

Status and Distribution Pattern of Barking Deer (*Muntiacus muntjak* Zimmermann) in Hemja VDC, Kaski

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Abstract

Barking deer (*Muntiacus muntjak* Zimmermann) is a solitary and forest dwelling ruminant. A study was carried out to know status and distribution of barking deers found in the forested mountains of Hemja VDC, Kaski District. The study was done by direct observation method with indirect counting of fecal pellets while walking systematically in total 11 line transects covering 6.64 km in length and a total of 20 quadrates with 20×20m²–40×40m² randomly laid down in three different sites of the study area. A total of 12 individuals (5 adult males, 4 adult females, 2 sub-adult females and 1 infant), 178 pellet groups, 13 latrines and one hunting spot were recorded inside three different blocks of the study area. The results showed clumped and uneven distribution of this deer. It prefers middle range of the mountain (1100-1300m) with dense canopy cover, proper water sources and less human disturbances.

Key words: barking deer, distribution pattern

Introduction

The muntjac or barking deer (*Muntiacus muntjak* Zimmermann) is a small forest dwelling ruminant (Teng *et al.* 2004). Muntjac deer are classified into 9 known species: *Muntiacus crinifrons*, *M. feae*, *M. gongshanensis*, *M. muntjak*, *M. putaoensis*, *M. reevesi*, *M. rooseveltorum*, *M. truongsongensis* and *M. vuquangensis* (Shi and Ma 1988, Amato *et al.* 1991, Nowak 1991, Giao *et al.* 1998, Wang & Lan 2000). There are 15 subspecies of the *Muntjak* in the world (Ohataishi & Gao, 1990). The species found in Nepal, Bhutan and Northern India is *M. muntjak vaginalis* (Tamang 1982). Barking deer is primarily a solitary species (Kurt 1981, Heggdal 1999) and can be seen occasionally in a group of 4 or 5 animals (Kurup 1971). They are shy and secretive creature (Kurt 1981). Muntjacs exhibit two patterns of defecation in captivity and even in wild. They defecate through their enclosure without regard to existing pellet groups, and they repeatedly use specific areas, which are called latrines (Dubost 1970). The barking deer are not listed in the IUCN Red List of Threatened Species. The barking deer is common species in Nepal and is called

‘Rate’ or ‘Ratuwa’ locally. It is supposed to be the smallest deer in shape among its family and color variation is observed in different ecological zones of Nepal. It is seen scarcely distributed in small number due to habitat loss and hunting in the country except in protected areas (Chalise 2001).

Methodology

Study site

Hemja VDC, a probable buffer zone of Annapurna Conservation Area (ACA) is never studied for wildlife. So, information on flora and fauna found in Hemja VDC is still lacking. This VDC (83°52'43"–83°58'30" E and 28°14'52"–28°18'00" N) is northern-most boarder of Pokhara valley covering 13.31km² area. It is about 10km far from Pokhara, the headquarters of Kaski district. The study area lies in the southern boarder of ACA, so it is a probable buffer zone of ACA. The main mountainous range of the area runs in southeast to northwest direction with its highest peak at Paripakha (1786m), which rises abruptly from the floor of Pokhara valley (900m). The study area is boarded by Seti river on the east and by Kaskikot VDC in the west. Pokhara-

Baglung highway crosses 11.5km through the Hemja VDC from south to northwest (Fig-1). It is connected with Lahachok and Dhital VDCs at the northern border and Naudada/Nagdada and Dhikur Pokhari at the western border. Similarly, the border of Kaskikot and Pokhara at the south surrounds it. In addition to the

muntjac, other mammals in Hemja VDC include wild cat (*Felis chaus*), leopard (*Panthera pardus*), mongoose (*Herpestes* spp.), Langur monkey (*Semnopithecus entellus*), Rhesus monkey (*Macaca mulatta*), etc. (Pokharel 2006).

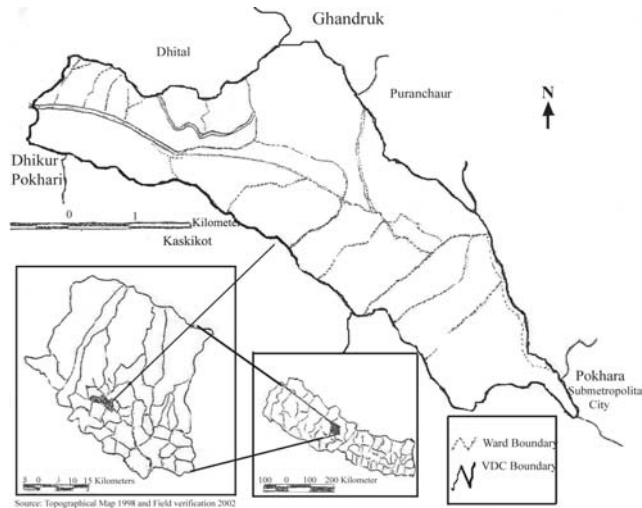


Fig.1. Location of the study area in Kaski, Nepal

Study design

The reconnaissance survey in the area for the research was carried out during the month of July of 2005. Realizing the information by initial survey, study was focused on three different sites of the area. The field survey was carried out to collect data on individuals and fecal pellets of barking deer from October 2005 to July 2006. There are two mountain ridges in the study area that include both faces of northern mountain ridge (Jhijhirka Ban, 1530m) and northern face of southern mountain ridge (Paripakha Ban, 1786m). Each face of the mountains was considered as a single block. Northern face of Jhijhirka Ban was considered as Block A, while that of southern face and its associated landmass was considered as Block B. Similarly, northern face of Paripakha Ban and its associated landmass taken as Block C. Regular monitoring of barking deer was done through transects of 0.4–1.6km in length for a total of 6.64km, laid out in different blocks of the area. Those transects covered all the habitat types of the study area crossing north to south by some transects and east to west for others. Block A, B and C contained 3, 3 and 5 transects respectively according to feasibility of topography. The animals

sighted within 50m in each side of transect and evidence of its presence such as pellets sighted within 5m in each side of transect were recorded. At each evidence sign, location and altitude were recorded. On these transects, a total of 20 quadrates with $20 \times 20\text{m}^2$ – $40 \times 40\text{m}^2$ were laid down to record the fecal deposits of animals. Block A, B and C contained 6, 6 and 8 quadrates respectively. The field observation was carried out from 5.15am to 6.50pm. Comparatively similar amount of time was spent in each block for data collection. Age group of barking deer was distinguished by their body proportion, height and size. Since horns are found only in male, age estimation of male was on the basis of size of horn (Fig. 3).

Considering characteristics of animal size and behaviors the following categories of age groups were decided.

Infants: Very small body size, found hiding in bush and remained associated with mother.

Juvenile: Small body size, not more than 1- year old, moving in group or might be solitary.

Sub-adult: Individuals with 1-2 years of age and estimated height at shoulder was not more than 45cm. Similarly, individuals with noticeable horns were considered as sub-adult males and without horns at the same height were considered as sub-adult female.

Adult: Adults of both sexes were estimated to be over 2 years of age and more than 45cm in height. Males had developed bifurcated horns with approximately 10cm or more in length.

Droppings and piles were categorized into random droppings and relic sites as defined below.



Fig 2. Very fresh fecal pellets of barking deer



Fig. 3. Horn remains of barking deer

Random droppings: A deposit of feces excreted single time anywhere in the study area.

Latrines (Relic site): It is the latrine of barking deer. It contains huge deposits of feces of different period (Fig. 2 -5 for muntjack evidences of droppings and others characters.

All the collected information were tabulated according to the objective of the study. Data were manually processed and analyzed in descriptive way as well by statistical measures.



Fig. 4. Bone remains of barking deer



Fig. 5. Barking deer in resting state

Results

A total of 12 individuals of barking deer (5 adult males, 4 adult females, 2 sub-adult females and one infant), 178 pellet groups and 13 relic sites were recorded during study period. A total of 2.76 km² area (21.02% of the total area) was sampled. Highest density of fecal pellets was observed in block A while lowest in block B (Table-1). However, chi-square goodness of fit test revealed that there were no significant differences in distribution of pellet groups in three different blocks [$\chi^2 (=5.15) < \chi^2_{0.05}$ at 2 d.f.]

Table 1. Distribution of barking deer pellet groups in different blocks

Block	Pellet group	Density (km ⁻²)
A	44	78.57
B	56	52.58
C	78	68.12

Latrines recorded in the area are tabulated with an interval of 100m in altitude (Table 2). No any latrines were recorded above 1500m of altitude. This area was least used by deer and it might be due to the steepness

of mountain (~ 800). Altitudinal range having with maximum number of dung piles recorded was 1200m – 1300m which was found to be 38.46% of total observed dung piles (13 sightings). Most of the deer were sighted in the altitudinal range of 1100m-1300m which covers the 75% of total deer sighted records. A scattered distribution was recorded to 1301 to 1500 meter above the sea level of mountain slope. No deer was sighted in the lower range of the mountain below 1100m and above 1500m elevation during the study period (Table 2).

Table 2. Distribution of barking deer and latrines in relation to altitude

Altitudinal range	Dung Piles No.	Percentage (%)	Deer sighted	Percentage (%)
1000m-1100m	2	15.38	0	0
1101m-1200m	4	30.77	4	33.33
1201m-1300m	5	38.46	5	41.67
1301m-1400m	1	7.70	1	8.33
1401m-1500m	1	7.70	2	16.67
> 1500m	0	0.00	0	0

Chi-square of goodness-of-fit test [$\chi^2 (=66.91) > \chi^2_{0.05}$ at 5 d.f.] showed that there has significant difference in distribution of dung piles in relation to altitudinal range.

Barking deer were observed only for a few seconds. They escaped in lightening speed when they noticed any kind of disturbance. Most of the deer were sighted in gorges. Barking deer with different age groups were recorded in different altitude mainly in the morning around 6 to 10 am (Table 3). Adult and sub-adult muntjaks were seen solitary while dependent infants were associated with mothers.

Table 3. Observation of barking deer in different altitude of the area and sighted time (Nepali standard time).

Age group/sex	Altitude (m)	Sighted Time(am)
Adult male	1120	7.10
Adult male	1190	7.30
Adult male	1320	7.15
Adult male	1445	8.10
Adult male	1155	7.30
Adult female	1210	6.35
Adult female	1255	9.15
Adult female	1175	8.05
Adult female	1440	8.10
Sub adult female	1250	6.20
Sub adult female	1230	7.10
Infant	1255	9.15

Discussion

In Hemja VDC, the barking deer distribution at different habitats was found to be clumped and uneven, which was similar with the finding of Pokharel (2005) in Royal Suklaphanta Wildlife Reserve and Nagarkoti (2006) in Nagarjun Royal Forest. The clumped pattern of distribution is common in the nature, almost the rule, when individuals are considered. Random distribution, relatively rare in nature, occurs where the environment is very uniform whereas uniform distribution occurs where competition between individuals is severe or where there is positive antagonism which promotes even spacing (Odum 1971). In the forest of Hemja VDC the resources such as food, water resources and cover were not distributed uniformly leading to the uneven distribution of the species. Increasing human pressure

to the forest resource might be another reason of uneven distribution of the species. Human disturbance and frequent pressure causes the fragmentation of the habitat along with continuous harassment to the animal's daily activities. It compels the animal to isolate into certain parts of the habitat.

Similarly, in Hemja VDC, middle range of the mountain is widely used by barking deer (Table-2 and 3). It might be due to the fact that the base of the mountain is excessively used by local people. Most of the area at the base is covered by cultivated grass and agriculture crops. So this was the area of high human disturbance. Similarly, somewhere, there was very steep mountain with less vegetation cover in the upper range of the mountain and mostly, there were human trails along the crest of the mountain. Moreover, middle range was least disturbed by human being and had high vegetation cover with natural springs for water source. That is why the middle range of the mountain was more suitable for the barking deer in Hemja area.]

Among three different blocks laid in the study area, block A and C had the higher fecal pellets density than that at block B. Block B was the southern face of the mountain which was comparatively drier than the other blocks which were faced to north of the mountain. Moreover, block A and C had denser vegetation cover than that in block B. Among these three blocks, block A had highest density of fecal pellets (Table 1), it is because the area was least encroached by human activities, as it was far distance from the human settlement area.

In Hemja VDC, the mountains were steep. Almost all the deer were encountered in steep slope and even most of the evidences of this deer were also recorded in the steep mountains. It is therefore likely that the barking deer prefers sloping terrain and steeper hills and it is in agreement with Shrestha (2003).

Barking deer are mainly solitary and shy animals. They are unevenly distributed and clumped distribution pattern was exhibited in Hemja VDC. The results confirmed that they prefer middle range of the mountains which has dense canopy cover, proper water sources and less human disturbances. Hence, our efforts should be directed towards preserving wild forests with least human interference.

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