

**A REPORT ON THE SUNDAY CREEK
(BROADFORD-KILMORE) WATER SUPPLY
CATCHMENT**

A PROPOSAL FOR PROCLAMATION PREPARED BY
THE LAND CONSERVATION COUNCIL

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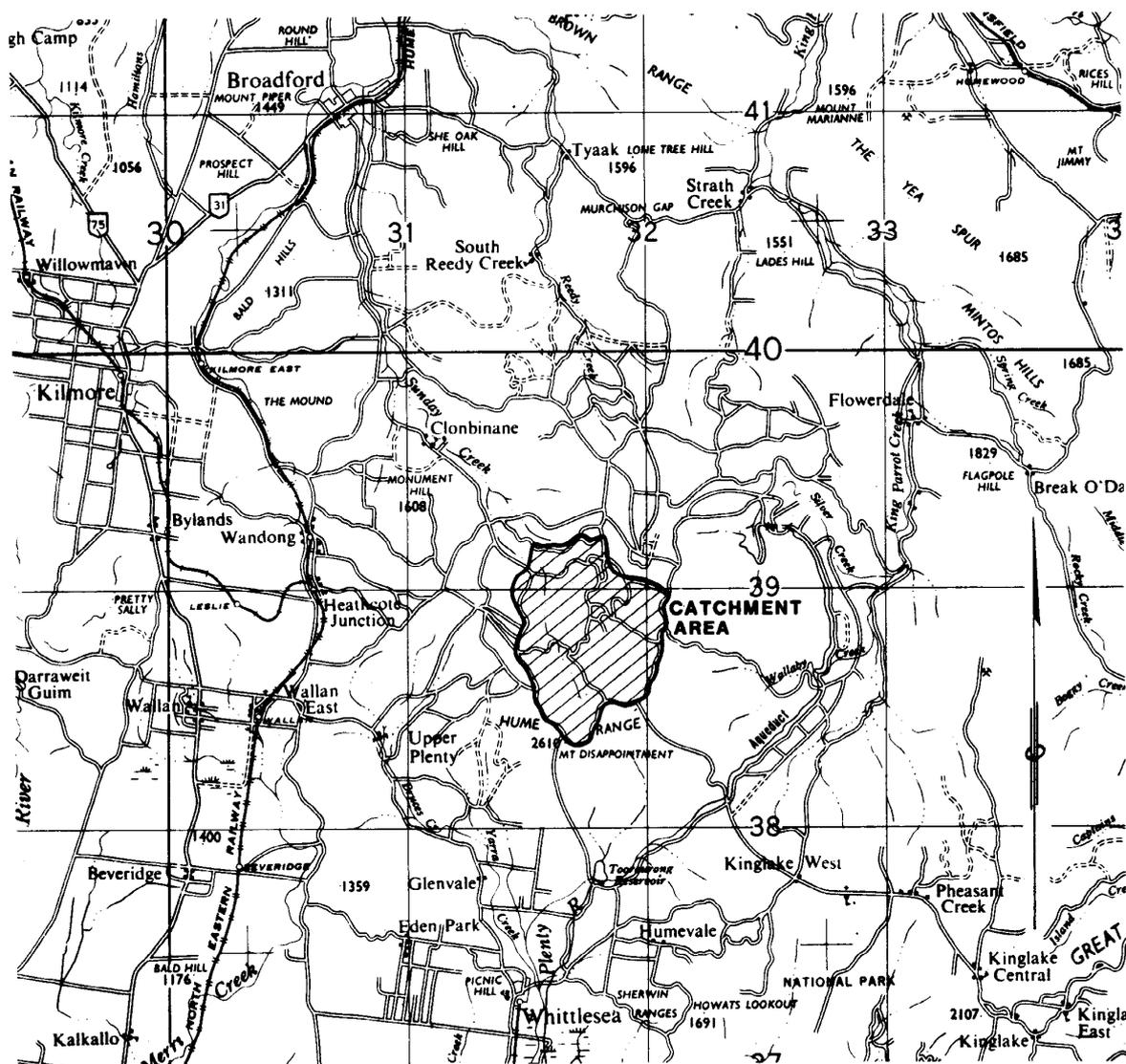
CONTENTS

1. INTRODUCTION.....	4
1.1 Sunday Creek Catchment.....	4
1.2 Kilmore Water Supply.....	4
1.3 Broadford Water Supply.....	4
1.4 Improvement Of The Supply System.....	4
1.5 Catchment Investigation.....	4
2. CATCHMENT DESCRIPTION.....	6
2.1 Geology And Geomorphology.....	6
2.2 Climate.....	6
2.3 Vegetation.....	6
2.4 Water Quality.....	6
2.5 Water Quality.....	6
3. LAND TENURE AND USE.....	6
3.1 Land Conservation Council Recommendations.....	6
3.2 Land Use.....	8
4. WATER SUPPLY HAZARDS.....	9
4.1 Fire.....	9
4.2 Bacterial Contamination.....	9
4.3 Roding and Timber-Harvesting.....	9
4.4 Recreation.....	9
RECOMMENDATION.....	11
REFERENCES.....	11

LIST OF FIGURES

Figure 1 - Locality Plan - Sunday Creek (Kilmore-Broadford) Water Supply Catchment.....	3
Figure 2 - Sunday Creek (Broadford - Kilmore) Water Supply Catchment.....	5
Figure 3 - Land Conservation Council Recommendations.....	7
Figure 4 - Sunday Creek (Broadford-Kilmore) Water Supply Catchment Plan No. S-1370.....	10

Figure 1 - Locality Plan - Sunday Creek (Kilmore-Broadford) Water Supply Catchment



1. INTRODUCTION

1.1 Sunday Creek Catchment

Sunday Creek rises on the northern slopes of the Great Dividing Range at Mount Disappointment, and flows through the township of Broadford to meet the Goulburn River at Seymour (see Figure 1).

The portion of the Sunday Creek catchment under investigation comprises some 20 sq km of forested land east of Wandong, mid-way between Seymour and the City of Melbourne. Both the Broadford Waterworks Trust and the Shire of Kilmore harvest water supplies from this area (see figure 2)

1.2 Kilmore Water Supply

The Shire of Kilmore currently draws water from three diversion weirs located on two tributaries of Sunday Creek (Harper and Hazel Creeks) which provide a total catchment of 4.7 sq km. An area including this catchment was proclaimed in 1963 and a land use determination made in 1965. The water passes through pipelines and aqueducts to the off-stream Balance Basin and Hollowback Reservoir (capacity 110 ML) The supply is chlorinated and distributed via local service storages into the reticulation systems of Kilmore, Wandong, and Wallan. Water supplies from this system are inadequate to provide summer demands.

1.3 Broadford Water Supply

Broadford Waterworks Trust currently draws supplies from a diversion weir on Sunday Creek, located a short distance downstream from the Reservoir site discussed below. The water is piped into the township's storages and reticulation system via a chlorination point. This water supply system is now at its capacity limit and additional storage is required to provide for domestic growth and industrial demands.

1.4 Improvement Of The Supply System

Following consultation between the Broadford Waterworks Trust and the Shire of Kilmore, it was resolved to jointly develop the water resources of Sunday Creek to the mutual satisfaction of both water supply bodies. The proposal to construct a 1,700 ML storage on the Sunday Creek has been approved and the dam is now under construction.

Supply to Broadford will be gravitated through the Trust's present system, with the addition of a short pipeline. Construction of pumping facilities at the dam and a new pipeline to Hollowback Reservoir, to augment the Kilmore supply, are also in progress. Kilmore will continue to be supplied primarily from the Harper and Hazel creeks' offtakes.

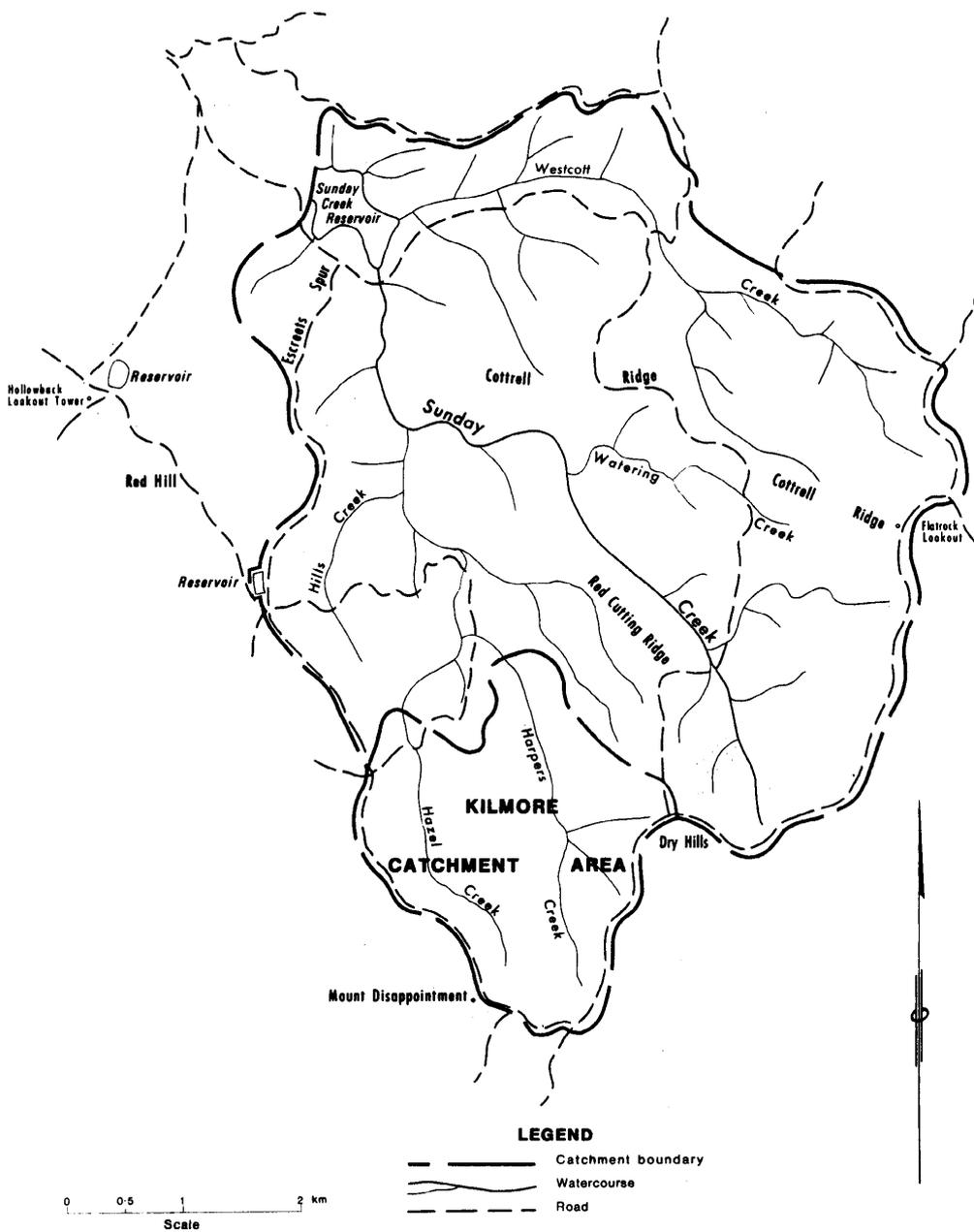
1.5 Catchment Investigation

After an earlier request (1976) from the Broadford Waterworks Trust for proclamation of the Sunday Creek catchment, a report was prepared. However proclamation was deferred pending finalisation of the reservoir site.

This report recommends proclamation of the additional catchment to the Sunday Creek Reservoir below the existing Kilmore catchment. A land use determination which will be made following this proclamation will replace the land use determination currently in force for the Kilmore water supply catchment.

Note: This report describes the entire 30 km² catchment to the reservoir; the proclamation of the Reservoir catchment however only covers the lower 20km².

Figure 2 - Sunday Creek (Broadford - Kilmore) Water Supply Catchment



2. CATCHMENT DESCRIPTION

2.1 *Geology And Geomorphology*

Some 70% of the south and eastern part of the catchment comprises a plateau formed on a Devonian granodiorite massif. Elevations here range from 794 m at Mount Disappointment to about 400 m towards the edge of the plateau. Upper Silurian Sandstones, mudstones, and shales form the balance of the catchment; here the topography is more dissected, with elevations descending rapidly to 360 m at the dam site.

2.2 *Climate*

The area is in a temperate zone with warm dry summers and the greater proportion (over one-third) of rain falling in winter. Average falls range from 800 mm per annum at lower elevations to 1,200 mm on the plateau.

2.3 *Vegetation*

The catchment is forested throughout. Open forest IV of mountain ash and messmate stringybark, as both mature and advanced regrowth stands, predominate on the plateau. With reducing elevation, the ash forests give way to open forest 111 and 11 of messmate stringybark and narrow-leaf peppermint, while the drier, steeper slopes carry broad-leaf peppermint and red stringybark. Mountain grey gum and manna gum occur on the wetter sites.

2.4 *Water Quality*

Streamflow records from a State Rivers and Water Supply Commission gauge on Sunday Creek, approximately two kilometres downstream of the dam site, indicate that the catchment to the dam would have run off values of the order of 150 ML/km² /annum, equivalent to about 15% of the annual rainfall. These records also indicate that the creek has ceased flowing past the gauge on several occasions in summer months, reinforcing the need for a water supply storage.

2.5 *Water Quality*

Samples of water are taken from Sunday Creek regularly and analysed for bacteriological, physical, and chemical quality parameters. Monthly testing for *E. coli* has indicated low to moderate counts throughout the year. Occasional higher counts occur, usually being associated with either storm flows or low flows during warm weather.

Chlorination has since been installed for the purpose of water disinfection.

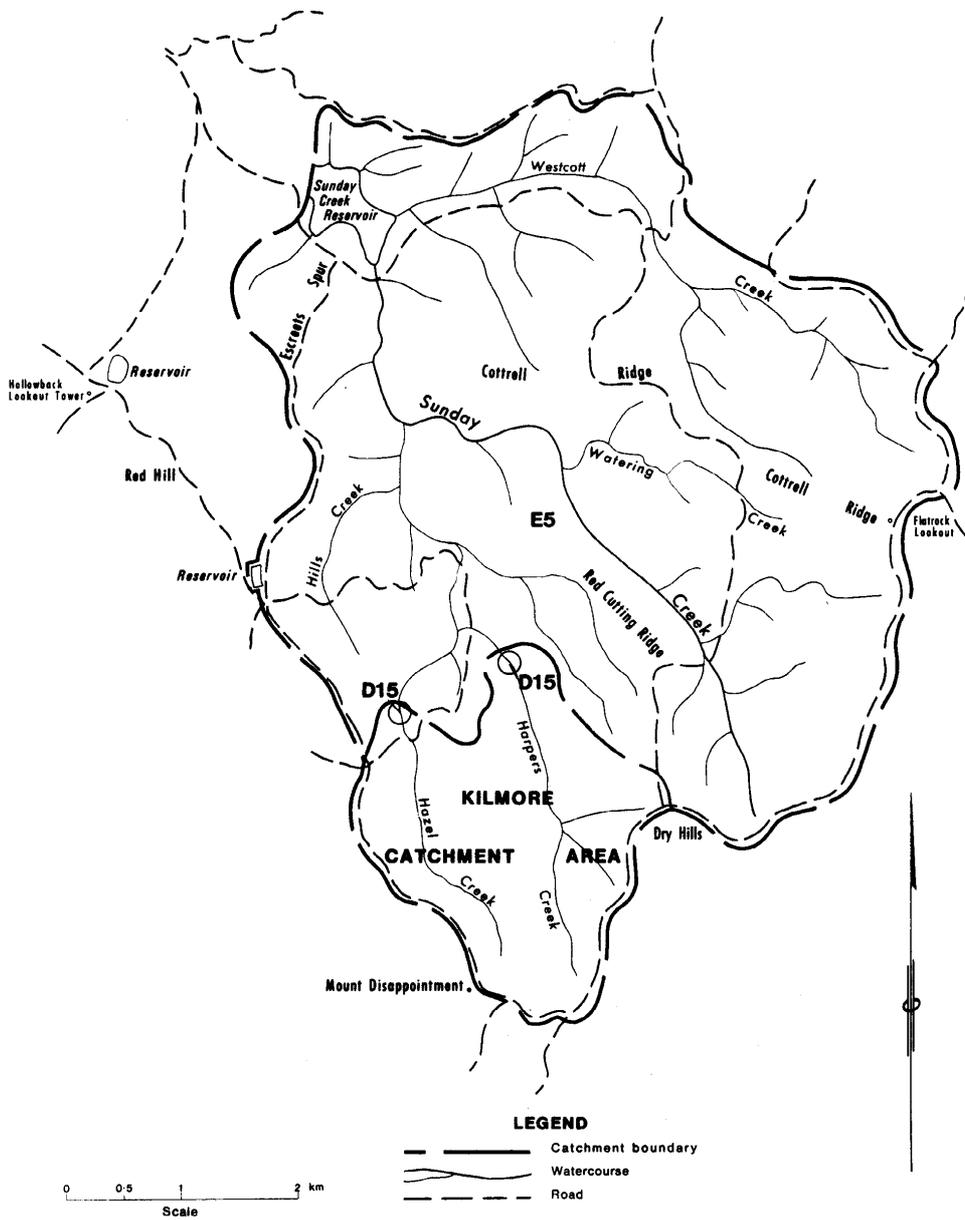
Turbidity in monitoring samples has been generally low in the stream although recent construction work on the reservoir has caused some suspended matter to pass downstream. Colour values are moderately high, in common with other eucalypt-forested small catchments.

3. LAND TENURE AND USE

3.1 *Land Conservation Council Recommendations*

The Sunday Creek catchment is entirely public land. It lies within the council's Melbourne Study Area, for which final recommendations were published in 1977. The relevant recommendations are shown in figure 3, and extracts are reproduced below:

Figure 3 - Land Conservation Council Recommendations



- E5** Mount Disappointment Forest - Harwood Production
- D15** Hazel and Harpers Creeks Offtakes - Water Production

Hardwood Production

E5 Mt Disappointment Forest

That the area be used:

- (a) primarily to produce hardwood timber in a manner having due regard to landscape values as seen from the main roads outside the forest that
- (b) major secondary uses be to:
 - (i) provide opportunities for open-space recreation and education
 - (ii) conserve native plants and animals, and provide opportunities for the development of wildlife conservation techniques
 - (iii) produce honey, gravel, sand, and other forest produce as defined in the *Forests Act 1958*
- (c) water production values be recognised.

And that the area be managed by the Forests Commission.

Water Production

D 15 Hazel and Harper Creeks offtakes:

- That
- (i) the storage areas
 - (ii) diversion works
 - (iii) associated facilities
 - (iv) the buffer strips around diversion works and storages, as defined in the land use determination (when prepared)

Be used for

- (a) water supply purposes
- (b) other activities permitted by the water supply authority after consultation with the Soil Conservation Authority and the Environment Protection Authority

and that these areas be permanently reserved under section 14 of the *Land Act 1958* for water supply purposes, and be managed by the water supply authority (Shire of Kilmore).

3.2 Land Use

The catchment supports high to moderately capability mountain ash and mixed species forests, which are utilised for timber production. Harvesting operations are carried out under forest management prescriptions, which specify buffer strips, crop sizes and maximum slopes for timber extraction, and set standards for the location, drainage and rehabilitation of roads, landings, and snig tracks.

Until recently the forests in the catchment largely comprised regrowth from the 1908, 1919, 1926 and 1938 wildfires and early logging operations. However, in November, 1982 the majority of the catchment was burnt in a severe wildfire. Current harvesting operations are concentrated on salvage logging of about 600 ha of ash-type forest from burnt areas.

The catchment is heavily used for a range of types of recreation, from the Mount Disappointment lookout to the picnic area downstream from the reservoir. The Westcott Creek road adjacent to the reservoir is a major forest access road for tourists, and is used for pleasure driving and trail bike riding, as well as access for logging vehicles.

This road will be partially inundated by the new reservoir. Following consideration of the preliminary environment report on Sunday Creek storage, the Ministry for Conservation assessment report recommends re-establishment of the road 100 metres from the reservoir and parallel to fully supply level, potentially allowing easy public access.

4. WATER SUPPLY HAZARDS

4.1 *Fire*

Fire can have a number of adverse effects on the water supply. With the first rains following a severe fire, ash and loose soil material is flushed into creeks, causing increased turbidity and colour in the water. Soil surfaces exposed by fire are more susceptible to erosion, and have rainfall is likely to result in increases in bedload sediment, and peaks in suspended sediment and turbidity, above those found under normal conditions. Reduced water quality following storm events may continue until a vegetative cover is re-established, usually within 12 months.

Initially peak run-off increases after a severe fire and the duration of flow from small catchment following rainfall decreases. In the medium term, dense strands of mountain ash regrowth use more soil water than old trees, and a water yield reduction effect may be experienced in summer creek flows in areas previously having older forests.

4.2 *Bacterial Contamination*

The moderate counts of bacteria found from time to time may have resulted from: native animal or bird access to the offtake weir pool; human contact such as swimming; or the leaving of contaminated food scraps.

While the substantial detention time in the new reservoir will assist in improving water quality by allowing time for bacteria to die-off, it would be preferable to limit access to the reservoir, to reduce both the likelihood and the degree of direct pollution.

4.3 *Roading and Timber-Harvesting*

Roads, particularly those on the granodiorite parent material, require regular maintenance. Careful siting and construction of new roads and tracks is also important.

Some of the minor roads and tracks in the catchment may require temporary or permanent closure, particularly those in the more erodible areas or on steeper grades.

Access tracks, snig tracks and log landings associated with timber harvesting similarly require drainage and rehabilitation after use to minimise their impact on water supply values.

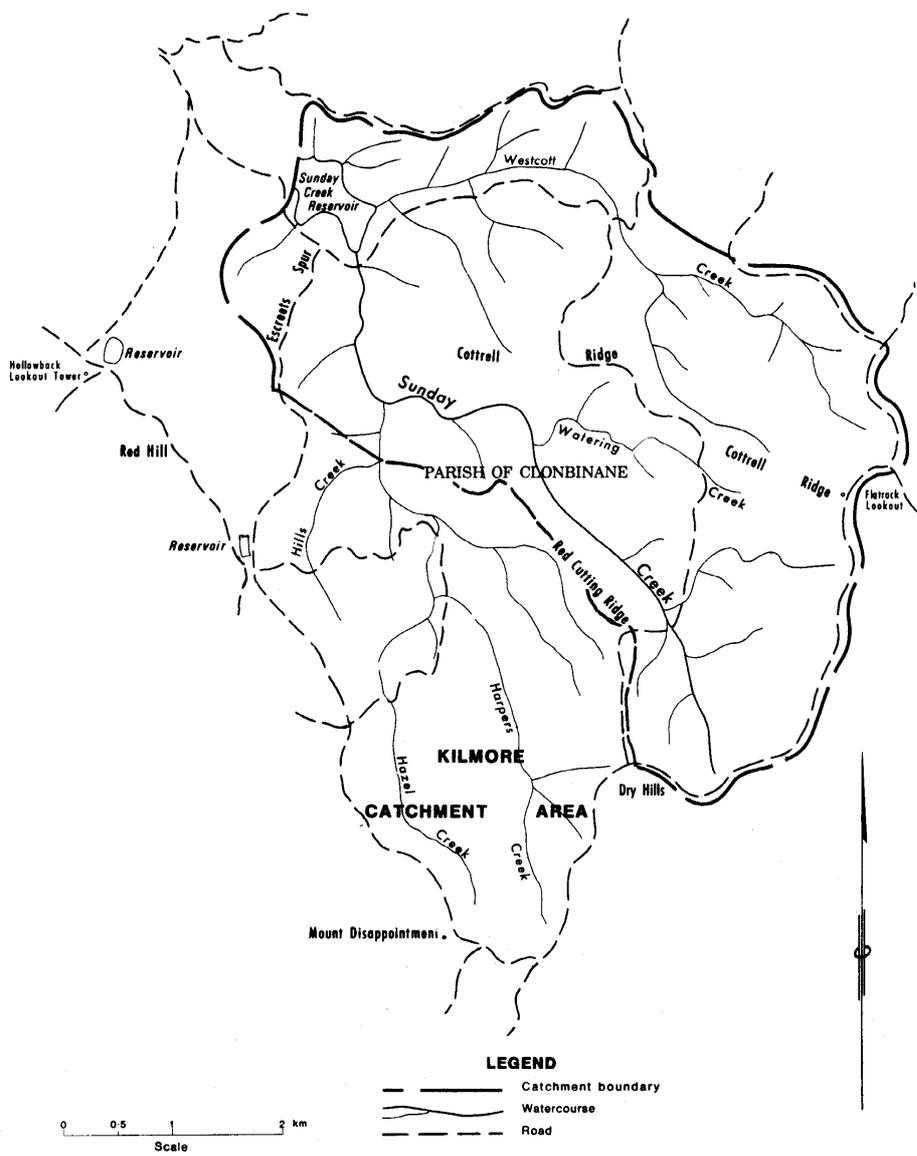
As with bacterial die-off, detention time in the new reservoir will allow settling of suspended sediment and some aggregation of clay particles, however the overall inflow of sediments should continue to be controlled by proper catchment management, to prevent premature silting-up of the storage.

4.4 *Recreation*

While most recreation users of the area act responsibly, on occasion catchment managers have found: road and track damage caused by trail bikes and four-wheel-drive vehicles; and swimmers, contaminated food scraps and bogged vehicles at or in the water supply offtake weir pools in the catchment. It is likely to be necessary to fence much of the reservoir perimeter to prevent such access.

Camping in the catchment is presently prohibited by Division of Forests' regulation, and this restriction should continue.

Figure 4 - Sunday Creek (Broadford-Kilmore) Water Supply Catchment Plan No. S-1370



RECOMMENDATION

1. That, under section 5(1)(b) of the *Land Conservation Act 1970*, the Land Conservation Council recommend to the Governor-in-Council that the Sunday Creek (Broadford-Kilmore) Catchment as shown on plan number S-1370 (figure 4) be proclaimed under section 22(1) of the *Soil Conservation and Land Utilization Act 1958*.

REFERENCES

Land Conservation Council	Melbourne Area Descriptive Report December 1973
Land Conservation Council	Melbourne Area Final Recommendations January 1977
McLennan, R. M.	Report on the Kilmore and Broadford Water Supply Catchments (unpublished draft); Soil Conservation Authority 1978
Ministry for Conservation	Environment Effects Statement Assessment Report - Sunday Creek Storage; Broadford Waterworks Trust, December 1982.
Van Hoof and Byrne Pty Ltd	Sunday Creek Storage - Preliminary Environment Report; Broadford Waterworks Trust, September 1982