

{2596}

ECOLOGY AND CONSERVATION OF SNOW LEOPARD PROJECT

(WWF Project # 6628)

Progress Report # 2

(Covering the period December, 1990 - March, 1991)

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INTRODUCTION:

This report summarises progress of the Ecology and Conservation of the Snow Leopard Project during the period December, 1990-March, 1991. A significant progress was made during this period - 3 snow leopards were radio-tagged and radio-tracked, a winter blue sheep survey was completed, and data was collected on activity, home range and sociality of snow leopard. A good sample of snow leopard scats were collected. Information was updated on the livestock depredation and additional questionnaires were completed.

Although a good season for the field work, the environment in this period was not very hospitable as heavy and frequent snow fall, deep accumulation of snow, and occasional snow storms with extremely low temperature affected the efficiency of the research team. The camp tents were collapsed several times by storms heavily laden with snow. Several days had to be spent clearing snow around the camp and mending the tents. Shortage of provisions and difficulty in portering the supplies to the camp was another problem the research team had to face.

Bouncing-off of the radio signals also presented a major problem in radio-tracking the collared snow leopards.

Despite all these adversaries, a total of 89 days were devoted to the field work.

This report is only intended to provide information on the snow leopard. Information on the blue sheep population and habitat use, food habits of the snow leopard, and snow leopard-human population interaction will come out shortly in a detailed report.

METHODS:

The methods used to study the blue sheep, and habitat classification system adopted in this study has been described earlier (Progress Report # 1). Therefore, only the methods used in trapping, immobilising, radio-tagging and radio-tracking of snow leopard is described briefly here.

A. Capture and immobilisation:

Two snow leopards were trapped using leg-snares placed on the trails known to be used by snow leopards. Initially, the snare cable was attached onto a metal stake 90-115 cm long, driven in to the ground. However, stakes were no longer used soon after I realised that they were not strong enough to hold snow leopard in the trap. The snare cable was then attached to a metal cable which was tied at both ends to heavy rocks. These rocks were placed in pits and weighted with more rocks to ensure that they can not be moved.

The captured snow leopards were immobilised with ketaset (ketamine hydrochloride) at an average dose of 7.26 mg/kg body weight combined with rompun (Xylazine hydrochloride) at an average dose

of 1.14 mg/kg body weight. The immobilised cats were weighed, measured and tattooed on the inside of one ear with identification number. The sex and age of the immobilised snow leopard were determined on the basis of genitalia, weight, measurements, tooth wear, and size & colouration of the nipples in case of females.

B. Radio-tagging:

The immobilised snow leopard was then fitted with a radio-transmitter weighing approximately 500 gm around its neck. The transmitter, containing an activity sensor, gave a fast pulse rate (85 beats per minute) when the animal was active and the pulse rate slowed down to 60 beats per minute when the animal was inactive.

C. Activity pattern:

The immobilised snow leopards were monitored for 24 hours and their activity was recorded at an interval of 5 minutes after they recovered from sedation and left the capture area, with a view to assess the effect of drugs and handling on their normal activity. These data, however, were omitted from analysis of the later activity data.

In addition, activity patterns of radio-tagged snow leopards were monitored for a minimum of 24 hours continuously at an interval of 5 minutes after the snow leopards had recovered from the experience of drugging and handling.

D. Home range:

The radio-collared cats were tracked from the ground. Position of the collared snow leopards were fixed from two or more prominent spots on the slope opposite to the location of the leopard. Bearings of the cat position were taken from such spots and location was determined using the triangulation method. Each cat location was plotted on the Survey of India maps (Scale 1:50,000). Home range of the collared cats was calculated using the minimum area polygon method.

RESULTS

A. Capture and immobilisation:

Leg snares were set for a total of 935 trap nights. Two snow leopards (SL 01 and 02) were trapped and the trapping success rate was 0.21%. Similarly, "Khor" (a kind of cage trap made from rocks and wooden planks), baited with live goat was operated for 50 trap nights. One snow leopard was trapped in the "Khor" (SL 03) and the trapping success rate was 2%.

No major injuries attributable to trapping were noticed except minor scratch on the legs as a result of leopard's struggle to escape. The use of "Khor" was found to be much efficient in capturing snow leopards inspite of several problems associated with it.

Table 1. Weight and measurements of the radio-collared snow leopards.

Cat No.	Age & sex	Weight (kg)	Body length (cm)	Tail length (cm)	Front shouder height (cm)	Capture date
01	Ad. Female	40-45 (est.)	111	89	71	30 Dec., 1990
02	Ad. Male	47	115	93	71	23 Jan., 1991
03	Ad. Female	39	113	93	78	1 Feb., 1991

No adverse effects of the drugs were noticed except mild salivation in SL 01, which was possibly due to a slight overdose. No animals were injured or lost as a result of capturing, immobilisation and handling. Weight, measurements and date of capture of all the snow leopards are presented (Table 1).

B. Radio-tagging:

Three snow leopards (2 adult females and 1 adult male) were fitted with radio-transmitters (table 1). Leopards 01 and 02 were adult females. Judging from the weight, body size, and size & colouration of nipples, both of them had given birth previously but were not lactating at the time of capture. Also no evidence of cubs accompanying SL 01 and 03 at the time of capture was found. Leopard 02 was an adult male, darker in colour than SL 01 and 03.

C. Activity pattern:

Leopards 01, 02, and 03 were active for 41.02% (N=234), 43.62% (N=298), and 40.74% (N=297) immediately after they recovered from the effect of drugs and left the capture area. Overall activity of snow leopards following such experience was 41.86% (N=829). However, a significant percentage of the active period can be attributed to the cat's effort to remove the radio collar.

In general, the male (SL 02) and the females (SL 01 and 03) were active for 47.14% (N=630) and 41.09% (N=932) respectively. The snow leopards were active for 43.53% (N=1562) of monitored time (data pooled from all collared leopards). Percent activity of the leopards during night (2000 hrs to 0355 hrs.), dawn (0400 hrs to 0755 hrs.), day (0800 to 1555 hrs.) and dusk (1600 to 1955 hrs.) was 36.08%, 43.56%, 40.28%, and 60.31% respectively.

Although the sample size of the activity data was considered small to draw conclusion, data presented in this report provide baseline information on the winter activity pattern of snow leopard. My data suggest that snow leopards are crepuscular in habit with activity peaking at dusk and dawn (fig. 1 & 2).

D. Home range and socialisation:

Snow leopard 01 was located 15 times between 30 December, 1990 and 16 February, 1991. SL 02 was located 16 times between 23 January and 16 February, and SL 03 was located 10 times between 1-16 February. Although the sample size of the leopard location is small, it is believed that the results presented here provide

Fig.1. Activity pattern of male leopard

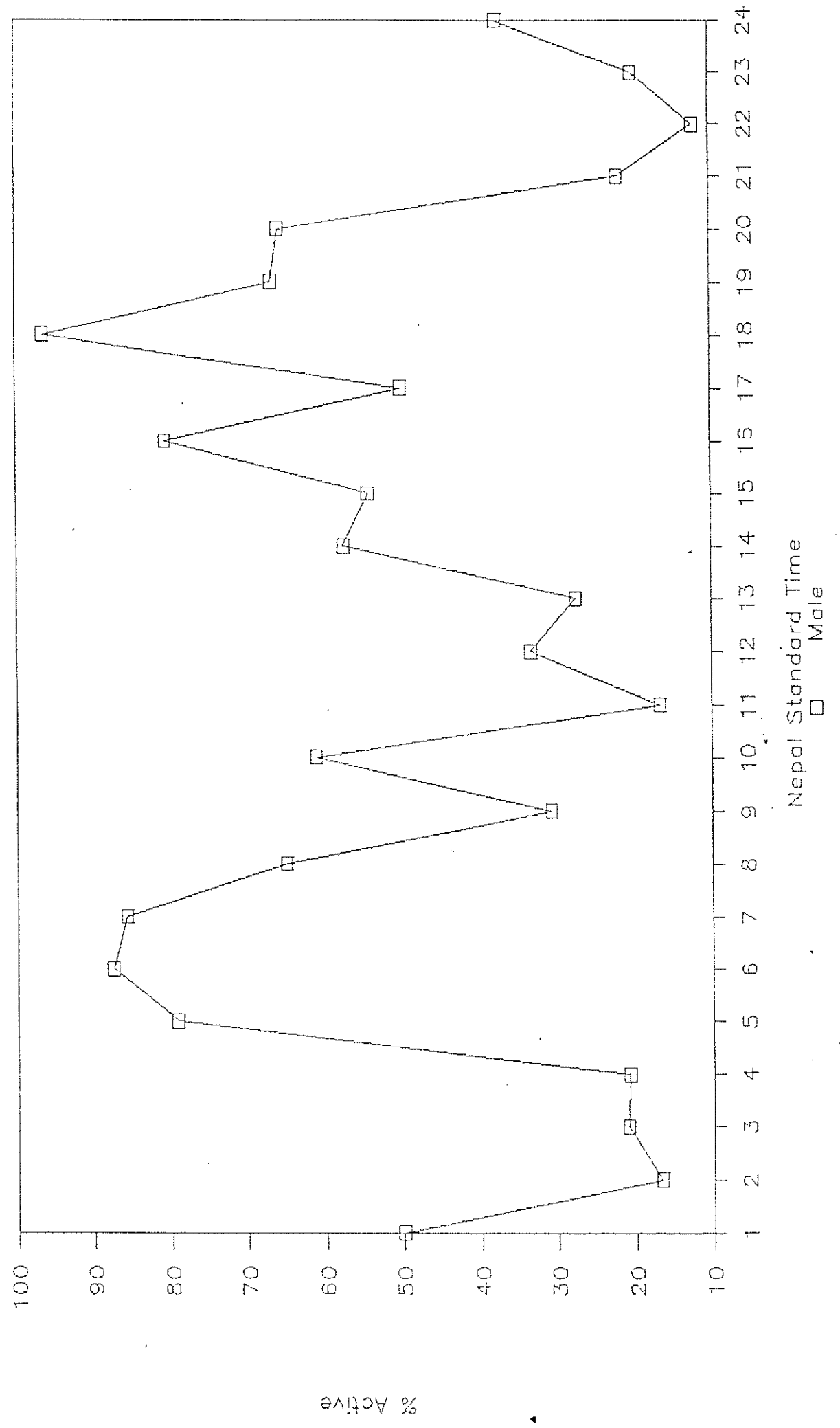
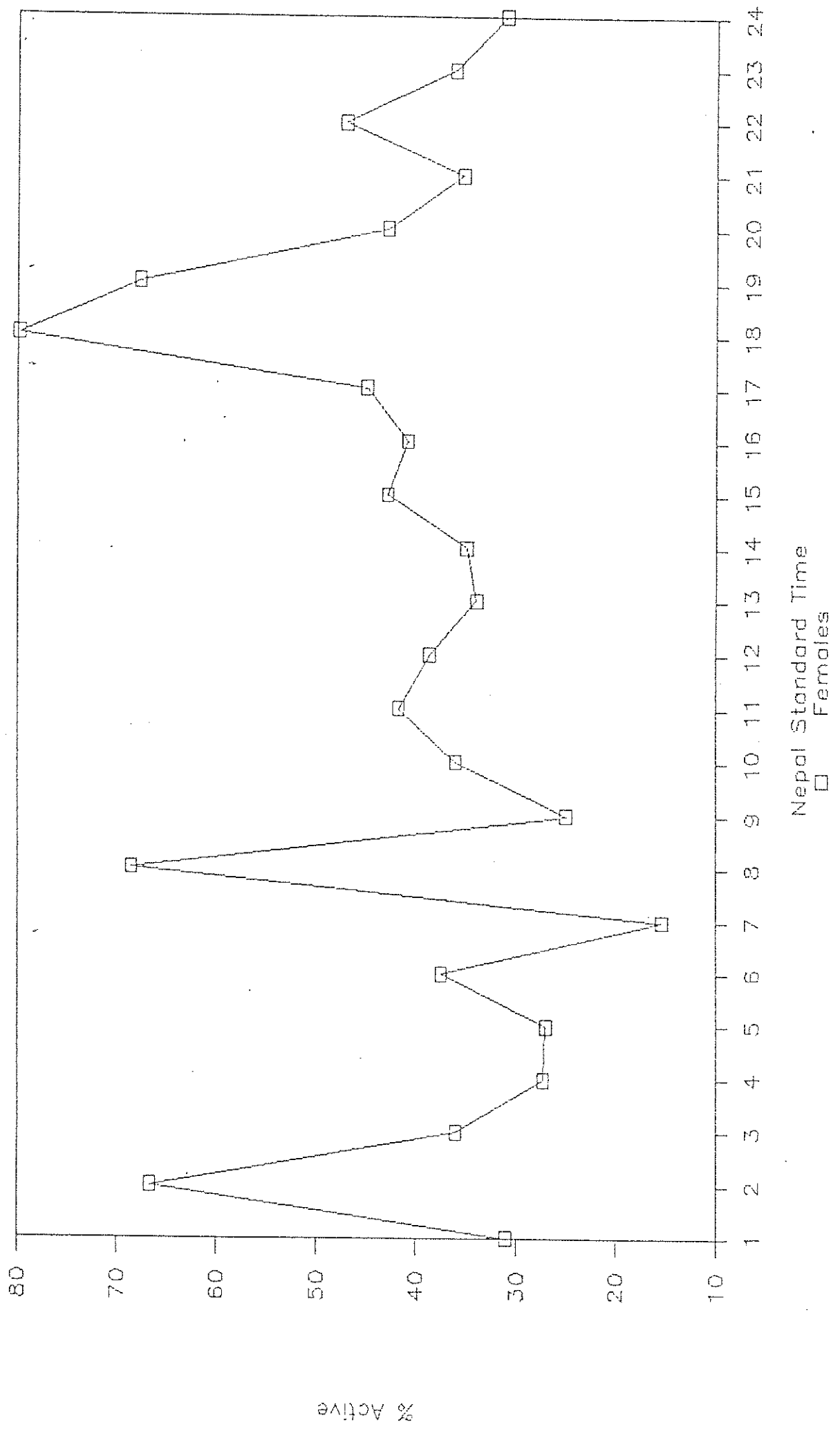


Fig.2. Activity pattern of female cats



a baseline information on the home range size of the snow leopards in Manang.

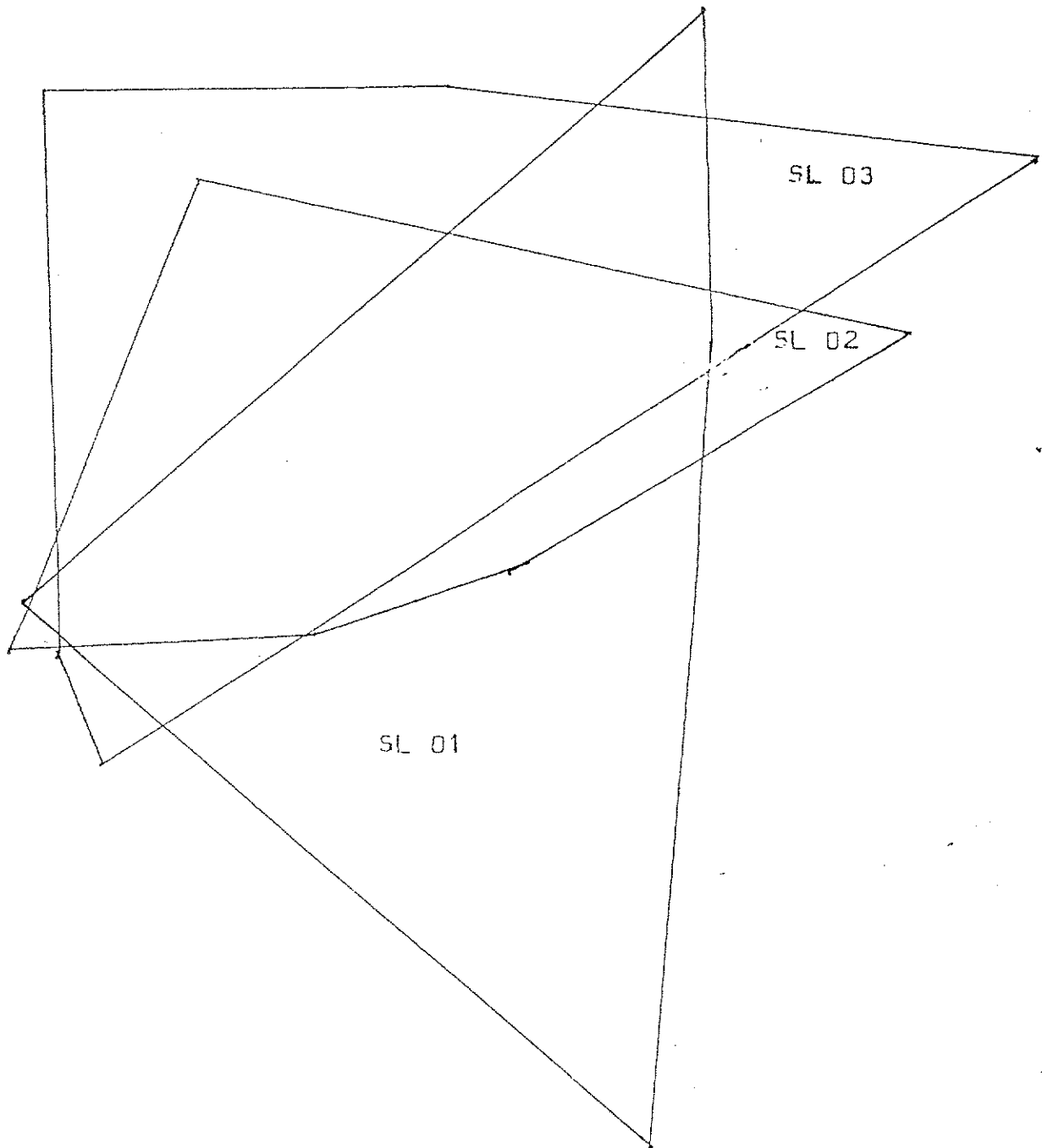
Home range for SL 01, 02, and 03 was 22.55 sq.km, 13.85 sq.km, and 21.05 sq.km respectively (table 2). Home ranges of all 3 snow leopards were more or less triangular in shape and overlapped almost entirely. An area of 8.02 sq. km at the centre of the core study area was shared by all the radio-tagged leopards (Fig. 3). Home range overlap between SL 01 and 02, 01 and 03, and 02 and 03 were 10.27 sq. km, 10.42 sq. km, 11.17 sq. km respectively.

Table 2. Home ranges for 3 radio-collared snow leopards

(Minimum area polygon method)

SL #.	Sex & age	No. location	Home range size (Sq. km)
01	Adult female	15	22.25
02	Adult male	16	13.85
03	Adult female	10	21.05
	Mean		19.15

Fig. 3. Home ranges for snow leopard 01 (adult female), 02 (adult male), and 03 (adult female).



Association among the radio-tagged leopards was found between SL 01 and 02 on 23 January (capture date of SL 02). Two sets of tracks of similar age on the snow, pugmark measurements, and subsequent radio-tracking confirmed that SL 01 and 02 were together when SL 02 was captured. As it was the peak rut season, and SL 01 and 02 were adult male and female respectively, it was presumed that they were breeding partners. SL 02 & 03, and SL 01 & 02 were located at a distance of 0.5 km. once each. SL 01 and 03 almost always maintained a distance of 1 km. or more. No evidence of snow leopard patrolling the home range boundaries or territoriality associated with defending home range was found. However, judging from the significant percentage of overlap between home ranges of all the snow leopards, it seems as if the spacing mechanism works temporally, rather than spatially.

E. Food habits of snow leopards:

A good sample of snow leopard scats was collected. The scats collected throughout the year shall be analysed to study the food habits and any seasonal variation in diet.

D. Blue sheep population, and snow leopard-human population conflict:

A winter survey of blue sheep population was conducted during December, 1990 - February, 1991. Fifty-three additional questionnaires were completed which registered the public attitude towards wildlife, degree of livestock depredation by the snow leopard, and local people's recommendations to abate the con-

flicting situation. In addition, 11 confirmed cases of livestock killed by the snow leopard was recorded. Details on these aspects of the project will follow in reports under preparation.