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STUDIES OF MACROPODIDAE IN QUEENSLAND.
5. EFFECTS OF DROUGHT ON REPRODUCTION
IN THE GREY KANGAROO (MACROPUS
GIGANTEUS)

By T. H. KIRKPATRICK, M.Sc., AND J. S. McEVOY, B.Sc.

SUMMARY

Reproductive activity and survival of pouch young were studied in a population of the grey kangaroo (*Macropus giganteus* Shaw) in the St. George district, southern Queensland, during a drought extending from September 1964 to December 1965. After 8 months of drought, reproductive activity virtually ceased and death of pouch young began to occur; reproduction did not return to normal until the drought broke. No young born between September 1964 and November 1965 survived the drought, and it is anticipated that for some years this will be reflected in population samples from this district.

I. INTRODUCTION

in central New South Wales (Poole and Pilton 1964) and in southern Queensland

The grey kangaroo (*Macropus giganteus* Shaw) breeds throughout the year (Kirkpatrick 1965*b*), and although a summer peak of reproductive activity in both areas was found, no cessation of breeding under normal conditions was detected.

During the year 1965 little rain fell over a large part of the grey kangaroo habitat in Queensland, and opportunity was taken to examine the impact of prolonged drought on reproduction and survival of pouch young in this species.

II. MATERIALS AND METHODS

The study area included approximately 500 square miles centred on "Abbieglassie", a grazing property situated between the towns of Bollon and Mitchell, southern Queensland. This is part of the St. George district of a previous paper (Kirkpatrick 1965*b*).

Rainfall records were kept at "Abbieglassie" homestead and are given in Figure 1.

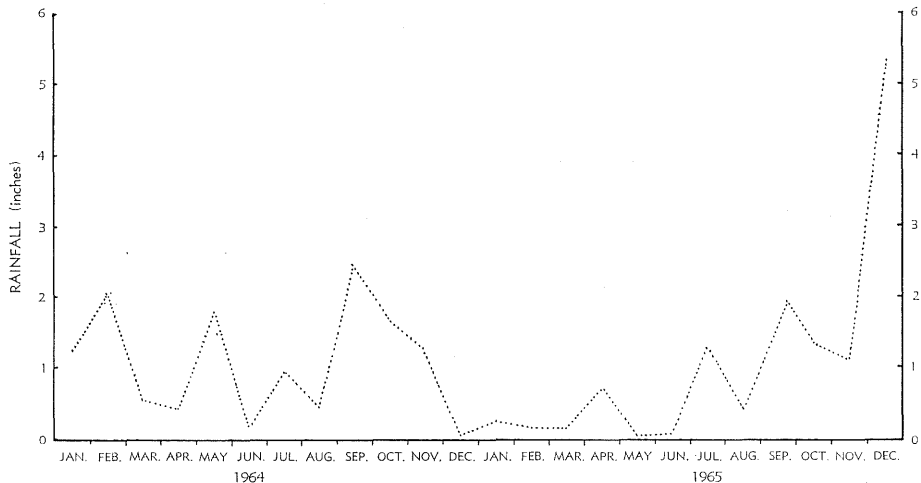


Fig. 1.—Rainfall records for "Abbieglassie", 1964-1965.

Kangaroos were collected at monthly intervals from February 1965 to January 1966. Sample size ranged from 25 to 150. Females were examined for pouch young and evidence of oestrus and pregnancy. Ages of all specimens were estimated (after Kirkpatrick 1965*a*).

III. RESULTS

Results are presented in Table 1, the components of which are explained as follows:

TABLE 1

MONTHLY REPRODUCTION AND SURVIVAL OF POUCH YOUNG IN THE GREY KANGAROO,
"ABBIEGLASSIE" STUDY AREA, FEBRUARY 1965-JANUARY 1966
All data are expressed as percentages

Month	Non-reproducing		Reproducing, With Young Born:—		
	Expected	Observed	On or before March 1965		After March 1965
			Expected	Observed	Observed
February	6.0	9.0	94.0	91.0	nil
March					
April	nil	..	81.0
May	nil	86.5	74.0	11.5	2.0
June	5.0	100.0	68.0	nil	nil
July	8.0	84.0	65.0	8.0	8.0
August	7.0	93.0	59.0	nil	7.0
September	8.0	100.0	55.0	nil	nil
October	9.0	100.0	52.0	nil	nil
November	8.0	100.0	40.0	nil	nil*
December	7.0	..	23.0
January	nil	nil	18.0	nil	100.0

* 1 young born November 1965 collected January 1966

Reproduction.—Non-reproducing females for each month are those older than 27 months (see Kirkpatrick 1965b) not in oestrus, pregnant or with a pouch young. Numbers of nulliparous females well past the normal breeding age were collected as the drought continued, and these are included as non-reproducing. Expected numbers of non-reproducing females in each month were calculated from data collected from the area during 1959-1964.

Survival of pouch young.—From estimated dates of birth of all pouch young collected, percentages of females carrying young born before and after March 1965 were calculated and compared with expected numbers based on the normal pattern of births from the area established during 1959-1964 (Kirkpatrick 1965b) and assuming no mortality. March 1965 was selected as the datum point because, as is evident from the data, reproduction was normal up to that month and depressed beyond it. The fate of the few young born after March is apparent from the data of subsequent months.

IV. DISCUSSION

The study area did not receive useful rain from September 1964 until December 1965, the drought breaking when 6.41 in. of rain fell between November 29 and December 14, 1965 (Figure 1). The only forage available during most of 1965 was sparse dry grass.

First collections of kangaroos were made during February and March 1965, and although conditions were severe reproduction appeared to be normal, with 91% of females reproducing, and there was a normal range of ages among the pouch young. Subsequent samples showed a drastic reduction in numbers of both new-born and older young. By August 1965 no pouch young born before March were found and by September no pouch young of any age were present. The bulk of the population remained reproductively inactive until the drought broke in December 1965, and although some females produced young in July and August 1965, apparently in response to falls of rain, few if any of these young survived. Reproduction and pouch young survival thus began to be affected after 8 months of drought; the return to normal occurred only after drought-breaking rains fell.

The importance of the effects of this drought on the population becomes apparent when the duration of pouch life (10 months) is considered. The absence in August 1965 of young born before March indicated that no young born between September 1964 and March 1965 survived the drought, and the total absence of pouch young in September and October 1965 showed that no young born between March and October 1965 had survived. Therefore no young born during the 14 months from September 1964 to October 1965 were added to the field population. As deaths of pouch young were occurring from March 1965 onwards, survival of young born between July and September 1964 was impaired, and although some young born after November 1965 survived (footnote to

Table 1) the majority of females did not give birth until late January 1966. For some years, therefore, the age distribution in population samples from the study area and the surrounding district should reflect the effects of this drought on reproduction.

More limited data for the red kangaroo (*Megaleia rufa* Desmarest) in the "Abbieglassie" study area suggested that the recent drought affected this species similarly.

REFERENCES

- KIRKPATRICK, T. H. (1965a).—Studies of Macropodidae in Queensland. 2. Age estimation in the grey kangaroo, the red kangaroo, the eastern wallaroo and the red-necked wallaby, with notes on dental abnormalities. *Qd J. Agric. Anim. Sci.* 22:301-17.
- KIRKPATRICK, T. H. (1965b).—Studies of Macropodidae in Queensland. 3. Reproduction in the grey kangaroo (*Macropus major*) in southern Queensland. *Qd J. Agric. Anim. Sci.* 22:319-28.
- POOLE, W. E., and PILTON, Phyllis E. (1964).—Reproduction in the grey kangaroo, *Macropus kanguru*, in captivity. *C.S.I.R.O. Wildl. Res.* 9:218-34.

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The authors are officers of the Entomology Section, Division of Plant Industry, Department of Primary Industries, and are stationed at Hermitage Research Station, via Warwick.