

# DRY SEASON ROADSIDE RAPTOR COUNTS IN THE NORTHERN CAPE, S.W.A. AND ANGOLA

W.R.J. DEAN

*Barberspan Ornithological Research Station,  
P.O. Barberspan 2765*

**ABSTRACT.** — Falconiforms were counted along roadsides in the northern Cape, South West Africa and Angola, during the dry seasons of 1968, 1972 and 1973. The highest raptor density (3,2 km/raptor) was in the Kalahari Gemsbok National Park and the lowest raptor density (26,3 km/raptor) was in the remainder of the northern Cape. Raptors observed and counted in Angola were mainly the larger species. Conserved areas appear to be important to the resident raptors and there is a marked difference between raptor density in the conserved (or less disturbed) areas and raptor density in the unconserved areas. Raptor biomass in conserved areas is distributed mainly in larger (>1001 grams) raptors whereas in unconserved areas raptor biomass is distributed mainly in raptors of <1000 grams.

## INTRODUCTION

The major fluctuations in roadside raptor counts in southern Africa are attributable to seasonal differences with the rainy season counts being much increased by the influx of palearctic migrants (Cade 1969). Dry season counts are valuable for showing different habitat preferences between resident raptors.

The problems in using this data as a measure of raptor density have been given by Cade (1969). Basically, the information is gathered by different observers who may differ in attentiveness and in training, and the speed of travel, time of day, season, weather, patterns of population dispersion, habits of the species and local superabundance of food can all affect the counts.

Within these constraints it is possible to show raptor density differences between conserved and unconserved areas and also to show differences in the structure of the raptor populations in different habitats.

## METHODS

Concomitant with other ornithological field work, during the dry seasons of 1972 and 1973 notes were made of falconiforms observed along roads in the northern Cape, South West Africa and Angola. The route travelled in the northern Cape was mainly from Kimberley to Twee Riveren via Kuruman, and from Kimberley to Warrenton. The Kalahari Gemsbok National Park counts, made from Twee Rivieren along the Auob river to Mata Mata, have been separated from the remainder of the northern Cape data. In South West Africa the route travelled was mainly from Mata Mata along the Auob valley to Stampriet, west to Mariental and north to Oshikango. The route in Angola was from Santa Clara to Luanda, twice via Benguela and the coastal road, and four times on the higher altitude road through Nova Lisboa.

Counts made during July 1968, on a route from Kuruman to Windhoek through the Kalahari Gemsbok National Park, south to Springbok and east to Warrenton, have also been included.

All raptors with the exception of Aegypiidae were counted. In the Angola counts the relatively sedentary Palmnut Vulture *Gypohierax angolensis* was included.

As the counts were made mainly out of the summer months, only residents have been considered.

Most of the counts were made by the driver only at speeds of 80-100 km/hour.

## RESULTS

Table 1 gives the species of falconiforms counted with data on weight and showing the grouping used in the road count analyses in Table 2. Table 1 also gives the group prey preferences. Comparative overall raptor densities are shown in Table 3 using additional data from Siegfried (1968) and Cade (1969). Table 4 gives percentage frequency of raptors counted according to weight classes. Estimated raptor biomass shown as a percentage frequency is given in Table 5.

## DISCUSSION

It is interesting to compare the mean raptor densities from the northern Cape and the Kalahari Gemsbok National Park. Cade (1969) considers that raptors in the less disturbed areas like the northern Cape "probably occur in about their original numbers and variety". The marked difference between overall raptor densities in the northern Cape and the Kalahari Gemsbok National Park suggest that the conserved areas are important to the resident raptors. It may be noted that raptors in the Kalahari Gemsbok National Park tend to be more common in the large *Acacia giraffae* trees along the Auob river and the road. The counts made away from the Auob river are few and the overall raptor density in the Kalahari Gemsbok National Park is probably not as high as the density given in Tables 2 and 3.

In the less disturbed areas larger raptors were more frequently counted than in disturbed areas. Table 5 shows that in undisturbed areas larger raptors (>1001 grams) contribute more than 60 % of the total estimated raptor biomass whereas in disturbed areas (northern Cape, S.W.A.) larger raptors contribute 30,6 % and 25,4 % respectively to the total. Reichholf (1974) showed that in disturbed areas in South America, the structure of the raptor community has altered with a decrease in the number of species despite an increase in raptor abundance

TABLE 1. Group, weight class and diet of raptors observed along roads. Data from Brown (1970) and personal observations. Nomenclature follows Brown (1970).

Group	Species	Weight class	Diet
Falcons	<i>Falco peregrinus</i>	3	Birds, mammals
	<i>F. biarmicus</i>	3	
	<i>F. chicquera</i>	2	
Kestrels	<i>F. ardosiacus</i>	2	Birds < 100 g mammals < 100 g insects, reptiles
	<i>F. rupicoloides</i>	2	
	<i>F. tinnunculus</i>	2	
Pygmy Falcon	<i>Polihierax semitorquatus</i>	1	Insects, birds
Secretary Bird	<i>Sagittarius serpentarius</i>	5	Insects, reptiles
Blackshouldered Kite	<i>Elanus caeruleus</i>	2	Mammals < 100 g, insects
Large Eagles	<i>Aquila verreauxi</i>	5	Mammals > 100 g birds > 100 g, reptiles
	<i>A. rapax</i>	5	
	<i>Stephanoaetus bellicosus</i>	5	
	<i>S. coronatus</i>	5	
	<i>Hieraetus fasciatus</i>	5	
Bateleur	<i>Terathopius ecaudatus</i>	5*	Mammals > 100 g, snakes, birds, carrion
Small Eagles	<i>Lophaetus occipitalis</i>	4	Mammals < 100 g, birds, insects, reptiles insects, reptiles
	<i>Circaetus cinereus</i>	4	
	<i>C. gallicus</i>	4	
	<i>Buteo rufofuscus</i>	4	
	<i>B. auguralis</i>	4	
Chanting Goshawk	<i>Melierax canorus</i>	3	Reptiles, birds, mammals < 100 g, insects
Goshawks	<i>Accipiter badius</i>	1	Birds, reptiles, insects
	<i>A. ovampensis</i>	2	
	<i>Melierax gabar</i>	1	
Gymnogone	<i>Polyboroides typus</i>	3	eggs, young birds, reptiles oil palm fruit, mammals < 100 g, birds
Others	<i>Gypohierax angolensis</i>	5	Carrion, fish Carrion, fish, birds > 100 g
	<i>Haliaeetus vocifer</i>	5	
Weight classes	1 = < 200 grams 2 = 201 - 500 grams 3 = 501 - 1 000 grams 4 = 1 001 - 2 000 grams 5 = > 2 001 grams		

\*Brown (1970) gives the weight of a Bateleur as 1 950 grams. Two juvenile Bateleurs, one female, the other unsexed, weighed 2 400 grams and 2 250 grams respectively.

TABLE 2. Raptors observed along roadsides. Density given in km/bird.

Group	Northern Cape			Kal. Gems. Nat. Park			South West Africa			Angola	
	A	B	C	A	B	C	A	B	C	A	B
Falcons				160	16	73	1200	248	881		
Kestrels	32	118	66	11	10	12	46	50	35	337	231
Pygmy Falcon	360	237	487	35	240	122	400	186	100		
Secretary Bird		554	1462	106	80	40			700		
Blackshouldered Kite		237	146		40	40		497	130		529
Large Eagles	1440	277	731	106	16	26	300	373	251	1348	247
Bateleur	1440			320					1763	135	64
Small Eagles		332	2925		240		480		233	337	162
Chanting Goshawks	96	79	75	20	48	18	48	51	25		3708
Goshawks			2925	106	120	72			1175	192	463
Gymnogone										674	1854
Others										26	31
Total raptors	65	63	117	65	73	95	123	80	349	80	248
Mean density	22,0	26,3	25,1	4,9	3,2	3,8	19,5	18,6	10,1	16,8	14,9
Overall mean density		24,6			3,9			13,4		15,4	
Distance travelled (km)	1440	1662	2925	320	240	365	2400	1493	3527	1348	3708
Northern Cape	A July 1968 B 1 July - 13 September 1972 C 15 March - 3 August 1973			South West Africa			A July 1968 B 16 July - 12 September 1972 C 13 April - 4 August 1973				
Kalahari Gemsbok National Park	A July 1968 B 16 July - 12 September 1972 C 13 April - 4 August 1973			Angola			A 19 July - 21 July 1972 B 4 May - 12 August 1973				

TABLE 3. Comparative overall densities of raptors in the northern Cape and Kalahari Gemsbok Park shown as km/bird. To obtain a comparative period only the mean density of Siegfried's (1968) counts from March to September and the counts in Cade (1969) made mainly out of the summer months have been used.

	Northern Cape	Kalahari Gemsbok National Park
Northern Cape A, Kalahari Gemsbok National Park A	22,0	4,9
Northern Cape B, Kalahari Gemsbok National Park B	26,3	3,2
Northern Cape C, Kalahari Gemsbok National Park C	25,1	3,8
Siegfried (1968)	45,9	
Cade (1969)	16,0	
Prozesky (in Cade 1969)		10,8
Maclean (in Cade 1969) April - August 1965		9,2
Cade, Willoughby and Prozesky (in Cade 1969)		4,8
Total mean density	27,0	5,2

TABLE 4. Percentage frequency of raptors in each weight class.

Count	Weight class*				
	1	2	3	4	5
Northern Cape A	6	67	23	0	3
B	11	33	33	8	14
C	6	55	33	1	5
Siegfried (1968)	2	47	36	5	10
Cade (1969)	27	59	11	3	0
mean	10,4	52,2	27,2	3,4	6,4
Kalahari Gemsbok National Park A	18	43	28	0	11
B	4	42	27	1	25
C	8	41	26	0	24
Prozesky (in Cade 1969)	2	37	17	6	38
Maclean (in Cade 1969) April - August 1965	32	16	21	1	30
Cade, Willoughby and Prozesky (in Cade 1969)	16	22	41	0	20
mean	13,3	33,5	26,6	1,3	24,6
South West Africa A	5	42	42	4	7
B	10	41	44	0	5
C	11	38	42	4	6
mean	8,6	40,3	42,6	2,6	6,0
Angola A	4	10	2	5	79
B	2	11	1	9	77
mean	3,0	10,5	1,5	7,0	78,0

\*See Table 1 for weight classes

due mainly to an increase in scavengers. Without this group, however, the abundance of raptors decreases with increasing human influences on habitat, a similar pattern as is shown in Table 2.

Blackshouldered kites show an interesting trend. Of the counts published in Cade (1969) for the northern Cape, only those of Rudebeck record blackshouldered kites. Siegfried (1968) records blackshouldered kites as more frequent in the summer months than in the winter months, January-February density of 102 km/bsk against a July-August density of 1788 km/bsk. My own counts show no blackshouldered kites in July 1968, a density of 237 km/bsk in 1972, and a density of 146 km/bsk in 1973. S.W.A. shows a similar pattern. In the Kalahari Gemsbok National Park however, although no blackshouldered kites were recorded in the 1968 count, they were recorded with the same density, 40 km/bsk, in 1972 and 1973. Maclean (in Cade, 1969),

despite many kilometres travelled and many raptors counted in the park, recorded only three blackshouldered kites (2613 km/bsk) in the park during the period October 1964 - August 1965.

## CONCLUSIONS

Roadside raptor counts can be used to show trends in the structure of raptor communities. The differences between the conserved and unconserved areas are consistent and may be due to actual differences in the raptor populations but the difference may also be due to differential habitat, visibility or aggregation factors.

Within limits, attending only to open habitats and conspicuous species like secretary bird *Sagittarius serpentarius*, kestrels *Falco* spp., blackshouldered kite *Elanus caeruleus*, bateleur *Terathopius ecaudatus* and chanting goshawk *Melierax canorus*, temporal and spatial changes in the population may be observed.

TABLE 5. *Distribution of estimated raptor biomass in road counts.*

Area	Percentage of raptor biomass in each weight class				
	Weight class*				
	1	2	3	4	5
Northern Cape	1,7	31,5	36,8	8,6	22,0
Kalahari Gemsbok National Park	1,5	13,9	23,8	2,3	58,5
South West Africa	1,4	22,9	50,4	6,2	19,2
Angola	0,2	2,0	6,2	5,8	86,0

\*See Table 1 for weight classes

#### ACKNOWLEDGEMENTS

I am grateful to the Peabody Museum of Natural History, Yale University, for the opportunity to make these notes. I thank Ian Macdonald and Carl Vernon for road count data and advice. W.R. Siegfried kindly commented on an early draft of this paper.

#### REFERENCES

- BROWN, L.H. 1970. *African Birds of Prey*. Collins, London.
- CADE, T.J. 1969. The status of the Peregrine and other falconiforms in Africa. In "Peregrine Falcon Populations. Their Biology and Decline". (J.J. Hickey, ed.) University of Wisconsin Press. Madison, Milwaukee and London.
- REICHHOLF, J. 1974. Artenreichtum, Häufigkeit und Diversität der Greivögel in einigen Gebieten von Südamerika. *J. Orn.* 115:381-397.
- SIEGFRIED, W.R. 1968. Relative abundance of birds of prey in the Cape province. *Ostrich* 39:253-258.

*Received 13 May 1975*