserve), to be used to preserve an interesting remnant of dumosa mallee open scrub.

Flora and Fauna Reserves

Such reserves are significant because they provide valuable habitat for populations of native fauna and contain examples of native vegetation with considerable floristic value in a natural or relatively natural state.

Recommendations

F11- F20 That the areas indicated on Map A and described below be used to:

(a) conserve native plants and animals

that

(b) apiculture be permitted

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

(d) grazing be phased out

(e) hunting and use of firearms not be permitted

(f) timber harvesting not be permitted

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.

F11 Yarrangook—1,525 ha, to be used to preserve five areas of relatively undisturbed mallee-broombush scrub that provide an important refuge for the Australian bustard, an endangered species in Victoria. The mallee-broombush vegetation here is interspersed with areas of open heath and brown stringybark scrub. The latter are among the northernmost in Victoria.

F12 Mitre—55 ha, to be used to preserve an intermittent salt lake fringed by halophytic shrublands and stands of salt paper-bark and its associated water-bird fauna. The rare glasswort *Halosarcia syncarpa* is found here, and a variety of waders use the lake.

Note:

In order to protect the existing halophytic vegetation and to allow regeneration of salt paper-barks and glassworts, grazing should not be permitted and a regeneration program should be initiated.

F13 Mitre Lake—784 ha, to be used to preserve a large salt lake fringed by halophytic shrublands and grasslands and patches of salt paper-bark low closed forest. The halophytic vegetation here includes the rare glassworts *Halosarcia flabelliformis* and *H. syncarpa*. When the lake contains water it is an important habitat for waders, particularly banded stilts and red-capped plovers.

Note:

In order to protect the existing halophytic vegetation and to allow regeneration of salt paper-barks and glassworts, grazing should not be permitted and a regeneration program should be initiated.

F14 Telfer's Swamp—34 ha, to be used to preserve portion of an intermittent salt lake fringed by halophytic shrublands and stands of paper-bark and its associated water-bird fauna. Two rare glassworts—*Halosarcia flabelliformis* and *H. syncarpa*—are found here. This area and the freehold part of the lake to the east sometimes carry large numbers of red-capped plovers and sharp-tailed sandpipers.

Note:

In order to protect the existing halophytic vegetation and to allow regeneration of salt paper-barks and glassworts, grazing should not be permitted and a regeneration program should be initiated.

Note:

In order to protect the existing halophytic vegetation and to allow regeneration of salt paper-barks and glassworts, grazing should not be permitted and a regeneration program should be initiated.

F15 Oliver's Lake—400 ha, to be used to preserve a large salt lake fringed by halophytic shrublands and woodlands of yellow gum, bull-oak, and slender cypress pine and the associated water-bird fauna. The halophytic vegetation here includes *Halosarcia syncarpa*—a rare glasswort, and the only Victorian record of *Helichrysum* sp. aff. *apiculatum*—a previously undescribed type of everlasting. The lake provides habitat for waders, and is particularly important for banded stilts.

Note:

In order to protect the existing halophytic vegetation and to allow regeneration of salt paper-barks and glassworts, grazing should not be permitted and a regeneration program should be initiated.

F16 Glenlee—590 ha, to be used to preserve the large remnant woodland of bull-oak, black box, yellow gum, and slender cypress pine and the associated mammal and bird fauna. This is the largest remnant of the woodlands that once covered the Wimmera plains. Particularly good regeneration of bull-oak and slender cypress pine is occurring in some parts, and sizeable patches of dumosa mallee scrub grow among the woodlands as well. The woodlands and scrub provide habitat for arboreal mammals, western grey kangaroos, echidnas, and a variety of birds, particularly parrots and honeyeaters. About 40 bird species have been recorded in the area, including the rare bush thick-knee and Gilbert's whistler.

F17 West Wail—594 ha, to be used to preserve woodlands of grey box, black box, yellow gum, bull-oak, and slender cypress pine. This reserve contains a number of rare and threatened plant species—winged pepper-cress (*Lepidium monoplocoides*), bottle bluebush (*Maireana excavata*), hairy-tails (*Ptilotus erubescens*), leafy templetonia (*Templetonia stenophylla*), and broom bitter-pea (*Daviesia benthamii* ssp. *humilis*). Wetlands in the western part form a watering point for large populations of migratory birds, woodswallows, trillers, and songlarks, as well as many permanent residents.

F18 Barrett Reserve—220 ha, to be used to preserve the woodland of yellow gum, bull-oak, and black box, and the associated bird fauna. This is a sizeable remnant of the woodland vegetation that once occurred on the grey cracking clays covering most of the central Wimmera but has now been mostly cleared for agriculture. Populations of three rare plant species occur here—Murray Swainson-pea (*Swainsona murrayana* ssp. *murrayana*), downy Swainson-pea

(*S. swainsonioides*), and bottle bluebush (*Maireana excavata*). Of more than 60 bird species found here, 20 are residents. These include the red-capped robin, hooded robin, rufous whistler, chestnut-rumped thornbill, and white-winged chough.

F19 Barrabool—1,050 ha, to be used to preserve the gum-box-bull-oak woodlands and the associated mammal and bird fauna. The woodlands here show an interesting gradation from river red gum next to the Wimmera River, through black box, to yellow gum and grey box in the drier eastern part. The occurrence of variable Swainson-pea (*Swainsona oroboides*) is important, as it has now become greatly depleted in the Wimmera and almost extinct further south. The area supports a variety of dryland birds including significant species such as the bush thick-knee, black-chinned honeyeater, and grey-

crowned babbler. Regeneration of silver banksias around Blackfellow's Waterhole should be encouraged.

Note:

Off-road vehicles have caused problems in this reserve and measures should be taken to control this illegal activity, which causes erosion and interferes with regeneration.

F20 Mount Jeffcott—270 ha, to be used to preserve the woodlands of yellow gum and grey box and the associated flora and fauna. More than 170 species of native plants have been recorded here, including two rare species—bottle bluebush (*Maireana excavata*) and hairy-tails (*Ptilotus erubescens*). Stands of drooping she-oak (*Casuarina stricta*) and slender cypress pine (*Callitris preissii*) occur on the Mount itself. More than 50 species of native birds are known to inhabit the area.

G. Geological Reserves

Geological reserves are areas that contain features of geological interest, and are reserved primarily to preserve these features for the public's education and enjoyment. Such areas often have recreation, nature conservation, scenic, and landscape values in addition to geological features.

Recommendations

- G1-** That the areas indicated on Map A and
G2 listed below be used to:
- (a) preserve features of geological interest
 - (b) provide opportunities for recreation and education to the extent that this is consistent with (a) above

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 Department of Industry, Technology and Resources.

- G1** Portion of the lunette associated with Connan Swamp (8 ha) south of allotment 66, Parish of Arapiles.
- G2** Yowang Hill (70 ha) east of allotment 32B, Parish of Coonooer East.

H. Historic Reserves

Sites of historical importance associated with pre-European occupation—and European exploration, agricultural, and timber activities, settlement, and the exploitation of stone and gold—are found on both private and public land throughout the Wimmera area.

There is considerable interest in the community about the State's history. This interest is likely to increase, particularly as more becomes known about historical relics located on public land. Council considers that sites of historical interest should be managed to promote public awareness of the history of the area and that they should be protected as far as possible from progressive deterioration due to exposure to the weather and from damage by the public.

Historic Reserves are small areas that contain important relics, but generally have only one historical theme represented. Their size will generally preclude the development of recreational facilities, although some aids to interpretation could be provided.

Within the study area, several sites of historical importance have been included in parks or other reserves. One site associated with the pre-European history of the area and one historic railway station have been included in historic reserves.

Serviceton Railway Station

The Serviceton Railway Station on the Melbourne-Adelaide line near the State border was erected in 1888, and the land on which it was built was the subject of a prolonged border dispute resulting from an incorrect border survey in 1847.

The station building is constructed of brick, concrete, and bluestone, with a slate-tiled roof and a slate stairway up to the booking lobby. It has two storeys and a basement, which once housed a mortuary and a dungeon. Being situated at the Victorian/South Australian border, it contains the original customs offices used for the collection of duties on goods travelling interstate. It also contains the original refreshment rooms. The nearby train-turning triangle (used as turn-around point for State rail services) and the remnants of the water tank are also still present, but all the other ancillary buildings have been removed.

Although a number of other historic buildings occupy public land in the Wimmera, Council has singled out the Serviceton railway station for specific mention because it is no longer in active use and therefore is under threat of deterioration through vandalism and lack of maintenance. Council believes that this magnificent old building, situated a short distance from the Western Highway, has considerable potential for expanded use as a community resource.

Recommendation

H1 Serviceton Railway Station

that the area comprising the Serviceton railway station and platforms be used to:

- (a) protect buildings, equipment, and artefacts associated with the history of the locality
- (b) provide opportunities for recreation and education associated with the history of the locality

and that it continue to be managed by the State Transport Authority in consultation with the Ministry for Planning and Environment, the Shire of Kaniva, and the local community.

Mooree

This area, being Crown land north of allotment 19, Parish of Leeor, was used by Aborigines as a camping ground and contains evidence of traditional Aboriginal life-styles.

Recommendation

H2 Mooree (55 ha)

That the area shown on the map be used to:

- (a) protect specific sites that carry or contain evidence of past Aboriginal occupation
- (b) provide opportunities for recreation and education associated with the history of the locality (development of recreational facilities would be minimal)

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

Throughout the predominantly agricultural regions of the study area, a number of parcels of public land carry remnants of native vegetation. This vegetation, particularly the ground flora, has often been modified from the original by grazing and invasion of weeds. The native tree species 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. In many instances the only access is via an unused road covered by an unused-road licence, which should continue subject to the approval of the land manager. These bushland reserves are generally too small to have major significance for fauna conservation, although some may be important for migratory birds. In addition, some of these reserves occasionally provide limited opportunities for hunting waterfowl game species in season and vermin and animal pests, such as rabbits and foxes.

Management should aim at the maintenance of the native flora, particularly the tree species. Limited gravel extraction, low-intensity grazing, and the cutting of small amounts of firewood and an occasional post and pole 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, railway lines, and lookout points. These uses may not be appropriate to all reserves. In some instances the land manager may have to exclude them, at least temporarily, in order to permit regeneration of tree species.

In all bushland reserves the suppression of fires is 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.

Recommendations

11-1163 That the areas indicated on Map A and described below be used to:

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

that

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

(c) apiculture be permitted

(d) grazing be permitted subject to the approval of 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.

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, except where indicated in Chapter D.

11 12 ha, being the water reserve south-east of allotment 31, section 6, Parish of Leeor

12 14 ha, being the water reserve south-west of allotment 6, section 6, Parish of Leeor

Note:

Portion of this requires revegetation with tree species native to the area.

13 16 ha, being the water reserve north of allotment 15, section 4, Parish of Leeor

14 21 ha, being the water reserve north of allotment 19C, section 2, Parish of Leeor

Note:

Portion of this requires revegetation with tree species native to the area.

15 14 ha, comprising the water supply reserve west of allotment 10 and unreserved Crown land west of allotments 9 and 10B, Parish of Dinyarrak

Note:

Portion of this requires revegetation with tree species native to the area.

16 50 ha, comprising various reserved and unreserved areas of Crown land north of allotments 3 and 1A, Parish of Dinyarrak

Note:

Portion of this requires revegetation with tree species native to the area.

17 2 ha, being the water reserve south-east of allotment 1, Parish of Durndal

18 8 ha south of allotment 12A, Parish of Yearinga

19 1 ha south of allotment 12D, Parish of Yearinga

110 23 ha south of allotment 36, Parish of Yearinga

111 40 ha, comprising various areas of reserved Crown land in the Township of Lillimur South

Note:

Portion of this requires revegetation with tree species native to the area.

112 57 ha, comprising the water supply reserve and unreserved Crown land west of allotment 30, Parish of Minimay

113 15 ha, being allotment 7A, Parish of Murrawong

114 12 ha, being the stone reserve east of allotment 15, Parish of Mahrong

Note:

The disused sandstone extraction pits found here should be reclaimed.

115 3 ha, being the stone reserve west of allotment 10, Parish of Mahrong

Note:

The disused pit found here should be reclaimed.

116 3 ha, being the stone reserve east of allotment 12, Parish of Mahrong

Note:

The disused pit found here should be reclaimed.

117 3 ha, being the stone reserve north-east of allotment 12, Parish of Mahrong

118 11 ha, being the water supply reserve north-east of allotment 18, Parish of Yarrock

119 8 ha, being the quarry reserve north of allotment 24, Parish of Yarrock

Note:

Portion of this requires reclamation works.

120 19 ha, being the stone reserve south of allotment 15, Parish of Yarrock

Note:

Portion of this requires reclamation works.

121 7 ha south of allotment 6A, section 2, Parish of Kaniva

122 7 ha, being allotment 10, section A, Parish of Kaniva

123 2 ha, being the water reserve adjoining allotments 13 and 14, section 5, Parish of Kaniva

124 152 ha, being the preservation of flora and fauna reserve south of allotment 136, Parish of Yanipy

Note:

Kaniva High School uses this area for nature study purposes and has established a toilet block and shelter. These uses should be permitted to continue.

125 22 ha north of allotment 24B, Parish of Yanipy

126 4 ha, being the 110th section reserve, allotment 121, Parish of Yanipy

127 2 ha, being the supply of stone reserve within allotment 102, Parish of Lawloit

128 2 ha north-east of allotment 89, Parish of Lawloit

129 30 ha, being reserved forest north-east of allotment 47, Parish of Minimay

130 12 ha, being the water supply reserve west of allotment 53, Parish of Minimay

131 8 ha, being the 110th section reserve within allotment 55A, Parish of Minimay

132 107 ha, being unreserved Crown land west of allotment 19B, Parish of Mortat

133 47 ha west of allotment 18, Parish of Mortat

134 65 ha, being reserved forest north of allotment 3, Parish of Mortat

135 8 ha, being the Departmental water reserve adjoining allotment 81, Parish of Mortat

- I36** 6 ha, being the Departmental spring reserve south of allotment 40, Parish of Morea
- I37** 20 ha, being allotment 53, Parish of Mirampiram
- I38** 47 ha, being the water conservation reserve south of allotment 125, Parish of Mirampiram
- I39** 12 ha, being the timber reserve south-east of allotment 96, Parish of Mirampiram
- I40** 11 ha, being the water supply reserve south of allotment 137, Parish of Mirampiram
- I41** 20 ha, comprising unreserved Crown land north of allotment 34, Parish of Peecheamber, and unreserved Crown land within allotment 14, Parish of Dahwedarre
- I42** 125 ha, being the stone reserve north-east of allotment 74, Parish of Dahwedarre

Note:

Stone could continue to be extracted from this reserve as long as worked-out areas are progressively rehabilitated and the area occupied at any one time does not exceed 10 ha.

- I43** 35 ha, being the water supply reserve, its extension, and adjoining unreserved Crown land north of allotment 51, Parish of Peecheamber
- I44** 10 ha, being the water supply reserve south of allotment 107, Parish of Yanac-a-yanac
- I45** 7 ha, being the stone reserve west of allotment 93, Parish of Yanac-a-yanac
- I46** 10 ha, being the stone reserve north of allotment 79, Parish of Yanac-a-yanac
- I47** 9 ha, being the reserve east of allotment 10, Parish of Yanac-a-yanac
- I48** 4 ha, being the area known as Boyeo Spring, west of allotment 223, Parish of Tarrangianic
- I49** 13 ha, comprising the water reserve and 110th section reserve north-west of allotment 69, Parish of Kinimakatka

- I50** 4 ha, being the gravel reserve south-west of allotment 58, Parish of Kinimakatka
- I51** 5 ha, being the water reserve south-west of allotment 32B, Parish of Kinimakatka
- I52** 40 ha, being the water supply reserve north of allotment 16B, Parish of Kinimakatka
- I53** 23 ha, being the camping and watering reserve south of allotment 21, Parish of Gymbowen
- I54** 25 ha, being the water supply reserve east of allotment 40A, Parish of Koonik Koonik
- I55** 16 ha, being the water reserve north of allotment 39A, Parish of Nurcoung
- I56** 2 ha within allotment 11, Parish of Coynallan
- I57** 31 ha, being the reserve north of allotment 44, Parish of Warraquil

Note:

This does not contain the existing garbage-disposal site located in the south-eastern portion of the area, see Recommendation S3.

- I58** 4 ha, south-west of allotment 150A, Parish of Woorak
- I59** 9 ha, being the water reserve east of allotment 118, Parish of Woorak
- I60** 1 ha east of allotment 137, Parish of Woorak
- I61** 10 ha, being the water supply reserves east of allotment 121A, Parish of Woorak
- I62** 4 ha south of allotment 14, Parish of Woorak
- I63** 1 ha, being the stone reserve north-east of allotment 7, Parish of Lorquon
- I64** 4 ha, being the recreation reserve and unreserved Crown land, Township of Lorquon
- I65** 2 ha, being the State school reserve, Township of Ni Ni

Note:

Portion of this requires revegetation with tree species native to the area.

- I66** 18 ha, being the water supply reserve west of allotment 116, Parish of Ni Ni

- I67 23 ha, being the water conservation reserve east of allotment 46, Parish of Ni Ni
- I68 13 ha, being the water supply purposes reserve north of allotment 12, Parish of Kiata
- I69 2 ha, being the quarry reserve west of allotment 92, Parish of Kiata
- I70 7 ha, being the watering purpose; reserve east of allotment 92, Parish of Kiata
- I71 81 ha, being the water supply reserves west of allotment 53, Parish of Gerang Gerung
- I72 4 ha, being the State school reserve north of allotment 10, Parish of Woraigworm
- I73 19 ha, being the water supply reserve north of allotment 13, Parish of Woraigworm
- I74 81 ha, being allotment 113, Parish of Arapiles

Note:

Council recognizes that the proposed Jane Duff Highway Park (Recommendation L28) is separated from this reserve by a narrow strip of freehold. Should this freehold be purchased by the Crown then I74 should be added to L28.

- I75 20 ha, being the water supply reserve north-west of allotment 48, Parish of Arapiles

Note:

Portion of this requires revegetation with tree species native to the area.

- I76 16 ha, being the water supply purposes reserve south-east of allotment 50, Parish of Babatchio
- I77 6 ha, being the limestone reserve north of allotment 29, Parish of Tullyvea
- I78 12 ha, being unreserved Crown land west of allotments 165 and 165A, Parish of Dimboola
- I79 20 ha west of allotment 171, Parish of Dimboola
- I80 19 ha, being the water supply reserve west of allotments 6 and 6A, Parish of Dimboola

Notes:

- 1. This reserve contains a depression that collects seepage from the Rural Water Commission's Rainbow channel. The Rural

Water Commission should be consulted in management of the reserve.

- 2. Portion of this requires revegetation with tree species native to the area.

- I81 8 ha, comprising the water conservation reserve and State school reserve east of allotment 67, Parish of Katyil

- I82 43 ha, being allotment 118B, Parish of Wail

Note:

Portion of this requires revegetation with tree species native to the area.

- I83 2 ha, being the school reserve south-east of allotment 1B, Parish of Batyik

- I84 7 ha, being the water reserve north of allotment 25C, Parish of Joop

Note:

Portion of this requires revegetation with tree species native to the area.

- I85 6 ha, being the water reserve north-west of allotment 2, Parish of Willenabrina

- I86 8 ha, being the 110th section reserve and adjoining Crown land east of allotment 31, Parish of Willenabrina

- I87 8 ha, comprising the camping and recreation reserve and adjoining unreserved Crown land north of allotment 110, Parish of Yellangip

- I88 18 ha, being the water supply reserve, allotment 117, Parish of Cannum

Note:

Portion of this requires revegetation with tree species native to the area.

- I89 24 ha, being the water reserve north of allotment 70, Parish of Cannum

- I90 204 ha, comprising portion of the camping and watering reserve, the rubbish depot, and reserve for water supply purposes adjacent to allotment 18, Parish of Dooen

Notes:

- 1. This contains considerable areas of excellent river red gum regeneration, which should be protected.
- 2. Consideration should be given to placing a weir across the drain that takes water from

Dooen Swamp back into the Wimmera River. This would allow greater control over the swamp's water regime. Longer periods of inundation would increase the value of the area for wildlife, and enhance the long-term viability of the river red gum forest through promotion of regeneration and increased tree vigour.

- I91** 19 ha, being the camping and watering reserve east of allotment 71B, Parish of Longerenong

Note:

Portion of this requires revegetation with tree species native to the area.

- I92** 41 ha, being portion of allotment 72 and the water supply reserve to the south, Parish of Jung Jung

Note:

Portion of this requires revegetation with tree species native to the area.

- I93** 3 ha, comprising allotment 243C and the adjacent water reserve, Parish of Ashens

- I94** 5 ha west of allotment 18, Parish of Marma

- I95** 3 ha south-east of allotment 49, Parish of Marma

Note:

Portion of this requires revegetation with tree species native to the area.

- I96** 5 ha, comprising the water reserve and State school reserve north of allotment 67D, Parish of Marma

- I97** 25 ha, comprising the reserve for public purposes and the 110th section reserve, west of allotment 59, Parish of Ashens

- I98** 20 ha, being the reserve for public purposes, allotment 68, Parish of Ashens

- I99** 1 ha, being the water reserve south-west of allotment 174, Parish of Werrigar

- I100** 25 ha, being the water reserve east of allotment 77, Parish of Kellalac

- I101** 10 ha, being the water reserve east of allotment 34, Parish of Bangerang

- I102** 2 ha, being the water reserve south-west of allotment 114, Parish of Bangerang

Note:

Portion of this requires revegetation with tree species native to the area.

- I103** 11 ha within allotment 76C, Parish of Bangerang

- I104** 4 ha adjoining allotment 4, Parish of Nullan

- I105** 3 ha, being the public purposes reserve south of allotment 38, Parish of Nullan

- I106** 27 ha, comprising the water reserve and the camping and watering reserve north of allotments 72 and 72A, Parish of Nullan

- I107** 12 ha, being the water reserve, allotment 68, Parish of Nullan

- I108** 23 ha, being allotment 52A, Parish of Nullan

- I109** 10 ha, being part of the water reserve, allotment 161B, Parish of Nullan

Note:

Portion of this requires revegetation with tree species native to the area.

- I110** 19 ha, being the reserve for public purposes, allotment 146, Parish of Nullan

- I111** 48 ha north of allotment 133, Parish of Rupanyup

- I112** 6 ha, comprising the stone and water reserves adjoining allotment 143, Parish of Rupanyup

- I113** 17 ha west of allotment 173, Parish of Lallat

- I114** 4 ha, being the Crown reserve east of allotment 46A, Parish of Dunmunkle

- I115** 2 ha, being the water reserve east of allotment 59, Parish of Wilkur

- I116** 12 ha, being the water reserve north-west of allotment 108, Parish of Warmur

Note:

Portion of this requires revegetation with tree species native to the area.

- I117** 6 ha south of allotment 66A, Parish of Warmur

- I118** 33 ha, being the water conservation reserve, allotment 78A, Parish of Warmur

I119 7 ha, south of allotment 8, Parish of Warmur

I120 51 ha, being the 110th section reserve west of allotment 4, Parish of Watchem

I121 21 ha, being the water reserve south of allotment 25, Parish of Watchem

I122 40 ha, being the water reserve west of allotment 40C, Parish of Watchem

Note:

Portion of this requires revegetation with tree species native to the area.

I123 6 ha, being the water reserve south-east of allotment 40C, Parish of Watchem

I124 1 ha, being the public purposes reserve, allotment 66, Parish of Carron

Note:

Portion of this requires revegetation with tree species native to the area.

I125 4 ha, being the public purposes reserve north of allotment 39, Parish of Carron

I126 6 ha, being the public purposes reserve, allotment 11A, section 3, Parish of Witchipool

Note:

Portion of this requires revegetation with tree species native to the area.

I127 7 ha, being the public purposes reserve south of allotment 4A, section 3, Parish of Witchipool

Note:

Portion of this requires revegetation with tree species native to the area.

I128 9 ha, being the water supply reserve south of allotment 49, section A, Parish of Laen

I129 2 ha, being the water reserve south of allotment 12A, section D, Parish of Laen

I130 12 ha, being the 110th section reserve south-west of allotment 25, section C, Parish of Laen

Note:

Portion of this requires revegetation with tree species native to the area.

I131 5 ha south of allotment 37A, section D, Parish of Laen

Note:

Portion of this requires revegetation with tree species native to the area.

I132 6 ha, being the 102nd section reserve south of allotment 7A, Parish of Rich Avon West

I133 8 ha, being the water reserve west of allotment 148A, Parish of Burrum Burrum

I134 4 ha, being the water reserve east of allotments 20 and 20A, Parish of Banyena

Note:

Portion of this requires revegetation with tree species native to the area.

I135 87 ha, being the water and camping reserve and 110th section reserve west of allotment 16, Parish of Corack

Note:

Portion of this requires revegetation with tree species native to the area.

I136 4 ha south of allotment 10B, Parish of Narraport

I137 8 ha, being the 110th section reserve south-west of allotment 88, Parish of Thalia

I138 7 ha, being the water supply reserve east of allotment 1A, section C, Parish of Corack East

I139 130 ha, being the racecourse and recreation reserve, allotment 7, section A, Parish of Corack East

Note:

Portion of this requires revegetation with tree species native to the area.

I140 45 ha, comprising the water conservation reserve and adjacent public land west of allotment 24, section A, Parish of Corack East

Note:

Portion of this requires revegetation with tree species native to the area.

I141 69 ha, comprising the timber reserve and 110th section reserve north of allotment 80, section D, Parish of Corack East

I142 7 ha, comprising the quarry reserve and water supply reserve north-east of allotment 31, section E, Parish of Corack East

Note:

Portion of this requires revegetation with tree species native to the area.

I143 16 ha east of allotment 4B, section 2, Parish of Banyenong

Note:

This area is salt-affected and portion of it requires revegetation with salt-tolerant native species.

I144 17 ha, being the public purposes reserve and adjoining Crown land north of allotment 78, Parish of Jeffcott

Note:

Portion of this requires revegetation with tree species native to the area.

I145 16 ha, being the public purposes reserve south of allotment 29, Parish of Jeffcott

I146 4 ha west of allotment 54D, Parish of Donald

I147 16 ha, being the public purposes reserve east of allotment 72, Parish of Donald

I148 6 ha, being the water supply reserve and recreation reserves south of allotment 99D, Parish of Charlton West

I149 7 ha, being the water supply reserve and State school site south of allotment 45A, Parish of Charlton West

I150 37 ha, comprising the quarry reserve east of allotment 105 and allotment 105, Parish of Charlton West

Note:

Portion of this requires revegetation with tree species native to the area.

I151 360 ha, comprising various areas of reserved and unreserved Crown land, Parish of Charlton West

Note:

Portion of this requires revegetation with tree species native to the area.

I152 3 ha, being the departmental reserve north of allotment 91C, Parish of Teddywaddy

I153 6 ha, being allotment 7J and the public purposes reserve to the north, Parish of Teddywaddy

I154 16 ha, being the water reserve adjoining allotment 16, section 5, Parish of Wycheproof

Note:

Portion of this requires revegetation with tree species native to the area.

I155 3 ha, being the water supply purposes reserve north-east of allotment 14, Parish of Bunguluke

I156 1 ha, being the watering purposes reserve north-east of allotment 6, section B, Parish of Bunguluke

I157 6 ha north-west of allotment 32A, Parish of Coonooer East

I158 55 ha adjacent to allotment 55, Parish of Coonooer East

Note:

Portion of this requires revegetation with tree species native to the area.

I159 30 ha, being the recreation and quarry reserve east of allotment 50, Parish of Coonooer East

Note:

Portion of this requires revegetation with tree species native to the area.

I160 116 ha, comprising the water supply reserve and 110th section reserve north of allotment 10, section E, Parish of Charlton East

Note:

Portion of this requires revegetation with tree species native to the area.

I161 9 ha, being the quarry reserve, allotment 11, section A, Parish of Charlton East

I162 8 ha west of allotment 13C, section D, Parish of Charlton East

Note:

Portion of this requires revegetation with tree species native to the area.

I163 12 ha, being unreserved Crown land east of allotment 11A, section A, Parish of Woosang

J. Scenic Reserves

These 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.

Recommendations

J1- J3 That the areas shown on Map A and described below be used to preserve scenic features

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.

J1 Mount Gowar, 62 ha, being Crown land south of allotment 27A, Parish of Yeungroon

Note:

Portion of this requires revegetation with tree species native to the area.

J2 Howell's Hill, 85 ha, comprising the 102nd section reserve and adjoining Crown land east of allotment 5A, section D, Parish of Charlton East

Note:

Portion of this requires revegetation with tree species native to the area

J3 Mount Buckra, 33 ha, being allotment 107A, Parish of Buckrabanyule

Note:

This area requires revegetation with tree species native to the area.

K. Rivers and Streams

Public Land Water Frontages

Along a number of rivers and streams in the study area, a strip of public land has been reserved between the water and adjacent public land or alienated land. No public land strip adjoins land alienated before 1881, and some properties in the study area have titles that extend to the banks or even incorporate the bed and banks of a stream. Thus some streams and rivers have either no public land water frontage or a discontinuous one. The recommendations that follow do not apply to privately owned 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 River Management Boards or drainage trusts under the guidance of the Rural Water Commission may be formed in certain areas. The Department of Conservation, Forests and Lands 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.

The grazing of stock along water frontages may, however, result in the lowering of water quality either by direct pollution or through physical disturbance to banks. Excessive grazing of water frontage areas carrying original native vegetation may also degrade conservation values through damage to vegetation, impairment of regeneration, or disturbance and pugging of soils. For these reasons grazing may have to be permanently or temporarily removed from some parts of water frontages.

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' on licensed frontages. Licensees are required to erect and maintain a suitable means of pedestrian access to the water frontage.

This requirement has not been enforced for many existing licences and Council believes that in a number of situations, for example along popular fishing streams, the provision of stiles would facilitate pedestrian access along public land water frontages, 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. Frontages of the Wimmera River and Yarriambiack Creek carry riparian vegetation of outstanding quality, and a section of the Wimmera River is discussed in detail in Recommendation K2. These streams pass through country that contains few, if any, other areas of public land. In too many cases, however, the provisions of the relevant Acts have not been enforced effectively, and such public land water frontages have been progressively cleared of native vegetation.

Public land water frontage reserves

Water frontage reserves are defined for the 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 a national park or State forest) or for some special purpose (such as a recreation or streamside reserve). Public land water frontage reserves include the beds and banks of rivers and streams, which should be managed in consultation with the Department of Water Resources.

Recommendation

K1 That the public land water frontages:

(a) be used to

- (i) protect adjoining land from erosion by the maintenance of adequate vegetation cover and to provide for flood mitigation

- (ii) maintain the character and quality of the local landscape
- (iii) conserve native flora and fauna
- (iv) provide opportunities for low-intensity recreation
- (v) allow access to water and for grazing of stock by adjoining landholders under licence where appropriate

that

- (b) (i) where a licence has been issued for a public land water frontage as in (a) (v) above, restricted recreation use by the public be permitted (activities such as walking, nature observation, fishing, or just relaxing should be allowed, while camping, lighting fires, or using motor or motorized recreation vehicles should be prohibited)
- (ii) licensees be required to provide stiles in any fences erected across their licence area if requested to do so by the land manager
- (iii) cultivation not be permitted, except with the approval of the Department of Conservation, Forests and Lands
- (iv) in particular cases, licensees be required to fence off and exclude stock temporarily from some parts of the licence area where, in the opinion of the land manager, special measures are necessary to protect water supplies, to rehabilitate areas that are eroding or salt-affected, or to permit regeneration of native plants that have particular value for nature conservation

that

- (c) The Department of Conservation, Forests and Lands be consulted prior to the proclamation of roads, the construction of roadways, or the creation of buildings on public land water frontages

and that

- (d) public land water frontages be permanently reserved under section 4 of the *Crown Land (Reserves) Act 1978* and managed by the Department of Conservation, Forests and Lands.

Notes:

1. Public land water frontage reserves cannot be accurately defined at the scale used on Map A (1:250 000). However, some of the larger reserves have been shown on the map. The appropriate Parish plan should be referred to in order to determine the precise boundaries of these reserves.
2. An area on Dunmunkle Creek east of allotment 178, Parish of Lallat, contains a woodland of very old bull-oaks with an unusual twisted form that produces an almost eerie effect. This area, known locally as the 'Black Forest', should be protected from grazing and timber-gathering.

Wimmera River frontage

The public land abutting the Wimmera River from Quantong Bridge in the south to Lake Hindmarsh in the north 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.

The enjoyment derived from various activities depends in large measure on the maintenance and protection of the river environment; that is, the river itself and the flora and fauna associated with it. Some archaeological sites of significance—such as Aboriginal camping sites and scar trees—also occur, and others will undoubtedly be identified.

Large river red gums characterize the riverine landscape, with understoreys including wallaby-grasses, spear-grasses, and in some locations, moira grass. Dispersed throughout these are areas of black box, slender cypress pine, yellow gum, and bull-oak woodlands. Their understoreys may include spear-grasses, tangled lignum, salt paper-bark, silver banksia, scarlet bottlebrush, and watties. Patches of kangaroo grass grasslands also occur.

In addition, a number of rare plants occur here and they are found in relatively intact and undisturbed vegetation communities. Near Loch Iel Bridge on the Western Highway a large population of a rare form of rusty-hood (*Pterostylis* sp. aff. *biseta*) occurs in a grassy woodland dominated by river red gum and black box. This area should be protected from vehicular traffic. Further north, near Antwerp, populations of the rare bottle bluebush (*Maireana excavata*) are, most significantly, associated with a black box woodland with an intact understorey of native species.

The forests and woodlands along the river, along with the many billabongs, pools, swamps, and floodways, provide suitable feeding and breeding habitat for many species of native birds, native animals, and fish. Mammals found here include the common brushtail possum, sugar and feathertail gliders, and yellow-footed antechinus, while the regent parrot, Mallee ringneck, sacred kingfisher, and tree martin are among the many birds that live in the woodlands.

The reserve also has great significance as a habitat corridor through the mainly agricultural environment and allows the movement of migrant and nomadic species as well as the dispersal of the young of many species.

After seasonal inundation, the area provides extensive breeding habitat for a host of water birds.

The river itself offers a variety of environments for recreation. They range from large open deep pools and red clay cliffs to numerous sand bars and beaches, billabongs, and swamps. Most of the river is accessible during dry periods by internal roads linked to sealed roads that cross the river at a number of locations.

Camping in secluded spots or adjacent to the many sand bars and beaches found along the Tarranyurk-Jeparit section of the river is popular, as too is fishing, walking, nature study, or in many cases just relaxing by the river.

The Wimmera River is the major river in the study area and is a very popular fishing water. Fish caught here include native fresh-water catfish, golden perch, Murray cod, redbfin, and tench. Carp also occur. Many fishermen camp overnight along the river in order to take advantage of the nocturnal feeding habits of

native catfish. The river with its swamps also provides opportunities for duck-hunting, although a section around Jeparit is a declared wildlife sanctuary.

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.

Reduction of natural stream flows in the Wimmera River through consumptive water uses has also reduced the stream's capacity to assimilate waste inputs and so has added to water-quality problems. Water uses that suffer as a result of poor quality include supply for domestic and stock consumption, swimming, boating, fishing, and protection of the aquatic ecosystem.

Water-quality and related problems experienced in the catchment include high salinity, colour, and nutrient levels, depressed dissolved-oxygen levels, and nuisance aquatic weed growths. Factors contributing to these problems are mostly diffuse inputs such as leaching of saline soils, colour from the decay of plant matter, and nutrients in run-off from both dryland and irrigated agricultural areas.

The major point source of pollutants entering the river is the discharge from the City of Horsham's sewage-treatment works to the McKenzie River prior to its confluence with the Wimmera River 5 km downstream of Horsham. Components of this discharge causing most concern are the nutrients, in particular phosphorus, which contribute to the nuisance aquatic plant growths observed along the Wimmera River below Horsham.

While algal growths do not appear to be a major problem, macrophytes such as *Phragmites australis* (common reed) have established extensive stands at a number of sites downstream as far as Lake Hindmarsh. Nuisance *Phragmites* stands occur to a lesser extent upstream of Horsham, as does the native fern azolla at less-than-nuisance levels.

Excessive aquatic plant production, and alteration of flow and nutrient regimes, restrict access to the river and so interfere with recreational and other uses, while macrophyte stands can impede stream flow, resulting in

siltation and flooding. Eventual decay of the plant matter results in depressed dissolved-oxygen levels, which degrade the river's aquatic ecosystems and reduce water supply and recreational uses.

Methods of control of these weed growths will need to be investigated. Caution will have to be exercised, however, as removal of *Phragmites* could lead to erosion and turbidity problems downstream.

In May 1985 the government issued State Environment Protection Policy No. W-15A, which covers the waters of the Wimmera River and catchment. This policy outlines beneficial uses of water that are to be protected, water-quality goals, and methods of attaining these goals.

It stipulates that, from May 1988, disposal of effluent from the City of Horsham's sewage-treatment plant to the Wimmera River and tributaries will be restricted to periods of extreme wet weather. In March 1986 the government purchased a property west of Horsham for the Victorian Crops Research Institute, and this will be used for land disposal of treated effluent from the sewage-treatment plant (see Recommendation Q1).

It has been suggested that some of the water that will be saved if the Wimmera-Mallee pipeline project is implemented could be used for additional flows in the Wimmera River (see Chapter D, Water Supply and Regulation). 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 important inland river.

Recommendation

- K2** That the areas indicated on Map A (including the bed and banks of the river) 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) areas currently licensed for grazing continue to be used for this purpose subject to Note 1 below
- (e) use of existing and licensed pump and pump-line sites be permitted to continue
- (f) apiculture be permitted
- (g) timber-harvesting not be permitted, other than firewood-gathering where this is consistent with (a) and (b) above
- (h) sand extraction 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.

Notes:

1. Grazing should not be permitted in areas not currently licensed, in those where rare plants occur, or in those where, in the opinion of the land manager, special measures are necessary to protect water supplies, to rehabilitate areas that are eroding or salt-affected, or to permit regeneration of native plants.
2. The reserve includes the existing wildlife sanctuary at Jeparit.
3. The land manager should continue to investigate methods of controlling bank erosion caused by the wash from power boats.

Streamside Reserves

In some instances, 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 reserves 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 woodlands to grasslands. 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 recreation. 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.

Recommendations

- K3-** That the areas shown on Map A and
- K5** 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 land manager if this use does not conflict with the maintenance of the water quality of the adjacent stream
 - (c) conserve flora and fauna
 - (d) maintain the quality and character of the local landscape
 - (e) provide grazing, at the discretion of the land manager, if this use does not conflict with the maintenance of the water quality of the adjacent stream or with (a), (b) and (c) above

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.

- K3** 30 ha on the Yarriambiack Creek, west of Warracknabeal, Parish of Werrigar.
- K4** 33 ha on the Yarriambiack Creek, being the camping reserve east of allotment 48A, Parish of Kellalac.

K5 70 ha on the Wimmera River, Parish of Marma.

Note:

Regeneration of river red gum should be an aim of management in this reserve.

River Management

A River Management Board (previously known as a river improvement trust) is constituted under the *River Improvement Act 1958*, as amended by the *Water Acts (Amendment) Act 1985*, for a section of the Avoca River in the study area.

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 made to land use in the river catchments and on the flood plain. The following changes have generally reduced the value of the rivers for nature conservation:

- Clearing of vegetation has increased run-off and reduced time of concentration of storm flows. The situation is sometimes aggravated by overgrazing and unwise cultivation in the catchment and along the river banks, 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 backwaters of value as fish habitat and for angling and swimming in a particular location. On the other hand, these operations, in preventing erosion, reduce transportation of silt.

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

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 Boards' 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 (August 1984) to examine and recommend the future technical and financial arrangements for an effective, regionally based river management system. This task force has now completed its work and its report was recently published. It examines the requirements and costs and funding arrangements for an effective accelerated program of catchment improvement and for a program of effective management of Crown river frontages. The Wimmera River catchment is highlighted as particularly in need of some form of future co-ordinated stream and catchment management.

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 minimize the consequences of flooding rather than attempt to prevent it.

- An adequate vegetation cover should be maintained along stream frontages to stabilize the banks and to reduce the velocity of flood-waters as they leave and re-enter the stream course.
- Structures such as road embankments and bridges on flood plains are a variation of the natural situation, and consideration should be given in their design to their effect on the flood pattern (see Note 3).
- 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.

Recommendation

- K6** That the assessment of the need for, and the planning and implementation of, any works involving changes to the beds and banks of streams be based on the policies and principles set out above.

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 flood plains 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.

L. Roadside Conservation and Highway Parks

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 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 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. Of particular note is the vegetation along roadsides on the agricultural Wimmera plains, where the loss of mature trees is becoming an increasing problem. Often these open roads and road reserves contain the great majority of trees in the landscape.

The Arthur Rylah Institute for Environmental Research, Technical Report Series No. 11, September 1984, 'Conservation of Roadsides and Roadside Vegetation', gives a comprehensive review of values, methods of assessment, and management of roadsides for the purposes of nature conservation.

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.

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 the eastern part of the area, 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 (9,000 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 study area to be continually upgraded. Tree-lined back roads with gravel surfaces on narrow alignments are becoming increasingly uncommon. Yet for many people such roads best fulfil their need for contact with rural environments. The Council believes that a conscious effort must be made to maintain the character of these roads, particularly when upgrading or realigning is being considered.

Recommendations

L1 That road reserves throughout the study area continue to be used for communication, transport, access, surveys and utilities.

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

- When improvements to a road are being carried out, trees and shrubs on the road reserve should be disturbed to the minimum extent consistent with the safe and efficient design and use of the road.
- Major works to realign minor roads carrying trees and shrubs should not be undertaken unless clearly warranted by the nature and volume of the traffic carried, and the managers of adjacent public land should be consulted regarding such works.
- Where 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 material should not be taken from road reserves unless no suitable alternative sources are available. Any such removal should be done so as to ensure a minimum disturbance of the native vegetation, and the disturbed area should be rehabilitated, where possible, with vegetation native to the area.
- Burning off, slashing, or clearing of roadside vegetation should be kept to a minimum consistent with providing adequate fire 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.

L2- L25 That, when widening or re-alignment of roads is proposed, sites of geological, historical, habitat, or botanical significance that may be affected be investigated and every effort made to retain and preserve them.

A number of important sites along road reserves should be protected, and these are listed below.

Sites of habitat and/or botanical significance

L2 Murrawong North Road
Mallee-broombush and brown stringybark scrub

- L3** The following road reserves, marked as L3 on Map A, carry stands of the rare jumping-jack wattle (*Acacia enterocarpa*):
- (a) Broughton Road, Shire of Kaniva
 - (b) Diapur-Lawloit Road, Shire of Lowan
 - (c) Miram East Road, Shire of Lowan
- L4** Murrayville Track
Mallee-broombush and brown stringbark scrub grow along a popular tourist route to the Big Desert.
- Note:**
Council is aware of a proposal by local Shires to have the Murrayville Track reclassified as a Tourist Road under the *Transport Act* 1983.
- L5** Nhill-Jeparit road
Good stands of bull-oak and black box
- L6** Road reserve, Parish of Kiata
Stands of bull-oak, black box and yellow gum
- L7** Road reserve south of allotments 83, 84, 85 and 88, Parish of Katyil
Woodland of yellow gum, black box, and bull-oak; some 78 species of native birds have been recorded here
- L8** Dimboola-Minyip road
Stands of grey box and bull-oak and roadside plantations
- L9** Road reserves, Parishes of Cannum, Tarranyurk, and Yellangip
Stands of bull mallee, dumosa mallee, red mallee, black box, and bull-oak
- L10** Wallup-Aubrey Tank road, Parish of Cannum
The rare Murray Swainson-pea (*Swainsona murrayana* ssp. *murrayana*)
- L11** Road reserve, Parishes of Cannum and Werrigar
Stands of yellow gum, black box, and bull-oak
- L12** Road reserve, Parishes of Kellalac and Wallup
Stands of yellow gum, black box, and bull-oak
- L13** Road reserve, Parish of Yellangip
Stands of dumosa mallee, bull mallee, and red mallee
- L14** Dooen-Marma road
Remarkable area of open grassland and black box woodland with large populations of drumsticks (*Craspedia globosa*) and yam-daisy (*Microseris scapigera*) present in the understorey
- L15** Borung Highway, Parishes of Areegra and Bangerang
Stands of bull-oak with excellent regeneration
- L16** Road reserves, Parish of Carron
Woodlands of black box, yellow gum, and bull-oak in the south-west and stands of bull mallee and dumosa mallee in the north and east
- L17** Road reserve along western edge of Lake Buloke
Stands of black box with four rare plant species occurring in the understorey—spiny lignum (*Muehlenbeckia horrida*), Australian box-thorn (*Lycium australe*), long eryngium (*Eryngium plantagineum*), and pale beauty-heads (*Calocephalus sonderi*)
- L18** Road reserves on the Lake Buloke Overflow
Some of these reserves carry sizeable populations of the rare spiny lignum, while others carry Australian box-thorn (*Lycium australe*), an uncommon plant at the south-eastern edge of its distribution. Regeneration of river red gum and black box is present in places.
- L19** Road reserve, Parish of Corack East
Woodlands of black box, yellow gum, grey box, bull-oak, and slender cypress pine
- L20** Road reserve, Parish of Jeffcott
Stands of yellow gum and black box in the southern and central sections and a woodland of slender cypress pine with excellent regeneration in the north
- L21** Wycheproof-Wooroonook road, Parishes of Charlton West and Teddywaddy
Stands of yellow gum, black box, and yellow box in the south and dumosa mallee in the north
- L22** Road reserve, Parish of Teddywaddy
Stands of yellow gum and black box

L23 Calder Highway, Parish of Teddywaddy
Yellow gum-box woodland with an understorey of native grasses

L24 Charlton-Glenloth road, Parish of Teddywaddy
Woodlands of river red gum, black box, and yellow gum, with excellent regeneration

Site of geological significance

L25 Western Highway, Parish of Lawloit
Cutting in Tertiary sandstone (Parilla Sand) where the Western Highway crosses the Lawloit Range

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.

L26 That the following guidelines be applied to unused roads:

1. The clearing of native trees and shrubs other than noxious weeds should continue to be clearly prohibited in the conditions of unused-road licences.
2. A condition permitting public use of licensed unused roads should be written into unused-road licences where necessary to provide practical access to public land.
3. 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.

Highway Parks

Along some of the roads, the reserve carries picnic areas and wayside stops, but along major tourist routes there is an additional need for areas sufficiently large to allow travellers to be isolated from the road environment and to allow dispersion of picnickers. These areas should have scenic qualities, perhaps incorporating a stream, and be sufficiently stable to withstand intensive use. They would be used by travellers for relaxation and picnicking and should be

adequately developed with picnic and rest facilities (fireplaces, tables, etc.).

Recommendation

L27- That the areas indicated on Map A and L29 described below be used:

- (a) for picnicking and to provide relaxation for the travelling public
- (b) to maintain the character and quality of the local landscape

that

- (c) facilities in keeping with the nature of the reserve be provided

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.

L27 Lawloit Range—16 ha adjacent to the Western Highway, being portion of the water reserve east of allotment 71, Parish of Kinimakatka

L28 Jane Duff—26 ha adjacent to the Natimuk-Goroke road, being the reserve south of allotment 122, Parish of Gymbowen

Note:

This reserve is currently managed as a highway park and has historical associations with the early settlement of the Wimmera.

L29 Shingle Hut—30 ha adjacent to the Calder Highway, comprising the reserve for camping and watering and adjacent Crown land west of allotment 17, Parish of Teddywaddy.

Note:

Portion of this requires revegetation with tree species native to the area.

Roadside Picnic Areas

Smaller less-developed picnic areas should supplement the system of highway parks and major reserves. Unlike highway parks, these would not be sufficiently large, nor developed to the high standards necessary, to cater for large numbers of people. They should be in attractive locations off the road reserve, and some picnic facilities should be provided.

Recommendation

- L30** That the land manager establish picnic areas in suitable locations adjacent to road reserves, particularly along the main roads and highways that traverse the area. Due to the paucity of small areas of public land suitable for such purposes here, Council believes that in a number of reserves, such as streamside reserves, small areas adjacent to the road could be developed for roadside picnic and stopping purposes.

M. 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 activity, 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 should 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.

Council believes that the land manager, in consultation with representatives of the Education Department and other user organizations, should be responsible for implementing educational aspects and for co-ordinating usage of the area.

Recommendation

M1 Catiabrim (1,350 ha)

That the area of public land shown on Map A be used to provide opportunities for students of all ages to:

- (a) study the nature and functioning of reasonably natural ecosystems in a manner such that the integrity of these ecosystems is maintained as far as is practicable
- (b) compare the ecosystems within education areas with other nearby natural and modified systems

- (c) observe and practise methods of environmental analysis, and the field techniques of the natural sciences
- (d) conduct simple long-term experiments aimed at giving an understanding of the changes occurring in an area with time

and that 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.

This comprises Recent aeolian sand (Lowan Sand) with minor exposures of Tertiary sandstone (Parilla Sand), and has a topography of irregular sub-parabolic dunes. Annual rainfall averages approximately 430 mm, and elevation ranges from 150 to 165 m. Vegetation consists of woodland I to open scrub of brown stringybark, open heath, and mallee-broombush alliance.

Note:

Educational tours of the central block of the Little Desert have been conducted successfully by commercial operators for several years, indicating that there is a considerable demand for use of the Little Desert as an educational resource.

N. Lake Reserves

Of the numerous lakes in the study area, the majority are located on the south-western Wimmera plains and form a complex system of wetlands of various depths and salinities. Most of these wetlands remain in public ownership, although many are surrounded by farmland and have been cleared—at least partially—of trees, and the majority are grazed.

Some of the public land lakes are reserved for 'public purposes', 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 recognized.

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. All 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 until the next wet season as either a bare salt pan or a fertile plain that can be used for agriculture. The natural water levels in some lakes are manipulated—either by deliberate drainage or by pumping for irrigation.

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 C).

Some of the lakes have been 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 will be able to set up local committees of management and 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.

Recommendations

N1- That the lakes described below and shown on Map A be used, according to their particular capabilities, for:

- (a) recreation, including hunting
- (b) nature conservation
- (c) scientific study
- (d) water supply
- (e) drainage
- (f) salt harvesting (where appropriate)

that

- (g) 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.

- N1** Fresh-water lake (36 ha), being the water reserve, allotment 2, Parish of Nurcoung
- N2** Salt-water lake (59 ha) north of allotment 36, Parish of Arapiles
- N3** Salt-water lake (2 ha) north of allotment 43, Parish of Arapiles
- N4** Salt-water lake and adjacent Crown land (17 ha) north of allotments 39 and 14A, Parish of Arapiles
- N5** Mitre Dam (33 ha), Parish of Arapiles
- N6** Lake Natimuk and Natimuk Creek (470 ha), Parish and Township of Natimuk

Lake Natimuk is the most popular recreational lake on the south-western Wimmera plains and is used extensively by people from Natimuk and by visitors from other parts of Victoria. Activities include fishing, yabbing, duck-hunting, swimming, boating, water-skiing, bird-watching, camping, and picnicking. The lake also has significance for nature conservation, as it often holds water after other lakes in the area have dried and therefore is an important refuge for water birds, including the rare freckled duck. Natimuk Creek is also valuable for nature conservation, as many parts still have natural vegetation of river red gum, black box, and tangled lignum growing along the creek.

Notes:

1. The area includes the Natimuk Lake Caravan Park, and the use of this reserve for that purpose should continue.
2. Ways of maintaining the water levels in Lake Natimuk have been investigated by the Department of Water Resources and the Rural Water Commission, who concluded that there were no practicable methods for achieving this. The Rural Water Commission has indicated that proposals for excavating part of the lake would result in only minimal savings of the large volumes of water required annually to produce and maintain any significant recreational benefit. Lake Natimuk is supplied by Natimuk Creek, which drains a small catchment to the south of the lake. Presently, no Commission works supply Lake Natimuk, so supply of extra water would require the construction of a channel system. However, due to existing commitments and the large volume of water needed, the lake would not be given a high priority for recreational supply. Council believes that the possibility of raising the weir at the northern end of Lake Natimuk when the lake is full, and water has flowed on to Lake Wyn Wyn, should be investigated.
3. The historic jetty, which was built by one of the district's first settlers, should be restored.

N7 Loch Iel (Pink Lake) and surrounds (106 ha), being north-west of allotment 61, Parish of Gerang Gerung

Note:

The public land surrounding the lake carries good stands of salt paper-bark and three rare plant species—a glasswort (*Halosarcia syncarpa*), bottle bluebush (*Maireana excavata*), and six-point arrowgrass (*Triglochin hexagona*). These should be protected.

N8 Lake Watchem (15 ha) north of allotment A, Parish of Watchem

N9 Western Wooroonook Lake (80 ha), Parish of Wooroonook

N10 Lake Hindmarsh and surrounds (15,600 ha)

Victoria's largest fresh-water lake, Lake Hindmarsh, forms part of the Wimmera River system, and is linked with Lake Albacutya to the north via Outlet Creek. It is very popular for recreational activities including fishing, yabbing, boating, water-skiing, swimming, nature study, camping, and picnicking. A large camping ground has been established at Four Mile Beach, and picnic facilities are provided there and at Picnic Point. A boat ramp is situated on the Wimmera River immediately upstream of the lake.

Between 25 and 35 professional fishermen operate using nets on Lake Hindmarsh, catching mainly English perch (redfin) and sometimes yabbies. In addition, a considerable amount of amateur netting occurs.

Lake Hindmarsh is also of great interest to the natural historian. Sandstone cliffs developed in Parilla Sand on the western shore of the lake are of geological interest, while the vegetation and fauna both exhibit great diversity.

The lake is ringed by woodlands of large old river red gums with shrubby understoreys growing on sandy soils. Further from the lake, these merge into black box woodlands, occasionally with open shrublands of tangled lignum. To the south-west of the lake this vegetation merges further into impressive woodlands of yellow gum and slender cypress pine. An excellent stand of salt paper-bark (*Melaleuca halmaturorum*) grows to the immediate north-east of the Wimmera River mouth. The extremely

rare plant species jerry-jerry (*Ammannia multiflora*), water-fire (*Bergia ammonioides*), *Cyperus rigidellus* (a flat-sedge), and six-point arrowgrass (*Triglochin hexagona*) have been recorded at Lake Hindmarsh, as have large populations of other significant plants, including three-nerve wattle (*Acacia trineura*), short rat-tail grass (*Sporobolus mitchellii*), and *Atriplex australasica*. The various vegetation types and rare species found here should be protected by management prescriptions.

Lake Hindmarsh is a valuable haven for both waterfowl and birds characteristic of dry woodland habitats. One of the only three Victorian breeding colonies of Australian pelicans has occurred here as does one of the few breeding colonies of pied cormorants in Victoria. The immediate vicinity of these colonies should be protected from the adverse effects of recreational activities such as boating and netting. Large numbers of ducks, including the rare freckled duck, occasionally use the lake. When the water level falls, the increased salinity attracts a variety of waders in large numbers. The river red gum woodlands at the northern end of the lake are frequented by a variety of significant birds, including the regent parrot, Mallee

ringneck, splendid fairy-wren, bush thick-knee, and Gilbert's whistler.

Lake Hindmarsh and the surrounding public land contain outstanding recreation and conservation values and Council believes that eventually the lake and its surrounds should become a regional park. With this in mind, management planning should aim at increasing the general amenity of the area and enhancing the recreational opportunities. Grazing of stock should continue to be prohibited and the important woodland habitats in the north and south-west should be zoned for nature conservation, as should the salt paper-bark stands in the south-east and the stretches of shoreline where breeding colonies of Australian pelicans and pied cormorants occur. A program should be commenced to ensure adequate regeneration in the river red gum woodlands surrounding the lake and to protect the rare plant species.

The area covered by this recommendation includes about 190 ha of land in the Mallee study area, which was recommended as public land water frontage in the Council's final recommendations for that area published in May 1977 (Recommendation J5).

O. 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 organized 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 camping areas south of Kiata in the Little Desert, and at Four Mile Beach on Lake Hindmarsh 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 opportunities. Council could not, however, make recommendations covering in detail all the forms of recreation currently pursued on public land. These include activities such as swimming, bushwalking, orienteering, canoeing, fishing, hunting, fossicking, picnicking, horse-riding, boating, trail-bike riding, and pleasure driving. Council believes that activities such as these can be accommodated, without detriment to other values, somewhere on public land. Consequently, Council points out that outdoor recreation in general is an acceptable primary or secondary use of much public land (except reference areas and some water storages and their buffers) and has left the details of recreational use to the land 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 those occurring on sandy soils), 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 that supplement the major ones. This system was constructed mainly for public land management and fire protection. The roads are frequently rough and sometimes steep 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 areas 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

Public land in the Wimmera area offers opportunities for the hunting of a range of waterfowl game species and vermin such as rabbits and foxes.

The study area includes Lake Buloke, one of the most popular duck-hunting areas in the State, while the numerous smaller lakes and wetlands in the Wimmera are also visited by many licensed hunters during the proclaimed Victorian duck-hunting season.

These recommendations provide for hunting (subject to various legal requirements) on nearly all of the public land currently popular for this activity. Hunting would not, however, be permitted in national or State parks, flora or fauna reserves, reference areas, and education areas. Some small areas such as licensed water frontages would also be unavailable for hunting.

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 organization allowing uses 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 organization 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.

It is likely that some existing camps may need to be phased out or relocated where these conflict with the primary use of the surrounding land, or if they are in particularly hazardous areas from the point of view of pollution, erosion, or wildfire.

Recommendations

Recreation

- 01** 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 authorities with management responsibilities 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.

Motorized recreation

- 02** That vehicular use of roads within the meaning of the Land Conservation (Vehicle Control) Regulations continue to be permitted on public land except where closure is necessary because of erodible soils, seasonal conditions, excessive maintenance, or conflict with the primary use of the area.
- 03** That the authorities with land management responsibilities endeavour to provide some areas for off-road vehicular use within land under their control.

Recreation reserves

- 04-016** That the areas described below and shown on Map A be used for organized sports (football, horse-racing, golf, etc.) and informal recreation (picnicking, camping, etc.) as permitted by the land manager
- that native trees be conserved where possible

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

- 04** Existing recreation reserves
- 05** 13 ha, being the railway water supply reserve within allotment 79B, Parish of Dinyarrak

This area contains a large dam that was used to supply water for the nearby township of Serviceton until the recent sinking of a ground water bore in the township itself. It is the only permanent water body in the region and should be developed for water-based recreation.

The public land surrounding the dam should be revegetated with tree species native to the area.

At present this area is temporarily reserved for railway water supply purposes and the State Transport Authority has indicated that it wishes to dispose of it. This would first require the issuing of a Crown grant to the Authority. The Council believes this reserve should be retained in public ownership so that it can be developed for recreational purposes.

06 2 ha within the water supply reserve north-east of allotment 18, Parish of Yarrock
The Yearinga Tennis Club is located here.

07 3 ha, being the water supply reserve north-east of allotment 1, section 2, Parish of Kaniva
This area should be added to the adjacent racecourse reserve.

08 43 ha, being reserved forest east of allotment 60A, Parish of Goroke and south-east of allotment 82A, Parish of Koonik Koonik
This area is occupied by the Goroke golf course.

09 2 ha north-west of allotment 59, Parish of Balrootan
The Wimmera Pistol Club operates a pistol range on this area.

010 8 ha, being allotment 59B, Parish of Natimuk
The Natimuk Field and Game Association operates a clay target range here.

Notes:

1. Grazing should not be permitted, in order to allow for regeneration of salt paper-barks.
2. Consideration should be given to adopting techniques for protection of the salt paper-barks from damage caused by use of the range.

011 Police Paddock Reserve (49 ha) west of allotment 4B, Parish of Dooen
This area is currently being developed

as a community parkland for a variety of community recreation, education, and conservation purposes.

012 Dooen Swamp Recreation Reserve—25 ha, being the quarry reserve and adjoining areas of Crown land east of allotment 20, Parish of Dooen

The northern part of this area is currently occupied by tracks used by the Horsham Motorcycle Club and the Horsham Go-Kart Club, while the southern part contains a pistol range used by the Horsham Pistol Club. The land in between is cleared open paddock. All three clubs have expressed a desire for expanded area.

This reserve should be carefully planned so that adequate provision is made for car-parking and for tree-planting to improve the amenity of the area so that it eventually becomes an attractive recreational resource well-screened from the adjacent highway.

013 89 ha, comprising various areas of reserved and unreserved Crown land in the Township of Brim, Parish of Batchica, and Parish of Willenabrina

Council is aware that this area, known locally as the Brim Community Parkland, is being developed and used for various recreational, historical, and conservation purposes by the local community in conjunction with the Department of Conservation, Forests and Lands.

014 2 ha, being allotment 18, section 2 (former State school reserve), Township of Lah

The people of Lah intend to develop this site for tennis courts.

015 0.4 ha in the water reserve south of allotment 8A, Parish of Kewell East
This site is occupied by the Kewell Tennis Club.

016 94 ha east of allotment 23, Parish of Charlton West
This area is occupied by the Charlton golf course.

P. 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. 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

P1 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, the land manager, and the Department of Conservation, Forests and Lands

(b) the Department of Conservation, Forests and Lands be consulted (for fire-protection purposes) with respect to training activities in protected public land

(c) it be excluded from reference areas, and except under special circumstances, from parks and other areas of recreation and conservation significance. Discussions should be held with the Department of Defence concerning alternatives to the proposed Little Desert national park for military training, as this is considered an inappropriate use within this park.

Q. Agriculture

The Council recommends that, at this stage, no additional large areas of public land be developed for agriculture and that only three small areas of public land and a number of public tanks be made available (see Recommendations Q3-Q5 and D159-D177).

Grazing on public land

Licensed grazing on public land is practised throughout the study area, both as forest grazing and grazing on public land water frontages. The availability of this public land is not of great significance in the economy of the grazing industry in the region. It is, however, of considerable importance to the individual licensees, for whom the forest grazing often forms an integral part of their enterprise.

Situations also arise where graziers who do not normally depend on forest grazing do require additional areas to provide short-term feed for livestock. These situations include drought, fire, and flooding. Council believes that areas of public land could be available to meet such emergency situations, and that such grazing could be controlled by the issue of agistment rights commensurate with the management goals of the particular areas of public land.

The Council believes that, for the areas available for grazing, an important management goal must be to maintain the vegetative cover and, where the cover is inadequate, to provide for its recovery. Maintenance of bull-oak woodlands is particularly important in the Wimmera, and it will be necessary to remove grazing from some of these areas for a period to provide for adequate regeneration.

Lake Buloke

The large area of public land at Lake Buloke is currently used for agriculture, as well as having highly significant values for conservation and recreation. It is described in Recommendation C43, and Council has recommended that agricultural activities continue to take place there.

Apiculture

The Council considers that apiary sites should continue to be permitted on public land other than in reference areas.

Recommendations

- Q1** Plant breeding centre, Victorian Crops Research Institute (608 ha)

That the areas of land shown on Map A be used for agricultural research purposes, and that they be permanently reserved under section 4 of the *Crown Land (Reserves) Act 1978* for this purpose.

Notes:

1. These areas were purchased by the government in March 1986 and will eventually use treated effluent from the City of Horsham's sewage-treatment works.
2. Part of this (348 ha) is located in the South-Western Area, District 2.

- Q2** Longerenong Campus of the Victorian College of Agriculture and Horticulture (V.C.A.H.) (966 ha).

That the area of land shown on Map A be used for agricultural research and education purposes, and that it remain permanently reserved under section 4 of the *Crown Land (Reserves) Act 1978* for this purpose.

Land recommended for agriculture

- Q3- Q5** That the land described below and shown on Map A (and in greater detail on Maps 1-3) be used for agriculture. It is intended that this land should form additions to present farms rather than be developed as new units.

With reference to section 5 (3) of the *Land Conservation Act 1970*, the Council recommends that land described below be made available for agriculture in accordance with the provisions of the *Land Act 1958*.

- Q3** 6 ha, being sections 1 and 2, Township of Tarranginnie
- Q4** 9 ha, being portion of allotment 72, Parish of Jung Jung

Note:

This includes tank D167 (see Chapter D).

Q5 2 ha, being portion of allotment 161B,
Parish of Nullan

Note:

This includes tank D169 (see Chapter D).

**Public tanks recommended for
agriculture**

In addition to the three areas described above, the Council has also recommended in Chapter D that a number of public tanks filled from the Rural Water Commission's channel system be made available for agriculture. These tanks are located on very small areas of public land, many of which are fenced in with freehold farms, are often cropped, and do not carry native vegetation. They are no longer required for community purposes.

The public tanks recommended to be made available for agriculture are described in Recommendations D159–D177.

Perpetual lease

It is proposed that the land described below and shown on Map A continue to be used for agricultural purposes. This block contains areas of native vegetation, some of which abut the Little Desert National Park. Discussions should be held between the Department of Conservation, Forests and Lands and the leaseholder aimed at developing mutually acceptable ways of retaining the remaining areas of native vegetation.

Q6 647 ha, being allotment 89, Parish of
Minimay

R. Minerals and Stone

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* and as subsequently gazetted (metallic minerals, coal, etc.). Nevertheless, knowledge of the location of our mineral resources is far from complete and new deposits of commercial significance will undoubtedly be found. Furthermore, currently uneconomic deposits of important minerals may become economically exploitable, and other minerals that are not used at present may become important.

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 deposits of gold or minerals. 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 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 or 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

Since 1977, sharp rises in the price of gold have resulted in a significant upturn in exploration activity. The interest of individual

prospectors has also increased, as seen by the increased number of claims being registered. A number of attempts are being made to re-open previously uneconomic mines on existing leases.

The substantial rise in the gold price has also stimulated a renewed interest in general prospecting (fossicking), evidenced by the increased number of Miner's Rights issued.

This increased interest in prospecting and mining has not been confined to the large-scale operations being planned and undertaken by the corporate sector. Many individual miners and prospectors are operating in Victoria—some professionally (that is, they rely on these activities for their sole source of income), some on a part-time, semi-professional basis, but many as a form of recreation encouraged by the possibility of 'striking it rich'. In terms of the number of people involved, this latter group has experienced the most substantial growth, especially since the increased use of the metal detector.

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 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 either an exploration or search 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 B—Reference Areas).

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 management authority 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 area. 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.

The requirements of the shires with regard to their needs for 'stone' production have been determined by a process of consultation and investigation, involving the shires, the Department of Industry, Technology and Resources, and this Council.

Public land is a significant source of road-making material for some shires. Although resources remain on areas of public land, they are not unlimited and Council believes that shires should be investigating now the extent to which private land could be used as a source of 'stone'.

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*.)

A substantial number of unwise excavations have been made upon public land, and in many instances, particularly with older excavation sites, the rehabilitation of excavated land is lagging.

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 forms of these activities described above under fossicking and prospecting.

The Council believes that the following principles should apply.

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 are taking place between officers of the Department of Industry, Technology and Resources and the Department of Conservation, Forests and Lands to determine conditions on the use of public land for exploration and/or extraction of ‘minerals’.

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 the 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.

4. A system should be established that would ensure, before work commences, the availability of funds for progressive and 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, should be more closely related to the market

value of the material. This would eliminate the temptation to use public land purely on the grounds of the nominal royalties often levied in the past.

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 mining of ‘minerals’ or ‘petroleum’ 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 require the lodgement of a bond as surety for adequate 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 of Industry, Technology and Resources 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 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.

- R1** That fossicking and prospecting under Miner's Right, involving minimal disturbance of soil or vegetation, be permitted on public land other than:
- (i) those areas specifically excluded in the recommendations (see the chapter on Reference Areas)
 - (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 R2 below.
- R2** 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 excepted or exempted unless the land manager and the Department of Industry, Technology and Resources together determine that such exemption or exception should no longer apply.
- R3** That public land in the study area (other than reference areas) continue to be available for exploration under licence and for extraction of 'minerals' and 'petroleum', subject to Recommendation R2 and the principles and guidelines set out above.

Note:

This recommendation does not refer to exploration under a Miner's Right, as covered by Recommendation R1, but does include claims made under a Miner's Right.

- R4** That public land in the study area (other than reference areas) continue to be available for exploration for 'stone' subject to the principles and guidelines set out above.

R5- R19 That the areas listed below and shown on Map A be used for the extraction of 'stone' in accordance with the principles and guidelines outlined above and, if not already reserved for this purpose, be temporarily reserved under section 4 of the *Crown Land (Reserves) Act 1978*, with management plans prepared by the Department of Conservation, Forests and Lands. (These areas are additional to sites on larger blocks of public land where gravel extraction is one of the recommended uses.)

Portions of some of these areas are currently used for extraction of stone under an Extractive Industry Lease and those portions would not be reserved under section 4 of the *Crown Land (Reserves) Act 1978*.

- R5 18 ha, being the stone reserve within allotment 3, Parish of Mahrong
- R6 16 ha, being the stone reserve north-west of allotment 69, Parish of Dahwedarre
- R7 15 ha, being the stone reserve south-west of allotment 83, Parish of Dahwedarre
- R8 4 ha, being the quarry reserve south of allotment 54A, Parish of Minimay
- R9 4 ha, being the quarry reserve within State forest north of allotment 22, Parish of Goroke
- R10 20 ha, being the quarry reserve north of allotment 96, Parish of Lawloit

R11 8 ha, being the stone reserve west of allotment 20, Parish of Catiabrim

Note:

When rehabilitated, this area should be added to Recommendation M1.

R12 25 ha, being the stone reserve south of allotment 125, Parish of Warraquil

R13 4 ha, being the stone reserve north-west of allotment 1A, Parish of Vectis East

R14 13 ha, being the gravel reserve east of allotment 105, Parish of Cannum

R15 16 ha, being the reserve for road purposes south of allotment 17F, section E, Parish of Charlton East

R16 23 ha, being the unreserved Crown land west of allotment 11A, section E, Parish of Charlton East

R17 4 ha, being the quarry reserve west of allotment 8, section E, Parish of Woosang

R18 8 ha, being the quarry reserve adjoining allotment 14B, section A, Parish of Woosang

R19 17 ha, being allotment 11, section 7, Parish of Glenloth

Note:

In relation to public safety, nothing in the recommendations affects the powers of Inspectors under the *Mines Act 1958* and *Extractive Industries Act 1966*. It is understood that these powers would be exercised in consultation with the management authority.

S. Utilities and Survey

Many utilities occupy land. they include roads, pipelines, power lines, power stations, 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.

Recommendations

General utilities

- S1 That existing easements continue to be used to provide access and services.
- S2 That new power lines, pipelines, communications equipment, and other utilities be planned to minimize disturbance to public land and protect the values associated with this land, that they not be sited on public land without the agreement of the management authority, and that new pipelines and power lines follow existing easements if possible (this may require widening of some easements). Wherever possible, utilities such as power lines and pipelines should not be located along streams or lakes.

Garbage and sanitary depots

Council considers that sites on public land for the disposal of garbage and sanitary materials should be located so as to cause minimal conflict with conservation values.

Facilities on public land should be shared by municipalities wherever practicable to minimize the number of sites required. At the same time, it is appreciated that locating sites reasonably close to users minimizes transport costs and the illegal dumping of rubbish. Areas used on a temporary basis (such as garbage depots and sanitary depots) should be fully rehabilitated at the operator's expense.

Within areas used as garbage depots, disposal of waste should be confined to small sections of the site at any one time, and there should be adequate supervision to ensure that garbage is dumped only in the designated areas.

- S3 That existing legal garbage depots (including those approved by the relevant authorities but not yet operating) continue to be available for garbage disposal.

Note:

The existing garbage depots next to the Kiata flora reserve (Recommendation F5), Gerang Gerung flora reserve (Recommendation F6), Barrett flora and fauna reserve (Recommendation F18), and Natimuk Creek (Recommendation N6) should not be expanded, and the authorities using these areas should seek alternative sites for garbage depots in the near future. The areas now being used should then be rehabilitated and added to the adjoining reserves.

- S4 That areas used on a temporary basis (such as garbage depots and sanitary depots) be fully rehabilitated. This should apply to sites used illegally as well as those used legally. Where the user or users are known, rehabilitation should be at their expense.
- S5 That, within areas reserved as garbage depots, disposal of waste be confined to small sections of the site at any one time, and that steps be taken to prevent the dumping of garbage other than in the designated areas.

- S6 That existing licensed waste-disposal depots in State forest continue to operate.
- S7 That 2 ha, being the quarry reserve north-west of allotment 39, Parish of Quantong, be used by the Shire of Wimmera as a garbage disposal site.

Trigonometrical stations

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

- S8 That the minimum area necessary for survey purposes be temporarily reserved around trigonometrical stations on public land where it would otherwise remain as unreserved Crown land; and, where other forms of public land tenure apply, that the appropriate department have the right to occupy a minimum area around the station and provide lines of sight, and the right to obtain access to the area.

Navigation aids and communications installations

- S9 That the minimum area necessary 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 around the aid and provide lines of sight, and the right to obtain access to the area.

Railway lines

Vegetation along railway lines can have particularly high conservation and landscape values, especially in agricultural districts where most of the vegetation has been cleared. They often contain remnants of the original vegetation and can serve as habitat corridors for native fauna. Unfortunately, in some sections of railway line in the Wimmera indiscriminate use of herbicides appears to have caused considerable damage to remnant native vegetation. Geological features exposed in railway cuttings are a useful adjunct to more detailed work involved in mapping the geology of an area and are often used as an educational resource.

- S10 Landscape and conservation values of railway easements can best be protected by observing the following guidelines.

- 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.
- While recognizing the need for clearing or pruning vegetation close to railway lines for reasons of safety and fire prevention, V/Line should consult the Department of Conservation, Forests and Lands regarding the manner in which the risk posed can be reduced, while at the same time reducing the environmental impact to a minimum.
- Burning off, slashing, or clearing of raiiside vegetation should be kept to a minimum consistent with providing adequate safety and fire protection. Particular care should be taken with the use of herbicides.
- Weeds and vermin on land associated with railways should be controlled by means that do not affect non-target species.

- S11 The following important site along a railway line should protected:

North-Western Railway between Diapur and Miram

This section of the railway line between Diapur and Miram carries large populations of the rare jumping-jack wattle (*Acacia enterocarpa*), especially at Diapur cutting. The cutting, through Tertiary sandstone (Parilla Sand), is also of geological significance.

Other utility areas

- S12 That existing legal use and tenure continue for areas that are at present reserved and used for utility purposes such as airports, public buildings, municipals depots, cemeteries, schools, etc.

Note:

The Winiam cemetery carries remnant native grassland containing the rare pale leek-orchid (*Prasophyllum occidentale*) and a form of tawny leek-orchid (*Prasophyllum* sp. aff. *fuscum*). This should be taken into account in the management of the cemetery.

T. Township Land

Public land in townships is currently used for a wide range of purposes. The Council has not proposed any change of use for such public land where the present use is for schools, public halls, sports grounds, and the like. In some cases, however, Council has made a specific recommendation for township land to be set aside as a bushland reserve, as a streamside reserve, or to be used for water production; these recommendations are included in the appropriate sections. Other areas of public land in townships should remain as unreserved Crown land—to be used, if required, for township purposes in the future.

Recommendation

T1 That public land in townships, other

than those areas that have been specifically reserved, should remain as unreserved Crown land to meet future requirements.

Note:

At the mapping scale used (1:250,000), it is generally not 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.

U. Other Reserves and Public Land

Some small areas of public land in the study area that are used for various purposes, such as water supply, 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 may 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 purpose be used in a way that will not preclude their commitment in the future to some specific public use.

Recommendation

U1 That, for small 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.

Note:

Some 3,200 ha of public land along the southern fringe of the Big Desert will be considered when the Council makes its recommendations on the use of contiguous public land as part of its review of the Mallee area.

Revegetation of areas

The deterioration of tree cover in some of the rural areas of the State is causing increasing and widespread concern. Clearing—to establish pasture and crop lands—has been the initial cause of this deterioration and continues in some areas. The gradual decline, and ultimate death, of the remaining trees, however, is emerging as the major problem.

Soil compaction by stock, excessive use for timber, attacks by insects, parasites, and other pathogens, exposure to winds, salting of the soil, erosion, and natural senescence among ageing trees are all possible causes of the decline. The prevention of natural regeneration

by grazing or other practices is exacerbating the problem.

Increasing soil salinity resulting in the degradation of grazing and crop country, loss of shelter for stock and for wildlife, and diminished aesthetic value are all consequences of this decline, which, although difficult to express in monetary terms, results in economic loss.

Throughout the study area, a large number of small parcels of public land carry little or no natural vegetation. In many cases they have been reserved for specific purposes, although not used for them, and have been continuously licensed to the adjoining landholders; over a period of time they have been cleared and integrated with the surrounding farmlands. In other cases the reserves can still be recognized by the native vegetation, but for a number of reasons, the tree cover has declined.

An amendment to the *Forests Act 1958* has introduced a tree-growing assistance scheme to encourage tree-planting and tree-fostering projects—where these are in the community interest.

To complement these activities, in areas where tree decline and salting are becoming a problem and in areas where native trees are greatly reduce in number, Council recommends that some of the small areas of public land be used as pilot schemes or nuclei for the re-establishment of tree species native to the area, or tree species suitable for firewood production.

The increasing return to the use of wood as a heating fuel and the clearing of vast areas of timbered land in the past have resulted in a shortage of firewood in many parts of the Wimmera. This situation is likely to become worse in the near future. Council believes that each of these small areas of public land should be investigated to determine whether it would be more appropriate to replant them with tree species native to the area, or with tree species that would be suitable for firewood production.

Following successful revegetation, some of these areas could serve as examples to the rural community of the effectiveness of such revegetation schemes.

Council notes that significant native plant species may be present on areas recommended for revegetation but not evident at the time of inspection. As revegetation may involve substantial soil disturbance, it will be necessary for these areas to be monitored and the protection of any significant native plant species that are found incorporated in the revegetation plan for the area.

Recommendations

U2– U41 That the areas indicated on Map A and described in the schedule below be used to foster the re-establishment of tree species native to the area or tree species suitable for firewood production

and that, when revegetation is completed, they become State forest and be managed by the Department of Conservation, Forests and Lands.

U2 83 ha, being the western part of allotment 41, Parish of Dinyarrak

Note:

This area and the remainder of allotment 41 are traversed by a drainage channel that is fed by a large catchment of agricultural land to the east. Management of allotment 41 should ensure that no obstruction of this channel occurs.

U3 14 ha, being the stone reserve east of allotment 11, Parish of Yarrangook

U4 14 ha, being allotment 12, Parish of Lillimur

U5 2 ha north of allotment 69, Parish of Minimay

U6 15 ha, being the stone reserve east of allotment 79, Parish of Dahwedarre

U7 4 ha, being the stone reserve south-east of allotment 88A, Parish of Yanac-a-yanac

U8 10 ha, being the quarry reserve within allotment 86, Parish of Yanac-a-yanac

U9 11 ha, comprising areas of reserved and unreserved Crown land in the Township of Salisbury

U10 8 ha, being the 110th section reserve south-west of allotment 46A, Parish of Kiata

U11 4 ha north-west of allotment 42A, Parish of Arapiles

U12 3 ha, being allotment 25B, Parish of Hindmarsh

U13 4 ha east of allotment 39A, Parish of Jeparit

U14 2 ha north-west of allotment 136C, Parish of Vectis East

U15 2 ha north of allotment 132, Parish of Kalkee

U16 26 ha, comprising the 110th section reserve and water supply reserve north of allotments 65 and 66, Parish of Kalkee

U17 8 ha, comprising the reserves south of allotment 97 and north of allotment 1A, Parish of Kewell West

U18 20 ha, being the water reserve east of allotment 96A, Parish of Willenabrina

U19 2 ha south of allotment 240, Parish of Jung Jung

U20 1 ha north of allotment 24, Parish of Jung Jung

U21 3 ha, being the State school site, south of allotment 67B, Parish of Ashens

U22 9 ha, comprising the water reserve and loam reserve west of allotment 155, Parish of Ashens

U23 8 ha, being the water reserve north-east of allotment 51, Parish of Lallat

U24 3 ha south of allotment 140, Parish of Burrum Burrum

U25 18 ha, comprising the reserve north of allotment 21 and unreserved Crown land north of allotment 21A, Parish of Areegra

U26 6 ha, being the camping and water reserve south-east of allotment 70, Parish of Warmur

U27 20 ha, being the water reserve north of allotment 105, Parish of Corack

U28 4 ha, being allotment 105B, Parish of Corack

U29 19 ha, comprising the water reserve and 110th section reserve south of allotment 21A, Parish of Narraport

- U30** 15 ha, being the water reserve west of allotment 7, section 1, Parish of Banyenong
- U31** 9 ha, being the water reserve, allotment 12A, section C, Parish of Corack East
- U32** 20 ha, being the water reserve, allotment 15A, section B, Parish of Corack East
- U33** 13 ha, being the water reserve, allotment 73, Parish of Teddywaddy

Note:

The possibility of exchanging public tank D177 and the cleared land around it for native bushland to the west of this reserve should be investigated.

- U34** 8 ha, being allotment 21B, Parish of Coonooer East

- U35** 18 ha, being allotment 30C, Parish of Coonooer East

- U36** 4 ha north of allotment 25A, Parish of Yeungroon

- U37** 5 ha, being the quarry reserve east of allotment 25A, Parish of Yeungroon

- U38** 19 ha, comprising the water reserve and adjacent Crown land east of allotment 12A, section E, Parish of Charlton East

- U39** 11 ha, being the water supply reserve east of allotment 11A, section C, Parish of Charlton East

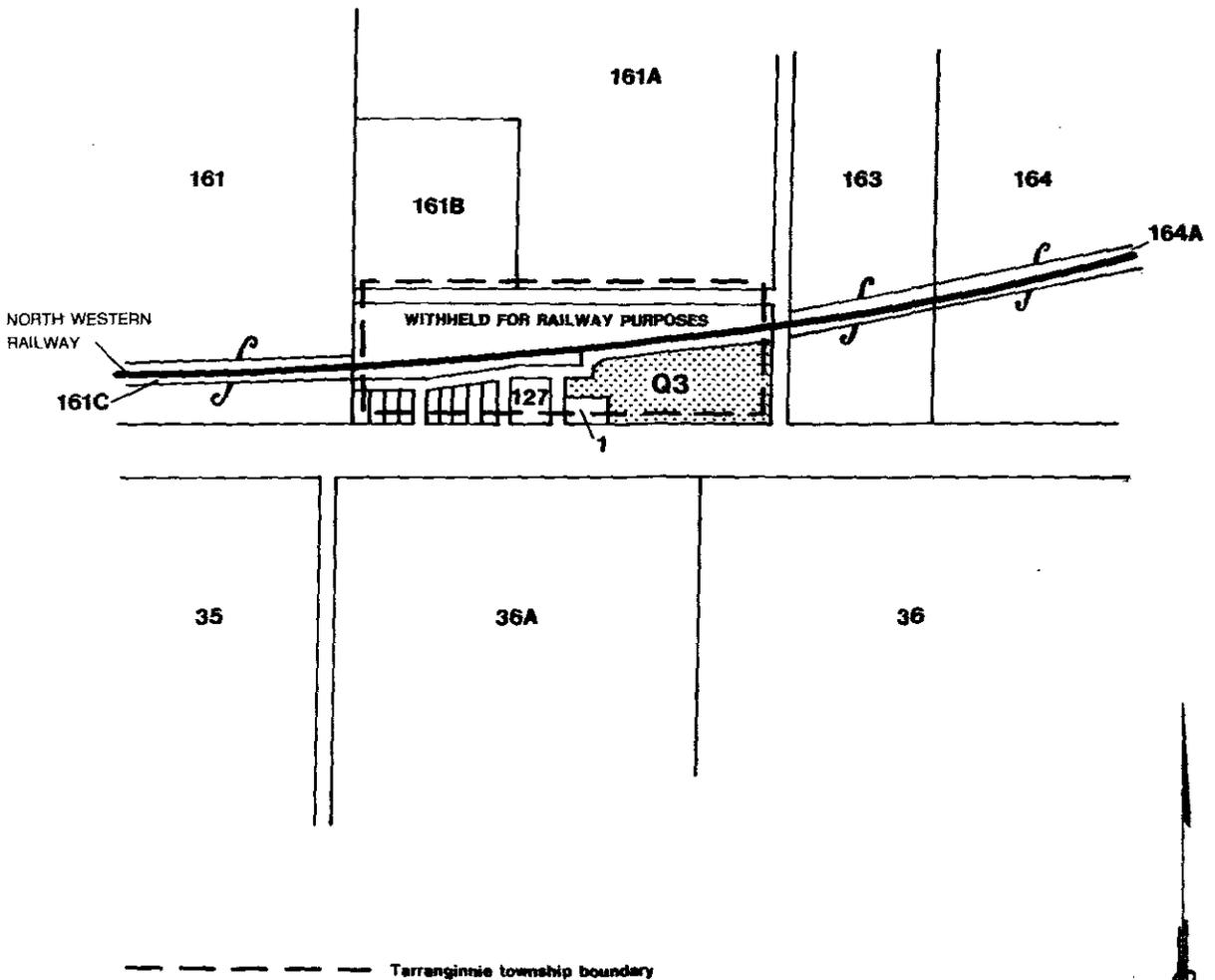
- U40** 2 ha, being the water supply reserve south-east of allotment 26, Parish of Buckrabanyule

- U41** 2 ha south of allotment 108E, Parish of Buckrabanyule

AGRICULTURE Q3 TARRANGINNIE

MAP 1

PARISH OF TARRANGINNIE



PUBLIC LAND RECOMMENDED FOR ALIENATION

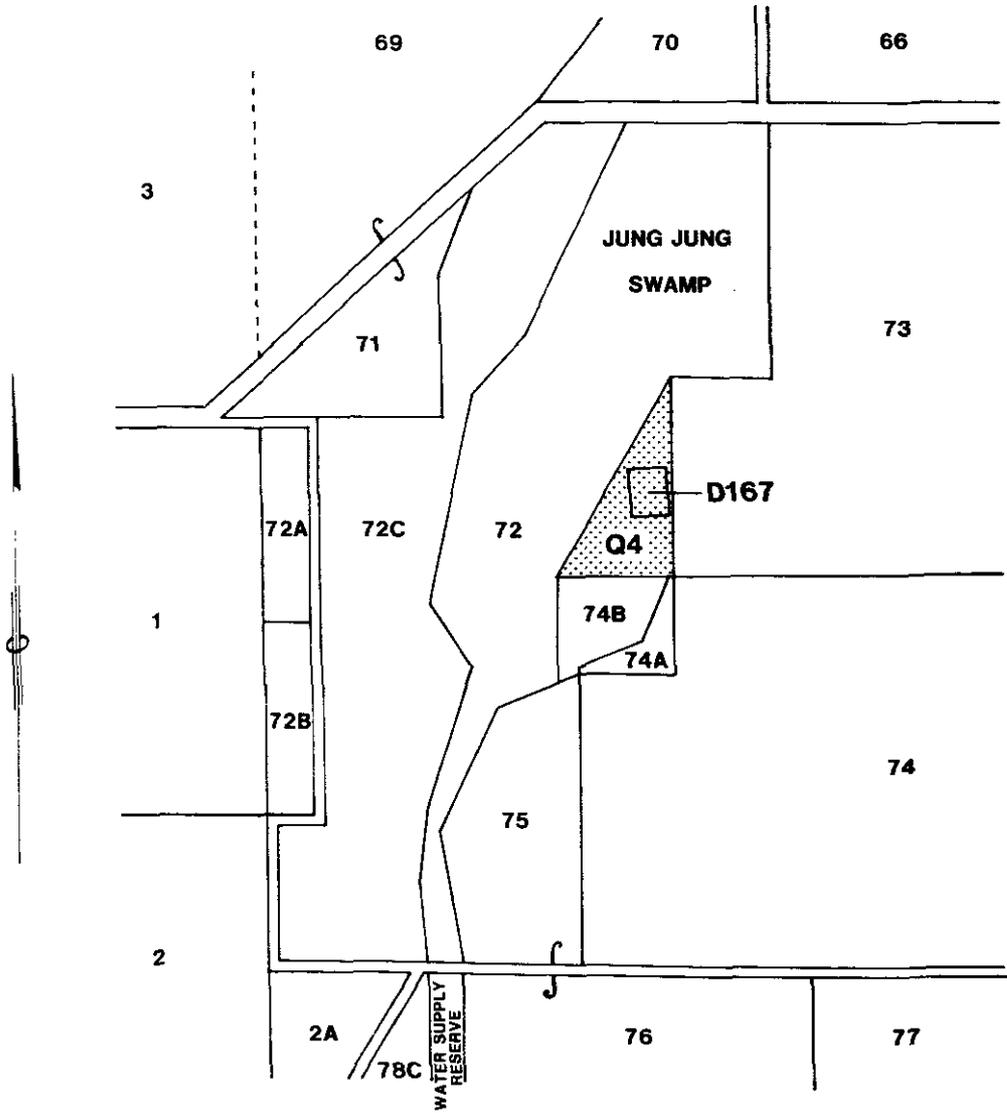


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**AGRICULTURE Q4
JUNG JUNG**

MAP 2

PARISH OF JUNG JUNG



PUBLIC LAND RECOMMENDED FOR ALIENATION

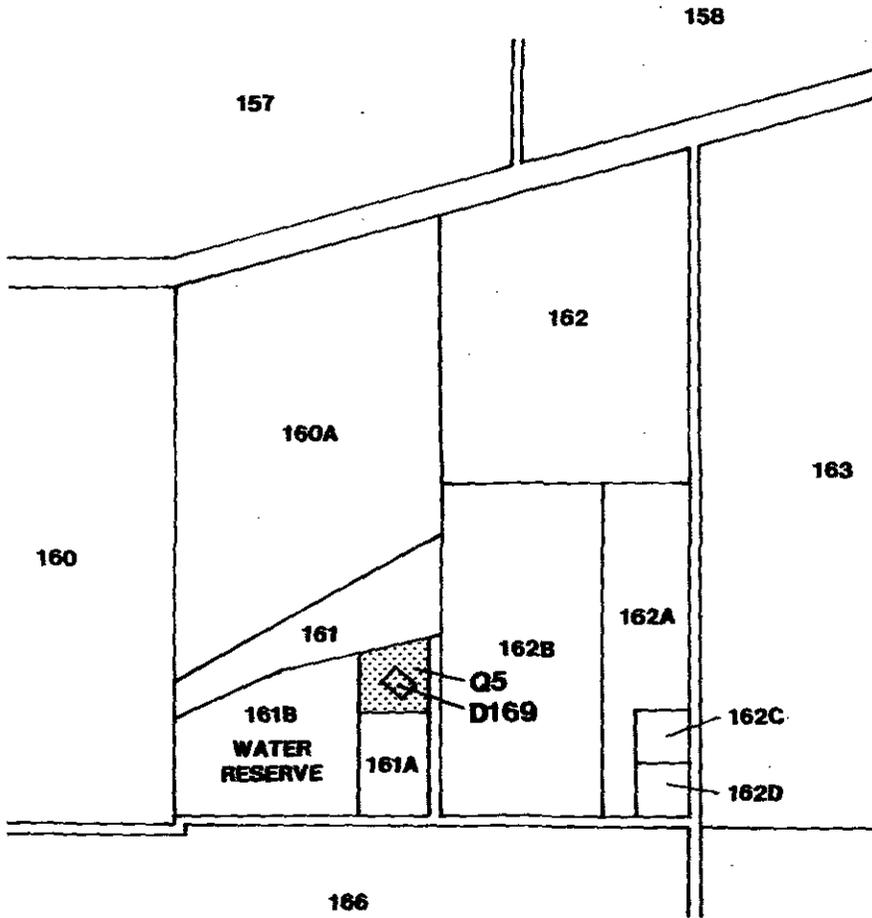


SCALE 1:15,840

**AGRICULTURE Q5
NULLAN**

MAP 3

PARISH OF NULLAN



PUBLIC LAND RECOMMENDED FOR ALIENATION



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