

# Feeding behaviour of the caracal *Felis caracal* Schreber 1776 in the Mountain Zebra National Park

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A total of 21 caracal kills were recorded in the Mountain Zebra National Park of which 15 were mountain reedbuck. In 200 scats analysed, mammals made up 93,8% of the prey species identified, birds 5,3% and reptiles 0,9%. Cape dassies (53,3%) and mountain reedbuck (19,6%) were the most common prey items in the scats. The way in which prey is eaten, food consumption and hunting behaviour are discussed.

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'n Totaal van 21 diere wat deur rooikatte in die Bergkwagga Nasionale Park gevang is, waarvan 15 rooiribbokke was, is gevind. Van 200 mismonsters wat ontleed is, het soogdiere 93,8% van die prooispesies uitgemaak, voëls 5,3% en reptiele 0,9%. Kaapse dassies (53,3%) en rooiribbokke (19,6%) was die algemeenste prooi-item in die misontleding. Die manier waarop prooi geëet word, voedselverbruik en jagmetodes word bespreek.

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Although the caracal or lynx *Felis caracal* Schreber 1776 is widespread in South Africa and is considered a problem in small-stock farming areas of the Cape Province, very little is known about its natural habits. Available published information, much of which consists of observations on captive animals is summarized in Pringle & Pringle (1979). A study was undertaken during 1979 and 1980 in the Mountain Zebra National Park (MZNP), some 27 km southwest of Cradock in the Cape Province of South Africa, to determine the feeding behaviour of wild caracal.

## Study area

The MZNP, an area of 6 536 ha, consists basically of an amphitheatre on the north-facing slopes of the Bankberg, with a series of steep-sided kloofs and an extensive plateau (Rooiplaat). The altitude ranges from 1 200 m to 1 957 m above sea level. Temperatures are extreme, ranging from 42 °C in summer to –7 °C in winter when snow frequently covers higher slopes.

The vegetation on the higher slopes is Karroid *Danthonia* (*Merxmüllera*) Mountain Veld and that of the northern parts, False Karroid Broken Veld as defined by Acocks (1953). The kloofs and streams in the valley are well wooded and many of the lower mountain slopes have a fairly dense covering of shrubs. The terrain is rugged with many broken, rocky outcrops and boulder-strewn slopes.

An indication of prey species available to predators in the study area is given by Nel & Pretorius (1971) and Penzhorn (1971). Numerous sheep and goats are available on neighbouring farms.

## Material and Methods

To assess prey species utilization, fresh kills were located by Park staff on routine duties and examined to determine how the animal was killed and how the caracal consumed the prey (there are no other large predators in the Park). Scats were collected throughout the study area over a two year period and the contents analysed as in Grobler & Wilson (1972). Undigested food remains in the scats served as a good means of identifying the range of prey species taken by caracal.

A hand reared free-ranging young male caracal was used for observations on how various prey species were eaten, and for determining food consumption. Food con-

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sumption was determined on three occasions in terms of mass consumed per day over seven days. The 'food' consisted of whole birds, small mammals and chunks of raw meat presented to the caracal on a daily basis even though there were days when nothing was consumed.

Six mountain reedbeek *Redunca fulvorufula* were shot to assess the maximum amount of meat on them which would be available to caracal by weighing the bones and flesh separately.

An estimate of caracal numbers in the MZNP was made from field observations, and distribution of kills, spoor, scats and lairs. Records were also kept of group size. Two cage traps were set at kills and six were selectively placed throughout the Park, with a variety of baits, for five months in an attempt to catch caracal and gain information on population numbers.

Records of caracal kills from the Kalahari Gemsbok National Park (KGNP) (Mills pers. comm.) have been included, among which caracals were seen in possession of the prey. One recent prey record from Zimbabwe is also included.

## Results

### Killing and hunting

A total of 21 kills were recorded of which 15 (51,4%) were mountain reedbeek (Table 1). Small prey species were almost entirely consumed and were therefore difficult to locate. The larger prey species (antelope) were killed with a bite in the throat at the junction of the lower jaw and neck. Cuts were present on the shoulders of antelope killed and these were presumed to be claw marks. It was apparent that the prey was stalked to within 5 m and a short burst of speed appeared to culminate the stalk. The actual killing took place with little signs of struggle. The stalk, rush and kill technique was often demonstrated by the tame caracal, with the powerful hind legs playing an important part in the final thrust.

**Table 1** Caracal kills recorded in the Mountain Zebra National Park from 1978 to 1980

Prey species	Age	Sex	Number
<i>Redunca fulvorufula</i>	adult	♂	7
<i>R. fulvorufula</i>	adult	♀	5
<i>R. fulvorufula</i>	juvenile	?	3
<i>Antidorcas marsupialis</i>	adult	♀	1
<i>A. marsupialis</i>	juvenile	?	1
<i>Sylvicapra grimmia</i>	adult	♀	1
<i>Raphicerus campestris</i>	adult	♂	2
<i>Pedetes capensis</i>	adult	?	1
Total			21

Adult mountain reedbeek and adult springbok *Antidorcas marsupialis* were left at the place where they were killed, but a juvenile (about six months old) springbok was dragged some 50 m into undergrowth where it was consumed. During December 1980 a caracal was disturbed at 17h00 on a freshly killed (throat bite) adult female grey duiker *Sylvicapra grimmia* in Zimbabwe. The following morning the kill was found about 65 m away, par-

tially covered with grass and with part of the hindquarters consumed. On the other hand, game rangers in MZNP recently saw a grey duiker keeping a caracal at bay before escaping.

Mills (pers. comm.) recorded caracal in the KGNP as taking springhaas *Pedetes capensis* (carried into a tree), springbok (3 adults, 1 subadult, 1 juvenile), steenbok *Raphicerus campestris* (two adults), black-backed jackal *Canis mesomelas* (two juveniles), African wildcat *Felis lybica* (adult) and an adult kori bustard *Ardeotes kori*. These records were from direct observation and probably only represent the larger species taken.

### Scat analysis

A total of 223 scats were collected, but 23 of these were discarded because they had no identifiable material or could have been from a carnivore other than caracal and the remaining 200 were used for the analysis (Table 2). Scats were widely separated and of various ages; each was thus taken as a separate feeding record.

**Table 2** Caracal prey in the Mountain Zebra National Park as determined from the analyses of 200 scats

Prey species	Occ	Rel %	Unit mass		
			(kg)	Mass	% Mass
<i>Procavia capensis</i>	120	53,3	1,8	216,0	17,1
<i>Redunca fulvorufula</i>	44	19,6	20,0	880,0	69,7
<i>Pronolagus rupestris</i>	12	5,3	1,4	16,8	1,3
<i>Lepus saxatilis</i>	12	5,3	3,0	36,0	2,9
Rodents	11	4,9	0,05	0,6	0,04
<i>Sylvicapra grimmia</i> <sup>a</sup>	6	2,7	10,0	60,0	4,8
<i>Raphicerus campestris</i> <sup>a</sup>	2	0,9	10,0	20,0	1,6
<i>Herpestes pulverulentes</i>	2	0,9	1,0	2,0	0,2
<i>Antidorcas marsupialis</i> <sup>a</sup>	1	0,4	26,0	26,0	2,1
<i>Pedetes capensis</i>	1	0,4	3,0	3,0	0,2
Total mammals	211	93,7	—	1 260,4	100%
Birds	12	5,3	—	—	—
Reptiles	2	0,9	—	—	—
Total	225	100%	—	—	—

Occ = occurrence in samples; Rel % = percentage occurrence in total sample; <sup>a</sup>unit mass from Coe, Cumming & Phillipson (1976); other unit masses from own observations except *Procavia* which was obtained from Fourie (pers. comm.).

It was evident from the analysis that the principle food, in terms of numbers, of caracal was the Cape dassie *Procavia capensis*. In terms of biomass, however, the mountain reedbeek made a greater contribution. Mammals represented 93,8% of the identified prey, birds 5,3% and reptiles (unidentified lizards) 0,9%.

Avian remains were mostly unidentified but included two greywing francolin *Francois africanus* and one crowned guineafowl *Numida meleagris*. No scats, in-

cluding those collected along the boundary, contained remains of domestic livestock. Reptile scales in the scats were not identified. The tame caracal showed little interest in lizards or a live slug-eater *Duberria lutrix* presented to him.

The tame caracal was observed burying his faeces on two occasions but on many other occasions they were left exposed. There was no well established midden but where the tame caracal spent most of his time in my yard, up to five scats could be found close together.

### Scavenging

One young male was trapped in the MZNP using a dassie which had been dead for several days. Trapping with carion baits was generally unsuccessful and only one caracal was trapped in 538 trap nights. Two other caracals were caught, one very old male on an adult mountain reedbuck, at their kills. Caracal returned to all but two of the fresh kills found. The two exceptions were mountain reedbuck which had been killed near a house and near a main access road.

### Prey consumption

The manner in which prey were consumed varied according to the size of the prey (Table 3). Small birds were consumed entirely except for a few feathers while with the larger birds, the primaries with pieces of wing attached, the viscera and portions of skull were left, along with the occasional leg. When presented with the cleaned innards of a chicken the tame caracal would eat the gizzard and heart but leave the liver.

**Table 3** Consumption of prey given to a free-ranging tame caracal in the Mountain Zebra National Park

Prey species	Body mass	Remains	Consumed	% Consumed	n
<b>BIRDS</b>					
<i>Erthoropygia coryphaeus</i>	20 g	trace	20 g	100	1
<i>Pycnonotus nigricans</i>	40 g	trace	40 g	100	1
<i>Streptopelia semitorquata</i>	220 g	20 g	200 g	90,9	1
<i>Francolinus africanus</i>	386 g	24 g	362 g	93,8	4
<b>MAMMALS</b>					
<i>Rhabdomys pumilio</i>	39 g	2 g	37 g	94,9	4
<i>Lepus saxatilis</i> (juv)	1,2 kg	150 g	1,05 kg	87,5	1
<i>Procavia capensis</i>	2,4 kg	1,3 kg	1,1 kg	55,0	4
<i>Redunca fulvorufula</i> <sup>a</sup>	26,1 kg	18,6 kg	7,5 kg	28,7	6

n = sample size; where greater than one a mean is given for the relevant measurements.

<sup>a</sup> = meat stripped off carcass and fed to caracal, represents maximum amount available.

Small mammals and birds were always played with by the tame male before being consumed and the viscera of all mammalian prey were left untouched. The tame caracal disliked liver, heart and lungs and would only consume these when hungry. With hares and dassies the

frontal portion of the skull, most of the skin, the viscera, tail and feet were left (except with dassies where the feet were often consumed).

Caracals use their incisors to pluck large amounts of hair from prey of dassie size upwards. The flesh is also eaten neatly away from the skin apparently to avoid consuming excessive quantities of hair.

Antelope carcasses were opened at the anus and the flesh on the hindquarters completely devoured. The flesh on the shoulders was next stripped from the bones in similar fashion. Feeding on adult mountain reedbuck and adult springbok would not proceed much further as by that stage the meat would be putrid in summer or dessicated in winter.

The mean food consumption of the tame caracal (at 8 months and 11,2 kg) was 796 g of meat per day. As this caracal was completely free-ranging and had a good deal of exercise, this was probably an indication of consumption when food is readily available. At this rate of consumption adults would be consuming approximately 1 kg per day (up to 2 kg at a feed). For the estimated maximum number of caracal in the MZNP (15 adult, 10 juvenile) prey consumption would therefore be about 7 300 kg of meat per annum (consumption by juveniles 500 g/day).

From the scat analysis it can be seen that 53,3% of what is caught consists of dassies and 19,6% of mountain reedbuck. This would represent 2 995 dassies per year ( $0,53 \times 7\ 300$  divided by 1,3 = mass of consumable material on a dassie). A similar estimate showed that about 190 mountain reedbuck would be killed per year, although this is likely to be an over-estimate because of the difficulty in determining quantities of meat consumed from a mountain reedbuck in the field.

### Group size

Caracals may be seen during the early morning and late afternoon although they are more active at night. A total of 57 sitings were obtained from staff and from observations during the study period. There were 41 sitings of single adults or large juveniles. Eleven pairs of adults were seen and one female with a kitten. Groups of three ( $n=3$ ) and four ( $n=1$ ) were females with kittens.

### Discussion

The mainly nocturnal and basically solitary nature of the species conforms with the findings of Rautenbach & Nel (1978). The method of killing large prey species by suffocation with a throat bite does not support the findings of Leyhausen (1956) and Pringle & Pringle (1979) who recorded caracal killing large animals with a bite at the nape of the neck. This seems unlikely as it would require biting through 15 mm of skin and flesh before reaching bone and the canines of a full-grown male only measured 16 mm. Adult male mountain reedbuck attain a mean live mass of 31 kg (Skinner 1980), while adult male and female caracals attain a mass of up to 20 kg and 14,5 kg (Pringle & Pringle 1979). This difference gives some indication of the hunting capabilities of these cats.

The importance of the larger prey species such as mountain reedbuck and springbok in the diet of caracal as indicated in the present study is surprising in view of the emphasis on smaller prey species previously recorded

(Bothma 1965, Pienaar 1969, Viljoen & Davis 1973 & Skinner 1979) although Smithers (1971) does mention impala *Aepyceros melampus* as prey in Botswana but he also found mainly smaller species in his analysis of stomach contents. The small samples in past studies may have biased the results, as may differences in size classification. For example, Pringle & Pringle (1979) included sheep, goats and vaal rhebok *Pelea capreolus* as small animals, while mountain reedbuck and springbok are considered 'larger and stronger'.

Until recently caracal were believed to abandon their prey after feeding and not to feed on carrion (Pringle & Pringle 1979) but at the MZNP caracal were observed to return to their kill and Skinner (1979) observed them feeding on a fresh donkey. This difference in behaviour may be due to persecution in sheep farming areas.

In comparison to the serval *Felis serval* which is slightly smaller and feeds mainly on small rodents (Smithers 1971), the caracal is a powerful medium-sized predator taking prey up to almost twice its own body mass. The caracal in the MZNP and probably in other areas, feed mainly on small to medium-sized mammals but will take birds and reptiles on occasion.

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