

Department of Conservation and Land Management
Research Division

RECOMMENDATIONS FOR THE 1987 DUCK SHOOTING SEASON
IN THE SOUTH WEST AND EUCLA LAND DIVISIONS
OF WESTERN AUSTRALIA

J.A.K. Lane and D.R. Munro

November 28, 1986

DR B. WILSON
DIRECTOR NATURE CONSERVATION

1987 DUCK SHOOTING SEASON - SOUTH WEST
AND EUCLA LAND DIVISIONS

INTRODUCTION

Duck shooting seasons in the South West and Eucla Land Divisions are determined annually. In past years I have been required to recommend whether or not, on biological grounds, a shooting season may be declared and, if so, the opening and closing dates and times, game species, bag limits etc. which should be applied.

The purpose of this memorandum is to present recommendations for the 1987 season.

BACKGROUND

From first European settlement to 1874 there were no restrictions on the taking of wild duck in Western Australia. In 1875 an Act of Parliament was proclaimed limiting duck hunting to the non-breeding period each year. Duck seasons were subsequently declared each year until 1969. In that year severe drought conditions over the entire South West and Eucla Land Divisions prompted a NO SEASON decision. Since 1969 conditions have varied considerably from year to year and as a consequence season specifications (bag limits, season duration etc.) have also been varied.

Since 1979 recommendations concerning duck shooting seasons have been based primarily upon a consideration of biological principles, rainfall statistics and an assessment of the condition (water level) of a sample of southwest wetlands. Over the past eight years depth gauges have been installed on more than 120 wetlands from Dongara to Esperance. 79 of these gauged wetlands are now monitored by research staff in September and November each year. Data gathered provide an objective measure of the conditions which have prevailed during the waterfowl breeding season and the conditions which are likely to prevail during the impending shooting season.

The practice followed over the past decade or so has been to declare a FULL SEASON when conditions for breeding have been average or better than average, a RESTRICTED SEASON when conditions have been poor, and a NO SEASON in years of

extreme drought or when conditions have been particularly poor for a number of years.

Specifications of FULL and RESTRICTED hunting seasons were standardized in 1979 and are as follows:

| | <u>FULL SEASON</u> | <u>RESTRICTED SEASON</u> |
|---------------|------------------------------|-----------------------------|
| Opening Date | 2nd weekend in January | 2nd weekend in January |
| Opening Day | Saturday | Sunday |
| Opening Time | 1800 hrs (WST) | 0600 hrs (WST) |
| Season Length | 10 weeks | 4 weeks |
| Bag Limit | 10 birds of any game species | 5 birds of any game species |

The principal objective of the FULL, RESTRICTED or NO system has been to ensure that shooting does not cause a serious reduction in the size of the breeding stock during dry years or periods of prolonged drought. For a more detailed account of the system and rationale see Lane J.A.K. and Munro D.R. (1983). 1982 Review of Rainfall and Wetlands in the South-West of Western Australia. Dept. Fish. Wildl. Rept. 58 : 1-41

It should also be noted that during the late 1970's and the 1980's the Department of Fisheries and Wildlife was endeavouring to both simplify the data-gathering and decision-making procedures and to place the decision-making procedure on a more objective and less controversial footing. The decisions to standardise season specifications and to base season determinations on an assessment of conditions were fundamental to achieving these objectives.

1987 DUCK SHOOTING SEASON

The figures and tables which follow provide a detailed description of rainfall patterns and conditions for waterfowl breeding during 1986.

RAINFALL

Rainfalls in the five Meteorological Districts of the south west for the period January-October 1986 ranged from +6% (6% above normal, North Coastal District) to -19% (South Coastal District) and averaged -7% (Figure 1).

Rainfalls in four of the five Districts were higher in 1986 than those recorded during the previous year, the largest

increase being -28% to +6% (North Coastal) and the smallest being -26% to -17% (South Central). South Coastal District rainfall decreased slightly from -17% to -19%.

Viewed on a monthly basis the most notable features of 1986 rainfall were the higher than average falls recorded throughout the south west in February, the generally low falls in March and April, the lower than average falls in the South Central and South Coastal Districts from May to October and the exceptionally low rainfall (46% below normal) in the South Coastal District in June (Figure 2).

The high falls in February were produced by tropical cyclone "Rhonda" weakening to form a rain-bearing depression and moving south along the lower west coast on the 21st and 22nd of the month. Record monthly falls resulted at Kalbarri (46 mm), Badgingarra (93 mm), Cataby (123 mm), Jurien Bay (164 mm), Lancelin (93 mm), Yealering (78 mm), Jerramungup (71 mm) and numerous centres near Perth.

Four centres in the South Coastal District (Pemberton, Walpole, Denmark and Esperance) recorded record low rainfalls for June.

Detailed analysis of rainfall distribution reveals that much of the south west corner of the State, from Mandurah to Newdegate to Albany, had Below Average (Decile Range 3) to Very Much Below Average (Decile Range 1) rainfall in 1986 (Figure 3). Two smaller areas of the south west (Perth-Beverley, and east of Ravensthorpe) recorded Above Average (Decile Range 8) to Much Above Average (Decile Range 9) falls and an area around Jurien Bay, Moora and Lancelin had Above Average to Very Much Above Average (Decile Range 10) falls. Rainfall over the remainder of the south west for the period January to October 1986 was generally Average.

WETLANDS

November 1986 water levels of monitored wetlands are provided in Appendix 1 together with depths recorded in Novembers of previous years and projected January 1987 (commencement of duck shooting season) depths.

The November data and other data from September each year have been used to prepare graphs showing Cumulative Percentages of Wetland Depths (Figure 4). These graphs give a visual impression of how "wet" or "dry" each year has been, from 1980 to the present. Thus Figure 4 indicates that, on the basis of water levels of gauged wetlands, 1983 and 1984 (when FULL SEASONS were declared) were "wetter" than 1981, 1982 and 1985 (when RESTRICTED SEASONS were declared) and these in turn were "wetter" than 1980 (when a NO SEASON was declared). Differences are statistically significant (paired t-tests, p generally <0.01).

WATER LEVELS IN SEPTEMBER AND NOVEMBER 1986 WERE HIGHER THAN THOSE RECORDED IN 1985 (RESTRICTED SEASON) HOWEVER THEY WERE

NOT SIGNIFICANTLY DIFFERENT FROM THOSE RECORDED IN 1981 AND 1982 (ALSO RESTRICTED) AND WERE LOWER THAN THOSE RECORDED IN 1983 AND 1984 (FULL SEASONS).

Notable features of September and November 1986 water levels are the high water levels recorded along the south coast from Hopetoun to Esperance (Wetland Nos 71-77, see Appendices 1 and 2); the high levels recorded from Perth north towards Jurien Bay (Wetlands 43-53) and east to Beverley (Wetlands 11-12); the low water levels throughout most of the south-west corner of the State, bounded by Mandurah-Newdegate-Albany-Manjimup and Bunbury (Wetlands 14-31, 37-40, 54-58 and 61-67), and the generally "average" (1980-1986) water levels recorded in the remainder of the south-west agricultural area.

CONCLUSION AND RECOMMENDATION

Due to much below average rainfall over a sizeable area of the south west, conditions for waterfowl breeding in the South West and Eucla Land Divisions during 1986 are considered, on average, to have been poor.

Monitoring of gauged wetlands indicates that although water levels are, on average, higher in 1986 than in 1985 (when a RESTRICTED SEASON was declared) they are not significantly different from those recorded in 1981 and 1982 when RESTRICTED SEASONS were also declared. 1986 water levels are lower than those of 1983 and 1984 when FULL SEASONS were declared.

In view of the above, and taking into account the fact that 1985 was a year of poor conditions for waterfowl breeding,

IT IS RECOMMENDED THAT A RESTRICTED DUCK SHOOTING SEASON BE DECLARED FOR THE SOUTH WEST AND EUCLA LAND DIVISIONS IN 1987.

This recommendation is consistent with decisions taken in recent years and the current policy that FULL SEASONS be declared when conditions for breeding have been average or better than average, RESTRICTED SEASONS be declared when conditions have been poor, and NO SEASONS be declared in years of extreme drought or when conditions have been particularly poor for a number of years.

Specifications of the recommended RESTRICTED SEASON are as follows:

Opening Day: Sunday 11 January 1987
Opening Time: 0600 hrs

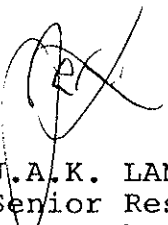
Season Length: 4 weeks

Closing Day: Sunday 8 February 1987
Closing Time: 2359 hrs.

Bag limit (per day) :5 birds of any game species

Game Species:

| | |
|-------------------------------------|--|
| Wandering Whistling-Duck | (<u>Dendrocygna arcuata</u>) |
| Plumed Whistling-Duck | (<u>D. eytoni</u>) |
| Australian Shelduck (Mountain Duck) | (<u>Tadorna tadornoides</u>) |
| Pacific Black Duck | (<u>Anas superciliosa</u>) |
| Grey Teal | (<u>A. gibberifrons</u>) |
| Chestnut Teal | (<u>A. castanea</u>) |
| Australasian Shoveler | (<u>A. rhynchotis</u>) |
| Pink-eared Duck | (<u>Malacorhynchus</u> <u>membranaceus</u>) |
| Hardhead (White-eyed Duck) | (<u>Aythya australis</u>) |
| Maned Duck (Wood Duck) | (<u>Chenonetta jubata</u>) |



J.A.K. LANE
Senior Research Officer
Research Division
CALM

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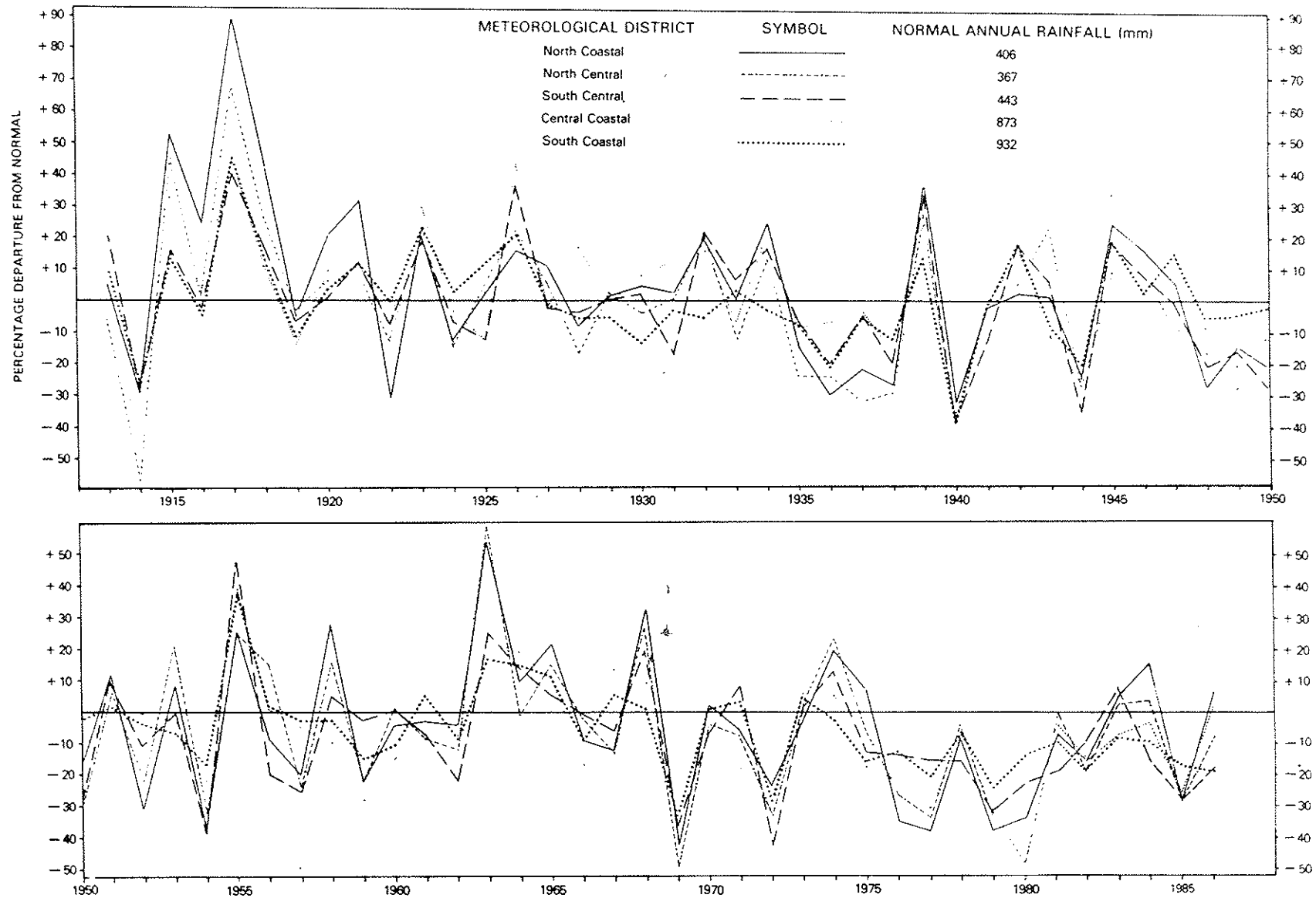


FIGURE 1. Rainfall recorded annually in each of the Meteorological Districts of the south-west, from 1913 to 1986 expressed as percentage departures from normal.

Percentage departures from normal for 1986 are based on January-October rainfall.

Normal rainfalls for this period are 93-96% of annual totals.

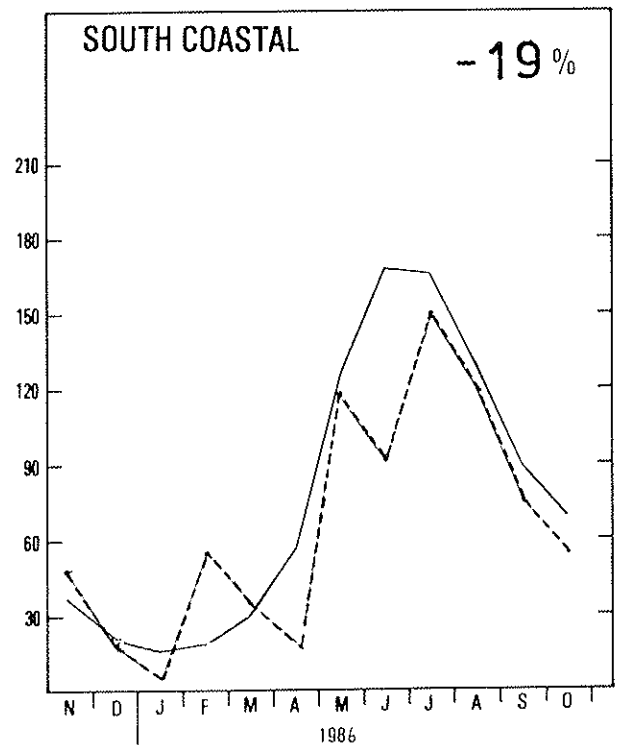
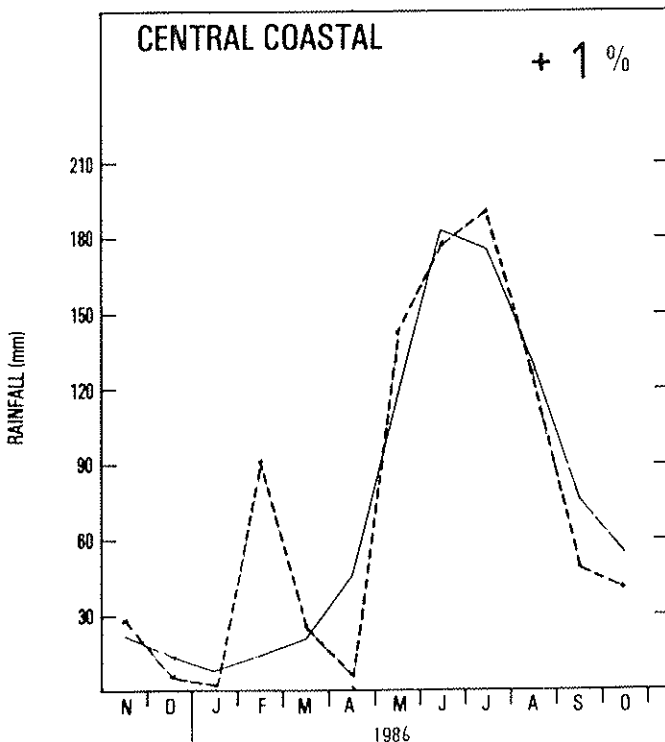
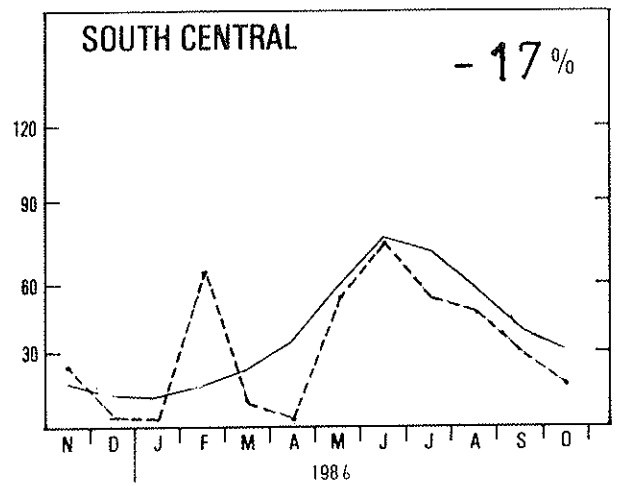
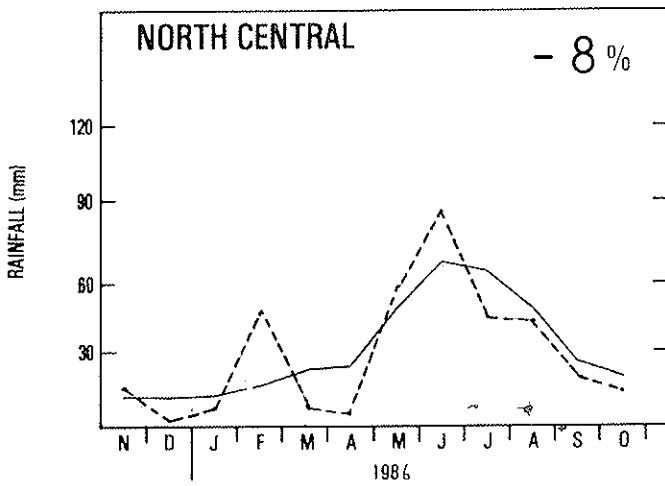
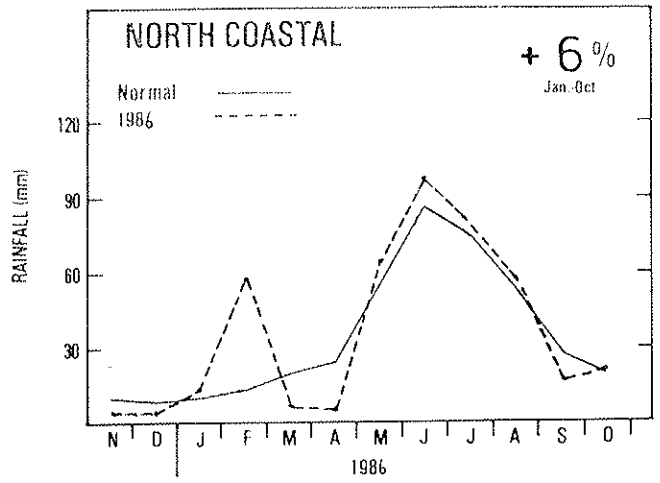
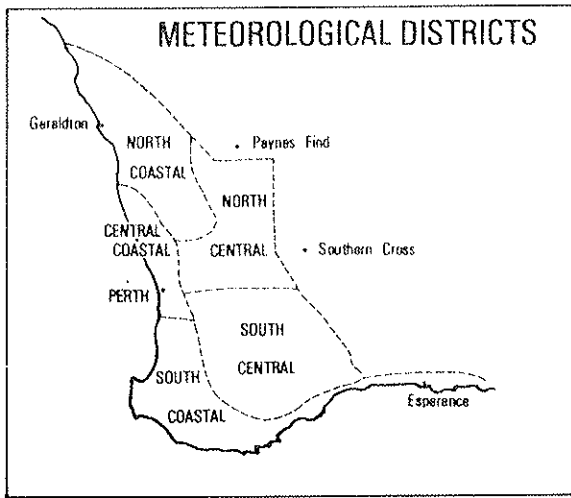


FIGURE 2. Rainfall recorded monthly in each of the five Meteorological Districts of the south-west, November 1985 to October 1986 and November to October Normal. Percentage departures from Normal (Jan -Oct) for each Meteorological District are also shown

DECILE RANGE

Description



1

VERY MUCH BELOW AVERAGE



2-3

MUCH BELOW AVERAGE - BELOW AVERAGE



4-7

AVERAGE



8-9

ABOVE AVERAGE - MUCH ABOVE AVERAGE



10

VERY MUCH ABOVE AVERAGE

EXPLANATION:

Decile range 1 is the range of the driest 10% of rainfalls which have been recorded for the January-October period. Decile 2 is the next driest 10% and so on. The middle 40% (Decile ranges 4-7) is considered "average".

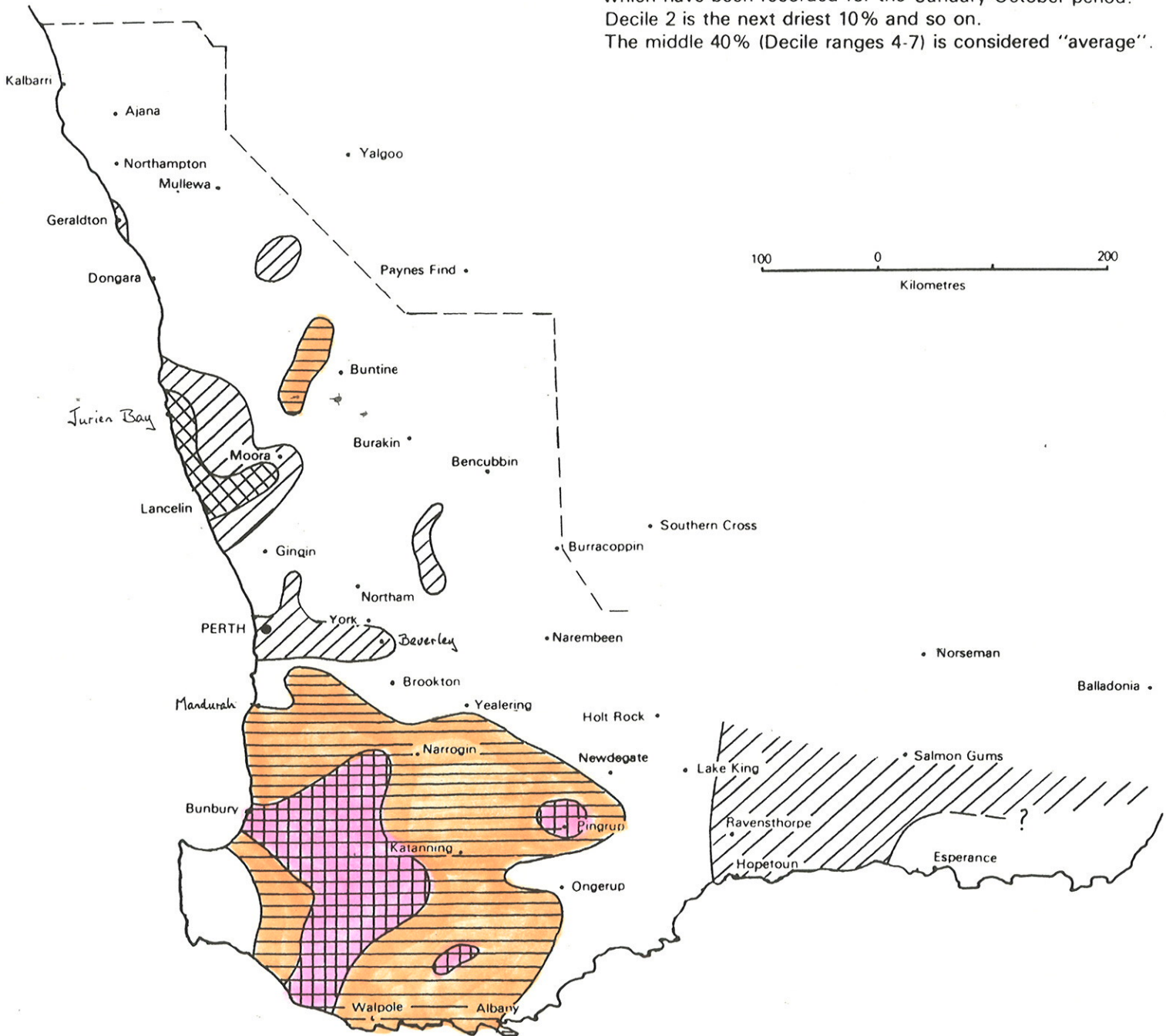


FIGURE 3. Distribution of Decile Range numbers of rainfall, Jan -Oct 1986

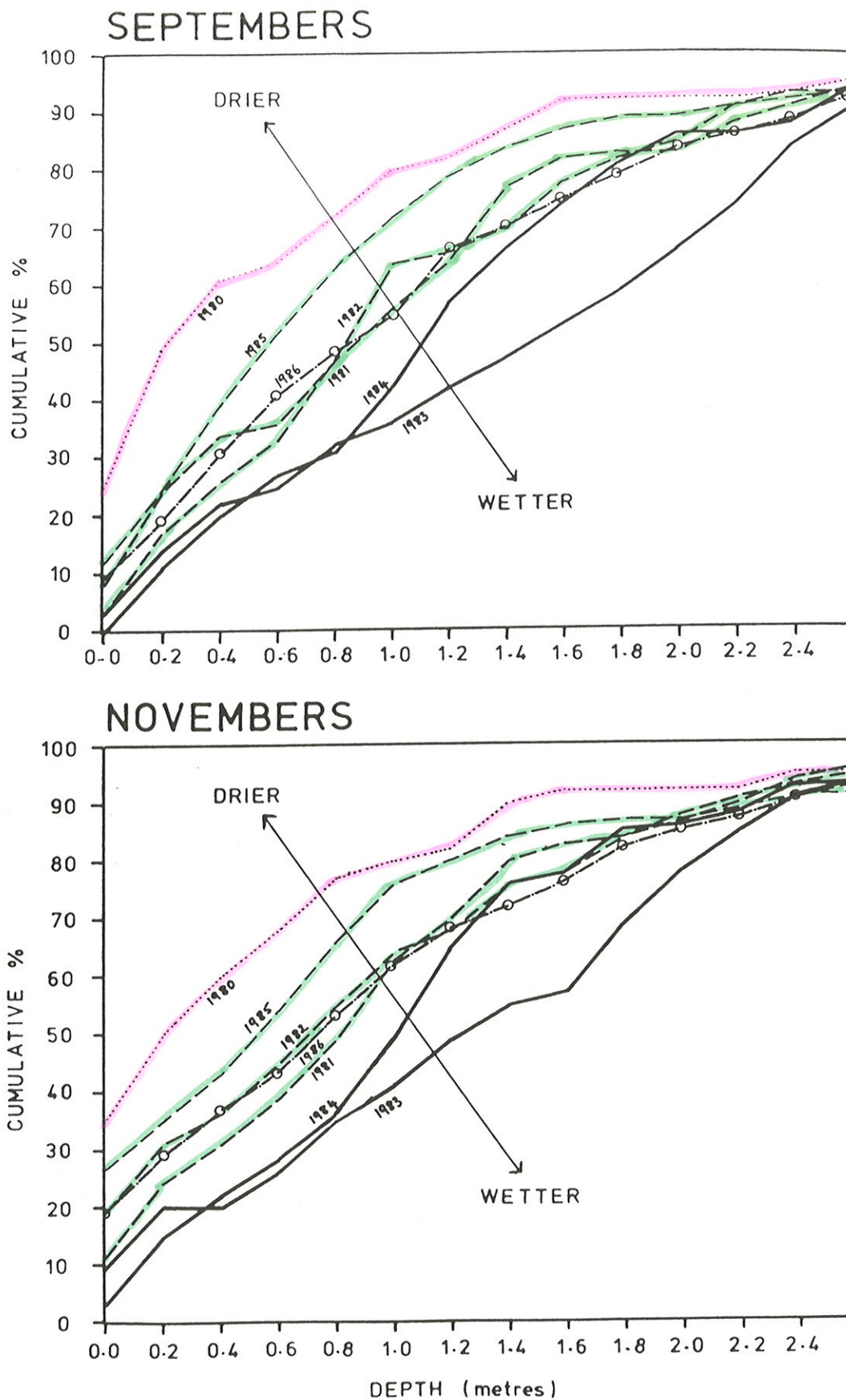


FIGURE 4. CUMULATIVE PERCENTAGES OF WETLAND DEPTHS.

Water levels of 79 wetlands in south-western Australia are monitored in September and November each year.

The above Figure shows that water levels were higher overall in September and November of 1986 than in the same months of 1980 when a NO (.....) SEASON was declared. They were not significantly different from levels recorded in 1981 and 1982 when RESTRICTED SEASONS (---) were declared.

Water levels in 1986 were lower than in 1983 and 1984 when FULL (——) SEASONS were declared.

Differences are statistically significant (paired t-test, $p < 0.01$).

APPENDIX I : NOVEMBER DEPTHS OF MONITORED WETLANDS; 1980-1986.

Unnamed Wetlands are referred to by Shire and Reserve Number (eg. Wetland No. 7 : Mt Marshall 26687). See Appendix 2 for wetland locations.

| WETLAND No. | WETLAND NAME | DEPTH (metres) | | | | | | | PROBABLE DEPTH JAN 1987* |
|-------------|-------------------|----------------|----------|----------|----------|----------|----------|----------|--------------------------|
| | | NOV 1980 | NOV 1981 | NOV 1982 | NOV 1983 | NOV 1984 | NOV 1985 | NOV 1986 | |
| 1 | LOGUE | DRY | 1.55 | 0.48 | 2.00 | 1.24 | DRY | 0.24 | DRY |
| 2 | EGANU | DRY | 2.28 | 2.00 | 2.33 | 2.24 | 0.89 | 2.30 | 1.75 |
| 3 | PINJARREGA | DRY | 2.14 | 0.85 | 2.13 | 2.06 | 0.82 | 0.99 | 0.45 |
| 4 | STREETS | DRY | 1.21 | 0.12 | 1.23 | 1.22 | 0.03 | 0.92 | 0.40 |
| 5 | HINDS | DRY | 1.00 | <0.20 | 1.34 | 1.10 | 0.32 | 0.75 | 0.35 |
| 6 | NINAN | DRY | 1.96 | 0.78 | 2.13 | 1.72 | 0.60 | 1.73 | 1.15 |
| 7 | MT MARSHALL 26687 | | 0.03 | DRY | DRY | DRY | DRY | DRY | DRY |
| 8 | WALYORMOURING | DRY | 0.51 | <0.08 | 0.63 | 0.51 | 0.06 | 0.42 | DRY |
| 9 | CAMPION | DRY | 0.65 | 0.21 | DRY | 0.63 | DRY | DRY | DRY |
| 10 | NOONYING | DRY | 1.18 | 0.48 | 1.19 | 1.13 | DRY | 1.15 | 0.65 |
| 11 | DOBADERRY | DRY | 0.49 | 0.14 | 0.58 | 0.48 | DRY | 0.52 | DRY |
| 12 | BEVERLEY | 0.24 | 1.70 | 1.24 | 1.63 | 1.68 | 0.56 | 1.68 | 1.20 |
| 13 | MEARS | DRY | 1.00 | 0.66 | 2.03 | 1.58 | 0.24 | 1.02 | 0.45 |
| 14 | WHITE WATER | | 1.08 | DRY | 1.70 | 0.66 | DRY | DRY | DRY |
| 15 | BROWN | DRY | 1.46 | 0.65 | 1.75 | 1.08 | DRY | DRY | DRY |
| 16 | YEALERING | 0.32 | 1.94 | 1.61 | 2.15 | 1.08 | 0.78 | 1.02 | 0.45 |
| 17 | TOOLIBIN | DRY | 1.35 | 1.05 | 1.93 | 1.11 | DRY | DRY | DRY |
| 18 | TAARBLIN | DRY | <0.08 | DRY | 2.00 | 1.12 | 0.15 | DRY | DRY |
| 19 | LITTLE WHITE | 0.47 | 0.81 | 0.81 | 1.30 | 0.69 | 0.41 | 0.16 | DRY |
| 20 | KWOBRUP | DRY | DRY | 0.71 | 1.06 | 0.33 | DRY | DRY | DRY |
| 21 | COYRECUP | <0.13 | 0.35 | 1.89 | 2.24 | 1.69 | 1.13 | 0.21 | DRY |
| 22 | CASUARINA | <0.49 | 0.90 | 0.60 | 0.94 | 0.95 | 1.05 | 0.94 | 0.50 |
| 23 | COBLININE | 1.27 | 1.21 | 2.60 | 5.06 | 4.11 | 3.22 | 2.25 | 1.85 |
| 24 | DUMBLEYUNG | 0.13 | 0.25 | 2.00 | 4.45 | 3.51 | 2.62 | 1.60 | 1.20 |
| 25 | GUNDARING | 0.67 | 0.95 | 1.65 | 2.12 | 1.34 | 1.54 | 0.79 | 0.30 |
| 26 | PARKEYERRING | <0.10 | 0.60 | 1.28 | 1.84 | 1.06 | 1.25 | 0.33 | DRY |
| 27 | FLAGSTAFF | 0.14 | 0.26 | 1.64 | 1.62 | 0.90 | 0.71 | 0.10 | DRY |
| 28 | WARDERING | 0.66 | 0.99 | 0.70 | 1.02 | 1.03 | 1.04 | 0.45 | 0.05 |
| 29 | MARTINUP | 0.24 | 0.33 | 1.34 | 1.72 | 1.28 | 1.32 | 0.42 | 0.05 |
| 30 | WEST ARTHUR 5456 | DRY | 0.80 | 0.51 | 0.82 | 0.85 | 0.85 | DRY | DRY |
| 31 | TOWERINNING | 0.54 | 1.10 | 3.14 | 3.40 | 3.17 | 3.32 | 2.57 | 2.05 |
| 32 | CORRIGIN 12900 | | | 0.19 | 1.20 | 0.59 | DRY | 0.75 | 0.15 |
| 33 | KONDININ | DRY | 0.62 | 0.25 | 1.99 | 0.87 | <0.18 | 0.16 | DRY |
| 34 | GOUNTER | DRY | 0.10 | 0.10 | 0.18 | 0.18 | DRY | 0.33 | DRY |
| 35 | VARLEY | | DRY | DRY | DRY | 0.04 | DRY | DRY | DRY |
| 36 | PALLARUP | DRY | <0.07 | DRY | DRY | DRY | DRY | DRY | DRY |
| 37 | BRYDE | DRY | DRY | DRY | 1.54 | 0.81 | DRY | DRY | DRY |
| 38 | ALTHAM | | DRY | DRY | 1.07 | 0.21 | DRY | DRY | DRY |
| 39 | YAALUP | | | 1.28 | 1.69 | 1.33 | 0.59 | DRY | DRY |

* Probable depth (rounded to nearest 0.05 m) at commencement of 1987 Duck Shooting Season (ie. 10 or 11 January 1987).

APPENDIX I - cont'd...

| WET- LAND No. | WETLAND NAME | DEPTH (metres) | | | | | | | PROBABLE DEPTH JAN 1987* |
|---------------------|-------------------|----------------|-------------|-------------|-------------|-------------|-------------|-------------|-----------------------------------|
| | | NOV 1980 | NOV 1981 | NOV 1982 | NOV 1983 | NOV 1984 | NOV 1985 | NOV 1986 | |
| 40 | ANDERSON | | 0.20 | 2.12 | 1.61 | 1.00 | 0.53 | 0.61 | 0.25 |
| 41 | GNOWANGERUP 26264 | 0.07 | DRY | 0.84 | 0.10 | <0.06 | DRY | <0.05 | DRY |
| 42 | YELLILUP | - | - | - | - | - | 0.75 | 1.73 | 1.50 |
| 43 | ENEMINGA | DRY | 2.42 | 1.39 | 2.52 | 1.35 | 0.19 | 2.11 | 1.55 |
| 44 | GURAGA | | | 2.14 | 2.40 | 1.80 | 0.70 | 1.81 | 1.35 |
| 45 | CRACKERS | DRY | 0.05 | DRY | 0.96 | 0.96 | 0.96 | 1.00 | 0.65 |
| 46 | WANNAMAL | 1.24 | 1.23 | 1.30 | 1.32 | 1.28 | 0.92 | 1.32 | 0.85 |
| 47 | YURINE | 0.66 | 2.20 | 1.42 | 1.75 | 1.50 | 0.32 | 1.58 | 1.00 |
| 48 | BAMBUN | 2.31 | 2.32 | 2.26 | 2.35 | 2.25 | 2.30 | 2.46 | 1.95 |
| 49 | CHANDALA | 0.82 | 0.70 | 0.81 | 0.79 | 0.73 | 0.76 | 0.76 | 0.30 |
| 50 | JANDABUP | 1.22 | 1.27 | 1.15 | 1.12 | 1.11 | 0.98 | 1.35 | 0.95 |
| 51 | JOONDALUP | 2.88 | 2.92 | 3.03 | 3.02 | 3.02 | 2.78 | 3.11 | 2.75 |
| 52 | THOMSONS | 0.86 | 0.90 | 0.92 | 0.78 | 1.03 | 0.78 | 1.24 | 0.80 |
| 53 | FORRESTDAL | 0.79 | 0.93 | 0.64 | 0.76 | 0.78 | 0.55 | 1.08 | 0.61 |
| 54 | CLIFTON | - | - | - | - | - | 4.35 | 4.37 | 4.00 |
| 55 | NINE MILE | | 1.37 | 1.77 | 1.96 | 1.83 | 1.61 | 1.45 | 1.10 |
| 56 | HARVEY 12632 | 1.16 | 1.08 | 1.47 | 1.38 | 1.05 | 1.22 | 1.11 | 0.55 |
| 57 | EGRET | - | - | - | - | - | 0.44 | 0.39 | DRY |
| 58 | BOYUP BROOK 18239 | <0.05 | DRY | DRY | 0.65 | 0.13 | DRY | DRY | DRY |
| 59 | BROADWATER | - | - | - | - | - | 0.84 | 0.68 | 0.15 |
| 60 | JASPER | - | - | - | - | - | 9.40 | 9.58 | 9.25 |
| 61 | UNICUP | 0.60 | 0.64 | 0.19 | 0.94 | 0.70 | 0.34 | 0.17 | DRY |
| 62 | MUIR | 0.17 | 0.52 | <0.02 | 0.42 | 0.26 | 0.20 | 0.05 | DRY |
| 63 | TORDIT-GARRUP | 2.75 | 2.88 | 2.65 | 2.49 | 2.54 | 2.29 | 1.94 | 1.65 |
| 64 | YARNUP | 0.80 | 0.94 | 0.80 | 0.94 | 0.95 | 0.97 | 0.96 | 0.75 |
| 65 | WARRINUP | 0.21 | 0.12 | DRY | 0.14 | 0.19 | DRY | 0.13 | DRY |
| 66 | KWORNICUP | 0.26 | 0.39 | <0.09 | 0.14 | 0.51 | 0.14 | 0.36 | 0.05 |
| 67 | POWELL | | 0.96 | 0.94 | 0.69 | 1.00 | 0.71 | 0.84 | 0.60 |
| 68 | PLEASANT VIEW | 1.52 | 1.15 | 0.79 | 0.46 | 0.39 | 0.48 | 0.72 | 0.35 |
| 69 | MOATES | 4.51 | 4.32 | 4.22 | 4.26 | 4.34 | 4.38 | 4.38 | 3.90 |
| 70 | METTLER | | | 0.44 | 0.11 | 0.15 | 0.25 | 0.47 | 0.25 |
| 71 | JERDACCUTTUP | 1.30 | 0.62 | <0.45 | 0.78 | 1.11 | 0.54 | 3.15 | 2.75 |
| 72 | SHASTER | 0.17 | 0.20 | DRY | 0.20 | 0.40 | 0.36 | 1.00 | 0.60 |
| 73 | ESPERANCE 26410 | | DRY | DRY | DRY | 0.14 | DRY | 1.97 | 1.60 |
| 74 | GORE | 1.35 | 1.32 | 1.04 | 0.58 | 1.67 | 1.50 | 1.68 | 1.30 |
| 75 | SHARK | 2.25 | 2.29 | 2.22 | 1.66 | 2.34 | 2.13 | 2.36 | 2.05 |
| 76 | WARDEN | <0.84 | 0.66 | 0.40 | <0.19 | 1.34 | 0.63 | 1.65 | 1.25 |
| 77 | MULLET | 0.57 | 0.53 | 0.58 | 0.05 | 0.56 | 0.66 | 0.64 | 0.25 |
| 78 | DUNDAS 33113 | <0.32 | <0.24 | DRY | DRY | <0.34 | DRY | DRY | DRY |
| 79 | ESPERANCE 27985 | | DRY | DRY | DRY | <0.02 | DRY | 0.08 | DRY |

RAINFALL

DECILE RANGE

Description



1

VERY MUCH BELOW AVERAGE



2-3

MUCH BELOW AVERAGE BELOW AVERAGE



4-7

AVERAGE



8-9

ABOVE AVERAGE MUCH ABOVE AVERAGE



10

VERY MUCH ABOVE AVERAGE

