

Government of Yukon



BOX 2703, WHITEHORSE, YUKON Y1A 2C6

TELEPHONE 403-667-5811

TELEX 036-8-260

GAME BRANCH

OUR FILE 3997-14
YOUR FILE

November 7, 1978

MEMORANDUM TO: Gordon Hartman

FROM: Manfred Hoefs

RE: Status of Goats in G.M.Z. 7

Attached is the report on the status of goats in G.M.Z. 7, based on our 1978 surveys. It includes a number of recommendations on which I would appreciate your decision.

- Done*
- a) If you agree with my renewed attempt to get the B.C. people to close goat hunting along the Skagway Road, please send a copy of this report (included) to Victoria. I think that may be a better method than working through Dave Hatler. At least Victoria will know about our request, and they can then send it on to Smithers for consideration.
 - b) In order to give the outfitter (Babala) sufficient notice, please let me know as soon as possible which of the harvest options, in the western half of G.M.Z. 7 you would like to see implemented.
 - c) If you agree with the recommendation regarding continuing monitoring as well as limited transplants (2 or 3 goats per season), \$6,500.00 will have to be transferred to my "special studies" account and Bill Magnusson must be informed about it.

Manfred Hoefs
Manfred Hoefs

MH/jm
Attch.

AN ASSESSMENT OF THE STATUS OF GOATS IN G.M.Z. 7

MANFRED HOEFS
YUKON GAME BRANCH
1978

CONTENT:

INTRODUCTION (BACKGROUND)

THE STATUS OF GOATS IN G.M.Z. 7

PRODUCTIVITY, RECRUITMENT AND HARVEST RATE OF GOATS

GOAT HARVEST IN G.M.Z. 7

RECOMMENDATIONS

REFERENCES CITED

APPENDICES:

DETAILED FLIGHT NOTES OF GOAT SURVEYS

WILDLIFE OBSERVATIONS MADE DURING GOAT SURVEYS

COST OF GOAT INVESTIGATION

MAP OF SURVEY AREA

INTRODUCTION (BACKGROUND)

In spite of the fact that mountain goats are the rarest big game species in the Yukon with only about 500 subject to hunting, game laws until 1974 were very liberal. There was a territory-wide open season of three month's duration (August 1 to September 30), and goats of either sex could be shot as long as their horns were 10 cm (4 inches) long. This provision only protected the kids of the year, since yearling goats already have horns longer than 10 cm by the time the hunting season starts in August.

When big game inventories were started in 1973 and 1974, it soon became apparent that the relatively small goat populations were subject to severe hunting pressure and that goats in some areas were definitely over-harvested. While 50 to 60 goats per season in the early 1970's may not appear excessive from a total population of about 500, one has to realize that hunting pressure was not evenly distributed, being concentrated in accessible areas. In particular, Game Management Zones 7 and 9, south of Whitehorse, were heavily hunted with at least 20 goats taken out of a population of about 100 animals in 1973.

A number of restrictions were imposed for the 1974 hunting season with the objective of reducing the harvest, particularly that of female goats, and allowing the depleted populations in Game Management Zones 7 and 9 to recover. In 1974, with the establishment of Game Management Zones, the Game Branch was able to deal with these depleted areas separately from others, where goat populations were still in better shape.

The following new regulations came into effect in 1974: female goats accompanied by a kid were protected; all goats with a horn length of less than 20 cm (8 inches) were protected; the length of the open season in Game Management Zone 7 was reduced to one month (September 1 to September 30); Game Management Zone 9 was closed to goat hunting, and all heads of the goats taken had to be submitted to the Game Branch for inspection and measuring (Hoefs *et al*, 1977).

While these new regulations were effective on a Yukon-wide scale in reducing the harvests and in shifting it away from the breeding stock, they were not stringent enough to protect the goats in G.M.Z. 7, particularly those in its eastern half. Annual monitoring revealed continuing population declines. When the harvest increased by 40% in 1977, the Game Branch decided to close goat hunting in the eastern half of G.M.Z. 7 for the 1978 season and to assess the status of goats in the entire G.M.Z. 7 during the 1978 summer.

Regardless of the outcome of this survey, the Game Branch also committed itself to a quota system on goat hunting for the entire Yukon Territory effective for the 1979 hunting season.

THE STATUS OF GOATS IN GAME MANAGEMENT ZONE 7, BASED ON 1978 SURVEYS

Aerial surveys were made with a Gazelle Helicopter (Shirley Helicopters' Ltd.) on the following dates: August 8, August 16, August 18 and September 5, 1978. During the August 8, 1978 survey, Dr. Dave Hatler of the B.C. Fish and Game Branch, participated as observer, since our flights extended for a considerable distance into B.C., and Dr. Hatler is B.C.'s regional biologist responsible for these adjacent areas.

Detailed flight reports for each of those dates are attached as an appendix to this report and they deal with personnel involved, weather conditions, flight routes and durations and observations made.

During this four-day reconnaissance, which covered Game Management Zone 7, adjacent areas of B.C., and one physiographic subdivision of the Kluane Game Sanctuary for comparisons, a total of 227 goats were observed, of these 151 were in the Yukon.

The large map in the appendix shows the total area covered and the locations where goats were observed.

Eastern Half of G.M.Z. 7:

That area of G.M.Z. 7 located east of Kusawa Lake has been of concern to the Yukon Game Branch for some time. The performance of its goat population has been monitored for four years, and goat hunting was terminated in it in 1978 because of the steadily declining trend in the population. The total number of goats in this area observed during our flights was 106, however only 29 were located in the Yukon. This total count is not comparable

to those made in previous years, since our 1978 survey extended further into B.C. If only goats on Yukon soil are considered, there was a further decline, since 31 were observed in the Yukon in 1977, but only 29 this year. One positive aspect was the observation of 6 goats on Montana Mountain, where only 3 were located last year. This observation shows that migration into the Yukon from B.C. is still taking place and will most likely result in a build-up of depleted Yukon populations, if protection from hunting can be maintained. The best goat habitat in the eastern half of G.M.Z. 7 (on the Yukon side of the border) is the Bennett Range, where 16 goats were located in the Yukon and 9 more just south of the border. This area is the home range of a nursery group of goats which have been observed here every year and which don't seem to move off onto adjacent ranges. For this reason it is suggested to designate it as a special goat management unit. It has been marked on the attached map.

Western Half of G.M.Z. 7:

The area of G.M.Z. 7, located west of Kusawa Lake to the Haines Road, constitutes a better wildlife management unit from the political point of view, since the Blanchard River valley and the adjacent upland between Blanchard Lake and Kusawa River form distinct physiographic boundaries, and migration of goats across the B.C. border is less likely than in the eastern half of G.M.Z. 7. For this reason our surveys did not extend much into B.C. In this area which forms the southern half of J. Babala's out-fitting area, we counted 45 goats, consisting of 35 adults and 10 kids. Hunting appears to have reduced the goat population also in the area, even though not as severely as in the eastern half of G.M.Z. 7.

Mountain ranges paralleling the Haines Road, on which as recently as 1976 goats were shot, did not have any goats during our 1978 surveys. An area between Pass Creek and the B.C. border, which according to the outfitter as well as guides is supposed to have goats, was surveyed twice (August 18 and September 5). However, no goats were located. There is no doubt that even in such intensive surveys, carried out with a helicopter and four observers, a few animals will be missed. However, this number will be small, and I doubt whether it will be larger than 10%. This area has the advantage of being located in proximity to Kluane Park and Sanctuary. and it is known that goats occasionally come out of the Sanctuary and cross the Haines Road. We have several eyewitness reports of such events. This influx will have somewhat compensated for hunting loss, since the total population has not changed greatly. It was estimated at 50 in 1973 and 45 were counted in 1978. If 10% were missed in our surveys, the population still stands at 50. The 'heart of the good habitat' in this western half of G.M.Z. 7 is a small mountain range between the headwaters of Devilhole Creek and Kluhini River, which is the home range of a nursery band of 28 goats. This range should also be designated as a special goat management unit. It is demarcated on the map in the appendix.

Kluane Game Sanctuary:

The Kluane area has a total of 850 goats (Hoefs, 1977), but most of the good habitat is now incorporated into Kluane Park and therefore not now under the jurisdiction of the Yukon Game Branch. One good goat range remains largely in the Kluane Sanctuary, only its northern third being park now. It is located along the west side of the Klukshu River and has

been referred to as "Gribbles Gulch Range". It is mainly from this excellent goat range that emigration into G.M.Z. 7 takes place. This area was surveyed for comparative purposes as far as densities, productivity and group sizes are concerned, as well as for the fact that it is the best source of goats for reintroductions into depleted areas. We observed 76 goats on this small range, consisting of 61 adults and 15 kids. The range should also be designated as special goat management unit and monitored annually together with the other two described earlier.

Summary of Status of Goats in G.M.Z. 7 and Adjacent Areas:

Based on our counts in 1978, allowing for a 10% error for goats being missed and for the fact that the odd goat has been observed north of the survey area, it is estimated that the numbers of goats at present are about as follows:

- 1) Gribbles Gulch in the Kluane Sanctuary: 85 goats
- 2) G.M.Z. 7 (west half - Babala's area): 50 goats
- 3) G.M.Z. 7 (east half - Callison's area): 35 goats

PRODUCTIVITY, RECRUITMENT AND SAFE HARVEST RATE OF GOAT POPULATION

During this year's goat surveys in G.M.Z. 7, adjacent areas of B.C. and one physiographic unit of the Kluane Game Sanctuary, a total of 227 goats were observed and classified into adults and kids of this year. The attached Table 1 shows the breakdown into eastern and western half of G.M.Z. 7 and the Kluane population. In total we counted 51 kids and 176 adult goats or a ratio of kids to adults of 29:100. Even though the variation observed was significant, ranging from 24:100 to 36:00, in a very general sense productivity has been good this year. To put this productivity into proper perspective and to allow comparisons, the ratio observed in other goat populations in the Yukon, British Columbia and Alberta are summarized in Table 2. This Table also shows the figures obtained in previous year's counts in the eastern half of G.M.Z. 7, which has been monitored to a varying degree since 1975. The productivity observed this year of 29 kids to 100 adults is better than those observed in 1977 and 1976. In 1975 a ratio of 32:100 was witnessed, but the area covered was limited to goat ranges surrounding Carcross and the total sample size was only 29. The observed productivity also compares favourably in a North American context. Only one of the population studies listed in Table 2 shows a higher productivity with 31 kids to 100 adults, observed in two Alberta populations in 1975. There is no doubt that the unusually mild winter during the past two years will in part explain the high productivity observed. Previous year's data and observations made in other areas remind us to be cautious and not to use this exceptional year as the expected.

TABLE 1.

Productivity of Goat Populations

Area	Survey Date	Adult Goats	Kid	Kid/Adult Ratio	Total Goats
G.M.Z. 7 west (Babala's outfitting area)	August 16/78	35	10	29:100	45
G.M.Z. 6 - Kluane Game Sanctuary	Sept. 5/78	61	15	25:100	76
G.M.Z. 7 east (Callison's outfitting area) (eastern half)	August 8/78	59	21	36:100	80
G.M.Z. 7 east (Callison's outfitting area)(western half)	August 18/78	21	5	24:100	26
TOTALS:		176	51	29:100	227

Table 2 shows that the mean value obtained, using all studies and a sample size of over 3200 goats, works out to be 23 kids per 100 adults. Only a few detailed population studies have been able to classify the percentage of yearlings in a population. Table 2 lists these figures expressed as number of yearlings per 100 adults. The percentage of yearlings in a population is a fair indication of recruitment rate since mortality from yearling age to age of sexual maturity, which in most populations studied is 2.5 years, is very low. The ratios of kids to adults and of yearlings to adults can be used as an approximation of mortality during the first year of life. This mortality works out to be an average 47% for the populations listed in Table 2. Until better data are available for Yukon populations this value could be used to estimate recruitment rates in local goat populations. These rates work out to be as follows for the population surveys made during the past three years: Logan Mountain goats (G.M.Z. 11) in 1976; 6%, G.M.Z. 7 eastern half: 6.5% in 1976; 11% in 1977, and all goats in G.M.Z. 7 in 1978: 14.5%. Recruitment rate must not be equated with sustainable yield or "safe removal rate" since we do not know natural adult mortality rate. Recent studies have shown that hunting of goats is not a compensatory but an additive mortality factor, based on the relatively young ages at which goats are shot (Kuck, 1977; Eastman, 1977). Hebert *et al*, 1977, estimate that natural adult goat mortality rate - of goats older than yearlings - is at least 2% and possibly as high as 4%. Some indication of sustainable yield or safe harvest rate would be the difference between recruitment rate and natural adult mortality rate. The Yukon recruitment rates cited above average out at 9.5%. An estimate of a safe harvest rate would therefore be 5.5% to 7.5%, which is slightly higher

than rates proposed in British Columbia goat management plans. Hebert *et al* (1977) state that goat populations in B.C. should not be subject to hunting in excess of 5% of the adult population. This figure should also serve as a guideline for Yukon goat harvests, since the environmental conditions Yukon goats live under are at least as severe as those in B.C.

GOAT HARVEST IN GAME MANAGEMENT ZONE 7

Table 3 summarizes the harvest statistics for goats in G.M.Z. 7 for the past 5 years. The figures listed are reported and measured trophies. They do not include those that may not have been reported to us, nor do they include any crippling losses. They are therefore conservative.

Based on game surveys in 1973, the writer estimated the goat population in G.M.Z. 7 at 100 (Hoefs, 1973). The known harvest that year was 20 goats, or 20% of the population. Such a rate is far in excess of a sustainable yield level for goat populations and it forced the Game Branch to impose a number of restrictions on goat hunters, which have been elaborated on in the introduction. These restrictions resulted in a decline of goat harvest by about 50% for the years 1974, 1975, 1976, which was probably a safe rate in the western half of Game Management Zone 7. In the eastern half of Zone 7 the goat population continued to decrease.

The harvest during those three years in the eastern half of G.M.Z. 7 averaged 3.3, which is 6 to 7% of the population size. It is probably sustainable for that population because of periodic influx of goats from Kluane Park. Also the fact that the population size has not changed significantly between our 1973 and 1978 surveys, supports this assumption.

During those same three years the harvest in the eastern half of G.M.Z. 7 has averaged 6 goats, which was excessive and resulted in a population decline. There is no influx into this area of goats from protected populations nearby; on the contrary, they are hunted also by B.C. people if they cross the Yukon-B.C. border.

The Yukon-wide trend in goat harvest, after the imposition of the 8 inch rule and the protection of nannies with kids, which resulted in fewer

females being shot, is not evident in the G.M.Z. 7 harvest. The sex ratio of goats killed by hunters remained 50:50, however, there is some indication of a longer life expectancy of billy goats. In 1974, when the population had just experienced a 20% harvest rate the year before, the average age of billies taken was only 3.2 years. This average age built up gradually over the past 4 years and reached 7.3 years for billies shot in 1977. For reasons unknown, there was an undesired increase in goat harvest in 1977, when 14 were killed by hunters. This excessive rate and alarming trends in population data obtained during the 1977 survey flight, forced the Game Branch to close the eastern half of G.M.Z. 7 to goat hunting and to reevaluate the status of goats in the western half of G.M.Z. 7 as well.

For the 1978 season we have so far only 1 reported goat kill from the outfitter, whom we have approached to voluntarily restrain the harvest until our surveys are completed. No resident goat kill has been reported to us so far (October 20, 1978) for the area.

TABLE 3.

Goat Harvest in Game Management Zone 7 - 1973 to 1977

	Western Half of G.M.Z. 7 (Bahala's outfitting area)			Eastern Half of G.M.Z. 7 (Callison's outfitting area)			Total	Sex	Mean Ages
	Resident Harvest	Non-resident Harvest	Sub- Totals	Resident Harvest	Non-resident Harvest	Sub- Totals			
1973	4	3	7	10	3	13	20	8♂ 8♀ 3 und.	\bar{x} (♂) = 6.7 yrs. \bar{x} (♀) = 6.9 yrs.
1974	-	4	4	3	2	5	9	4♂ 5♀	\bar{x} (♂) = 3.2 yrs. \bar{x} (♀) = 6.0 yrs.
1975	-	3	3	6	-	6	9	5♂ 4♀	\bar{x} (♂) = 4.9 yrs. \bar{x} (♀) = 5.0 yrs.
1976	-	3	3	7	-	7	10	5♂ 5♀	\bar{x} (♂) = 5.2 yrs. \bar{x} (♀) = 6.2 yrs.
1977	5	5	10	3	1	4	14	7♂ 7♀	\bar{x} (♂) = 7.3 yrs. \bar{x} (♀) = 6.1 yrs.
1978	?	1	1	-	-	0	?	1♂	\bar{x} (♂) = 6.0 yrs.

RECOMMENDATIONS

The recommendations made must be evaluated in light of the following facts:

- 1) The mountain goat is the rarest of the Yukon's big game mammals; less than 500 are found outside of the Kluane area.
- 2) Goats are still numerous in B.C. and southeastern Alaska. Non-resident hunters, therefore, have no problem in taking a goat from those areas, should restrictions be imposed on non-resident Yukon goat hunting.
- 3) Game Management Zones 10 and 11 in the southeastern Yukon are open to goat hunting and resident hunters can obtain a goat from those areas.

It is recommended that:

- a) The goat season remains closed in the eastern half of Game Management Zone 7 for a 5-year period, at which time a reassessment of potential goat harvest in the area will be made.
- b) The B.C. Fish and Wildlife Service should again be approached to extend the closure on goat hunting across the border to help Yukon's goat conservation measures. A copy of this report with a covering letter should be sent to the appropriate B.C. authority. The area in B.C. in which goat conservation would greatly aid the Yukon is small. It is shown on the large map in the appendix. It is this area which is most likely subject to overhunting, because of the new Skagway road, the White Pass Rail Road and a number of lakes. Protection of goats here would also aid the tourism industry, if these animals could be observed from the railroad or along the new highway. The protection of these 60 odd goats can not possibly be objected to by a province that may have as many as 50,000.

The argument that one B.C. outfitter may be adversely affected, is not a very good one. All of northern B.C. and the Yukon is divided up into outfitting areas. Any conservation step taken anywhere will therefore affect at least one outfitter. As a Game Branch, we should be reminded of the fact that we are managing a public resource for the benefit of the public at large.

- c) Three alternatives are possible for goat management in the western half of Game Management Zone 7. It appears that the harvest rate of the past 4 years has not reduced the population, most likely because of influx from Kluane Park and Sanctuary. On the other hand, we know also that the carrying capacity for goats is higher than the present population level, since a number of mountain ranges which had goats in the past are devoid of them now. The following alternatives are therefore suggested in decreasing order of preference.
- (-1) A five-year closure on goat hunting, which would most likely result in a population build-up to range capacity levels; particularly if the natural increase is supplemented by influx (natural as well as artificial by transplants) from the Kluane area. It is not possible to predict how many goats could live in the area. However, the present difference observed in goat density in G.M.Z. 7 and in the Kluane area (see map in Appendix) is beyond description and bears no relation to whatever difference there may exist between these two areas in respect to climatic factors, predator pressure, competition with sheep, or habitat quality.
- (-2) Continued, very restricted hunting of goats through a quota system. It appears that a harvest of 4 goats per year can be sustained.

(-2) cont'd.

However, this would prevent any population build-up. From the political point of view, this would most likely be the best alternative. The permits would specify where hunting is to take place, or better, where it should not take place. It is desirable to leave a buffer along the Haines Road, where goats are protected. If this is not done, influx from Kluane would be jeopardized and the 4 goat harvest (8% rate) would be too high and would eventually lead to a population decline. The buffer zone along the Haines Road, where no permit hunting should be allowed, is marked on the map in the appendix.

(-3) Continued, unrestricted hunting as is presently the case. While this system has worked reasonably for the past four years, it is highly unlikely to be satisfactory in the future. Planned developments in the area (the proposed pipe line and the Shakwak paving project), and the fact that the eastern half of G.M.Z. 7 is closed to goat hunting will bring more hunting to this area. All goat ranges are accessible by float planes, and this fact will gradually become known. This is the least desirable and the most dangerous of the alternatives listed.

- d) A budget of \$8,500.00 should be set aside to annually monitor these goat ranges and to start a limited reintroduction project of goats into depleted areas, obtained from the Kluane Sanctuary.
- e) If the goat populations respond favourably to these conservation steps, a reassessment of potential harvests should be made after 5 years. If hunting is allowed subsequently, it should only be on a quota basis.
- f) Lastly, three special goat management areas have been listed in this report and are shown on the map attached. These should be incorporated into a Yukon-wide system of special wildlife areas, and efforts should be made to provide special protection for these ranges as far as wildlife disturbance, habitat alteration and habitat destruction are concerned.

REFERENCES CITED

- Eastman, D.S. (1977): Research needs for Mountain Goat management. Proc. 1. International Mountain Goat Symposium: 160 - 168.
- Hebert, D.M. & W.G. Turnbull (1977): A description of southern interior and coastal mountain goat ecotypes in British Columbia. Proc. 1. International Mountain Goat Symposium; 126 - 146.
- Hoefs, M. (1972): Ecological investigation in Kluane National Park; C.W.S. Unpubl. Report.
- Hoefs, M. & G. Lortie (1976): Big Game Inventory in Game Management Zone 11. Unpubl. Report; Yukon Game Branch.
- Hoefs, M. (1974): Game Surveys in south-central Yukon and an Evaluation of the present degree of exploitation. Unpubl. Report, Yukon Game Branch.
- Hoefs, M. (1975): Goat survey in Carcross area. Unpubl. Report, Yukon Game Branch.
- Hoefs, M. (1976): Goat survey in Carcross area. Unpubl. Report, Yukon Game Branch.
- Hoefs, M. (1977): Goat survey in Carcross area. Unpubl. Report, Yukon Game Branch.
- Hoefs, M., G. Lortie & D. Russell (1977): Distribution, abundance and management of mountain goats in the Yukon. Proc. 1. International Mountain Goat Symposium: 47 - 53.
- Kuck, L. (1977): The impacts of hunting on Idaho's Pahsimeroi mountain goat herd. Proc. 1. International Mountain Goat Symposium: 114 - 125.

McCrorry, W.P., D.A. Blood, D. Portman & D. Harwood (1977): Mountain goat surveys in Yoho National Park, B.C. Proc. 1. International Mountain Goat Symposium. 69 - 73.

McFetridge, R.J. (1977): Strategy of resource use by mountain goat nursery groups. Proc. 1. International Mountain Goat Symposium: 169 - 173.

APPENDICES

- 1) Detailed flight notes of goat surveys.
- 2) Other wildlife observations made during goat surveys.
- 3) Cost of the goat investigation.
- 4) Map of survey area.

Goat survey in Yukon-B.C. border area near Carcross

15/August/1978

Date: August 8/1978

Time: 9:10 a.m. to 4:00 p.m. (approx. 5 hours flying time)
(stopped at Bennett for lunch)

Weather: low clouds in the morning, sunny and warm in the afternoon,
fairly calm.

Helicopter: Gazelle of Shirley Helicopters

Pilot: Wayne Eng

Navigator-
Recorder: M. Hoefs, Yukon Game Branch.

Observer-
Recorder: Dave Hattler, B.C. Fish and Wildlife Branch.

Observer: Doug Larson, Yukon Game Branch.

The purpose of this survey was to continue to monitor the goat population in the eastern part of G.M.Z. #7, and to extend this survey into B.C. on mountain ranges which are continuous across the border, and whose goats also move freely back and forth across the border.

The following observations of wildlife were made and the numbers correspond to those on the map attached.

- | | | | |
|-------|-----------|--|---------------------------------------|
| (1) | 4 caribou | 2 females | 1 yr. 1 calf |
| (2) | 1 goat | adult | |
| (3) | 2 goats | female and kid | |
| (4) | 2 goats | female and kid | |
| (5) | 2 goats | female and kid | |
| (6) | 2 goats | female and kid | |
| (7) | 4 goats | 2 females, 1 yr1, kid | |
| (8) | 3 goats | adults, spread out | |
| (9) | 1 goat | adult | |
| (10) | 6 goats | 5 adults | 1 yr1 - in canyon of Montana Mountain |
| (10a) | 1 moose | male moose on Montana Mountain near canyon along Mining Road (Yukon) | |
| (11) | 3 caribou | 1 male 1 female 1 calf | |

(12)	2 goats	adults - probably male
(13)	8 sheep	2 male (one legal, one young) 4 female 2 lambs
(14)	2 goats	1 female 1 kid
(15)	7 caribou	appeared to be all bulls, but only four were mature
(16)	3 goats	adults
(17)	12 goats	9 adults 3 kids
(18)	1 goat	adult, probably male)
(19)	6 goats	3 adults 3 kids
(20)	5 caribou	3 female yrl. 2 calves
(21)	13 goats	9 adults 4 kids (Yukon)
(22)	3 goats	3 adults (Yukon)
(23)	6 goats	3 adults 1 yrl. 2 kids
(24)	3 goats	2 adults 1 kid
(25)	1 goat	1 adult (Yukon)
(26)	1 goat	1 adult
(27)	2 goats	2 adults

Of the total of 80 goats located, consisting of 59 adults and 21 kids, only 23 were found in the Yukon.

Since this survey extended for considerable distance into B.C., only a few of the populations observed can be compared with population estimates done in previous years.

Unit I - The Mt. Patterson-Morley Peak Range has been done for three years now. While the number of adult goats has been fairly constant around 11 to 13, the kid crop during the current year with 7 has been much better than the previous two years when 1 and 5 respectively were observed in 1976 and 1977.

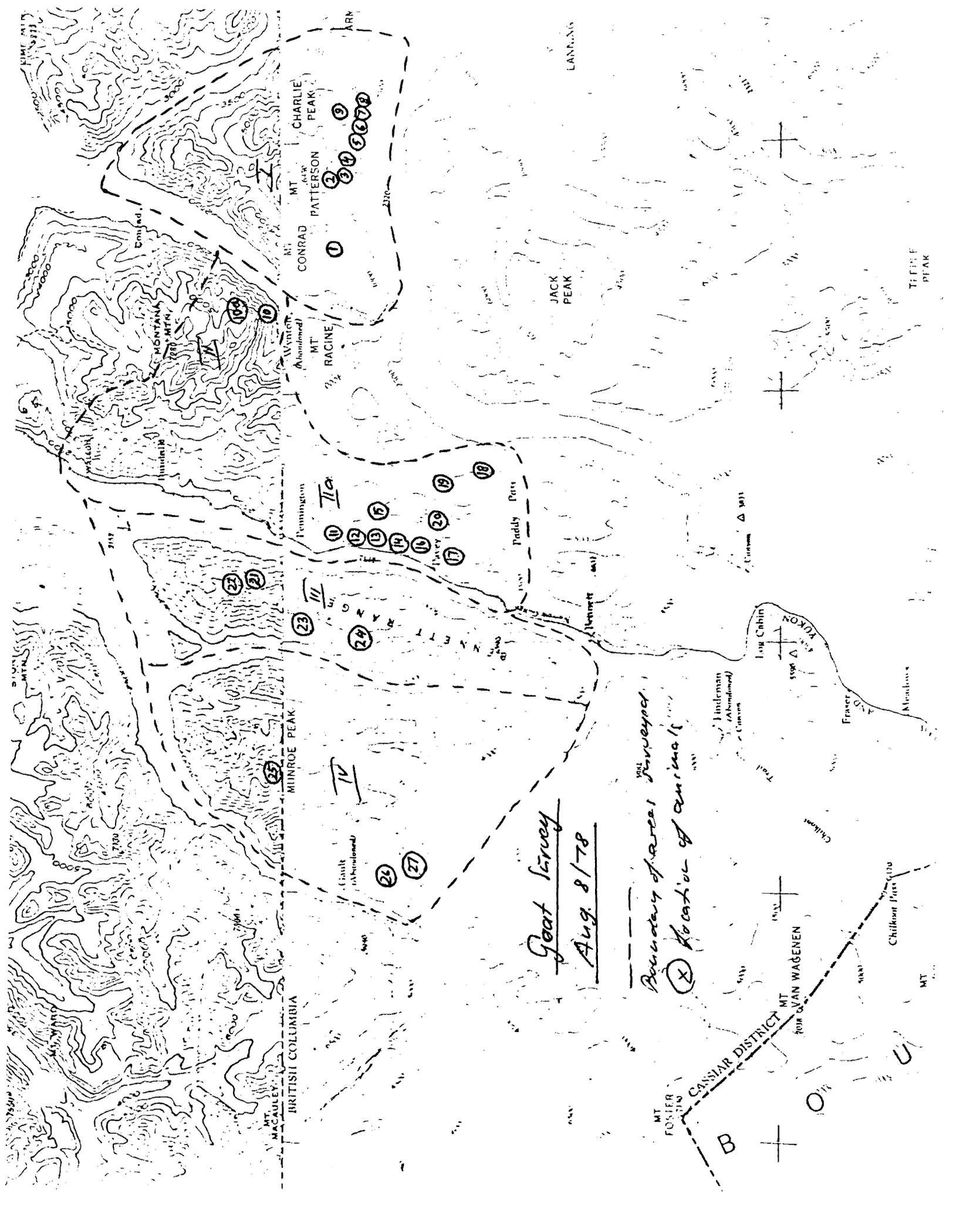
The number of goats in the canyon of Montana Mountain (Unit II) has increased from 3 in 1977 to 6 in 1978. However, this increase is

due to migration into the area from B.C. (Unit IIa), which has not been assessed in previous years. With complete protection as of 1978, these goats on Montana Mountain will hopefully build up to a larger resident herd.

The Bennett Range (Survey Unit III) has also been surveyed for three consecutive years. The population has increased partly because of a high kid crop during the current year of 7, but also because of immigration into the area of adult goats. Based on 1977 data, only 12 adult goats could be expected in the area, however, we saw 18. This discrepancy reveals the artificiality of our boundaries of survey units and assumed discrete goat populations. Part of this immigration may have occurred from Survey Unit IV, where two adult goats disappeared.

Unit IV is an artificial range since only single adult goats have been observed on it for three years. Those goats are probably part of a population that is continuous across the Partridge Lakes valley, since the nursery bands are always located on the west side of the valley.

Manfred Hoefs.



Goat Survey
Aug 8/78

Boundary of areas surveyed
(X) Location of animals

BRITISH COLUMBIA

MT. MACAULEY

MINROE PEAK

Chault (Abandoned)

Flemington

71a

71b

71c

Abandoned

MT. RACINE

CONRAD

MT. PATTERSON

CHARLIE PEAK

JACK PEAK

LANRANG

TELFER PEAK

Long Cabin

Hindeman (Abandoned)

Champion

Fraser

Murchison

Chilkoot

Chilkoot Pass

MT. FOSTER

CASSIAR DISTRICT

FOUR VAN WAGENEN

MT.

B

+

O

U

GOAT SURVEY IN THE WESTERN HALF OF G.M.Z. ON AUGUST 16, 1978

Weather: sunny in the morning
cloudy in the afternoon
warm and calm

Aircraft: Gazelle Helicopter (Shirley Helicopters Ltd.)

Pilot: Wayne Eng

Navigator-
Recorder: M. Hoefs

Observers: a) morning flight - Bob Welsh, guide for
Babala's outfitting area
b) afternoon flight - Doug Larson

Flying Time: 10:00 a.m. to 7:00 p.m. with interruption
for lunch - 7 hours total flying time.

The area covered was the entire western half of G.M.Z. 7 bordered by Kusawa Lake in the east, the Frederick Lake valley in the north, the Haines Road in the west, and the Yukon-B.C. border in the south. Two small physiographic subdivisions could not be covered, but were done a few days later and are described separately.

The survey methods were the same as those applied in other goat and sheep surveys at this time of the year. An attempt was made to get complete coverage which means that all areas were exposed to the eyes of the observers. Any goats missed were, therefore, not missed because the area was not covered by the aircraft, but because the goats were not noticed by the observers. Since no snow is left at this time of the year and the white coats of goats and sheep are very obvious against the background of vegetation or dark rocks, the animals are very obvious, and it is reasonable to say that 80 to 90% of the animals present were accounted for.

The following is a list of observations made. The numbers correspond to locations marked on the attached map.

- 1) 17 adult goats and 6 kids
- 2) 3 adult goats
- 3) 2 adult goats

- 4) 1 adult goat
- 5) 1 adult goat
- 6) 2 mature rams
- 7) about 65 to 70 nursery sheep in one band
- 8) 2 adult goats and 1 kid
- 9) 2 ewes
- 10) 6 adult goats and 3 kids
- 11) 1 cow and calf moose
- 12) 7 rams (3 full curl) 2 ewes, 1 lamb
- 13) 14 ewes and 4 lambs
- 14) 1 legal ram
- 15) 1 legal ram
- 16) 13 rams (7 legal)
- 17) 1 legal ram, 8 ewes and yearlings, 1 lamb
- 18) 4 rams (smaller than 3/4 curl)
- 19) 4 ewes and 1 lamb
- 20) 8 rams (4 legal, 4 young)
- 21) 2 rams (legal), 8 ewes and yearlings, 2 lambs
- 22) 1 ram (3/4 curl)
- 23) 4 rams (legal)
- 24) 3 ewes and yearlings
- 25) 3 adult goats

Total number of sheep seen:

36 rams (legal), 8 rams (young), 41 ewes and yearlings, 9 lambs and about 70 ewes, yearlings and lambs which were not separated total sheep about 164 observed, total estimated at 180 - 200.

Total number of goats seen was 45, consisting of 35 adults and yearlings and 10 kids of this year.

M. Hoefs.



Goat survey Aug. 16/78 ; Sept. 8/78

Date of survey: August 18, 1978
Duration: 9:45 a.m. to 2:00 p.m.
(about 4 hours helicopter time)
Helicopter: Gazelle (Shirley Helicopters)
Pilot: Wayne Eng
Navigator-Recorder: M. Hoefs
Observer: Doug Larson
Weather: Some sunny periods, but mostly overcast.
Cool, some wind from south.

This survey was a continuation of the one carried out on August ~~10~~⁸, 1978 in cooperation with the B.C. Fish and Wildlife Branch. It covered areas on both sides of the border wherever mountain ranges are continuous, since it can be assumed that goats also move freely back and forth.

The following is a summary of wildlife observations made. The numbers correspond to locations which are shown on the attached map.

- (1) 2 goats mature
- (2) 4 rams all full curl
- (3) 11 sheep 9 ewes 2 lambs
- (4) 1 sheep ewe
- (5) 3 rams 2 full curl, 1 3/4 curl
- (6) 9 sheep 2 male young, 4 ewes, 3 lambs
- (7) 9 sheep 8 ewes and yearlings 1 lamb
- (8) 18 sheep 11 ewes and yearlings 7 lambs
- (9) 14 sheep 11 ewes and yearlings 3 lambs
- 3 male moose
- (10) 15 goats 11 nannies and yearlings 4 kids
- (11) 5 goats 4 mature goats 1 kid
- (12) 1 goat adult
- (13) 3 rams 1 full curl, 2 3/4 curl

- (14) 4 rams 1 full curl, 3 3/4 curl
- (15) 1 goat adult
- (16) 2 goats adults

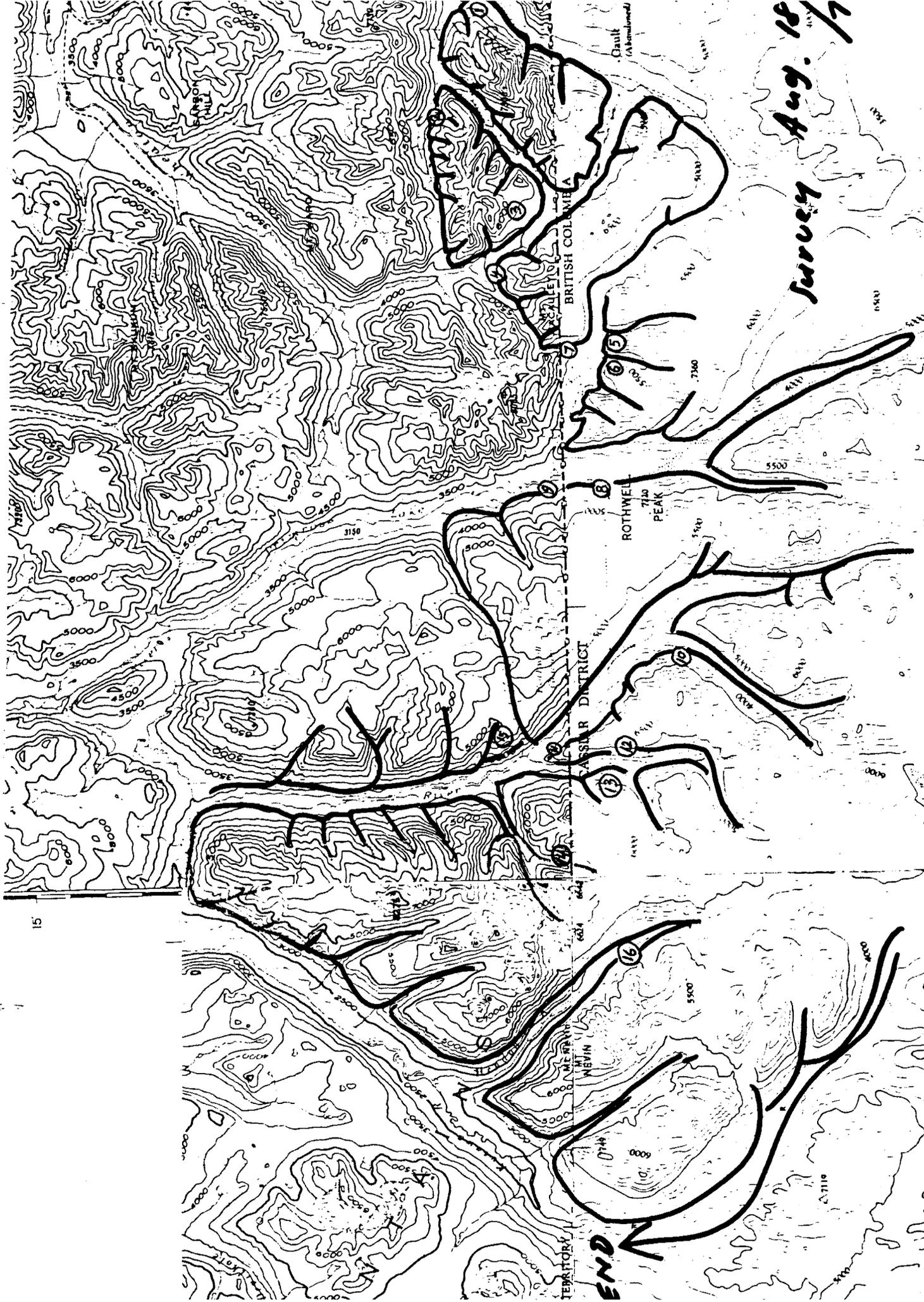
In summary the following wildlife observations were made. Twenty-six goats, consisting of 21 adults and 5 kids, of which only 6 were in the Yukon, consisting of 5 adult goats and 1 kid.

Seventy-two (72) sheep, consisting of 12 rams (4 full curl, 6 3/4 curl, 2 young) 44 ewes and yearlings, and 16 lambs. Of these only 30 were in the Yukon, consisting of 4 rams (1 full curl, 3 3/4 curl) 21 ewes and yearlings and 5 lambs.

The coverage was good, and we feel that 80% of the goat and sheep present in the area were located.

Manfred Hoefs

Survey Aug. 18/17



SHEEP - GOAT SURVEY ALONG HAINES ROAD, SEPTEMBER 5, 1978

An aerial survey was made of goat and sheep habitat along the Haines Road, which had not been covered during our earlier survey two weeks ago because of bad weather.

We did a reconnaissance of two physiographic units in G.M.Z. 7 and one on the west side of the road in the Kluane Game Sanctuary. The three units covered were the following:

- a) Klukshu Range: located between Klukshu River and Lake in the north and west and the Takhanni River in the east and south;
- b) Pass Creek range: located between Pass Creek and a tributary to it in the north and west, a tributary to the Blanchard River in the east, and the B.C. - Yukon boundary in the south;
- c) Gribbles Gulch range in the Kluane area: located between Fraser Creek in the west, Alder Creek in the north, Nesketahen Lake in the south and the Haines Road in the east.

We used a Gazelle Helicopter of Shirley's Corp. Wayne Eng was pilot, M. Hoefs was navigator and recorder and observer. We flew from about 4:00 P.M. to 5:30 P.M.

As on the previous survey two weeks ago, no goats were located on the Pass Creek Range. We only saw two mature rams.

Three different bands of sheep were located in Klukshu Range consisting of seven rams (mature), six ewes and yearlings with three lambs, for a total of 16 sheep.

The Gribbles Gulch range has both goats and sheep in about equal abundance. The sheep are concentrated in the northern half, while the goats predominated in the southern half.

We located 81 sheep, consisting of 36 rams, 31 ewes and yearlings with 14 lambs; and 76 goats consisting of 61 adult goats with 15 kids.

M. Hoefs

WILDLIFE OBSERVATIONS MADE DURING GOAT SURVEYS

During the goat reconnaissance observations were recorded of other wildlife species in the area, the only important one being Dall Sheep.

During the August 8/1978 survey 20 caribou were located between Bennett Lake and Tutshi Lake, all in B.C., where we also observed a small band of sheep. The caribou consisted of 8♂, 6♀, 2 yearlings and 4 calves, while the composition of the sheep band was 2♂, 4 ewes and 2 lambs. These observations are interesting if one considers that Montana Mountain, located just north of the border, had a good sheep population as recently as about 20 years ago and the odd caribou is still shot in the area at present.

On August 18, 1978, when flying the area between Bennett Lake and Kusawa Lake, we observed a total of 72 sheep, consisting of 12 rams, 44 ewes and yearlings, and 16 lambs, of which 30 were located in the Yukon.

Sheep were distributed throughout the western half of G.M.Z. 7, surveyed on August 16 and September 5/1978. We located a total of 180 sheep with approximately the following population structure: 51 rams, 104 ewes and yearlings and 25 lambs. In 1974 it was estimated that this sheep population stood at 200 to 210, a level which it probably still has at present, since not all sheep will have been located.

A stable sheep population appeared to also occupy the northern half of 'Gribbles Gulch range' in the Kluane area. On September 5/1978 we observed a total of 81 sheep, consisting of 36 rams, 31 ewes and yearlings, and 14 lambs. The total number of sheep counted by the writer in 1972 was 71 (Hoefs, 1972).

While we saw a total of 6 moose during four days of surveys, we did not see a single grizzly. The lack of moose observations is based on the fact that we flew well above timber line and shrub zone in typical alpine habitat, which sheep and goat are using at that time of the year, but where moose are seldom seen. On the other hand, grizzlies are known to use such habitats.

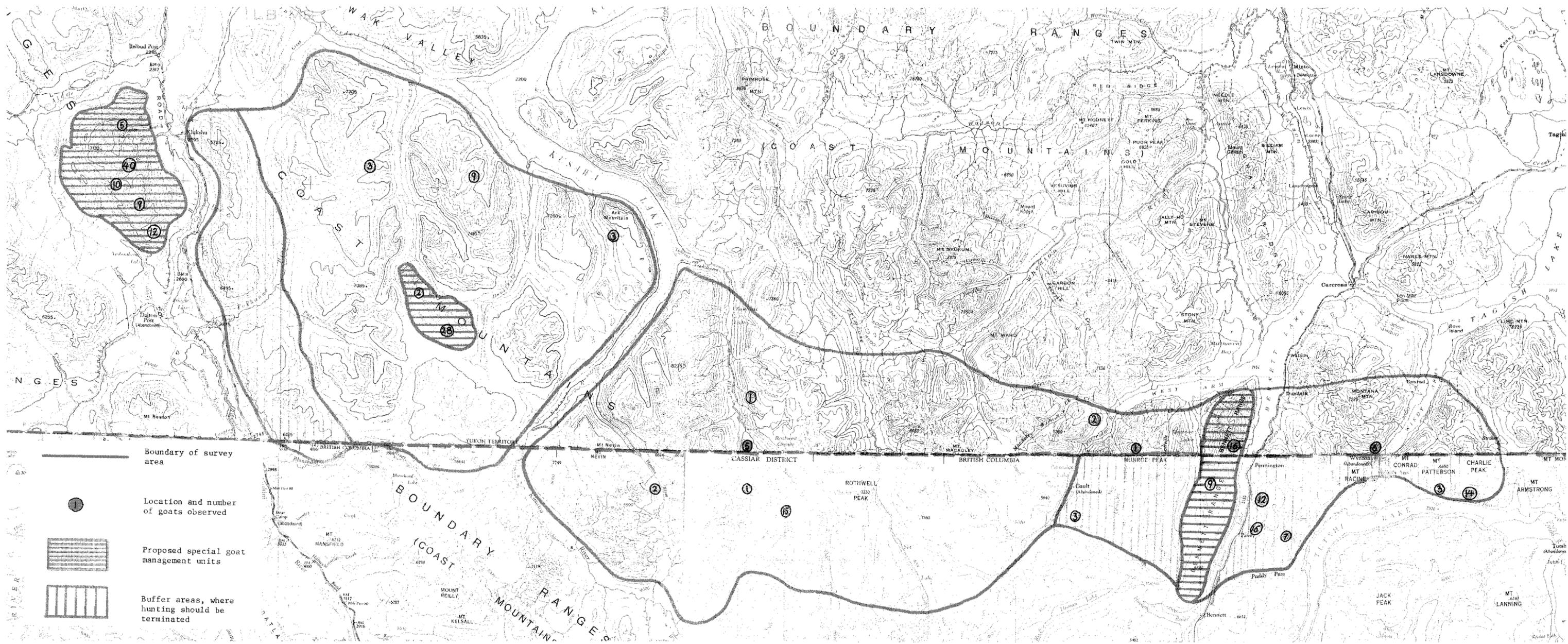
COST OF THE GOAT INVESTIGATION

It is not possible to estimate the cost of this goat reconnaissance in great detail since some surveys were combined with other work in the area, for instance pipe line-related work, since the status of other wild-life in the area, for instance sheep, was assessed simultaneously and lastly, since our flights extended for a considerable distance across the Yukon - B.C. boundary in an effort to establish the entire ranges of the goat populations in question.

The helicopter flight on August 8, 16, and 18, and on September 5, took a total of 18 hours in the air for a charter cost, including the purchase of gasoline, of about \$6,500.00.

Salaries for observers during flights and principal investigator for review of literature, analyses of data and write-up of report work out to be about \$1,500.00.

The total project cost therefore amounts to about \$8,000.00, and this figure must be kept in mind for budgeting purposes, when future assessments of the status of goats in Game Management Zone 7 are contemplated.



Boundary of survey area

Location and number of goats observed

Proposed special goat management units

Buffer areas, where hunting should be terminated