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NOTES ON RIVER HABITAT USE BY THE LARGER UNGULATES IN THE KALAHARI GEMSBOK NATIONAL PARK

by

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Abstract—A study of some aspects of river habitat use by springbok, gemsbok, blue wildebeest, red hartebeest and eland in the Auob and Nossob riverbeds in the Kalahari Gemsbok National Park. Suggestions for future research are made.

Introduction

The relative abundance and distribution of the larger ungulates in the Kalahari Gemsbok National Park have received the attention of Eloff (1959 a and b, 1961 and 1962) in the past. Since 1962, however, little has been published on this subject. In 1970 a new effort was launched to get more information on the habits and habitat of the larger ungulates in the Kalahari Gemsbok National Park. Current efforts form part of a long-term study of the ecology of the park and this report, although incomplete, deals with one aspect of the research.

Material and Methods

Periodic counts of the larger ungulates were done in the park on four different occasions. Animals were recorded from a vehicle at 8 km intervals while driving the roads along the riverbeds from Twee Rivieren to Mata Mata, from Twee Rivieren to Nossob Camp and from Nossob Camp to the South West African border at Union's End. All animals within the riverbed and on the adjacent slopes were counted and the respective 8 km totals were expressed as percentages of the total for each river. Counts at 8 km intervals for some periods are averages for several individual counts. Thus the figures for early September 1970 are based on five counts for the Nossob and eight for the Auob; that for late November to early December 1970 on two counts for each river; that for early January 1971 on a single count for the Nossob only and that for late May 1971 on two counts for the Auob and one for the Nossob. For simplicity the November/December data in the figures are indicated by a November subscript only.

Climatic conditions varied from one period to the next. Starting in

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September, at the end of the dry winter, conditions in the park became progressively drier until after the early January count. Shortly after this count it started to rain with a resultant improvement in range conditions by mid-January. The May 1971 count was made at the end of the rainy season when conditions in the park were relatively favourable.

Results

SPRINGBOK *Antidorcas marsupialis* (Zimmermann, 1780):

In the Auob most springbok occurred in the lower (the 40 km nearest Twee Rivieren) and in the upper third of the river, with relatively few springbok in the middle section (Figs. 1 and 8; Table 1). Nevertheless, springbok were found throughout the Auob even though the habitat became progressively drier from September 1970 to early January 1971.

In the Nossob River springbok showed a distinct abundance in that section of the river in the immediate vicinity of Nossob Camp (Figs. 2 and 9). Springbok abundance in the Nossob also changed considerably with an increase in aridity. In September 1970, springbok were still distributed fairly widely along the riverbed. This had changed by November/December when most of the springbok were seen in the vicinity of Nossob Camp, although the animals were still present in small numbers in other parts of the river. By early January 1971 (very dry) springbok had almost disappeared from most of the Nossob, except for a few animals in scattered localities. The one exception was a herd of 210 springbok in the vicinity of Nossob Camp. Following more favourable conditions, springbok were again widely distributed in the Nossob by May 1971. On the average, considerably more springbok were found in the northern half of the Nossob than in the southern section (Tables 2 and 3).

GEMSBOK *Oryx gazella* (Linn., 1758):

Although the distribution of gemsbok in the Auob River showed a relative abundance in the upper parts (Table 1), considerable numbers of gemsbok were also found at certain times in the lower portion of this riverbed (Figs. 3 and 8). In the Nossob gemsbok also occurred fairly uniformly scattered over the entire length of the river, but nevertheless showed a distinctly localised distribution in dry periods such as early January 1971 (Fig. 4). On the average, however, most gemsbok were found in the lower half of the Nossob as compared to the upper half (Fig. 9; Table 3).

BLUE WILDEBEEST *Connochaetes taurinus* (Burchell, 1823):

In both riverbeds blue wildebeest were found in scattered herds of varying size. No records are available for the dry summer month (early January) for the Auob River, but counts during this period in the Nossob indicated the complete absence of wildebeest from the entire length of the latter (Figs. 5 and 6). This tends to support the ideas of Eloff (1962)

that the wildebeest (and red hartebeest) possibly still migrate regularly in the park.

In the Auob, wildebeest were mostly found near Twee Rivieren in the south and near Mata Mata in the north (Figs. 5 and 8; Table 1). In the Nossob River that portion in the vicinity of Nossob Camp contained most of the wildebeest, with a relatively isolated herd near Twee Rivieren (Figs. 6 and 9; Table 2). On the average, the southern half of the Nossob has more wildebeest than the northern half (Table 3). Wildebeest in the Nossob were infrequently found in the last (northern) 80 km of the riverbed towards Union's End (Tables 2 and 3).

Eloff (1966) sketched the southward dispersal of the blue wildebeest in the Auob River of the park, starting with a nucleus herd of 46 animals about 19 km south of Mata Mata in 1948. By 1962, the last record in Eloff (1966), two lone wildebeest bulls were seen 112 km south of Mata Mata. During current counts in September 1970 a herd of 70 wildebeest was seen 22 km from Twee Rivieren in the Auob, while herd of 27 wildebeest was found in the Auob 1,5 km north of its confluence with the Nossob. In early December 1970 two wildebeest bulls were seen near the airstrip at Twee Rivieren.

It is clear that while the southward dispersal of the wildebeest in the Auob was completed by the arrival of the two lone bulls near Twee Rivieren in 1962, the wildebeest has now established itself in the southern reaches of the Auob where it has probably become a permanent resident.

RED HARTEBEEST *Alcelaphus buselaphus* (Pallas, 1766):

Red hartebeest are rare in the Auob River. During three census periods, totalling 12 different counts, only one herd of four red hartebeest was seen in the Auob approximately 48 km north of Twee Rivieren. Red hartebeest are also fairly rare in the southern half of the Nossob River (Figs. 7 and 9), with the greatest concentration of this species being found in the last 80 km of the riverbed towards Union's End (Tables 2 and 3).

ELAND *Taurotragus oryx* (Pallas, 1766):

Eland are rarely seen in any of the riverbeds although they were found in the interior in fairly large herds including numerous calves. On a drive from Batulama in the Auob to the area around the Skrij Pan along the western boundary of the park, for example, two herds of 34 and 65 eland respectively were encountered on 7 December 1970. In the riverbeds, however, eland were encountered only once during five visits (including June 1970). This sighting of a single eland at 7,30 p.m. in the bed of the Nossob River five km south of the windmill and dam at Rooikop was not part of any of the regular riverbed counts. Eland, however, do cross the riverbeds into the interior of the park, but apparently they seldom stay long in the riverbeds.

Discussion

From the evidence gathered thus far it is evident that different species utilise the two river habitats in different ways. Even the same riverbed showed a variation in habitat use by various species. When all the animals were considered together, it was also evident that the lower two-thirds of the Auob showed a slightly smaller average individual animal count than the northernmost third (Table 1). In the Nossob, animal abundance increased progressively from south to north (Table 3), with the northernmost half showing greater relative abundance than the southernmost half.

The available data indicated interesting differences in river habitat use by individual species. It is clear that differences exist and the immediate task therefore is to try determining the nature of this preference, if it may be called such. One answer probably lies in the nature of the country surrounding the riverbeds. The interior habitat varies considerably and should affect the distribution of species which are not exclusive to the riverbeds. It is therefore necessary to mark a reasonable number of individuals of all the pertinent species in the riverbeds in order to study the extent and nature of their movements from the riverbeds into the adjacent areas. Data are needed on the extent and the periodicity of such movements on both a daily, seasonal and an annual basis. The need for a marking effort to study animal movements was already vigorously advocated by Eloff (1959 a, 1961), and current data strongly endorse this need.

As the species vary in relative distribution with time, so they also vary in relative abundance. Although numerical estimates for these species have been obtained for several different periods on fixed census routes in the park, these efforts are continuing and details will appear in a later paper. However, an example of the magnitudes of change will be given here.

Along the entire bed of the Nossob in the park, a distance of 320 km, the total number of individuals of the following animals were recorded and compared from September 1970 to May 1971: springbok, gemsbok, blue wildebeest and red hartebeest. In September 1970 the total animal count for the Nossob was 1 643 individuals. The habitat then became progressively drier until early January 1971. From September 1970 to late November/early December 1970 the total count decreased by 54,1 per cent to 753 animals. From November/December 1970 to early January 1971 a further decrease of 35,5 per cent was noted; the total then being 486 animals. The rainy season started in early January and by mid-January 1971 there had been a rapid response mostly by the springbok to the newly emerging green sprouts of especially the driedoring *Rhigozum trichotomum*. By May 1971 the total count of the four ungulate species concerned had increased by 381,1 per cent to 2 338 animals.

The rapid response of the springbok within two weeks in January 1971 as mentioned above was most remarkable. On 3 January 1971 a count of

the springbok in the Nossob from Twee Rivieren to Nossob Camp (168 km) yielded 471 individuals. A similar count on 15 January 1971 yielded 1 364 springbok, including one herd of 706 animals near Twee Rivieren. It was also clear that the increase in number of these animals could not have resulted from the production of young since most of the springbok were mature. These animals had probably been present in areas outside the riverbed and moved into the riverbed in response to available forage. These movements into and out of the riverbed further emphasises the need for marking individuals and for studying ungulate movements in the park. The bearing of such research on studies of river habitat use should be self evident.

To conclude, the beds of the Auob and Nossob Rivers in the Kalahari Gemsbok National Park offer suitable habitat to four of the five large ungulate species usually found in the Park. These species utilise the river habitat in varying degrees with the springbok and the gemsbok most often encountered and widely distributed, with the blue wildebeest more localised in specific herds occupying specific localities, and with the red hartebeest almost exclusively found in the Nossob where they most often occur in the more northern reaches of the riverbed. The blue wildebeest in the Auob have completed their southward dispersal and have probably established themselves as permanent residents in the lower reaches of the riverbed.

Acknowledgements

I wish to thank the following for their assistance: The National Parks Board for permission to do the research, for accommodation and research facilities and for help in many ways; Ranger E. le Riche and Nature Conservator C. le Riche for their help and advice; Dr. J. Nel, Prof. F. C. Eloff and students of the B.Sc. (Hons) class of 1970, all of the Dept. of Zoology at the University of Pretoria, and Mr. I. Rautenbach of the Transvaal Museum who helped with the game counts and gave useful advice. The University of Pretoria gave financial assistance.

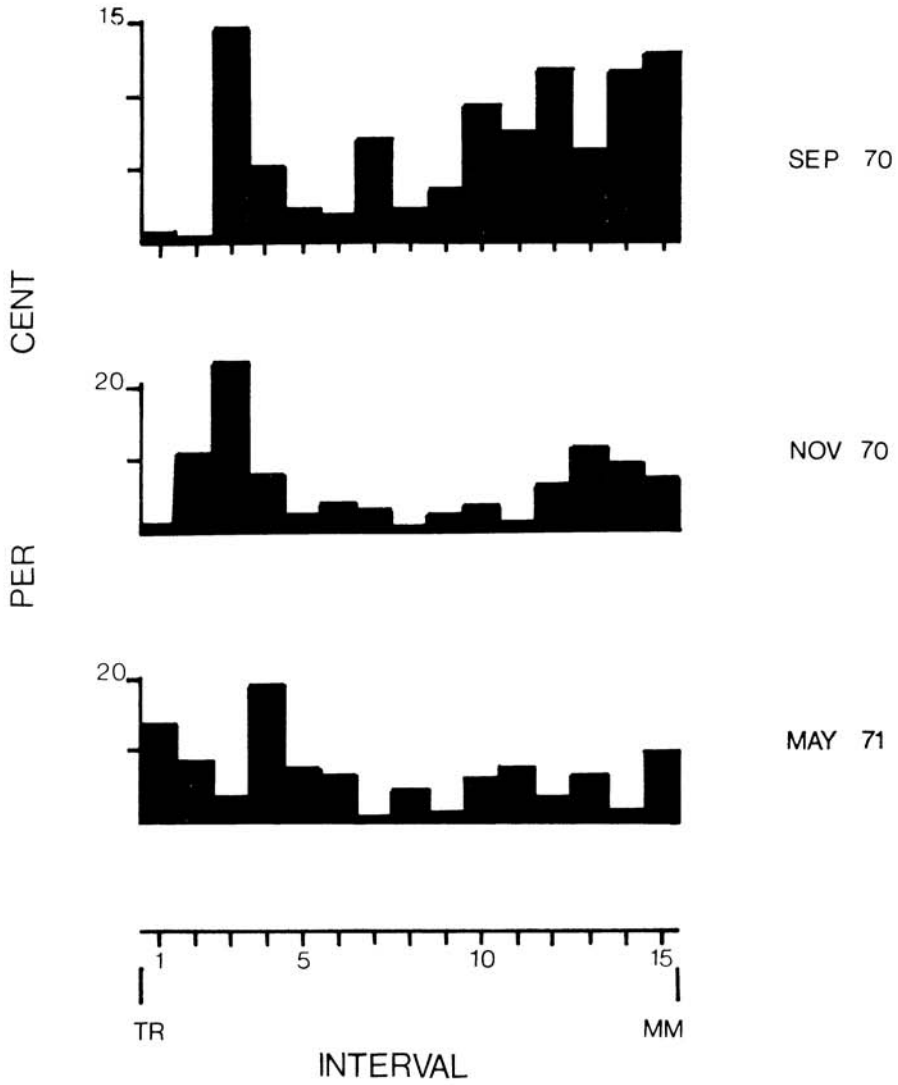

Fig. 1 Relative abundance of springbok at eight km intervals in the Auob riverbed of the Kalahari Gemsbok National Park. TR indicates Twee Rivieren and MM indicates Mata Mata.

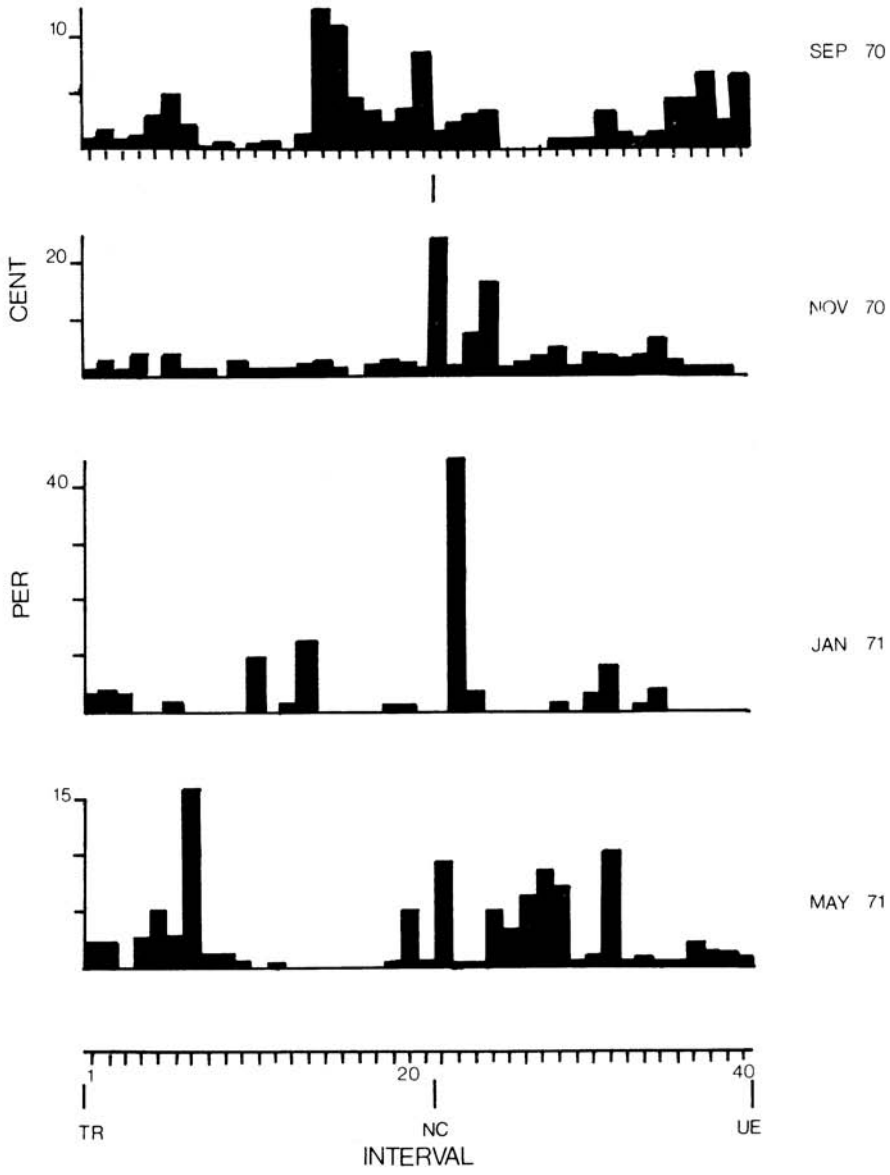

Fig. 2 Relative abundance of springbok at eight km intervals in the Nossob riverbed of the Kalahari Gemsbok National Park. TR indicates Twee Rivieren, NC indicates Nossob Camp and UE indicates Union's End.

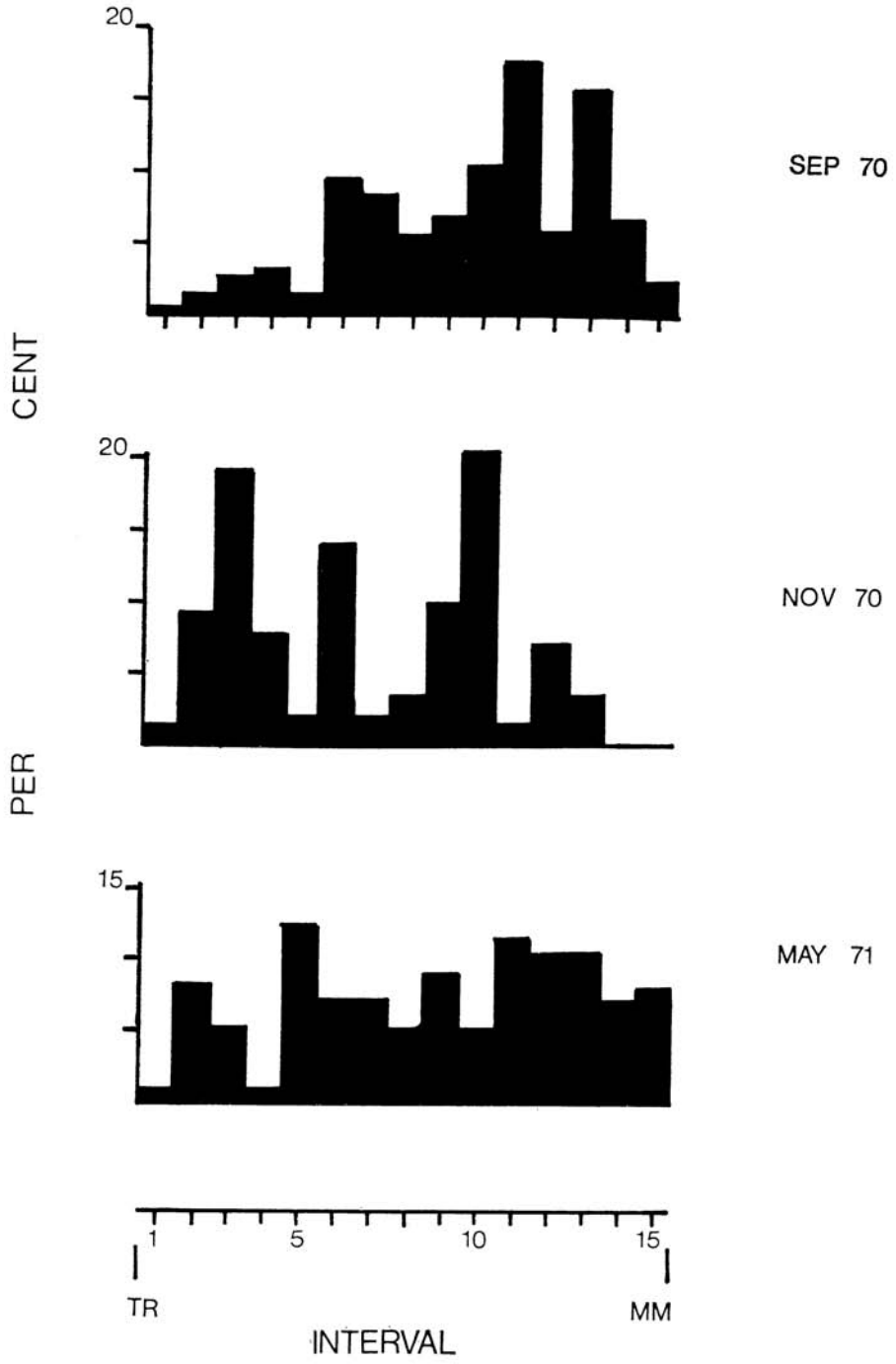

Fig. 3 Relative abundance of gemsbok at eight km intervals in the Auob riverbed of the Kalahari Gemsbok National Park. Symbols as in Fig. 1.

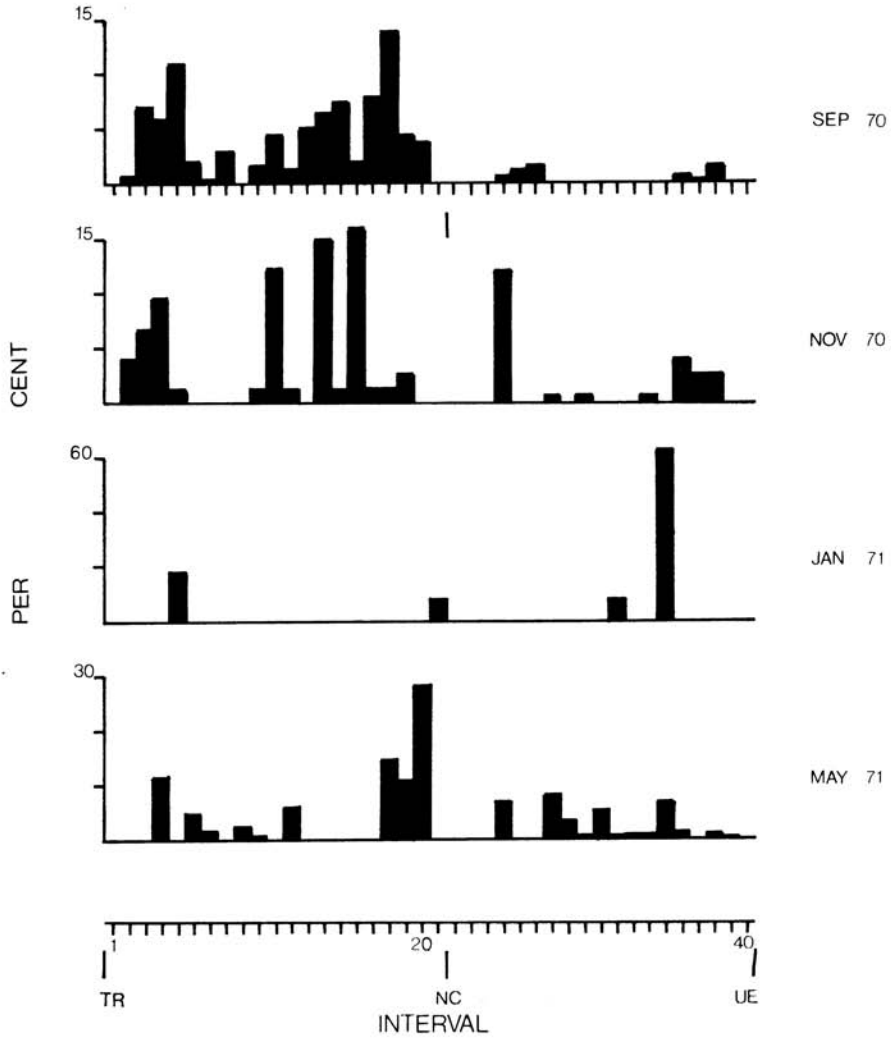

Fig. 4 Relative abundance of gemsbok at eight km intervals in the Nossob riverbed of the Kalahari Gemsbok National Park. Symbols as in Fig. 2.

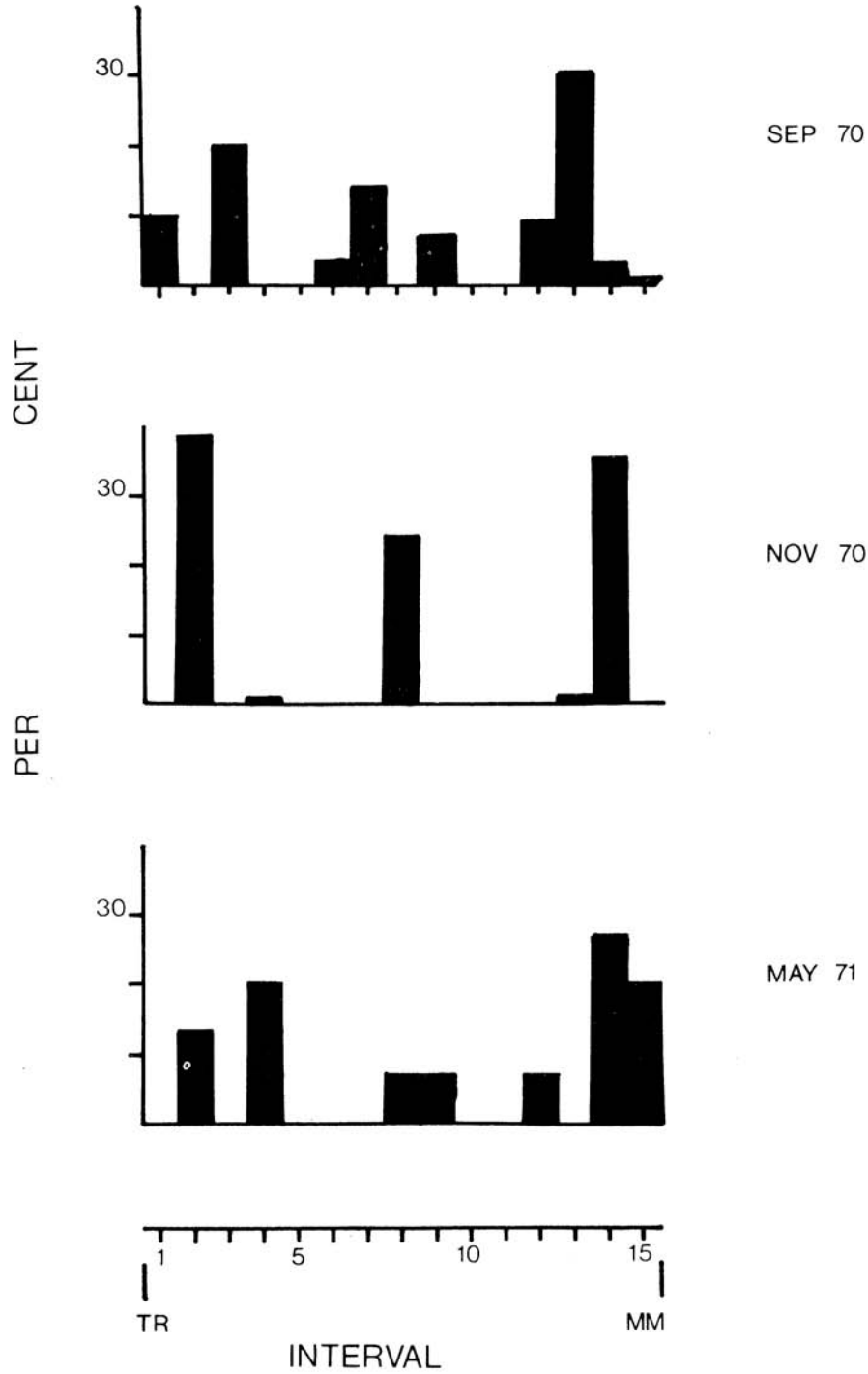

Fig. 5 Relative abundance of blue wildebeest at eight km intervals in the Auob riverbed of the Kalahari Gemsbok National Park. Symbols as in Fig. 1.

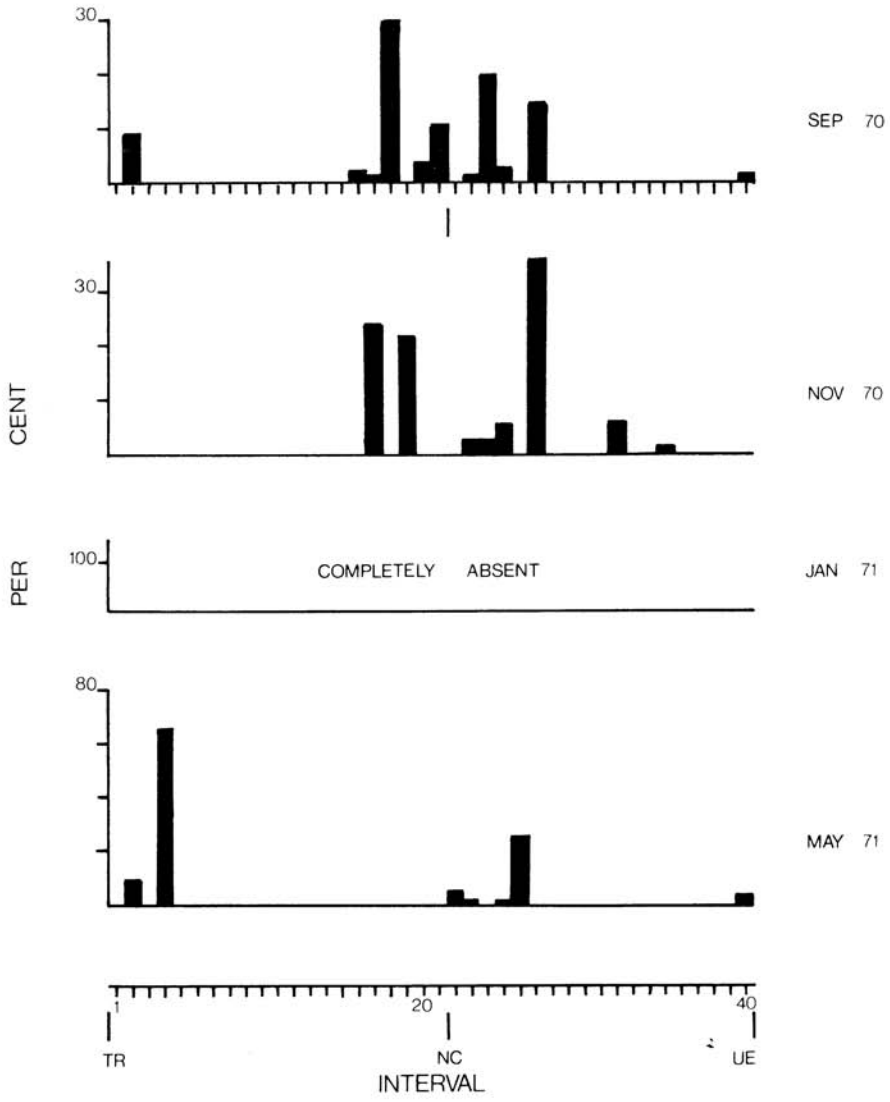

Fig. 6 Relative abundance of blue wildebeest at eight km intervals in the Nossob riverbed of the Kalahari Gemsbok National Park. Symbols as in Fig. 2.

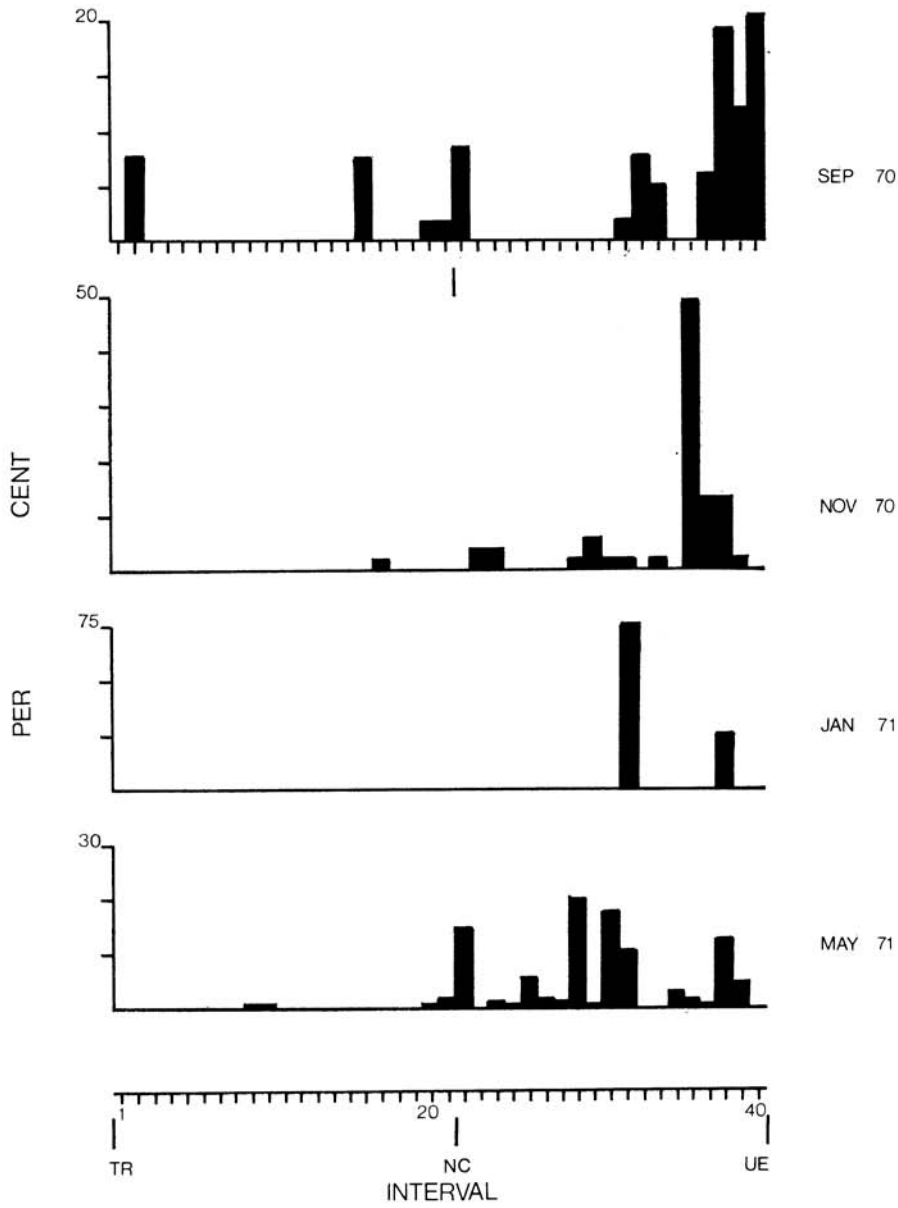

Fig. 7 Relative abundance of red hartebeest at eight km intervals in the Nossob riverbed of the Kalahari Gemsbok National Park. Symbols as in Fig. 2.

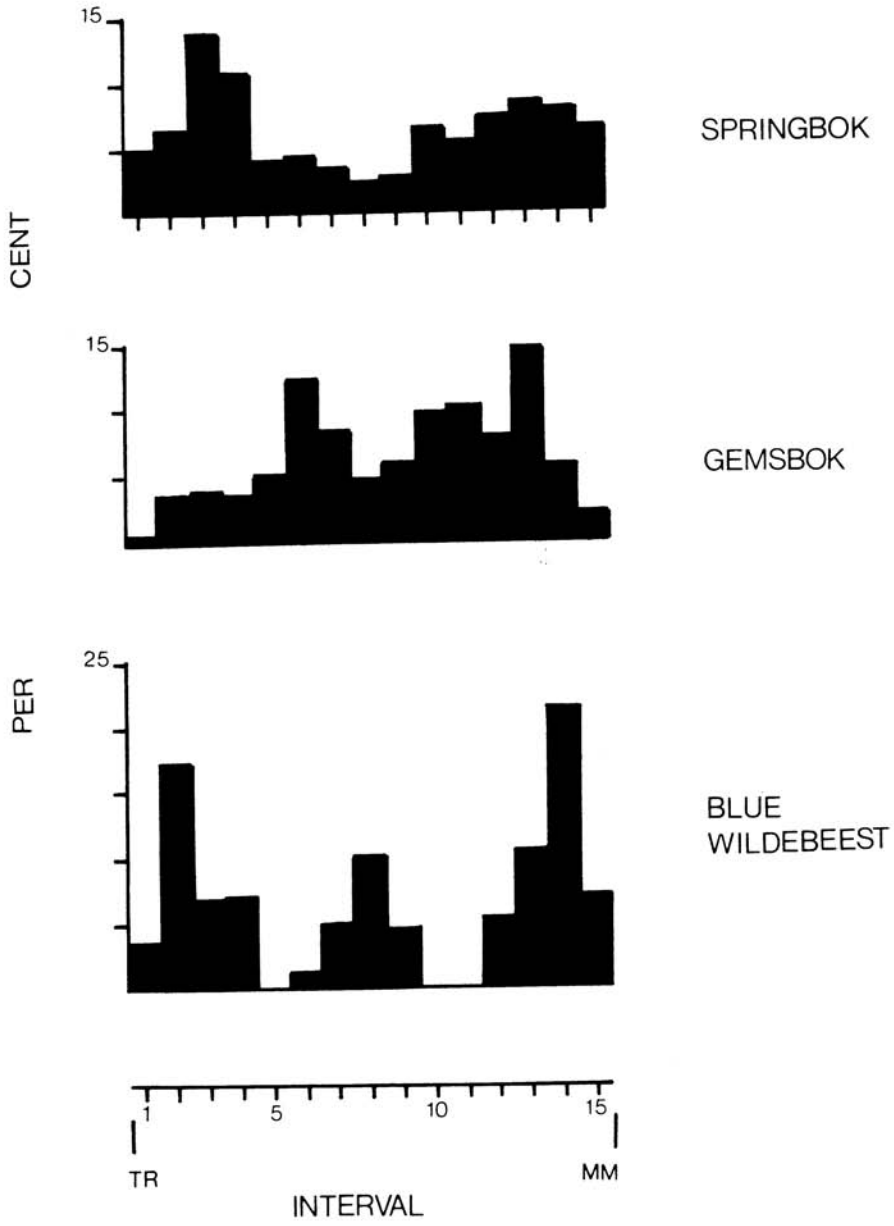

Fig. 8 Average relative abundance of three species of ungulates for September 1970, November/December 1970 and May 1971 at eight km intervals in the Auob riverbed of the Kalahari Gemsbok National Park. Symbols as in Fig. 1.

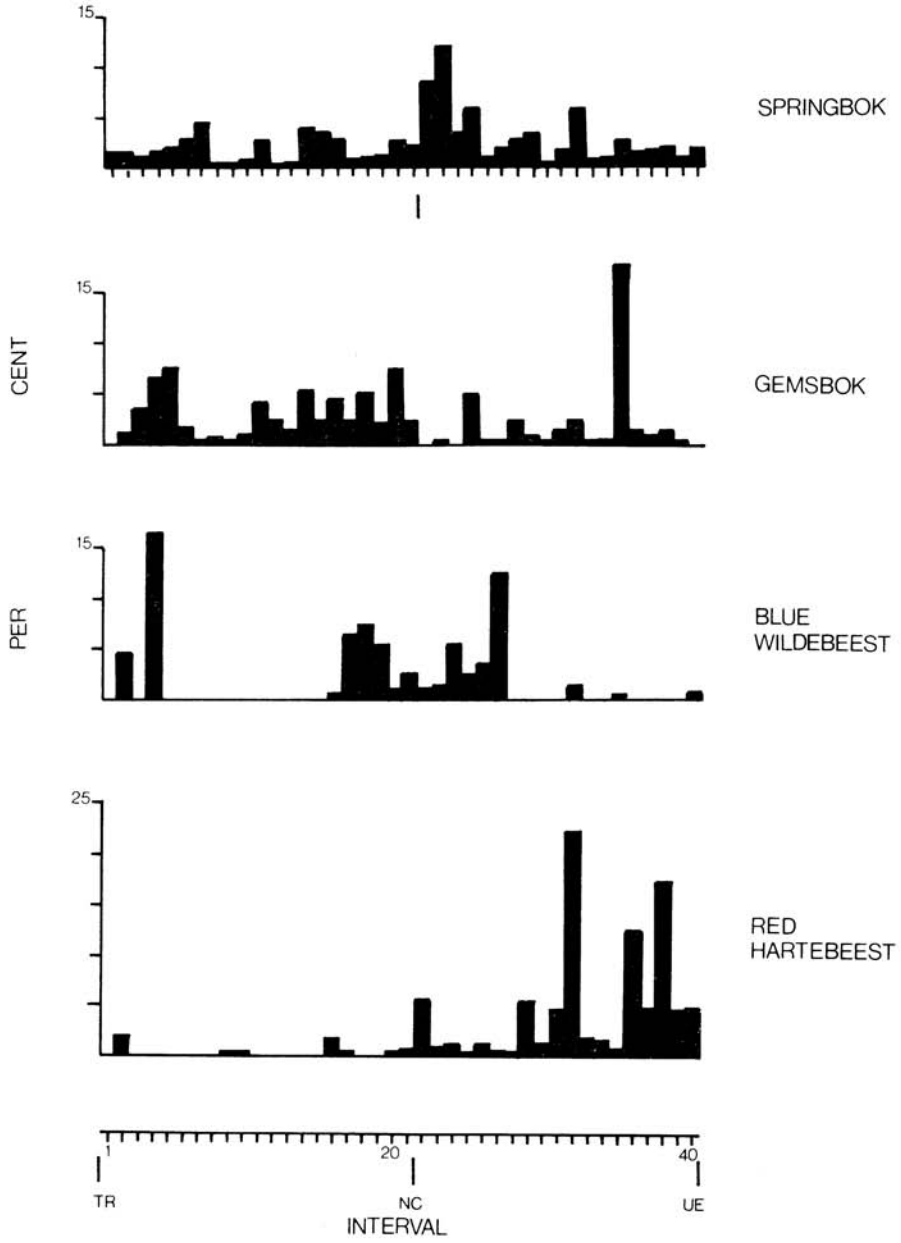

Fig. 9 Average relative abundance of four species of ungulates for September 1970, November/December 1970, early January 1971 and May 1971 at eight km intervals in the Nossob riverbed of the Kalahari Gemsbok National Park. Symbols as in Fig. 2.

Table 1

Average percentages of abundance for September 1970, *November/December* 1970 *and May* 1971, *of three species of ungulates at* 40 *km intervals in the Auob riverbed in the Kalahari Gemsbok National Park, from Twee Rivieren Camp* (0 *km*) *to Mata Mata Camp* (120 *km*).

Species	*Interval in kilometres*		
	0–40	40–80	80–120
Springbok	42,4	20,4	37,2
Gemsbok	16,0	42,0	42,0
Blue wildebeest ..	34,5	20,9	44,6
Average for three species	30,9	27,8	41,3

Table 2

Average percentages of abundance for September 1970, *November/December* 1970, *early January* 1971 *and May* 1971, *of four species of ungulates at* 40 *km intervals in the Nossob riverbed in the Kalahari Gemsbok National Park from Twee Rivieren* (0 *km*) *to Union's End* (320 *km*)

Species	*Interval in kilometres*							
	0–40	40–80	80–120	120–160	160–200	200–240	240–280	280–320
Springbok	8,4	9,2	10,7	9,1	32,4	9,6	12,2	8,4
Gemsbok	19,3	4,6	15,5	21,5	7,9	4,6	22,5	4,1
Blue wildebeest ..	28,2	—	—	28,0	18,2	21,8	2,5	1,3
Red hartebeest ..	2,0	0,3	—	3,0	9,0	9,2	31,5	45,0
Average for four species	14,5	3,5	6,6	15,4	16,9	11,3	17,2	14,6

Table 3

Average percentages of abundance for September 1970, *November/December* 1970, *early January* 1971 *and May* 1971, *of four species of ungulates at* 80 *and* 160 *km intervals in the Nossob riverbed in the Kalahari Gemsbok National Park from Twee Rivieren* (0 *km*) *to Union's End* (320 *km*)

Species	*Interval in kilometres*					
	0–80	80–160	160–240	240–320	0–160	160–320
Springbok ..	17,6	19,8	42,0	20,6	37,4	62,6
Gemsbok ..	23,9	37,0	12,5	26,6	60,9	39,1
Blue wildebeest	28,2	28,0	40,0	3,8	56,2	43,8
Red hartebeest	2,3	3,0	18,2	76,5	5,3	94,7
Average for four species ..	17,8	22,0	28,2	32,0	40,0	60,0

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