WATER RESOURCES

OF

THE RICHMOND VALLEY

SURVEY OF THIRTY N.S.W. RIVER VALLEYS

REPORT Nº2 — MAY 1966

WATER RESOURCES OF THE RICHMOND RIVER VALLEY

PREFACE

BY THE N.S.W. MINISTER FOR CONSERVATION

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In accordance with the policy of the New South Wales Liberal-Country Party Government announced prior to the May, 1965 State Elections, I recently directed the Water Conservation and Irrigation Commission of New South Wales to undertake a comprehensive valley survey of the State's water resources as a prerequisite to the formulation of a balanced and soundly-based programme of water conservation.

The survey will be the largest and most comprehen ive study of water resources ever undertaken in Australia. It will embrace thirty major river valleys of the State and will cover all the main aspects of their physiography, meteorology and water resources - both surface and underground - together with a review of current and possible future water requirements.

As it will be some time before the whole survey can be completed, it has been decided to prepare and issue separate reports for the individual river valleys. This report on the Water Resources of the Richmond River Valley is the second to be completed.

JACK G. BEALE. M.L.A.

13th MAY, 1966.

WATER RESOURCES OF THE RICHMOND VALLEY

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WATER RESOURCES OF THE RICHMOND VALLEY

1. INTRODUCTION.

Water is a basic essential for the existence of mankind. That there is an abundance of this resource is obvious when it is realised that there are over 320 million cubic miles of water on the Earth and each cubic mile is equivalent to more than a million million gallons.

However, the magnitude of this resource must be qualified in so far as its usefulness is concerned by awareness that 97.2 percent of this 320 million cubic miles is in the ocean unfit to drink or for irrigation use, a further 2 percent lies frozen in glaciers and over 99.5 percent of the remaining 0.8 percent is in the form of underground water. Consequently only a very minor part of this plentiful resource is in a form or locations suitable or readily available for consumptive use by man.

The gross water resources available to any country are normally considered to be the amounts of rainfall and snow, which fall on the land, whilst a country's surface water resources are those parts of rainfall and snow which eventually appear as streamflow.

A comparison between the estimated average annual rainfall for Australia and other parts of the world, indicates the reason for Australia often being referred to as the world's driest continent. For example, Australia's average annual rainfall is about $1\frac{1}{2}$ feet compared with about 2 feet for Africa, Asia and Europe and almost $4\frac{1}{2}$ feet for South America.

When allowance is made for the rainfall lost in the evaporation and transpiration processes and to underground water resources, the comparison of the residuals (or surface water resources) is even more unfavourable than indicated by the average rainfall figures. Australia's average annual surface water resources have been assessed as averaging about 240 million acre feet, or being equivalent to less than 2 inches of rainfall occurring without loss over the whole of Australia as against $\frac{1}{2}$ foot in Africa, 1 foot in North America and $1\frac{1}{2}$ feet in South America.

The average annual surface water resources of the Richmond Valley have been assessed at about 1,600,000 acre feet per annum. On a square mile of catchment area basis, these resources are considerably greater than the average values for both Australia and New South Wales. However, in common with other areas of Australia, the annual surface water resources of the Valley exhibit a considerable degree of variability. It is therefore essential that they be conserved and effectively used.

2. PHYSIOGRAPHIC FEATURES.

The Richmond River Valley comprises an area of about 2,680 square miles and is drained by the North, Middle and South Arms of the Richmond River which rise in elevated country about 4,000 feet above sea level some fifty miles west of the coast.

The Middle or Main Arm rises in the McPherson Range near Mount Lindesay and flows in a general southerly direction to Casino. Along its course it is joined by a number of tributaries, the principal of which are Findon, Ford's, Lynch's, Fawcett's and Eden Creeks. Below Casino the Middle Arm flows in a general south-easterly direction to a point some ten miles downstream of Coraki. At Coraki it is joined by the North Arm and a further three miles downstream by the South Arm. In the final stage of its passage through the valley, the Richmond River flows in a general north-easterly direction, entering the South Pacific Ocean at Ballina.

The North Arm drains a steep and deeply dissected plateau extending from the Main McPherson Range through Loft's Pinnacle and Mount Mathieson to near the coast. The major tributaries which form the North Arm are Leycester, Goolmagar, Terania, Cooper's and Wilson's Creeks. The South Arm or Bangawalbin Creek rises near the southern extremity of the Richmond Range, its principal tributaries being Myall and Myrtle Creeks.

About one fifth of the Richmond Valley can be classified as having mountainous topography with land slopes in excess of 15 degrees. The remainder of the valley is comprised of approximately equal areas

of undulating to steep country with slopes between 3 and 15 degrees and flat country with slopes less than 3 degrees.

In the Lower Valley much of the original vegetation has been entirely removed, particularly where soil and topography have favoured pastoral land use. On the slopes, the original forest cover has been thinned and replaced by grass to provide extensive areas for grazing. Although vegetation of the rugged infertile uplands of the ranges consists of basically poor forest, the plateau north of Lismore supports a cover of dense forest and scrub.

The principal features of the Richmond River Valley are shown on Figure 1 whilst the generalised land slopes are shown on Figure 2.

3. CLIMATIC FEATURES.

RAINFALL.

The entire valley is well watered, the annual median rainfall being everywhere in excess of 40 inches. (A rainfall having a probability of occurrence of 50 percent, that is, the rainfall most likely to occur, is termed the median rainfall). Highest yearly totals occur along the coastal strip near the river mouth where the median is close to 70 inches at some stations. Median annual totals in excess of 65 inches are also recorded on the high ground along the ridge which divides the catchment of the Richmond from that of the Tweed River. The driest portion of the catchment is along the valleys of the middle reaches of the Richmond River and its South Arm tributary where the annual median is less than 45 inches. The distribution of annual median rainfalls over the catchment is shown at Figure 3 whilst the distribution of the monthly median rainfalls is shown at Figures 4 to 15.

The wettest period is from December to April. In these five months the catchment usually receives over 60 percent of the annual total. Median rainfall for each of these months exceeds 5 inches along part of the coast and on the high ground near the northern boundary of the catchment and is greater than 3 inches almost generally.

The driest month is August. The median during this month exceeds 3 inches only along a limited part of the coast while in the valley of the Richmond River above Casino and in the valley of the South Arm tributary the median is less than 1 inch at some stations.

Monthly and annual rainfalls recorded at Ballina, Bingeebeebra, Banyabba, Casino, Coraki, Cumbalum, Dunoon, Kyogle, Lismore, Mount Pikapene, Mullumbimby, Old Bonalbo, White Swamp and Woodenbong are given at Appendices 1 to 14 respectively.

Very heavy rain may occur over the valley when a depression is located off the Queensland coast near Brisbane. Under these conditions totals of 5 inches in 24 hours are not uncommon. The highest total recorded in the valley during a 24 hour period ending 9 a.m. was 16.26 inches on 6th February, 1939 at Nimbin.

Very high monthly totals can occur throughout the valley, particularly during the warmer months. Falls of at least 15 inches can be observed at all stations during each of these months while at most stations the highest total for an individual month can be in excess of 25 inches. The greatest monthly total on record for a station in the valley is 34.31 inches at Cumbalum in February, 1893.

The tables at Appendix 15 show, on a monthly and annual basis for Old Bonalbo, Woodenbong, Banyabba, Bingeebeebra, Dunoon, Lismore, Coraki, Mount Pikapene, Kyogle, Ballina and Casino the following data:

(i) the maximum and minimum rainfalls and,

(ii) the rainfalls corresponding to probabilities of occurrence of 10%, 30%, 50%, 70% and 90%.

Although many dry months occur even during the summer it is unusual for a dry spell to persist for more than three or four months during the period November to May. Minimum recorded rainfalls for periods of up to twelve months at Ballina, Casino, Coraki and Kyogle are shown in the tables at Appendix 16. These tables indicate the minimum cumulative rainfalls commencing in any month of the year and continuing for up to twelve months, which have occurred at the selected rainfall stations.

At Casino, which is in the drier part of the valley, in 10 percent of years the December rainfall total is less than 1½ inches but during the five months December-April over 15 inches is recorded in 90 percent.

At Ballina, which is in the wettest part of the area only once in ten years is less than 23 inches received during the five month period December to April.

During the driest period of the year, the four months June to September, at Casino the median rainfall is 7 inches whilst one year in ten the total for the four months is less than 3 inches. At Ballina the median rainfall for this period is $15\frac{1}{2}$ inches whilst once in ten years the total does not reach $9\frac{1}{2}$ inches.

TEMPERATURE.

Temperature recordings have been taken at a number of places in and near the Richmond Valley. The average monthly temperatures for three stations are listed in Tables 1, 2 and 3.

(1) Broadwater, Table 1, which may be taken as representative of the coastal strip.

(2) Lismore, Table 2, which is representative of the lower inland.

(3) Urbenville, Table 3, which is located just outside the Richmond Valley but gives an approximation to conditions on the higher ground in the Valley.

TABLE 1

BROADWATER (Elevation 40 feet)

Average temperatures (^{o}F) based on 28 years of records

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
Average Maximum	83.8	82.6	79.9	76.8	72.4	68.6	68.0	70.5	74.3	78.5	81.0	83.4	76.6
Average Minimum	65.7	65.6	63.4	58.1	52.7	47.7	46.0	46.2	49.4	55.4	59.7	63.0	56.1
Average Mean	74.7	74.1	71.7	67.5	62.5	58.1	57.0	58.3	61.8	66.9	70.3	73.2	66.4
Extreme highest on record 110.0^{o}F						Extreme lowest on record 30.5^{o}F							

TABLE 2

LISMORE (Elevation 37 feet)

Average temperatures (^{o}F) based on 28 years of records

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
Average Maximum	86.5	84.7	82.0	78.6	72.5	68.6	68.0	71.2	75.8	80.5	83.2	85.7	78.1
Average Minimum	65.4	65.0	62.2	56.5	50.5	45.6	43.6	44.6	49.5	55.9	60.3	63.7	55.2
Average Mean	76.0	74.8	72.1	67.5	61.5	57.1	55.8	57.9	62.7	68.2	71.8	74.7	66.7
Extreme highest on record 113.0^{o}F							Extreme lowest on record 23.0^{o}F						

TABLE 3

URBENVILLE (State Forest) (Elevation 1200 feet)

Average temperatures (^{o}F) based on 17 years of records

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
Average Maximum	83.8	80.8	78.8	73.9	68.6	64.3	64.1	66.8	71.7	76.3	81.3	84.2	74.6
Average Minimum	61.7	61.6	60.0	51.7	44.9	40.4	36.8	38.3	43.3	50.8	55.3	59.4	50.3
Average Mean	72.7	71.2	69.4	62.8	56.6	52.3	50.4	52.6	57.5	63.5	68.3	71.8	62.4
Extreme highest on record 109.0^{o}F							Extreme lowest on record 18.0^{o}F						

Tables 1, 2 and 3 indicate that the entire valley experiences warm to hot conditions during the period from November to April. During the remainder of the year, days are mild to warm over most of the valley with average maxima falling to the low sixties only in the higher country during the two coldest months.

Average night temperatures away from the coast however, fall to the low forties during July at stations in the middle reaches of the river while in sheltered valleys in the upper reaches average night temperatures in July are in the middle thirties.

Very hot conditions can occur at any time between December and March when west to northwesterly winds bring air from Western Queensland.

Temperatures over 100°F occur throughout the valley, the highest on record being 114°F at Casino.

During the period from June to August conditions of light winds and clear skies combine on occasions to produce very low overnight temperatures. Apart from the coastal strip where temperatures below freezing are rare, all stations in the valley have recorded temperatures as low as 25°F while temperatures below 20°F can occur in the higher valleys.

FROSTS.

The immediate coastal strip is almost frost free; Broadwater experiences less than one frost a year on the average. Away from the coast, however, frosts occur several times each winter and, on occasions, are quite severe. Both Casino and Lismore average above seven winter frosts while in sheltered valleys in the higher country frosts may occur more than twenty times a year on the average.

Heavy frosts have occurred as early as the end of May and as late as mid August in the central Richmond Valley and air temperatures as low as 23°F have been recorded at both Lismore and Casino.

The dates of the earliest and latest occurrence of an air temperature of 36°F or lower at Lismore are mid-May and Mid-October respectively.

SUNSHINE.

No sunshine measurements have been taken in or near the Richmond Valley. Table 4 gives an estimate of hours of bright sunshine for places in the valley away from the coast and has been based on cloud observations. Along the coast where conditions are slightly more cloudy the hours of sunshine are proportionately less.

TABLE 4

SUNSHINE

Estimated Duration of Bright Sunshine - Richmond Valley

In Hours Per Day

Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
8.4	8.0	7.5	7.0	6.7	6.6	7.0	8.0	8.4	8.4	8.3	8.6	7.7

EVAPORATION.

No observations of evaporation are available for the Richmond Valley.

Table 5 gives estimated monthly and year evaporation (from a sunken pan) for the valley together with an estimate of the standard deviation.

TABLE 5

Estimated Monthly and Annual Evaporation in Inches (based on the Australian sunken tank) for the Richmond Valley.

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
Average	5.7	3.7	3.4	2.8	2.6	1.9	1.4	2.9	4.0	4.8	5.8	6.3	45.3
Standard Deviation	1.1	0.8	0.7	0.5	0.5	0.5	0.5	0.6	0.8	0.9	1.1	1.2	4.8

WIND.

Strong winds occur over the Richmond Valley from time to time associated with one of the following conditions:

(1) Strong east to southeast winds associated with a strong depression centred off the coast near Brisbane. These depressions often originate as tropical cyclones and may still be of cyclonic intensity when they affect the valley. Under these conditions wind speeds on the coast may reach 60 miles per hour but moderate as they move inland.

(2) Violent squalls associated with thunderstorms. The strongest gusts experienced in the valley occur with thunderstorms and may exceed 80 miles per hour on occasions.

Table 6 gives extreme wind gusts likely to be experienced in the valley with various return periods.

TABLE 6

Wind Gusts to be Expected with Given Frequencies.

Return period (years)	10	20	50	100
Wind gust equalled or exceeded (m.p.h.)	80	85	90	95

4. GROUNDWATER POTENTIAL

Geologically the catchment of the Richmond River lies towards the southern end of the Clarence-Moreton Sedimentary Basin. Extensive basaltic flows occupy most of the elevated country in the north, the sedimentary sequence being exposed only in the valleys of the Richmond River and its larger tributaries. The high divide to the north is capped by rhyolitic flows. The geological features of the valley are shown at Figure 16.

Stock water supplies can usually be obtained from bores in the sedimentary strata, the quality of the water varying with the particular beds which underlie the area.

In general it can be said that the Mallanganee Coal Measures and the Grafton beds yield brackish waters suitable only for stock, whilst the Tabulam Group and the Kangaroo Creek sandstones yield quite good quality waters which are usually suitable for domestic and garden use; yields rarely exceed 500 gallons per hour.

The basalts can usually be relied on to produce useful supplies of water from either bores or wells and also give rise to many springs. The waters are usually of relatively low salinity but are fairly hard. Yields range up to 1,000 gallons per hour.

However, the best potential for underground water is found in the alluvial flats of the two main valleys and in the sand beds near the coast. Discussion is simplified if nine sub-divisions of the valley are used.

Richmond River and Tributaries above Wiangaree.

The alluvial flats are narrow and often discontinuous, the valley side slopes being fairly steep with overlapping spurs common. Grevillia marks the upstream limit of continuous flats on the Richmond River; they also extend for several miles up Lynch's, Grady's and Findon Creeks.

The depth of the alluvium is variable, the greatest depth known being 87 feet in a bore in the flats immediately upstream of Wiangaree; it is said to have been finished in 8 feet of gravel. The static water level in the flats is roughly the level of the river, which is deeply entrenched in the alluvium.

Irrigation supplies of the order of 3,000 to 5,000 g.p.h. can be expected from bores or wells on most properties, but because of the elevation and steep gradient of the valley, considerable seasonal fluctuation of the water table can be expected. The aquifers are limited in extent and their reliability over prolonged dry seasons is suspect.

Wiangaree-Casino.

The alluvium is believed to be almost entirely fluviatile in origin. However, there may have been occasional incursions of the sea abov Casino, shells and silty muds typical of estuarine conditions having been reported in some bores.

The water quality varies considerably but as far as is known all underground waters analysed have proven suitable for irrigation of lucerne and pastures, provided soil drainage is good.

There is no direct evidence regarding the occurrence of underground water in sufficient quantities for irrigation, but it is considered that this area has the best potential of the alluvial flats in the whole valley, and that it may well be possible to obtain supplies of the order of 5,000 to 7,000 g.p.h. from screened bores.

Fawcett's and Eden Creeks.

These two creeks join the Richmond River just upstream of Kyogle and Casino respectively. The flats along Eden Creek are more extensive than those on Fawcett's Creek, and as much of the catchment of the former is underlain by sandstones it seems likely that hydrogeological conditions should be more favourable.

Samples from bores in the alluvium along Fawcett's Creek show the underground water to be suitable for the irrigation of most crops and it seems probable that the quality of the water in the Eden Creek flats would be slightly better than this.

In both valleys it should be possible to obtain water from either bores or wells in sufficient quantity for limited irrigation.

Casino-Coraki.

This area is typical of flats deposited under deltaic conditions, there being broad levees flanking the river. Between the levees and the side slopes of the valley there are extensive swampy areas.

As is to be expected in alluvium deposited under estuarine conditions, the quality of the underground water is very variable. Most wells yielding good quality water are in shallow sands on the levees, whilst those in the lower lying areas are often brackish.

In the levees good quality water is normally confined to shallow depths of the order of 20 feet, beyond which the salinity usually increases with depth. Because of their limited extent aquifers in such areas can be overpumped, with the result that poorer quality water is drawn into the aquifer either from the same level or from below.

Yields are normally adequate for stock, domestic and garden use, but it is unlikely that large supplies of good quality water can be obtained because of the limited thickness and extent of the sandy aquifers. Yields up to 2,000 g.p.h. may be obtainable from wells in the levees but in general the irrigation potential is believed to be poor.

North Arm above Lismore.

The alluvium associated with the North Arm and its numerous tributaries is of fresh water origin, except perhaps just upstream of Lismore. Much of the catchment is underlain by basalts and the rather clayey material derived from them can be expected to produce relatively impermeable alluvium.

Useful, though limited supplies (up to 3,000 - 4,000 g.p.h.) could probably be obtained from wells in the valleys of the main tributaries.

Lismore - Coraki.

Surface and sub-surface conditions are similar to those in the Casino-Coraki area. The plains are much less extensive, but there is little doubt that the sediments are deltaic.

Water qualities are variable, the best quality being found in shallow wells in the levees, where the largest yields also occur. However, yields in excess of 3,000 g.p.h. are unlikely.

South Arm.

There are extensive alluvial flats in the valley of Myrtle Creek which combines with Myall Creek to form the South Arm. Much of the area is of relatively low relief and swampy conditions are widespread, as in the Casino-Coraki area.

Water quality is expected to be variable, because of the estuarine origin of some of the alluvial deposits and the extensive outcrops of the Grafton beds, which themselves yield rather brackish water and would give rise to poorer quality water in the fringes of the alluvial plains.

Some good quality supplies, suitable for irrigation on a limited scale, are likely from favourably located wells, but in general the groundwater potential of this area, both as regards quality and quantity is believed to be poor.

Coraki - Ballina.

Broad levees flank each side of the river and the tributaries from the hills to the north have also built up levees. Much of the area behind the levees is too low to drain by normal methods and is undeveloped. From Riley's Hill to Ballina the river runs between alluvial flats of quite recent origin, the flats appearing to overlie the beach sands which outcrop at Wardell and on the Woodburn-Broadwater road.

Further downstream, and to the north of Ballina are extensive coastal swamps whilst along the coast are sand beds which are discussed more fully below.

Bores and wells are fairly common in the developed parts of this internal delta, but the water quality is variable. Wells in the levees usually yield water of quite good quality whilst those in the swamps produce brackish water. Yields are usually less than 1,000 g.p.h.

Coastal Sand Beds.

The extent and location of these beds is shown on the geological map at Figure 16, the total area being about 30 square miles. The vegetation is mainly low scrub and some parts are swampy with considerable accumulations of decayed vegetable matter. These latter conditions give rise to peaty water, a common phenomenon in almost all such sandy areas. Anaerobic conditions and the presence of sulphide producing bacteria are responsible for the presence of hydrogen sulphide in many of the waters.

Analyses indicate the salinity of most underground waters to be low, but they often contain iron and are usually quite acid.

It should be possible to obtain appreciable supplies of water from batteries of spear points or sand packed bores in much of this area. An approximation based on a 50 inch rainfall and 20 percent infiltration suggests that it may be possible to extract several million gallons of water per day from these beds. The cost of extraction, treatment and reticulation would be the deciding factor in its utilization, because of the distance of this source of underground water from the areas where it could be used to best advantage.

5. STREAM GAUGING STATIONS.

Streamflow is the component of precipitation which manifests itself as surface flows in rivers and streams. As it governs the economic and engineering aspects of schemes for irrigation development, town and commercial water supply and hydro-electric generation, it is a most important element for consideration in the appraisal of any such proposals.

In view of the importance of basic streamflow data in the investigation of surface water resources, it is necessary to collect adequate records of streamflow in a valley.

Streamflow records are obtained by establishing gauging stations on the various streams in a valley, at which records of river heights are obtained and flows measured over a range of heights. Using these heights and flow measurements, the stream flows are then calculated.

The measurement of streamflows in the Richmond Valley commenced with the establishment of stream gauging stations on Wilson's Creek at Goonengarry and Cooper's Creek at Repentance in 1920. These stations, which were established for the purpose of investigation of proposals for hydro-electric schemes, were discontinued in 1929. A station which was established for similar purposes on Emigrant Creek at Knockrow in 1921 was discontinued in 1927.

No streamflows were measured in the Richmond Valley from 1929 to 1943 when gauging stations were established on the Main Arm at Wiangaree Bridge and Casino and on Lynch's Creek at Wiangaree. Since 1943 additional stations have been established and at the present time the Water Conservation and Irrigation Commission is operating a total of twelve gauging stations so located as to measure the runoff from about one third of the total area of the Valley and to provide reasonable data for use in investigation of water resources proposals.

However, it should be noted that, due to the extensive sections of river channels of the Richmond River and tributaries which are subject to tidal influence, it would not be possible to accurately measure runoff from all sections of the Basin. It is estimated that, provided suitable sites existed for installation of stream gauging stations, the maximum area for which runoff measurements could be obtained would represent not more than about two thirds of the total area of the Basin.

Among the currently operated stations are the original gauging stations on Cooper's and Emigrant Creeks which have been re-established for water resources purposes. The locations of the existing and discontinued gauging stations are shown on Figure 17 and relevant details concerning each station are given in Table 7.

TABLE 7

Stream	Station	Catchment Area in Square Miles	Type of Gauge	Period of Operation
Richmond River	The Risk	220	Staff gauge	1950 to date
Lynch's Creek	Wiangaree*	44	Staff gauge	1943 to 1961
Richmond River	Wiangaree	271	Staff gauge	1943 to date
Richmond River	Casino	690	Staff gauge	1943 to date
Back Creek	Bentley	42	Pressure recorder	1951 to date
Leycester Creek	Rock Valley	69	Staff gauge	1951 to date
Goolmagar Creek	Coffee Camp	42	Staff gauge	1951 to date
Terania Creek	Blakes	17	Staff gauge	1947 to date
Cooper's Creek	Repentance	24	Pressure recorder	1920 to 1929) 1951 to date)
Wilson's Creek	Goonengarry*	11	Staff gauge	1920 to 1929
Wilson's Creek	Federal	21	Pressure recorder	1952 to date
Byron Creek	Binna Burra	15	Pressure recorder	1951 to date
Wilson's Creek	Eltham	86	Float recorder	1957 to date
Emigrant Creek	Knockrow	7.3	Float recorder	1921 to 1927) 1959 to date)

* Discontinued stations

The present density of gauging stations in the Richmond Valley is about five stations per 1,000 square miles. This density compares favourably with the present densities per thousand square miles for Coastal New South Wales (four stations), Australia (0.3 stations) and with the American density of less than three stations per thousand square miles.

Notwithstanding the present favourable position concerning station density, the Commission proposes to expand the existing network, particularly on the South and Middle Arms and their tributaries, with the installation of an additional nineteen stations and the improvement of the standard of river level recording at the more important of the existing stations.

The ultimate coverage of gauging stations to be provided by the proposed network has been designed so as to yield adequate data for the investigation of all future water resources proposals in the Valley.

6. CATCHMENT YIELDS.

The water yield of a catchment is related to the amount of precipitation, type of vegetation, topography and size of catchment. The continuous measurement of streamflow at the stream gauging stations has provided a considerable volume of information for determination of water yield within the Richmond Valley.

The yields at existing and discontinued stations in the Valley for the period of complete years of computed record are given in Table 8.

TABLE 8

Stream	Station	Complete Years of Computed Records	Average Yield over Period of Complete Years of Record		
			Ac.Ft. /Annum	Cusecs	Gallons /Minute
Richmond River	The Risk	10	242,800	333	124,000
Lynch's Creek	Wiangaree*	17	99,600	136	51,000
Richmond River	Wiangaree	22	304,600	417	156,000
Richmond River	Casino	22	616,000	844	315,000
Back Creek	Bentley	14	45,300	62	23,000
Leycester Creek	Rock Valley	14	95,600	131	49,000
Goolmagar Creek	Coffee Camp	14	87,400	120	45,000
Terania Creek	Blakes	18	82,900	114	42,000
Cooper's Creek	Repentance	17	85,300	117	44,000
Wilson's Creek	Goonengarry*	8	62,400	85	32,000
Wilson's Creek	Federal	11	46,900	64	24,000
Byron Creek	Binna Burra	14	39,700	54	20,000
Wilson's Creek	Eltham	8	175,900	241	90,000
Emigrant Creek	Knockrow	6	14,800	20	8,000

* Discontinued stations.

Details of the recorded maximum, minimum and mean streamflows for each month of record for the gauging stations on the Richmond River at Casino and Wiangaree and for the North Arm tributaries, Back Creek at Bentley, Leycester Creek at Rock Valley, Goolmagar Creek at Coffee Camp, Terania Creek at Blakes, Cooper's Creek at Repentance, and Wilson's Creek at Federal are tabulated in Appendices 17 to 24 respectively.

7. AVERAGE ANNUAL RUNOFF.

Due to the lack of adequate long term streamflow records in the Richmond River Valley as indicated in the previous section, the current estimate of the long term average annual runoff of the Valley has been partly based on streamflow correlations with the adjoining Clarence River catchment for which streamflow records are available from 1922.

On this basis the average annual runoff from the Richmond River Valley has been assessed as being of the order of 1,600,000 acre feet per annum which is equivalent to a continuous rate of flow of 2,190 cusecs or 820,000 gallons per minute.

These surface water resources per square mile of catchment are more than 50 percent greater than the average for Coastal New South Wales and are equivalent to about six times the average for Australia.

The volume of annual runoff represents approximately 22 percent of the average annual rainfall over the valley and may be compared with the estimated runoff statistics for the adjoining Tweed and Brunswick Basins as set out in Table 9.

TABLE 9

Basin	Catchment Area in Square Miles	Runoff		
		Acre Feet Per Annum	Acre Feet per Annum per Square Mile	Percentage Runoff
Richmond River	2,680	1,600,000	600	22
Tweed River	430	390,000	910	26
Brunswick River	190	220,000	1,160	32

The above comparison indicates that the percentage runoff from the Richmond River Basin is significantly less than that from the Tweed and Brunswick Rivers. This factor is probably attributable to the relative sizes of the three basins as percentage runoff of a catchment is generally inversely proportional to its area.

8. VARIABILITY OF STREAMFLOWS.

Available records indicate that streamflows in the Richmond Valley are subject to a high degree of variability. Over the period of streamflow record the annual flow of the Main Arm at Casino has varied from about 20 percent to about 230 percent of the annual average flow. The North Arm tributaries show generally similar variations in their annual flows and at Leycester Creek at Rock Valley, the variation has been from about 12 percent to about 200 percent of the average annual flow.

The degree of variability in monthly flow is even more marked. At Casino the monthly flow has varied from a minimum of about one hundredth to a maximum of nearly twelve times the average monthly flow.

A comparison of the monthly streamflow variations during the period of record for the Main Arm stream gauging stations Casino and Wiangaree is shown on Figure 18. A similar comparison for the North Arm stream gauging stations Terania Creek at Blakes, Leycester Creek at Rock Valley and Wilson's Creek at Federal is shown on Figure 19. These diagrams indicate that there is a general similarity in behaviour of streamflow at the stream gauging stations on the North and Main Arms of the river.

The highest recorded flood during the period of streamflow record in the Richmond Valley occurred during February, 1954. Most streams in the Valley reached their highest levels in the history of white settlement and peak discharges for the Main Arm at Casino and the North Arm at Lismore have been estimated at 150,000 and 180,000 cusecs, respectively. A total discharge of 415,000 acre feet which was estimated to have passed the Casino gauging station during this month represents almost 70 percent of the long term average annual discharge.

One of the most severe sequences of low flow in the Main Arm of the Richmond River since the commencement of stream gauging, occurred in the period from September, 1957 to April, 1958 when the discharge at Casino was less than 20 cusecs (7,500 gallons per minute) for a period of fifty-eight consecutive days and less than 10 cusecs (3,750 gallons per minute) for twenty-nine days. The lowest flow recorded was 1 cusec (375 gallons per minute). The flows in other streams in the valley during this period also rank amongst the lowest on record.

Although streamflows ceased completely for twelve days downstream of Casino Weir during April, 1965 the most prolonged sequence of low flows at Casino were those which occurred in 1957-58.

A quantitative indication of streamflow variation at selected stream gauging stations is given in Table 10. This table shows the maximum, minimum and mean discharges for these stations over the period of computed record.

Reference to Table 10 on page 20 shows that over the period of available streamflow records, the flow of the Main Arm at Casino has varied from zero to about 150,000 cusecs. The tributaries of the North Arm have also shown high variability. Leycester Creek at Rock Valley has experienced flows varying from zero to about 40,000 cusecs since the commencement of streamflow measurement at this station in 1951.

The catchment areas of the stations at Casino and Rock Valley are 690 and 69 square miles respectively. On a catchment area basis the flow per square mile of catchment has varied from zero to about 220 cusecs per square mile at Casino and from zero to about 580 cusecs per square mile at Rock Valley.

TABLE 10

Stream	Station	Period of Computed Records	Computed Discharge in Cusces (Equivalent Discharge Gallons per Minute)		
			Maximum	Minimum	Mean
Richmond River	Wiangaree	May 1943 to December 1965	145,000 (94,200,000)	3 (1,100)	412 (154,000)
Richmond River	Casino	May 1943 to December, 1965	150,000 (56,100,000)	0	831 (311,000)
Back Creek	Bentley	August 1951 to December 1965	27,500 (10,300,000)	0	61 (23,000)
Leycester Creek	Rock Valley	August 1951 to December 1965	40,000 (15,000,000)	0	129 (48,000)
Goolmagar Creek	Coffee Camp	August, 1951 to December 1965	27,000 (10,100,000)	0	117 (44,000)
Terania Creek	Blakes	May 1947 to December 1965	20,000 (7,500,000)	0.1 (40)	110 (41,000)
Cooper's Creek	Repentance	February,1920 to December 1927. August 1951 to December 1965	24,000 (9,000,000)	0	112 (42,000)
Wilson's Creek	Federal	February 1952 to December 1965	33,300 (12,500,000)	0	62 (23,000)

9. PERSISTENCE OF STREAMFLOWS.

In general, streamflows in the Richmond Valley persist for extended periods after the cessation of runoff producing rainfall and therefore it appears that the Valley has a high groundwater storage capacity which is able to sustain flow in streams for some considerable time without the occurrence of significant rainfall.

An indication of the persistence of dry weather flows in the Richmond Valley may be obtained from an examination of flow duration curves which have been constructed for the gauging stations at Wiangaree and Casino on the Main Arm, Terania Creek at Blakes, Wilson's Creek at Federal, Goolmagar Creek at Coffee Camp, Leycester Creek at Rock Valley, Back Creek at Bentley and Cooper's Creek at Repentance.

The duration curve of flow for the Richmond River at Wiangaree (Figure 20) is based on 22 years of record commencing in 1943. The frequencies of flow during this period are shown in Table 11:

TABLE 11

Percent of Time Flow Equalled or Exceeded	Corresponding Flows	
	Cusecs	Gals./Min.
10	480	180,000
30	180	67,000
50	80	30,000
70	40	15,000
90	25	9,000
95	20	7,500
100	3	1,100

The duration curve for the Richmond River at Casino (Figure 21) is also based on a 22 year period of record, commencing in 1943. The frequencies of flow at this station during the period of records are tabulated in Table 12:

TABLE 12

Percent of Time Flow Equalled or Exceeded	Corresponding Flows	
	Cusecs	Gals./Min.
10	1,120	420,000
30	330	120,000
50	160	60,000
70	90	34,000
90	35	13,000
95	20	7,500
100	0	0

The duration curve for Back Creek at Bentley (Figure 22) is based on a period of records of 14 years commencing in 1951. The frequency of flows during this period is given in Table 13.

TABLE 13

Percent of Time Flow Equalled or Exceeded	Corresponding Flows	
	Cusecs	Gals./Min.
10	75	28,000
30	20	7,500
50	10	3,700
70	4	1,500
90	2	750
95	1	370
100	0	0

The duration curve for Leycester Creek at Rock Valley (Figure 23) is based on a 14 year period of record, commencing in 1951. The frequencies of flow during the period are tabulated in Table 14:

TABLE 14

Percent of Time Flow Equalled or Exceeded	Corresponding Flows	
	Cusecs	Gals./Min.
10	160	60,000
30	45	17,000
50	20	7,500
70	10	3,700
90	4	1,500
95	2	750
100	0	0

The duration curve for Goolmagar Creek at Coffee Camp (Figure 24) is based on a 14 year period of record, commencing in 1951 and indicates the frequencies of flow given in Table 15:

TABLE 15

Percent of Time Flow Equalled or Exceeded	Corresponding Flows	
	Cusecs	Gals./Min.
10	170	64,000
30	43	16,000
50	20	7,500
70	9	3,400
90	3	1,100
95	1	370
100	0	0

The duration curve for Terania Creek at Blakes (Figure 25) is based on an eighteen year period commencing in 1947 and indicates the frequencies of flow given in Table 16:

TABLE 16

Percent of Time Flow Equalled or Exceeded	Corresponding Flows	
	Cusecs	Gals./Min.
10	150	56,000
30	38	14,000
50	20	7,500
70	11	4,100
90	4	1,500
95	2	750
100	0.1	40

The duration curve for Cooper's Creek at Repentance (Figure 26) is based on a period of record of twenty years extending from 1920 to 1927 and recommencing in 1951. This curve indicates the frequency of flows to be as given in Table 17.

TABLE 17

Percent of Time Flow Equalled or Exceeded	Corresponding Flows	
	Cusecs	Gals./Min.
10	235	88,000
30	62	23,000
50	24	9,000
70	12	4,500
90	4	1,500
95	3	1,100
100	0	0

The duration curve for Wilson's Creek at Federal (Figure 27) is based on a 13 year period of record, commencing in 1952. The frequencies of flow during the period are tabulated in Table 18.

TABLE 18.

Percent of Time Flow Equalled or Exceeded	Corresponding Flows	
	Cusecs	Gals./Min.
10	100	37,000
30	30	11,000
50	12	4,500
70	7	2,600
90	4	1,500
95	2	750
100	0	0

To permit a more direct comparison of flow characteristics of the Richmond River and its tributaries, composite flow duration curves have been plotted at Figure 28. These curves which are based on discharge per square mile of catchment indicate that the North Arm tributaries located in the eastern section of the plateau above Lismore exhibit the best low flow persistence. The most favourable low flow characteristics are exhibited by Terania Creek and Cooper's Creek.

10. OCCURRENCE OF FLOODING.

Historical records of flood levels at Coraki since 1857 indicate that the Richmond River valley experiences a medium or major flood on an average of about once every three years. In this report a medium or major flood has been adopted as a flood during which the peak level exceeds a level of 15 feet (Ballina Low Water Datum) at Coraki. A diagram which indicates the magnitudes and dates of occurrence of floods above this level is given at Figure 29.

A large proportion of these floods have occurred during the months of January, February and March as a result of intense rainfall associated with tropical cyclonic depressions. It is of interest to note that since 1857 only two floods have occurred during the Spring months of September to November inclusive.

Since records were commenced in 1857 the most severe sequence of floods above fifteen feet at Coraki occurred during the periods from 1889 to 1895 when 11 floods were experienced in 7 years and from 1945 to 1956 when 16 floods were recorded in 12 years.

The highest recorded flood at Coraki occurred in February, 1893 when a level of 22.8 feet was reached. However there is little reliable information for this flood.

The second highest recorded flood at Coraki occurred in February 1954 when the river reached a peak height of 22.61 feet. A comparison of the peak heights and estimated peak discharges at Casino and Lismore for this flood is given in Table 19.

TABLE 19

Location	Peak Height (Referred to Low Water Ballina Datum)	Estimated Peak Discharge (Cusecs)
Casino	82.45 ft.	150,000
Lismore	43.65 ft.	180,000

It has been estimated that an area of about 300 square miles of the valley is subject to flooding. As much of this area is rich alluvial land used for dairying and cultivation, substantial stock and property losses occur as a result of flooding of the Richmond River.

A programme of flood mitigation works to alleviate the effects of medium and major floods was commenced by the Richmond River County Council in 1960. When completed, these works will provide a degree of relief against damage and losses from flooding at Lismore and Casino and in the valleys downstream of these towns.

However as the programme of works does not include flood mitigation dams, the works are not expected to have any significant effect on the volume of flood runoff in the valley.

11. DROUGHT PERIODS.

The term "drought" is difficult to define, but is often applied to a period when the soil moisture is insufficient for the requirements of most crops during the growing season. A shortage of water for domestic, municipal or industrial use, which arises as a result of below average precipitation, is also commonly regarded as a drought condition. A diminished rate of streamflow, as a result of a decline in precipitation is normally a prime indicator of drought conditions.

A diagram showing annual rainfall recorded at Casino is appended as Figure 30. This diagram indicates that the lowest calendar year rainfall for Casino was 19.29 inches in 1902 and the next lowest was 19.73 inches in 1915. The longest sequence of below average falls occurred from 1940 to 1946 and the lowest 5 year period occurred from 1940 to 1944 inclusive. Other protracted sequences of low rainfall years were registered from 1880 to 1885 and 1911 to 1915.

Since the commencement of regular recording of streamflow in 1943 the lowest calendar year rainfalls at Casino have been 24.31 inches in 1957 and 24.90 inches in 1960. However during the 12 month period ending 31st May, 1965 only 21.37 inches were recorded at Casino.

The lowest flow recorded over a twelve monthly period on the Main Arm at Casino occurred from July, 1964 to June, 1965 inclusive. The total runoff during this period was only about 57,000 acre feet (less than one tenth of the average annual flow) and the average discharge over the period was 78 cusecs (29,000 gallons per minute). The corresponding flow during the same period at Wiangaree was 33,000 acre feet, equivalent to an average discharge of 45 cusecs (17,000 gallons per minute).

The lowest recorded twelve monthly flows for stations on the North Arm tributaries also occurred during 1964 to 1965. Details of these flows are given in Table 20.

TABLE 20

Stream	Station	Period of Records	Minimum Recorded Twelve Monthly Flow				
			Period	Ac.Ft.	Average Discharge		Percent of Average
					Cusecs	Gals./Min.	
Back Creek	Bentley	1951 to date	July 1964 to June 1965	3,200	4	1,600	7%
Leycester Creek	Rock Valley	1951 to date	July 1964 to June 1965	7,400	10	3,800	8%
Goolmagar Creek	Coffee Camp	1951 to date	July 1964 to June 1965	12,000	16	6,100	14%
Terania Creek	Blakes	1947 to date	July 1964 to June 1965	8,900	12	4,600	11%
Cooper's Creek	Repentance	1920 to 1927 1951 to date	June 1964 to May 1965	9,500	13	4,900	11%
Wilson's Creek	Federal	1952 to date	June 1964 to May 1965	5,000	7	2,600	11%

Available streamflow records indicate that on occasions the Main Arm at Casino and the North Arm tributaries above Lismore have either ceased to flow or been reduced to the merest trickle. Periods of extremely low or no flow occurred in 1953 to 1954, 1957 to 1958 and 1964 to 1965.

The Richmond River at Casino ceased to flow for a total period of 19 days during March and April 1965. However over a 60 day period from 29th November 1957 to 27th January 1958 inclusive, the total flow was only about 1,340 acre feet which is equivalent to an average rate of flow of about 11 cusecs or 4,200 gallons per minute. The minimum flow during this 60 day period was 1 cusec or 375 gallons per minute.

Leycester Creek at Rock Valley ceased to flow for a total of 13 days during December 1957 and January 1958 and the flow was less than 2 cusecs (750 gallons per minute) continuously from 29th November 1957 to 12th January 1958.

The lowest flow recorded at Terania Creek at Blakes is 0.1 cusecs (38 gallons per minute) and occurred over a 7 day period in December 1953. The total flow for December 1953 was only 51 acre feet which is equivalent to an average flow of about 0.8 cusecs (300 gallons per minute).

The flow in Wilson's Creek at Federal ceased for continuous periods of 12 days during December 1953 and 2 days during January 1954. The total flow for December 1953 was 29 acre feet which is equivalent to an average flow of about 0.5 cusecs (190 gallons per minute).

The streamflow records for Back Creek at Bentley, Goolmagar Creek at Coffee Camp and Cooper's Creek at Repentance indicate that these streams have ceased to flow on several occasions.

12. THE 1964 TO 1965 DROUGHT.

From May 1964 to May 1965, a period of extremely low rainfall was experienced over the Richmond Valley. The twelve monthly rainfall of about 21 inches at Casino to 31st May 1965 is the lowest twelve monthly total since 1915 to 1916 when about 20 inches were recorded for the twelve months to January 1916. Lower aggregate twelve monthly falls have been registered at Casino in only about 4 years since 1879 with the lowest being about 15 inches from November 1901 to October 1902.

The recorded monthly rainfalls at four selected locations in the valley since May 1964 are given in Table 21.

TABLE 21

Month	Rainfall in Points			
	Casino	Lismore	Kyogle	Ballina
May 1964	274	425	411	803
June 1964	68	141	64	264
July 1964	106	156	136	160
August 1964	66	100	28	87
September 1964	78	115	64	146
October 1964	124	129	75	219
November 1964	420	427	526	758
December 1964	215	260	334	420
January 1965	315	328	414	310
February 1965	254	406	143	556
March 1965	40	147	38	250
April 1965	304	317	246	500
May 1965	137	161	87	357
June 1965	356	852	624	1,066
July 1965	1,074	1,207	1,813	1,139
August 1965	194	398	418	463
September 1965	198	151	286	83
October 1965	115	66	189	199
November 1965	271	506	345	144
December 1965	789	1,169	990	1,116
January 1966	35	82	86	145
February 1966	640	657	888	692
March 1966	207	145	233	118
Totals May 1964 to March 1966	6,280	8,345	8,438	9,995
Totals June 1964 to May 1965	2,127	2,687	2,155	4,027

Streamflows in the Richmond River and its tributaries for a 12 month period from mid 1964 to mid 1965 have been the lowest experienced since records were commenced in 1943. The total flow of the Richmond River at Casino for a twelve month period from July 1964 to June 1965 and the minimum twelve monthly flows recorded at Casino in other drought periods are compared in Table 22.

TABLE 22

Period	Total Volume in Acre Feet	Average Flow in Gallons Per Minute
July 1964 to June 1965	57,000	29,000
April 1957 to March 1958	67,900	35,000
August 1951 to July 1952	127,500	66,000
April 1944 to March 1945	107,700	56,000

Extremely low stream flows were recorded in the valley during March and April 1965. At Casino the Richmond River ceased to flow for the first time since records were commenced in 1943. However the minimum flow during this period at Wiangaree was 11 cusecs (4,100 gallons per minute).

On the North Arm, Wilson's Creek at Federal ceased to flow for one day and the flow in Leycester Creek at Rock Valley, Goolmagar Creek at Coffee Camp and Back Creek at Bentley was less than 0.5 cusecs (190 gallons per minute) at some stage during the period. The minimum flows recorded for Cooper's Creek at Repentance and Terania Creek at Blakes during the March to April 1965 period were 1.2 cusecs (450 gallons per minute) and 2 cusecs (750 gallons per minute) respectively. However, with the exception of Terania Creek, these North Arm tributaries have ceased to flow at some stage during their period of records.

A comparison of the minimum recorded 60 day flow of the Main Arm and selected North Arm tributaries during the 1964 to 1965, 1957 to 1958 and 1953 to 1954 droughts is given in Table 23.

TABLE 23

Stream	Station	Minimum 60 Day Flow (Acre Feet)		
		1964-65	1957-58	1953-54
Richmond River	Casino	1,480	1,340	1,830
Richmond River	Wiangaree	1,670	1,700	1,530
Leycester Creek	Rock Valley	214	114	132
Terania Creek	Blakes	454	475	122
Wilson's Creek	Federal	187	170	87

13. WATER REQUIREMENTS FOR CURRENT DEVELOPMENT.

Dairying, beef cattle raising and the growing of vegetables and tropical crops such as bananas and sugar cane are the major agricultural activities in the Richmond River Valley.

The area authorised for irrigation by license under the Water Act, has increased from 600 acres at June 1947 to about 6,500 acres at June, 1965. A graph showing the growth in licensed area since 1947 is appended at Figure 31.

Except for minor seasonal variations following wet and dry years, the rate of increase in both licensed area and number of licenses since 1947 has been fairly uniform. However, while the number of licenses and authorities for irrigation have increased from 64 at June 1947 to 424 at June 1965, the average acreage applicable to each license has remained fairly constant at about 14 acres.

A total of 50 licenses permitting a maximum diversion of up to 21,500 gallons per minute (58 cusecs) for town and commercial water supplies were current at the end of June, 1965.

Up to the present time no major water conservation storages have been constructed in the valley. However, several minor dams have been built by local councils for town and commercial water supply and hydro-electric power generation.

The Mullumbimby Municipal Council operates a small hydro-electric and water supply storage on the headwaters of Wilson's Creek. This scheme, which was commissioned in 1926, is licensed to divert stream-flow from Wilson's Creek into the Brunswick River system at a maximum rate of 20 cusecs (7,500 gallons per minute). However the capacity of the diversion storage is only 30 million gallons (110 acre feet) which is equivalent to less than three days operation at maximum capacity and operation of the scheme is therefore restricted during periods of low flow.

The Rous County Council operates a storage on Rocky Creek above Lismore to augment the water supply to Lismore. This dam, which was constructed in 1952, has a storage capacity of approximately 11,000 acre feet and is capable of diverting a maximum discharge of 10 cusecs (3,800 gallons per minute).

In addition, several small weirs have been constructed on the Main Arm of the Richmond River for water supply purposes. However, the total storage capacity of these weirs is relatively insignificant.

The estimated maximum requirements under present conditions for irrigation under license, water supply, riparian usage and river losses are given in Table 24.

TABLE 24.

Requirement	Cusecs	Gallons per Minute
Irrigation under license (6,500 acres at 2 feet per season).	27	10,100
Town and commercial water supplies.	58	21,700
Riparian usage and losses	25	9,300
Total present requirements	110	41,100

Analysis of the total water requirements of individual tributary basins has indicated that for limited periods during the critical low flow period in 1965, discharges in a number of streams were insufficient to fully meet estimated requirements. The major deficiencies in supplies occurred on the headwater tributaries of the Main Arm. In comparison flows in the tributaries of the North Arm during this critical period were generally adequate to meet estimated requirements.

14. POSSIBLE IRRIGATION DEVELOPMENT.

Tidal influence extends to points about 5 miles upstream of Lismore on the North Arm and 2 miles downstream of Casino on the Main Arm. In the lower reaches excessive salinity precludes the use of streamflow for irrigation and although some useful supplies may be obtained in the upstream section of tidal influence, areas below Coraki including those on the South Arm, are largely dependent upon the availability of underground water supplies for irrigation development.

Consideration of available topographic information indicates that utilisation of streamflow for irrigation will be largely restricted to river frontage land, the most extensive areas of which are situated on the Main Arm and its tributaries. However, fairly extensive river frontage areas also exist along the North Arm from Lismore to Coraki and to a lesser extent along the tributaries above Lismore.

A preliminary assessment has indicated that the total area suitable for irrigation from streamflow is of the order of 107,000 acres. Details of this area are given in Table 25.

TABLE 25

Location	Approximate Area Suitable for Irrigation from Streamflow (acres)
Main Arm Above Coraki	60,000
Main Arm Tributaries	30,000
North Arm	11,000
North Arm Tributaries	6,000
Total Area	107,000

If the whole of the 90,000 acres on the Main Arm and tributaries were irrigated with 2 feet of water per annum, the average water requirement excluding transmission losses during an eight month irrigation season would be about 370 cusecs (140,000 gallons per minute). Allowance for increased river requirements for water supply and other purposes would increase the average requirement during the irrigation season to about 400 cusecs (150,000 gallons per minute). This total requirement represents approximately 48 percent of the average flow of the Main Arm at Casino.

Excluding the areas on tributary streams, the total average requirement for the Main Arm alone would be about 270 cusecs (100,000 gallons per minute) or approximately 30 percent of the average flow at Casino.

The estimated maximum irrigable area of 17,000 acres on the North Arm and tributaries would, assuming an annual usage of 2 feet of water, have an average requirement during the irrigation season of about 70 cusecs (26,000 gallons per minute). Estimated increases in demands for water supply and other purposes would make the total requirement about 95 cusecs during irrigation months or slightly less than 10 percent of the estimated average flow of the North Arm at Lismore.

The total average irrigation season requirement downstream of Lismore, (on the basis of an irrigated area of 11,000 acres) is estimated to be about 73 cusecs (27,000 gallons per minute).

Preliminary analyses based on available streamflow records indicate that in order to provide the estimated requirements of the maximum areas of 60,000 acres and 11,000 acres on the Main and North Arms respectively, during a repetition of the worst recorded sequence of low flows, the following storage volumes would be required;

(i) a storage of about 115,000 acre feet capacity on the Main Arm near Grevillia, and;

(ii) a storage of about 10,000 acre feet capacity on the Northern Arm tributary, Leycester Creek near the gauging station at Rock Valley.

Under critical low flow conditions it would be necessary to provide releases from the above storages to supplement natural flows in the Main Arm for about 40 percent of the time and in the North Arm for about 20 percent of the time.

Although the water requirements for possible development along the Main and North Arms could be met from these storages, full development of available irrigable areas on tributary streams of both the Main and North Arms would be contingent upon the construction of small regulating storages on each headwater stream.

15. INVESTIGATIONS OF DAM SITES.

Since 1953 some thirty-seven possible dam sites in the valley have been considered by the Water Conservation and Irrigation Commission. Twenty-four of these sites were for flood mitigation purposes, while the remaining thirteen sites were for water conservation purposes.

The possible flood mitigation dam sites were considered in connection with investigations undertaken by the Richmond River Flood Mitigation Committee. This Committee, which was comprised of representatives of the Department of Public Works, Soil Conservation Service, Water Conservation and Irrigation Commission and the Richmond-Tweed Regional Development Committee was appointed in 1948 to report on the practicability of providing effective relief against damage and losses by floods in the Richmond River and to advise the nature of the works required.

Nine of the possible flood mitigation dam sites were considered sufficiently suitable to warrant further investigation. However the Richmond River Flood Mitigation Committee's final report issued in 1958 recommended against the construction of flood mitigation storages and consequently further investigations of these nine sites were not undertaken.

A total of eight water conservation dam sites have been considered sufficiently promising to warrant further investigation. These sites

are situated on the Main Arm of the Richmond River and its tributaries - Horseshoe, Warrazambil, Lynch's, Findon, Eden, Iron Pot and Mummulgum Creeks.

In view of the present use made of streamflow for irrigation along the Main Arm and its tributaries and the additional areas suitable for development, investigations are currently being undertaken for small regulating storages on Eden, Iron Pot, Horseshoe and Mummulgum Creeks. However, further field survey and foundation drilling at the dam sites on these streams will be necessary before the economic aspects of the proposals can be fully considered and the optimum storage capacities determined. Arrangements are being made to complete these field investigations at an early date.

The locations of the dam sites on Eden, Iron Pot, Horseshoe and Mummulgum Creeks and the sites on the Main Arm at Grevillia and on Leycester Creek which were referred to in Section 14 are shown on Figure 32.

16. ACKNOWLEDGMENT.

The Water Conservation and Irrigation Commission wishes to acknowledge the assistance given by The Director, Bureau of Meteorology in providing the Section on Climatic Features, the Rainfall Statistical Data and the Richmond Valley Median Rainfall Maps.

BALLINA RAINFALL STATISTICS
(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1892			NO RECORDS				325	189	243	948	364	616	
1893	981	3067	1206	692	111	1226	706	893	66	394	572	483	10397
1894	1360	781	1446	600	932	314	36	186	991	370	342	1250	8608
1895	2450	503	409	478	240	265	74	216	240	256	198	747	6076
1896	334	1570	493	311	503	197	296	287	238	139	1647	516	6531
1897	166	460	847	31	332	1344	606	485	400	242	328	2039	7280
1898	1472	1415	794	236	811	921	470	646	197	499	77	359	7897
1899	1060	829	92	544	1414	412	1744	1682	568	453	180	815	9793
1900	190	550	242	225	1322	1326	431	0	230	0	456	311	5283
1901	190	390	1115	707	728	616	784	625	424	296	10	102	5987
1902	395	513	238	1336	491	219	297	447	83	270	181	186	4656
1903	133	225	326	85	727	586	857	231	470	466	867	370	5343
1904	297	62	1199	1171	888	174	384	148	76	257	170	242	5068
1905	252	274	320	1320	998	158	18	143	28	295	107	419	4332
1906	463	1325	826	116	621	300	17	341	289	360	117	812	5587
1907						NO RECORDS							
1908	174	1386	513	1022	676	238	212	916	146	88	312	369	6052
1909	166	945	599	701	240	260	625	452	371	174	583	317	5433

BALLINA RAINFALL STATISTICS
(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1910	608	702	1110	1079	350	767	47	253	384	206	288	534	6328
1911	894	380	530	305	300	205	244	569	28	374	92	138	4059
1912	65	261	904	173	557	681	2129	223	74	239	373	82	5761
1913	427	1054	289	552	1342	1214	1194	0	438	91	120	221	6942
1914	236	198	1204	59	503	1230	1424	589	506	804	110	406	7269
1915	302	291	39	252	713	193	338	326	97	10	65	179	2805
1916	276	910	337	1067	574	302	491	220	803	696	423	563	6662
1917	438	788	739	633	978	100	77	244	525	217	1312	227	6278
1918	875	208	715	981	596	197	175	444	406	66	202	151	5016
1919	409	316	785	950	1762	378	611	291	32	274	79	202	6089
1920	1212	329	330	689	1080	185	541	195	516	613	679	264	6633
1921	960	325	424	790	2360	899	1109	339	555	209	150	901	9021
1922	564	1135	419	34	517	766	1061	186	426	183	26	453	5770
1923	229	227	391	1921	63	253	320	610	114	85	78	353	4644
1924	642	395	400	224	342	1241	1276	361	88	317	327	215	5828
1925	816	151	2443	880	972	463	285	1123	0	341	1335	818	9627
1926	582	46	1515	230	458	737	299	372	118	0	0	592	4949
1927	2562	936	805	580	72	785	82	49	829	318	846	1029	8893

Appendix 1
Sheet 3

BALLINA RAINFALL STATISTICS
(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1928	860	1197	342	635	940	444	406	321	80	256	94	513	6088
1929	1293	920	1614	1236	937	618	969	252	185	432	192	271	8919
1930	798	256	2119	889	2173	1409	337	530	129	296	22	228	9186
1931	287	2223	1242	971	308	465	257	412	73	269	476	962	7945
1932	63	216	70	826	925	408	339	354	464	366	348	155	4534
1933	1023	275	484	1232	713	1158	1254	105	796	474	825	816	9155
1934	443	1187	290	884	2308	155	1536	248	446	368	614	543	9022
1935	1008	943	1246	669	1099	248	612	302	898	249	107	361	7742
1936	492	305	948	319	1738	211	414	92	409	268	84	1063	6343
1937	626	987	2520	876	109	880	962	611	49	742	1653	440	10455
1938	989	1465	725	434	1774	364	1179	488	232	212	312	88	8262
1939	641	140	2376	764	556	268	489	260	213	889	197	200	6993
1940	290	622	777	825	623	687	143	533	84	513	359	745	6201
1941	912	746	595	648	565	676	207	73	43	11	488	100	5064
1942	121	1542	265	311	297	394	405	213	173	912	414	722	5769
1943	810	760	327	438	2382	166	3	288	192	375	917	1234	7892
1944	2638	121	199	75	281	559	1118	920	478	102	294	394	7179
1945	367	624	300	1092	1049	1979	868	158	278	228	515	587	8045

BALLINA RAINFALL STATISTICS
(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1946	566	1163	834	552	133	85	0	47	366	284	178	662	4870
1947	1283	865	1209	999	568	50	93	302	233	253	647	529	7031
1948	780	232	1078	992	939	2098	77	214	655	36	381	311	7793
1949	545	731	1160	860	773	625	216	423	268	900	176	132	6809
1950	305	1169	606	1000	636	2040	1958	825	117	860	881	454	10851
1951	1226	380	448	249	560	1224	78	44	81	129	81	236	4736
1952	218	1381	530	772	433	811	741	774	267	412	89	144	6572
1953	1690	2606	1075	229	412	68	282	382	184	309	57	315	7609
1954	481	2767	308	508	1082	319	919	627	1097	549	232	165	9054
1955	1482	337	871	777	604	657	471	11	224	287	150	2062	7933
1956	786	2068	505	305	578	461	97	551	162	253	119	863	6748
1957	1179	710	590	124	75	311	691	482	27	371	70	266	4896
1958	662	704	687	2418	51	1752	100	1371	231	331	293	451	9051
1959	1940	719	1849	476	674	581	997	527	828	516	964	956	11027
1960	251	591	813	231	568	738	362	77	64	212	296	464	4667
1961	1093	1458	759	572	697	277	262	653	434	429	554	548	7736
1962	1785	192	962	1961	832	119	1800	830	82	117	447	1272	10399
1963	689	645	1387	1996	1830	1062	73	528	91	424	617	737	10079
1964	686	929	1540	621	803	264	160	87	146	219	758	420	6633

BINGEBEEBRA RAINFALL STATISTICS

(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1936	No	Records	1021	102	72	134	107	0	171	155	141	631	
1937	643	695	1258	113	16	209	157	299	26	516	929	532	5393
1938	1450	188	791	N.R.	674	143	118	28	52	303	598	96	
1939	366	204	1249	489	201	221	207	160	129	366	320	474	4386
1940	240	237	1129	26	56	163	6	80	35	17	256	745	2990
1941	1354	519	364	506	308	248	10	77	13	30	425	170	4024
1942	175	1533	382	0	96	101	204	0	119	736	185	896	4427
1943	184	214	176	216	103	19	14	178	237	608	638	1462	4049
1944	708	193	507	90	79	0	502	268	261	157	139	187	3091
1945	461	673	123	197	186	1489	178	76	305	225	383	487	4783
1946	924	1224	1148	629	15	5	9	45	359	244	257	298	5157
1947	1326	1358	856	639	301	107	17	140	154	183	515	1015	6611
1948	289	414	877	320	800	1483	70	90	402	28	249	289	5311
1949	177	1074	1129	86	115	394	133	94	142	415	100	235	4094
1950	643	1550	396	388	0	1464	1054	200	189	613	385	498	7380
1951	1779	150	705	190	162	337	21	77	23	210	88	213	3955
1952	133	661	480	507	273	200	104	434	149	769	59	370	4139
1953	837	1178	1098	112	100	0			NO RECORDS			232	
1954	275	1350	300	227	502	70	718	85	416	148	0	153	4244

BINGEBEBRA RAINFALL STATISTICS

(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1955	544	279	1529	377	NO RECORDS		108	N.R.	366	417	N.R.	1238	
1956	435	2722	672	212	507	387	43	13	82	128	157	813	6171
1957						NO RECORDS							
1958	535	414	439	543	15	508	0	363	236	173	179	803	4208
1959	1894	671	1926	140	286	45	200	114	252	259	1068	703	7558
1960	236	596	242	132	317	92	187	103	32	81	185	315	2518
1961	278	884	376	235	317	143	313	132	192	470	477	912	4729
1962	979	349	732	382	68	42	945	184	143	164	104	1303	5395
1963	965	400	1197	395	1191	87	0	170	104	105	891	425	5930
1964	242	1028	1516	549	256	23	118	103	99	127	322	363	4746

BANYABBA FORESTRY RAINFALL STATISTICS
(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1940	420	275	715	233	59	270	0	57	48	183	205	343	2808
1941	968	605	493	216	346	254	52	26	8	44	539	204	3755
1942	342	1054	232	94	71	162	252	33	15	626	298	875	4054
1943	284	245	183	377	374	48	27	194	349	508	450	585	3624
1944	1637	183	604	125	113	37	405	574	100	59	132	363	4332
1945	405	701	112	327	291	1879	378	79	158	179	221	412	5142
1946	406	1207	1052	423	5	17	2	15	258	447	170	646	4648
1947	1327	1139	880	515	227	35	19	73	141	464	516	701	6037
1948	459	358	1266	347	810	1976	82	88	251	0	314	248	6199
1949	383	860	1445	200	210	255	215	305	315	625	220	285	5318
1950	721	1763	445	703	195	2521	1901	467	315	727	511	428	10697
1951	1443	1140	507	116	183	591	40	32	3	75	37	130	4297
1952	213	403	467	546	280	110	110	720	0	245	32	N.R.	
1953	1016	1385	945	80	157	N.R.	0	0	17	135	NO	RECORDS	
1954	528	2851	125	165	526	131	1340	279	693	460	773	374	8245
1955	509	459	1308	856	518	150	60	25	388	283	149	926	5631
1956	507	N.R.	1044	458	827	300	55	0	215	150	50	387	
1957	217	586	414	55	0	78	297	547	0	323	15	35	2567

BANYABBA FORESTRY RAINFALL STATISTICS
(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1958	627	303	348	772	118	346	0	605	140	65	65	564	3953
1959	1304	1172	851	0	0	0	331	200	245	239	1005	1132	6479
1960	425	335	167	45	286	85	80	100	0	35	245	171	1974
1961						NO	RECORDS						
1962	1058	410	785	2215	350	0	1820	250	136	180	387	985	8576

CASINO RAINFALL STATISTICS (Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1858	200	133	471	835	143	87	353	125	63	577	420	302	3709
1859	218	191	714	171	67	637	18	274	66	456	158	247	3217
1860	158	1320	439	721	40	81	50	797	208	233	336	833	5216
1861	653	467	462	1412	119	703	265	449	235	125	444	207	5541
1862	592	537	843	28	429	282	2	2	23	302	365	368	3773
NO RECORDS 1863 - 1878													
1879	495	615	640	759	639	510	146	670	401	13	438	691	6017
1880	413	1592	301	699	37	17	60	0	271	262	333	176	4161
1881	279	521	476	285	235	40	30	190	302	388	652	149	3547
1882	138	758	312	76	124	216	254	125	40	727	320	520	3610
1883	1265	638	188	277	320	39	52	42	128	224	28	161	3362
1884	19	144	250	640	1195	143	532	47	134	225	551	115	3995
1885	286	605	128	133	38	158	5	29	158	188	276	555	2559
1886	674	119	291	264	306	461	630	234	461	443	716	471	5070
1887	973	872	1412	392	454	183	505	800	78	70	382	231	6352
1888	54	795	168	103	184	148	33	12	378	525	216	575	3191
1889	344	135	395	441	396	36	1685	990	275	144	527	110	5478
1890	926	1607	2782	627	562	257	57	49	195	115	207	312	7696

CASINO RAINFALL STATISTICS
(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1891	1205	353	538	182	470	472	181	235	345	160	253	591	4985
1892	511	278	1360	1550	286	228	163	113	183	565	307	369	5913
1893	1036	2920	955	317	30	813	105	275	79	211	468	51	7260
1894	1540	351	1090	372	152	192	0	43	285	522	224	506	5277
1895	1338	391	78	324	101	0	48	131	204	203	310	779	3907
1896	389	1069	260	71	77	97	293	55	91	115	1096	358	3971
1897	316	117	735	68	95	296	353	148	312	109	329	1229	4107
1898	1228	754	978	49	248	407	184	118	490	222	111	266	5055
1899	1002	383	226	432	231	140	1059	261	378	221	113	667	5113
1900	259	300	130	101	461	382	716	86	251	16	219	295	3216
1901	189	355	1303	325	253	310	240	206	231	345	39	66	3862
1902	331	292	57	148	69	29	67	39	126	241	215	315	1929
1903	184	538	411	88	558	591	407	225	466	301	575	233	4577
1904	232	104	625	1132	767	5	198	21	87	459	139	468	4237
1905	174	484	458	445	366	46	35	98	32	388	120	405	3051
1906	464	937	799	306	573	87	0	374	258	531	125	335	4789
1907	628	770	688	86	219	284	30	97	3	44	290	295	3434
1908	311	1009	599	370	226	31	99	673	237	142	393	397	4487

CASINO RAINFALL STATISTICS.
(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1909	183	429	336	375	88	151	271	112	154	230	406	634	3369
1910	732	593	1155	464	35	513	43	35	247	329	296	698	5140
1911	787	794	341	208	101	5	246	278	37	196	260	156	3409
1912	148	403	880	56	42	751	471	157	116	587	314	189	4114
1913	196	325	380	902	544	663	318	1	248	189	122	212	4100
1914	298	409	535	89	337	317	458	169	99	641	341	285	3978
1915	281	381	5	113	320	41	113	181	127	17	154	240	1973
1916	356	720	162	1074	211	125	151	112	378	317	401	439	4446
1917	740	480	480	51	81	17	45	128	577	371	1444	424	4838
1918	720	207	415	446	185	0	56	133	102	85	752	241	3342
1919	85	28	1139	285	1076	213	0	20	11	95	239	259	3450
1920	853	310	425	268	498	225	413	80	311	524	820	338	5065
1921	504	133	451	484	1228	460	901	96	401	129	99	1129	6015
1922	228	956	216	38	213	231	284	128	594	132	15	328	3363
1923	349	97	238	1117	6	186	169	171	44	140	143	511	3171
1924	563	255	418	174	110	573	386	172	130	329	359	303	3772
1925	609	595	1596	362	774	530	165	595	37	106	857	426	6652
1926	771	5	207	320	234	326	75	48	92	39	73	892	3082

CASINO RAINFALL STATISTICS
(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1927	1651	262	542	316	7	211	87	4	205	270	1001	337	4893
1928	651	816	524	738	229	257	299	109	39	125	40	416	4243
1929	936	713	776	481	144	289	625	72	34	235	147	487	4939
1930	707	200	484	743	513	750	105	322	57	303	136	269	4589
1931	265	1300	615	838	281	119	107	149	54	83	491	952	5254
1932	130	565	65	778	213	57	69	43	307	183	420	214	3044
1933	689	241	138	614	466	317	369	6	326	367	660	823	5016
1934	442	506	172	733	838	58	414	141	186	163	268	664	4585
1935	580	648	406	311	216	1	532	67	368	135	111	248	3623
1936	690	103	902	226	158	152	115	1	147	96	137	682	3409
1937	469	758	999	158	15	255	203	212	22	870	740	701	5402
1938	965	499	1010	626	812	63	142	111	39	225	618	174	5284
1939	602	278	1159	264	122	163	169	141	118	629	466	227	4338
1940	299	364	825	72	95	136	10	107	11	176	306	625	3026
1941	1065	473	417	291	391	206	35	16	2	7	376	74	3353
1942	241	1056	208	126	65	65	152	31	66	798	336	708	3852
1943	277	394	47	292	215	28	11	112	242	552	424	908	3502
1944	867	155	361	33	132	111	282	295	114	79	182	267	2878
1945	247	564	107	420	279	1377	383	69	332	95	106	374	4353

CASINO RAINFALL STATISTICS
(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1946	672	1144	719	542	66	8	1	16	266	298	134	216	4082
1947	1196	1073	832	276	191	30	28	59	91	164	401	407	4748
1948	322	233	732	240	431	1383	61	45	262	8	299	240	4256
1949	438	740	1018	115	174	317	286	100	110	626	343	230	4497
1950	261	1192	449	618	140	1259	822	177	196	466	376	315	6271
1951	1413	335	715	123	240	417	9	45	54	145	62	182	3740
1952	183	374	379	367	292	162	149	601	109	568	71	232	3487
1953	799	1555	1101	136	96	0	68	116	21	317	135	95	4439
1954	232	1987	394	400	520	99	927	164	453	351	154	175	5856
1955	598	304	1080	847	375	199	100	27	255	201	124	1264	5374
1956	531	1799	544	248	405	318	63	34	44	136	112	766	5000
1957	309	474	278	61	62	117	274	419	22	269	116	30	2431
1958	460	275	451	597	86	583	7	514	131	152	174	928	4358
1959	1343	1065	1509	94	101	67	352	143	452	280	723	430	6559
1960	215	481	344	110	230	79	118	99	39	156	273	346	2490
1961	464	995	582	187	226	138	243	131	193	411	621	655	4846
1962	891	778	530	510	121	48	1317	128	102	76	293	1244	6038
1963	1014	397	957	403	1023	190	19	322	57	163	725	415	5685
1964	306	1018	848	621	274	68	106	66	78	124	420	215	4144

CORAKI RAINFALL STATISTICS
(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1895				NO	RECORDS				165	163	214	912	
1896	384	1178	371	170	116	134	279	105	295	211	1602	327	5172
1897	151	235	631	55	210	736	468	288	327	290	388	995	4774
1898	1144	876	966	200	430	686	300	388	289	333	85	229	5926
1899	1022	575	287	504	457	263	1705	850	736	279	390	733	7801
1900	197	408	267	76	747	746	796	79	268	22	225	144	3975
1901	397	520	1237	414	454	427	329	274	438	404	0	24	4918
1902	441	114	27	394	99	63	175	91	140	283	216	279	2322
1903	225	291	609	104	681	660	388	193	360	215	802	535	5063
1904	276	120	1172	1167	933	0	285	0	73	251	145	179	4601
1905	229	353	261	787	912	53	12	89	10	309	284	294	3593
1906	400	1147	1009	107	592	325	14	483	287	420	189	769	5742
1907	758	1099	1064	83	518	374	42	53	3	96	379	318	4787
1908	177	1110	509	591	529	65	160	1047	141	101	261	491	5182
1909	235	574	729	426	75	168	266	138	380	241	434	460	4126
1910	750	663	1486	486	123	554	38	80	211	285	442	435	5553
1911	753	689	660	273	104	32	236	478	35	264	102	108	3734
1912	116	242	1125	115	112	832	733	70	150	341	497	173	4506

CORAKI RAINFALL STATISTICS.
(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1913	180	456	307	865	791	1017	502	0	427	97	75	275	4992
1914	99	384	697	72	704	577	777	326	142	670	126	276	4850
1915	133	364	20	145	350	71	138	207	117	0	80	211	1836
1916	550	763	161	1019	202	130	184	134	505	381	218	439	4686
1917	434	583	620	185	186	52	31	119	561	345	1721	192	5029
1918	690	156	459	571	255	46	29	169	206	107	295	202	3185
1919	61	81	729	586	1365	214	62	6	37	127	62	121	3451
1920	1035	464	439	406	610	237	435	120	412	447	656	200	5461
1921	982	218	540	783	1589	524	997	92	507	102	169	984	7487
1922	151	1288	124	3	271	201	525	0	437	143	58	293	3494
1923	125	399	365	1815	0	154	199	260	59	192	120	362	4050
1924	753	602	409	150	188	785	607	179	99	403	241	193	4609
1925	759	469	1719	429	1080	640	77	723	19	103	815	616	7449
1926	863	0	468	899	375	514	221	38	157	102	0	1167	4804
1927	2299	621	603	414	0	345	63	30	283	272	889	558	6377
1928	986	1056	341	665	239	286	388	276	12	209	49	306	4813
1929	1162	530	1289	620	398	1152	159	182	118	485	157	370	6622
1930	876	237	1140	823	1017	1090	73	147	101	223	111	230	6068

CORAKI RAINFALL STATISTICS.
(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1931	156	1776	863	1437	183	219	146	178	62	84	449	992	6545
1932	61	129	105	752	489	129	184	200	300	252	423	244	3268
1933	1010	355	230	840	563	400	703	27	516	413	607	663	6327
1934	483	693	226	816	1433	61	825	228	243	152	349	790	6299
1935	481	582	665	421	275	22	523	132	374	225	95	299	4094
1936	423	218	922	276	465	170	137	20	298	89	43	519	3580
1937	565	964	1315	86	11	449	513	359	9	604	756	578	6209
1938	1218	633	898	716	1437	138	361	249	37	313	230	107	6337
1939	272	101	1436	590	349	119	271	179	210	696	370	306	4899
1940	181	334	866	115	161	506	72	343	87	257	227	429	3578
1941	893	888	308	479	351	310	112	22	26	22	159	116	3686
1942	162	1008	245	284	95	149	237	58	85	688	340	655	4006
1943	238	208	326	89	543	45	27	188	246	287	434	872	3503
1944	1946	256	556	46	127	188	490	423	157	117	197	363	4866
1945	257	626	371	1002	369	1158	284	154	171	125	235	290	5042
1946	486	906	973	526	51	24	0	11	230	333	248	603	4391
1947	1140	1037	825	473	270	25	20	105	133	185	591	484	5288
1948	376	277	905	436	578	1637	82	77	356	20	414	155	5313

CORAKI RAINFALL STATISTICS

(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1949	555	689	1452	471	436	510	322	165	116	716	216	155	5803
1950	171	1111	487	303	194	1535	1394	273	218	386	638	250	7560
1951	1323	321	542	114	272	695	22	53	31	132	70	83	3658
1952	77	584	535	356	278	288	307	606	140	510	69	146	3896
1953	1131	1566	1055	45	87	0	157	158	44	249	90	93	4675
1954	371	2207	252	208	940	106	916	275	593	371	331	78	6648
1955	1255	356	998	917	373	275	118	12	155	190	105	1838	6592
1956	355	2000	571	268	480	408	60	14	78	109	97	510	4950
1957	449	486	286	50	0	249	351	526	51	222	71	84	2825
1958	322	329	388	1074	64	755	25	1044	169	270	158	554	5152
1959	1247	1227	1438	196	124	183	579	143	514	280	685	767	7383
1960	212	366	419	315	346	141	162	112	27	73	214	222	2609
1961	487	1206	770	356	421	92	234	162	186	356	524	667	5461
1962	1010	205	1010	1056	329	107	1701	285	112	98	381	977	7271
1963	519	493	1003	1117	1228	650	31	382	108	143	451	247	6372
1964	480	721	996	561	265	181	87	57	237	128	804	231	4748

CUMBALUM RAINFALL STATISTICS (Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1884					NO RECORDS						650	273	
1885	289	679	208	395	145	237	188	126	291	267	157	587	3569
1886	941	122	206	291	543	1940	1423	209	507	484	1291	683	8640
1887	805	1551	1437	1139	992	173	771	949	241	170	428	524	9180
1888	84	945	687	307	321	300	561	76	404	579	182	478	4924
1889	156	126	801	1169	939	19	1899	1640	365	771	372	656	8913
1890	1551	1619	2354	1721	1082	221	246	276	265	38	300	798	10471
1891	1069	442	845	566	1453	664	677	844	553	365	413	288	8179
1892	522	91	2037	1489	1462	970	395	138	373	989	270	363	9099
1893	843	3431	1250	511	201	1122	555	894	92	457	446	479	10281
1894	1483	913	1612	399	974	329	23	152	780	377	307	1445	8794
1895	2051	686	387	425	260	233	44	202	233	190	229	609	5549
1896	411	1937	531	276	585	160	301	144	239	262	1944	524	7314
1897	156	497	888	41	313	1227	530	513	383	170	355	1721	6794
1898	1717	1442	962	297	542	1094	426	674	244	559	165	472	8594
1899	1077	873	154	610	1215	443	1554	1428	571	472	182	918	9497
1900	281	405	345	279	1237	1335	756	72	298	39	485	343	5875
1901	167	513	1333	447	796	828	706	447	424	351	99	43	6154

CUMBALUM RAINFALL STATISTICS
(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1902	372	654	254	1044	580	305	340	352	111	397	236	177	4822
1903	208	153	340	117	819	720	691	251	488	477	1221	340	5825
1904	360	125	1643	1580	1280	56	357	190	71	284	156	280	6382
1905	310	383	330	1262	1197	124	12	108	16	329	92	428	4591
1906	389	1364	987	242	675	592	15	457	282	432	137	909	6481
1907	1239	1113	2028	89	695	675	76	154	30	94	538	625	7356
1908	356	1694	493	1146	741	272	316	1101	176	108	343	509	7255
1909	219	908	1196	603	100	226	452	392	452	250	587	344	5729
1910	744	778	1624	1145	278	1006	57	373	450	225	469	415	7565
1911	867	500	890	445	340	172	234	464	39	379	128	166	4624
1912	73	265	993	283	694	853	1676	174	83	252	475	189	6010
1913	322	968	368	832	1253	1232	984	0	475	97	150	263	6944
1914	153	302	974	33	774	1328	1203	589	313	868	194	407	7138
1915	442	399	52	156	758	129	329	289	105	14	92	198	2963
1916	225	885	298	1382	494	184	416	207	729	815	484	669	6788
1917	496	868	764	432	775	100	48	351	494	310	1512	248	6398
1918	1006	266	667	901	571	139	215	283	459	84	264	46	4901
1919	389	370	897	895	1979	411	325	127	15	325	128	211	6072

CUMBALUM RAINFALL STATISTICS
(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1920	1276	400	287	535	259	151	413	172	562	582	767	296	5700
1921	1189	294	540	748	2130	904	1113	261	504	225	178	1007	9093
1922	479	1309	506	81	420	438	1127	54	516	202	48	292	5472
1923	216	562	417	2423	72	216	310	525	91	88	163	418	5501
1924	564	214	411	176	478	1640	1126	424	81	280	402	187	5983
1925	853	243	2590	626	1056	646	213	1042	57	212	1275	579	9392
1926	759	50	1049	784	423	778	294	124	123	39	25	645	5093
1927	2189	1125	829	754	54	579	41	46	765	60	1401	914	8757
1928	808	905	275	589	569	390	477	290	40	211	106	315	4975
1929	1319	902	1550	1228	1031	1241	59	219	133	676	246	243	8847
1930	1057	282	1948	855	1701	1025	306	424	104	250	31	232	8215
1931	307	1979	1101	955	266	371	215	227	83	239	458	1121	7322
1932	138	216	63	652	783	331	219	245	481	213	379	168	3888
1933	993	299	488	1300	636	889	895	33	697	321	762	653	7966
1934	465	989	306	848	1939	131	1177	137	365	313	514	697	7881
1935	741	864	1319	275	749	157	535	242	712	141	105	348	6188
1936	466	223	961	407	1251	152	228	16	324	270	86	634	5018
1937	496	812	1734	489	37	753	932	592	85	694	1676	388	8688

CUMBALUM RAINFALL STATISTICS (Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1938	810	1804	712	492	2152	425	1068	582	191	148	302	138	8824
1939	463	153	2106	583	552	270	385	238	219	897	185	231	6282
1940						NO RECORDS							
1941		NO RECORDS		846	596	564	202	37	25	26	304	106	
1942	97	1248	379	309	304	373	433	219	111	774	217	860	5324
1943	707	806	224	472	1539	69	2	333	86	297	772	1057	6364
1944	2308	152	220	52	231	361	873	678	255	154	258	310	5852
1945	253	465	325	881	1070	1894	588	146	192	284	477	529	7104
1946	585	1174	810	565	87	61	0	44	256	330	190	348	4450
1947	1165	808	1113	1082	542	39	0	287	199	290	646	385	6556
1948	649	191	924	1044	464	1184	50	162	662	16	331	204	5881
1949	319	742	1138					NO RECORDS					
1950						NO RECORDS							
1951						NO RECORDS			84	147	57	265	
1952	174	1072	538	593	314	460	657	677	264	340	97	149	5335
1953	1482	2237	974	149	344	13	274	399	144	227	58	174	6475
1954	478	2181	267	458	919	353	706	624	951	551	190	179	7857
1955	922	377	793	703	631	559	293	14	153	237	88	1556	6326

CUMBALUM RAINFALL STATISTICS
(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1956	672	1742	496	367	550	485	88	343	180	199	142	644	5908
1957	1068	615	531	138	32	265	539	477	25	384	88	129	4291
1958	548	567	614	1958	77	1195	72	1183	202	137	264	496	7313
1959	1562	883	1634	455	532	665	1012	365	612	644	903	863	10130
1960	309	448	757	295	443	548	324	76	38	147	276	308	3969
1961	849	1409	617	520	1207	278	303	451	351	390	425	587	7387
1962	1875	181	651	1874	950	155	1500	778	69	153	322	1159	9667
1963	569	591	1219	1353	1454	854	23	510	104	371	723	768	8539
1964	439	997	1407	493	734	83	146	106	195	212	740	385	5937

DUNOON RAINFALL STATISTICS
(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1895					NO	RECORDS					156	1062	
1896	508	1982	416	204	192	135	305	96	219	81	1762	738	6638
1897	166	476	757	97	167	543	586	54	287	129	383	1635	5280
1898	1592	1926	1681	220	261	606	75	238	379	513	156	305	7952
1899	1153	698	263	537	555	454	1431	834	778	293	159	1443	8598
1900	237	402	236	129	757	698	971	37	306	19	348	424	4564
1901	361	957	1715	319	635	679	364	369	324	261	119	133	6236
1902	362	513	144	323	56	91	181	153	83	300	353	314	2873
1903	292	526	544	366	624	712	585	416	503	405	622	258	5853
1904	341	92	1387	1574	1086	14	261	101	63	211	252	341	5723
1905	286	551	460	999	912	88	19	96	52	392	112	793	4760
1906	474	1213	1030	199	1012	261	14	548	391	680	206	723	6751
1907	990	1017	1159	205	387	480	59	75	10	108	656	725	5871
1908	311	1398	541	546	435	42	178	921	119	154	484	227	5356
1909	297	412	832	505	105	207	288	95	322	248	349	409	4069
1910	696	587	1559	580	82	952	56	42	205	268	664	469	6160
1911	1572	968	678	150	159	77	181	395	46	397	151	87	4861
1912	151	728	850	94	259	696	577	101	102	372	736	150	4816

DUNOON RAINFALL STATISTICS.

(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1913	448	1170	501	1137	705	791	422	0	568	122	133	275	6272
1914	286	718	1111	36	738	691	746	330	185	739	272	270	6122
1915	250	450	30	123	449	51	217	207	69	0	142	243	2231
1916	304	885	208	1337	207	97	136	239	716	658	382	717	5886
1917	737	826	689	155	245	50	29	169	511	294	1953	604	6262
1918	1264	168	687	731	482				NO RECORDS				
1919	219	107	954	796	1502	212	114	67	0	189	259	253	4672
1920	1511	433	436	795	954	167			NO RECORDS				
NO RECORDS 1921 - 1934													
1935	570	626	530	357	343	26	402	207	487	154	91	595	4388
1936	602	139	726	227	557	196	119	0	260	175	87	474	3562
1937	474	981	1053	261	26	461	591	406	38	737	1203	595	6826
1938	1252	889	1230	961	1243	146	498	280	61	222	182	169	7133
1939	483	124	2099	546	261	147	239	206	148	658	283	208	5402
1940	302	595	853	150	218	272	49	205	12	314	350	952	4272
1941	1316	984	461	544	469	638	113	9	42	37	146	153	4912
1942	226	1440	498	318	98	185	284	61	56	945	338	N.R.	
1943						NO RECORDS							

DUNOON RAINFALL STATISTICS (Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1944						NO	RECORDS						
1945	330	637	350	710	558	1800	496	N.R.	225	307	284	260	
1946	714	1402	1263	583	122	6	0	48	228	200	106	N.R.	
1947	N.R.	1135	938	653	409	45	18	92	185	185	493	744	
1948	N.R.	239	447	563	548	1470	15	85	711	45	351	N.R.	
1949	305	687	1416	488	N.R.	437	157	NO RECORDS		733	505	120	
1950	N.R.	1511	888	806	125	2104	1447	NO RECORDS		653	873	329	
1951	N.R.	392	966	201	240	706	45	NO RECORDS					

KYOGLE RAINFALL STATISTICS.
(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1905					NO RECORDS						249	439	
1906	617	988	1031	74	562	174	10	410	439	433	146	527	5411
1907	726	NO RECORDS		145	388	237	106	153		NO	RECORDS		
NO RECORDS 1908 - 1913													
1914	NO RECORDS		743	NO	RECORDS	465	399	193	162	453	323	446	
1915	154	495	30	106	279	37	181	184	142	0	47	178	1833
1916	649	695	215	771	259	106	130	119	421	295	365	1043	5068
1917	698	594	459	36	60	0	37	128	632	207	949	464	4264
1918	809	125	337	456	164	45	28	162	30	128	637	192	3113
1919	138	87	695	314	1105	94	39	10	14	116	94	283	2989
1920	1041	361	349	331	443	132	456	18	264	347	538	349	4629
1921	588	334	754	465	468	591	1100	88	288	151	214	1168	6209
1922	313	1025	192	46	321	218	309	63	533	395	99	422	3936
1923	155	38	267	1140	0	141	261	248	55	102	91	657	3155
1924	523	168	231	204	113	923	389	200	187	309	434	379	4060
1925	570	345	2059	401	875	618	76	399	37	31	714	301	6426
1926	654	97	240	441	326	399	193	114	85	79	71	866	3565
1927	1472	384	576	383	5	260	59	0	123	250	842	430	4784

KYOGLE RAINFALL STATISTICS.
(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1928	425	1277	314	801	209	248	575	122	0	165	67	290	4493
1929	978	350	1185	532	135	406	766	93	39	391	120	407	5402
1930	820	343	405	836	620	884	157	245	50	242	95	188	4885
1931	298	2136	824	904	226	144	162	184	86	101	545	840	6450
1932	186	451	33	686	340	83	81	50	401	329	349	264	3253
1933	1269	305	188	721	351	367	488	19	370	376	944	897	6295
1934	716	601	222	767	1054	127	488	217	225	182	250	522	5371
1935	473	616	519	318	172	28	554	106	433	294	55	712	4280
1936	653	362	883	167	299	186	178	5	164	147	58	741	3843
1937	561	687	1181	202	35	426	237	369	38	462	692	1053	5943
1938	1303	322	703	944	867	83	284	195	40	230	245	144	5360
1939	655	55	1492	532	204	162	193	134	127	444	272	737	5007
1940	178	740	699	63	125	142	0	86	8	132	419	867	3459
1941	922	518	409	369	459	320	48	25	1	39	232	171	3513
1942	296	1077	473	114	107	51	318	24	75	956	344	858	4693
1943	386	304	107	79	278	20	24	223	304	464	512	1555	4256
1944	941	234	285	136	148	163	445	278	230	129	349	242	3580
1945	544	639	186	415	384	1217	453	86	125	181	222	569	5021

KYOGLE RAINFALL STATISTICS. (Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1946	707	990	898	397	61	4	2	102	338	299	167	195	4160
1947	1400	733	614	668	313	60	40	80	177	200	567	1036	5888
1948	491	190	1083	337	622	1431	40	85	517	38	437	716	5987
1949	340	796	1219	144	217	399	270	79	113	637	283	272	4769
1950	444	1326	643	540	175	1644	1015	185	129	780	653	421	7955
1951	2117	306	776	299	162	690	15	42	24	148	80	350	5009
1952	153	700	427	357	279	209	200	666	124	565	93	500	4273
1953	557	2021	1013	100	84	2	103	172	48	242	130	272	4744
1954	248	2729	265	413	789	162	808	283	433	616	327	238	7311
1955	613	328	1415	1097	436	225	117	36	180	444	67	1099	6057
1956	813	2473	622	246	427	309	72	49	24	154	126	898	6213
1957	628	702	257	45	10	110	397	582	2	343	174	109	3359
1958	393	255	547	669	31	963	8	238	235	260	107	573	4279
1959	1337	864	1082	203	176	107	399	124	327	407	1085	633	6744
1960	259	572	563	134	320	135	147	123	39	179	335	242	3048
1961	668	883	309	254	412	170	247	193	190	425	364	595	4710
1962	1332	441	685	900	364	77	1416	152	170	94	296	1230	7157
1963	670	384	1228	478	1253	158	32	272	68	186	834	431	5994
1964	202	990	1020	454	411	64	136	28	64	75	529	334	4307

LISMORE RAINFALL STATISTICS
(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1884	518	670	946	644	1682	134	856	137	143	192	389	98	6409
1885	235	874	175	238	40	284	28	6	206	166	229	441	2922
1886	625	118	189	190	264	688	716	142	515	495	1015	416	5373
1887	858	894	1293	487	649	164	622	950	176	88	289	264	6734
1888	48	1099	198	171	220	198	176	34	445	441	160	432	3622
1889	147	139	462	735	582	32	1773	1433	208	346	393	462	6712
1890	932	1641	2595	950	697	145	136	81	177	51	191	526	8122
1891	912	393	780	318	553	475	215	352	393	178	330	411	5310
1892	390	198	1878	2066	398	363	283	139	274	544	256	350	7139
1893	1255	3147	1377	463	32	872	198	575	64	357	359	14	8713
1894	1648	580	1339	331	399	165	11	44	477	320	341	1061	6716
1895	1619	739	299	210	131	38	36	72	226	270	135	634	4409
1896	516	1387	345	148	117	95	255	109	224	116	1440	495	5247
1897	153	180	757	39	86	438	437	230	327	100	540	1299	4586
1898	1334	1219	1136	185	342	615	255	245	378	351	96	214	6370
1899	1031	542	269	575	427	327	1517	629	653	192	171	896	7229
1900	231	283	217	80	589	833	677	33	295	13	229	216	3696
1901	289	546	1191	316	450	600	308	213	309	285	60	58	4625

LISMORE RAINFALL STATISTICS
(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1902	323	309	52	333	25	43	101	91	243	221	252	363	2356
1903	167	438	423	225	688	696	503	195	346	348	491	192	4712
1904	234	56	1106	1371	881	14	304	40	56	317	215	279	4873
1905						NO	RECORDS						
1906	638	1252	867	172	637	287	2	402	268	353	165	518	5561
1907	807	895	1080	115	413	340	61	136	6	67	521	555	4996
1908	181	1324	516	434	352	29	163	859	165	108	378	453	4962
1909	234	471	593	404	69	172	250	133	392	227	372	610	3927
1910	742	676	1616	742	86	690	49	83	196	227	608	389	6104
1911	847	757	607	352	95	47	211	391	32	306	125	161	3931
1912	102	323	660	69	104	674	554	122	109	245	462	133	3557
1913	237	622	283	705	617	662	330	0	451	134	122	296	4459
1914	137	538	745	77	506	515	716	300	81	693	114	249	4671
1915	219	384	11	75	463	39	240	264	108	11	94	236	2144
1916	436	731	183	813	280	139	238	198	444	397	245	541	4645
1917	758	583	579	210	156	46	30	153	478	215	1202	525	4935
1918	625	68	417	410	368	19	26	273	231	108	563	184	3292
1919	192	124	1067	716	1451	239	77	42	37	139	123	294	4501

LISMORE RAINFALL STATISTICS
(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1920	1208	447	397	452	728	205	445	120	335	435	666	270	5708
1921	800	191	657	692	1471	615	977	164	490	217	141	1200	7615
1922	311	1698	344	28	331	308	507	81	615	121	118	300	4762
1923	207	92	412	1809	16	157	188	414	111	154	205	548	4313
1924	365	351	380	167	217	1028	588	187	162	300	484	345	4574
1925	702	374	2423	523	1101	635	109	919	41	96	849	849	8621
1926						NO	RECORDS						
1927	1739	439	800	684	8	362	52	12	326	166	1084	518	6190
1928	1035	1175	418	772	324	387	558	183	54	258	107	179	5450
1929	1553	964	1565	632	339	406	885	113	115	588	250	378	7788
1930	1112	139	937	1069	1130	930	88	318	110	391	104	226	6554
1931	260	1942	1026	1168	227	236	158	285	82	57	632	921	6994
1932	101	327	138	770	448	233	101	103	296	202	399	96	3214
1933	873	436	222	1059	476	594	547	24	493	402	822	697	6645
1934	559	770	244	873	1284	98	633	134	140	208	327	798	6068
1935	526	604	556	431	380	20	489	128	427	164	179	412	4316
1936	563	142	847	241	667	209	132	13	222	181	46	682	3945
1937	464	1023	1364	169	21	600	433	420	38	591	1163	516	6802

LISMORE RAINFALL STATISTICS (Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1938	1279	1067	886	1176	1605	129	379	257	64	161	166	147	7316
1939	501	120	1571	397	206	164	242	181	218	717	562	276	5155
1940	415	492	882	236	119	202	45	272	14	314	571	657	4219
1941						NO	RECORDS						
1942	304	1156	412	213	101	111	248	50	79	882	408	741	4705
1943	574	621	246	317	555	33	23	173	289	287	621	1076	4815
1944	1328	190	337	16	130	232	562	425	189	98	491	287	4285
1945	394	503	297	777	586	1710	545	126	302	119	209	473	6041
1946	774	1238	1152	382	120	19	0	32	253	273	108	349	4700
1947	1350	809	845	531	374	45	29	94	162	244	517	567	5567
1948	480	205	849	459	442	1579	52	97	354	23	281	183	5004
1949	477	740	1299	304	339	385	174	110	139	732	409	125	5233
1950	229	1166	679	833	165	1584	1295	454	183	630	630	318	8166
1951	1385	317	810	170	257	795	7	53	61	113	50	152	4170
1952	150	808	440	326	205	227	303	512	210	386	121	295	3983
1953	1068	1812	925	98	121	0	224	161	23	250	54	330	5066
1954	451	2973	164	352	1036	146	1001	272	503	362	223	191	7674
1955	1189	206	982	1269	565	235	135	9	178	258	130	176	5332

LISMORE RAINFALL STATISTICS
(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1956	753	2256	455	347	617	388	55	64	46	174	115	1059	6329
1957	593	494	462	78	5	110	405	509	7	330	91	25	3109
1958	498	349	733	740	35	832	11	858	162	197	140	410	4965
1959	1684	955	1576	127	149	276	634	254	625	367	1133	349	8129
1960	229	373	665	244	270	111	135	124	20	112	350	328	2961
1961	532	1089	440	306	483	144	243	219	173	537	541	633	5340
1962	1816	257	691	854	322	73	1814	204	98	54	256	1164	7603
1963	720	615	1204	809	1598	667	10	328	144	230	744	485	7554
1964	220	956	1088	560	425	141	156	100	115	129	427	260	4577

MT. PIKAPENE RAINFALL STATISTICS
(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1940	718	236	734	100	29	121	9	19	29	128	326	1092	3541
1941	908	584	386	289	416	207	24	12	16	14	498	121	3475
1942	116	1014	184	114	82	98	289	11	66	641	339	711	3665
1943	194	145	131	182	113	52	41	137	375	359	603	630	2962
1944	1019	151	225	59	149	50	390	331	140	37	320	265	3136
1945	492	809	126	206	126	1720	396	90	273	59	176	408	4881
1946	433	591	1085			NO RECORDS						467	
1947	1291	1028	994	400	156	44	14	111	167	272	587	909	5973
1948	357	493	949	198	505	1789	83	52	313	12	295	353	5399
1949	303	878	997	89	262	325	217	102	185	656	340	382	4736
1950	562	1232	356	348	143	1498	810	200	169	695	431	327	6771
1951	1526	292	675	63	128	367	31	80	15	109	57	204	3547
1952	77	588	532	312	304	215	98	345	102	529	108	315	3525
1953	716	1193	1072	108	116	0	6	127	32	241	315	177	4103
1954	444	2240	214	586	409	249	1925	196	398	643	387	327	8018
1955	614	387	1550			NO RECORDS				423	46	508	
1956	751	2183	1148	451	640	418	72	6	143	143	186	671	6812
1957	290	376	377	115	0	76	239	455	24	308	133	12	2405

MT. PIKAPENE RAINFALL STATISTICS
(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1958	470	461	400	492	164	665	0	283	237	210	232	1114	4728
1959	1472	904	1198	202	104	108	335	123	483	247	1169	1077	7422
1960	181	516	191	250	289	144	131	81	43	139	225	390	2580
1961	133	1117	361	278	336	113	247	164	176	484	443	1335	5187
1962	1232	345	733	973	176	32	1166	195	240	170	253	1149	6664
1963	656	310	868	384	1300	125	21	200	228	228	501	304	5125
1964	309	722	1173	595	255	75	118	55	107	242	335	294	4280

MULUMBIMBY RAINFALL STATISTICS.
(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1899	758	961	279	539	609	404	1636	1207	758	347	113	973	8584
1900	392	462	401	101	1588	702	1199	67	402	16	275	374	5979
1901	158	794	1737	448	962	772	304	445	379	496	124	124	6743
1902	479	587	304	462	61	133	192	184	185	540	241	390	3758
1903	561	374	1019	293	1136	896	1120	399	552	490	624	491	7955
1904	464	109	2961	1745	1072	81	280	174	100	357	154	472	7969
1905	691	455	590	2114	1326	77	0	219	70	530	262	464	6798
1906	651	1430	1072	91	923	312	0	447	549	813	308	1192	7788
1907	1181	1157	1999	235	879	841	65	110	12	98	607	683	7867
1908	523	1010	890	400	471	60	314	1288	78	191	468	304	5997
1909	131	524	494	520	138	181	342	137	434	177	311	387	3776
1910	1407	778	1682	578	134	1266	44	117	523	263	602	781	8175
1911	1584	659	528	668	147	32	226	513	42	448	116	195	5158
1912	430	373	693	137	196	866	646	125	87	334	469	211	4567
1913	593	998	616	1302	1085	827	838	0	312	70	210	130	6981
1914	190	590	1044	96	776	750	542	318	297	885	145	596	6229
1915	296	474	54	112	604	50	186	254	108	40	223	245	2646
1916	162	895	139	804	268	193	104	202	487	777	446	512	4989

MULLUMBIMBY RAINFALL STATISTICS (Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1917	507	587	956	197	312	102	23	196	498	186	1608	422	5594
1918	1159	185	477	727	470	66	110	441	163	53	255	449	4555
1919	128	218	1760	1216	1656	224	94	110	15	218	131	358	6128
1920	1503	380	286	739	411	323	841	92	438	462	553	376	6404
1921	1381	153	658	926	1221	1020	1198	225	523	110	107	971	8493
1922	185	1589	375	57	445	182	1068	144	594	159	33	341	5172
1923	210	321	346	1928	5	218	188	434	170	122	87	540	4569
1924	525	673	335	296	417	1119	800	187	60	542	622	575	6151
1925	1522	383	2371	406	1438	859	141	626	32	154	1580	1031	10543
1926	827	50	600	1574	578	996	205	163	289	81	47	796	6206
1927	3467	744	863	278	15	390	36	131	701	480	1634	764	9503
1928	1161	1449	333	1103	454	250	384	208	39	197	99	235	5912
1929	1139	1493	1372	1734	475	925	145	105	116	827	135	311	8777
1930	1248	320	1526	842	1040	1489	295	341	104	298	254	369	8126
1931	322	2611	1367	1260	390	141	172	269	78	204	747	1391	8952
1932	96	282	109	578	671	497	76	78	447	213	383	117	3547
1933	979	386	533	2286	434	505	687	22	522	335	996	651	8336
1934	456	1374	492	890	1551	87	1123	267	302	281	767	616	8206

MULLUMBIMBY RAINFALL STATISTICS (Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1935	746	559	615	615	395	66	465	270	806	350	184	416	5487
1936	585	262	929	239	942	178	198	11	190	292	121	676	4623
1937	624	1080	2476	265	19	456	530	616	34	964	1771	457	9292
1938	1188	924	1165	623	2604	453	485	338	137	211	209	177	8514
1939	420	99	2695	765	325	194	250	249	138	840	367	244	6586
1940	285	514	1115	416	282	342	82	360	22	193	424	1139	5174
1941	1425	948	1252	715	513	377	124	36	36	19	297	172	5914
1942	261	2152	580	774	419	320	353	96	98	862	496	910	7321
1943	516	776	198	401	788	155	0	180	425	461	1131	1100	6131
1944	1798	133	385	76	201	272	706	570	298	69	388	392	5288
1945	342	896	597	962	765	1618	785	172	220	322	285	540	7504
1946	776	1475	1149	719	85	8	0	96	364	240	156	285	5353
1947	1938	1366	1168	932	611	14	36	226	248	177	631	636	7983
1948	626	331	1356	761	915	1850	54	154	800	12	414	267	7540
1949	526	661	1288	515	542	485	242	112	223	1084	98	145	5921
1950	519	1796	861	642	104	1608	2311	371	253	575	747	422	10209
1951	2359	387	1002	219	451	1070	26	46	70	199	29	239	6097
1952	113	889	859	596	360	900	461	946	240	327	118	320	6129

Appendix 11
Sheet 4

MULLUMBIMBY RAINFALL STATISTICS
(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1953	1168	3223	1097	97	220	5	133	340	145	377	147	264	7216
1954	533	3705	313	307	1169	218	986	530	770	838	378	268	10015
1955	1486	496	1122	926	1297	316	203	29	194	403	81	2339	8892
1956	977	3726	956	446	1076	555	80	100	103	222	69	956	9266
1957	1508	588	476	212	24	159	695	633	16	458	209	605	5583
1958	437	525	1056	1579	50	1159	24	1546	220	240	264	521	7621
1959	1478	813	1642	289	243	390	743	297	772	639	1174	780	9260
1960	416	588	669	371	485	120	172	53	32	314	670	273	4163
1961	1051	1419	480	474	745	272	259	273	228	450	690	899	7240
1962	1825	394	1111	972	515	103	1936	1027	148	165	207	1343	9746
1963	1069	473	1869	1295	1899	516	5	342	229	230	1074	610	9611
1964	295	1278	1686	819	494	89	177	73	165	301	780	401	6558

OLD BONALBO RAINFALL STATISTICS.
(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1915			NO RECORDS				126	134	95	0	89	439	
1916	553	961	249	912	168	190	140	160	268	318	416	344	4679
1917	742					NO RECORDS							
1918	614	50	325			NO RECORDS					246	N.R.	
1919	N.R.	171				NO RECORDS							
NO RECORDS 1920-1924													
1925	635	402	978	111	363	373			NO RECORDS				
1926						NO RECORDS							
1927		NO RECORDS			10	379	92	15	126	179	566	236	
1928	371	2098	190	696	240	51	332	0	0	187	0	131	4296
1929	586	310	576	312	0	549	0	45	0	261	0	289	2928
1930	343	195	616	373	192	794	0	0	99		NO RECORDS		
1931						NO RECORDS							
1932	103	NO RECORDS		378	NO RECORDS		91			NO RECORDS			
1933	702	220	107	470	350	450	440	50	458	208	847	750	5052
1934	100	45	85	615	363	81	421	197	137	196	322	477	3039
1935	241	373	180	228	97	0	408	22	438	69	83	590	2729
1936	333	0	700	47	80	146	118	0	99	147	120	311	2101

Appendix 12
Sheet 2.

OLD BONALBO RAINFALL STATISTICS
(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1937	528	468	981	326	0	237	110	316	0	283	985	580	4814
1938	1371	418	966	261	584	22	90	133	0	438	327	266	4876
1939	359	111	1392	318	140	188	181	162	128	254	278	523	4034
1940	90	358	814	70	0	77	0	87	24	104	201	863	2688
1941	805	461	349	260	439	136	17	35	0	31	205	187	2925
1942	763	1137	408	32	64	10	177	0	157	565	316	747	4376
1943	236	230	377	0	158	43	15	243	139	480	410	1205	3536
1944	683	146	363	8	161	129	465	451	152	47	195	274	3074
1945	600	619	127	333	117	1197	288	63	178	105	165	365	4157
1946	803	649	581	317	0	0	2	41	375	366	275	276	3685
1947	1055	773	385	605	202	50	42	90	175	187	427	555	4546
1948	346	422	744	182	485	1056	70	130	469	21	NO RECORDS		
1949	299	964	1054	26	99	432	202	63	116	616	325	140	4336
1950	339	1082	313	162	210	1191	871	127	0	636	394	186	5511
1951	1739	237	900	198	114	283	0	74	17	174	44	167	3947
1952	107	536	373	88	238	196	116	191	103	571	161	186	2866
1953	681	1210	622	55	54	0	0	129	35	150	195	95	3226
1954	398	1933	186	148	326	149	784	279	278	623	265	229	5598

Appendix 12
Sheet 3.

OLD BONALBO RAINFALL STATISTICS.
(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1955	430	293	1103	615	401	157	127	55	300	129	40	378	4028
1956	760	1709	1075	360	368	352	63	21	41	133	165	787	5834
1957	312	363	276	62	0	88	295	419	0	307	108	60	2290
1958	407	584	515	475	17	752	0	197	147	158	27	1136	4415
1959	1538	804	1464	110	106	20	263	97	418	339	978	749	6886
1960	197	535	265	125	231	114	114	78	27	222	211	334	2453
1961	150	988	237	190	205	114	338	131	167	336	684	706	4246
1962	700	517	725	363	135	35	831	162	91	135	59	785	4538
1963	552	341	729	398	817	0	0	244	117	56	660	360	4274
1964	328	627	614	370	227	57	72	78	123	127	248	401	3272

WHITE SWAMP RAINFALL STATISTICS.
(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1894			NO RECORDS						341	1201	208	387	
1895	1986	606	124	156	136	3	80	57	182	360	378	716	4784
1896	369	1041	296	274	177	72	393	78	177	283	1471	503	5134
1897	613	234	664	6	72	382	672	216	398	297	94	1349	4997
1898	1396	1182	857	93	239	327	147	130	223	289	234	425	5542
1899	1126	375	216	533	264	259	541	166	275	342	178	796	5071
1900	179	327	379	191	771	298	368	74	232	94	214	131	3258
1901	222	441	748	360	98	340	108	724	87	304	47	90	3569
1902	171	369	164	23	9	59	20	36	85	297	757	431	2421
1903	127	475	292	160	592	412	470	435	619	1035	297	267	5181
1904	59	236	233	410	518	18	163	19	141	252	132	586	2767
1905	665	213	653	405	277	74	7	129	53	402	178	612	3668
1906	438	531	1171	159	370	224	49	622	366	291	200	564	4985
1907	419	497	704	86	154	411	118	168	25	110	402	310	3404
1908	199	652	1197	283	103	66	144	580	263	188	575	137	4387
1909	160	241	439	282	171	201	203	154	232	225	372	375	3055
1910	928	337	501	252	66	555	137	152	317	377	307	800	4729
1911	1800	654	324	89	249	25	161	262	87	363	96	113	4223

Appendix 13
Sheet 2

WHITE SWAMP RAINFALL STATISTICS.
(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1912	54	495	433	68	48	968	341	138	132	300	352	200	3529
1913	521	215	331	478	721	601	80	13	265	201	78	378	3882
1914	137	858	748	134	222	275	228	86	75	317	251	512	3843
1915	324	341	95	137	263	34	189	75	78	20	47	300	1903
1916	552	633	208	457	188	265	160	199	268	N.R.	374	341	
1917	823					NO RECORDS							
1918						NO RECORDS							
1919						NO RECORDS							
1920						638	646	58	245	461	475	377	
1921	383	210	434	278	314	1192	843	85	459	159	142	1418	5917
1922	344	803	32	20	286	195	491	30	444	224	301	436	3606
1923	341	92	182	677	21	308	76	168	201	51	73	430	2620
1924	689	601	420	354	48	595	811	198	256	333	660	298	5263
1925	585	399	925	193	617	405	141	504	85	46	641	855	5396
1926	231	6	44	142	293	139	180	55	271	105	35	989	2490
1927	1510	366	524	295	0	351	102	20	67	513	781	417	4946
1928	430	2892	310	883	234	394	283	95	0	216	190	561	6488
1929	732	986	599	763	70	563	92	95	63	240	147	360	4710

WHITE SWAMP RAINFALL STATISTICS.
(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1930	579	228	293	371	1273	445	342	242	107	348	164	115	4507
1931	417	1115	832	336	414	152	185	85	147	173	574	578	5008
1932	113	157	212	574	267	72	178	36	718	244	602	131	3304
1933	1080	309	94	402	92	342	459	66	458	470	771	883	5426
1934	757	754	157	1005	351	143	507	118	301	241	314	445	5093
1935	306	577	174	419	234	143	308	61	463	256	141	323	3405
1936	609	86	585	171	422	221	258	23	148	73	143	251	2990
1937	226	448	2103	170	33	145	168	397	77	448	917	593	5725
1938	919	387	502	229	866	187	292	206	63	555	233	203	4642
1939	331	139	1793	374	214	269	284	390	52	153	215	221	4435
1940	428	619	1015	85	166	160	0	80	45	138	501	883	4120
1941	987	378	417	185	299	279	95	40	6	64	288	127	3165
1942	345	1354	377	116	208	248	386	28	218	857	288	1129	5554
1943	425	269	141	169	219	149	44	301	278	402	434	1479	4310
1944	835	163	217	27	162	111	340	528	195	79	295	125	3077
1945	395	526	83	290	275	1363	323	156	150	104	287	186	4138
1946	1279	592	934	272	70	30	17	60	513	303	234	523	4827
1947	2731	807	886	340	289	94	72	137	372	251	647	896	7522

WHITE SWAMP RAINFALL STATISTICS.
(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1948	458	227	730	163	426	1414	125	108	337	10	221	497	4716
1949	247	378	1135	91	187	445	167	32	308	915	328	173	4406
1950	890	1227	437	583	116	1394	1506	151	179	834	685	329	8331
1951	1742	143	728	204	159	519	17	153	54	237	4	274	4234
1952	54	356	452	362	356	505	117	397	103	774	185	183	3844
1953	413	932	481	164	186	10	25	206	10	269	232	216	3144
1954	610	2662	338	235	381	273	704	369	475	1205	322	247	7821
1955	531	589	1195	685	591	131	232	100	279	730	119	696	5878
1956	1892	1674	596	539	668	671	137	71	81	229	163	914	7635
1957	256	322	242	35	5	191	348	471	45	224	115	113	2367
1958	380	1116	424	565	23	851	38	241	285	283	332	713	5251
1959	1294	1414	1011	237	173	57	327	113	272	576	1278	793	7545
1960	273	641	342	127	390	199	203	151	46	256	294	402	3324
1961	403	1964	190	207	199	237	408	241	274	446	788	1010	6367
1962	861	230	877	579	100	66	890	200	278	152	223	832	5288
1963	571	468	1348	199	1129	117	33	329	106	249	518	507	5574
1964	449	434	1128	492	475	110	293	186	301	183	276	283	4610

WOODENBONG RAINFALL STATISTICS.

(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1933						NO RECORDS						817	
1934	563	692	130	567	383	77	358	97	330	182	278	429	4086
1935	531	658	244	225	196	51	311	59	458	294	17	672	3716
1936	633	91	631	98	173	163	132	12	96	60	124	275	2488
1937	295	519	1211	97	6	239	123	376	53	385	742	613	4659
1938	931	143	499	443	456	84	230	106	90	347	376	162	3867
1939	505	71	1797	357	221	236	231	260	94	168	265	443	4648
1940	181	524	771	82	82	113	0	79	31	74	363	873	3173
1941	727	463	320	279	377	206	61	11	0	54	210	229	2937
1942	311	1303	361	148	139	130	218	24	121	859	110	742	4466
1943	418	184	132	110	144	35	32	251	268	426	575	1452	4027
1944	817	217	237	26	123	110	372	345	202	50	231	220	2950
1945	247	416	145	278	235	1241	164	178	155	117	227	212	3615
1946	965	566	739	308	33	8	5	14	395	334	159	288	3814
1947	1453	626	628	392	250	56	45	95	236	178	517	897	5373
1948	407	278	602	236	401	1226	64	56	450	30	310	312	4372
1949	298	486	978	111	118	431	187	89	179	674	97	173	3821
1950	506	968	407	615	84	1178	695	138	95	800	366	381	6233

WOODENBONG RAINFALL STATISTICS.

(Points)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1951	1697	252	484	199	167	372	0	77	25	186	17	224	3700
1952	91	341	450	326	291	303	154	252	122	613	73	170	3186
1953	531	830	668	144	137	12	13	169	17	169	200	192	3082
1954	548	2206	347	174	365	245	452	314	408	603	231	262	6155
1955	233	460	1220	500	425	123	136	73	227	465	88	895	4845
1956	946	1660	453	378	447	442	126	36	107	216	135	938	5884
1957	293	441	270	38	12	150	360	377	11	284	64	68	2368
1958	328	717	191	386	45	658	15	178	183	175	257	686	3819
1959	999	997	1095	98	113	52	274	129	282	450	1369	876	6734
1960	228	532	255	106	208	162	141	100	30	183	271	317	2533
1961	267	1146	233	339	231	246	306	154	165	424	498	722	4731
1962	646	215	824	699	98	40	775	191	198	108	67	868	4729
1963	363	398	958	255	1255	88	11	172	31	157	715	439	4842
1964	363	412	1091	600	192	192	173	62	119	78	265	397	3944

STATISTICAL RAINFALL DATA
(Points)

Station	Rainfall Statistic	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
Old Bonalbo (Period 34 years)	Minimum	90	0	85	0	0	0	0	0	0	31	0	60	2101
	10%	129	129	154	29	0	0	0	11	0	63	34	136	2571
	30%	331	350	295	118	98	51	53	59	31	141	163	270	3150
	50%	479	526	462	261	160	122	123	94	120	202	230	363	4096
	70%	692	789	727	362	235	193	292	162	162	327	326	585	4477
	90%	1213	1460	1089	615	420	651	625	298	397	594	766	825	5555
	Maximum	1739	2098	1464	912	817	1197	871	451	458	636	985	1205	6886
Woodenbong (Period 31 years)	Minimum	91	71	130	26	6	8	0	11	0	30	17	68	2368
	10%	229	151	154	85	35	36	6	16	19	55	65	171	2614
	30%	306	375	300	131	121	86	63	75	92	164	131	249	3666
	50%	505	486	484	255	192	162	154	106	122	186	231	397	3944
	70%	638	672	752	365	266	245	248	178	212	401	331	700	4687
	90%	992	1272	1188	593	443	1074	436	339	405	662	687	897	6101
	Maximum	1697	2206	1797	699	1255	1241	775	377	458	859	1369	1452	6734
Banyabba Forestry (Period 9 years)	Minimum	217	183	112	0	0	0	0	15	0	0	15	35	1974
	10%	284	245	125	45	0	0	0	25	0	35	37	130	2567
	30%	406	458	348	125	113	48	40	57	48	75	170	285	3953
	50%	509	605	507	233	210	150	82	100	141	239	245	412	4648
	70%	968	1139	851	423	346	270	331	279	258	460	450	646	6037
	90%	1443	1763	1308	856	526	1976	1820	574	388	626	773	985	8576
	Maximum	1637	2851	1445	2215	810	2521	1901	605	693	727	1005	1132	10697

STATISTICAL RAINFALL DATA
(Points)

Station	Rainfall Statistic	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
Bingeebeebra (Period 24 years)	Minimum	133	150	123	0	0	0	0	0	13	17	0	153	2518
	10%	176	199	209	56	15	12	3	29	25	29	74	179	3041
	30%	259	407	389	165	88	79	19	83	102	138	168	307	4117
	50%	448	666	689	231	194	153	126	109	146	197	257	481	4578
	70%	816	1051	1129	442	305	293	202	174	237	391	405	774	5352
	90%	1567	1542	1387	589	654	1474	832	331	381	675	910	1159	6996
	Maximum	1894	2722	1926	639	1191	1489	1054	434	416	769	1068	1462	7558
Dunoon (Period 30 years)	Minimum	151	92	30	36	26	14	14	0	0	0	87	87	2231
	10%	221	125	211	100	84	43	31	12	15	41	113	150	3613
	30%	298	517	510	200	226	108	115	95	65	160	157	254	4777
	50%	405	708	741	321	411	236	228	187	195	264	277	375	5562
	70%	592	965	1046	545	632	587	416	268	323	386	383	601	6213
	90%	1310	1379	1669	1123	1079	711	730	535	562	678	1156	936	7102
	Maximum	1592	1982	2099	1574	1502	952	1431	921	778	739	1953	1635	8598
Lismore (Period 78 years)	Minimum	48	56	11	16	5	0	0	0	6	11	46	14	2144
	10%	166	139	197	80	39	33	26	33	38	86	103	146	3530
	30%	309	366	415	233	193	140	125	102	114	163	166	268	4576
	50%	529	581	672	389	360	234	241	157	192	228	285	370	5035
	70%	819	894	940	686	554	449	458	266	298	335	486	520	6232
	90%	1353	1412	1396	1060	1104	832	859	518	479	548	825	898	7621
	Maximum	1816	3147	2595	2066	1682	1710	1814	1433	653	882	1440	1299	8713

STATISTICAL RAINFALL DATA
(Points)

Station	Rainfall Statistic	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
Coraki (Period 69 years)	Minimum	61	0	20	3	0	0	0	0	3	0	0	24	1836
	10%	133	156	230	76	75	45	27	14	27	89	69	108	3451
	30%	238	353	388	200	194	134	112	89	101	132	145	222	4126
	50%	449	530	609	426	350	249	234	158	157	249	235	306	4899
	70%	758	721	922	620	518	510	388	260	287	313	414	519	5553
	90%	1162	1206	1289	1019	1017	832	796	483	505	485	756	872	6648
	Maximum	2299	2207	1719	1815	1589	1637	1705	1047	736	716	1721	1838	7801
Mt. Pikapene Forestry (Period 23 years)	Minimum	77	145	126	59	0	0	0	6	15	12	57	12	2405
	10%	123	185	152	73	50	37	7	11	19	23	118	143	2733
	30%	304	393	357	128	126	80	33	80	73	140	236	306	3542
	50%	492	588	532	250	164	125	118	123	167	241	326	382	4728
	70%	744	992	933	377	301	310	281	196	235	349	422	703	5357
	90%	1400	1803	1163	591	586	1631	1024	339	389	651	597	1135	7178
	Maximum	1526	2240	1198	973	1300	1789	1925	455	483	695	1169	1335	8018
Kyogle (Period 50 years)	Minimum	138	38	30	36	0	0	0	0	0	0	47	109	1833
	10%	179	129	188	81	37	29	24	19	15	75	67	188	3165
	30%	403	337	310	217	166	106	77	81	51	149	127	293	4189
	50%	600	506	555	390	279	162	187	122	126	236	289	447	4727
	70%	713	724	769	532	403	317	368	191	228	346	436	731	5393
	90%	1329	1321	1216	894	859	919	747	282	432	555	822	1052	6448
	Maximum	2117	2729	2059	1140	1253	1644	1416	666	632	956	1085	1555	7955

STATISTICAL RAINFALL DATA.
(Points)

Station	Rainfall Statistic	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
Ballina (Period 57 years)	Minimum	63	46	39	34	51	50	0	0	0	0	0	82	2805
	10%	209	197	290	214	128	148	77	68	48	81	69	143	4722
	30%	431	327	462	453	509	266	227	231	115	214	132	247	6066
	50%	642	710	725	689	623	463	405	339	224	284	296	420	6809
	70%	905	944	1030	887	938	755	817	528	419	375	483	577	7940
	90%	1524	1480	1661	1232	1785	1275	1306	826	797	754	888	975	9717
	Maximum	2638	2767	2520	2418	2382	2098	2129	1371	1097	912	1653	2062	11027
Casino (Period 86 years)	Minimum	19	5	5	33	6	0	0	0	2	7	15	30	1929
	10%	183	134	136	72	56	17	11	19	33	74	104	154	3049
	30%	298	337	341	175	125	80	67	60	87	140	154	240	3611
	50%	466	482	478	313	227	173	151	112	140	216	297	342	4249
	70%	719	758	735	446	363	295	286	168	258	328	401	510	4980
	90%	1199	1158	1144	765	677	585	626	387	401	566	724	844	6016
	Maximum	1651	2920	2782	1550	1228	1383	1685	990	594	870	1444	1264	7696

MINIMUM RAINFALL RECORDED.
IN CONSECUTIVE MONTHS
(Points)

Station	Number of Months	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Ballina	1	63	46	39	34	51	50	0	0	0	0	0	82
	2	279	286	274	199	218	85	47	116	54	0	230	203
	3	349	395	555	510	218	132	203	127	118	254	295	464
	4	884	676	1100	770	265	498	332	335	351	530	556	1036
	5	1597	1235	1535	817	631	782	413	571	627	866	1148	1290
	6	1790	1826	1651	1183	915	960	649	789	958	1509	1400	2003
	7	2128	2152	1958	1467	1093	1208	867	1304	1862	2007	2113	2196
	8	2454	2249	1968	1645	1755	1484	1771	2121	2035	2519	2306	2534
	9	2551	2259	2033	2173	2015	1976	2538	2567	2592	3110	2644	2860
	10	2561	2324	2212	2320	2276	2731	2848	3070	3273	3448	2970	2957
	11	2626	2503	2488	2581	3180	3053	3405	3645	3954	3774	3067	2967
	12	2805	2779	3111	3485	3353	3610	3852	4050	4190	3871	3077	3032
Casino	1	19	5	5	33	6	0	0	0	2	7	15	30
	2	113	212	118	98	54	9	17	18	9	112	105	180
	3	413	497	274	149	75	25	31	25	204	389	208	324
	4	780	566	303	194	91	205	60	252	437	432	352	574
	5	897	595	370	322	301	266	315	475	560	576	602	894
	6	926	662	409	431	535	513	497	602	704	826	933	963
	7	993	701	535	607	753	674	654	746	954	1278	1002	992
	8	1032	827	776	889	848	693	798	996	1509	1347	1031	1059
	9	1158	1068	991	984	1013	837	1048	1636	1578	1376	1098	1098
	10	1399	1283	1306	1216	1157	1087	1688	1784	1607	1443	1137	1224
	11	1614	1598	1478	1434	1407	1727	2024	1813	1674	1482	1263	1465
	12	1929	1782	1622	1684	2047	2334	2053	1880	1713	1608	1504	1680

MINIMUM RAINFALL RECORDED IN CONSECUTIVE MONTHS

(Points)

Station	Number of Months	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Coraki	1	61	0	20	3	0	0	0	0	3	0	0	24
	2	142	141	127	50	75	24	11	43	48	80	24	160
	3	295	529	336	132	75	35	98	70	197	285	230	344
	4	662	634	583	289	86	164	182	229	316	362	568	606
	5	1012	697	724	447	316	446	294	345	393	746	606	938
	6	1083	872	849	491	649	508	391	446	867	1010	1000	1099
	7	1221	963	989	740	785	629	468	1030	1448	1404	1099	1162
	8	1404	1103	1048	830	878	929	1052	1491	1842	1503	1162	1337
	9	1544	1386	1128	923	1249	1196	1587	1921	1941	1566	1337	1428
	10	1545	1492	1339	1294	1451	1776	1943	2079	2004	1741	1428	1568
	11	1625	1703	1889	1990	2180	2466	2139	2278	2179	1832	1568	1821
	12	1836	2106	2283	2643	2575	2547	2388	2453	2270	1972	1851	1901
Kyogle	1	138	38	30	36	0	0	0	0	0	0	47	109
	2	193	305	136	55	60	.6	49	24	40	47	225	330
	3	460	490	312	96	67	108	63	65	189	225	581	417
	4	785	716	422	133	169	157	113	234	367	731	714	882
	5	1064	788	508	261	361	273	273	468	739	1109	981	1426
	6	1101	812	720	424	493	367	516	764	1212	1376	1874	1896
	7	1198	1035	959	556	781	650	812	1374	1823	1976	1987	2032
	8	1421	1339	959	881	1048	1132	1402	1924	2031	2089	2262	2056
	9	1608	1454	1006	1153	1301	1447	1939	2279	2144	2560	2400	2279
	10	1608	1501	1184	1401	1611	2142	2296	2392	2561	2878	2623	2583
	11	1655	1679	1833	2067	2306	2456	2575	2586	2879	2902	2826	2748
	12	1833	2328	2404	2713	2620	2794	2634	2904	2903	2977	2928	2898

RICHMOND RIVER AT WIANGAREE BRIDGE (No. 2)
(Previously Wiangaree No. 1)

LOCATION: Latitude 28°30' Longitude 152°58'

PERIOD OF ESTABLISHMENT: May, 1943 to date.

COMPLETE YEARS OF COMPUTED RECORDS: 22.

ZERO OF GAUGE: R.L. 52.81 Assumed Datum.

CATCHMENT AREA: No. 2 Gauge 271 square miles.
No. 1 Gauge 276 square miles.

CONTROL: Rock and gravel. Subject to alteration.

EQUIPMENT: Staff gauge range 0 to 60 feet.

CURRENT METER OBSERVATIONS:

(a)	Number obtained	133
(b)	Maximum Observation in cusecs	17,699
(c)	Minimum observation in cusecs	8.2

MAXIMUM ESTIMATED DISCHARGE DURING PERIOD OF RECORDS: 145,000 cusecs.

MEAN DAILY DISCHARGE DURING PERIOD OF RECORDS: 412 cusecs.

MEAN ANNUAL DISCHARGE FOR 22 YEARS: 304,600 acre feet.

REMARKS:

No. 1 Station was established in May, 1943 and discontinued in March, 1960. No. 2 Station was established in April, 1960 at a site approximately 1½ miles upstream of No. 1 Station.

RICHMOND RIVER AT WIANGAREE.

Year 1943

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	..	..	..	..
Feb.	..	..	..	..
Mar.	..	..	..	..
Apr.	..	..	..	..
May	..	..	..	..
June	131	32	45	2,684
July	32	25	27	1,690
Aug.	32	22	26	1,626
Sept.	261	25	55	3,322
Oct.	250	25	55	3,396
Nov.	470	25	102	6,112
Dec.	23700	25	1085	67,272
Total	..	..	..	..

Year 1944

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	10400	40	1081	67,002
Feb.	1290	101	286	16,602
Mar.	206	56	98	6,092
Apr.	184	48	71	4,232
May	92	40	47	2,920
June	101	40	44	2,668
July	470	52	105	6,496
Aug.	1800	40	170	10,538
Sept.	309	48	76	4,550
Oct.	56	32	38	2,376
Nov.	92	19	33	1,956
Dec.	52	19	24	1,480
Total	..	..	..	126,912

Year 1945

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	345	13	53	3,314
Feb.	5400	16	251	14,064
Mar.	485	22	69	4,288
Apr.	206	3	67	4,048
May	717	32	106	6,542
June	49200	206	2433	145,954
July	1620	115	316	19,596
Aug.	157	67	103	6,362
Sept.	67	33	53	3,188
Oct.	91	33	45	2,778
Nov.	42	28	32	1,918
Dec.	91	18	33	2,016
Total	..	..	..	214,068

Year 1946

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	4000	18	315	19,554
Feb.	10000	42	1098	61,508
Mar.	37500	99	2144	132,916
Apr.	7050	148	816	50,584
May	148	67	106	6,550
June	67	52	60	3,616
July	52	39	49	3,032
Aug.	39	28	31	1,886
Sept.	45	18	30	1,800
Oct.	59	20	28	1,744
Nov.	28	13	18	1,064
Dec.	139	8	28	1,756
Total	..	..	..	286,010

RICHMOND RIVER AT WIANGAREE

Year 1947					Year 1948				
Month	Discharge in Cusecs			Discharge for Month Acre Feet	Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	42600	8	1865	115,654	Jan.	345	40	103	6,388
Feb.	No Records			43,000*	Feb.	65	48	56	3,254
Mar.	No Records			59,000*	Mar.	7300	56	575	35,650
Apr.	No Records			61,000*	Apr.	297	83	143	8,580
May	455	162	225	13,964	May	28100	101	1218	75,490
June	228	85	129	7,742	June	58800	65	3353	201,176
July	83	56	70	4,336	July	297	121	177	10,986
Aug.	56	48	53	3,296	Aug.	111	74	94	5,850
Sept.	173	40	69	4,114	Sept.	3200	56	239	14,328
Oct.	56	32	40	2,464	Oct.	111	40	63	3,914
Nov.	206	25	81	4,864	Nov.	48	25	36	2,170
Dec.	3650	48	410	25,390	Dec.	195	32	56	3,478
Total	..	..	..	344,824*	Total	..	..	..	371,264

Year 1949					Year 1950				
Jan.	309	13	40	2,464	Jan.	3850	19	237	14,718
Feb.	184	13	80	4,474	Feb.	13100	13	925	51,826
Mar.	9500	131	1564	96,946	Mar.	5100	92	643	39,882
Apr.	860	131	267	16,006	Apr.	567	111	290	17,386
May	629	92	148	9,202	May	548	141	215	13,356
June	1290	92	208	12,504	June	55134	101	3532	211,922
July	131	56	78	4,674	July	2320	332	991	61,434
Aug.	65	44	58	3,608	Aug.	935	250	432	26,810
Sept.	48	40	43	2,600	Sept.	228	173	196	11,744
Oct.	2200	32	159	9,860	Oct.	4400	184	506	31,402
Nov.	74	40	44	2,670	Nov.	717	173	234	14,062
Dec.	40	19	28	1,722	Dec.	2130	152	311	19,280
Total	..	..	..	166,730	Total	..	..	..	513,822

* Estimated.

RICHMOND RIVER AT WIANGAREE

Year 1951

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	46400	101	2594	160,808
Feb.	No Records			54,820*
Mar.	"	"		57,162*
Apr.	"	"		4,850*
May	"	"		7,648*
June	"	"		50,000*
July	"	"		6,912*
Aug.	"	"		4,162*
Sept.	"	"		2,860*
Oct.	"	"		2,680*
Nov.	"	"		1,554*
Dec.	"	"		3,166*
Total	..	..	..	356,622*

Year,1952

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min	Mean	
Jan.	No Records			1,294*
Feb.	"	"		4,262*
Mar.	"	"		25,124*
Apr.	"	"		7,362*
May	"	"		6,668*
June	"	"		19,046*
July	"	"		3,600*
Aug.	"	"		27,120*
Sept.	"	"		3,740*
Oct.	"	"		6,320*
Nov.	"	"		2,320*
Dec.	"	"		1,400*
Total	..	..	..	110,256*

Year 1953

Jan.	No Records			3,430*
Feb.	"	"		104,380*
Mar.	"	"		79,200*
Apr.	"	"		13,284*
May	"	"		5,880*
June	"	"		2,860*
July	"	"		2,940*
Aug.	"	"		2,140*
Sept.	"	"		2,040*
Oct.	"	"		2,060*
Nov.	"	"		1,160*
Dec.	"	"		780*
Total	..	..	..	220,154*

Year 1954

Jan.	No Records			2,540*
Feb.	"	"		264,500*
Mar.	"	"		39,000*
Apr.	"	"		6,156*
May	"	"		23,024*
June	"	"		23,254*
July	"	"		79,600*
Aug.	"	"		18,760*
Sept.	"	"		12,020*
Oct.	"	"		85,254*
Nov.	"	"		18,638*
Dec.	"	"		7,420*
Total	..	..	..	580,166*

* Estimated.

RICHMOND RIVER AT WIANGAREE

Year 1955

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	No Records			7,600*
Feb.	"	"		6,856*
Mar.	"	"		247,468*
Apr.	"	"		109,854*
May	"	"		87,000*
June	"	"		17,942*
July	"	"		11,380*
Aug.	"	"		6,200*
Sept.	"	"		4,880*
Oct.	"	"		6,520*
Nov.	"	"		3,540*
Dec.	"	"		58,344*
Total	..	..	..	567,584*

Year 1956

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	No Records			138,202*
Feb.	"	"		502,860*
Mar.	"	"		115,176*
Apr.	"	"		33,548*
May	"	"		77,686*
June	"	"		16,540*
July	"	"		8,090*
Aug.	"	"		4,760*
Sept.	"	"		3,460*
Oct.	"	"		3,160*
Nov.	"	"		2,120*
Dec.	"	"		18,800*
Total	..	..	..	924,402*

Year 1957

Jan.	No Records			10,260*
Feb.	"	"		20,400*
Mar.	"	"		10,660*
Apr.	"	"		3,700*
May	"	"		2,720*
June	"	"		2,400*
July	"	"		6,840*
Aug.	"	"		10,254*
Sept.	"	"		3,224*
Oct.	"	"		1,584*
Nov.	"	"		4,796*
Dec.	"	"		772*
Total	..	..	..	77,610*

Year 1958

Jan.	No Records			1,006*
Feb.	"	"		4,256*
Mar.	"	"		1,506*
Apr.	"	"		12,680*
May	"	"		3,890*
June	"	"		49,232*
July	"	"		7,364*
Aug.	"	"		4,900*
Sept.	"	"		2,186*
Oct.	"	"		1,716*
Nov.	"	"		1,146*
Dec.	"	"		5,556*
Total	..	..	..	95,438*

* Estimated.

RICHMOND RIVER AT WIANGAREE AND WIANGAREE BRIDGE

Year 1959

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	No Records			82,560*
Feb.	"	"		76,114*
Mar.	"	"		98,750*
Apr.	"	"		26,854*
May	"	"		9,050*
June	"	"		6,120*
July	"	"		30,450*
Aug.	"	"		8,020*
Sept.	"	"		10,230*
Oct.	"	"		11,300*
Nov.	"	"		88,266*
Dec.	"	"		15,370*
Total	..	..	..	463,084*

Year 1960

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	No Records			6,666*
Feb.	624	51	210	12,172
Mar.	No Records			30,428*
Apr.	"	"		6,152*
May	"	"		7,510*
June	220	72	96	5,738
July	184	54	79	4,920
Aug.	171	33	54	3,326
Sept.	30	24	26	1,590
Oct.	47	27	29	1,772
Nov.	133	18	32	1,924
Dec.	125	12	26	1,618
Total	..	..	..	83,816*

Year 1961

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	1260	11	134	8,280
Feb.	11020	22	545	30,546
Mar.	265	26	86	5,344
Apr.	595	39	133	7,996
May	310	39	80	4,968
June	520	66	220	13,204
July	780	30	118	7,332
Aug.	No Records			9,000*
Sept.	650	34	127	7,640
Oct.	810	31	166	10,268
Nov.	306	59	119	7,146
Dec.	2690	74	370	22,946
Total	..	..	..	134,670*

Year 1962

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	13600	167	976	60,536
Feb.	595	90	208	11,674
Mar.	4940	108	636	39,458
Apr.	14140	178	1118	67,092
May	1470	156	391	24,244
June	189	74	114	6,816
July	40810	59	1932	119,758
Aug.	1025	149	345	21,360
Sept.	220	86	120	7,194
Oct.	94	35	56	3,470
Nov.	71	21	37	2,212
Dec.	1800	30	273	16,938
Total	..	..	..	380,752

* Estimated.

RICHMOND RIVER AT WIANGAREE BRIDGE

Year 1963

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	20800	86	747	46,286
Feb.	910	78	261	14,634
Mar.	23600	78	1590	98,616
Apr.	1260	161	478	29,702
May	65800	260	2000	124,000
June	1420	188	295	17,690
July	409	139	233	14,456
Aug.	426	67	131	8,106
Sept.	No Records			4,000*
Oct.	"	"		3,000*
Nov.	"	"		8,000*
Dec.	"	"		10,000*
Total	..	..	..	377,490*

Year 1964

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	156	32	56	3,500
Feb.	555	36	142	8,260
Mar.	8400	121	971	60,200
Apr.	955	234	471	28,300
May	2600	146	357	22,100
June	465	100	172	10,300
July	234	76	108	6,670
Aug.	76	49	62	3,830
Sept.	76	43	55	3,270
Oct.	63	21	33	2,030
Nov.	53	21	31	1,850
Dec.	86	21	36	2,230
Total	..	..	..	152,540

Year 1965

Jan.	94	14	31	1,920
Feb.	360	19	54	3,030
Mar.	29	11	14.9	923
Apr.	39	11	14.1	845
May	34	10.5	20.7	1,280
June	705	10.5	90	5,420
July	56700	10.5	1535	95,200
Aug.	165	37	63	3,930
Sept.	176	37	74	4,410
Oct.	85	37	42	2,630
Nov.	54	20	30	1,800
Dec.	3150	50	496	30,700
Total	..	..	..	152,088

* Estimated.

RICHMOND RIVER AT CASINO.

LOCATION:	Latitude 28°52' Longitude 153°02'
PERIOD OF ESTABLISHMENT:	May, 1943 to date
COMPLETE YEARS OF COMPUTED RECORDS:	22
ZERO OF GAUGE:	R.L. 29.75 Standard Datum (Ballina)
CATCHMENT AREA:	690 square miles.
CONTROL:	Rock
EQUIPMENT:	Staff gauge range 0 to 40 feet.
CURRENT METER OBSERVATIONS:	(a) Number obtained : 134
	(b) Maximum Observation in cusecs : 63,806
	(c) Minimum observation in cusecs : 1.4
MAXIMUM ESTIMATED DISCHARGE DURING PERIOD OF RECORDS:	150,000 cusecs.
MEAN DAILY DISCHARGE DURING PERIOD OF RECORDS:	831 cusecs
MEAN ANNUAL DISCHARGE FOR 22 YEARS:	616,000 acre feet.
REMARKS:	

RICHMOND RIVER AT CASINO

Year 1943

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	..	..	..	..
Feb.	..	..	..	..
Mar.	..	..	..	..
Apr.	..	..	..	..
May	..	..	..	..
June	166	48	74	4,430
July	48	31	40	2,452
Aug.	64	28	39	2,428
Sept.	495	22	89	5,334
Oct.	700	34	120	7,446
Nov.	1,270	48	215	12,918
Dec.	34,000	64	1,750	108,486
Total	..	...	..	..

Year 1944

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	24,850	143	3,173	196,706
Feb.	4,810	217	722	41,860
Mar.	930	121	240	14,868
Apr.	245	101	151	9,034
May	166	82	103	6,374
June	217	82	101	6,060
July	3,500	101	320	19,852
Aug.	3,230	101	400	24,808
Sept.	756	101	168	10,052
Oct.	121	48	71	4,430
Nov.	191	22	60	3,624
Dec.	82	22	43	2,688
Total	..	..	..	340,356

Year 1945

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	405	13	86	5,356
Feb.	1,350	22	101	5,632
Mar.	644	64	158	9,808
Apr.	405	82	168	10,054
May	1,130	64	149	9,214
June	66,100	360	5,116	306,984
July	7,890	217	883	54,772
Aug.	277	121	186	11,550
Sept.	191	101	130	7,782
Oct.	101	64	82	5,094
Nov.	121	48	68	4,052
Dec.	166	34	62	3,864
Total	..	..	..	434,162

Year 1946

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	10,400	22	654	40,544
Feb.	21,700	82	2,264	126,772
Mar.	33,000	191	3,298	204,462
Apr.	15,350	360	1,878	112,706
May	360	154	242	14,990
June	155	121	140	8,386
July	121	64	99	6,116
Aug.	64	56	61	3,800
Sept.	405	48	89	5,346
Oct.	217	34	70	4,326
Nov.	82	22	44	2,658
Dec.	217	10	34	2,128
Total	..	..	..	532,234

RICHMOND RIVER AT CASINO

Year 1947

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	28,500	7	1,922	119,180
Feb.	10,600	287	1,849	103,546
Mar.	16,480	326	2,221	137,716
Apr.	16,480	405	2,367	142,038
May.	1,270	245	526	32,636
June	450	166	249	14,942
July	166	116	142	8,774
Aug.	143	101	115	7,128
Sept.	166	69	104	6,244
Oct.	245	48	82	5,104
Nov.	439	34	118	7,108
Dec.	4,895	166	1,002	62,096
Total	..	..	..	646,512

Year 1948

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	686	106	236	14,618
Feb.	196	82	117	6,814
Mar.	11,405	106	974	60,366
Apr.	742	143	307	18,392
May	38,600	224	2,598	161,098
June	59,000	198	5,728	343,676
July	813	261	462	28,622
Aug.	317	143	212	13,142
Sept.	5,660	121	490	29,372
Oct.	337	73	138	8,556
Nov.	191	60	92	5,490
Dec.	450	82	177	10,976
Total	..	..	..	701,122

Year 1949

Jan.	337	41	76	4,730
Feb.	2,740	44	379	21,222
Mar.	19,900	416	3,736	231,654
Apr.	2,780	296	738	44,268
May	2,170	217	384	23,826
June	3,910	238	651	39,086
July	1,650	184	343	21,262
Aug.	217	137	166	10,264
Sept.	172	82	130	7,810
Oct.	10,300	64	608	37,704
Nov.	198	76	106	6,362
Dec.	82	41	67	4,144
Total	..	..	..	452,332

Year 1950

Jan.	4,210	31	284	17,604
Feb.	20,800	64	2,606	145,946
Mar.	24,100	644	2,496	154,776
Apr.	2,050	590	1,178	70,662
May	2,982	296	789	48,888
June	58,400	204	6,229	373,722
July	12,670	845	4,235	262,604
Aug.	5,830	580	1,426	88,428
Sept.	950	255	416	24,930
Oct.	8,490	291	1,882	116,702
Nov.	3,350	228	824	49,456
Dec.	2,280	400	910	56,426
Total	..	..	..	1,410,144

RICHMOND RIVER AT CASINO

Year 1951

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	54,700	400	6,538	405,338
Feb.	16,980	712	2,334	130,698
Mar.	27,400	410	2,536	157,236
Apr.	830	255	492	29,520
May	508	209	276	17,124
June	12,670	203	1,209	72,536
July	318	190	236	14,650
Aug.	215	116	151	9,374
Sept.	116	101	110	6,600
Oct.	143	56	97	6,010
Nov.	78	34	50	3,014
Dec.	231	22	146	3,064
Total	..	..	..	855,164

Year 1952

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	45	28	37	2,284
Feb	1,760	9	162	9,410
Mar.	6,860	96	496	30,666
Apr.	430	121	205	12,280
May	617	96	214	13,256
June	3,910	106	393	23,600
July	262	101	127	7,982
Aug.	5,660	190	981	60,848
Sept.	196	101	141	8,438
Oct.	2,675	73	351	21,732
Nov.	160	41	72	4,300
Dec.	73	20	40	2,466
Total	..	..	..	197,262

Year 1953

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	815	31	153	9,472
Feb.	33,300	41	5,491	307,504
Mar.	39,400	400	3,647	226,132
Apr.	1,312	255	528	31,680
May	555	143	237	14,720
June	172	111	139	8,364
July	190	82	111	6,898
Aug.	166	60	76	4,726
Sept.	269	48	81	4,856
Oct.	221	28	59	3,638
Nov.	41	8	21	1,210
Dec.	34	3	12	764
Total	..	..	..	619,964

Year 1954

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	132	4	48	3,004
Feb.	150,000	56	7406	414,716
Mar.	920	237	475	29,450
Apr.	276	150	206	12,364
May	3,000	129	708	43,878
June	2,540	223	576	34,530
July	37,800	252	3,288	203,858
Aug.	5,850	216	711	44,070
Sept.	1,120	161	365	21,894
Oct.	9,700	319	1,589	98,554
Nov.	1,880	172	422	25,300
Dec.	630	86	190	11,800
Total	..	..	..	943,418

RICHMOND RIVER AT CASINO

Year 1955

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	1,155	59	215	13,344
Feb.	399	128	211	11,820
Mar.	55,400	172	4,251	263,566
Apr.	15,050	530	2,997	179,800
May	26,900	618	2,493	150,774
June	1,138	410	633	37,956
July	699	276	339	21,044
Aug.	263	141	193	11,940
Sept.	348	104	146	8,752
Oct.	1,033	104	233	14,440
Nov.	235	33	100	6,014
Dec.	11,720	12	1,204	74,670
Total	..	..	..	794,120

Year 1956

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	14,150	120	1,758	109,014
Feb.	81,300	555	9,901	574,232
Mar.	9,980	1,190	3,166	196,320
Apr.	1,880	302	817	49,036
May	23,000	285	1,938	120,170
June	4,360	191	556	33,366
July	378	168	238	14,774
Aug.	168	104	140	8,662
Sept.	104	76	91	5,490
Oct.	115	50	65	4,060
Nov.	87	28	44	2,668
Dec.	4,735	26	355	21,994
Total	..	..	..	1,139,786

Year 1957

Jan.	1,480	50	266	16,488
Feb.	1,480	215	586	32,802
Mar.	605	157	283	17,550
Apr.	162	50	103	6,192
May	50	28	42	2,632
June	157	50	61	3,670
July	368	50	99	6,160
Aug.	6,750	41	388	24,068
Sept.	319	30	90	5,418
Oct.	126	9	24	1,476
Nov.	1,720	14	159	9,564
Dec.	52	1	9	566
Total	..	..	..	126,586

Year 1958

Jan.	38	1	16	967
Feb.	189	14	56	3,164
Mar.	146	26	64	3,988
Apr.	3,050	33	356	21,370
May	178	38	82	5,076
June	15,500	35	1,486	89,132
July	740	122	226	14,026
Aug.	570	86	164	10,140
Sept.	146	48	79	4,770
Oct.	158	19	67	4,150
Nov.	24	7	15	894
Dec.	530	6	74	4,563
Total	..	..	..	162,240

RICHMOND RIVER AT CASINO.

Year 1959

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	30,800	158	2,471	153,194
Feb.	49,200	325	4,635	259,588
Mar.	22,300	370	3,338	206,964
Apr.	2,450	392	877	52,602
May	448	203	317	19,626
June	370	169	230	13,810
July	2,360	136	548	33,964
Aug.	392	68	163	10,088
Sept.	2,000	120	342	20,548
Oct.	2,120	88	297	18,394
Nov.	24,300	220	3,203	192,210
Dec.	4,510	237	807	50,030
Total	..	..	..	1,031,018

Year 1960

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	510	152	247	15,332
Feb.	660	78	237	13,772
Mar.	4,810	186	737	45,702
Apr.	307	120	176	10,538
May	860	68	175	10,864
June	415	68	138	8,252
July	325	68	120	7,448
Aug.	325	49	93	5,738
Sept.	49	25	35	2,076
Oct.	36	10	22	1,344
Nov.	186	8	35	2,076
Dec.	112	5	31	1,900
Total	..	..	..	125,042

Year 1961

Jan.	960	0.5	174	10,784
Feb.	14,900	36	625	35,012
Mar.	320	68	188	11,658
Apr.	810	111	266	15,936
May	710	94	198	12,296
June	1,480	118	436	26,186
July	2,040	64	211	13,066
Aug.	605	76	166	10,272
Sept.	440	43	122	7,318
Oct.	920	39	297	18,402
Nov.	980	66	198	11,906
Dec.	3,400	101	583	36,168
Total	..	..	..	209,004

Year 1962

Jan.	14,750	178	2,575	159,620
Feb.	2,120	160	418	23,406
Mar.	9,400	196	1,160	71,920
Apr.	36,600	440	2,804	168,210
May	2,200	320	494	30,640
June	320	152	217	13,030
July	68,800	152	5,610	347,750
Aug.	1,660	320	462	28,640
Sept.	320	175	224	13,430
Oct.	160	72	114	7,086
Nov.	160	44	80	4,796
Dec.	5,380	40	701	43,480
Total	..	..	..	912,008

RICHMOND RIVER AT CASINO

Year 1963

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	27,850	360	2,469	153,090
Feb.	1,400	206	500	27,984
Mar.	26,750	240	3,810	236,200
Apr.	3,240	480	1,109	66,560
May	65,600	610	1,687	414,600
June	1,480	440	568	34,060
July	660	240	397	24,620
Aug.	520	175	227	14,084
Sept.	360	83	150	8,976
Oct.	145	94	123	7,628
Nov.	3,620	54	372	22,344
Dec.	1,705	119	423	26,244
Total	..	..	..	1,036,390

Year 1964

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min	Mean	
Jan.	280	54	102	6,296
Feb.	9,840	94	736	42,686
Mar.	22,200	360	3,169	196,480
Apr.	6,220	610	1,755	105,270
May	1,570	420	679	42,080
June	3,360	240	535	32,090
July	480	160	236	14,630
Aug.	175	94	134	8,300
Sept.	119	54	87	5,192
Oct.	107	22	47	2,906
Nov.	300	30	60	3,624
Dec.	145	3.5	42	2,604
Total	..	..	..	462,158

Year 1965

Jan.	320	14	59	3,660
Feb.	360	30	116	6,480
Mar.	36	0	13	788
Apr.	88	0	14	816
May	66	14.5	30	1,860
June	1,190	10.5	998	5,990
July	74,600	34	4,710	292,000
Aug.	1,880	88	300	18,600
Sept.	1,120	77	229	13,700
Oct.	136	29	66	4,070
Nov.	66	2.0	13.5	812
Dec.	7,500	29	1,073	66,500
Total	..	..	..	415,276

BACK CREEK AT BENTLEY (BUCKLAND BRIDGE)

LOCATION:	Latitude 28°44' Longitude 153°05'
PERIOD OF ESTABLISHMENT: .	August, 1951 to date
COMPLETE YEARS OF COMPUTED RECORDS:	14
ZERO OF GAUGE:	R.L. 59.04 Assumed Datum
CATCHMENT AREA:	42 square miles
CONTROL:	Rock
EQUIPMENT:	Automatic Recorder (Pressure type) installed August, 1954. Staff gauge, range 0 to 35 feet.
CURRENT METER OBSERVATIONS:	(a) Number obtained : 101
	(b) Maximum Observation in Cusecs : 4,700
	(c) Minimum observation in cusecs : 0.1
MAXIMUM ESTIMATED DISCHARGE DURING PERIOD OF RECORDS:	27,500 cusecs
MEAN DAILY DISCHARGE DURING PERIOD OF RECORDS:	61 cusecs
MEAN ANNUAL DISCHARGE FOR 14 YEARS:	45,300 acre feet
REMARKS:	

BACK CREEK AT BENTLEY (BUCKLAND BRIDGE)

Year 1951

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	..	..	..	..
Feb.	..	..	..	..
Mar.	..	..	..	..
Apr.	..	..	..	..
May	..	..	..	..
June	..	..	..	..
July	..	..	..	..
Aug.	..	..	..	..
Sept.	..	..	..	..
Oct.	8.3	1.8	3.8	234
Nov.	1.8	1.2	1.3	80
Dec.	18	0.7	3.3	204
Total	..	..	..	..

Year 1952

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	1.9	0.3	0.9	57
Feb.	200	0.2	15	888
Mar.	200	1.2	40	2,504
Apr.	57	2.5	18	1,066
May	18	2.5	3.7	228
June	77	2.5	9.7	584
July	40	2.5	5.8	358
Aug.	1200	4.8	68	4,206
Sept.	8.3	1.8	3.4	202
Oct.	463	2.5	34	2,098
Nov.	2.5	2.5	2.5	150
Dec.	2.5	1.2	1.4	90
Total	..	..	..	12,431

Year 1953

Jan.	66	1.2	10	614
Feb.	4700	2.5	781	43,740
Mar.	5000	23	229	14,210
Apr.	49	21	29	1,712
May	41	13	14	894
June	11	9	9	552
July	8	4	6.8	420
Aug.	9	3	4.3	266
Sept.	5	0.5	2.6	157
Oct.	36	0	1.7	104
Nov.	1.7	0	0.7	39
Dec.	3	0.5	1	54
Total	..	..	..	62,762

Year 1954

Jan.	2	0.2	0.5	31
Feb.	25000	0.2	558	31,249
Mar.	149	18	37	2,274
Apr.	170	9	27	1,590
May	340	6	76	4,702
June	123	17	37	2,236
July	3800	15	257	15,908
Aug.	672	17	45	2,790
Sept.	380	2.2	30	1,812
Oct.	616	12	76	4,666
Nov.	308	9	25	1,472
Dec.	49	7	9	564
Total	..	..	..	69,294

BACK CREEK AT BENTLEY (BUCKLAND BRIDGE)

Year 1955

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	484	3	25	1,534
Feb.	14	3.4	7.4	411
Mar.	25000	5	358	22,188
Apr.	4060	25	268	16,104
May	2000	36	117	7,238
June	149	25	46	2,788
July	25	19	20	1,262
Aug.	17	12	14	896
Sept.	12	9	10.5	630
Oct.	9	5	6	386
Nov.	8	1.3	3.4	206
Dec.	2870	0	96	5,921
Total	..	..	..	59,564

Year 1956

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	1280	0.5	76	4,696
Feb.	27500	9.2	700	40,600
Mar.	No Records			45,000*
Apr.	71	23	41	2,484
May	3100	18	167	10,360
June	308	9.2	32	1,925
July	24	11.6	14	882
Aug.	11.6	6.8	8.5	527
Sept.	6.8	4.4	6.1	364
Oct.	4.4	3.2	4	248
Nov.	4.4	2.8	3.6	217
Dec.	237	2.5	20	1,248
Total	..	..	..	108,551 *

Year 1957

Jan.	296	3.2	21	1,308
Feb.	445	6.8	120	6,750
Mar.	49	9	18	1,096
Apr.	9	3.4	6.9	416
May	3.4	3.4	3.4	210
June	7	3.4	4.1	248
July	10	3.4	5.8	362
Aug.	2490	5.4	59	3,637
Sept.	14	3	11	646
Oct.	19	1	2.5	157
Nov.	19	0	4.1	246.
Dec.	0	0	0	0
Total	..	..	..	15,076

Year 1958

Jan.	1.9	0	1.1	66
Feb.	1.9	0.4	1.3	75
Mar.	21	0.4	3.6	223
Apr.	100	0.4	12.5	752
May	4	2.5	3.1	195
June	4000	3	174	10,434
July	41	5	15	918
Aug.	240	5	35	2,170
Sept.	7	4	5.3	320
Oct.	29	1.5	6.8	421
Nov.	2	1	1.7	104
Dec.	55	1	5.9	366
Total	..	..	..	16,044

* Estimated.

BACK CREEK AT BENTLEY (BUCKLAND BRIDGE)

Year 1959

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	9000	9.5	209	12,945
Feb.	5000	14	286	16,006
Mar.	1880	17	203	12,586
Apr.	112	17	37	2,236
May	40	12	20	1,244
June	13	11	12	722
July	560	7.5	57	3,543
Aug.	20	10.5	14.6	906
Sept.	240	9	30	1,784
Oct.	220	9	28	1,726
Nov.	3600	12	247	14,850
Dec.	285	15	30	1,872
Total	..	..	..	70,420

Year 1960

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	25	9	13	796
Feb.	15	6.5	10.2	590
Mar.	1,064	6.5	43	2,634
Apr.	12	6.5	7.5	452
May	12	4.5	5.6	346
June	12	1.2	4.7	280
July	5.5	4.5	5	307
Aug.	32	3	5.6	347
Sept.	25	1.2	5.7	339
Oct.	4.5	0.9	1.9	119
Nov.	9	0.6	2.8	166
Dec.	189	0.6	7.2	446
Total	..	..	..	6,822

Year 1961

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	20	0	5.1	314
Feb.	667	0	54	3,010
Mar.	125	2.5	36	2,210
Apr.	75	8	29	1,750
May	105	4.5	22	1,340
June	109	9	25	1,480
July	39	9	15	940
Aug.	46	6.5	16	975
Sept.	9	5.5	7.3	440
Oct.	126	4.5	25	1 520
Nov.	46	2	14.9	894
Dec.	420	1.2	31	1,910
Total	..	..	..	16.783

Year 1962

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	1100	13	113	7,030
Feb.	126	16	45	2,550
Mar.	185	24	49	3,060
Apr.	6,750	24	218	13,100
May	648	24	44	2,702
June	22	13	16	940
July	15300	13	592	36,700
Aug.	122	16	24	1,510
Sept.	24	13	17	1,020
Oct.	13	3.5	9.0	561
Nov.	10	2.5	4.5	272
Dec.	992	0.4	70	4,320
Total	..	..	..	73,765

Appendix 19
Sheet 5

BACK CREEK AT BENTLEY (BUCKLAND BRIDGE)

Year 1963

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	3050	16	122	7,590
Feb.	576	13	47	2,620
Mar.	2900	13	209	12,900
Apr.	420	34	82	4,920
May	16700	44	360	22,290
June	302	38	60	3,630
July	55	13	24	1,510
Aug.	135	13	28	1,740
Sept.	13	7	9.4	565
Oct.	7	4	5.3	329
Nov.	696	2	36	2,160
Dec.	175	5	20	1,270
Total	..	..	..	61,524

Year 1964

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	9	2	5.4	332
Feb.	696	23	84	4,870
Mar.	4000	20	207	12,800
Apr.	528	40	114	6,840
May	426	23	50	3,080
June	82	17	29	1,710
July	44	9	15	927
Aug.	11.5	6.5	8.4	523
Sept.	6.5	3	5	302
Oct.	6.0	1.7	3.4	213
Nov.	16	1.7	4.9	292
Dec.	13	1.7	3	183
Total	..	..	..	32,072

Year 1965

Jan.	2.5	1.0	2.0	124
Feb.	4.5	0.5	1.8	102
Mar.	0.5	0.2	0.4	24
Apr.	1.0	0.2	0.7	42
May	3.5	0.5	1.3	79
June	71	0.2	6.1	369
July	6910	1.7	326	20,200
Aug.	974	5	49	3,070
Sept.	201	2.6	21	1,260
Oct.	102	1.0	4.8	300
Nov.	1.0	0.2	0.7	42
Dec.	290	3.5	53	3,280
Total	..	..	..	28,892

LEYCESTER CREEK AT ROCK VALLEY

LOCATION:	Latitude 28°44' Longitude 153°10'
PERIOD OF ESTABLISHMENT:	August, 1951 to date.
COMPLETE YEARS OF COMPUTED RECORDS:	14
ZERO OF GAUGE:	R.L. 77.24 Assumed Datum.
CATCHMENT AREA:	69 square miles.
CONTROL:	Gravel.
EQUIPMENT:	Staff gauge range 0 to 20 feet.
CURRENT METER OBSERVATIONS:	(a) Number obtained : 94
	(b) Maximum Observation in cusecs : 8,000
	(c) Minimum observation in cusecs : 0.19
MAXIMUM ESTIMATED DISCHARGE DURING PERIOD OF RECORDS:	40,000 cusecs
MEAN DAILY DISCHARGE DURING PERIOD OF RECORDS:	129 cusecs
MEAN ANNUAL DISCHARGE FOR 14 YEARS	95,600 acre feet
REMARKS:	

LEYCESTER CREEK AT ROCK VALLEY

Year 1951

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	..	..	..	..
Feb.	..	..	..	..
Mar.	..	..	..	..
Apr.	..	..	..	..
May	..	..	..	..
June	..	..	..	..
July	..	..	..	..
Aug.	..	..	..	..
Sept.	..	..	..	..
Oct.	14	5	10	596
Nov.	5	1	3	188
Dec.	6	1	2	152
Total	..	..	..	..

Year 1952

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	2.5	0.7	1.7	106
Feb.	430	0.3	71	4,124
Mar.	535	12	128	7,954
Apr.	83	12	41	2,442
May	56	12	16	1,004
June	237	4	27	1,600
July	93	6	14	846
Aug.	700	12	114	7,050
Sept.	32	6	14	828
Oct.	560	10	139	8,648
Nov.	16	1.9	9	530
Dec.	5.5	1.9	3	176
Total	..	..	..	35,308

Year 1953

Jan.	245	1.9	27	1,693
Feb.	9,050	3.4	985	55,148
Mar.	10,300	56	433	26,822
Apr.	143	25	64	3,792
May	103	17	29	1,824
June	17	10	14	822
July	64	10	19	1,202
Aug.	25	7	11	664
Sept.	14	2.5	5	278
Oct.	36	1.9	7	423
Nov.	6.8	0.7	2	126
Dec.	4.3	0.7	1	68
Total	..	..	..	92,862

Year 1954

Jan.	3.4	1.4	2	116
Feb.	40,000	2.5	1,221	68,395
Mar.	560	18	91	5,624
Apr.	252	14	31	1,868
May	650	11	112	6,930
June	252	35	72	4,346
July	6,630	32	723	44,840
Aug.	945	38	85	5,296
Sept.	515	29	99	5,930
Oct.	1,050	35	152	9,420
Nov.	192	16	48	2,890
Dec.	16	5	9	530
Total	..	..	..	156,185

LEYCESTER CREEK AT ROCK VALLEY

Year 1955

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	625	5	36	2,248
Feb.	50	16	29	1,632
Mar.	23,900	16	647	40,110
Apr.	5,520	73	500	30,004
May	1,250	68	158	9,808
June	165	63	82	4,912
July	58	32	38	2,364
Aug.	29	14	20	1,226
Sept.	26	6	11	660
Oct.	140	6	16	972
Nov.	12	4	7	420
Dec.	7,400	3.2	303	18,764
Total	..	..	..	113,120

Year 1956

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	2,300	9	172	10,646
Feb.	39,800	84	1,677	97,294
Mar.	1,550	5.8	392	24,309
Apr.	692	38	103	6,202
May	7,320	38	389	24,110
June	1,010	27	82	4,910
July	33	21	27	1,666
Aug.	21	15	18	1,124
Sept.	15	7.2	12	706
Oct.	9.4	4.6	6.6	409
Nov.	9.4	2.6	5.3	318
Dec.	904	3.6	58	3,622
Total	..	..	..	175,316

Year 1957

Jan.	268	5.8	40	2,460
Feb.	442	25	107	6,029
Mar.	653	22	78	4,808
Apr.	22	7	14	858
May	7	5	6	360
June	18	4.5	7	411
July	157	5	19	1,180
Aug.	907	12	66	4,110
Sept.	39	5	14	810
Oct.	99	2	6	394
Nov.	191	1.6	14	854
Dec.	1.3	0	0.5	31
Total	..	..	..	22,305

Year 1958

Jan.	5	0	2.3	144
Feb.	3.5	2	2.7	149
Mar.	27	2	8	478
Apr.	1,625	4	103	6,160
May	22	9	12	740
June	7,550	9	199	11,926
July	32	15	22	1,358
Aug.	1,015	15	93	5,748
Sept.	27	6	14	824
Oct.	29	5	10	644
Nov.	4.5	3	3.8	225
Dec.	15	4	5.2	324
Total	..	..	..	28,720

LEYCESTER CREEK AT ROCK VALLEY

Year 1959

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	9,350	4	339	21,022
Feb.	18,000	39	850	47,616
Mar.	6,300	52	492	30,502
Apr.	262	44	101	6,086
May	70	27	38	2,326
June	30	24	27	1,608
July	560	19	91	5,628
Aug.	44	24	31	1,938
Sept.	777	30	62	3,714
Oct.	1,015	27	73	4,556
Nov.	7,100	30	507	30,414
Dec.	147	28	45	2,762
Total	..	..	..	158,172

Year 1960

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	44	14	20	1,218
Feb.	37	12	20	1,154
Mar.	606	25	57	3,506
Apr.	30	14	21	1,246
May	44	10.5	15	940
June	20	6	11.8	710
July	37	7.5	14.6	908
Aug.	70	6	13.7	850
Sept.	6	3	4	242
Oct.	9	2	3.4	212
Nov.	80	1.5	8.8	526
Dec.	16	1	3.6	226
Total	..	..	..	11,738

Year 1961

Jan.	147	0.7	16.7	1,038
Feb.	8,000	3	301	16,882
Mar.	425	22	71	4,386
Apr.	90	20	33	2,002
May	123	16	41	2,534
June	404	20	59	3,526
July	404	12	33	2,064
Aug.	52	6	27	1,658
Sept.	30	9	16	960
Oct.	1,850	9	164	10,168
Nov.	52	14	25	1,496
Dec.	2,600	20	161	9,966
Total	..	..	..	56,680

Year 1962

Jan.	8,000	14	685	42,478
Feb.	2,180	16	134	7,482
Mar.	2,350	12	242	15,002
Apr.	8,900	30	484	28,990
May	1,850	42	109	6,754
June	56	29	39	2,342
July	21,100	26	1,002	62,114
Aug.	320	33	68	4,216
Sept.	42	22	30	1,814
Oct.	22	9	17	1,052
Nov.	16	4	8.4	503
Dec.	2,430	4	282	17,488
Total	..	..	..	190,235

LEYCESTER CREEK AT ROCK VALLEY

Year 1963

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	7,100	41	381	23,618
Feb.	235	37	73	4,092
Mar.	16,500	46	630	39,078
Apr.	1,400	68	152	9,144
May	30,800	80	968	60,012
June	710	56	91	5,472
July	91	29	50	3,106
Aug.	51	25	31	1,896
Sept.	37	12	21	1,270
Oct.	16	12	14	864
Nov.	1,475	9	81	4,860
Dec.	243	2.5	124	7,700
Total	..	..	..	161,112

Year 1964

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	31	9	15	932
Feb.	1,255	23	187	10,800
Mar.	5,770	59	444	27,500
Apr.	1,045	80	252	15,100
May	491	31	92	5,730
June	243	31	54	3,240
July	35	23	28	1,750
Aug.	23	9	16	990
Sept.	16	9	13.3	796
Oct.	12	4	6.9	430
Nov.	49	5	11.4	682
Dec.	40	2	6.4	398
Total	..	..	..	68,348

Year 1965

Jan.	9	2	3.2	196
Feb.	12	2	4.9	276
Mar.	3.2	0.5	0.7	46
Apr.	12.0	0.5	2.9	172
May	7.5	1.5	3.3	207
June	173	1.5	25	1,490
July	14,100	6	824	51,100
Aug.	514	12	97	5,990
Sept.	173	12	47	2,830
Oct.	14	10	11.7	728
Nov.	31	2.5	5.7	340
Dec.	281	2.5	84.5	5,240
Total	..	..	..	68,615

GOOLMAGAR CREEK AT COFFEE CAMP

(Previously Clapins No. 1 & No. 2)

LOCATION:	Latitude 28°40' Longitude 153°13'
PERIOD OF ESTABLISHMENT:	August, 1951 to date.
COMPLETE YEARS OF COMPUTED RECORDS:	14
ZERO OF GAUGE:	No. 2 Station R.L. 73.48 Assumed Datum.
CATCHMENT AREA:	No. 2 Station 42 square miles.
CONTROL:	Gravel.
EQUIPMENT:	Staff gauge. Range 0 to 35 feet.
CURRENT METER OBSERVATIONS:	(a) Number obtained : 92
	(b) Maximum Observation in cusecs : 1,010
	(c) Minimum observation in cusecs : 0
MAXIMUM ESTIMATED DISCHARGE DURING PERIOD OF RECORDS:	27,000 cusecs.
MEAN DAILY DISCHARGE DURING PERIOD OF RECORDS:	117 cusecs.
MEAN ANNUAL DISCHARGE FOR 14 YEARS:	87,400 acre feet.

REMARKS:

No. 1 Station (catchment area 38 square miles) was established on 26th August, 1951 and discontinued on 5th November, 1957.
No. 2 Station was established at a site approximately 1 mile downstream of Station No. 1 on 5th November, 1957.

GOOLMAGAR CREEK AT COFFEE CAMP
(Previously Clapins No. 1 & No. 2)

Year 1951					Year 1952				
Month	Discharge in Cusecs			Discharge for Month Acre Feet	Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	..	..	..	..	Jan.	2.4	0.1	0.7	46
Feb.	..	..	..	..	Feb.	644	0	44	2,554
Mar.	..	..	..	..	Mar.	375	18	76	4,708
Apr.	..	..	..	..	Apr.	186	12	66	4,088
May	..	..	..	..	May	51	8	16	986
June	..	..	..	..	June	280	5	33	1,978
July	..	..	..	..	July	47	5	11	694
Aug.	..	..	..	..	Aug.	857	8	99	6,154
Sept	18	5.5	11	670	Sept.	25	5	12	738
Oct.	25	4.5	8	506	Oct.	387	10	41	2,568
Nov.	5.5	2.4	3	181	Nov.	10	0.8	4	230
Dec.	8	0.2	1.4	88	Dec.	5.5	0.6	2	129
Total	..	..	..	..	Total	..	..	..	24,873

Year 1953					Year 1954				
Jan.	426	1.5	29	1,803	Jan.	30	0.4	4	268
Feb.	6,420	3	954	53,422	Feb.	27,000	3	694	38,856
Mar.	7,500	47	319	19,792	Mar.	409	14	71	4,426
Apr.	105	25	48	2,886	Apr.	49	9	22	1,330
May	77	12	25	1,562	May	881	4	137	8,477
June	18	10	12	726	June	248	23	87	5,192
July	172	5	16	1,005	July	5,990	17	363	22,524
Aug.	130	1.5	7	460	Aug.	1,600	23	79	4,874
Sept.	17	2	4	240	Sept.	215	14	55	3,300
Oct.	14	0.7	2	141	Oct.	905	37	138	8,546
Nov.	1.5	0	0.4	22	Nov.	94	9	44	2,652
Dec.	2.4	0	0.2	15	Dec.	56	4.5	14	851
Total	..	..	..	82,074	Total	..	..	..	101,296

GOOLMAGAR CREEK AT COFFEE CAMP
(Previously Clapins No. 1 & No. 2)

Year 1955

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	456	4	38	2,344
Feb.	174	19	50	2,786
Mar.	15,500	29	706	43,766
Apr.	9,630	74	636	38,144
May	1,000	56	180	11,156
June	137	40	71	4,248
July	99	19	38	2,336
Aug.	13	7	11	662
Sept.	13	5	7	432
Oct.	84	4	9.4	581
Nov.	5	0.2	29	172
Dec.	5,270	0.2	891	55,250
Total	..	..	..	161,877

Year 1956

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	No Records			4,000 *
Feb.	No Records			56,000 *
Mar.	1,350	97	352	21,840
Apr.	915	45	152	9,138
May	1,350	20	153	9,482
June	767	7	61	3,668
July	20	9	14	882
Aug.	25	3	8	496
Sept.	3	1.5	1.9	117
Oct.	3	0	8	52
Nov.	0	0	0	0
Dec.	953	0	119	7,403
Total	..	..	..	113,078 *

Year 1957

Jan.	No Records			8,000 *
Feb.	No Records			4,500 *
Mar.	No Records			1,800 *
Apr.	No Records			840 *
May	No Records			270 *
June	21	4	8.5	510
July	183	6	21	1,284
Aug.	3,450	6	126	7,820
Sept.	63	16	26	1,552
Oct.	45	6	14	894
Nov.	77	1.2	14	862
Dec.	3.5	2	1.1	66
Total	..	..	..	28,398 *

Year 1958

Jan.	97	0.6	7.7	479
Feb.	42	2.2	7.2	406
Mar.	184	2.2	11.4	707
Apr.	1,960	6	166	9,952
May	67	14	29	1,818
June	9,000	10	466	27,958
July	82	15	34	2,136
Aug.	2,560	15	142	8,782
Sept.	59	11	17	1,040
Oct.	45	3.5	9.4	584
Nov.	15	2	3.4	202
Dec.	28	2	7.2	446
Total	..	..	..	54,510

* Estimated.

GOOLMAGAR CREEK AT COFFEE CAMP
(Previously Clapins No. 1 and No. 2)

Year 1959

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	8200	8	264	16,376
Feb.	6700	45	495	27,728
Mar.	3560	28	355	21,996
Apr.	241	28	66	3,962
May	59	23	29	1,810
June	114	19	33	1,994
July	1530	19	229	14,220
Aug.	90	19	31	1,908
Sept.	314	28	68	4,092
Oct.	470	19	55	3,418
Nov.	4500	23	385	23,110
Dec.	74	15	31	1,938
Total	..	..	..	122,552

Year 1960

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	90	8	17	1,034
Feb.	52	3.5	12.3	713
Mar.	617	19	84	5,194
Apr.	90	11	31	1,874
May	352	8	35	2,192
June	33	11	18	1,102
July	23	11	14	842
Aug.	28	5.5	9	555
Sept.	8	5.5	6	360
Oct.	11	2	4.4	274
Nov.	59	2	6.4	386
Dec.	23	2	5.6	348
Total	..	..	..	14,874

Year 1961

Jan.	714	2	73	4,513
Feb.	13680	11	342	19,100
Mar.	153	30	64	3,950
Apr.	217	30	65	3,870
May	277	20	51	3,150
June	206	20	57	3,430
July	489	12	38	2,330
Aug.	206	12	45	2,790
Sept.	301	9	40	2,380
Oct.	933	9	94	5,830
Nov.	241	12	31	1,840
Dec.	2700	12	150	9,330
Total	..	..	..	62,513

Year 1962

Jan.	8580	35	907	56,200
Feb.	508	30	83	4,630
Mar.	1310	25	215	13,300
Apr.	9000	54	616	37,000
May	1490	35	113	7,040
June	41	20	27	1,640
July	16510	25	655	40,600
Aug.	165	27	48	2,980
Sept.	39	9	18	1,090
Oct.	13	3	7	436
Nov.	9	2	4.4	261
Dec.	4500	2	329	20,400
Total	..	..	..	185,577

GOOLMAGAR CREEK AT COFFEE CAMP
(Previously Clapins No. 1 & No. 2)

Year 1963

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	3,200	39	345	21,400
Feb.	1,680	33	187	10,500
Mar.	7,780	39	689	42,700
Apr.	2,650	45	226	13,600
May	18,200	52	572	35,500
June	933	27	100	6,020
July	136	17	38	2,350
Aug.	45	13	22	1,380
Sept.	22	6	12	730
Oct.	33	6	13	796
Nov.	1,760	6	145	8,690
Dec.	195	22	64	3,980
Total	..	..	..	147,646

Year 1964

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	145	6	19	1,180
Feb.	1,420	27	185	10,700
Mar.	6,050	75	340	21,100
Apr.	1,310	18	298	17,900
May	393	13	106	6,560
June	767	23	75	4,490
July	67	13	25	1,570
Aug.	59	6	13	798
Sept.	22	4.5	9.1	546
Oct.	6	1.8	3.8	232
Nov.	50	2.5	9.9	593
Dec.	27	1	5.5	340
Total	..	..	..	66,009

Year 1965

Jan.	1,110	2.5	44	2,760
Feb.	92	2.5	17	956
Mar.	4	0.3	1.5	94
Apr.	9	0.4	2.8	170
May	27	2.5	7.3	450
June	933	1	59	3,520
July	14,600	9	549	34,100
Aug.	508	14	63	3,910
Sept.	118	10	41	2,450
Oct.	40	3	10	650
Nov.	14	2	3.7	221
Dec.	393	10	153	9,490
Total	..	..	..	58,771

TERANIA CREEK AT BLAKES

LOCATION:	Latitude 28°38' Longitude 153°18'
PERIOD OF ESTABLISHMENT:	May, 1947 to date
COMPLETE YEARS OF COMPUTED RECORDS:	18
ZERO OF GAUGE:	R.L. 39.64 Assumed Datum
CATCHMENT AREA:	17 square miles
CONTROL:	Rock
EQUIPMENT:	Staff gauge range 0 to 20 feet
CURRENT METER OBSERVATIONS:	(a) Number obtained : 81 (b) Maximum observation in cusecs: 825 (c) Minimum observation in cusecs: 0.1
MAXIMUM ESTIMATED DISCHARGE DURING PERIOD OF RECORDS:	20,000 cusecs
MEAN DAILY DISCHARGE DURING PERIOD OF RECORDS:	110 cusecs
MEAN ANNUAL DISCHARGE FOR 18 YEARS:	82,900 acre feet
REMARKS:	

TERANIA CREEK AT BLAKES

Year 1947					Year 1948				
Month	Discharge in Cusecs			Discharge for Month Acre Feet	Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	..	..	..	..	Jan.	88	9	24	1,502
Feb.	..	..	..	..	Feb.	26	9	14	820
Mar.	..	..	..	..	Mar.	1920	9	225	13,946
Apr.	..	..	..	..	Apr.	400	16	50	3,004
May	..	..	..	..	May	8640	16	217	13,444
June	26	9	16	956	June	12480	16	258	15,482
July	9	7	8	516	July	26	12	23	1,420
Aug.	No Records			444*	Aug.	12	9	10	628
Sept.	16	5	6	372	Sept.	621	9	88	5,288
Oct.	12	3	5	318	Oct.	57	9	23	1,444
Nov.	57	3	10	628	Nov.	16	7	9	560
Dec.	110	8	23	1,410	Dec.	16	5	10	652
Total	..	..	..	..	Total	..	..	..	58,190

Year 1949					Year 1950				
Jan.	26	5	9	574	Jan.	160(	2	77	4,772
Feb.	99	5	19	1,082	Feb.	1920	5	182	10,170
Mar.	2000	40	312	19,330	Mar.	5300	77	345	21,414
Apr.	200	26	60	3,592	Apr.	300	26	96	5,730
May	200	26	54	3,348	May	621	26	78	4,808
June	340	26	43	2,576	June	11355	16	343	20,610
July	26	16	19	1,192	July	1380	40	376	23,302
Aug.	26	9	11	688	Aug.	520	40	108	6,692
Sept.	9	5	7	436	Sept.	300	16	106	6,352
Oct.	1840	5	73	4,530	Oct.	570	16	108	6,684
Nov.	57	9	23	1,390	Nov.	960	16	84	5,044
Dec.	9	3	5	328	Dec.	382	26	95	5,864
Total	..	..	..	39,066	Total	..	..	..	121,442

* Estimated

TERANIA CREEK AT BLAKES

Year 1951

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	8000	26	469	29,054
Feb.	520	40	117	6,532
Mar.	7400	40	328	20,342
Apr.	57	16	35	2,094
May	57	9	13	822
June	2840	9	174	10,436
July	40	9	5	944
Aug.	9	5	8	478
Sept.	5	5	5	300
Oct.	9	3.5	5	324
Nov.	3.5	2	2	122
Dec.	9	2	3	188
Total	..	..	..	71,636

Year 1952

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	16	2.5	3.3	202
Feb.	621	0.1	42	2,410
Mar.	154	25	63	3,876
Apr.	112	14	39	2,334
May	40	14	22	1,376
June	112	14	25	1,476
July	56	14	19	1,184
Aug.	1840	40	149	9,256
Sept.	56	25	30	1,774
Oct.	74	14	31	1,850
Nov.	14	6	7	408
Dec.	14	6	6	396
Total	..	..	..	26,542

Year 1953

Jan.	340	6	23	1,416
Feb.	5600	6	756	42,342
Mar.	9280	56	254	15,764
Apr.	74	25	42	2,516
May	40	6	17	1,038
June	6	6	6	360
July	25	6	8	506
Aug.	40	2	6	340
Sept.	14	2	4	236
Oct.	14	2	4	244
Nov.	2	0.3	1.3	79
Dec.	6	0.1	0.8	51
Total	..	..	..	64,892

Year 1954

Jan.	40	1.1	13	829
Feb.	20000	25	590	33,034
Mar.	202	19	62	3,872
Apr.	19	6	11	634
May	570	6	130	8,030
June	1090	14	129	7,724
July	4460	14	379	23,474
Aug.	780	25	74	4,566
Sept.	340	14	79	4,738
Oct.	340	25	94	8,850
Nov.	74	6	34	2,100
Dec.	74	6	24	1,610
Total	..	..	..	99,461

TERANIA CREEK AT BLAKES

Year 1955

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	6200	6	133	8,270
Feb.	74	6	23	1,282
Mar.	8640	40	680	42,184
Apr.	7400	40	630	37,782
May	960	74	161	9,962
June	92	40	59	3,510
July	25	6	19	1,182
Aug.	25	6	10	614
Sept.	6	2	5	316
Oct.	6	2	4	240
Nov.	6	0.3	2	117
Dec.	4460	0.3	1502	93,122
Total	..	..	..	198,581

Year 1956

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	621	6	68	4,232
Feb.	16500	6	997	57,798
Mar.	621	52	193	11,936
Apr.	115	3.8	36	2,165
May	71	3.8	21	1,309
June	24	5.6	12	698
July	24	5.6	12	740
Aug.	9.8	2	5	312
Sept.	5.6	2	4	235
Oct.	5.6	3.8	5.3	329
Nov.	5.6	2	4	246
Dec.	621	2	115	7,116
Total	..	..	..	87,116

Year 1957

Jan.	621	24	140	8,696
Feb.	340	24	90	5,048
Mar.	57	14	32	1,974
Apr.	24	2	9	549
May	5.6	2	3.6	225
June	14	2	5.6	338
July	71	14	28	1,742
Aug.	1920	2	168	10,391
Sept.	1840	5.6	121	7,272
Oct.	14	2	7	444
Nov.	13	2	5	296
Dec.	22	2	5	304
Total	..	..	..	37,279

Year 1958

Jan.	13	2	5	312
Feb.	6	2	5	264
Mar.	34	2	17	1,068
Apr.	1840	13	202	12,106
May	106	9	37	2,300
June	6200	10	791	47,444
July	264	10	60	3,750
Aug.	3560	6	315	19,504
Sept.	22	13	15	878
Oct.	85	13	20	1,214
Nov.	13	4.5	7	414
Dec.	152	4.5	35	2,147
Total	..	..	..	91,401

TERANIA CREEK AT BLAKES

Year 1959

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	7400	4.5	628	38,946
Feb.	264	34	121	6,780
Mar.	340	13	71	4,414
Apr.	621	13	137	8,214
May	85	11	33	2,022
June	106	21	45	2,694
July	621	16	213	13,226
Aug.	300	11	68	4,218
Sept.	340	34	75	4,476
Oct.	520	34	207	12,812
Nov.	2840	21	406	24,372
Dec.	106	11	35	2,164
Total	..	..	..	124,338

Year 1960

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	34	4	16	1,002
Feb.	49	4	24	1,372
Mar.	106	21	47	2,916
Apr.	66	11	26	1,550
May	34	4	14	846
June	34	11	20	1,202
July	21	4	9	540
Aug.	11	4	4.7	290
Sept.	4	2	3.3	198
Oct.	4	2	2.5	156
Nov.	11	2	3.8	226
Dec.	21	2	5.5	342
Total	..	..	..	10,640

Year 1961

Jan.	340	2	66	4,118
Feb.	8210	4	420	23,506
Mar.	186	25	64	3,978
Apr.	25	6	10.6	638
May	83	6	25	1,554
June	61	6	20	1,190
July	25	2	7.7	480
Aug.	106	6	46	2,864
Sept.	106	6	32	1,898
Oct.	42	6	18.6	1,152
Nov.	83	13	28	1,658
Dec.	83	6	27	1,676
Total	..	..	..	44,712

Year 1962

Jan.	8640	6	971	60,194
Feb.	61	6	30	1,698
Mar.	274	13	124	7,708
Apr.	7400	42	709	42,528
May	83	13	36	2,230
June	25	13	20	1,180
July	18650	21	525	32,600
Aug.	106	11	45	2,760
Sept.	34	11	19	1,150
Oct.	34	11	15	931
Nov.	11	4	8	473
Dec.	5600	4	484	30,000
Total	..	..	..	183,452

Appendix 22
Sheet 6

TERANIA CREEK AT BLAKES

Year 1963

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	4830	21	509	31,500
Feb.	1840	11	307	17,200
Mar.	1380	34	277	17,200
Apr.	152	11	77	4,640
May	12480	28	1129	70,000
June	200	28	69	4,160
July	41	16	27	1,650
Aug.	92	8	27	1,670
Sept.	28	8	13	752
Oct.	28	4	20	1,200
Nov.	3920	8	200	12,000
Dec.	141	8	34	2,120
Total	..	..	..	164,092

Year 1964

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	72	8	13	808
Feb.	232	16	43	2,510
Mar.	621	16	138	8,540
Apr.	426	41	173	10,400
May	234	21	91	5,620
June	85	4	21	1,240
July	21	11	14	872
Aug.	21	11	14	892
Sept.	11	4	6.9	414
Oct.	4	4	4	248
Nov.	21	4	6	372
Dec.	85	2	17	1,036
Total	..	..	..	32,952

Year 1965

Jan.	106	11	38	2,360
Feb.	34	11	15	850
Mar.	11	2	5	322
Apr.	4	2	3	168
May	11	4	7	436
June	34	11	15	904
July	14120	11	330	20,400
Aug.	66	16	34	2,130
Sept.	85	8	39	2,320
Oct.	31	8	13	790
Nov.	16	6	9.4	562
Dec.	219	31	74	4,570
Total	..	..	..	35,812

COOPER'S CREEK AT REPENTANCE

LOCATION:	Latitude 28°39' Longitude 153°25'
PERIOD OF ESTABLISHMENT:	February, 1920 to October, 1929 August, 1951 to Date
COMPLETE YEARS OF COMPUTED RECORDS:	17
ZERO OF GAUGE:	R.L. 78.49 Assumed Datum. Approximately 1,000 feet above mean sea level
CATCHMENT AREA:	No. 2 Station 24 square miles
CONTROL:	Rock
EQUIPMENT:	Automatic Recorder (Pressure type) installed March, 1963. Staff gauge range 0 to 25 feet
CURRENT METER OBSERVATIONS:	(a) Number obtained : 132
	(b) Maximum Observation in cusecs : 4511
	(c) Minimum Observation in cusecs : 0.39
MAXIMUM ESTIMATED DISCHARGE DURING PERIOD OF RECORDS:	24,000 cusecs
MEAN DAILY DISCHARGE DURING PERIOD OF RECORDS:	112 cusecs
MEAN ANNUAL DISCHARGE FOR 17 YEARS:	85,300 acre feet

REMARKS:

No.1 Station was established on 11th February, 1920 and discontinued on 4th October, 1929. Catchment Area 27 square miles.
No. 2 Station was established on 30th August, 1951.

COOPER'S CREEK AT REPENTANCE

Year 1920					Year 1921				
Month	Discharge in Cusecs			Discharge for Month Acre Feet	Month	Discharge in Cusecs			Discharge r Month Acre Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.					Jan.	685	9	262	16,228
Feb.	579	34	100	3,798	Feb.	249	34	101	5,630
Mar.	228	12	45	2,808	Mar.	1,000	24	260	16,136
Apr.	504	29	101	6,076	Apr.	2,070	127	436	26,148
May	1,180	40	138	8,544	May	8,920	57	1000	61,994
June	825	40	105	6,160	June	1,210	29	345	20,696
July	658	40	146	9,042	July	12,280	94	842	52,154
Aug.	94	7	35	2,140	Aug.	271	24	102	6,300
Sept.	146	12	51	3,048	Sept.	315	34	124	7,444
Oct.	504	9	92	5,720	Oct.	66	9	29	1,828
Nov.	880	16	220	13,196	Nov.	16	5	9	524
Dec.	1,300	12	94	5,856	Dec.	4,030	3	337	20,904
Total	..	..	..	..	Total	..	..	..	235,986

Year 1922					Year 1923				
Jan.	605	57	184	11,412	Jan.	16	1	7	404
Feb.	2,970	66	633	35,470	Feb.	7	0	2	112
Mar.	658	66	221	13,716	Mar.	12	1	5	328
Apr.	60	9	30	1,778	Apr.	2,970	7	414	24,840
May	360	5	73	4,528	May	293	20	77	5,788
June	127	24	51	3,032	June	40	1	14	826
July	1,570	16	176	10,910	July	80	1	11	670
Aug.	109	20	45	2,808	Aug.	228	5	56	3,494
Sept.	740	12	97	5,826	Sept.	40	9	19	1,146
Oct.	66	16	31	1,910	Oct.	12	3	9	532
Nov.	24	5	11	654	Nov.	5	0	2	134
Dec.	20	3	10	592	Dec.	186	0	19	1,170
Total	..	..	..	92,636	Total	..	..	..	39,444

Appendix 23
Sheet 3

COOPER'S CREEK AT REPENTANCE

Year 1924

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	23	0	4	268
Feb.	245	1	14	792
Mar.	7	1	4	230
Apr.	11	0	6	340
May	5	0	2	154
June	2,710	0	143	8,598
July	1,180	32	304	18,848
Aug.	67	11	36	2,204
Sept.	58	11	21	1,256
Oct.	58	7	13	802
Nov.	192	43	85	5,082
Dec.	67	6	29	1,800
Total	..	..	..	40,374

Year 1925

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	940	7	59	3,658
Feb.	760	31	148	8,266
Mar.	3,310	26	777	48,174
Apr.	820	115	283	16,980
May	1,370	63	280	17,328
June	2,470	31	345	20,726
July	102	22	52	3,238
Aug.	585	18	75	4,654
Sept.	42	11	25	1,492
Oct.	11	5	7	442
Nov.	1,570	5	255	15,294
Dec.	820	42	267	16,568
Total	..	..	..	156,820

Year 1926

Jan.	1,890	31	223	13,812
Feb.	31	8	20	1,120
Mar.	42	1	9	540
April	1,180	42	246	14,788
May	820	31	148	9,164
June	185	14	75	4,510
July	185	36	70	4,338
Aug.	55	18	28	1,752
Sept.	55	11	28	1,670
Oct.	11	1	4	246
Nov.	1	0	0.3	20
Dec.	1,780	0	170	10,530
Total	..	..	..	62,490

Year 1927

Jan.	2,750	71	824	51,074
Feb.	1,000	115	186	10,402
Mar.	1,240	36	212	13,158
Apr.	36	14	24	1,430
May	14	5	11	682
June	48	5	17	1,010
July	8	3	7	432
Aug.	3	1	2	114
Sept.	270	0	42	2548
Oct.	115	8	47	2900
Nov.	4,260	71	273	16,402
Dec.	1,430	185	662	41,014
Total	..	..	..	141,166

COOPER'S CREEK AT REPENTANCE

Year 1951					Year 1952				
Month	Discharge in Cusecs			Discharge for Month Acre Feet	Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	..	..	..	..	Jan.	3.1	0.7	2	130
Feb.	..	..	..	..	Feb.	1420	0.4	68	3,960
Mar.	..	..	..	..	Mar.	285	26	74	4,578
Apr.	..	..	..	..	Apr.	56	22	33	1,988
May	..	..	..	..	May	31	12	21	1,328
June	..	..	..	..	June	1190	10	93	5,610
July	..	..	..	..	July	26	18	21	1,284
Aug.	..	..	..	..	Aug.	1040	22	123	7,628
Sept.	6.5	4.5	5	324	Sept.	36	10	20	1,208
Oct.	10	3.1	6	384	Oct.	100	8	24	1,480
Nov.	3.1	1.7	2	138	Nov.	8	3	5	306
Dec.	4	0.7	2	138	Dec.	4	3	3	212
Total	...	...	...	...	Total	...	...	...	29,712

Year 1953					Year 1954				
Jan.	2520	3.1	75	4,647	Jan.	140	2.5	28	1,725
Feb.	6000	12	768	43,000	Feb.	24000	21	696	38,952
Mar.	2520	55	251	15,536	Mar.	285	25	63	3,930
Apr.	121	21	46	2,740	Apr.	25	14	20	1,203
May	21	9.5	14	868	May	755	7.5	108	6,671
June	9.5	4.5	6.7	403	June	194	35	70	4,222
July	35	3.5	7.5	462	July	9,650	41	407	25,244
Aug.	48	1.5	5.5	344	Aug.	790	34	67	4,182
Sept.	9.5	3.5	6.1	366	Sept.	118	23	50	3,014
Oct.	9.5	2.5	4.2	260	Oct.	1,150	55	198	12,266
Nov.	3.5	0.7	1.4	86	Nov.	73	26	44	2,650
Dec.	2.5	0.2	1.2	72	Dec.	25	8.2	17	1,068
Total	...	...	...	68,784	Total	...	...	...	105,127

COOPER'S CREEK AT REPENTANCE

Year 1955					Year 1956				
Month	Discharge in Cusecs			Discharge for Month Acre Feet	Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	10300	6.2	197	12,204	Jan.	2520	29	222	13,784
Feb.	790	44	95	5,346	Feb.	13180	122	737	42,720
Mar.	10300	49	387	23,996	Mar.	818	64	323	20,026
Apr.	9210	73	491	29,462	Apr.	382	34	104	6,252
May	550	61	181	11,248	May	3600	34	192	11,886
June	118	39	61	3,648	June	280	21	52	3,108
July	61	20	35	2,186	July	29	11	20	1,252
Aug.	20	11	15	932	Aug.	14	8.8	11	706
Sept.	11	4.5	8.7	522	Sept.	8.8	2	4.7	280
Oct.	30	3.5	7.6	471	Oct.	5.2	1.3	2.6	162
Nov.	14	0	2	121	Nov.	3.9	2.8	3.2	190
Dec.	4440	0	214	13,239	Dec.	579	2.8	69	4278
Total	..	..	..	103,375	Total	..	..	..	104,644

Year 1957					Year 1958				
Jan.	1110	7	215	13,330	Jan.	15	2.8	5.7	354
Feb.	307	44	135	7,540	Feb.	11	2.8	6.8	382
Mar.	174	39	72	4,456	Mar.	939	3.9	38	2,334
Apr.	36	17	26	1,554	Apr.	1740	8.8	199	11,932
May	15	3.9	8.5	526	May	111	21	49	3,058
June	21	3.9	10	598	June	3940	21	217	13,044
July	14	4	6	366	July	100	21	45	2,790
Aug.	1520	3.9	50	3,078	Aug.	4940	25	273	16,898
Sept.	61	6.8	18	1,104	Sept.	38	14	23	1,396
Oct.	134	2.8	10	644	Oct.	25	5.2	12	726
Nov.	57	3.9	19	1,138	Nov.	5.2	2.8	4.3	259
Dec.	17	3.9	5.7	354	Dec.	640	5.2	27	1,651
Total	..	..	..	34,688	Total	..	..	..	54,824

COOPERS CREEK AT REPENTANCE

Year 1959

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	5550	8.8	171	10,610
Feb.	8350	29	316	17,688
Mar.	5730	39	278	17,238
Apr.	325	34	99	5,932
May	64	25	37	2,294
June	81	17	41	2,442
July	818	17	147	9,120
Aug.	188	21	49	3,056
Sept.	550	25	83	4,980
Oct.	363	25	58	3,612
Nov.	5460	44	316	18,934
Dec	307	25	57	3,514
Total	..	..	..	99,420

Year 1960

Month	Discharge in Cusecs			Discharge for Month
	Max.	Min.	Mean	
Jan.	160	11	33	2,070
Feb.	90	8.8	37	2,122
Mar.	780	34	141	8,738
Apr.	484	29	85	5,102
May	188	17	52	3,204
June	72	34	45	2,704
July	39	11	22	1,344
Aug.	17	2.8	6.3	393
Sept.	6.8	2.8	3.1	186
Oct.	No Records			
Nov.	No Records			
Dec.	No Records			
Total	..	..	..	..

Year 1961

Jan.	No Records
Feb.	No Records
Mar.	No Records
Apr.	No Records
May	No Records
June	No Records
July	No Records
Aug.	No Records
Sept.	No Records
Oct.	No Records
Nov.	No Records
Dec.	No Records
Total	

Year 1962

Jan.	No Records
Feb.	No Records
Mar.	No Records
Apr.	No Records
May	No Records
June	No Records
July	No Records
Aug.	No Records
Sept.	No Records
Oct.	No Records
Nov.	No Records
Dec.	No Records
Total	

COOPER'S CREEK AT REPENTANCE

Year 1963

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	No Records			
Feb.	No Records			
Mar.	6540	51	348	21,556
Apr.	3440	39	209	12,534
May	11700	58	566	35,118
June	162	24	50	2,976
July	96	17	34	2,096
Aug.	39	9.5	17	1,032
Sept.	19	4.8	9.2	552
Oct.	29	3.8	11	702
Nov.	1740	3.8	68	4,066
Dec.	322	31	63	3,922
Total	..	..	..	..

Year 1964

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	46	12	17	1,056
Feb.	780	23	106	6,178
Mar.	2120	46	216	13,420
Apr.	2190	88	228	13,688
May	430	36	73	4,534
June	115	25	44	2,630
July	46	12	19.4	1,200
Aug.	12	6	8.4	522
Sept.	7.5	2.5	4.3	258
Oct.	9.5	3.5	4.4	274
Nov.	270	3.5	9.5	572
Dec.	125	2.5	7.6	468
Total	..	..	..	44,800

Year 1965

Jan.	58	2.5	6.4	394
Feb.	300	2.5	37	2,080
Mar.	7.5	2.5	4.2	260
Apr.	58	1.2	5.2	312
May	24	2.8	7.8	480
June	742	1.2	44	2,670
July	13180	19	274	17,000
Aug.	75	21	36	2,250
Sept.	75	11	31	1,870
Oct.	110	3.2	14	866
Nov.	29	0	1.9	111
Dec.	450	21	115	7,120
Total	..	..	..	35,413

WILSON'S CREEK AT FEDERAL

LOCATION:	Latitude 28°40' Longitude 153°28'
PERIOD OF ESTABLISHMENT:	February 1952 to date
COMPLETE YEARS OF COMPUTED RECORDS:	11
ZERO OF GAUGE:	R.L. 79.00 Assumed Datum
CATCHMENT AREA:	21 square miles
CONTROL:	Rock and gravel
EQUIPMENT:	Automatic Recorder (pressure type) installed August, 1956. Staff gauge, range 0 to 20 feet
CURRENT METER OBSERVATIONS:	(a) Number obtained : 90 (b) Maximum Observation in cusecs : 2010 (c) Minimum observation in cusecs : 0.2
MAXIMUM ESTIMATED DISCHARGE DURING PERIOD OF RECORDS:	33,300 cusecs
MEAN DAILY DISCHARGE DURING PERIOD OF RECORDS:	62 cusecs
MEAN ANNUAL DISCHARGE FOR 11 YEARS	46,900 acre feet
REMARKS:	

WILSON'S CREEK AT FEDERAL

Year 1952

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	..	..	..	..
Feb.	280	0	13	752
Mar.	170	6	29	1,770
Apr.	38	11	20	1,208
May	23	8	12	761
June	2300	8	91	5,472
July	23	11	14	890
Aug.	450	11	81	5,033
Sept.	23	11	15	906
Oct.	47	6	11	700
Nov.	6	3	4	238
Dec.	5	2.5	3.3	202
Total	..	..	..	..

Year 1953

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	2300	2.5	69	4,291
Feb.	6740	8	596	33,352
Mar.	940	47	153	9,506
Apr.	96	14	35	2,086
May	14	7	10	622
June	7	4	5	314
July	18	4	5	306
Aug.	14	2.5	3.4	212
Sept.	8	2.5	3.2	194
Oct.	6	2	2.9	181
Nov.	2	0.5	1.2	72
Dec.	2	0	0.5	29
Total	..	..	..	51,165

Year 1954

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	30	0	5	313
Feb.	19920	3	601	33,644
Mar.	243	18	43	2,640
Apr.	18	8	11	633
May	310	6	53	3,287
June	130	18	41	2,448
July	4000	14	206	12,785
Aug.	310	11	38	2,381
Sept.	130	14	30	1,775
Oct.	1010	42	135	8,344
Nov.	130	11	34	2,020
Dec.	11	6	8.4	521
Total	..	..	..	70,841

Year 1955

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	5000	5	114	7,082
Feb.	150	18	42	2,341
Mar.	5600	18	206	12,785
Apr.	2300	58	247	15,330
May	No Records			
June	No Records			
July	No Records			
Aug.	No Records			
Sept.	No Records			
Oct.	No Records			
Nov.	No Records			
Dec.	No Records			
Total	..	..	..	..

WILSONS CREEK AT FEDERAL

Year 1956

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	No Records			..
Feb.	No Records			..
Mar.	No Records			..
Apr.	No Records			..
May	No Records			..
June	No Records			..
July	No Records			..
Aug.	No Records			..
Sept.	8.6	3.8	5.1	304
Oct.	3.8	2.6	3.3	202
Nov.	3.8	1.6	2.4	147
Dec.	530	1.6	27	1,680
Total	..	..	..	..

Year 1957

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	800	5.8	81	5,018
Feb.	96	23	52	2,898
Mar.	170	17	29	1,782
Apr.	12	5.8	9	540
May	5.8	3.8	4.5	280
June	3.8	3.2	3.6	218
July	12	2.6	5	308
Aug.	2700	2.6	25	1,578
Sept.	23	5.8	9.1	546
Oct.	8.6	3.8	4.8	297
Nov.	30	0.6	4.7	281
Dec.	17	1	1.7	107
Total	..	..	..	13,853

Year 1958

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	3.8	1	1.4	87
Feb.	3.8	1	1.8	102
Mar.	2700	1	31	1,919
Apr.	1340	3.8	146	8,758
May	82	12	32	1,980
June	2700	12	135	8,096
July	82	12	21	1,664
Aug.	5360	17	251	15,560
Sept.	23	7.2	12	709
Oct.	17	3.2	5.3	327
Nov.	3.2	3.2	3.2	192
Dec.	450	2.6	5.3	329
Total	..	..	..	39,723

Year 1959

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	4850	2.6	138	8,556
Feb.	3600	28	148	8,302
Mar.	5980	5.8	249	15,424
Apr.	250	17	63	3,760
May	19	17	17	1,082
June	41	8.6	20	1,227
July	1520	12	92	5,708
Aug.	34	12	21	1,274
Sept.	870	12	63	3,808
Oct.	225	12	32	1,968
Nov.	3720	22	251	15,050
Dec.	1900	17	40	2,454
Total	..	..	..	68,613

WILSON'S CREEK AT FEDERAL

Year 1960

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	28	8.6	14	842
Feb.	100	5.8	8.6	500
Mar.	580	12	50	3,118
Apr.	82	12	25	1,482
May	58	8.6	15	955
June	17	8.6	10	611
July	8.6	5.8	6.7	412
Aug.	7.2	3.8	4.6	284
Sept.	3.8	2.9	3.2	192
Oct.	6.5	2.1	3.5	218
Nov.	22	1.6	2.8	168
Dec.	8.6	0.2	2.7	168
Total	..	..	..	8,950

Year 1961

Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean	
Jan.	450	1.6	30	1,880
Feb.	14267	2.6	203	11.400
Mar.	176	18	48	2,970
Apr.	280	18	38	2,270
May	1,340	8	32	1,980
June	118	18	49	2,910
July	104	6	15	936
Aug.	41	8	15	930
Sept.	24	6	9	552
Oct.	490	6	27	1,690
Nov.	450	7	28	1,654
Dec.	2,950	8	70	4,340
Total	..	..	..	33,512

Year 1962

Jan.	7803	24	399	24,700
Feb.	200	18	38	2,110
Mar.	250	18	86	5,310
Apr.	6867	24	156	9,380
May	340	18	37	2,280
June	24	12	15	894
July	33300	10	401	24,900
Aug.	3200	18	97	6,010
Sept.	24	8	14	860
Oct.	8	5	6	404
Nov.	6	3.5	4.5	270
Dec.	940	3.5	83	5,170
Total	..	..	..	82,288

Year 1963

Jan.	1,900	37	200	12,400
Feb.	740	30	104	5,830
Mar.	6,867	37	274	17,000
Apr.	3,720	18	209	12,500
May	9,470	41	402	24,900
June	118	18	31	1,860
July	37	12	22	1,380
Aug.	12	7	10	652
Sept.	8	6	6.4	386
Oct.	7	4	5.8	358
Nov.	1,090	4	43	2,580
Dec.	370	8	44	2,760
Total	..	..	..	82,606

WILSON'S CREEK AT FEDERAL

Year 1964					Year 1965				
Month	Discharge in Cusecs			Discharge for Month Acre Feet	Month	Discharge in Cusecs			Discharge for Month Acre Feet
	Max.	Min.	Mean			Max.	Min.	Mean	
Jan.	18	6	11	682	Jan.	8	1.7	4.0	245
Feb.	1090	6	101	5,850	Feb.	80	2	6.8	379
Mar.	2000	37	204	12,700	Mar.	2.1	1.3	1.4	89
Apr.	3000	45	175	10,500	Apr.	5.3	0	1.8	108
May	92	18	44	2,740	May	11	1.6	3.7	232
June	50	18	23	1,400	June	800	1.8	40	2,420
July	18	8	10	624	July	8350	12	235	14,600
Aug.	7	5	6	382	Aug.	250	12	31	1,930
Sept.	6	3.5	4.4	267	Sept.	34	12	19	1,160
Oct.	3.5	3	3.2	200	Oct.	69	5.8	15	924
Nov.	940	2	12	752	Nov.	5.8	3.8	4.6	276
Dec.	30	2.5	4.7	295	Dec.	450	22	91	5,650
Total	..	..	..	36,392	Total	..	..	..	28,013

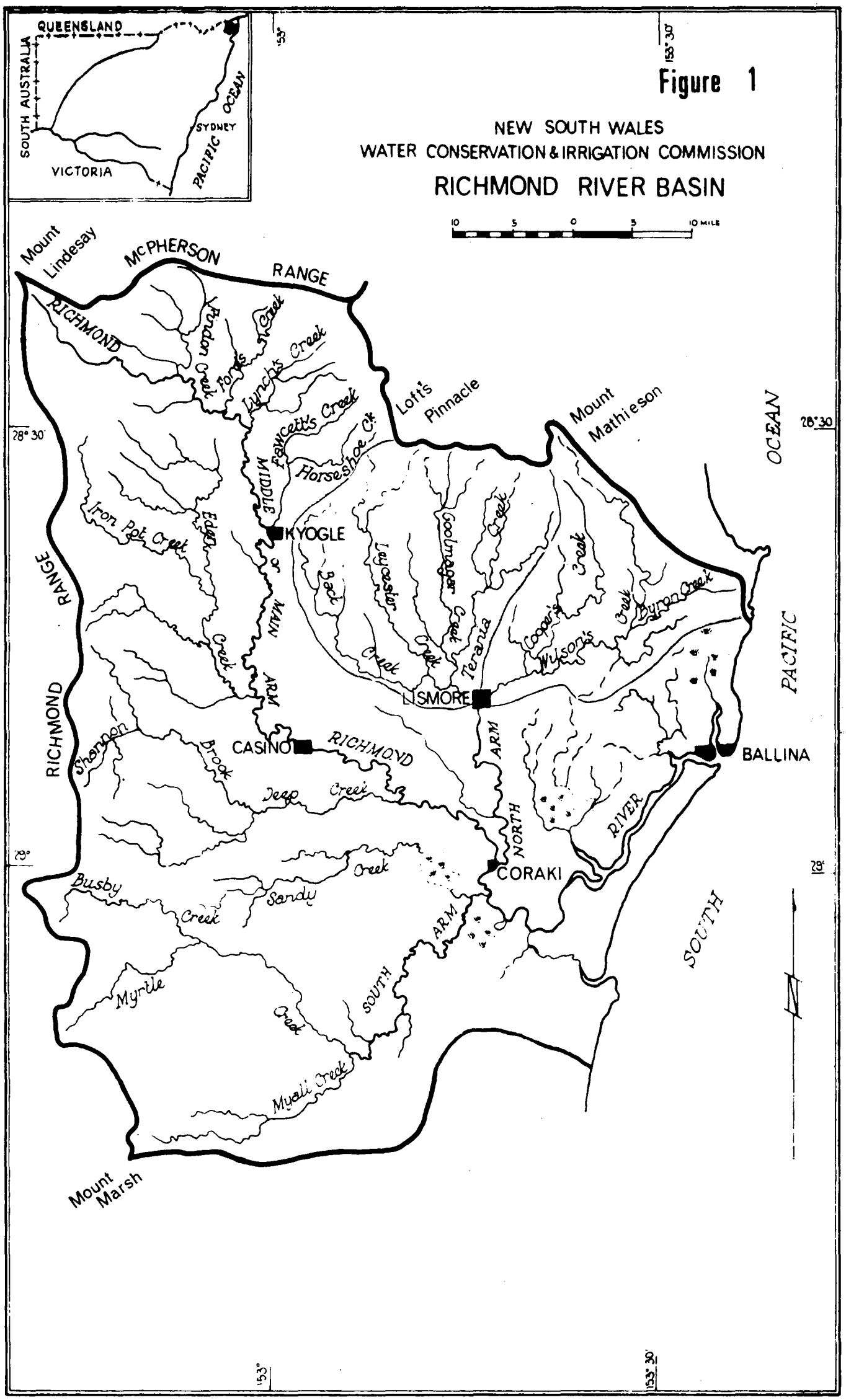

QUEENSLAND
SOUTH AUSTRALIA
VICTORIA
SYDNEY
PACIFIC OCEAN
Figure 1
NEW SOUTH WALES
WATER CONSERVATION & IRRIGATION COMMISSION
RICHMOND RIVER BASIN
10 5 0 5 10 MILE
153° 30'
28° 30'
29°
153°
Mount Lindesay
McPHERSON RANGE
RICHMOND RANGE
Mount Marsh
Mount Mathieson
Lott's Pinnacle
OCEAN
PACIFIC
SOUTH
Upper Richmond Creek
Forks Creek
Lynch's Creek
Fawcett's Creek
Horseshoe Ck.
MIDDLE
KYOGLE
Iron Pot Creek
Eden Creek
MAIN ARM
Back Creek
Leycester Creek
Goolmangar Creek
Terania Creek
Cooper's Creek
Wilson's Creek
Byron Creek
LISMORE
CASINO
RICHMOND
Shannon Brook
Jeep Creek
NORTH ARM
BALLINA
RIVER
CORAKI
SOUTH ARM
Busby Creek
Sandy Creek
Myrtle Creek
Myall Creek

Figure 2

NEW SOUTH WALES
WATER CONSERVATION & IRRIGATION COMMISSION

RICHMOND RIVER BASIN
LAND SLOPES

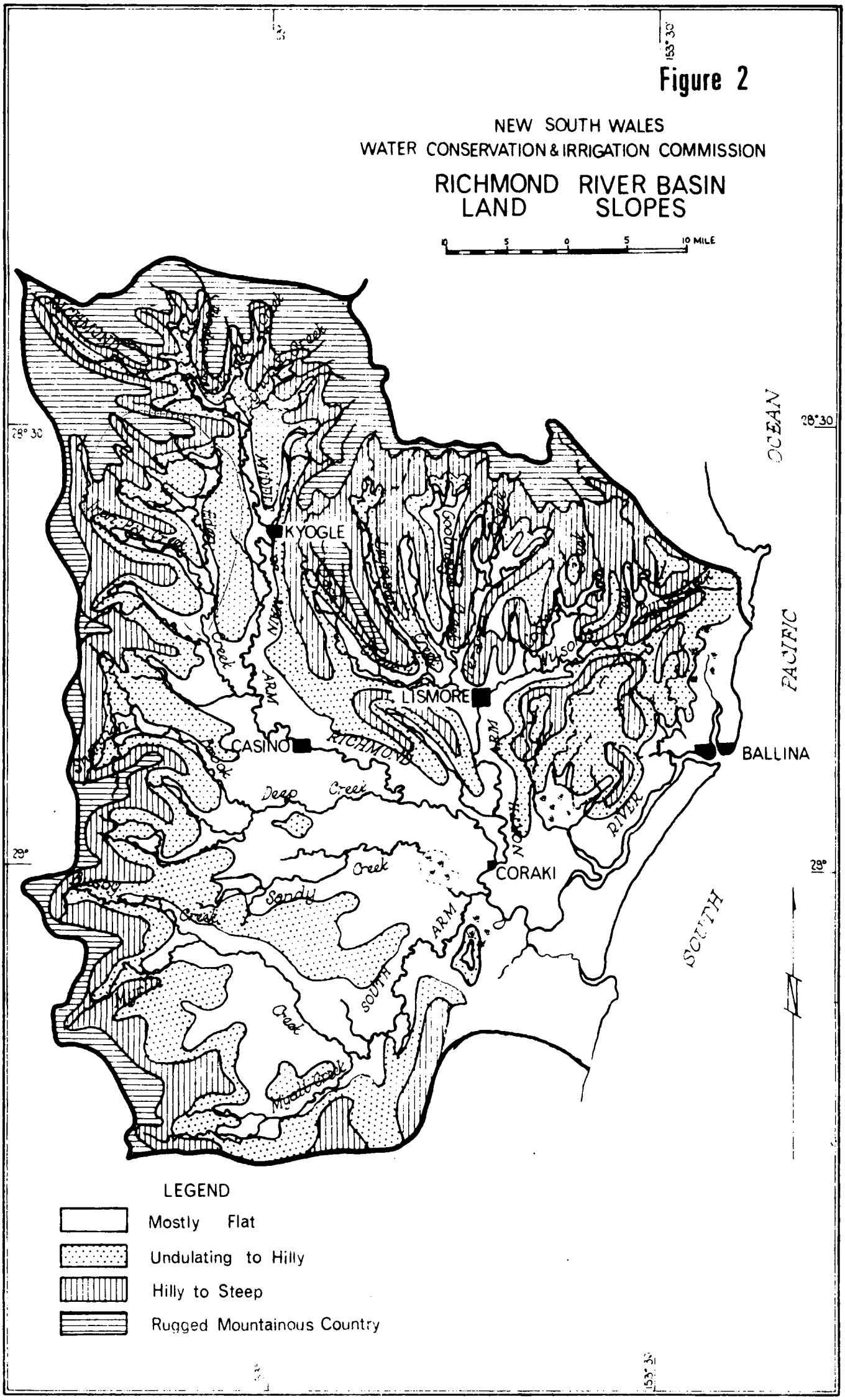


FIGURE 3

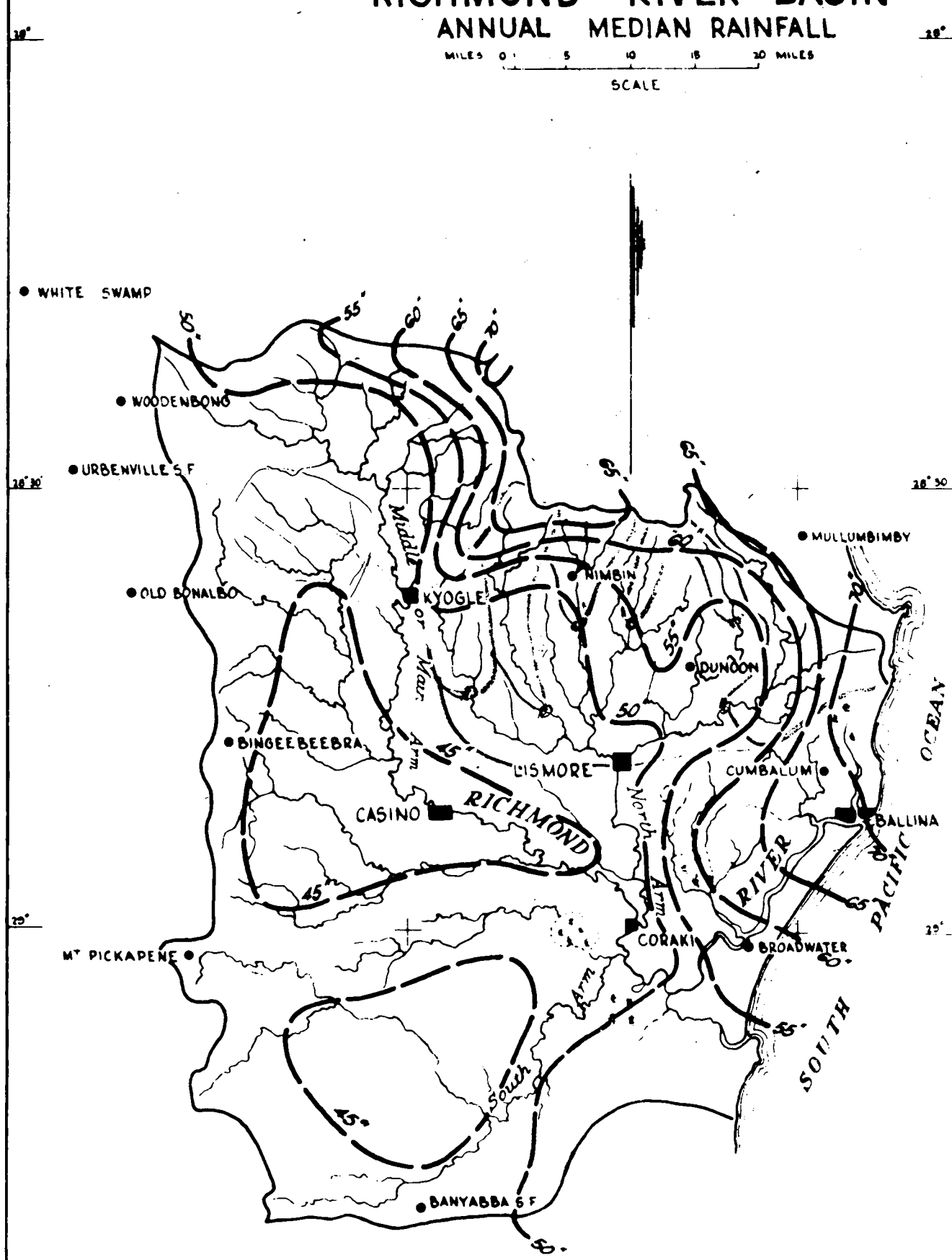

RICHMOND RIVER BASIN
ANNUAL MEDIAN RAINFALL
MILES 0 5 10 15 20 MILES
SCALE
28°
28° 30
29°
29° 30
153°
153° 30
WHITE SWAMP
WOODENBONG
URBENVILLE S F
OLD BONALBO
BINGEEBEEBRA
CASINO
LISMORE
KYOGLE
NIMBIN
DUNOON
MULLUMBIMBY
CUMBALUM
BALLINA
BROADWATER
CORAKI
Mt PICKAPENE
BANYABBA S F
Middle Arm
North Arm
South Arm
RICHMOND RIVER
SOUTH PACIFIC OCEAN
45
50
55
60
65
70

FIGURE 4

RICHMOND RIVER BASIN

JANUARY MEDIAN RAINFALL

MILES 0 1 5 10 15 20 MILES

SCALE

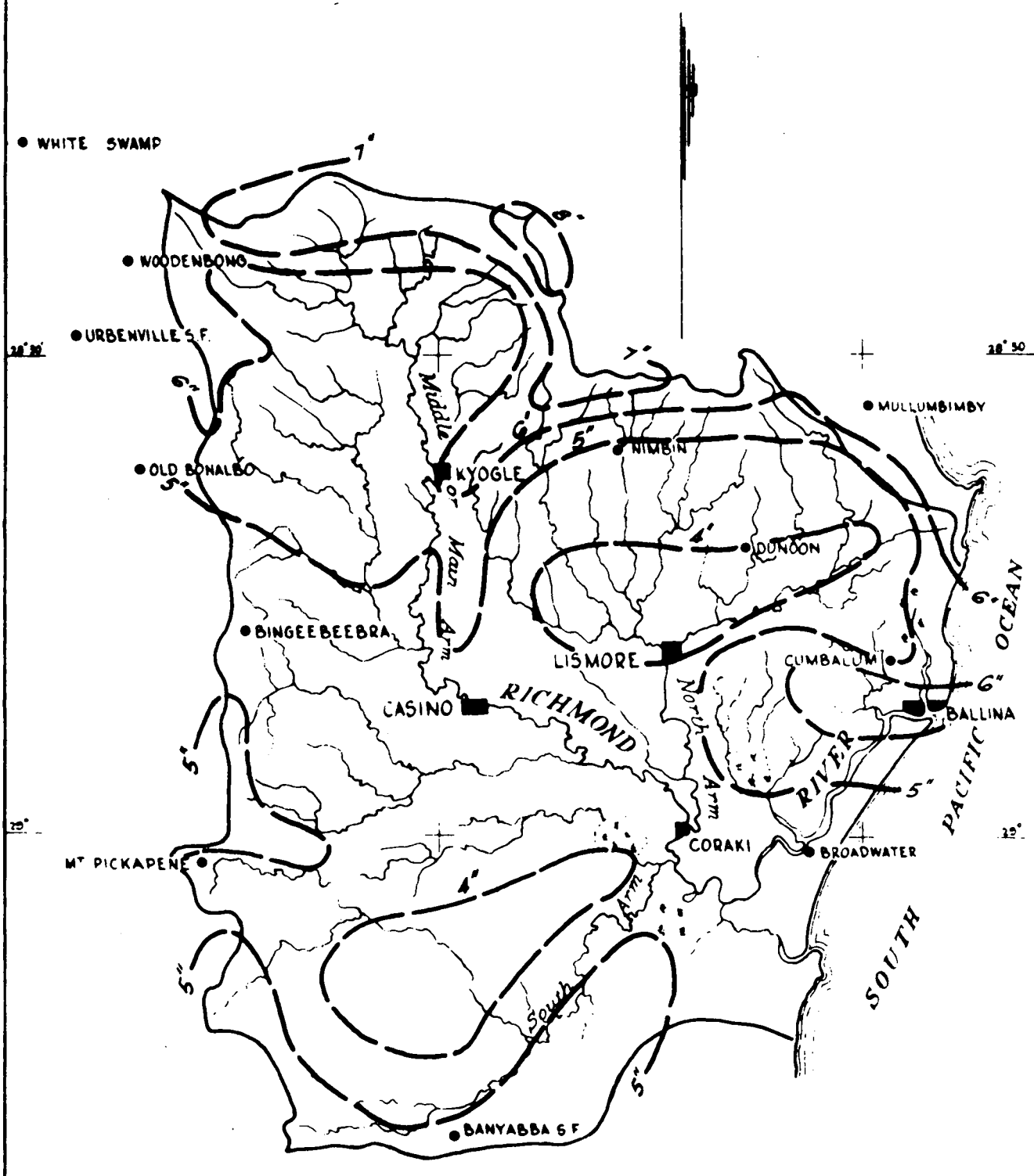


FIGURE 5

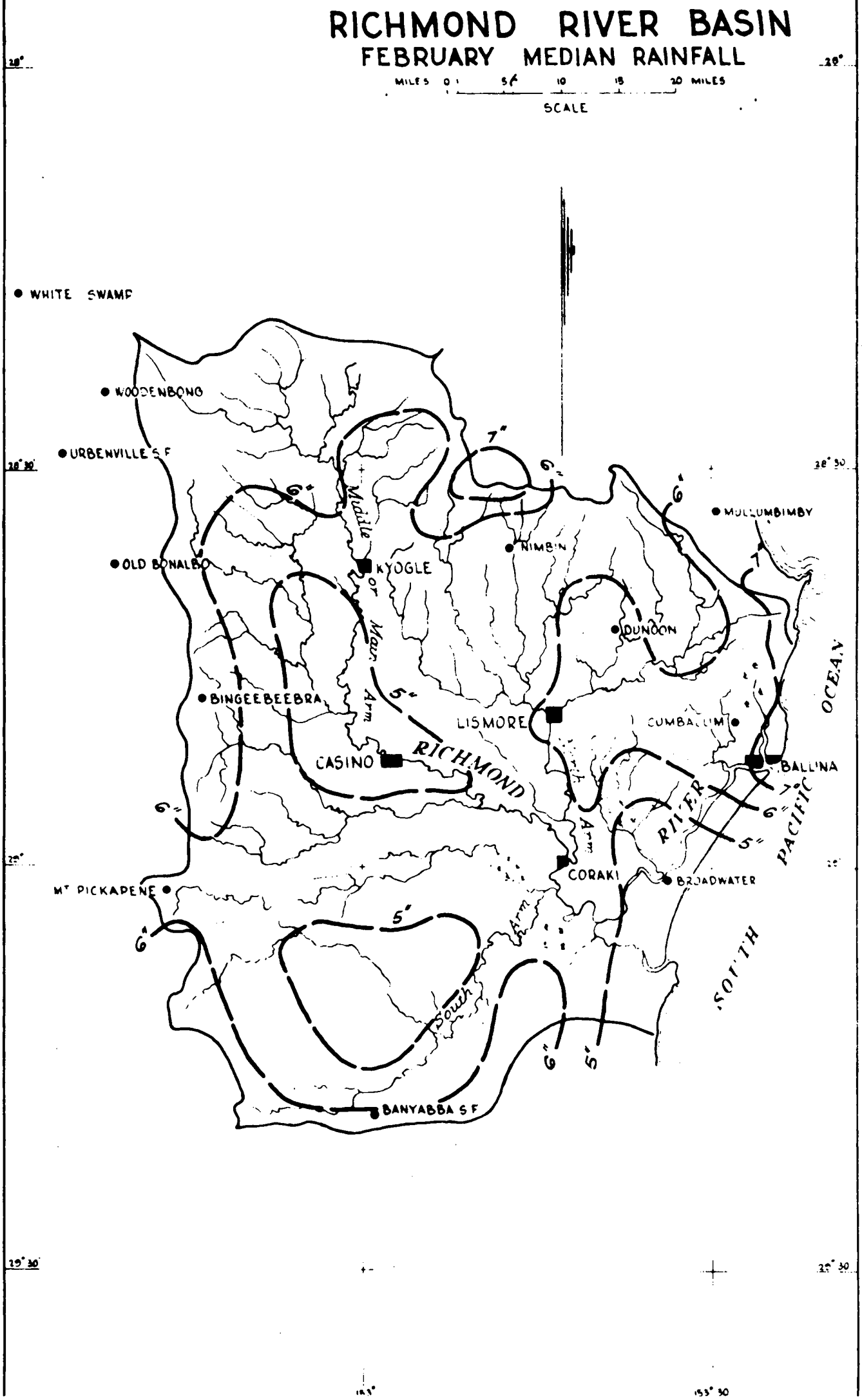

RICHMOND RIVER BASIN
FEBRUARY MEDIAN RAINFALL
MILES 0 5 10 15 20 MILES
SCALE
28°
28° 30
29°
29° 30
153°
153° 30
WHITE SWAMP
WOODENBONO
URBENVILLE S F
OLD BONALBO
BINGEEBEEBRA
KYOGLE
Middle or Main Arm
NIMBIN
MULLUMBIMBY
DUNOON
LISMORE
CASINO
RICHMOND
North Arm
CUMBALUM
BALLINA
RIVER
CORAKI
BROADWATER
Mt PICKAPENE
South Arm
BANYABBA S F
PACIFIC OCEAN
SOUTH
7"
6"
5"

FIGURE 6

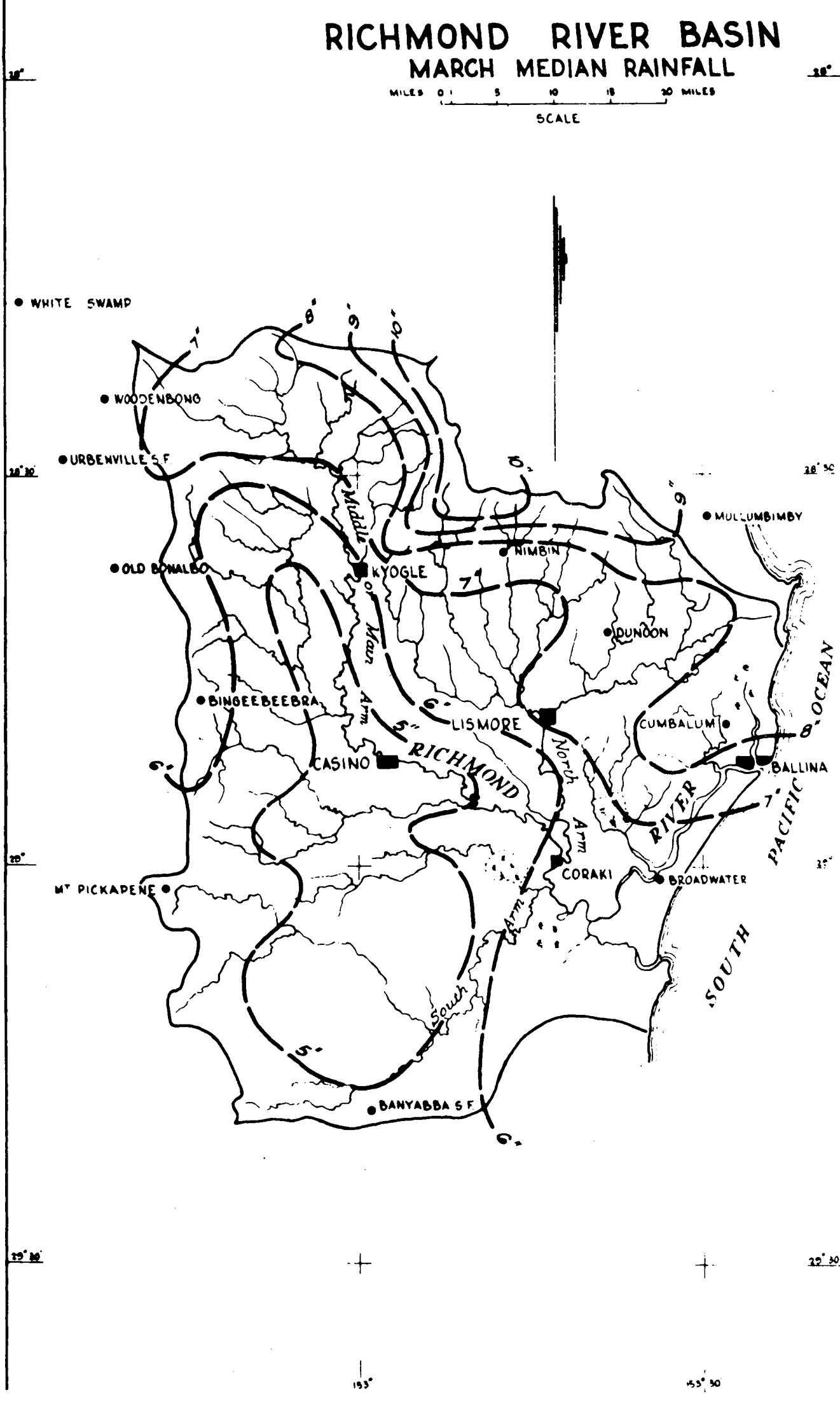

RICHMOND RIVER BASIN
MARCH MEDIAN RAINFALL
MILES 0 1 5 10 15 20 MILES
SCALE
WHITE SWAMP
WOODENBONG
URBENVILLE S.F.
OLD BONALBO
BINGEEBEEBRA
CASINO
MT PICKAPENE
KYOGLE
NIMBIN
MULLUMBIMBY
DUNOON
LISMORE
CUMBALUM
BALLINA
CORAKI
BROADWATER
BANYABBA S.F.
Middle Arm
North Arm
South Arm
RICHMOND RIVER
SOUTH PACIFIC OCEAN
28°
28° 30'
29°
29° 30'
153°
153° 30'

FIGURE 7

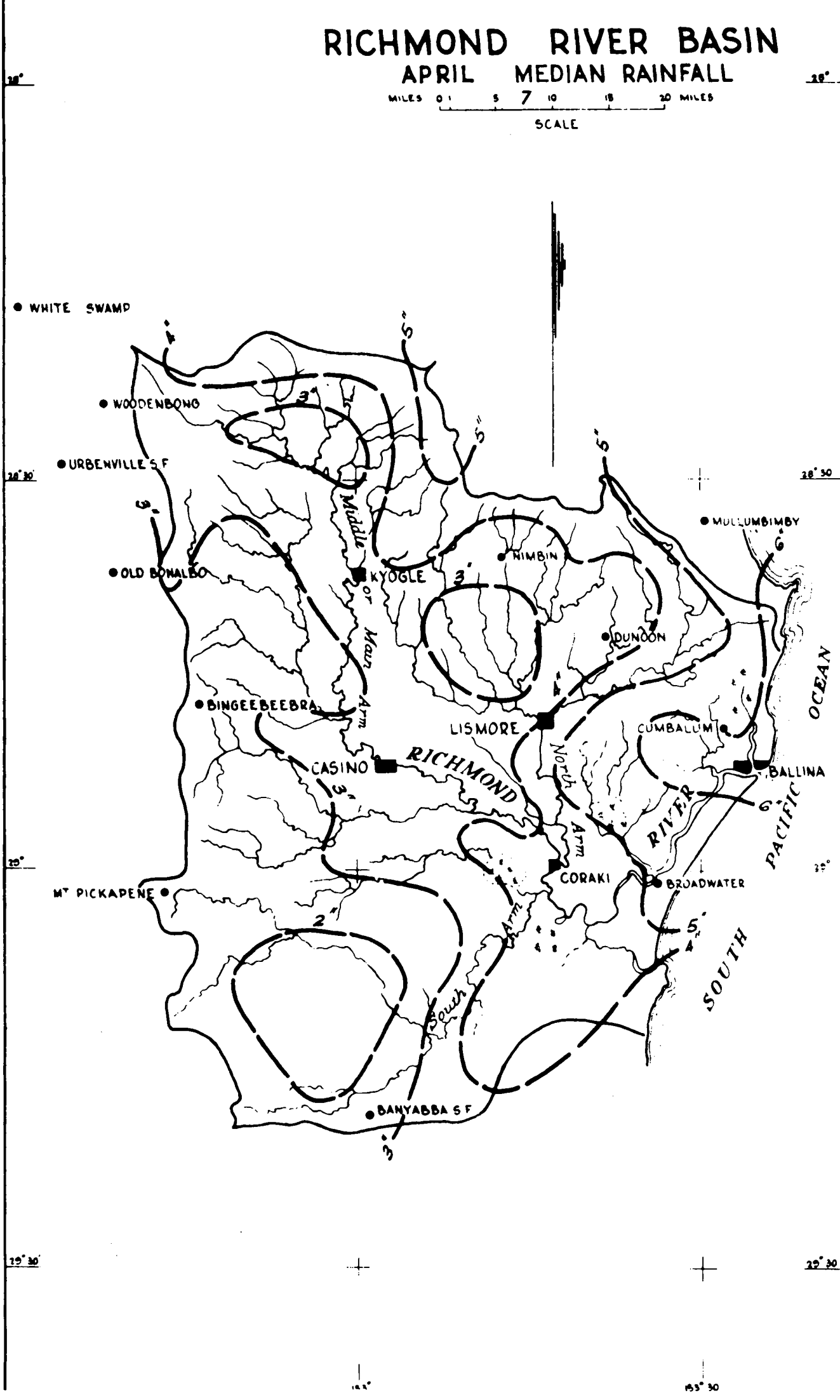

RICHMOND RIVER BASIN
APRIL MEDIAN RAINFALL
MILES 0 1 5 7 10 15 20 MILES
SCALE
28°
28° 30'
29°
29° 30'
WHITE SWAMP
WOODENBONG
URBENVILLE S.F
OLD BONALBO
BINGEEBEEBRA
MT PICKAPENE
KYOGLE
NIMBIN
DUNOON
LISMORE
CASINO
CORAKI
MULLUMBIMBY
CUMBALUM
BALLINA
BROADWATER
BANYABBA S.F
Middle or Main Arm
RICHMOND RIVER
North Arm
South Arm
PACIFIC OCEAN
SOUTH
1"
2"
3"
4"
5"
6"

FIGURE 8

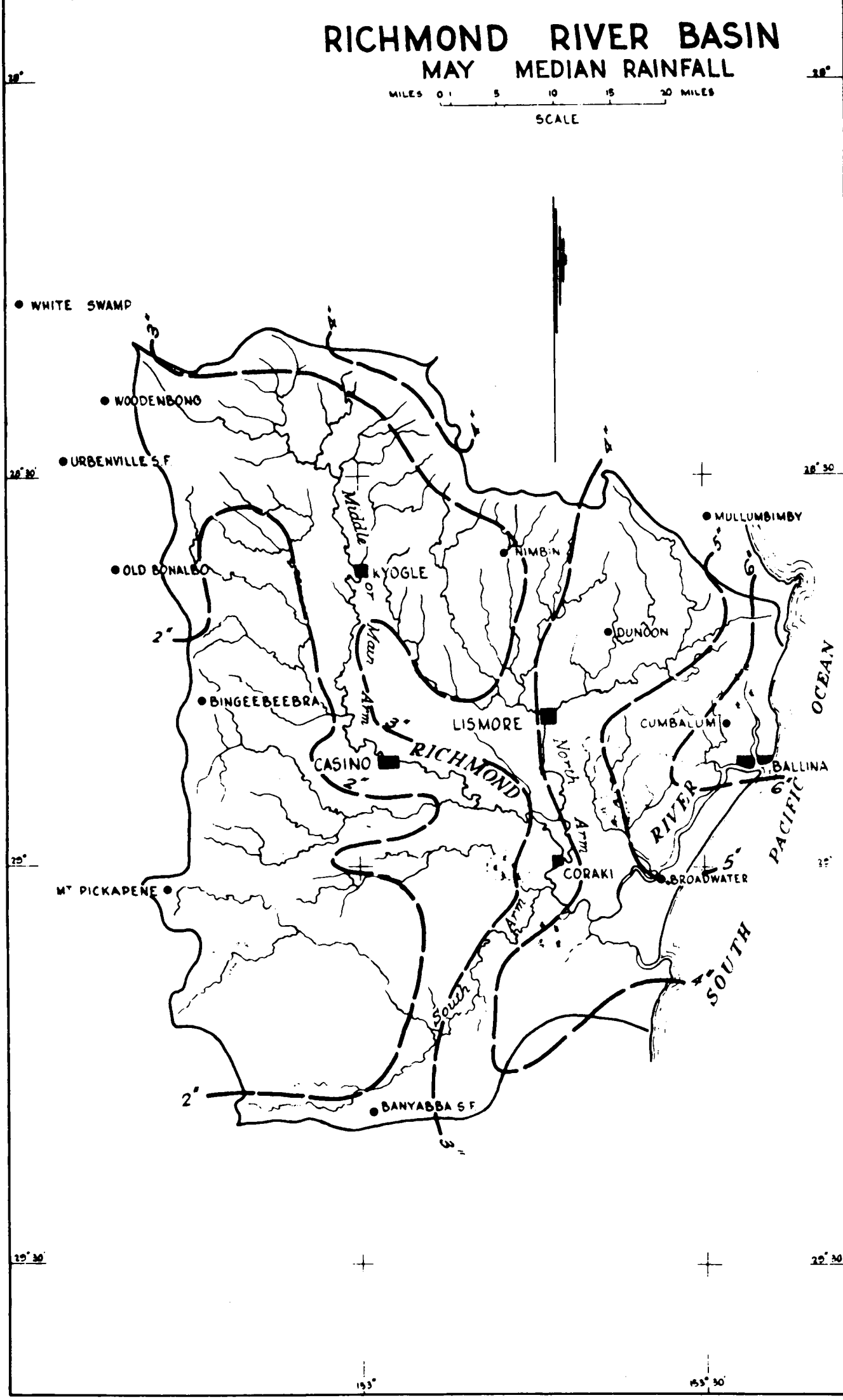

RICHMOND RIVER BASIN
MAY MEDIAN RAINFALL
MILES 0 1 5 10 15 20 MILES
SCALE
WHITE SWAMP
WOODENBONG
URBENVILLE S.F.
OLD BONALBO
BINGEEBEEBRA
MT PICKAPENE
KYOGLE
Middle
or
Main
Arm
NIMBIN
DUNOON
LISMORE
CASINO
RICHMOND
North
Arm
South
Arm
CORAKI
MULLUMBIMBY
CUMBALUM
BALLINA
BROADWATER
RIVER
PACIFIC
OCEAN
SOUTH
BANYABBA S.F.
28°
28° 30'
29°
29° 30'
153°
153° 30'
2"
3"
4"
5"
6"

FIGURE 9

RICHMOND RIVER BASIN

JUNE MEDIAN RAINFALL

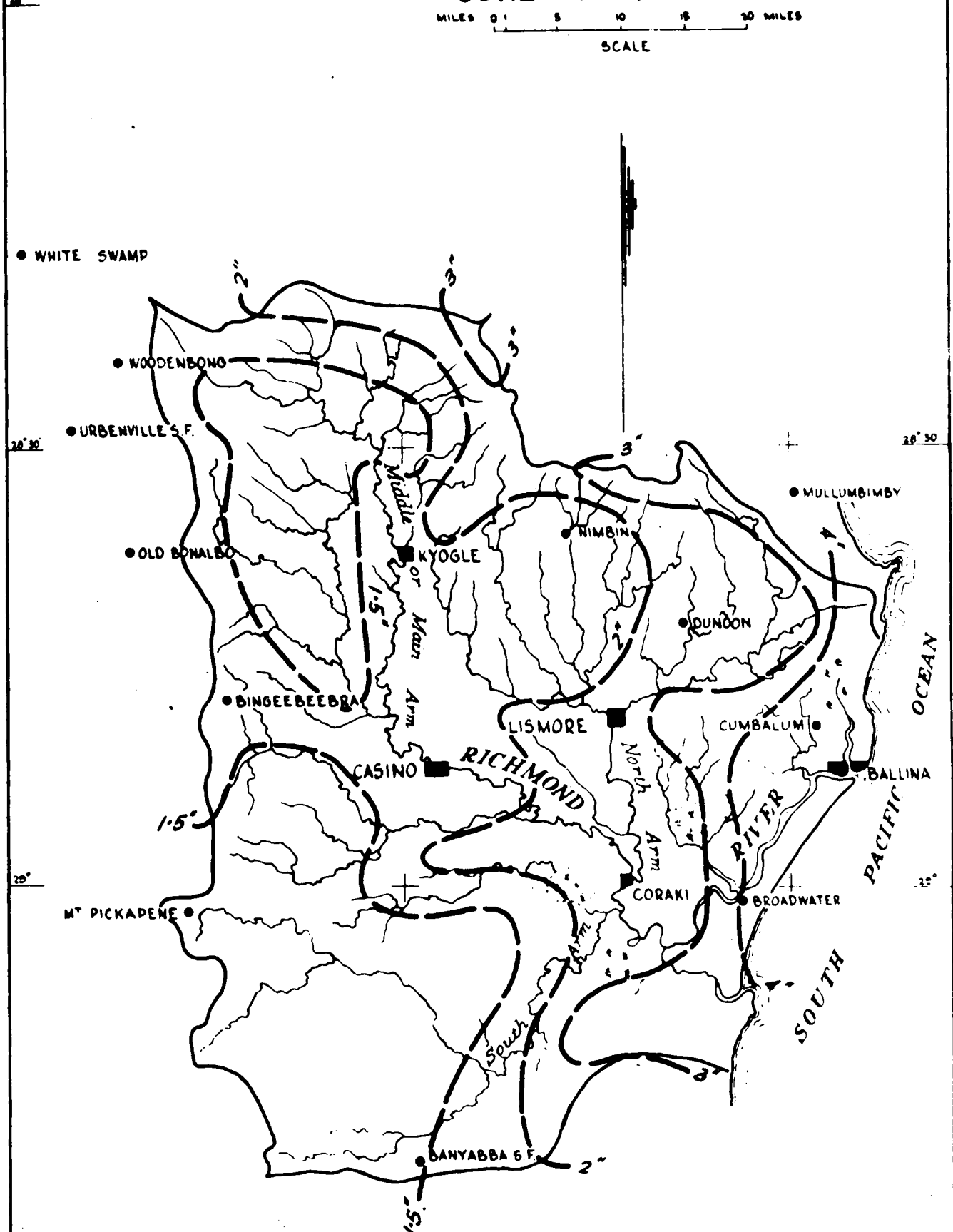


FIGURE 10

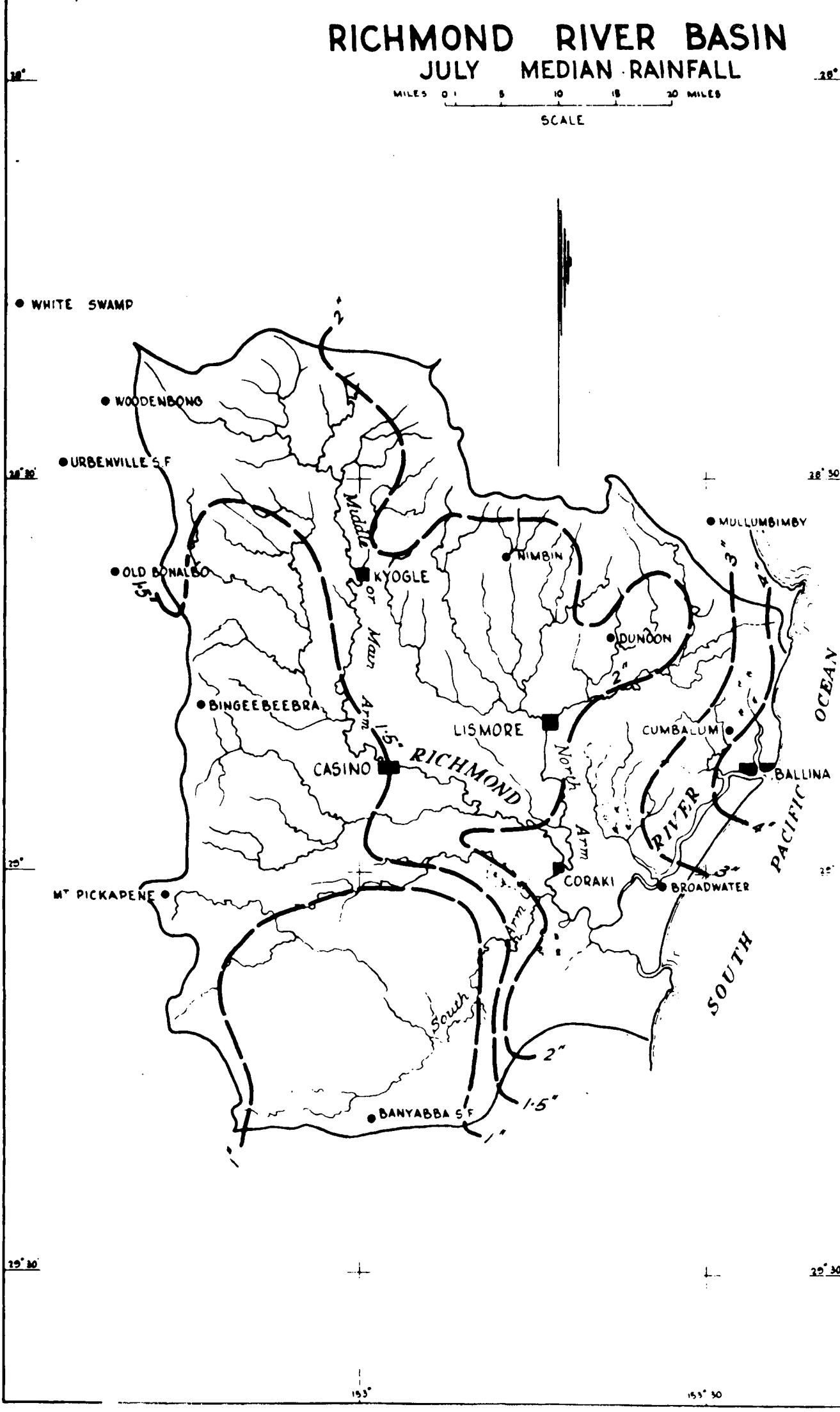

RICHMOND RIVER BASIN
JULY MEDIAN RAINFALL
MILES 0 1 5 10 15 20 MILES
SCALE
28°
28° 30'
29°
29° 30'
153°
153° 30'
WHITE SWAMP
WOODENBONG
URBENVILLE S.F
OLD BONALBO
BINGEEBEEBRA
KYOGLE
Middle or Main Arm
NIMBIN
MULLUMBIMBY
DUNOON
LISMORE
CASINO
RICHMOND
North Arm
South Arm
CORAKI
CUMBALUM
BALLINA
BROADWATER
RIVER
Mt PICKAPENE
BANYABBA S.F
SOUTH PACIFIC OCEAN
1.5"
2"
3"
4"

FIGURE 11

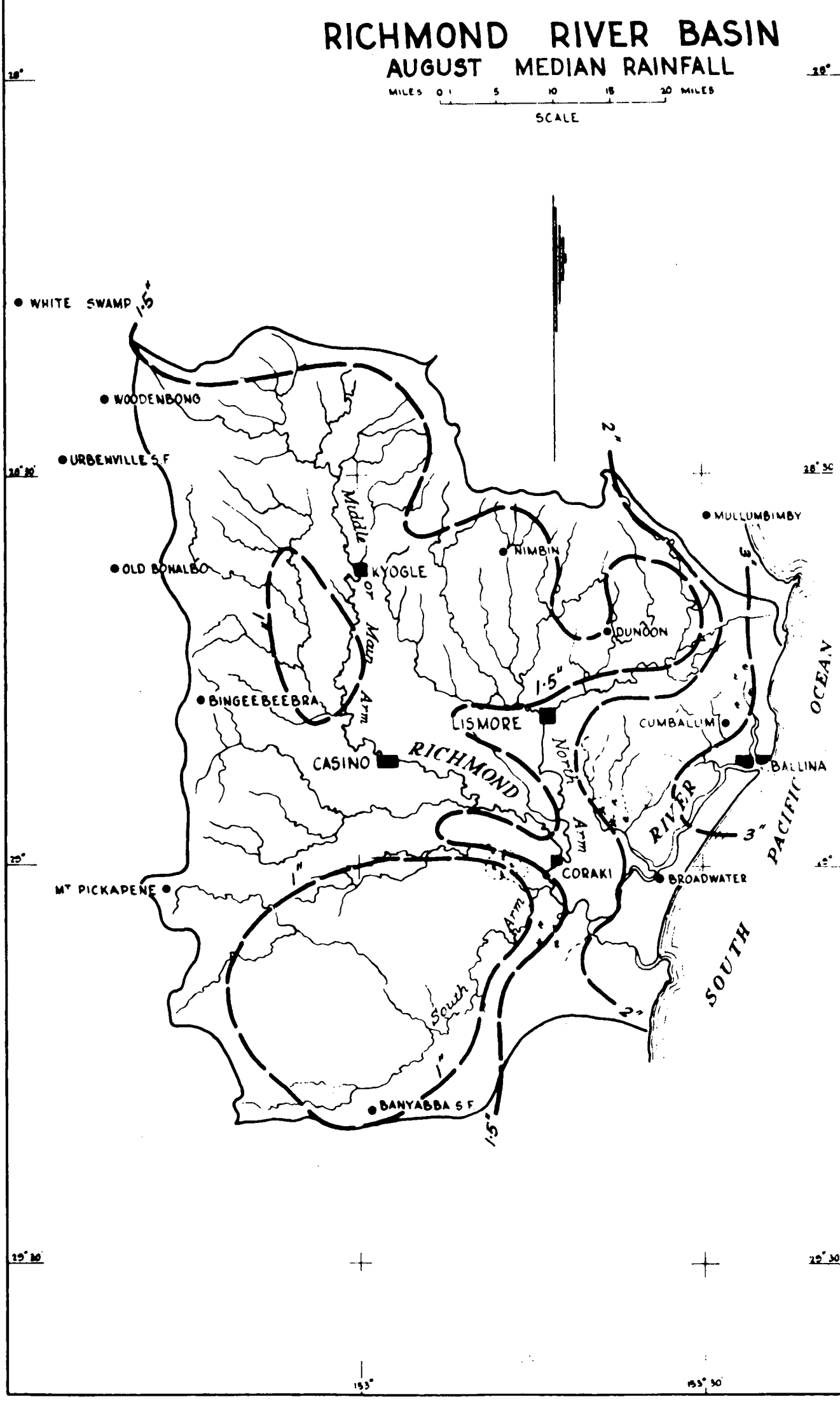

RICHMOND RIVER BASIN
AUGUST MEDIAN RAINFALL
MILES 0 1 5 10 15 20 MILES
SCALE
28°
28° 30'
29°
29° 30'
153°
153° 30'
WHITE SWAMP
WOODENBONO
URBENVILLE S.F
OLD BONALBO
BINGEEBEEBRA
CASINO
KYOGLE
Middle or Main Arm
NIMBIN
DUNOON
LISMORE
RICHMOND
North Arm
CORAKI
MULLUMBIMBY
CUMBALUM
BALLINA
BROADWATER
RIVER
SOUTH PACIFIC OCEAN
Mt PICKAPENE
South Arm
BANYABBA S.F
1.5"
2"
3"
1"

FIGURE 12

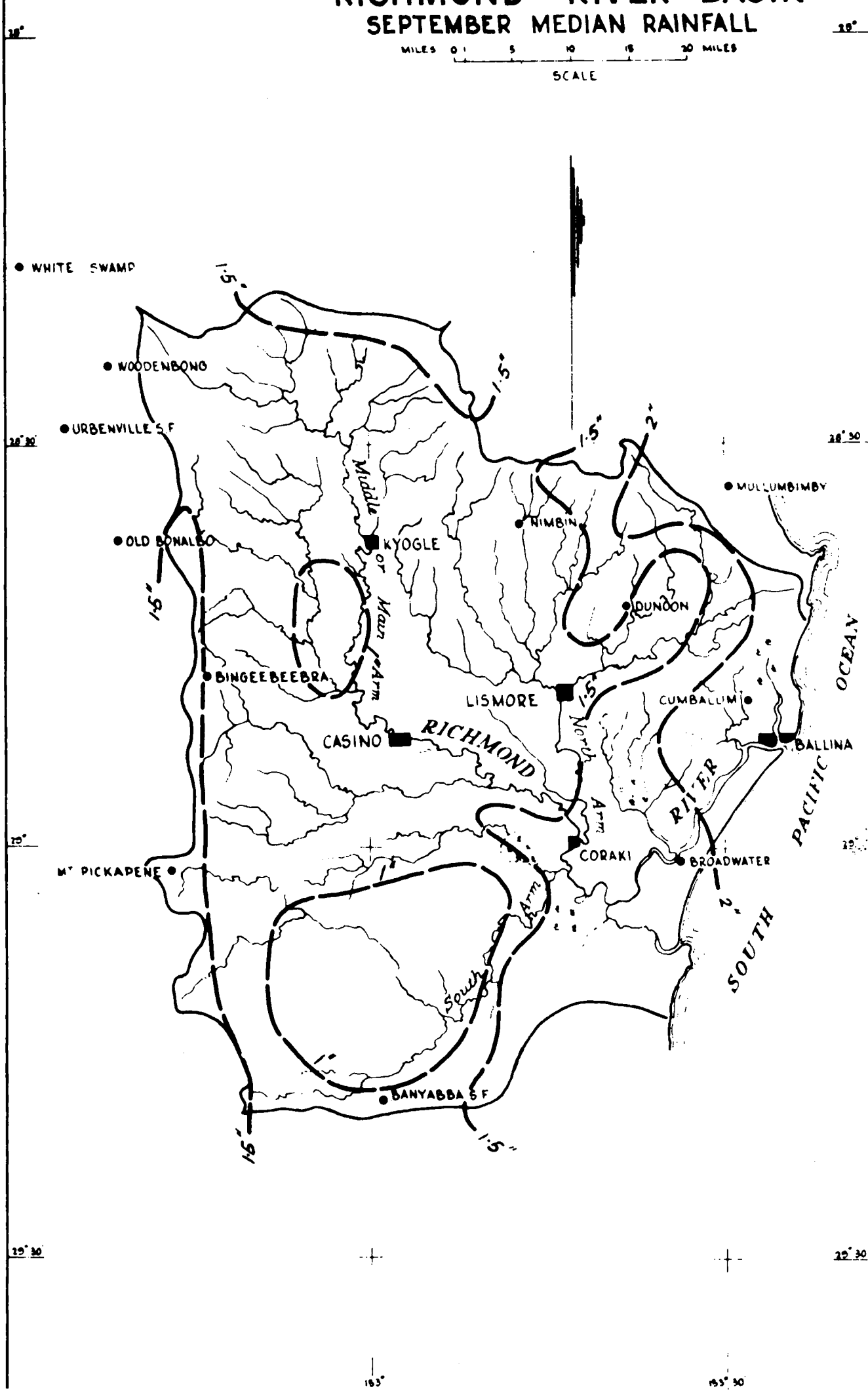

RICHMOND RIVER BASIN
SEPTEMBER MEDIAN RAINFALL
MILES 0 1 5 10 15 20 MILES
SCALE
WHITE SWAMP
WOODENBONG
URBENVILLE S F
OLD BONALBO
BINGEEBEEBRA
KYOGLE
Middle or Main Arm
NIMBIN
MULLUMBIMBY
DUNOON
LISMORE
CASINO
RICHMOND
North Arm
CUMBALLUM
BALLINA
RIVER
CORAKI
BROADWATER
Mt PICKAPENE
South Arm
BANYABBA S F
1·5"
2"
1"
SOUTH PACIFIC OCEAN

FIGURE 13

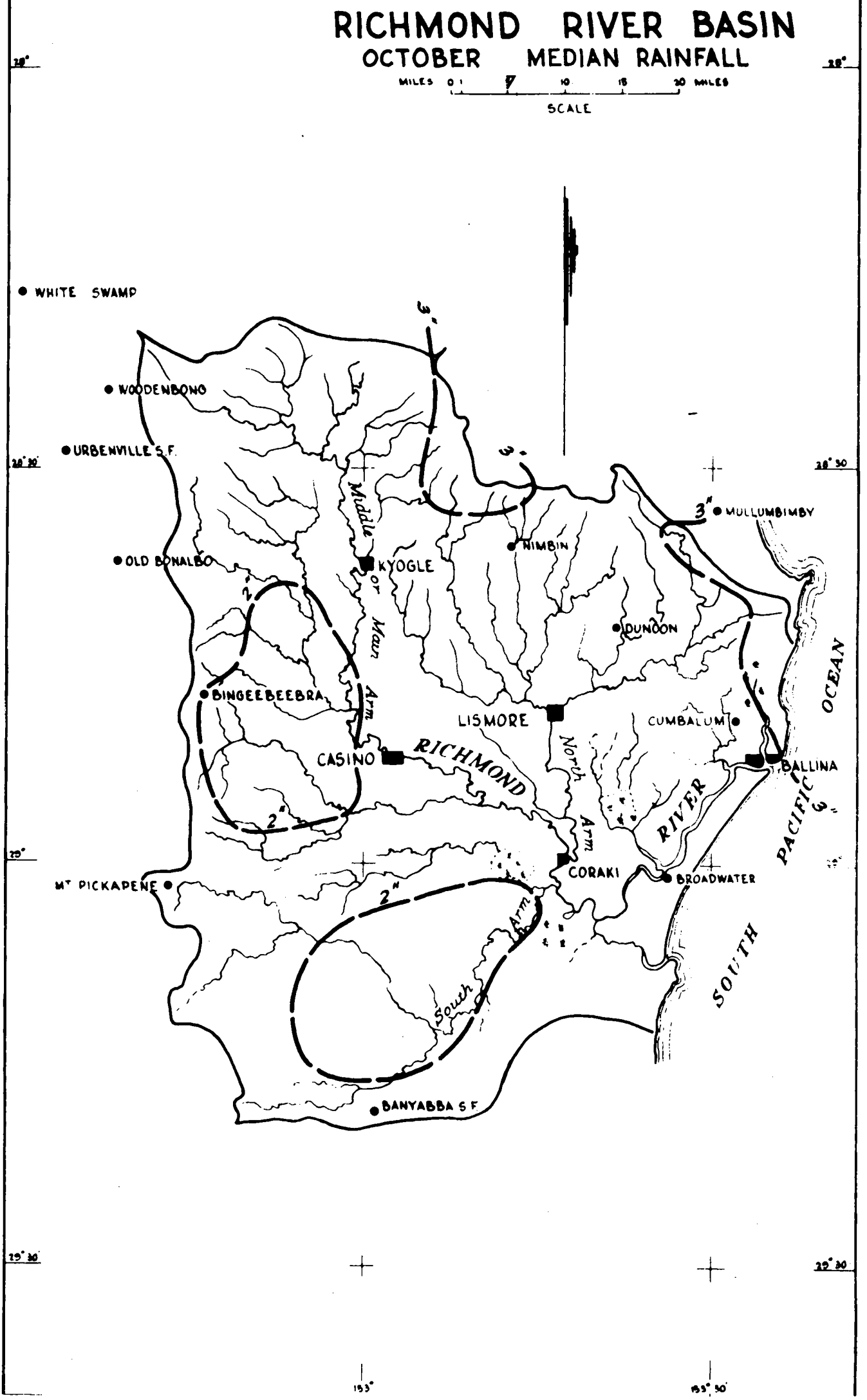

RICHMOND RIVER BASIN
OCTOBER MEDIAN RAINFALL
MILES 0 5 10 15 20 MILES
SCALE
28°
28° 30'
29°
29° 30'
153°
153° 30'
WHITE SWAMP
WOODENBONG
URBENVILLE S.F.
OLD BONALBO
BINGEEBEEBRA
KYOGLE
Middle or Main Arm
NIMBIN
MULLUMBIMBY
DUNOON
LISMORE
CUMBALUM
CASINO
RICHMOND
North Arm
RIVER
BALLINA
CORAKI
BROADWATER
Mt PICKAPENE
South Arm
BANYABBA S.F.
PACIFIC OCEAN
SOUTH
2"
3"

FIGURE 14

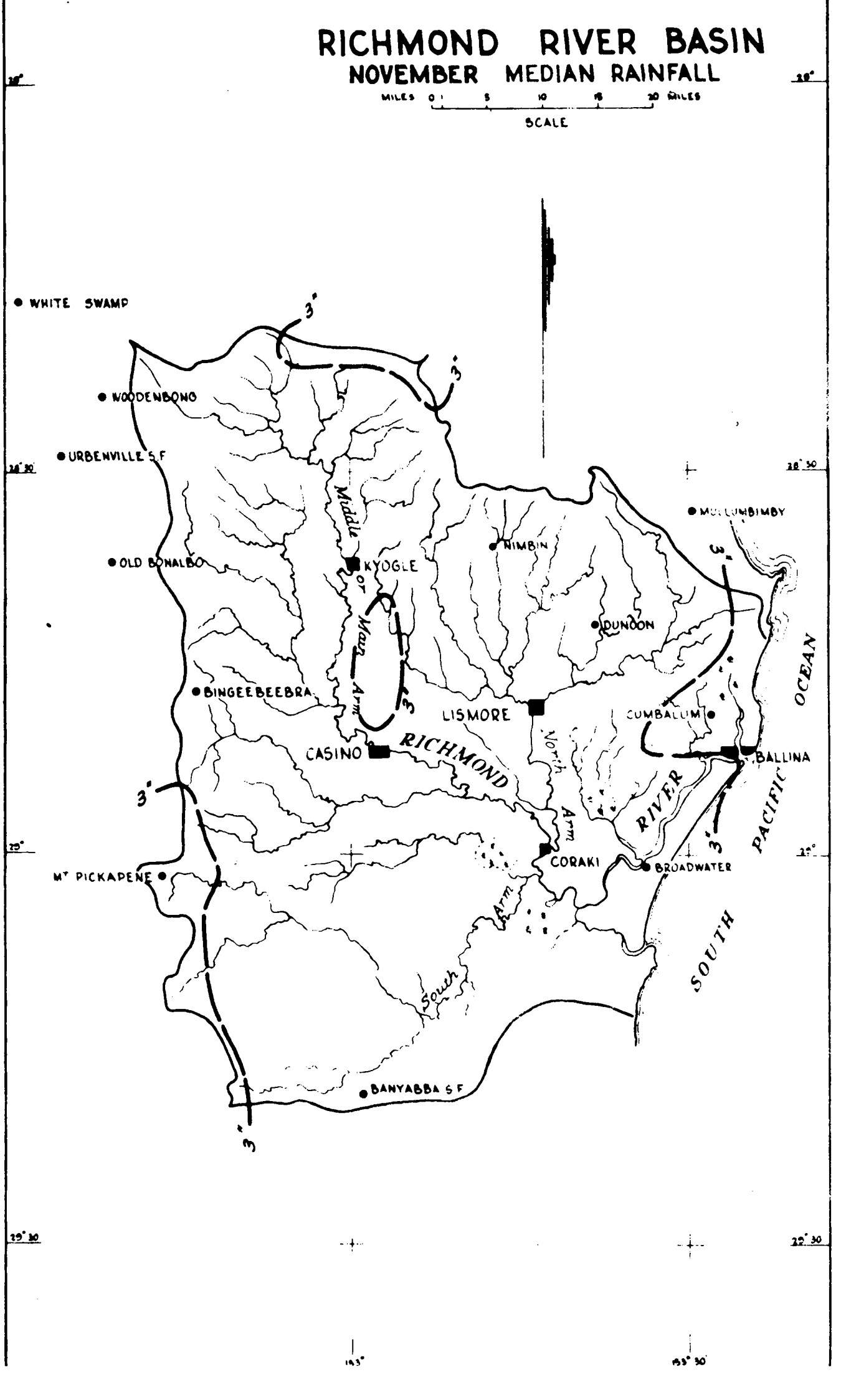
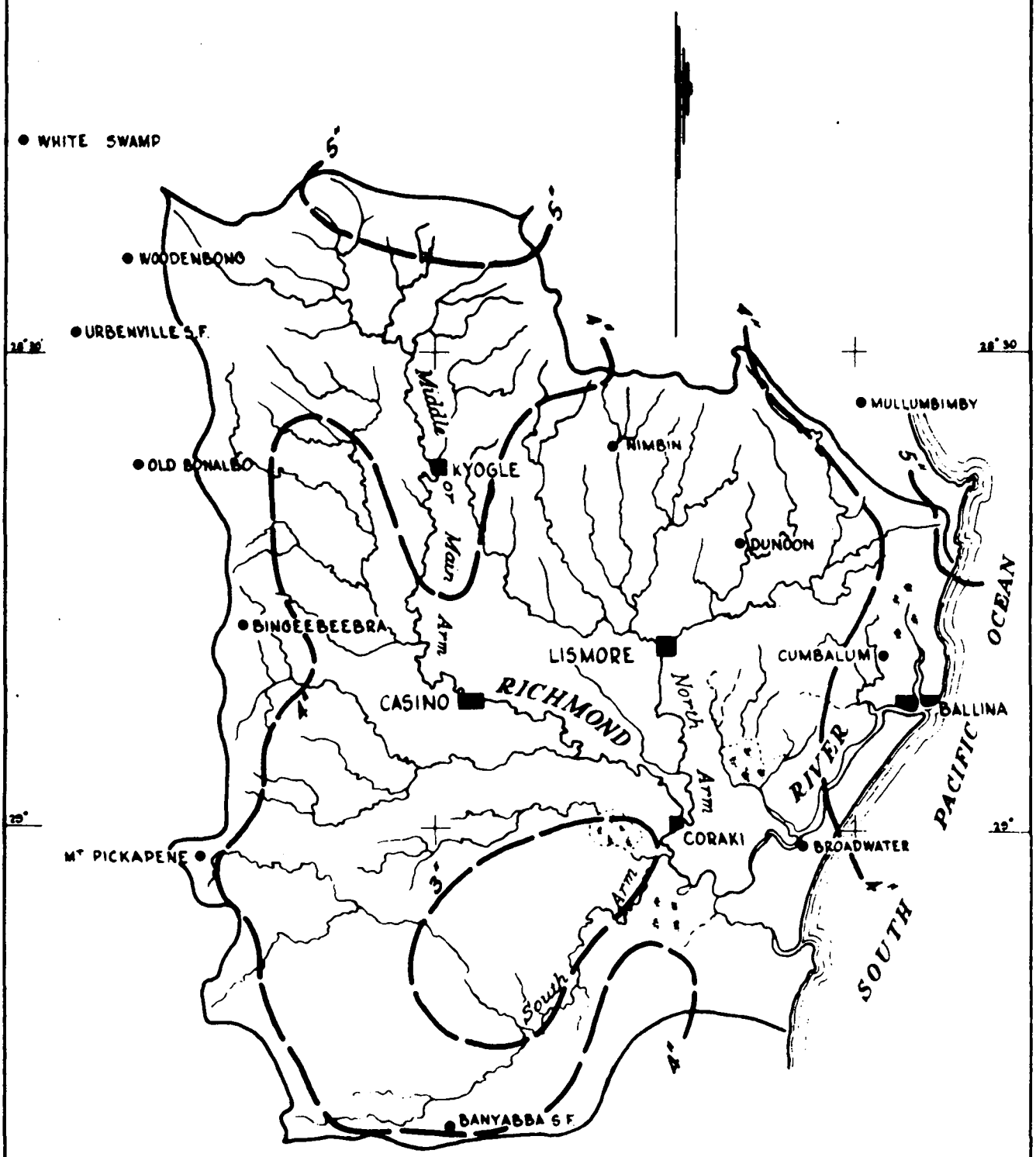
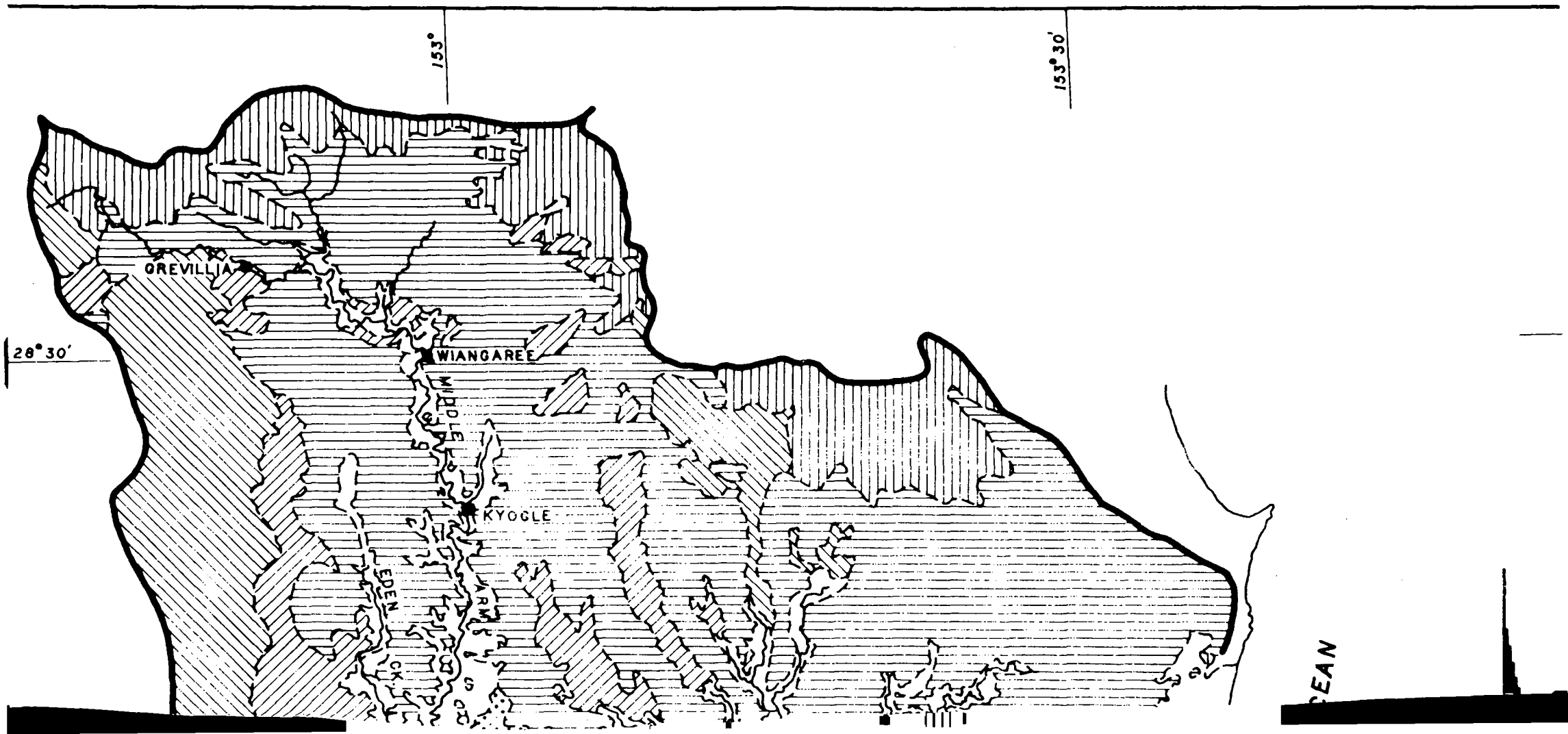

RICHMOND RIVER BASIN
NOVEMBER MEDIAN RAINFALL
MILES 0 5 10 15 20 MILES
SCALE
WHITE SWAMP
WOODENBONO
URBENVILLE S.F
OLD BONALBO
BINGEEBEEBRA
MT PICKAPENE
KYOGLE
Middle Arm
North Arm
NIMBIN
DUNOON
LISMORE
CASINO
RICHMOND RIVER
CORAKI
South Arm
BANYABBA S.F
MULLUMBIMBY
CUMBALUM
BALLINA
BROADWATER
SOUTH PACIFIC OCEAN
3"

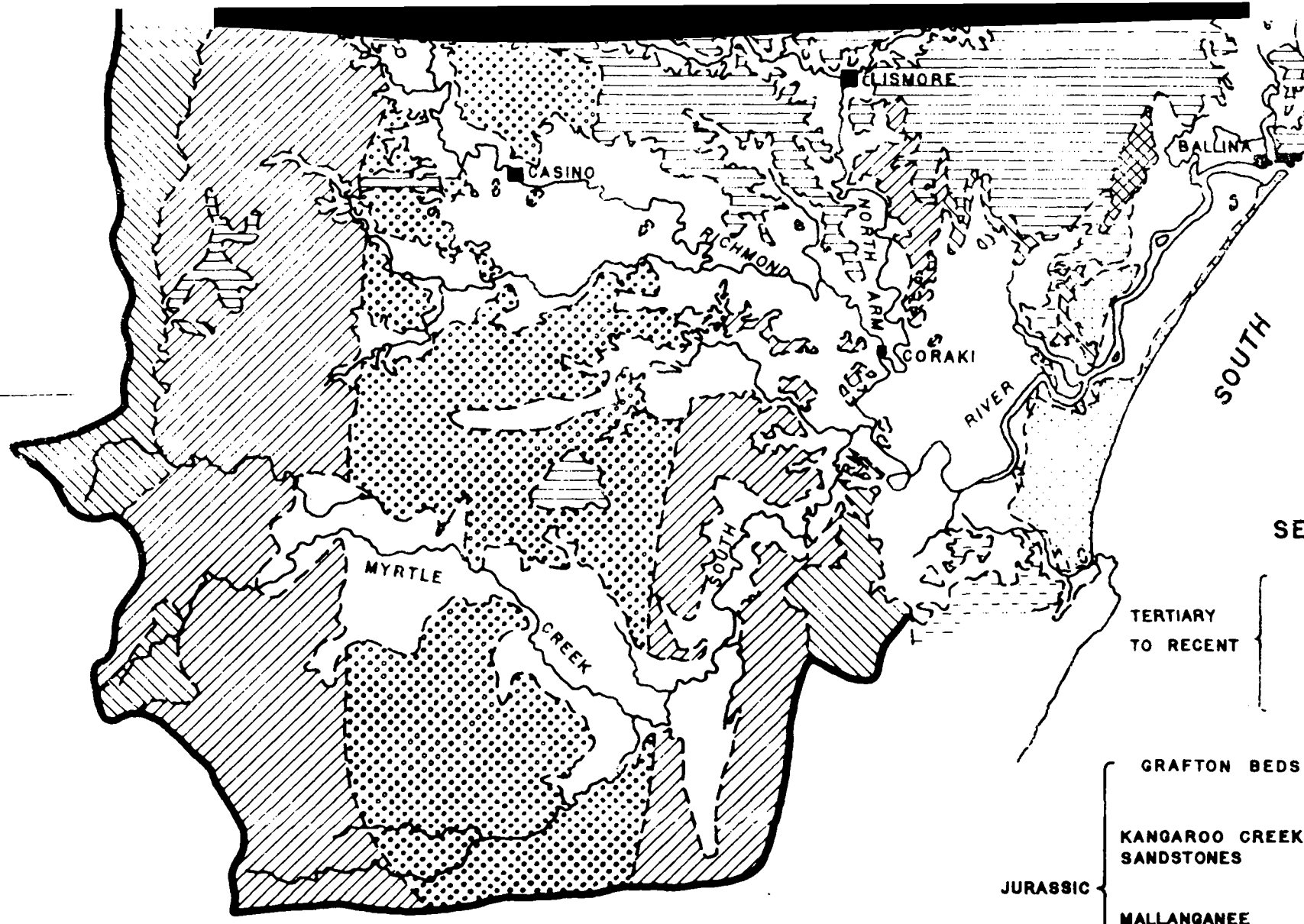
FIGURE 15

RICHMOND RIVER BASIN
DECEMBER MEDIAN RAINFALL

MILES 0 5 7½ 10 15 20 MILES
SCALE




153°
153°30'
28°30'
OREVILLIA
WIANGAREE
KYOGLE
EDEN CK
SEAN



NEW SOUTH WALES

WATER CONSERVATION & IRRIGATION COMMISSION

RICHMOND RIVER BASIN
GEOLOGICAL FORMATIONS

SCALE: 0 5 10 15 20 MILES

153°

153°30'

LEGEND

SEDIMENTARY

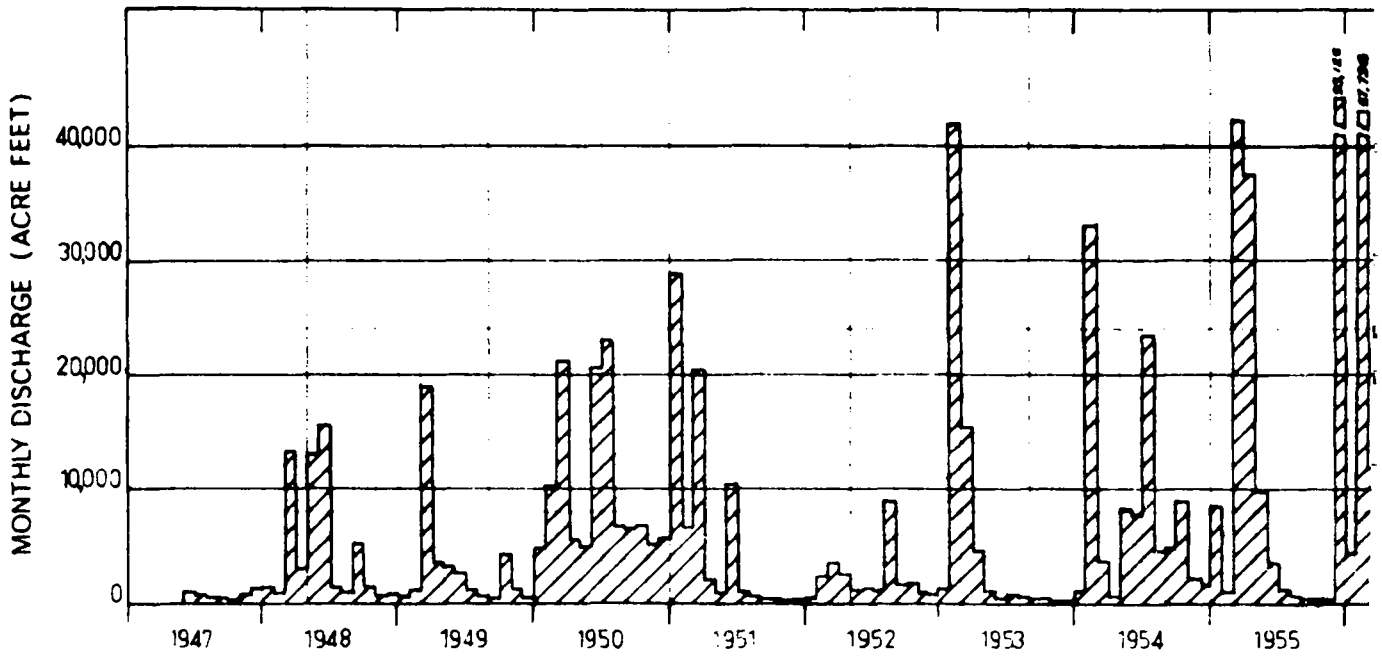
TERTIARY TO RECENT
- ALLUVIUM
- SAND BEDS

JURASSIC
- GRAFTON BEDS — SILTSTONES, SHALES, THIN COAL MEASURE
- KANGAROO CREEK SANDSTONES — MASSIVE QUARTZ-S
- MALLANGANEE COAL MEASURES — SANDSTONES SILTSTO SHALES COALSEAMS
- TABULAM GROUP — SANDSTONES & CONGL WITH SILTSTONE & CL

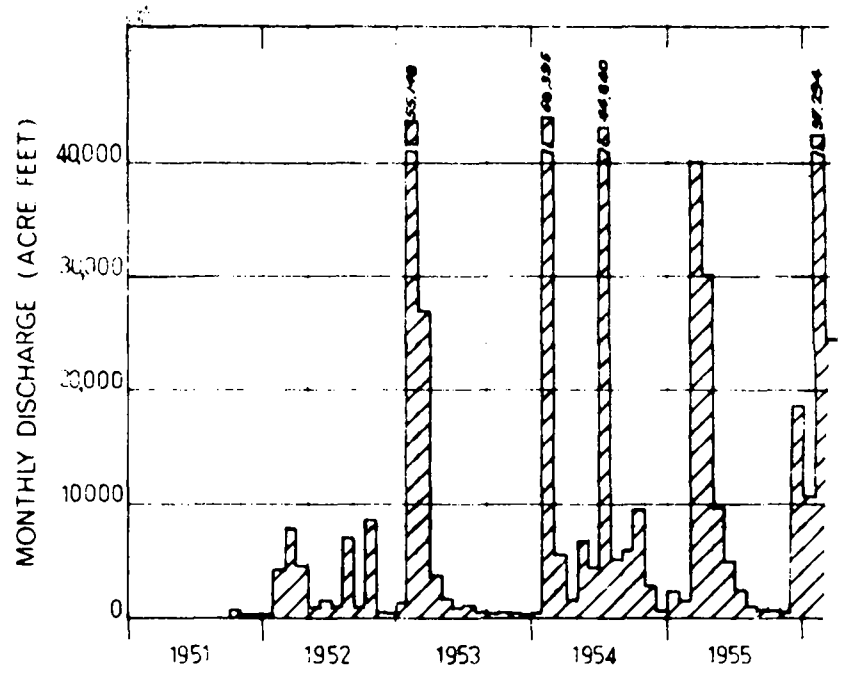
PALAEOZOIC
- FITZROY SERIES — GREYWACKES SILTSTON QUARTZITES PHYLLITE

IGNEOUS

TERTIARY
- BASALT
- RHYOLITE



TERANIA CR



HYDROGRAPHS OF MONTHLY DISCHARGE

FOR NORTH ARM OF

RICHMOND RIVER TRIBUTARIES

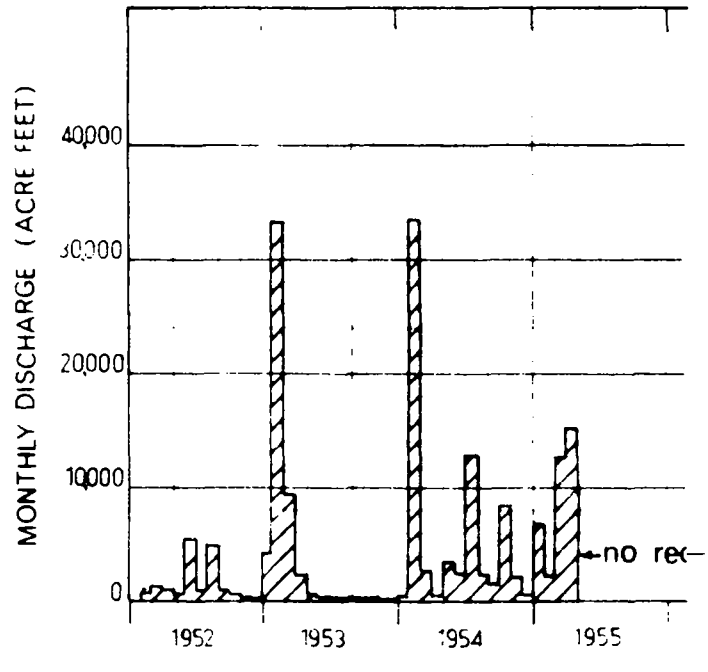
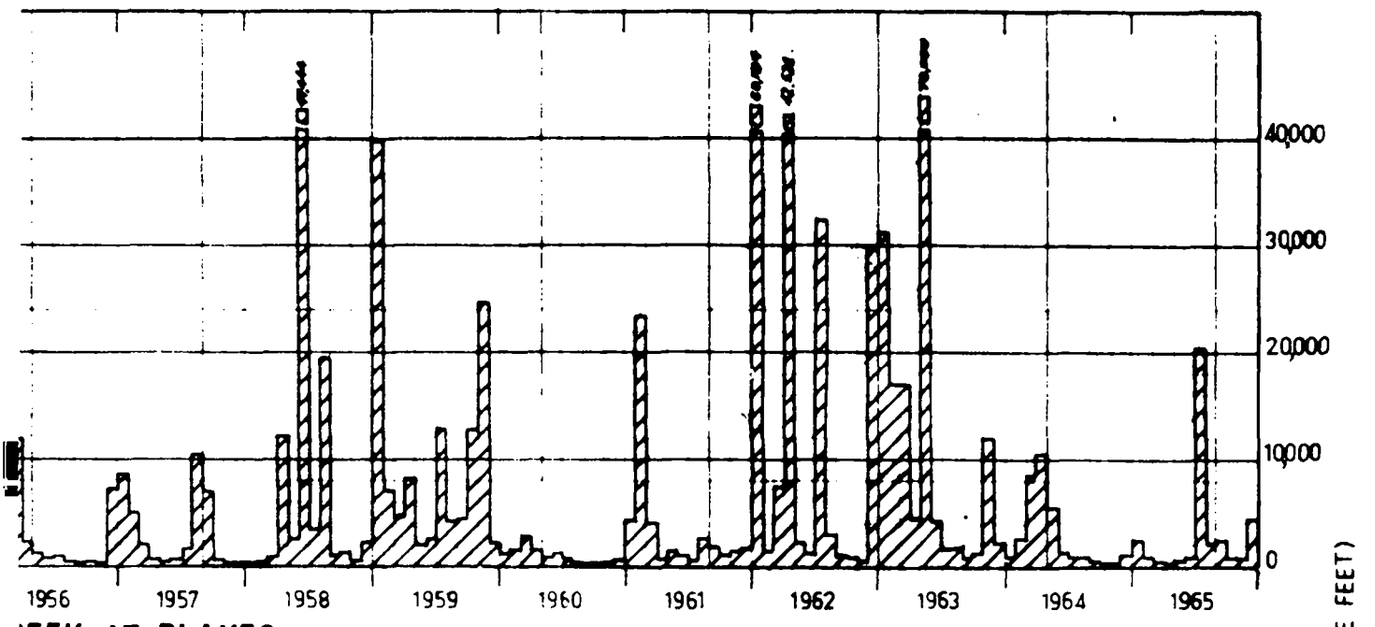
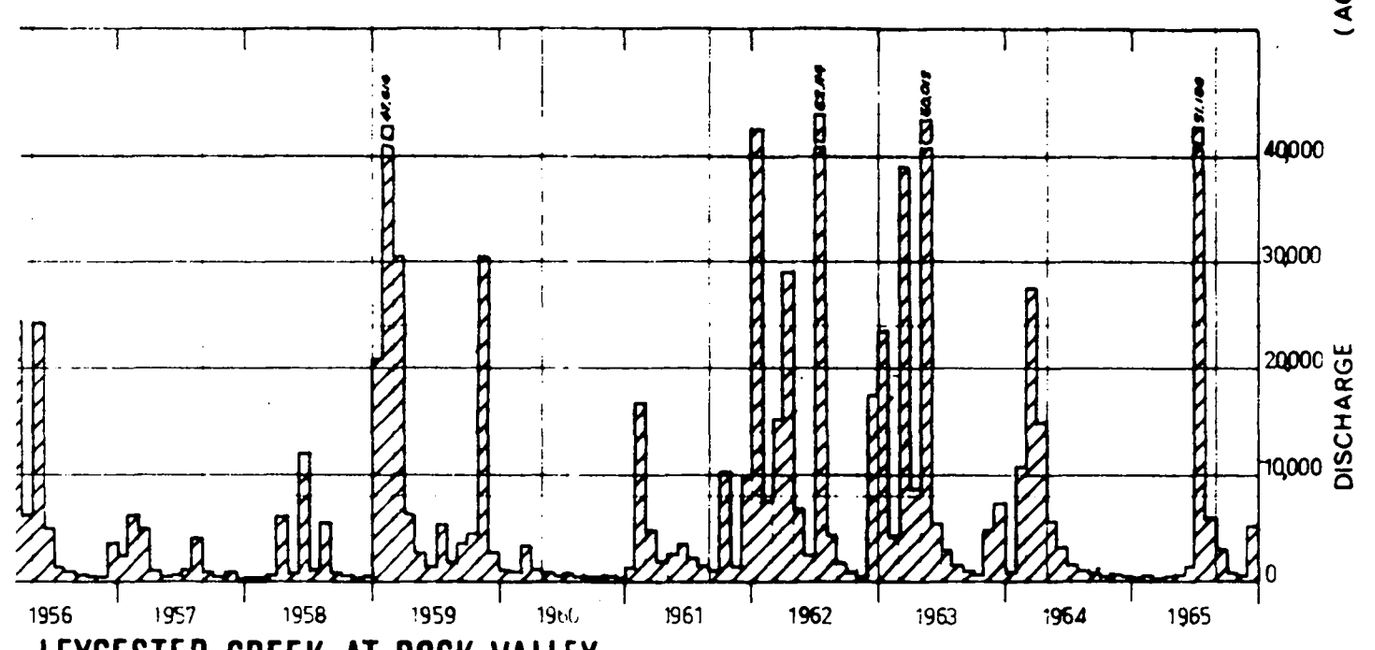


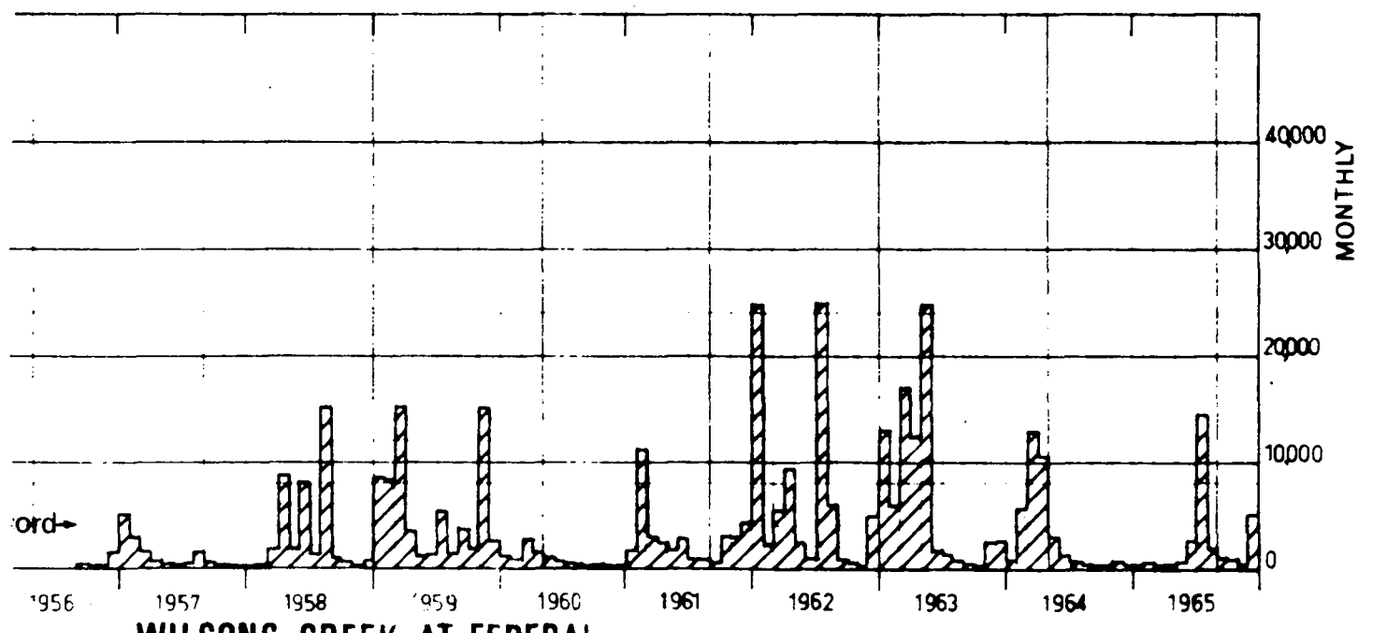
FIGURE 19



EEK AT BLAKES



LEYCESTER CREEK AT ROCK VALLEY



WILSONS CREEK AT FEDERAL

Figure 17

NEW SOUTH WALES
WATER CONSERVATION & IRRIGATION COMMISSION

RICHMOND RIVER BASIN GAUGING STATIONS

AS AT 31st JANUARY 1968

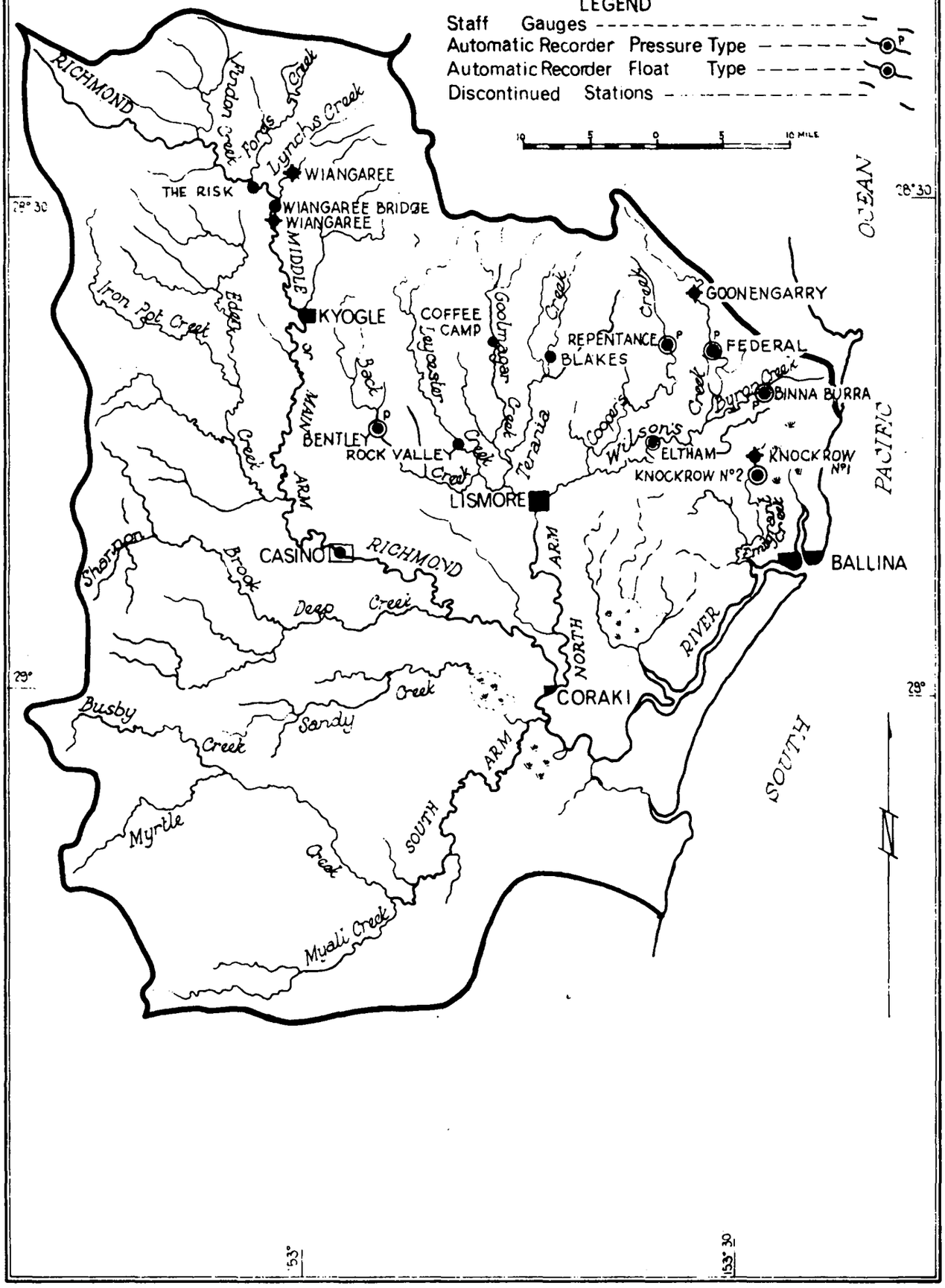
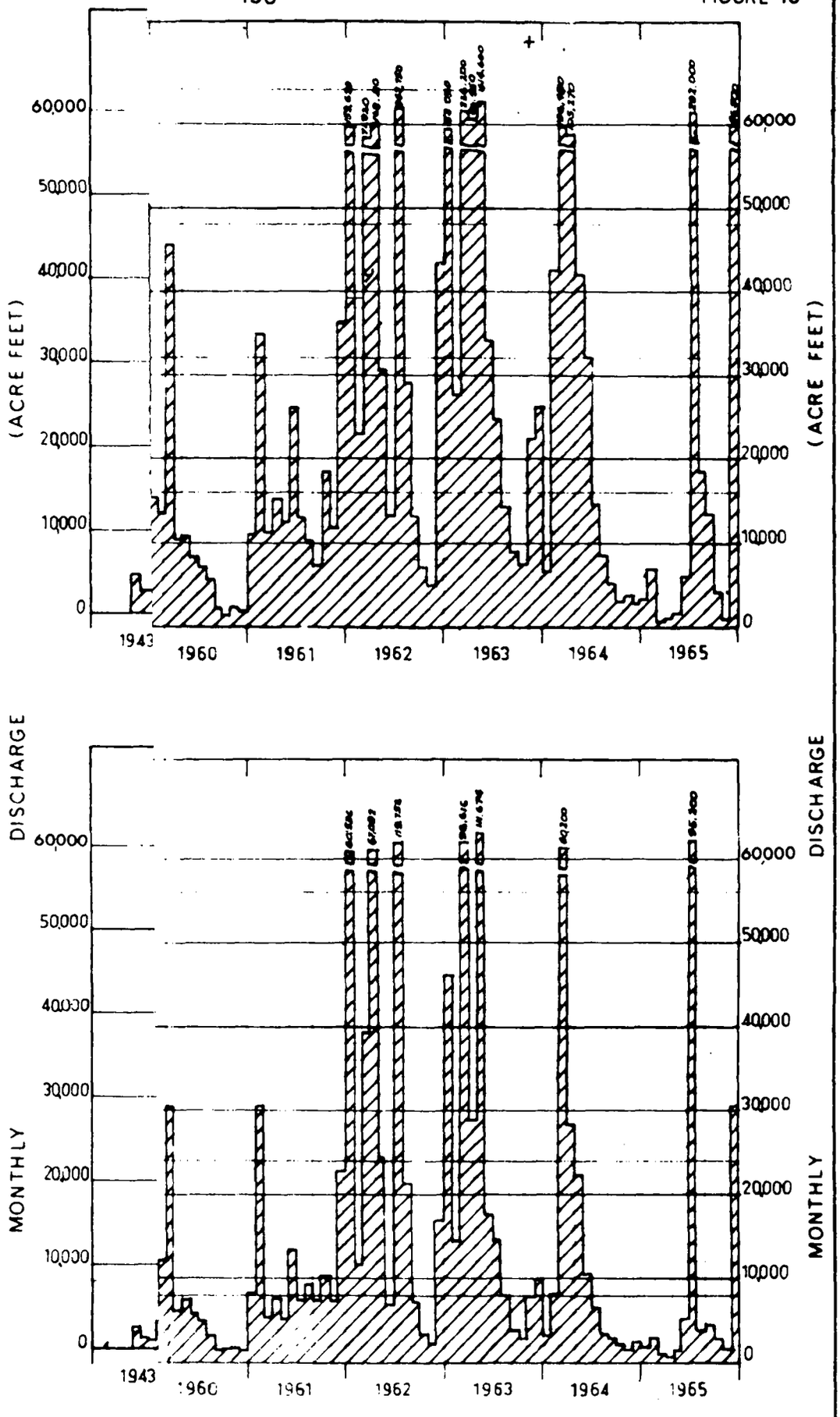
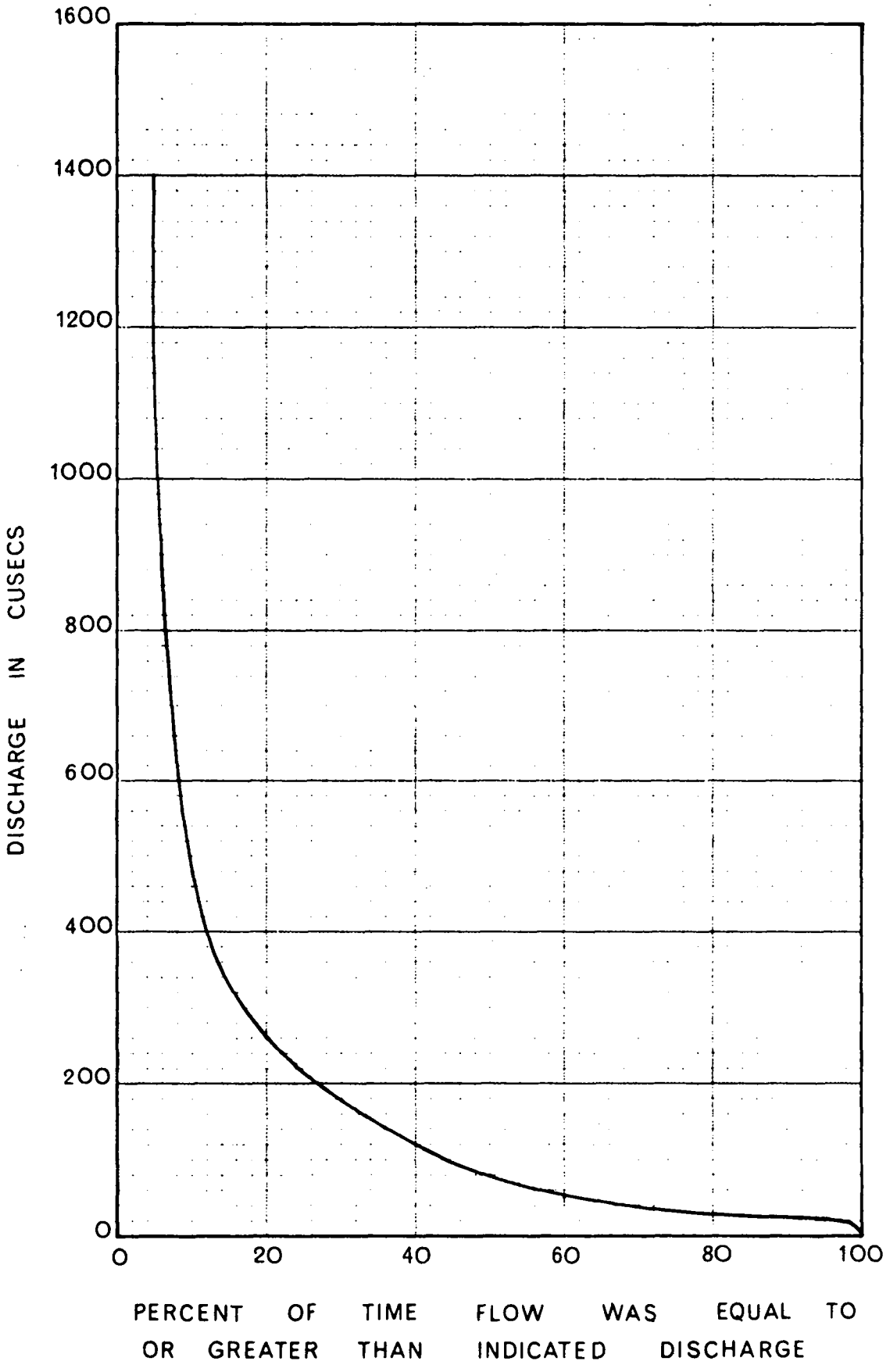


FIGURE 18

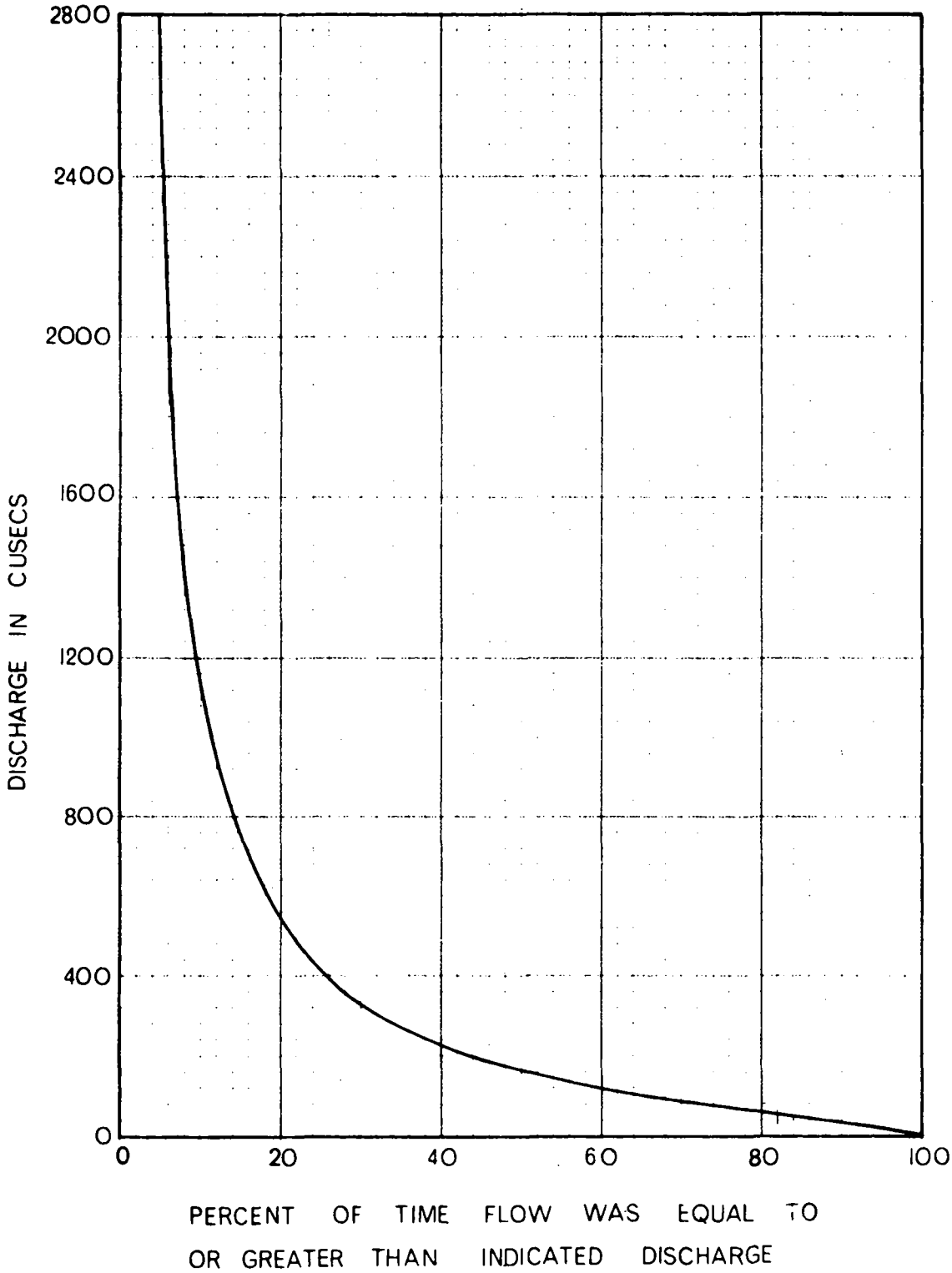


MOND RIVER

FIGURE 20

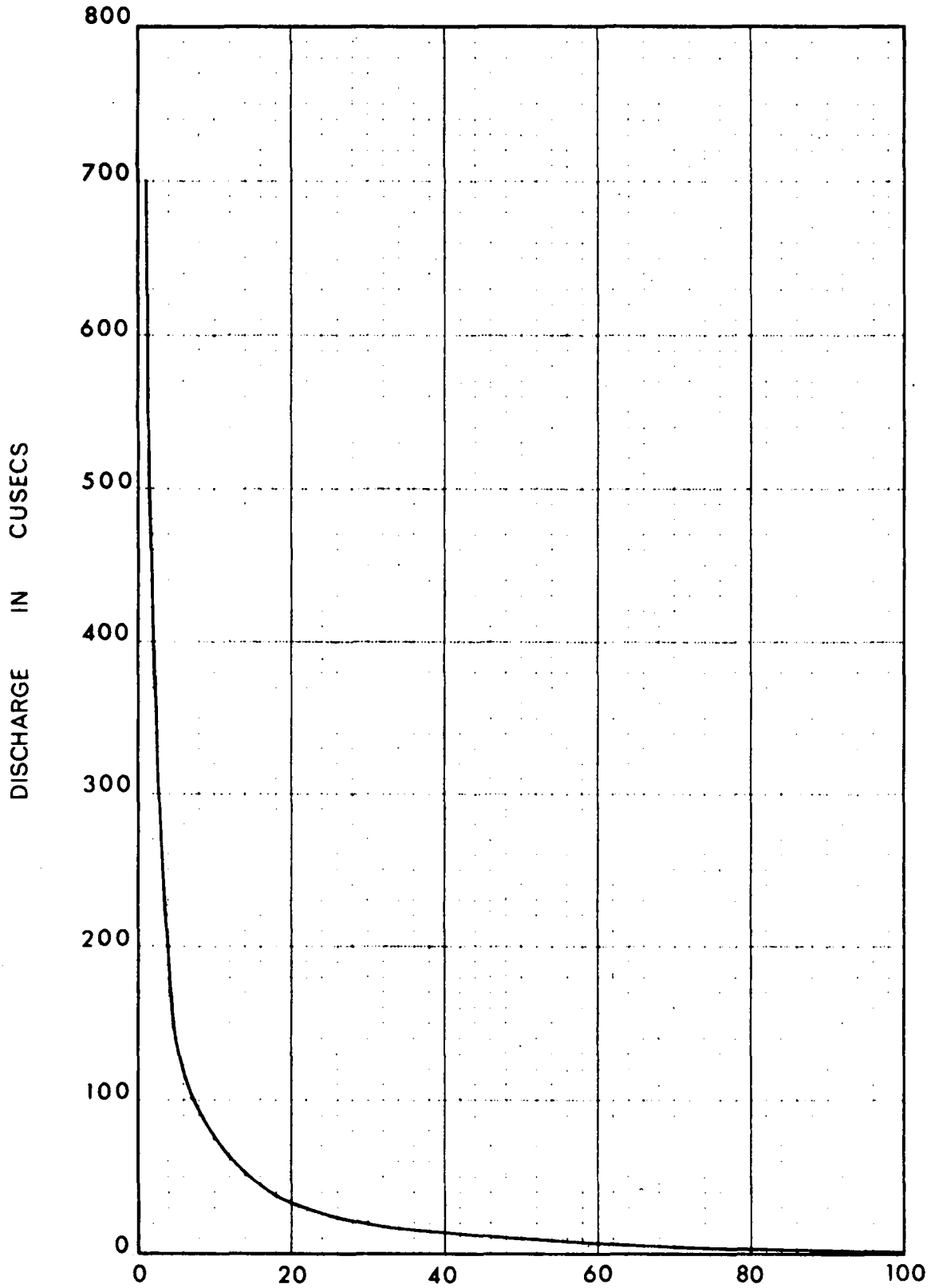


FLOW DURATION CURVE FOR RICHMOND RIVER AT WIANGAREE



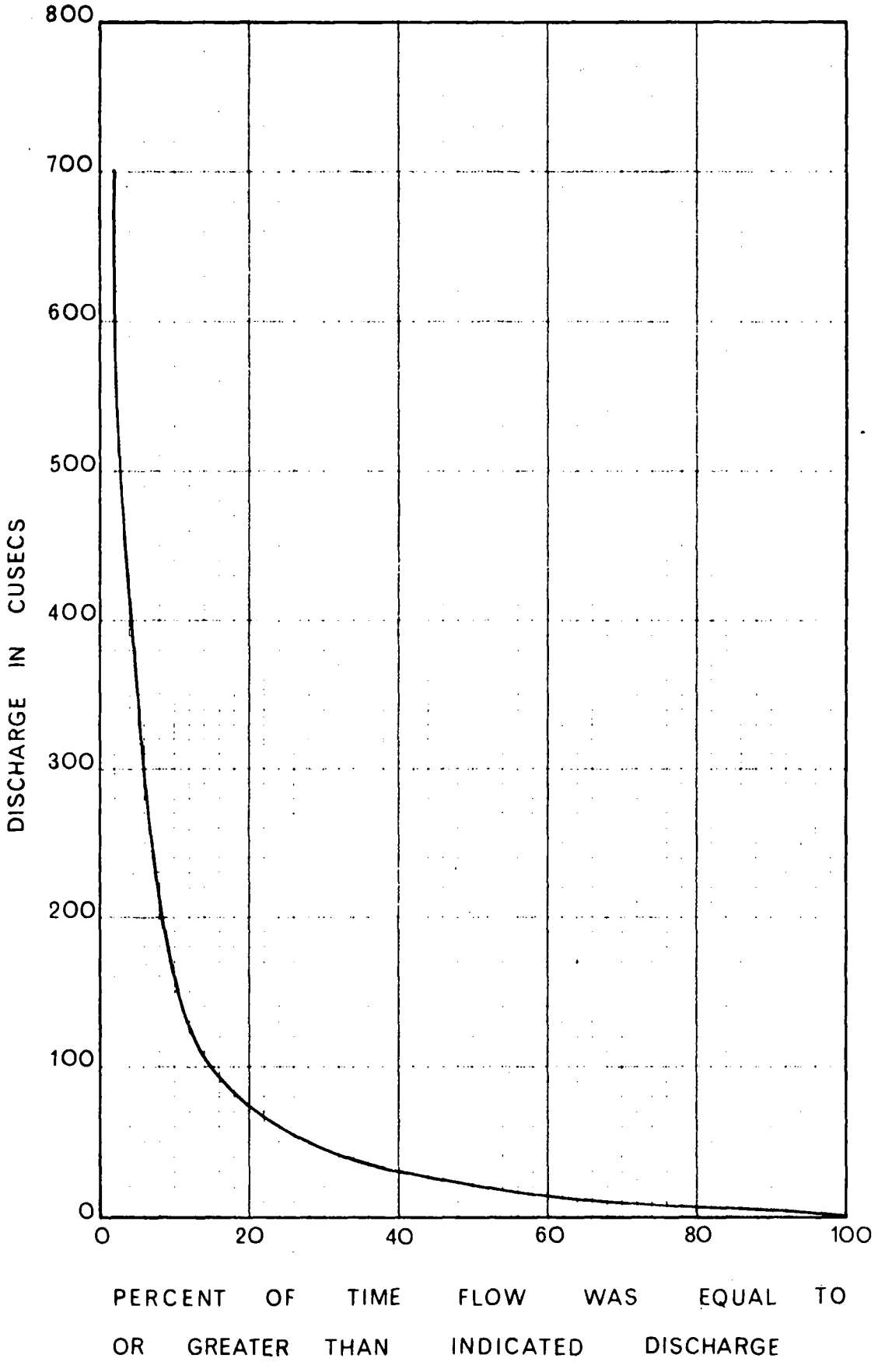
FLOW DURATION CURVE FOR RICHMOND RIVER AT CASINO

FIGURE 22

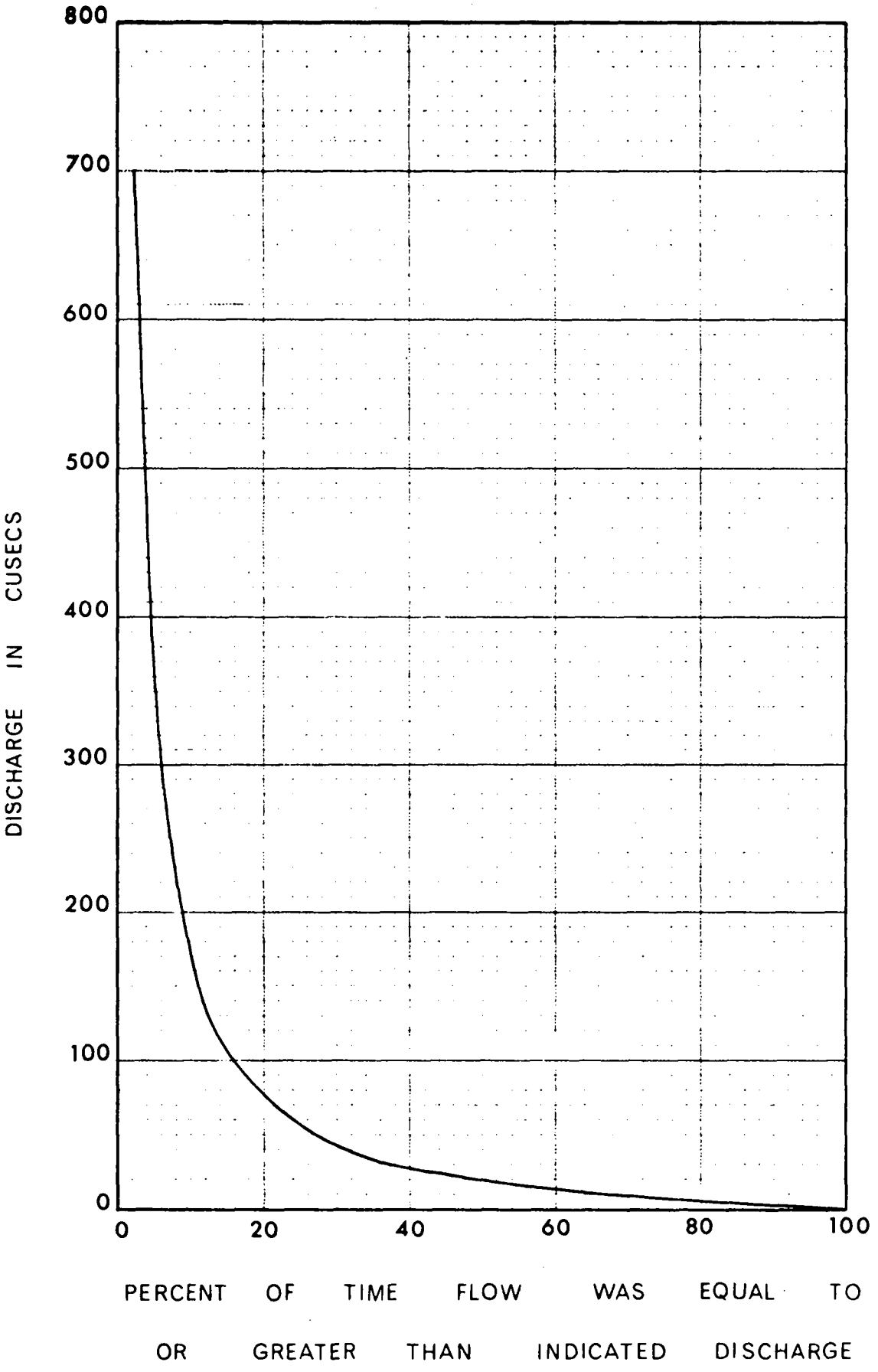


FLOW DURATION CURVE FOR BACK CREEK AT BENTLEY

FIGURE 23

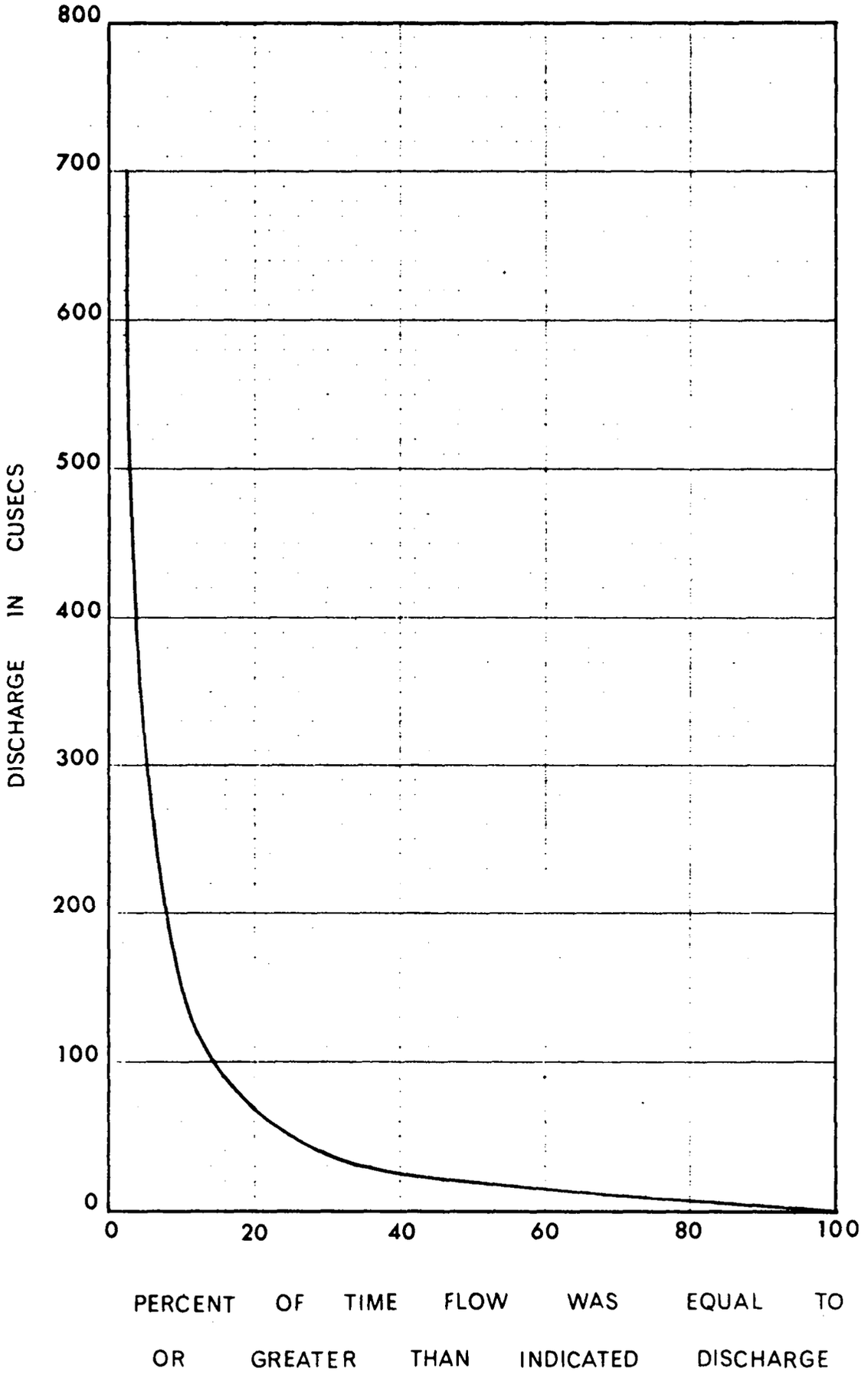


FLOW DURATION CURVE FOR LEYCESTER CREEK AT ROCK VALLEY



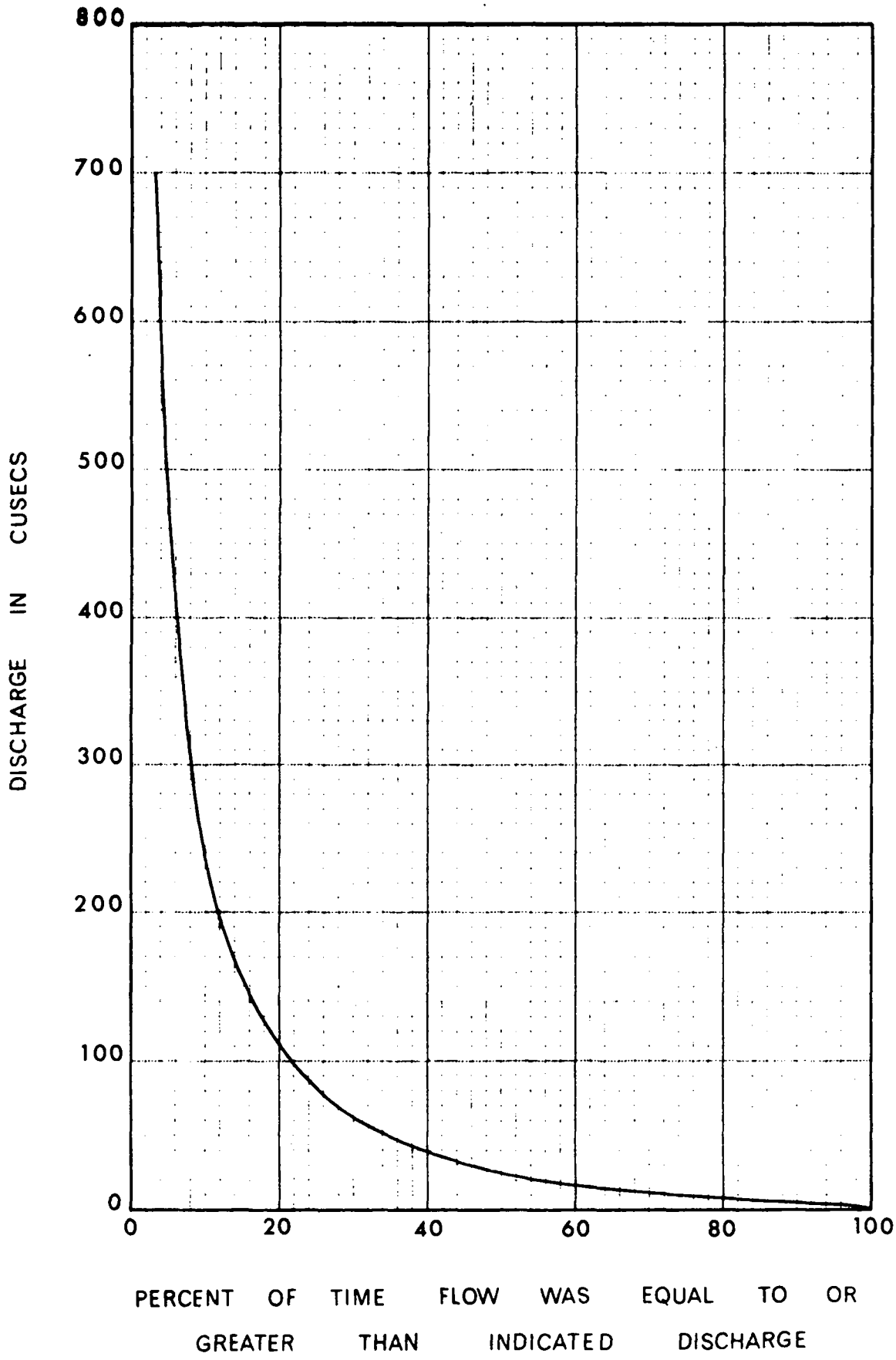
FLOW DURATION CURVE FOR GOOLMAGAR CREEK AT COFFEE CAMP

FIGURE 25



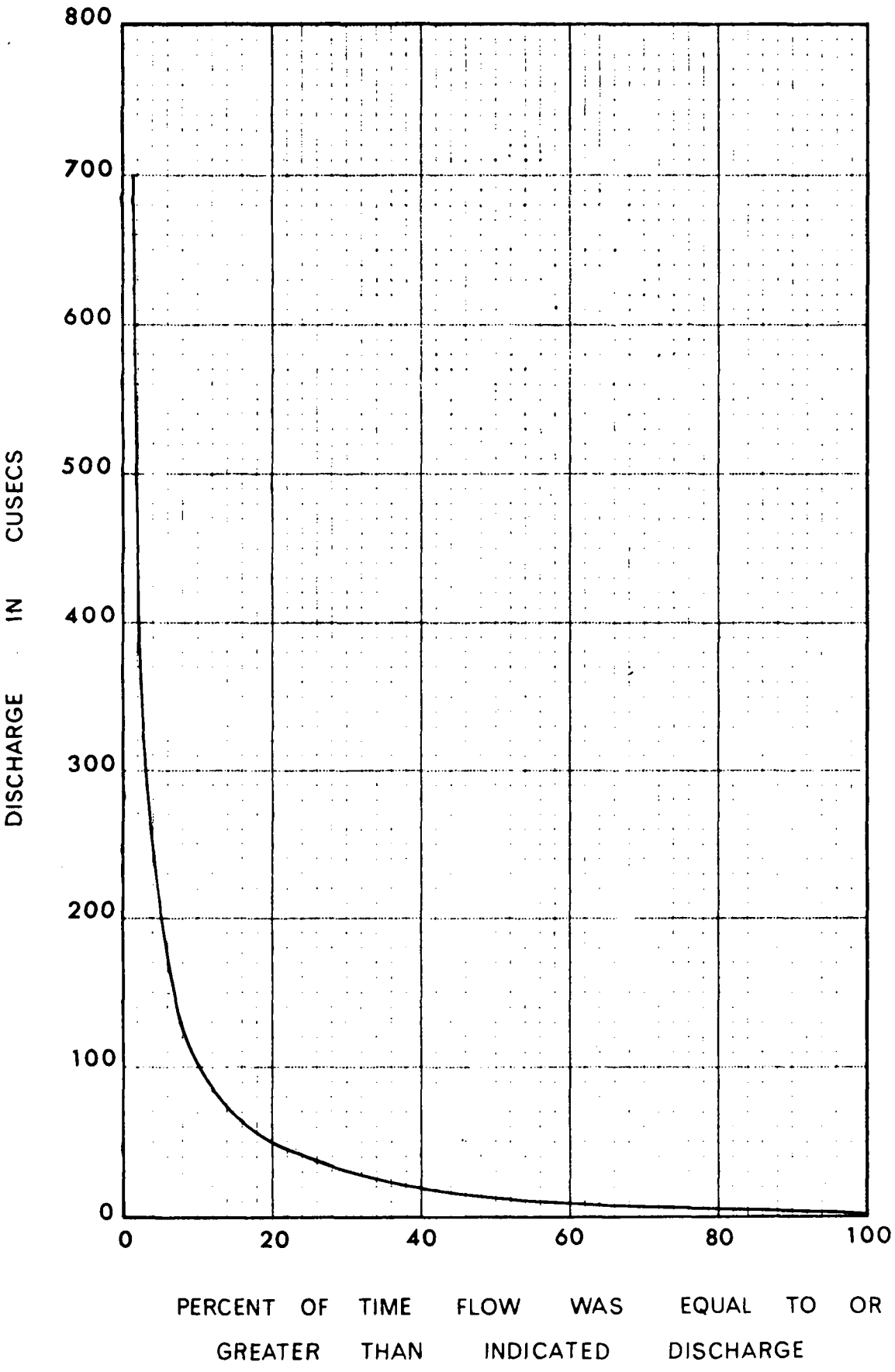
FLOW DURATION CURVE FOR TERANIA CREEK AT BLAKES

FIGURE 26



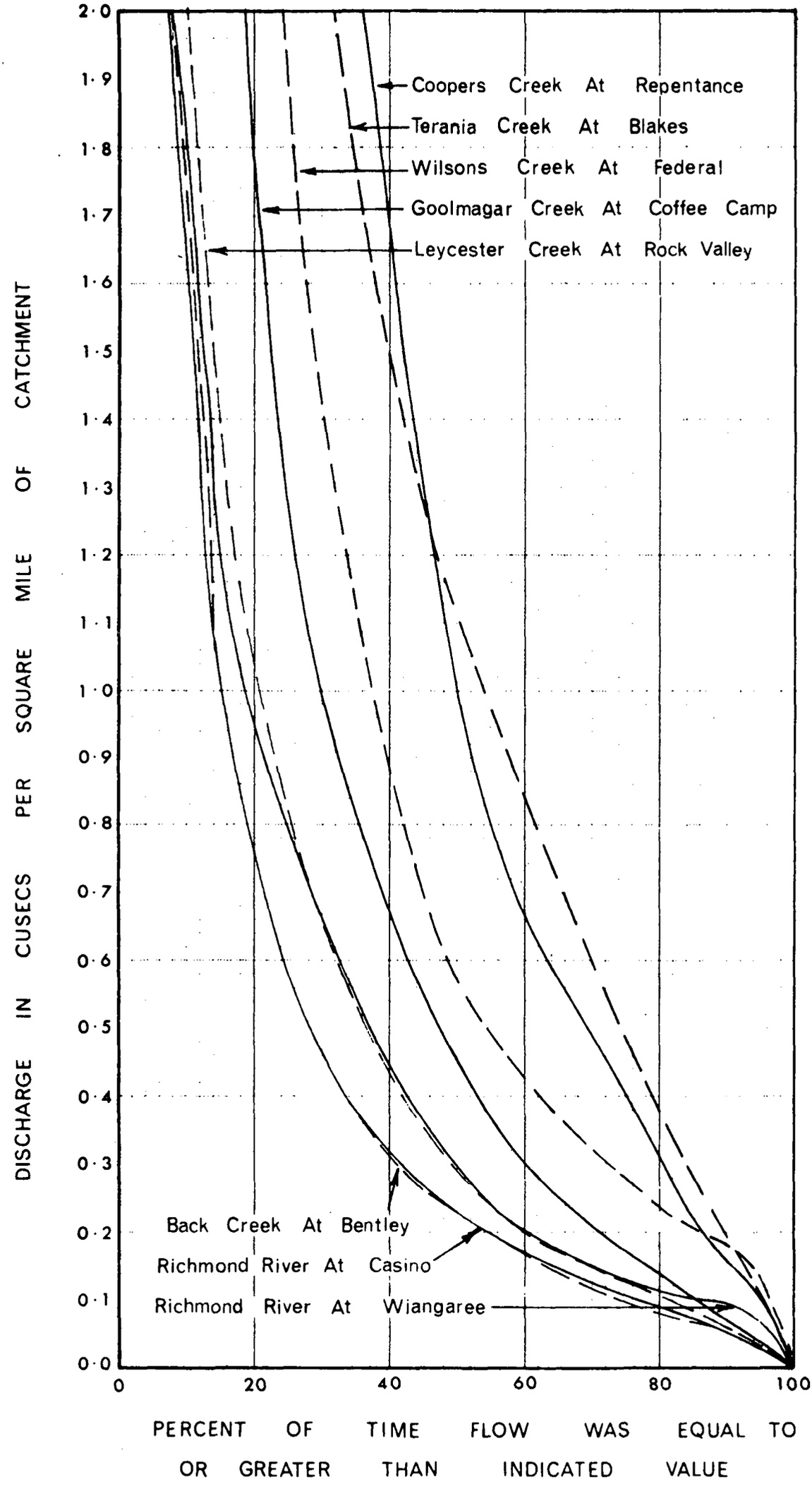
FLOW DURATION CURVE FOR COOPER'S CREEK AT REPENTANCE

FIGURE 27

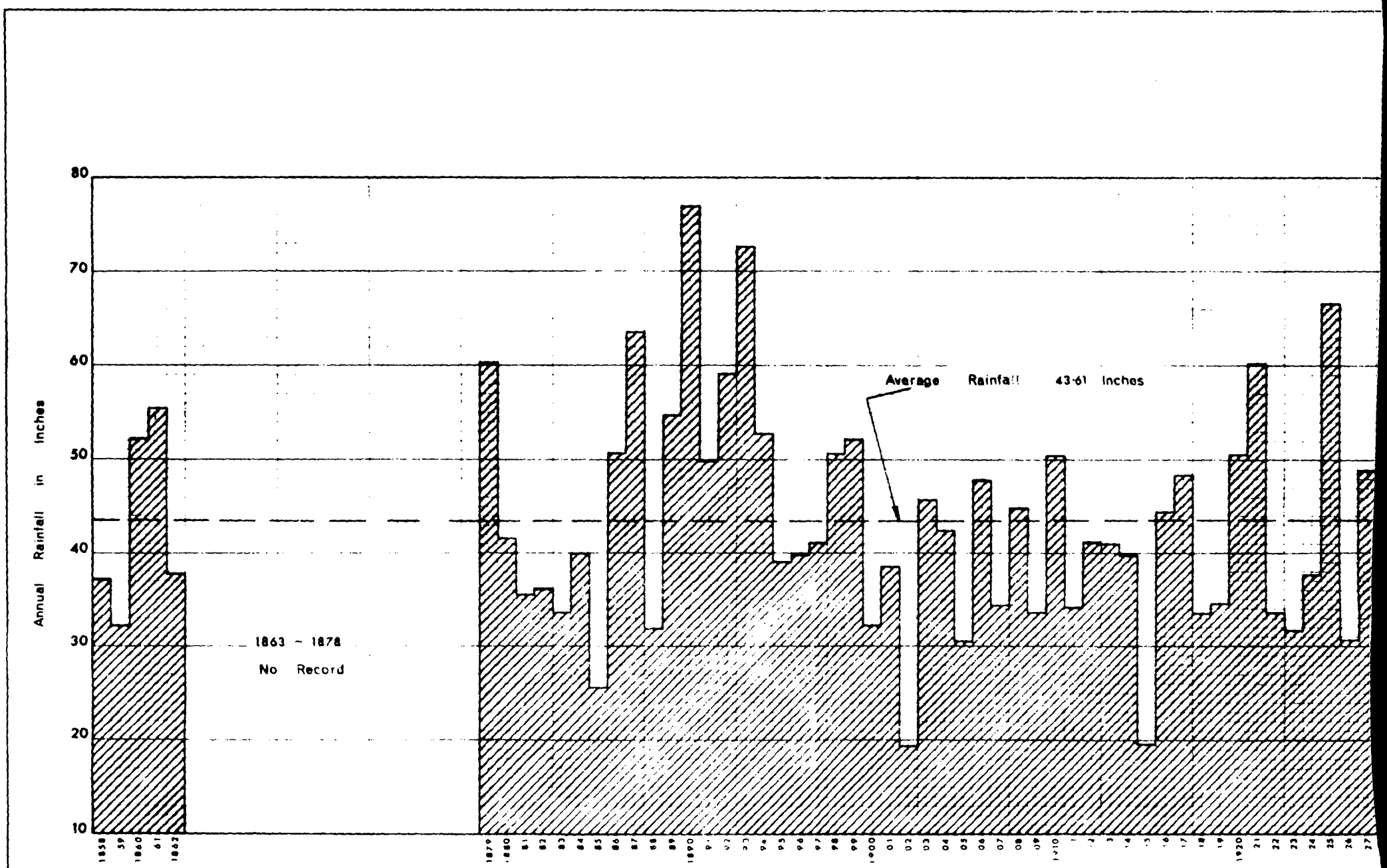


FLOW DURATION CURVE FOR WILSON'S CREEK AT FEDERAL

FIGURE 28

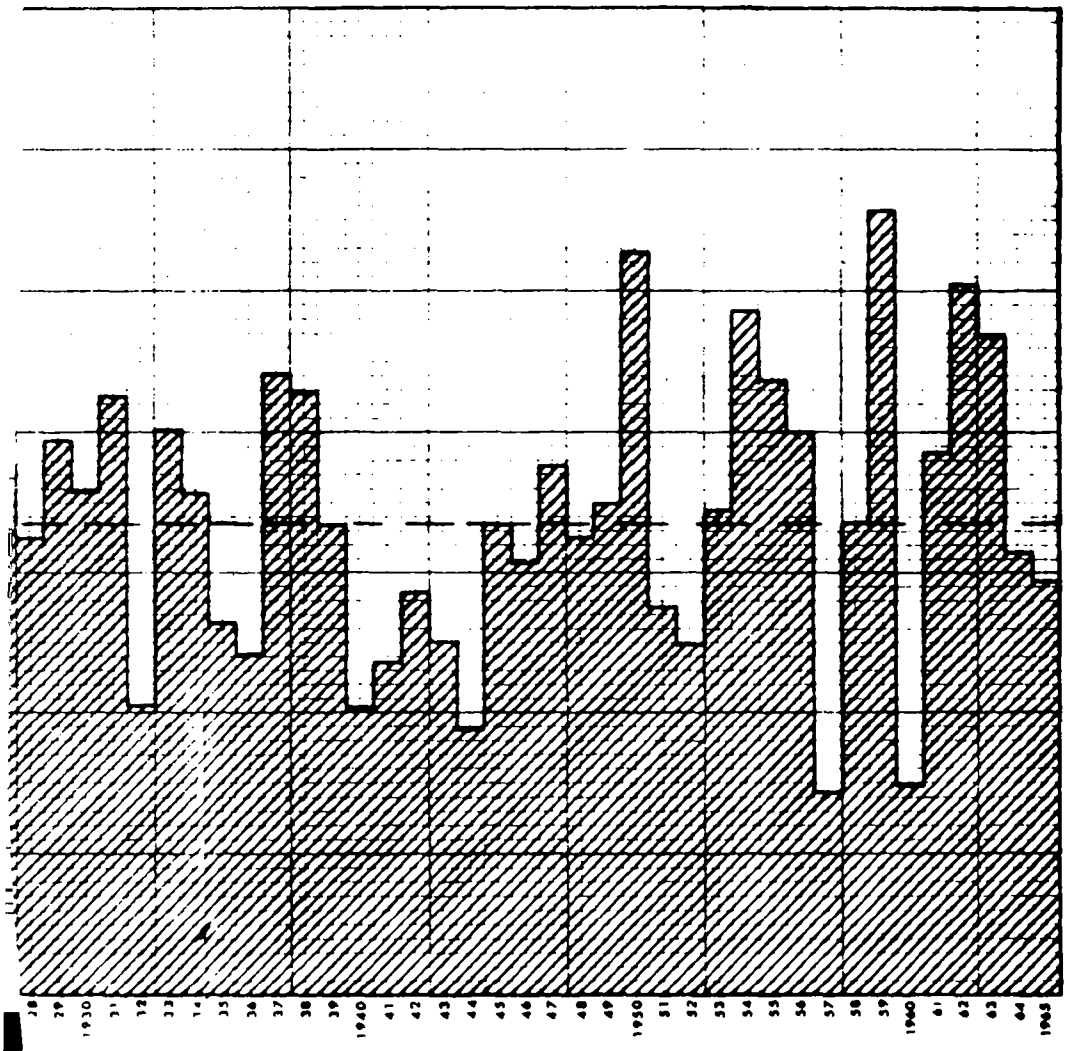


FLOW DURATION CURVES FOR RICHMOND RIVER AND TRIBUTARIES



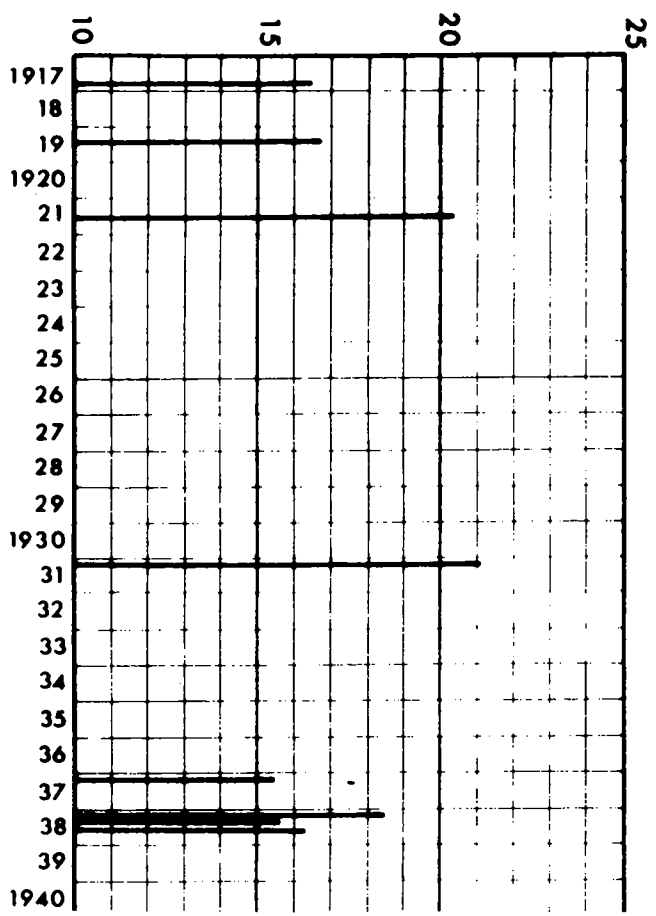
DISTRIBUTION OF ANNUAL RAINFALL AT CASINO.

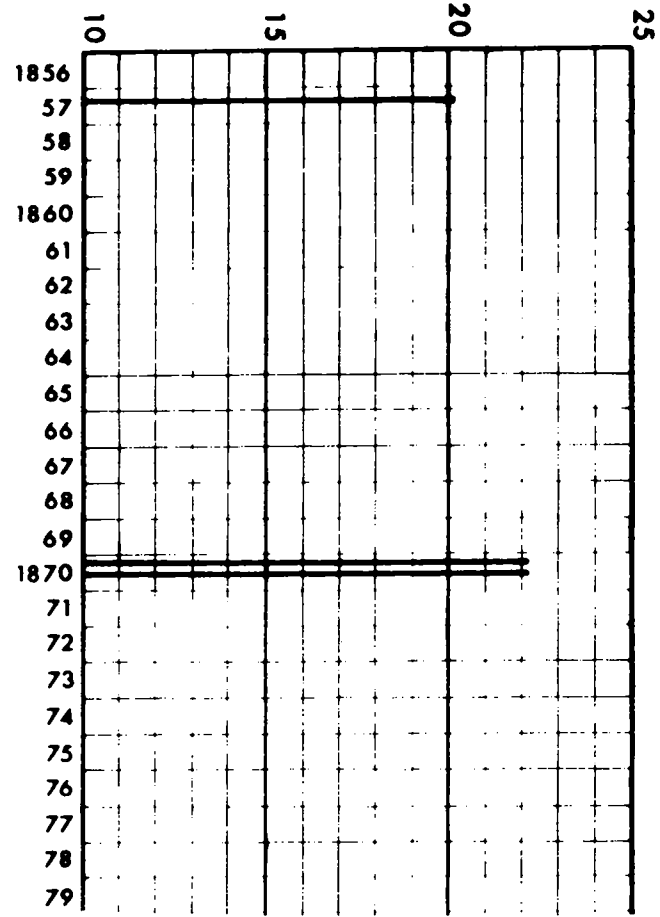
FIGURE 30

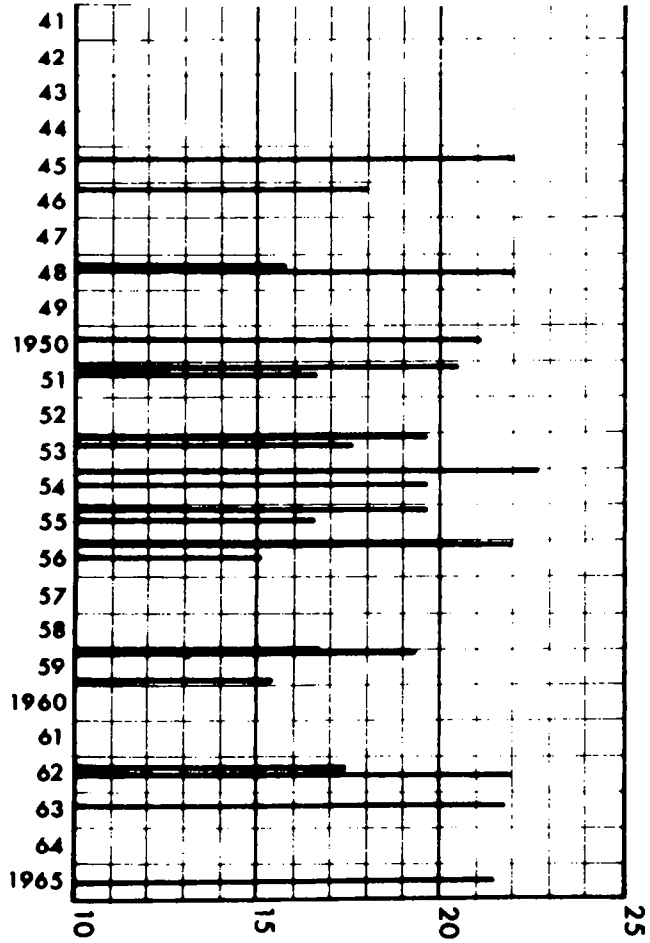


PERIOD 1858 to 1965

HEIGHTS AT CORAKI - REDUCED TO L.W. BALLINA (IN FEET)






41
42
43
44
45
46
47
48
49
1950
51
52
53
54
55
56
57
58
59
1960
61
62
63
64
1965
10
15
20
25

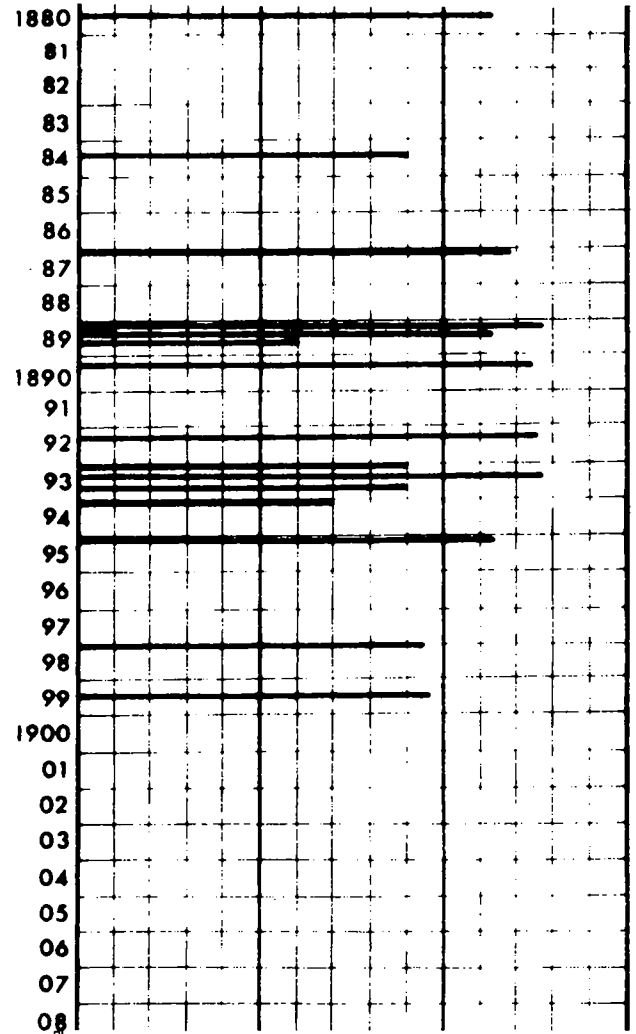
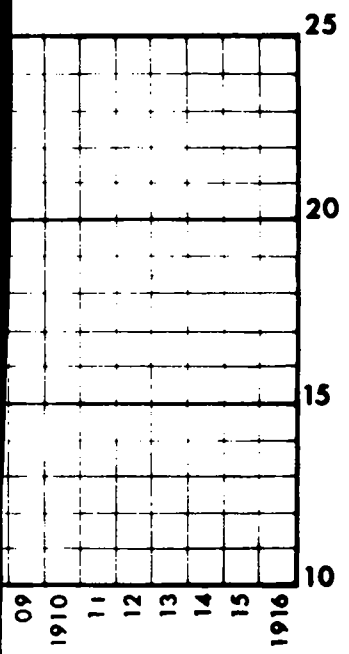
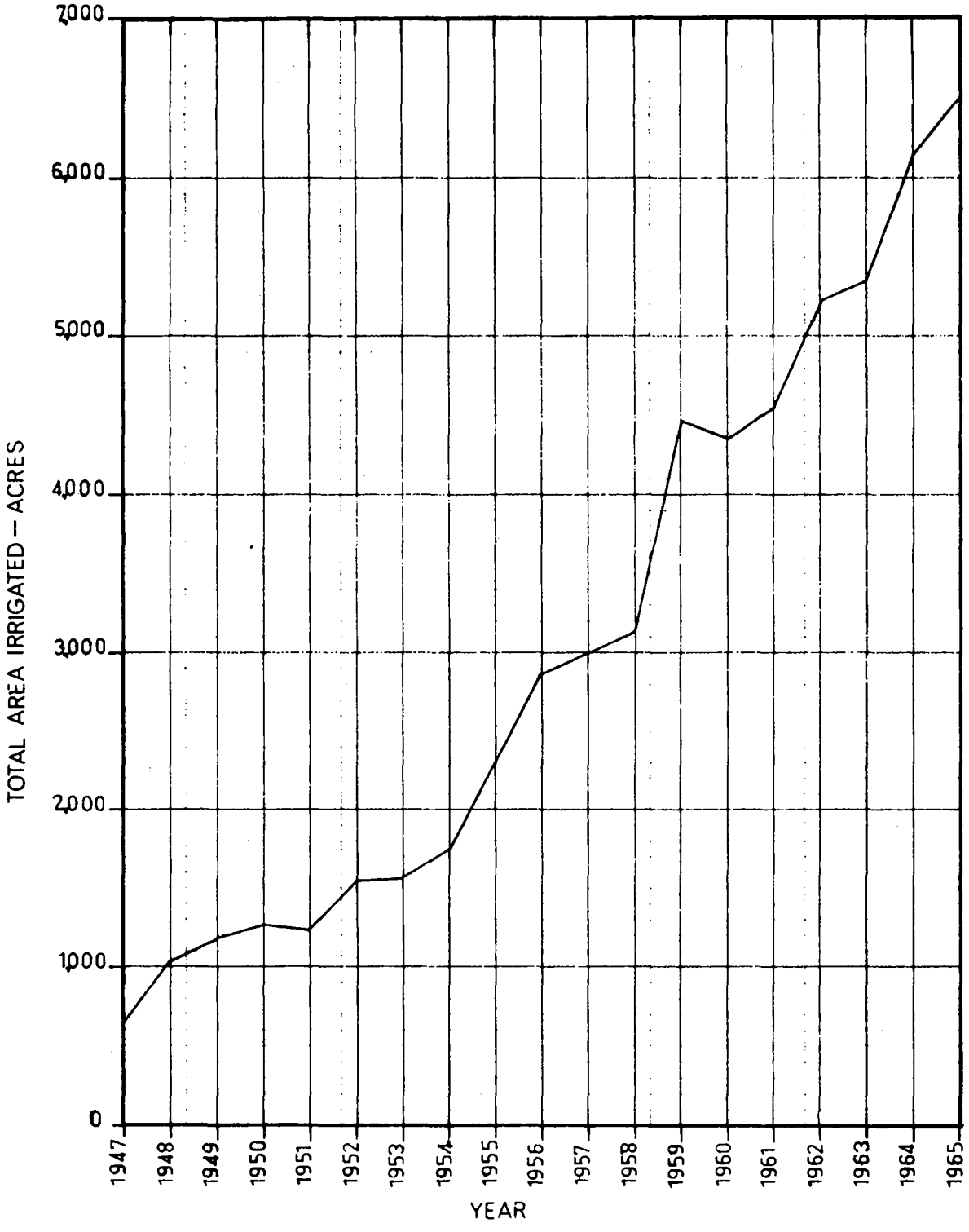

1880
81
82
83
84
85
86
87
88
89
1890
91
92
93
94
95
96
97
98
99
1900
01
02
03
04
05
06
07
08

FIGURE 29



DETAILS OF FLOOD LEVELS ABOVE 15 FEET AT CORAKI

FIGURE 31



AREA AUTHORISED FOR IRRIGATION

AT 30th JUNE EACH YEAR

IN RICHMOND VALLEY

Figure 32

NEW SOUTH WALES
WATER CONSERVATION & IRRIGATION COMMISSION

RICHMOND RIVER BASIN
LOCATION OF WATER CONSERVATION DAM SITES