

A REPORT ON THE
PAINKALAC CREEK (AIREYS INLET)
CATCHMENT

A PROPOSAL FOR PROCLAMATION PREPARED
FOR CONSIDERATION BY THE LAND CONSERVATION
COUNCIL

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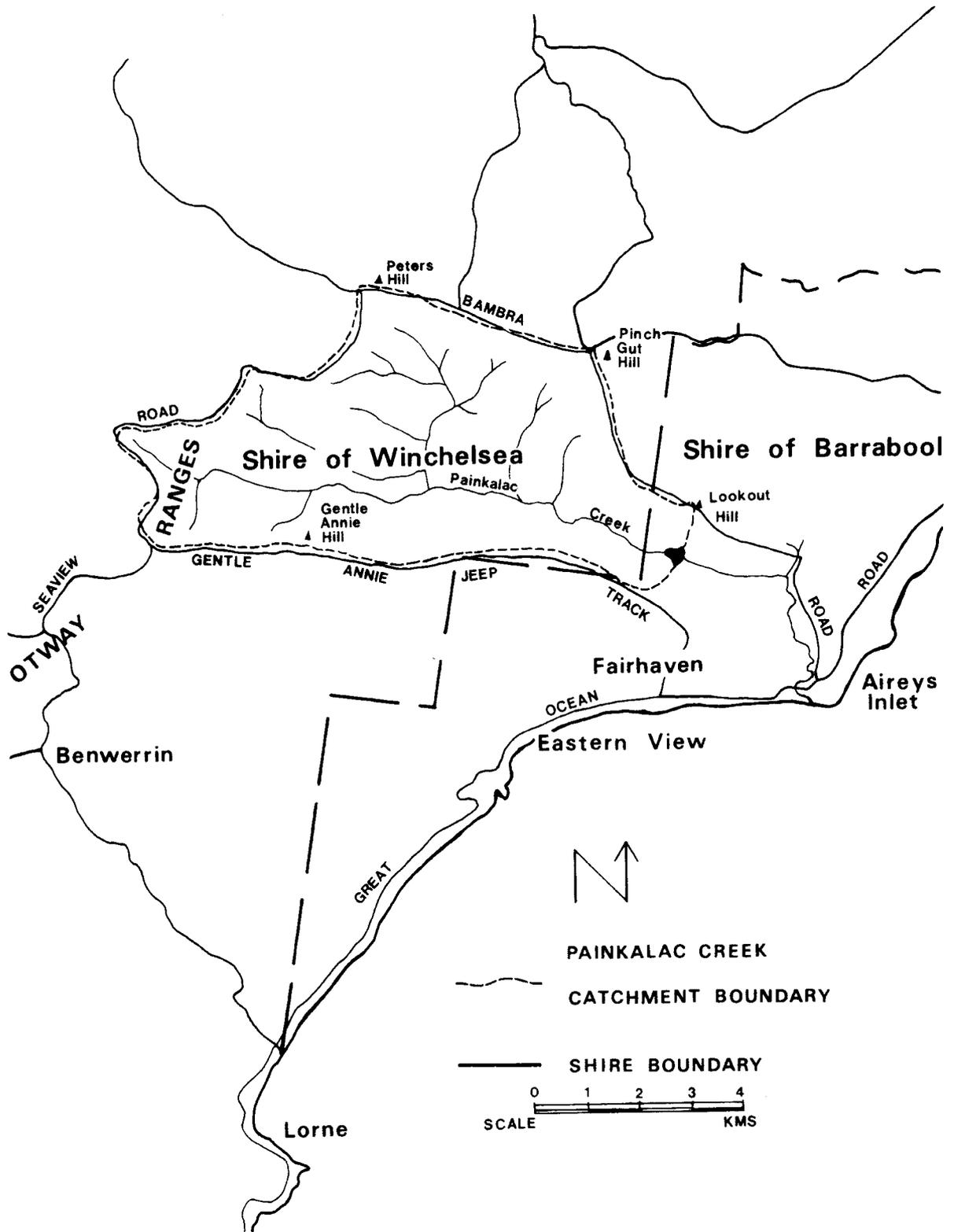
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Figure 1 - Painkalac Creek Catchment - Locality Plan



INTRODUCTION

The Aireys Inlet Waterworks Trust is presently constructing a dam on the Painkalac Creek, to supply water to Aireys Inlet and Fairhaven. A request from the Trust's consulting engineers for proclamation of the catchment to the dam was received by the Authority on the 1st July 1966 and forwarded to the Land Conservation Council.

After field investigation this report has been prepared on behalf of the LCC, to advise Council members of the state of the catchment, and to recommend proclamation under the Land Conservation Act and the Soil Conservation and Land Utilization Act.

The site of the dam is inside the LCC Melbourne Study Area, although most of the catchment is in the Corangamite Study Area. The recently published Final Recommendations for the Corangamite Area do not specifically mention the Painkalac Creek catchment, however, it states "where a number of other products are required from a catchment supplying water used for domestic purposes, the catchment should be proclaimed".

The majority of this catchment is reserved forest, parts of which are used for forestry and military training. There is also an established use for recreation, by individuals, motorised recreation to vehicle users, and the scouting association. Approximately 50% of the small areas of freehold land is cleared.

The Soil Conservation Authority also believes that, where possible, proclamation of new catchments should be carried out early in the development of the water supply system, so that the Authority can advise on any potential land use problems before they arise.

LAND CONSERVATION COUNCIL RECOMMENDATIONS

Final recommendations for the Corangamite and Melbourne study areas affecting the catchment are shown in Figure 2. Boohan Forest (E1) covers the headwaters. This area is recommended to be used "(a) primarily to produce hardwood timber" and that "(c) water production values be recognised and protected."

Angahook-Lorne State Park (A4 Corangamite, A2 Melbourne) is recommended to be used to "(a) provide opportunities for recreation and education" and (c) supply water and protect catchments".

PLANNING CONTROLS

Most of the catchment is in the Shire of Winchelsea, and the freehold blocks along Seaview and Cemetery roads are covered by the Shire's Interim Development Order, which requires council approval for subdivision of land, but which state no minimum subdivision size.

The dam site is in the Shire of Barrabool. The Waterworks Trust has bought the freehold land within the catchment in this Shire.

THE SUPPLY SYSTEM

After considerable investigation and a small majority vote by local residents the Trust decided to construct a dam on the Painkalac Creek and a reticulated supply systems to Aireys Inlet and Fairhaven. The on-stream storage of 409 megalitre capacity is situated approximately 5 km north-west of Aireys Inlet township. The storage and reticulation will supply 400 houses, with a supply capability of 1000 houses.

At this stage the area to be inundated has been cleared, the foundations are complete and the spillway has been constructed. The proposed bank, of volume 46,000 cubic metres, will be clay fill with rock beaching.

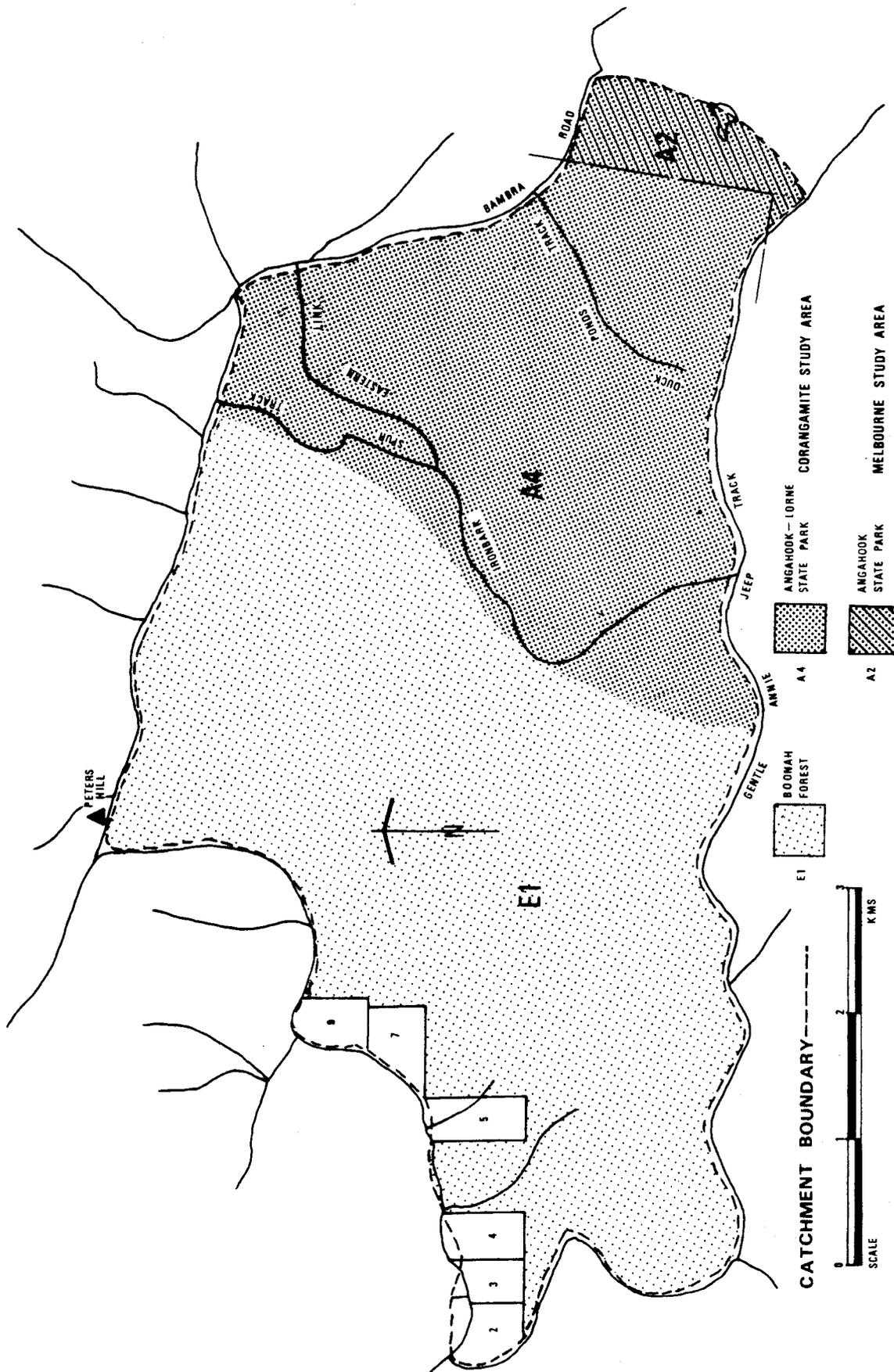
With favourable weather and continued availability of finance the dam should be completed by April 1979. The reticulation system comprising the main pipeline, holding reservoir, a pumping station, and distributary pipes should be operational by mid-1980.

WATER QUALITY

Water quality samples are presently being taken both above and below the dam at monthly intervals. Results from June 1977 to August 1978 have shown *Escherichia coli* counts ranging from 0 to 90 organisms per 100 ml. The source of these is probably animal pollution. If periodic high counts continue occur, further monitoring will be required to locate the source, and the Trust may need to chlorinate the supply. Otherwise, no water treatment is envisaged.

Turbidity has also been measured, and these figures were low and satisfactory, until construction work started on the dam.

Figure 2 - LCC Final Recommendations or Painkalac Creek Catchment



THE CATCHMENT

The catchment has an area of approximately 3,420 hectares and is situated north-west of Aireys Inlet. It runs in an easterly direction and is approximately 11 km long and 3 km wide. Refer to the locality map and catchment plan in the back of this report.

Bordering the catchment are the dry-weather-only Bambra Road from Peters Hill, over Pinch Gut Hill to Lookout Hill, and Gentle Annie Jeep Track, over Gentle Annie Hill, along the northern and southern boundaries respectively.

GEOLOGY AND TOPOGRAPHY

The Painkalac Creek catchment is at the north-eastern end of the Otway Ranges, which are derived from Lower Cretaceous felspathic sandstone and mudstone parent material. At least two stages of weathering have occurred, resulting in the present landforms in the western half of the catchment.

There is a small area of rolling hills, possibly the remnant of an old plateau surface, where Gentle Annie Track leaves Seaview Road. Uplift of this surface and renewed dissection probably resulted in the other landform on the lower cretaceous sediments, the deeply-dissected hills forming the headwaters of the catchment.

Tertiary era sedimentation occurred in several places in the Otways area. Two phases are represented in the eastern half of the Painkalac Creek catchment. Both have unconsolidated sediments as parent material, which after weathering has resulted in deeply dissected hills.

One group comprises gravels, sands, and silts and the other more common in this catchment, consists of finer sediments: sands, silts and clays.

Elevation of the catchment area drops from 430 m at the corner of Seaview Road and Gentle Annie Track, to 23 m at the dam site.

SOILS AND VEGETATION

On the Lower Cretaceous rock two main soils have developed. On gentler slopes along the catchment boundary, and steep southern and eastern slopes, there is usually a brown gradational soil. This has a loam or clay surface texture grading to a clay in the subsoil. The soil is well-structured, comparatively fertile, from 1 - 2 m deep, and carries a tall open forest¹ of mountain grey gum (*Eucalyptus cypellocarpa*), messmate (*E. obliqua*), southern blue gum (*E. globulus*), with some swamp gum (*E. ovata*).

On the drier, more exposed north-and west-facing steep slopes, a brown duplex soil is the most common type. Profiles have approximately 40 cm loam over silty clay. The soil is up to a metre deep, and carries an open forest² of messmate, narrow leaf peppermint (*E. radiata*), mountain grey gum, southern blue gum, and small areas of almost pure red iron bark (*E. sideroxylon*).

The Tertiary deposits have formed a wide variety of soils, depending on the coarseness of the sediments and the prevailing weathering and leaching conditions.

Red-yellow duplex soils are commonly found on the finer Tertiary deposits. This soil has a fine sandy loam topsoil over clay, and averages two metres in depth. Another soil, found on the fine and parts of the coarser sediments, is the yellow gradational soil, weak structure. This has a sandy loam surface horizon, the profile also being about two metres deep. Elsewhere on coarse sediments a range of deep uniform-textured sand soils are found. These may or may not have an impermeable hardpan, but all are very infertile.

Tree species on the soils on Tertiary sediments vary with landform and fertility. The red-yellow duplex soil supports either an open forest of messmate and mountain grey gum on south and east slopes, or a woodland³ of narrow leaf peppermint, messmate, brown stringybark (*E. baxteri*), and some red ironbark, on drier slopes. On lower slopes where the yellow gradational soils, weak structure occur, there is usually an open forest of mountain grey gum, messmate, brown stringybark, or red ironbark, (on the finer Tertiary sediments), and a poorer open forest of low messmate and shining peppermint (*E. nitida*) (on soils on the coarser sediments).

The uniform sand soils only support either a scrub of prickly and woolly tea tree (*Leptospermum juniperinum* and *L. lanigerum* resp.) and *Acacia verticillata* or on the hardpan areas, a heath of austral grass tree (*Xanthorrhoea australis*), *Casuarina pusilla*, and silky tea tree (*L. myrsinoides*). Sparse stands of shining peppermint are common on the margins of sand soil areas.

¹ 30 - 70% foliage cover, tree height 30 m

² 30 - 70% foliage cover, tree height 10 - 30 m

³ 10 - 30% foliage cover, tree height 10 - 30 m

CLIMATE

The catchment is at the north-eastern edge of a high rainfall region influenced by the Otways. Forty-year rainfall records are available for two meteorological stations close to the catchment: Benwerrin, on the main ridge, has an average annual rainfall of 1122 mm, with twin peaks in June and August. The mean rainfall for the months May-September averages 2.4 times the mean fall for the summer months, showing the marked seasonal nature of the rainfall; Eastern View has an average annual total of 729 mm, but is less strongly seasonal, with the mean fall for the wettest months of July to September being 2.0 times the mean summer fall.

Heavy summer storms are common however, the highest recorded one-day rainfall at Eastern View being 170 mm in February 1954. Similarly, most other Otways stations have had their highest falls in summer.

There are several snowfalls each year on the higher parts of the Otways, probably including the western edge of the catchment.

Monthly figures for mean daily temperatures are estimated to be from 7°C in July to 18°C in January, with cooler conditions towards the west of the catchment and milder temperatures near the coast. Because of the temperatures below 10°C plant growth would be restricted for 2 - 3 months each year, and in the east of the catchment "effective" rainfall may not be received in January and February.

There are few frost records for this area, but the upper parts of the catchment probably receive 20 - 30 light frosts each year. The lower reaches of the catchment would have fewer frosts, being closer to the sea.

LAND TENURE AND USE

Part of the catchment immediately above the dam is within the Forests Commission Angahook Forest Park. The land on which the dam is being built is freehold land purchased by the Trust. The remainder of the catchment is Reserved Forest with the exception of approximately 140 ha on the western boundary of the catchment. This land is divided between five owners, the majority of whom are hobby farmers, and only lightly graze their properties.

The headwaters of the catchment have been selectively logged in the past by the Commission, however there have been no recent operations. Further operations are to be planned in this area to harvest the commercial eucalypt species such as mountain grey gum, messmate, blue gum and brown stringybark. Uncommercial stands comprising narrow leaf and shining peppermint, and stunted messmate and brown stringybark, cover much of the Tertiary sediments.

As mentioned in the introduction there are established recreation uses throughout the catchment. Scout groups have been regularly using an area along Duck Ponds Track for camps, the Forest Park attracts walkers, picnickers, and pleasure drivers, and the tracks have been used for motorised recreation vehicles.

HAZARDS TO THE WATER SUPPLY

Even under natural conditions the steep Lower-Cretaceous-based soils are prone to landslips. When the tree cover is removed and replaced by shallow-rooted pasture species which transpire less water, the change of landslips occurring is increased, particularly in high rainfall areas.

With most land uses, there is also some compaction of the soil surface, which causes an increase in both surface runoff and sheet erosion. Steep slopes on the Tertiary parent material are also moderately prone to landslips, and all the Tertiary areas have a moderate to severe sheet and rill erosion hazard.

Turbidity and suspended sediment arising from any works in the catchment will reduce to some extent by detention. However, as the dam acts as the town storage, and through-flow in the Creek must be maintained by releasing water from the dam, water quality problems could result after summer storms. Average streamflow (9 years records) for summer is only 86% of this storage capacity of the dam, which holds one-eleventh of the average annual flow.

At present use of the freehold land along the catchment boundary does not appear to be creating any significant hazards to the water supply, as clearing has generally been restricted to the gentler ridge tops.

Future Forests Commission logging and regeneration operations are anticipated, for which prescriptions should be prepared, as works in the high rainfall areas are particularly likely to cause soil erosion.

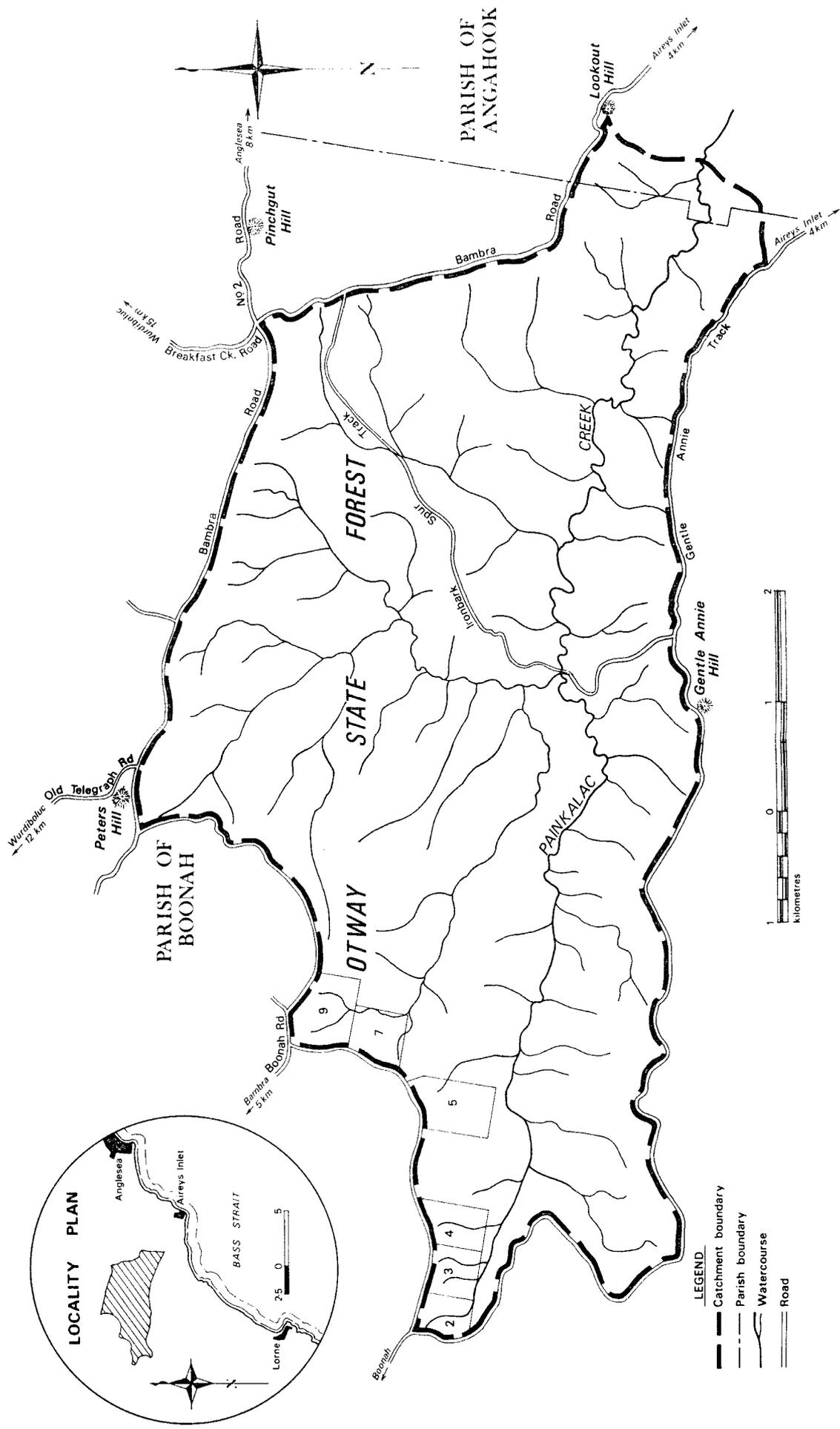
The motorised recreation vehicles have caused some vegetation damage and soil erosion, particularly along the Ironbark Spur Track. The Commission have erected gates across the Bambra Road and Gentle Annie Track entrances to Ironbark Spur Tracks, Ironbark Spur eastern link track, and Duck Ponds Track. The Ironbark Spur Tracks are to remain closed until 31st December 1980, and the Duck Ponds Track was closed for winter/spring 1978 (until 31st October).

Traffic along the boundary roads is self-limiting: grades along Gentle Annie track are too steep for two-wheel-driver vehicles, and the Bambra Road is clearly signposted "Dry weather road only".

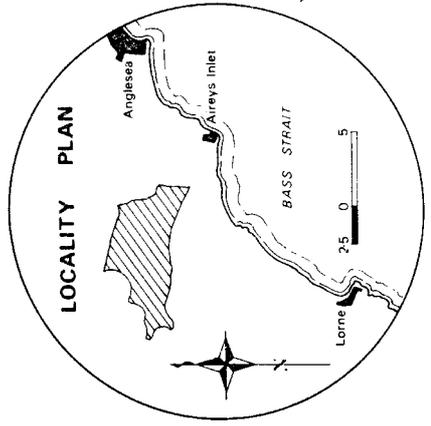
Further inspection will be necessary to determine whether there is any connection between recreation use and the periodic pollution of the water supply, indicated by the *E. coli* counts, and whether management or controls are required.

RECOMMENDATIONS

1. That the Authority approves this report and forwards it to the Land Conservation Council for consideration;
2. That the Land Conservation Council recommends to the Governor-in-Council that the Painkalac Creek (Aireys Inlet) Water Supply Catchment, as shown on plan S-736, be proclaimed under section 5(1)(b) of the *Land Conservation Act* 1970 and section 22(1) of the *Soil Conservation and Land Utilisation Act* 1958.



Plan No. S-736



- LEGEND**
- Catchment boundary
 - - - Parish boundary
 - ~ Watercourse
 - == Road