

A REPORT ON THE BUFFALO RIVER (LAKE BUFFALO) WATER SUPPLY CATCHMENT



A proposal for Proclamation
Prepared for consideration by the Land Conservation Council

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LAKE BUFFALO WATER SUPPLY CATCHMENT

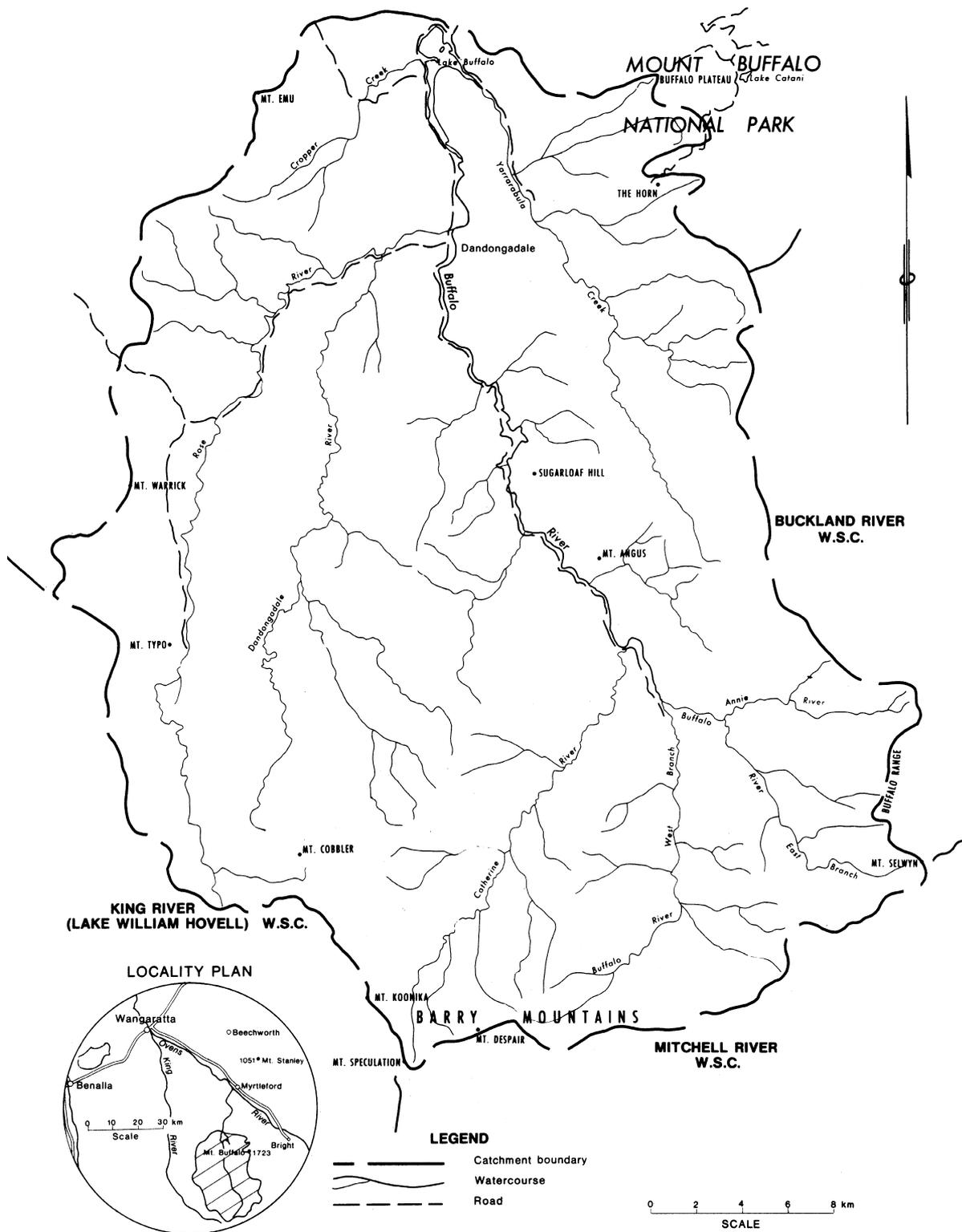


FIGURE 1

INTRODUCTION

The Land Conservation Council, in its final recommendations for the North-Eastern Area, District 3, 4 and 5, has recommended that Lake Buffalo catchment should be investigated by the Soil Conservation Authority and if appropriate the catchment should be recommended for proclamation under section 22(1) of the *Soil Conservation and Land Utilization Act 1958* and section 5(1)(b) of the *Land Conservation Act 1970*.

Similarly, in the final recommendations for the Alpine area, the Council recognises the particularly sensitive nature of land above 1,200 m and identifies the need for a standardised means of catchment protection, initially through the procedure for proclamation. This report is presented for consideration by the Land Conservation Council.

The report recommends that the Lake Buffalo Water Supply catchment be proclaimed.

1. *The Catchment and Water Resources*

The Lake Buffalo catchment of 1,150 km² lies to the south of Myrtleford (figure 1). The Buffalo River system rises in the highlands of Mt Selwyn. Major tributaries are the Rose, Dandongadale and Catherine Rivers. It is partially bound by the proclaimed catchments of the King River (Lake William Hovell) to the south-west, Mitchell River to the south and Buckland River to the south-east.

The town water supply for Myrtleford is obtained from Buffalo Creek. This catchment, which has not been proclaimed adjoins the north-eastern corner of the Lake Buffalo catchment.

Stage 1 of Lake Buffalo, with a capacity of 24,000 ML, was constructed in 1965 with a view to securing pumping supplies for irrigation along the Buffalo and Ovens Rivers and urban supply to the city of Wangaratta. By the end of 1968, however, dry-period regulated flow was fully committed for irrigation. The existing dam was designed to facilitate enlargement of the storage to 1,000,000 ML, however this is unlikely to occur in the foreseeable future. The area which would be inundated by Stage II is predominantly cleared grazing land, with shoreline slopes being gentle in most situations.

Water quality is good, for the purposes intended, with salinity levels averaging less than 300 mg/L and all other parameters within acceptable limits. About 5% of the mean annual discharge of the Buffalo River is currently used for irrigation.

2. *Climate*

The catchment has a coll temperate climate influenced by the highlands in the south. Mean annual rainfall increases from around 1,100 mm to 1,600 mm, due to the influence of elevation and topography, as one ascends the catchment. During the winter months, most of the catchment with elevations about 1,500 m receives its precipitation as snow which, in a normal winter, accumulates from June until September. High intensity storms are of short duration and mainly occur in summer.

Because of the broad range in elevation, the temperature range for different locations varies considerably. However, the hottest months are January and February and July is the coldest. Mean monthly temperatures in the alpine environment can be below 0°C for June, July and August, and frosts can occur at any time of the year, particularly above the tree-line in areas subject to cold air drainage.

3. *Physiography and Geology*

The catchment lies at elevations between 300 m and over 1,600 m above sea-level, with Mounts Cobbler, Speculation and Selwyn and the Mount Buffalo massif being the dominant features. It is a predominantly hilly and mountainous area of Ordovician mudstones, shales and sandstones, with massive granitic intrusions at Abbeyard, Mount Emu and principally Mount Buffalo. Mount Cobbler, at the southern end of the catchment, consists of sedimentary rocks of the Devonian period. Alluvial deposits of quaternary origin are found in the valley floors.

The valleys of the rivers are deep, with steep sides and sharp ridges. Slopes vary from 10% to 25% in the lower part of the valley sides to over 50% higher up. At lower elevations, flats or gently sloping areas are found near stream level - a pattern of narrow alluvial terraces becomes apparent in the Catherine Station area along the Buffalo River and along the Rose River south of the Whitfield road. The terrace becomes wider and more frequent in the vicinity of Lake Buffalo.

4. *Soils and Vegetation*

Friable brown gradational soils with a loamy texture are developed on the moist mountain slopes. On the steeper slopes and northern aspects, the soils are commonly red and stony red gradational types with shallow profiles. Coarse sandy loams occur on the steeper slopes of granitic areas, whereas yellow duplex soils with poor drainage characteristics have developed on undulating terrain.

Alpine humus soils are widespread at higher elevations in well-drained areas on the Mt Buffalo plateau and, to a lesser extent, on other high areas such as Mt Cobbler. Small areas of peat soils also occur on Mt Buffalo.

In the lower parts of the valleys, the soils developed on bedrock are deeper podsol profile. However, it is common to find soils of alluvial origin here associated with the terraces found in the lower valleys. The soils found in the catchment, with the exception of the yellow duplex soils, are readily permeable.

Native vegetation varies from sub-alpine complexes of heath and herbfield on the Mount Buffalo massif, through snow gum and snow gum-candlebark, to alpine ash, with extensive forests or predominantly broad-leaf peppermint occurring at lower elevations and on drier aspects, and pockets of narrow-leaf peppermint in sheltered basins and on moister aspects. Shrubs, grasses and herbs are found in the lower strata. Mountain swamp gum is found in the drainage lines of the Catherine River and the Buffalo River west branch headwaters. A small area of messmate occurs in the south-west corner of the catchment.

Some of the land, principally in the broader valleys, has been cleared and sown to pasture, with limited areas on the river flats being used to grow tobacco. In the northern portion of the catchment some of the land, including purchased freehold, has been used to grow softwoods.

5. *Land Tenure, Use and Management*

Some 80 km² or 7% of the catchment is freehold land, with the flatter areas predominantly cleared of native vegetation. The major use of this land is grazing, for beef and some lamb production and tobacco growing.

The Water Commission holds freehold title to lands acquired for Stage II of Lake Buffalo. A substantial proportion of this land around the reservoir margins is cleared or lightly timbered and is currently leased by the Commission predominantly for grazing or tobacco growing. Proposals for the establishment of softwood plantations on this land, until such time as it is required for water supply purposes, are currently under consideration by the Commission.

The Department of Conservation, Forests and Lands is responsible for management of public land in the catchment, according to its designated use (as park, State forest or other reservation). The State forest in the catchment is primarily protection forest. At high elevations, principally in the headwaters of the Buffalo River, stands of mixed species eucalypts and alpine ash are managed to yield sawlogs. The softwood plantations near Croppers Creek will also ultimately yield logs, round timbers for preservation and pulpwood. The Department of Conservation, Forests and Lands has prepared and administers detailed prescriptions for the management of harvesting and regeneration operations in the catchment.

The catchment lies within the Shire of Myrtleford (east of the Buffalo River) and Oxley (west of the Buffalo River). Development in both these shires is regulated by Interim Development Order. Freehold land within the catchment in both shires is zoned Rural A (general farming); the relevant provisions of this zone relate to minimum subdivision allotment size and density and the erection of buildings near streams. However, two additional clauses imposing controls on land adjacent to specified watercourses and land adjacent to Lake Buffalo have been incorporated in the Shire of Myrtleford I.D.O. The purpose of these special controls is to conserve scenic values on specified freehold land and maintain water quality. The clauses are reproduced in Appendix A.

Public land is exempted from the Ordinance.

6. *Land Conservation Council Recommendations*

The northern portion of the catchment falls within the Land Conservation Council's North-Eastern area, Districts 3, 4 and 5. Final recommendations were published for this area in 1977 and have been accepted by government. A review of land within an area including this catchment and referred to as the Ovens Special Investigation, was completed in 1981 and final recommendations published; they are yet to be accepted by the government.

LAKE BUFFALO WATER SUPPLY CATCHMENT
LAND CONSERVATION COUNCIL FINAL RECOMMENDATIONS*

LEGEND

NORTH-EASTERN AREA-DISTRICTS 3, 4 & 5 (1977)

- A1** Mount Buffalo National Park
- A2** Wabonga Plateau State Park
-  Hardwood Production Zone -to cease 1988
- D7** Lake Buffalo
- F18** Cropper Creek Hydrology Experiment
- Q1** Existing Powerlines
- S1** Uncommitted Land

OVENS SOFTWOOD PLANTATION ZONE SPECIAL INVESTIGATION (1981)

-  Existing softwood plantations and land previously allocated for softwood production.
- A10-A16** Land which could be allocated for softwood production from 1983 to 1992.
- A45** Land which could be considered for softwood production should the government decide to continue the planting programme after 1992.
- B1** Forest Area

ALPINE AREA (1979)

- A1** Wonnangatta-Moroka National Park
- A5** Wabonga Plateau State Park
-  Once-only logging-to cease 1988

ALPINE AREA - SPECIAL INVESTIGATION (1983)

- A6** Rose River Park Addition
- A13** Barry Mountains Park Addition
-  To be included in the schedule to the *National Parks Act* with proclamation deferred-see text
- I1** State Forest #
-  M7 Streamside Conservation-Natural Features Zone

* Some of these recommendations have been approved by the government. Refer to the text for status.

#*State Forest* is a new concept which incorporates *Timber Production* and *Uncommitted* areas previously recommended

LAKE BUFFALO WATER SUPPLY CATCHMENT

PLAN No. S-1369A

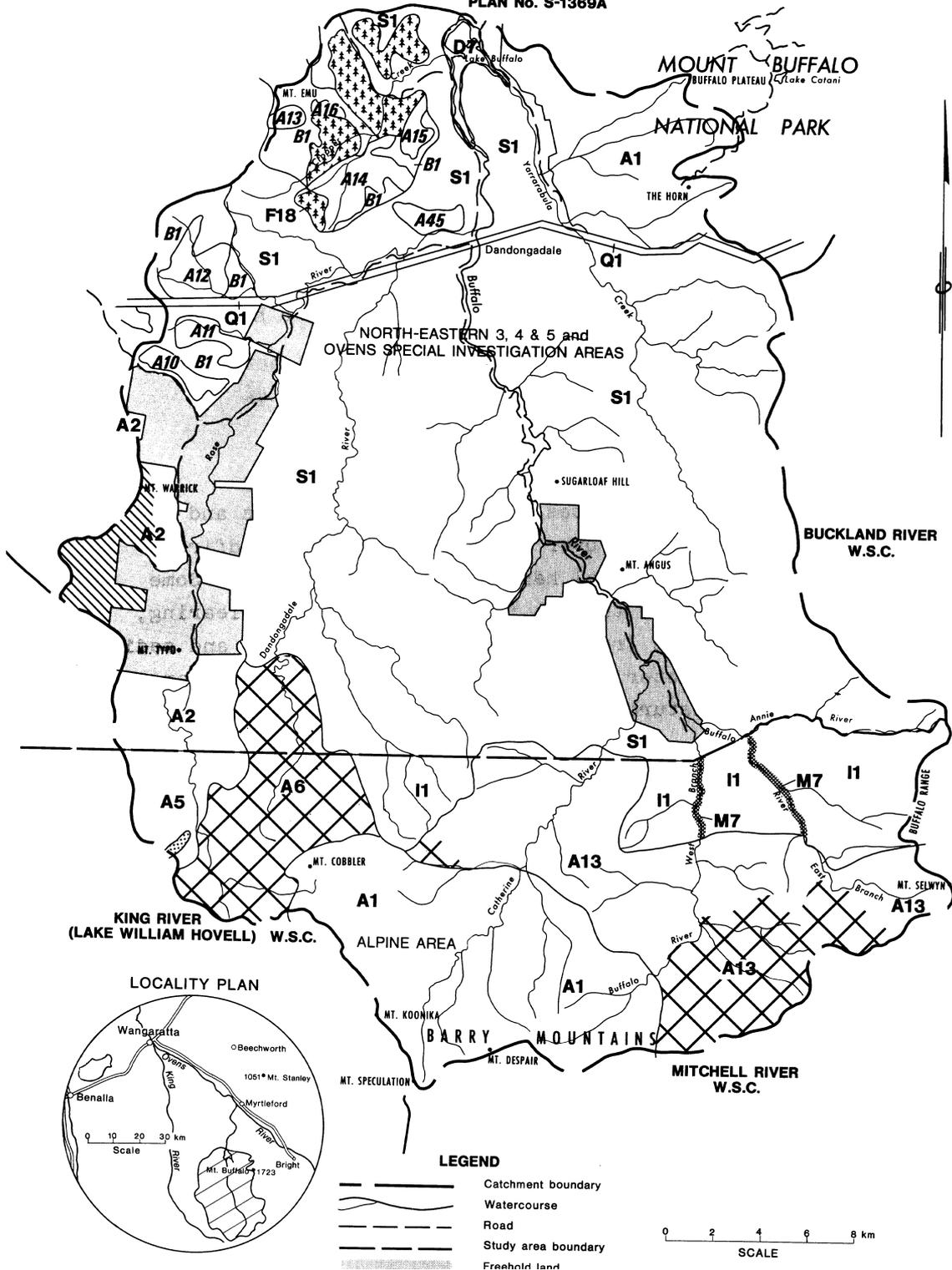


FIGURE 2 - LAND CONSERVATION COUNCIL RECOMMENDATIONS

The southern portion of the catchment falls within the Council's Alpine Area, for which final recommendations on public land use were published in 1979; these have been accepted by the government. A subsequent review of land use in the whole study area, known as the Alpine Special Investigation, was completed in 1983; these recommendations are currently under consideration by the government.

Final recommendations for the use of public land have been summarised and are presented in Figure 2.

7. *Water Quality Hazards*

Erosion from distributed sites in or close to streams and the removal of ground-cover over extensive areas by wildfire are the greatest potential hazards to water quality. Some disturbance may arise through farming activities, clearing, or forest operations (roading, logging). Turbidity and sedimentation of the water is not currently a problem however, the impacts of disturbance being relatively shore-lived.

Stock have access to substantial sections of the major streams passing through freehold areas, with the potential for faecal contamination and streambank erosion to occur. This hazard will continue to exist while this practice remains; however, faecal pollution is less of a concern, as water is detained in the storage for a relatively long time before its release and is not used directly from the storage for domestic purposes.

The lake is subject to thermal stratification, which can result in depleted oxygen content at deep water levels. This is not viewed as a significant problem at present.

8. *Recommendations*

As a result of these investigations, it is recommended that:

the Land Conservation Council recommend to the Governor-in-Council under section 5(1)(b) of the *Land Conservation Act* 1970, that the catchment be proclaimed under section 22(1) of the *Soil Conservation and Land Utilization Act* 1958:

The Buffalo River (Lake Buffalo) catchment, as shown on Plan No. S-1369 (Figure 3).

LAKE BUFFALO WATER SUPPLY CATCHMENT

PLAN No. S-1369

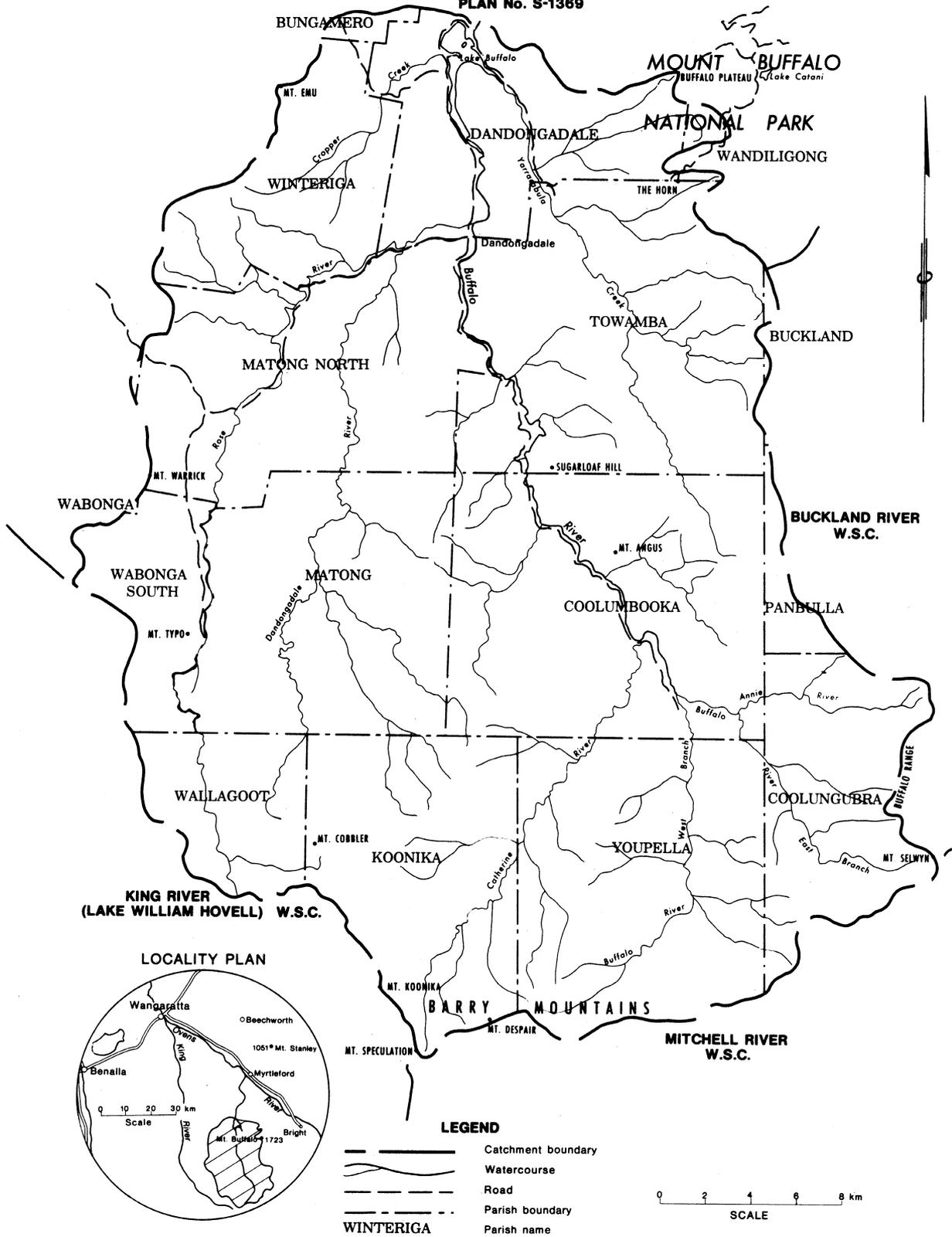


FIGURE 3

APPENDIX A

Interim Development Order

The following are relevant extracts from the Interim Development Order for the Shire of Myrtleford.

Freehold land zones Rural A:

Clause 11 Lands adjacent to watercourses - Buffalo River

Clause 12 Land adjacent to Lake Buffalo

"PART IV - SPECIAL CONTROLS AND PROVISIONS"

11. LAND ADJACENT TO WATERCOURSES

11.1 Purpose of Special Controls Adjacent to Watercourses

The purpose of special controls adjacent to watercourses is to conserve and enhance the natural beauty and importance of the watercourses and nearby land and in particular:-

- (a) to prevent increased turbidity and pollution of water in watercourses;
- (b) to prevent increased surface water runoff or concentration of surface water runoff leading to erosion or siltation of water storages;
- (c) to conserve, wherever practicable, existing wild life habitats close to watercourses and, where appropriate, to allow for generation or regeneration of habitats; and
- (d) to regulate and restrict uses and developments which may interfered with the use of water for agricultural, domestic or other purposes.

11.2 Areas of Natural Beauty, Interest and Importance

The area of land within 60 metres of (the Buffalo River is) specified as being an area of natural beauty, interest and importance.

11.3 Use and Development in Specified Areas

- (1) Notwithstanding anything in this Order, a person shall not:-
 - (a) construct without consent any building or works (other than a fence); or
 - (b) remove or destroy without consent any living tree with the exception of essential State Electricity Commission tree clearing maintenance along existing power transmission lines;

on land specified under Clause 11.2 being in an area of natural beauty, interest and importance.

- (2) Subject to sub-clauses 11.3(3) and 11.3(4), the Responsible Authority may consent to the construction of buildings or works at a distance of less than 60 m but not less than 30 m from (the Buffalo River), where the Responsible Authority is satisfied that it is practicable to construct the building or works on land that is so specified, having regard to the purpose of the special controls identified in clause 11.1.
- (3) Notwithstanding anything in this Order, the Responsible Authority shall not consent to a use, development or sub-division of land which may cause or make more likely the direct discharge of treated or untreated liquid wastes to (the Buffalo River).
- (4) In consideration an application for consent:-
 - (a) to use, develop or subdivide land;
 - (b) to remove or destroy a living tree,

on land specified under Clause 11.2, the Responsible Authority shall have regard to (other matters specified in this Order) and, in addition, to:-

- (i) the comments of the Soil Conservation Authority;
- (ii) the desirability of collecting and controlling the discharge of surface water runoff and stored water, by the use of silt traps, settling basins, diffusion through wet lands or otherwise;
- (iii) the effects of flooding and flood control measures;
- (iv) the maintenance of water quality in the adjacent watercourses;
- (v) the importance of the adjacent watercourse to the maintenance of an adequate supply of irrigation waters to downstream land;
- (vi) the importance of the adjacent watercourse to the preservation of wildlife, fish and other aquatic life, and
- (vii) the natural beauty of the area.

12. LAND ADJACENT TO LAKE BUFFALO

12.1 Purpose of Special Controls Adjacent to Lake Buffalo

The purpose of the special control adjacent to Lake Buffalo is to conserve and enhance the natural beauty and importance of the lake or nearby land by creating an area of minimal development surrounding the land and to prevent pollution of the water of the lake.

12.2 Area of Natural Beauty, Interest and Importance

The land within 100 m of the fully supply level contour of Lake Buffalo is specified as being an area of natural beauty, interest and importance.

12.3 Use and Development in Specified Area

- (1) Notwithstanding anything in this Order, a person shall not:-
- (a) construct without consent any building or works (other than a fence);
or
 - (b) remove or destroy without consent any living tree with the exception of essential State Electricity Commission tree clearing maintenance along existing power transmission lines.

On land specified under Clause 12.2 being in an area of natural beauty, interest and importance.

- (2) Subject to sub-clause 12.3(3) and 12.3(4), the Responsible Authority may consent to the construction of buildings or works at a distance of less than 100 m from the fully supply level contour of Lake Buffalo, where the Responsible Authority is satisfied that it is practicable to construct the building or works on land that is so specified, having regard to the purpose of the specified controls identified in clause 12.1.
- (3) Notwithstanding anything in this Order, the Responsible Authority shall not consent to a use, development, or subdivision of land which may cause or make more likely the direct discharge of treated or untreated liquid wastes to Lake Buffalo.
- (4) In considering any application for consent to remove or destroy any living tree or to use, develop or sub-divide land within 100 m of the fully supply level contour of Lake Buffalo, the Responsible Authority shall have regard to those matters specified (earlier in this Order) and, in addition:-
- (a) the comments of the Soil Conservation Authority;
 - (b) the comments of the State Rivers and Water Supply Commission;
 - (c) the desire to retain the water quality in the Lake;
 - (d) the importance of the Lake and the surrounding land to the preservation of wildlife, fish and other aquatic life; and
 - (e) the natural beauty of the area."