PART 1
INTRODUCTION

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THE AREA OF THE STUDY

The Broken River in north-eastern Victoria rises to the north-west of the Main Divide and east of Mansfield. It flows first west, then north and north-west, to several kilometres north of Benalla where it turns to the west and continues on to join the Goulburn River just south of Shepparton. For the purposes of this survey the catchment has been delineated to a point on the river near Goomalibee, a few kilometres north west of Benalla. This includes an area of about 2070 km^2.

Commencing at Casey's Weir on the Broken River (Plate 2) north of Benalla, the catchment boundary runs north-east along a chain of low hills and across a wide, low saddle to the prominent Warby Range (or Futter's Range) and then south through the Glenrowan Gap and along the watershed between the Fifteen Mile Creek and Ryan's Creek east of Lurg. It continues south, almost straight to the south-east where it forms the head-waters of the Broken River. The southern boundary of the catchment runs west and then north-west across the northern edge of the Mansfield Plain and rises up onto the Strathbogie Ranges. The catchment includes only the northerly edge of the Strathbogie Plateau, which has a predominantly southerly drainage into the Lake Eildon catchment and the Seven Creeks system. The boundary then follows a northerly trending ridge in the region of Boho South. The western boundary to the north of Warrenbayne is indefinite because of the branching of the Five Mile Creek at Baddaginnie, but the upper Five Mile Creek has been included in the survey area. From a few kilometres north-west of Baddaginnie the boundary to the survey area has been drawn more or less due north to join the river near Goomalibee.

The natural flow of the Broken River is characterised by considerable variation from year to year (Fig. 1) and by large seasonal variations with winter flooding and very low flows in summer. There have been years when no summer flow occurred. The stream is also subject to flash flooding when the rise and fall of the flood peaks is rapid. Much sediment is carried by the floods and occasionally deposited on valuable river flats. These characteristics have made the Broken River unattractive as a local water source and the bulk of its water, as well as being locally unused, has created a considerable nuisance around Benalla and downstream to Shepparton.

To help overcome these problems and to conserve water for stock and domestic purposes, Lake Nillahcootie was constructed on the Broken River just north of Barjarg in the south of the catchment. It has a storage capacity of 39.8 X 10^6 m^2 and a catchment of about 3885 km^2. Construction was completed in 1968.

The large shallow basin to the north-east of Benalla which contained the Mokoan Swamp (Winton Swamp) has also been damned to store 370 x 10^6 m^2 of water most of which is diverted from the Broken River south of Benalla through 19 km of earthen channel. This water is to be released early in each irrigation season into the Broken River through Stockyard Creek for use in the Goulburn and Murray valleys.

The survey area also includes the catchment and storage of the Loombah Weir, the Benalla urban water supply, on the Upper Ryan's Creek.

Plate 2, Casey's Weir on the Broken River at Goorambat allows water to be diverted to the north for stock and domestic purposes.

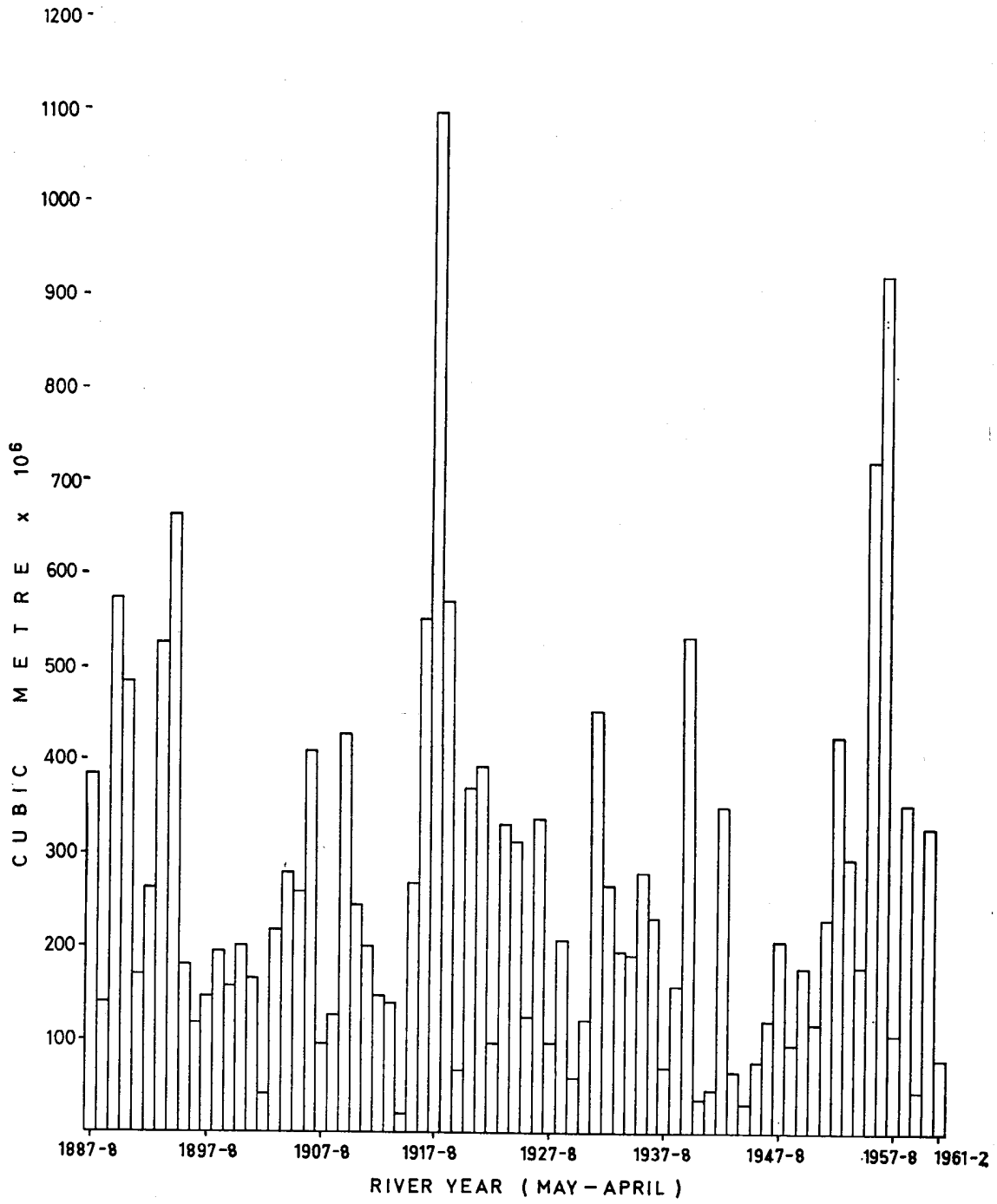

Fig. 1 - Annual discharge of the Broken River at Goorambat, 1887-1962.

REASONS FOR THE STUDY

As one of its general functions the Soil Conservation Authority is carrying out studies of the land throughout the State to provide basic ecological information relevant to the solution of land use problems. The Broken River catchment is one of several mountainous catchment studies in north-eastern Victoria.

The completion of Lake Nillahcootie in 1968 was preceded by the proclamation of its catchment under the *Soil Conservation and Land Utilization Act.* The proclamation required the Soil Conservation Authority to prepare a land use determination for the area. Such a determination must be based on an understanding of the ecology of the area. This study, in part, provides this information. The catchment to the Loombah Weir has also been proclaimed.

Because of the potential value of the water resources of the catchment, and their unreliable nature, the use of public and private lands in the catchment has long been the subject of local concern. A large proportion of the catchment is still Crown land. Thus there is a demand for information about these lands, particularly the potential of the various areas for alternative uses, such as forestry, agriculture, water supply and environment preservation.

This study provides a characterisation of the main landscape patterns with discussion of the environment and land use capabilities of each, and indicates the role of each type of country in the function of the area as a catchment. This information is intended to provide the basis for sound decisions of land use and catchment management to enable optimum use of all the natural resources of the area, including the water, and to minimise siltation, erosion or other environmental deterioration.

METHOD OF SURVEY

This study is one of a series carried out by the Soil Conservation Authority using the principles set out by Gibbons and Downes (1964).

The land-system scale of survey is considered appropriate for the rapid collection and presentation of ecological data from relatively large areas. It also facilitates the recognition of specific problem areas where more detailed study is required. The land system is a survey unit within which the patterns of topography, climate, vegetation and soils are consistent.

The detailed information was gathered by a series of exploratory traverses within each mapping unit. The boundaries of the land systems were chosen on various criteria but are dominantly topographic. After preliminary field work had enabled the major criteria to be established a light aircraft was used to enable the topographic boundaries to be delineated directly onto photomosaics. The view from the aircraft enabled interpretation of some areas which were difficult to interpret from the aerial photos or by ground traverses alone, and also resulted in early familiarity with the area as a whole which greatly facilitated the progress of the survey.

Some boundaries were subsequently modified when better quality aerial photos became available.

MAPS AND SOURCES OF INFORMATION

The base map used in the survey is derived from the road network of the Parish and County plans, with the addition of stream detail plotted from aerial photographs.

The survey area includes parts of the 1 mile to 1 inch map quadrangles of Dookie, Wangaratta, Moyhu, Violet Town, Strathbogie, Whitfield, and Mansfield. Of these, only the Wangaratta sheet was available as an adequate topographic map.*

The Wangaratta map sheet, which has 50-ft. contours, includes only the north-eastern corner of the catchment around Mokoan Swamp. Various other contour maps of limited coverage were available in some of the State Forest areas, mostly at a scale of 10 chains to 1 inch, although those of the Strathbogie Forest area were compiled by the Forests Commission at 40 chains to 1 inch.

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* Comments on the availability of maps and aerial photographs refer mainly to the period when the field works were being carried out - 1962-63. The Wangaratta 1:250 000 topographic map, with contour intervals of 250 feet was published in 1968 by the Royal Australian Survey Corps.

Geological detail for the area is available on maps at 1:250 000, produced by the Mines Department of Victoria. The two map sheets concerned are Wangaratta (S J55-2) and Warburton (S J55-6), both provisional editions dated 1968.

The catchment lies within the Upper Goulburn Region of the Central Planning Authority and information on the resources of the catchment is available in that Authority's report on the Region (1951).