POPULATION DYNAMICS OF MARKHOR IN CHITRAL GOL

by

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Summary. *Survey conducted to assess markhor population in Chitral Gol in January* 1977 *indicated the presence of* 299 *animals. As compared to* 1975 *estimation, an increase in male/female ratio was noticed whereas the number of young per female dropped to more than half. Males were classified into mature and over-mature categories and it was recommended that* 14 *males may be harvested. Tracks of snow-leopard confirmed its presence in Chitral Gol.*

Introduction. From December 30, 1976 to January 8, 1977 markhor (*Capra falconeri falconeri*) in Chitral Gol (declared a game sanctuary in 1971) were counted to compare the population and its structure with that recorded in February-March 1975.

This winter snowfall was delayed and only the peaks were covered with snow. The markhor had not yet completely descended to the valley bottom and were in transitional stage of migration from higher to lower elevations. Therefore, no definite territories could be marked according to herd positions, as done during the previous count (Aleem, 1976). Instead, a quick survey was conducted of all the areas of markhor distribution to avoid double counting. Binoculars (7×50) were used for spotting the animals and their categorisation by age and sex. Because of cloudy weather, the animals could be observed from dawn to dusk though poor visibility made categorisation more difficult. The rut was towards its close but some couples were still courting. The herds had, therefore, not yet stabilized and were forming and disintegrating.

Population. Though a total of 387 animals were flushed and categorised, the population was estimated to be 299 after discounting possible double sights. They were categorised as follows:

Category	Number	Percentage in the population	Number per female
Male	107	36	
Female	124	42	
Yearling	37	12	0.30
Young	31	10	0.25

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The estimate is compared below with that of 1975:

Category	*Feb.-March* 1975	*Jan.* 1977	*Deviation*
Male	61	107	+46
Female	94	124	+30
Yearling	32	37	+ 5
Young	53	31	—21
Yearling per female	0.33	0.30	
Young per female	0.56	0.25	

Thus about 90% of the yearlings and young of 1975 appear to have grown into adult males and females. The addition in males is higher than in females. Though the number of yearlings is about the same as in 1975 the number of young has markedly decreased.

Analysis of population. Male/female Ratio: The mature categories of the population i.e., males and females were distributed as follows:

Locality	Number in the locality	Males	Females	Male/female ratio
Meran	14	3	6	1 : 2
Thusi	12	3	6	1 : 2
Chutak	36	14	13	1 : 1
Shosh Mologh	39	17	16	1 : 1
Banjun Nakh	22	11	8	1 : 1
Daleem Dehar	26	6	11	1 : 2
Tajammal Nakh	24	9	11	1 : 1
Tongogh	29	12	12	1 : 1
Kasaver	34	15	13	1 : 1
Kasaver Lasht	18	7	7	1 : 1
Ishpe Dher	17	5	7	1 : 1
Krui Dheri	28	5	14	1 : 3
Total	299	107	124	

The male/female ratio in the adult popultion in most of the areas is 1 : 1. Jarvis (1965-68) and Lucas (1969-70) (cf. Schaller, 1971) reported a 45/48 ratio amongst 98 markhor of unspecified race born in various zoos. Rudge (1969) while studying shot samples of feral goats (*Capra hircus* L.) from forests near Wellington, New Zealand, sexed thirty three embroys from 38 pregnant females. 18 of these were males and 15 females giving a 1 : 1 ratio.

Compared to the 1975 count, the proportion of males was higher in 1977: the male/female ratio in the entire population being 107/124 as compared to 61/94 in 1975.

Overmature males: The males have been reported to live even for an age of 15 years whereas the females older than 8 years have rarely been seen, thus it can safely be inferred that if the males older than 7 years are excluded from the population, it would not be harmed. Moreover, the older males get too bulky and because of less agility cannot effectively compete with the younger males for mates.

The male population was categorised into over mature (age over 7-1/2 years) and mature, as follows:

Location	No. of males	Mature	Over mature
Meran	3	2	1
Thusi	3	3	—
Chutak	14	12	2
Shosh Mologh	17	14	3
Banjun Nakh	11	7	4
Daleem Dehar	6	5	1
Tajammal Nakh	9	8	1
Tongogh	12	9	3
Kasaver	15	11	4
Kasaver Lasht	7	5	2
Ishpe Dher	5	5	—
Krui Dheri	5	4	1
Total	107	85	22

Thus a population of 107 males contained 22 over—mature animals. Eight of these were in localities where no mature males were present. 14 *over mature males can thus be harvested to bring the population in balance*. Though no records are available for the number of females a male serves during the rut, in a number of localities one male was accompained by more than one female. At the same time more than one male were observed in a herd but such males are always dominated and only one, the strongest takes part in the rut. Schaller (1971) reported 6 herds with the following male/female ratios (excluding yearlings)—6 : 4, 2 : 4, 1 : 4, 2 : 4, 1 : 3, 1 : 4.

The five herds observed during the present survey showed the following proportion (yearlings excluded)—5 : 6, 4 : 3, 3 : 1, 5 : 3, 3 : 4.

Females in relation to yearlings and the young: The number of yearlings and the young in the population was as follows:

Locality	Females	Yearling	Yearling/female ratio	Young	Young/female ratio
Meran	6	2	0.33	3	0.50
Thusi	6	2	0.33	1	0.17
Chutak	13	5	0.39	4	0.31
Shosh Mologh	16	4	0.25	2	0.13
Banjun Nakh	8	1	0.13	2	0.25
Daleem Dehar	11	6	0.55	3	0.27
Tajammal Nakh	11	2	0.18	2	0.18
Tongogh	12	2	0.17	3	0.25
Kasaver	13	4	0.31	2	0.15
Kasaver Lasht	7	2	0.29	2	0.29
Ishpe Dher	7	1	0.14	4	0.57
Krui Dheri	14	6	0.43	3	0.21
Total	124	37	0.30	31	0.25

The yearlings and the young count of 1977 is compared below with that of 1975:

	1975	1977
Yearling (total)	32	37
Young (total)	53	31
Yearling/female	0.33	0.30
Young/female	0.56	0.25

The number of yearlings in the population (37) and the number of yearling per female (0.30) are about the same as 1975 (32 and 0.33), the young/female ratio has however, drastically declined from 0.56 to 0.25.

Herd composition. Due to rut season the markhor did not exhibit a stable herding behaviour. Eight herds were observed with the following composition:

Herd No.	Total animals	Males	Females	Yearling	Young
1	11	5	6	—	—
2	7	4	3	—	—
3	5	3	1	—	1
4	11	5	3	—	3
5	9	3	4	—	2
6	4	3	—	1	—
7	5	4	1	—	—
8	8	6	—	2	—

Of the 8 herds there were no young in 5 herds whereas 5 others lacked in the presence of yearlings. The number of young in the herds was also small ranging from 1-3. The two largest herds seen were of 11 animals: One (number 1) comprising 5 males and 6 females, the other (number 7) containing 5 males, 3 females and 3 young indicating male dominance. The herds were forming and disintegrating. Hard No. 6 comprised of 4 individuals, 3 males and one yearling female. One male out of 3 was dominating the other two and a fight to attract the yearling female was on when herd No. 7 of 5 animals consisting of 4 males and one female joined this herd and a reshuffle in herds was noticed: The yearling female and one male of herd No. 6 joined herd No. 7 whereas the female of herd No. 7 joined the herd No. 6, thus regrouping into herds of 2 males and one female (herd number 6), and 5 males and one female (herd number 7) indicating the instability in the herd composition.

Predation. Wolf (*Canis lupus*), falcon (*Falco bimaricus*) and to some extent fox (*Vulpes vulpes*, only on stranded youngs are the predators on markhor. The reports of predation, however, were not made during the study period.

Snow leopard (*Panthera uncia*) was the major predator prior to 1972, but since it seemed to have disappeared. But during the present study tracks of two (a couple) snow leopards were observed along the contour path for a distance of almost 4 km. (Fig. 1) after which these were lost in the rock.

Fig. 1. Tracks of snow Leopard. Pug marks were observed along the contour path. Two different sized paws showed the presence of a couple.

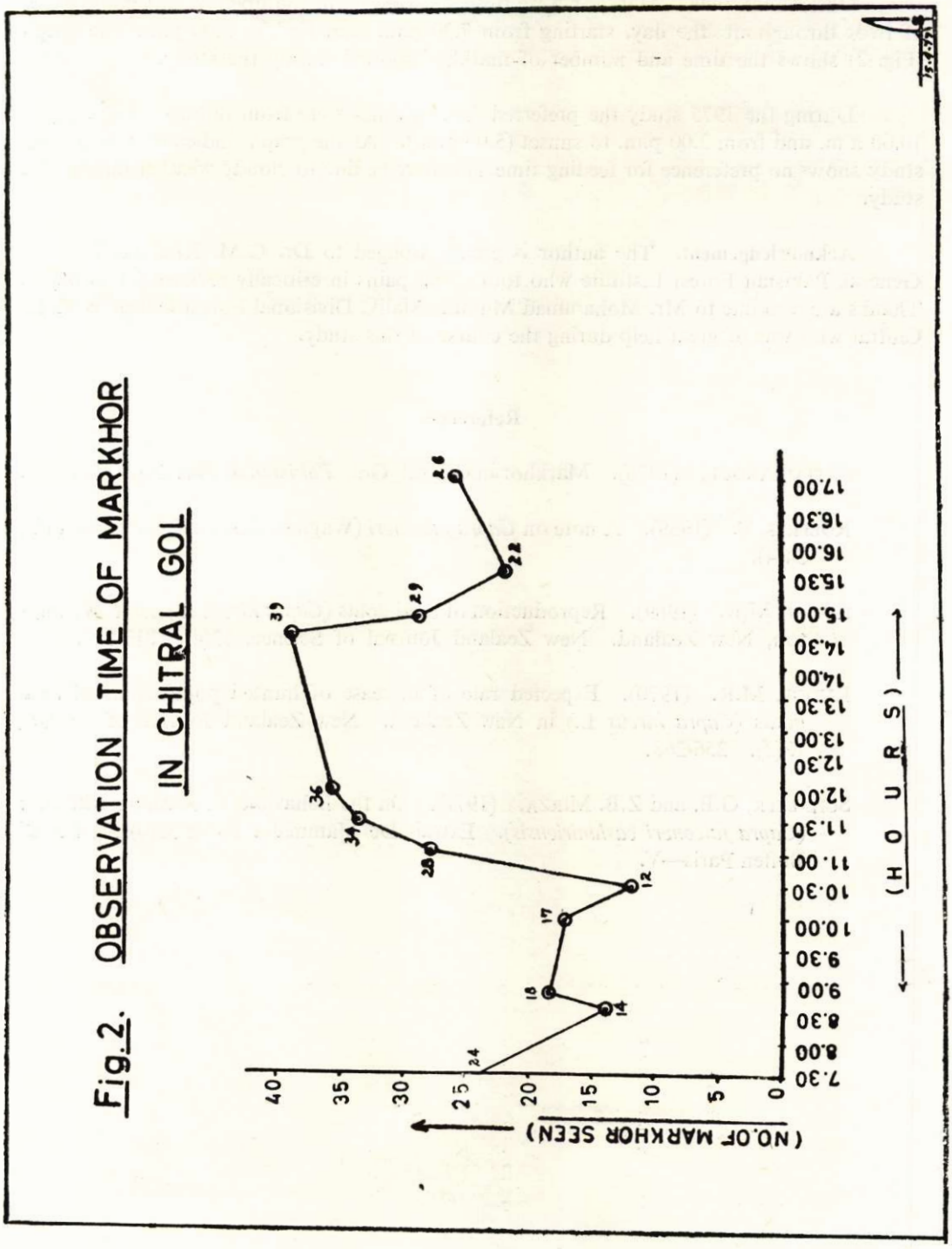
Fig.2. OBSERVATION TIME OF MARKHOR IN CHITRAL GOL
(NO. OF MARKHOR SEEN)
(HOURS)
40
35
30
25
20
15
10
5
0
7.30
8.00
8.30
9.00
9.30
10.00
10.30
11.00
11.30
12.00
12.30
13.00
13.30
14.00
14.30
15.00
15.30
16.00
16.30
17.00
24
14
18
17
12
28
34
36
39
29
22
26

Observation time. Markhor were observed feeding in the open or under the cover of trees throughout the day, starting from 7.30 a.m. (sun rise) to 5.00 p.m. The graph (Fig. 2) shows the time and number of markhor spotted during the study.

During the 1975 study the preferred feeding times were from sunrise (7.00 a.m.) to 10.00 a.m. and from 3.00 p.m. to sunset (5.00 p.m.). As the graph indicates, the present study shows no preference for feeding time.This may be due to cloudy weather during the study.

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References

ALEEM, ABDUL, (1976). Markhor in Chitral Gol, *Pakistan J. For.* 26(2). 117-128.

ROBERTS, T. (1969). A note on *Capra falconeri* (Wagner, 1939), z.f. Sougetiesunds, 34(4).

RUDGE, M.R. (1969). Reproduction of feral goats (*Capra hircus* L.) near Wellington, New Zealand. New Zealand Journal of Science, 12(4). 817-827.

RUDGE, M.R. (1970). Expected rate of increase of hunted populations of feral goats (*Capra hircus* L.) in New Zealand. New Zealand Journal of Science, 13(2). 256-268.

SCHALLER, G.B. and Z.B. MIRZA, (1971). On the Behaviour of Kashmir Markhor (*Capra falconeri cashmiriensis*). Extrait De Mammalia Tome 35(4) 55, rue ed Buffen Paris—V.