

**SHORT-TERM EFFECTS OF THE KETZA RIVER GOLD MINE, ON THE
DISTRIBUTION AND DEMOGRAPHY OF THINHORN SHEEP (OVIS DALLI)**

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INTRODUCTION

Since 1984 major developments by Canamax Resources Inc., and Pacific Trans-Ocean Resources Ltd. have occurred on the Ketz River gold property at the headwaters of the Ketz River. Site development began in 1987, and the gold mine was in full production in 1988. In 1987 the mine was expected to produce 1550 kg of gold annually over a mine life of 4.5 years, and employ approximately 109 people (Indian and Northern Affairs 1988).

The mine site is at 1400 m a.s.l. in an area where sheep (Ovis dalli) are known to occur, and access to the mine is along a road which bisects good sheep habitat. Concern for wildlife in the vicinity of the mine was raised in the early 1980's when Iona Silver Mines Ltd. was exploring 5 km east of the Ketz property. At that time a road existed along the lower extent of the Ketz River. B.C. Research Ltd., an environmental consulting firm, was employed by Iona Silver Mines Ltd. to provide an environmental evaluation in the Ketz River watershed and surrounding area. Their evaluation was brief, making reference to only two sheep sightings in the two preliminary reports available to the Yukon Territorial Government (YTG). These results were at odds with previous wildlife survey work by YTG in 1976 and 1977 (Lortie et al. 1978); at that time sheep were considered relatively common in the area.

The discrepancy in results and interpretations between these two independent wildlife surveys prompted YTG and Canamax to again assess wildlife resources in the vicinity. Two helicopter surveys were completed by YTG in 1986 to inventory the sheep population and delineate sheep winter range. Approximately 100 sheep were observed on each flight in the vicinity of the mine. In addition numerous people were interviewed for their impressions of wildlife in the area, and the locations of 5 mineral licks were disclosed,

substantiating the belief that the area is important to thinhorn sheep.

Since that study was done, the mine has gone into full production, the road to the mine and mill site has been upgraded, exploration in the surrounding area has increased, and approximately 70 positions have been staffed on a rotational basis. Traffic levels associated with hunting and off-road recreation have increased. Potential impacts on sheep include harrassement, and hunting losses in addition to habitat loss.

This study was proposed to: (1) compare the demographic characteristics of the sheep population straddling the Ketzka River to a distant population northwest of the mine site but in a similar ecological region (Oswald and Senyk 1977); (2) determine seasonal distribution of the Ketzka population; and (3) further delineate critical habitat. The study was intended to provide further baseline data on range-use patterns, and to measure the immediate effects of mining activity on the demography of a resident sheep population.

STUDY AREA

The area of study is in the St. Cyr Range of the Pelly Mountains, south of Ross River and falls with portions of Game Management Subzones 10-01, 10-04 and 10-05. One study block (the Ketzá block) was a corridor extending the length of the Ketzá River road and up to 12 km on either side of the road (Fig. 1). The control block was northwest of the Ketzá Mine and southeast of the South Canol Road (see Fig.1).

The entire study area is within the Pelly Mountains Ecoregion (Oswald and Senyk 1977). The area is rugged and much of it is above treeline at 1350 to 1500 m a.s.l (Oswald and Senyk 1977).

The Ketzá River Road leaves the Robert Campbell Highway and travels 49 km south into the Pelly Mountains along the Ketzá River and Cache Creek to an elevation of 1400 m a.s.l. It passes directly through active sheep range.

Both Stone and Fannin sheep are common in the study area. Pelage of resident sheep varies from almost pure white to black. Caribou (Rangifer tarandus), moose (Alces alces) and bear (Ursus arctos and U. americanus) are also common in the study area.

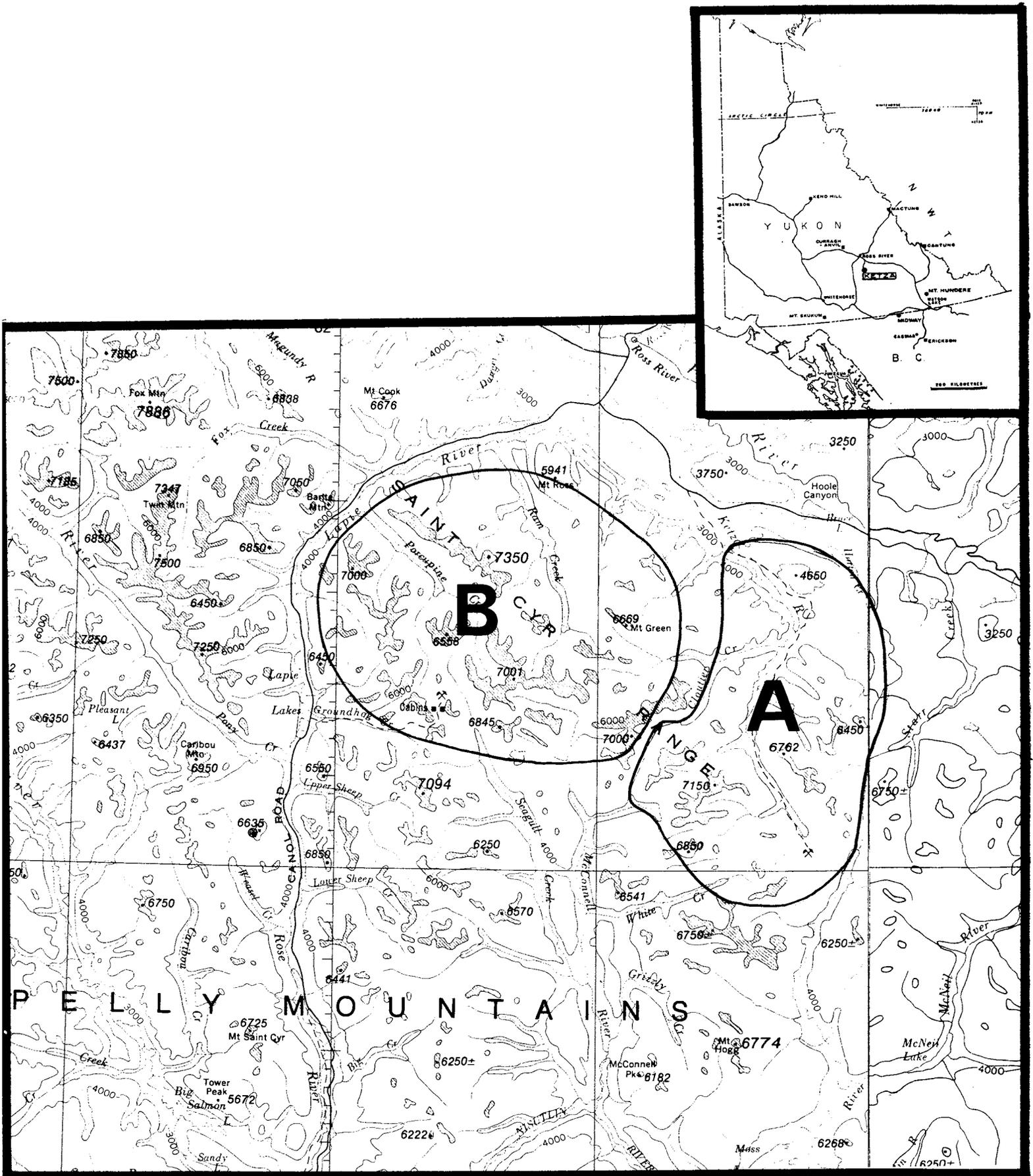


Figure 1. Location of (A) the Ketza River study block and (B) the control block within the Pelly Mountains.

METHODS

Two complete, systematic helicopter surveys were conducted in the Ketzá block, in June and November 1988. These augmented the two previous surveys done in March and May, 1986. Together, these sheep surveys were intended to delineate seasonal ranges, and to assess abundance and population composition. In addition, one helicopter survey was conducted in March, 1989 on winter ranges delineated in March, 1986, to determine population composition.

Complete surveys conformed to procedures described in Barichello et al. (1987). Entire coverage of potential sheep habitat was surveyed by helicopter with three observers on board, and sheep were counted and classified by sex and horn class.

In the control block, survey boundaries were not rigid, and an incomplete search was made of potential sheep habitat. The purpose was to provide a comparison of demographic features with the Ketzá river population. Of particular interest was the difference in lamb production between regions.

RESULTS and DISCUSSION

Seasonal Ranges

Seasonal ranges are presented in Figures 2 to 5. We suspect sheep were missed during surveys, particularly in May and June when sheep were in snow-free areas; we therefore believe results are incomplete. Much of the Ketza River area appeared to be used by sheep throughout the year. It is noteworthy that in the area immediately around the mine-site sheep were observed on three of the four systematic surveys.

Demographic comparisons

It was our impression that sheep were very difficult to observe, therefore counts may not accurately represent abundance. The camouflage characteristics of stone/fannin sheep pelage, a high treeline, the extensiveness of a well-developed shrub zone, and possibly the relatively heavy use by dark sheep of the shrub zone, may contribute to poor sightability of sheep in the study area. We suspect that the very low May/June counts reflect, in particular, the difficulties in sighting dark animals in a snow-free environment.

In the Ketza block, as many as 56 non-lamb sheep, 35 nursery sheep and 21 rams, and 22 lambs were observed in the study area from 1986 to 1989 (Table 1). Arbitrarily accepting an observer error of up to 30%, we estimate a population of approximately 27 rams and 46 nursery sheep, and on an average year, 15-20 lambs, surrounding the Ketza River road.

From March 1986 to March 1989, in the Ketza block, there was an increasing trend in nursery sheep numbers and total sheep observed. Productivity has varied from 32 to 63 lambs per 100

Table 1: Numbers and composition of sheep observed from helicopter surveys in; (A) the Ketzá block, and, (B) the control block, from 1986-1989.

Date	Area	Total	Nursery	Lambs	Rams		Lambs per 100 ns
					Total	4/4	
March, 1986	A.	65	28	16	21	5	57
March, 1986	B.	46	23	12	11	3	52
May, 1986	A.	26	17	-	9	4	-
May, 1986	B.	48	33	-	15	10	-
June, 1988	A.	38	22	7	9	0	32
June, 1988	B.	66	46	6	14	5	13
Nov., 1988	A.	66	33	19	14	6	58
Nov., 1988	B.	10	5	2	3	2	40
March, 1989	A.	73	35	22	16	8	63
March, 1989	B.	55	34	11	10	5	32



Figure 2. Area surveyed in March, 1986. Shaded areas show distribution of sheep.

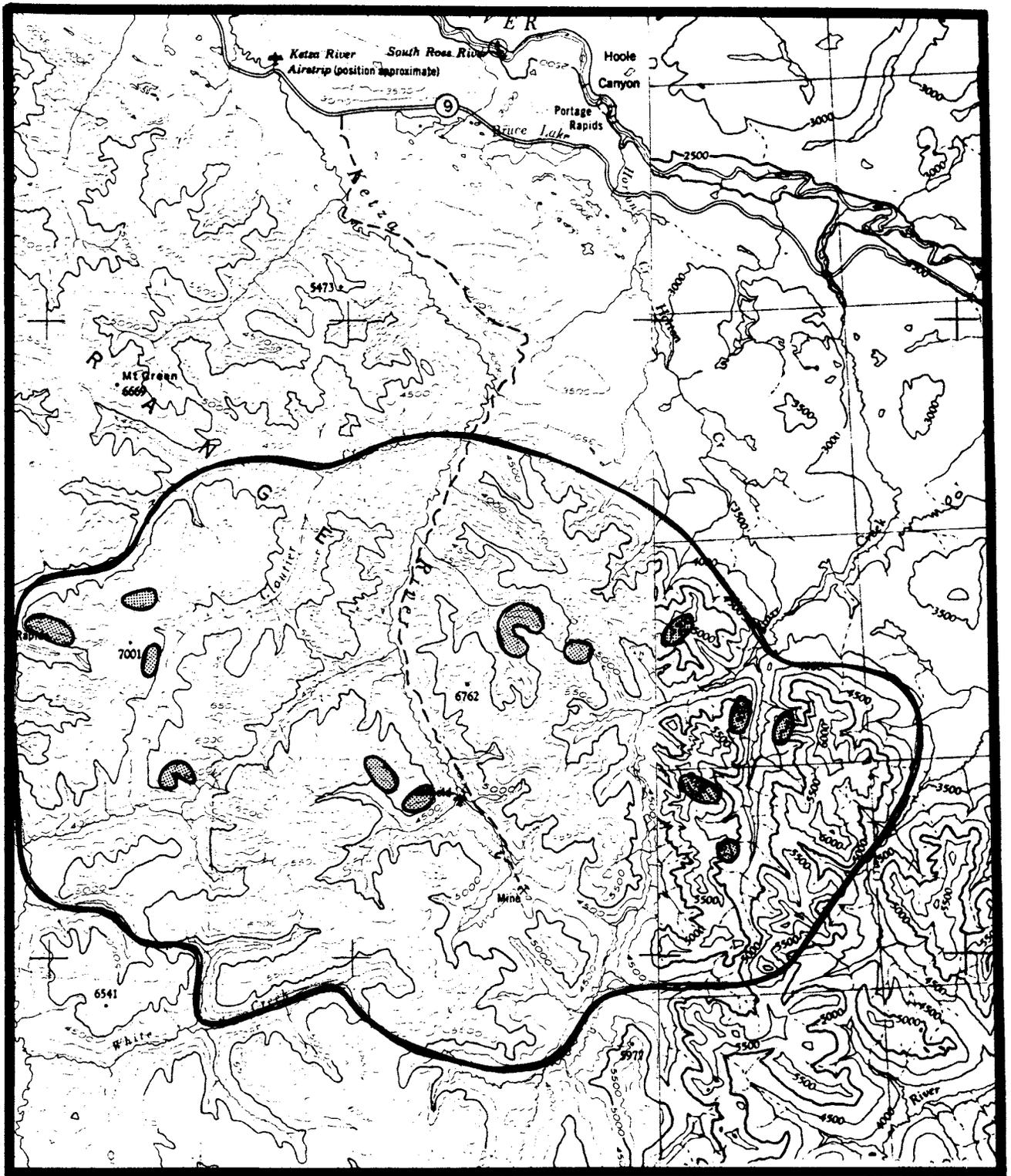


Figure 3. Area surveyed in May, 1986. Shaded areas show distribution of sheep.



Figure 4. Area surveyed in June, 1988. Shaded areas show distribution of sheep.



Figure 5. Area surveyed in November, 1988. Shaded areas show distribution of sheep.