Sheep Surveys and Evaluation of Present Harvests In Southwestern Yukon

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SHEEP SURVEYS AND EVALUATION OF PRESENT HARVEST IN SOUTHWESTERN YUKON

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Introduction

In 1973 the Yukon Game Branch started a series of game surveys with the aim to obtain gradually a complete inventory of the Yukon's wildlife resource. Such an inventory is essential for proper game management.

During that year (1973) the south-central Yukon was covered, an area of about 5000 quare miles bordered by the Alaska Highway in the north, the Haines Road in the west, and the B.C.-Yukon boundary in the south.

This report covers the inventory work done during the 1974/75 fiscal year. The area worked - the south-western Yukon - covers about 18,000 square miles and is bordered by the Alaska Highway in the south, the Klondike Highway in the east and north, and the Alaska-Yukon boundary in the west.

The inventory work is done is two stages: summer work in July and August is meant to document the abundance and distribution of dall sheep and goats, while winter work in late February and March is involved with caribou and moose and the locating of critical winter ranges. Since no goats are found anymore in this area, this report is confined to a dall sheep inventory.

About 30,000 dollars are set aside in the Game Branch budget during the 1974/75 fiscal year for inventory work, about half that amount was spent for the summer work reported on here.

Expenditures

For the purpose of this inventory work a Hiller helicopter (12E CF-OKQ) was contracted. This type of helicopter is particularly useful for this type of work because it offers good visibility and allows one observer to sit on each side of the pilot; it is also powerful enough to handle fairly strong winds in mountainous terrain. It belongs to the Yukon based company "Yukon Air" and was piloted by Chuck Ford, a very experienced man with a thorough knowledge of the Yukon's geography.

To cover the area most economically we operated out of Beaver Creek, Burwash Landing, Kluane Lake, Haines Junction, Whitehorse and Minto.

The charter cost of the helicopter was $145.00 per hour of flying plus fuel and transportation of fuel to strategic locations in the field.

A total of about 93 hours were used during the summer inventory, which amounts to about $13,500 charter cost. In addition $800 were used to purchase aircraft fuel, $700 for meals and accommodations of a crew of two plus the pilot for this 2 to 3 week period, and $300 for transportation of fuel into the field. The total cost of this summer inventory work therefore amounted to $15,350.

The game branch budget made allowance of $30,000

for inventory work during the 1974/75 fiscal year. Half of this was meant to be spent for summer survey and the other half for winter work. Our expenditures for the summer inventory are therefore fully in line with our planning.

Methods

This survey was carried out between July 17, 1974 and August 7, 1974; during this period 16 days had weather conditions suitable for flying. Aircraft fuel had been transported to strategic locations within the area before the survey started, and we operated out of the following base stations: White River (near Beaver Creek), Burwash Landing, Kluane Lake (Bayshore Motel), Haines Junction, Minto and Whitehorse.

As already pointed out the inventory was done with a Hiller 12E helicopter piloted by Chuck Ford, Game Branch staff members M. Hoefs and G. Lortie served as navigators, observers and recorders. Summary Table 1 lists which observers did the various areas of the survey (H - Hoefs, L or G - Lortie). Whenever weather conditions permitted so, we did one morning and one afternoon flight of 3 to 4 hours each. The individual flight reports are attached as an appendix to this report.

Previous surveys have shown that the most appropriate time for sheep and goat inventories are the months of July and August. At this time the snow has melted in the mountains and the great majority of these animals have migrated to alpine elevations. Their white

coat colour is fairly easy to locate against the dark green background of alpine meadows. Our surveys are being restricted to July, since flying during August would greatly interfere with hunting at that time.

During these summer surveys an attempt is made to get complete coverage and total counts. The total area to be covered is divided into physiographic sub-divisions, on many of them the sheep populations appear to be discrete continued. At least, it is highly unlikely that sheep cross from one of such areas to another during the time of our survey. The flight path is traced on a map (1:250 000) to assure good coverage of an area. Whenever a sheep band is located one close pass is made to classify the sheep into rams (legal and young), nursery sheep and lambs. If a large group is encountered it is necessary to land at a safe distance of perhaps a mile and do an accurate classification through a spotting scope. Flight reports are written up in the evenings after a day's surveys, giving details on the terrain, observations on winter ranges and other animals, the numbers of sheep and the total numbers estimated to be in the area considering terrain type, percentage of coverage, weather conditions and visibility.

The physiographic sub-divisions used, the winter ranges catalogued, and the numbers of sheep documented

are listed in this report and on the map that accompanies it.

This report only mentions the sheep in the area. Goats do no longer exist here, and caribou and moose will be dealt with after the completion of the winter surveys.

SUB-DIVISIONS USED IN SHEEP SURVEY

For the purpose of this summer's survey the Ruby-Nisling and Dawson Ranges were divided up into sub units primarily based on physiography, to many of which a given sheep population appreared to be more or less confined; even though this does not apply to some of them.

These sub-divisions were given letters and numbers in an alphabetical manner, the sequence followed the dates of the surveys. Most sub-divisions we confined to a given outfitting area, though some overlap outfitting area boundaries, in particular between the areas of V. HASSARD and Vic HOTTE.

The detailed boundaries of the individual uits can be looked up at the accompanying map, and detailed survey reports; only a very general description is given here.

Sub-divisions A, B, C, D and F are located in R. DICKSON'S outfitting area.

Area A consists of the Nutzotin Range and Miles Ridge north of R. DICKSON'S base camp at Tchawshmon Lake, while area B consists of the range south of the above lake and include Flat Top, Rabbit and Centre Mountains. This range extends across the Alaskan boundary and about half of the sheep habitat on this

range is located on the Alaskan side. Area C is a low mountain range between the White and Donjek River north of the Alaska Highway and Wolf Lake and south of Fish-hole Lake. It includes Koidern Mountain. Area F consists of several small mountains between the Donjek River in the east and north, Wolf Lake in the northeast, and the Alaska Highway in the southwest. It includes several unnamed peaks between 5000 and 6000 feet elevation. Area D is a low, elongated range extending into OSTASHEK'S outfitting area. It is bordered by the Swanson Creek valley in the south, the Donjek River in the east and the headwaters of Grayling Creek in the north.

Sub-divisions E, G, H, I are in J. OSTASHEK'S outfitting area as well as areas U, V, W in the Dawson Range - to be listed later on in the description.

Area E consists of 3 small mountain ranges located between the Kluane and Donjek Rivers north of the Alaska Highway. Area G is a large range, consisting of nine more or less discrete sub-divisions located between Talbot Arm of Kluane Lake in the east, Kluane Lake and the Alaska Highway in the south, Kluane River in the west, and the b oad valley formed by Tincup Creek, the southern Arm of Onion Creek, and the headwaters of Dwarf Birch Creek in the north. It includes the mount-

ain ranges around Tincup, Donjek and Tchawchmon Lakes, as well as the large area between Talbot Arm and Brooks Arm and Brooks Creek of Kluane Lake.

Area H consists of eight sub units of varying sizes in the Nisling Range bordered approximately by Dwarf Birch Creek in the southeast, the Nisling River in the northeast, the Grace Lake valley in the west, and the valley formed by Tincup Creek and the headwaters of the south fork of Onion Creek in the south west.

Area I consists of three sub units of medium sizes in the Nisling Range along the eastern boundary of OSTASHEK'S outfitting area. It is bordered by Dwarf Birch Creek in the northwest, Talbot Creek in the south, and Tyrell Creek in the east. Exchange of sheep between Area I-1 and K-2 in HOTTE'S outfitting area is certain, and exchange between I-1 and J-1 in HASSARD'S area is likely.

Sub-divisions J and portions of K are in V. HASSARD'S outfitting area. Are J consists of four large units bordered by Kluane Lake and Talbot Arm in the west, Talbot Creek in the north, the Alaska Highway in the south, and Alaskite Creek, Gladstone Lake, Venus Creek, Fourth of July Creek and Jarvis River in the east while

Areas J-3 and J-4 appear to be more or less discrete, interchange of animals between J-1 and J-2, as well as between J-1, J-2 and K-3 (in HOTTE'S outfitting area) is likely. Half of areas K-3 and K-4 are also in V. HASSARD'S outfitting region.

Sub-divisions L, M, portions of K, N. C, as well as Q, R, S, t (in the Dawson Range) are included in Vic HOTTE'S outfitting area. Area K consists of five sub units of varying sizes. Sub unit K-5 is located north of the Nisling River. It is bordered by Maloney Creek in the north, Schist Creek in the east, and the Nisling River in the south and west. The remaining K units (K 1, 2, 3, 4) are bordered by Nisling River in the north, Tyrell, Alaskite and Venus Creek in the west, Twelfth of July Creek in the south, and Stevens Lake and Sekulmun Lake, Isaac Creek in the east. Portions of sub units K-3 and K-4 are in V. HASSARD'S outfitting area, and exchange of animals between K-2 and I-1 in OSTASHEK'S area is known to occur.

Area L consists of three large (L-2, L-3, L-4) and one small (L-1) sub units. L-1 is located along the northern end of Sekulmun Lake - on its west shore - the northern and western boundary of the area being Albert Creek. The remained L units (L-2, L-3, L-4) are

bordered by Isaac Creek in the north, Twelfth of July Creek, several small lakes and two unnamed creeks and the Jarvis River valley in the west, Sekulmun Lake and west Aishihik River in the east, and the Alaska Highway in the south. Interchange of animals between L-3 and L-4, L-2 and L-3, as well as L-2, L-3 and K-4 is likely to occur.

Area M consists of 4 large sub units, all of which appear to be "discrete", in particular M-1, with little interchange of animals between them. Sub unit M-1 is located between Sekulmun Lake and Aishihik Lake, the West Aishihik River being the southern boundary. Sub unit M-2 is located along the east side of the Aishihik road, Cracker Creek, Moraine Lake and the headwaters of the Nordernskoild River making up the eastern boundary, the Alaska Highway forms the southern boundary.

Sub unit M-3 is the mountain range around Long Lake and east southeast from Long Lake to Hutshi Lake and the Nordenskoild River.

Sub unit M-4 consists of several low mountains around Kirkland Creek including Triangulation Mt. and Mt. Vowles.

Area N is a small mountain range north of the Alaska Highway. It is bordered by Cracker Creek and

Moraine Lake in the west and by Mendenhall River and Taye Lake in the east.

Area O is officially known as "Sifton Range". It was surveyed last year, but since it is included in V. HOTTE'S outfitting area, the survey data are listed in this report.

Area P is officially known as "Miners Range". Part of it is included in V. HOTTE'S outfitting area. It was surveyed this summer as well as in 1973.

Areas Q, R, S, T of the Dawson Range are part of V. HOTTE'S outfitting region.

Area Q includes Mt. Nansen, Victoria Mt. and Mt. McDade located about 20 miles east of Carmacks.

Area R includes Mt. Klaza and is located between Klaza Creek and Big Creek.

Area S includes Prospector Mt. and Apex Mt. and is located north of Big Creek.

Area T parallels the boundary between V. HOTTE'S and J. OSTASHEK'S outfitting regions. It includes Mt. Cockfield in the north and Mount Pattison in the south.

Areas U, V and W are located in the northern half of OSTASHEK'S outfitting region. Area U is a low mountain range between the Nisling and the Klo-

tassin Rivers. Area W is located along the Yukon River north of the Klotassin River between the mouth of Coffee Creek and Britannia Creek. Area V is a small low mountain range southwest of the Nisling River and east of of Grayline Creek in the central portion of OSTASHEK'S outfitting region.

Area X and Y are open only to resident hunters and are located north of DICKSON'S outfitting region. Area X is located between the White and Yukon Rivers near their confluence, and area Y is located west of the White River and east of Scottie Creek.

The sizes of the various areas described are listed in this report.

Results of Classified sheep count

Table 1 summarizes the classified counts by nursery sheep, lambs, legal rams and young rams, broken down into the numbers encountered in the various physiographic sub-divisions described earlier.

The total number of sheep observed was 3780 and the total number estimated to inhabit this area is around 4591. Over most of the counting our survey was done in great detail and the estimated numbers can be expected to be within $\pm$ 10% of the real numbers.

One large area, however, bordered by Aishihik Lake in the west, the Dawson Range in the north, and the Klondike Highway in the east, could only be superficially covered. Part of this area is sub-division M3 and M4. In this area sheep density is very low and small groups or individual animals may be encountered in widely dispersed small niches of habitat. Little information would have been obtained from intensive searches in this area, the cost of which do not justify the returns.

Table 1 lists the sheep population in detail and it is therefore not necessary to repeat them here. The total numbers per area are also listed on the map. In general it can be said that the Ruby Range has the most sheep (about 3600), followed by Nisling Range (500), Dawson Range (200), Miners Range (125) and Sifton Range (105).

Productivity

Over 90% of the nursery bands located during this survey could be classified into "nursery sheep" (ewes, yearlings of either sex, some young 2 to 3 year old rams) and "lambs of the year". This classification resulted in 2,072 "nursery sheep" and 593 "lambs of the year" or a ratio of lambs to nursery sheep of 29%. This is poor productivity and considerable lower than last year's lamb crop of 36% for the south-central Yukon (Heynen's, Callison's and Babala's areas). There was great variation between areas in this year's lamb crop, the lowest being observed in Area M-1, between Aishihik and Sekulmun Lakes with only 12%. Also very low were Areas M-2 and M-3, east of Aishihik Lake, with 21%. Area K-5, an isolated small population north of the Nisling River had a productivity of only 21%. On the other extreme was Area H-6 in Ostashek's outfitting region with a productivity of 46%, and Area A in Dickson's outfitting region with 35%. A productivity as high as 56%, as was observed last year (1973) in the Primrose Mt. Area (7) in Callison's outfitting region, was no where observed this year in the Ruby, Nisling and Dawson Ranges.

RATIOS OF RAMS TO NURSERY SHEEP

While the ratio of all rams to nursery sheep will vary greatly with the hunting pressure a given population is exposed to, the ratio of young rams (up to 5 years of age or less than 270° curl) should be fairly constant.

Long-term observations of a protected population in Kluane Park (Hoefs, 1973) revealed that this ratio is about 26/100 or 26%.

The following table shows that this ratio also exists in hunted population. Only those statistics are used in this table which are known to be total counts or something approaching total counts of a given population.

TABLE: 2

AREA	NURSERY SHEEP	YOUNG RAMS	RATIO
A (total)	95	32	34:100
B (total)	431	97	23:100
E-3	44	11	25:100
J-1	199	43	22:100
J-2	86	46	53:100
J-3	145	37	25:100
L-3	220	78	35:100
M-1	100	24	24:100
N	27	6	22:100
P	73	18	25:100
White Mt.	21	6	29:100
TOTALS:	1441	398	28:100

This percentage of 28% is very similar to the expected 26% as observed in Kluane Park, and it has therefore been used to calculate the numbers of young rams expected to be in a given population when only the number of nursery sheep could be accurately established.

Even though almost all of the areas surveyed are subject to hunting pressure to varying degrees at least one area (A in Dickson's outfitting region) receives such little hunting pressure that a comparison to Kluane Park populations is possible. Hoefs (1973) observed over a 5-year period that the ratio of total rams (rams that are in ram bands during the summer months) to nursery sheep in the "Sheep Mountain" population was 66:100. The ratio observed in Dickson's area "A" in 1973 was 64:100. Dickson's area "B" also receives little hunting by this outfitter, however, it ranges into Alaska and it is hunted there to an unknown degree. All other areas surveyed are either hunted or they are too small for valid comparisons.

The close agreement between Area "A" in Dicksons outfit and that observed in Kluane Park indicates that the natural population structures inside and outside of Kluane Park are similar and that observations made in the Park can be used to compute suggested harvest data.

TABLE: 1

Observed and estimated total numbers of dall sheep in the Ruby-Nisling-Dawson-Sifton and Miners Ranges

	A. Observed Numbers										B. Estimated Numbers							
Area Code	Nursery Sheep	Lambs	Unclassified Nursery Sheep	Total Rams	Legal Rams	Young Rams	Total Adults	Total Sheep	% Coverage	Surveyor	Nursery Sheep	Lambs	Total Rams	Legal Rams	Young Rams	Total Adults	Total Sheep	Additional Remarks
A0	77	19	6	45	20	25	128	157	90%	L								
A1	2			16	9	7	18	18	90%	L								
A2	16	14					16	30	90%	L								
A3								0	90%	L								
A4								0	90%	L								
A	95	33	6	61	29	32	162	195			110	40	65	30	35	175	215	
B	431	136	21	162	65	97	614	750	90%	L	500	165	200	70	130	700	865	Sheep are continuous across Alaska border.
C								0		L							0	
D								0		L							0	
E1								0		H							0	
E2								0		H							0	
E3	44	10		14	3	11	58	68	90%	H	45	12	20	5	15	65	77	
E	44	10		14	3	11	58	68	90%	H	45	12	20	5	15	65	77	
F1				13	6	7	13	13										
F2								0										
F3								0										
F4	11	3					11	14										
F	11	3		13	6	7	24	27	90%	L	22	6	13	6	7	35	41	
G1.2.4.5.6.9								0									0	
G 3				1		1	1	1	90%	L	)							Estimates take into consideration
G 7	49	7		27	11	16	76	83	90%	L	)100	25	50	20	30	150	175	-counts by outfitter Ostashek
G8	104	30		25	11	14	124	154	80%	H	130	40	60	25	35	190	230	
G	153	37		53	22	31	201	238			230	65	110	45	65	340	405	
H1.2.3.5.7.8.								0	90%	L							0	
H4	9	4		9	4	5	18	22	90%	L	)							
H6	46	21		11	5	6	57	78	90%	L	)60	15	30	14	16	90	105	
H	55	25		20	9	11	75	100			60	15	30	14	16	90	105	
I2.3.								0	80%	H							0	No nursery sheep
I1				14	10	4	14	14	80%	H	16	4	14	10	4	30	34	-observed during game census
I				14	10	4	14	14			16	4	14	10	4	30	34	
J1	199	64	*114	57	22	43	264	328	90%	L	220	75	75	25	50	295	370	*114 included in totals and
J2	86	18		67	21	46	153	171	90%	H	90	20	70	25	45	160	180	segregated by 114=84+27+3
J3	145	62		71	34	37	216	278	90%	H	160	70	90	45	45	250	320	-Composition of nursery bands estimated
J4								0	90%	H							0	from smaller sample size
J	430	144		195	77	126	633	777			470	165	235	95	140	705	870	
K1								0	90%	H							0	No nursery sheep
K2				24	8	16	24	24	90%	H			25	9	16	25	25	-located during census
K3	177	56		51	18	23	228	284	90%	L	200	65	50	20	30	250	315	
K4	9	2		43	29	14	52	54	90%	L	10	2	50	30	20	60	62	
K5	59	17		18	12	6	77	94	90%	H	65	20	30	13	17	95	115	
K	245	75		136	67	59	381	456			275	87	155	72	83	430	517	
L1	8	3					8	8		L	20	5	6			26	31	Estimates take into account -observation by K. McKinnon, summer 1974.
L2								0		L							0	Probable dispersal of rams
L3	220	55		110	32	78	330	385	95%	H	230	60	120	40	80	350	410	-out of this area into L4
L4	10			42	27	10	52	52	95%	L	15	5	45	30	15	60	65	
L	238	58		152	59	88	390	445			265	70	171	70	95	436	506	
M1	100	12		40	16	24	140	152	95%	L	105	15	45	18	27	150	165	
M2	46	14		45	32	13	91	105	90%	L	50	15	50	30	15	100	115	
M3	119	21	7	54	9	45	180	201	75%	L	150	25	75	25	50	225	250	
M4	10	2		1			11	13	50%	L	20	4	5			25	29	-This extensive area could only
M	275	49	7	140	57	82	422	471			325	59	175	73	92	500	559	be superficially covered.
N	27	10		11	5	6	38	48	90%	H	30	12	15	5	10	45	57	-Hoefs (1973 survey)
O	41	17	11	12	6	6	64	81	90%	H	60	25	20	8	12	80	105	-Hoefs (1973 survey)
P	73	19		21	3	18	94	113	90%	H	80	20	25	20	5	105	125	-Hoefs (1973 survey & 1974 survey)
Q								0		G							0	
R								0		G							0	
S(North)								0		G							30	-Chuck Ford (1966-67)
S(South)	22	4		9	2	7	31	35	90%	G	25	5	10	3	7	35	40	
T								0		G							0	
U				7	4	3	7	7	50%	G	30	15	25	10	15	55	70	-Estimates based on observations
V								0		G							0	by A.Harmann (1971)
W								0		G							0	
X								0		G						8	8	-Estimates based on observations
Y								0		G							0	by A. Harmann (1970)
TOTALS	2140	620	166	1020	424	596	3160	3780			2543	765	1283	536	747	3826	4591	

Sheep Densities

To compute the densities of sheep in the various physiographic sub-divisions, the acreage of those areas above the 4500' contour lines was determined by use of planimeters. Not all the habitat above this elevation is used by sheep, but there is also winter range below this altitude which is used, and therefore serves in a compensatory manner.

Table 13 in the appendix lists the sizes of these various sub-divisions as well as those of the estimated sheep habitats.

The following Table 3 gives the densities expressed as number of sheep per square miles of sheep habitat. These densities are the highest for the years since they are based on July counts. For late winter estimates about 10% can be subtracted to account for hunting and natural mortalities. Surveys in the Kluane Game Sanctuary (Hoefs 1973) has shown that densities of more than two sheep per square mile represents excellent sheep habitat, while densities of 1 to 2 sheep per square mile are good habitat. Most densities observed during this survey fall into these two categories. Densities higher than two were found in areas A.B,E, and J and densities of 1 to 2 in areas G,F,K,L and U.

Table: 3

Density*1 of sheep in the various survey areas expressed as numbers of sheep per square mile of sheep habitat.**2

Survey Area *3	Sq.Miles Sheep Habitat	Number of Sheep	Density (Sheep/sq.mile)
A	72.0	215	3
B	52.5	865	16.6 *4
E	35.0	77	2.2
F	40.0	41	1.0
G	267.0	405	1.5
H	236.0	105	0.4
I	165.0	34	0.2
J	415.0	870	2.1
K	324.0	517	1.6
L	325.0	506	1.6
M	320.0	559	1.7
N	70.0	45	0.6
O	120.0	105	0.9
P	170.0	125	0.7
S	120.0	70	0.6
U	50.0	70	1.4
X	120.0	8	0.1

1) Density refers to mid-summer (July) densities, before the hunting season starts and when most lambs of the year are still alive.

2) Sheep habitat refers to areas above the 4500 elevations.

3) Survey areas not listed here don't have any sheep.

4) This density is unrealistic and can be explained by the fact that this mountain range continues into Alaska and is much larger than 52.5 square miles which is only the Yukon portion of this range. Sheep roam freely across the boundary, but during the survey appeared to have been concentrated on the Yukon side, which gave rise to this high density.

Evaluation of present harvest of rams and recommendations for future management

Long term investigation in the Kluane area on Dall sheep have documented the structure of a population with respect to sex ratios and age classes (Hoefs 1974a). From these investigations we know how many rams can be expected to be "produced" annually from a given number of nursery sheep. That these ratios of young rams to nursery sheep are valid has subsequently also been found in sheep populations in the south-central Yukon (Hoefs 1974b) and during the present survey.

Since sheep harvest statistics are presently compiled according to outfitting areas, the estimation of sheep numbers in the area surveyed has also been broken down into outfitting districts and is revealed in Table 4. The following Table 5 gives the number of nursery sheep, the expected annual production of rams and the known harvest statistics for the past two hunting seasons.

Two levels of ram production have been listed in Table 5, the first lists the number of rams that become legal (270 degree curl and in the 6th year) and could be harvested under present regulation, even though they could not be referred to as "trophies". It is known that 100 nursery sheep produce annually about eight such rams, which could be harvested annually on a sustained yield

TABLE 4

Estimation of sheep numbers broken down into outfitting areas

OUTFITTING AREAS	NURSERY SHEEP	LAMBS	TOTAL RAMS	LEGAL RAMS	YOUNG RAMS	TOTAL ADULTS	TOTAL SHEEP
DICKSON	632	211	278	106	172	910	1121
OSTASHEK	381	111	199	84	105	580	691
V. HASSARD	575	198	285	120	165	860	1058
HOTTE	905	232	491	213	262	1411	1643

TABLE 5

Ram "production" on a sustained yield basis in the different outfitting areas and present degree of harvest

OUTFITTING AREAS	NUMBER OF NURSERY SHEEP	RAMS* (legal)	RAMS** (trophy)	TOTAL HARVEST 1973	1974
OSTASHEK	381	30	23	21	18
V. HASSARD	575	46	34	?	26
DICKSON	632	50	38	8	10
HOTTE	905	72	54	34	31

* This is the number of legal rams (5 to 6 years old) produced annually by the given number of nursery sheep

** This is the number of trophy rams (8 to 9 years old) produced annually by the given number of nursery sheep

basis. However, this harvest includes nortality factors other than hunting, even though such mortality factors are very low in that age group. The second level refers to rams in their 9th year, which are here referred to as "trophy" class animals. Not all of these are "trophies", as far as "making the book" is concerned, but it can be expected that 20 to 30% of these rams have horns 39" or longer. Between the 6th and the 9th year of life natural mortality has reduced the number of rams in a population, and it can be expected that only about 6 such rams are "produced" annually by 100 nursery sheep. Perhaps 5 of these could be hunted on a sustained yield basis without running down the population.

Harvesting at this age level appears to be the optimum. The number that could be taken annually is fairly high and contains a good percentage of trophies. It is also about the average age at which rams are taken at present by non-resident hunters, as is obvious from the harvest statistics that are included in this report.

If rams are allowed to live longer, the chances of getting trophies that "make the book" are increased, since horn growth continues throughout the life of a ram, but natural mortality increases drastically in the old age classes leaving only very few rams to be harvested by hunters. Therefore leaving rams to become 11 to 12

years old can only be attempted in areas with a very low hunting pressure since 100 nursery sheep only produce 1 or 2 such rams per year.

Each outfitting area will be evaluated individually.

R. A. DICKSON'S area

It contains excellent sheep habitat with densities that may surpass any other area in the Yukon. Unfortunately the sheep ranges are continuous into Alaska and the sheep move freely across the boundary, which makes it impossible to get an accurate estimation of their number. It is also difficult to evaluate the impact of hunting since nothing is known about the harvest on the Alaska side of the border, even though rumours have it that it is very severe. Alaskan sheep population in general are subject to much greater hunting pressure than those in the Yukon, and the sheeo of the Wrangell Mountains in particular.

Based on our surveys carried out in early July we estimate that there are about 1100 sheep in Dickson's area at that time. These include about 630 nursery sheep (Table 5) which can be expected to produce 50 legal rams per year or 38 rams in the 9th year age class.

The known harvest has been 10 rams in 1974 (Table 7) and 8 rams in 1973 (Table 6). If these sheep were year-round Yukon residents, the present harvest would be

Table 6

SHEEP HARVEST DATA

Dickson

1973

F.M.U. # 5	AGE CLASS													
	4	5	6	7	8	9	10	11	12	13	14	Σ	ES.	ON-RES.
LENGTH OF LONGEST HORN					34 4/8 39 3/8	32 4/8	35 4/8 35 4/8		37 37 2/8					
													2	
													1	
													2	
													2	
7													7(3)	

mean age 9.85 years
mean horn length 35.94 inches.

(8)

Table 7

SHEEP HARVEST DATA

Dickson

1974

G.M.U. #5

RES.

NON-RES.

AGE CLASS

LENGTH OF LONGEST HORN	RES.	NON-RES.	AGE CLASS
			4
			5
	2	34 35 2/8	6
	2	33 6/8 32 2/8	7
	2	33 4/8 35 6/8	8
	1	34	9
37	1	34 1/8	10
	1	34 4/8	11
			12
			13
			14
	9		Σ
1			10
		mean age 8.00 years. mean horn length 34.13 inches.	

insignificant and could easily be doubled without doing any harm to the population.

However, the fact that the rams taken into the area are not very old - the average age being only 8.00 years in 1974 - indicates that these sheep must be moving across to Alaska during the hunting season and must be subject to severe hunting pressure there, which would reserve all the old rams. Until more data are available on the status of the entire population and, more importantly, on the harvest of sheep in Alaska, it is not possible to make any recommendations. The fact, however, remains that the present harvest of 10 rams or less in the Yukon is insignificant and need not be curtailed. All the harvest of rams in this area is presently through non-resident hunting, except for survey area F, which is located along the Alaska Highway (see map), where the occasional animal may be taken by resident hunters.

J. OSTASHEK'S area

This area contains excellent, high density, sheep habitat (E3, G8, I1), but most of it is low-density habitat and the entire northern portion is more suitable for mountain caribou. We estimate that the total number of sheep in this area is perhaps 700 (Table 1) of which

Table 8

SHEEP HARVEST DATA

Ostashak. 1973.

NON-RES.	F.M.U. #5	AGE CLASS												
		4	5	6	7	8	9	10	11	12	13	14	15	
LENGTH OF LONGEST HORN														
				32	32 28 4/8	36 4/8	36 2/8 34 2/8 40	37 35 4/8 34 4/8	41	34 34 3/8 34 1/8	36 4/8 39 36 40			
ES.				1	2	1	3	3	1	3	4			
										+ 3 unclassified.				
	18 (21)													

mean age 10.22 years.
mean horn length 35.77 inches.

Ostashek.

SHEEP HARVEST DATA

1974

G.M.U. #5		AGE CLASS 4	5	6	7	8	9	10	11	12	13	14	Σ	
NON-RES.	LENGTH OF LONGEST HORN		29 7/8	32 3/8 26 7/8 29 1/8 28 30 4/8	32 5/8 29 7/8	32 6/8 32 3/8 34 4/8 37 2/8	33 32 4/8 35			34 4/8	38 1/8	(16 years) 34 4/8		mean age 8.27 years. mean horn length 32.72 inches.
RES.			1	5	2	4	3			1	1	1	18	
													18	

Table 9

about 380 are nursery sheep. This estimate is in agreement with the opinion of the previous outfitter of the area, Phil Temple, who figures that he had about 580 sheep, while the present outfitter, John Ostashek, thinks that he has much more. However, the harvest statistics support our estimate.

The nursery sheep can be expected to produce about 30 legal rams (270° curl) per year or about 23 rams in the 9th year age class. At least 10 of these rams in survey Unit I-1 are not permanent residents of Ostashek's outfitting area but more across the boundary into V. Hotte's area. They may be on either side of the boundary during the hunting season and be subject to hunting by both outfitters.

Taken this into consideration as well as some natural mortality the harvestable surplus in the 9-year age class is perhaps not much more than 15 rams in Ostashek's area. The harvest statistics bear this out, even though two years of informations are not conclusive. During 1973 and 1974 (Tables 8,9) Ostashek took 21 and 18nrams respectively, there may also be some additional harvest by resident hunters or natives, which has not been reported to us, since the area is accessible by boat (G7,G8) as well as from the Alaska Highway (E3). The previous outfitter hunted the area only lightly, taken

an average of 12 rams during 1970, 71 and 72. This probably resulted in a build-up of "trophy" rams in certain areas. In 1973 therefore a considerable number of good trophies were taken, in fact 75% or 14 of the 18 rams classified were 9 years of age and older, and the average age was 10.2 years with an average horn length of 35.8 inches. During the 1974 hunting season most of the "cream" have already been taken off, only 1/3 of the rams taken were 9 years of age or older, the average age dropped to 8.3 years and the average horn length to 32.7 inches (Table 9). It can be predicted that a further drop will occur in 1975, if the harvest of 18 to 21 rams in the area continues.

It is recommended that the outfitter reduces his take to perhaps 15 rams per year, to maintin "trophy hunting" in his area, and to less than that for a few years if he wants to build up his "stock".

V. HASSARD'S area

This is the smallest outfitting area in the Yukon, but it probably ranks highest as far as sheep habitat goes as well as sheep densities observed, and compares well with first-class sheep habitats in Kluane National Park (Hoefs 1973). In contrast to the previously described outfitting area, our estimates for this area are

J. Hassard

SHEEP HARVEST DATA

1974

Table 10

LENGTH OF LONGEST HORN

G.M.U. # 5	AGE CLASS 4	5	6	7	8	9	10	11	12	13	14	Σ	
NON-RES.				35 33 1/8	34 5/8 33 4/8 35 2/8 33 3/8	33 1/8 35 38 1/8	35 35 39 3/8	35 34 7/8 35 5/8	35 5/8	37 4/8	38 1/8		mean age 9.72 years mean horn length 35.45 inches
RES.				2	4	3	3	3	1	1	1	18	
		29 4/8 28 7/8		34 3/8	32 4/8	33				37 7/8			mean age 7.83 years mean horn length 32.63 inches
		2		1	1	1				1		6	
							1 abandoned ; 1 accidental.					24	+2 = (26)

in agreement with those of the outfitter and his guides. Tables 1,5 reveal that there are about 1058 sheep in the area of which 575 are nursery animals, which can be expected to produce 46 legal rams or 34 9-year old rams per year. The harvest in the area during 1974 (Table 10) was about 26 rams, which is well below the allowable take. The fact that some very old rams were taken, 12-13-14 years of age, supports our conclusion that the sheep populations in this area are still in very good shape.

For the time being, no special recommendations are necessary, even though this may change in a very few years. Tote trails have made this area accessible and the take by resident hunters has increased greatly in the last few years.

V. HOTTE'S area

Because of its size this area has the largest number of sheep of any outfitting district in the Yukon. While most sheep range is average in quality, a few areas (for instance L3, K3, M1 & K5) have a fairly high density.

It is estimated that Hotte's area supports at present about 1650 sheep of which about 905 are nursery sheep. (Table 1). These nursery sheep would produce about 72 legal rams per year or about 54 rams in the 9-year age class. The harvest during the last two years has been

HOTTE

SHEEP HARVEST DATA

1974

G.M.U. #5		AGE CLASS 4	5	6	7	8	9	10	11	12	13	14	Σ	
NON-RES.	LENGTH OF LONGEST HORN			30 6/8 33 5/8 34 1/8 34 7/8 33	31 4/8 31 37 33 5/8 33	34 6/8 37 3/8 34 36 3/8	40 7/8 36 7/8		36 36	38 3/8 36 5/8 35 1/8 37 (wolf kill)				mean age 8.40 years. mean horn length 35.11 inches.
RES.				5	5	4	2		2	4			22	
	LENGTH OF LONGEST HORN		27	33 3/8 30 2/8	36 4/8 34 5/8	32 5/8 32 4/8 37 1/8				36 4/8				mean age 7.44 years. mean horn length 33.39 inches
			1	2	2	3				1			9	

Table 11

HOTTE

SHEEP HARVEST DATA

1973

Table 12

F.M.U. # 5		AGE CLASS 4	5	6	7	8	9	10	11	12	13	14	Σ	
ON-RES.	LENGTH OF LONGEST HORN			28 3/8	32 4/8 33 32	33 2/8 31 4/8 35 4/8 32 6/8 30 2/8 33 4/8	32 32 4/8 35 4/8	34 36 4/8 39 3/8 35 4/8 37 4/8	35 4/8 38 4/8 33 5/8	39 7/8 36 6/8	39 3/8 34 2 unclass.			mean age 9.40 years. mean horn length 34.58 inches.
ES.				1	3	6	3	5	3	2	2		25 (27)	
				53 6/8	33 4/8 29 4/8	32 2/8			34 4/8	40 1/8	41			mean age 9.14 years. mean horn length 35.00 inches
				1	2	1			1	1	1		7	
													32	(34)

34 rams in 1973 and 31 rams in 1974 (Tables 11,12) which is below the allowable take. At present about 2/3 of the harvest can be attributed to non-resident hunters and 1/3 to local people. We have at present no explanation for the fact that the average age of the rams taken is so low (8.4 years) (Tables 11,12)and 9.4 years in 1973, except that the hunting pressure over so huge an area can not be evenly distributed. A few favoured areas may be hit very hard - and this applies definitely to the harvest by residents - while the rams in more remote areas may not be taken and die from other causes. The outfitter "rotates" his hunting on a 2 to 3 year cycle and will hunt areas next season (1976), which have not been hunted recently. It is therefore anticipated that the age of the rams to be taken next season - except those taken by residents - will be older than those taken last year. There is no doubt that sheep in certain easily accessible areas along the Alaska Highway (Miners and Sifton range for instance) have been harvested severely, but considering Hotte's area on a whole, the sheep populations are still in good shape.

References used:

Alaska Dept. of Fish and Game:		Annual Reports on dall sheep
V. Geist	(1971)	Mountain sheep University of Chicago Press
M. Hoefs	(1973)	Ecological investigations in Kluane National Park Report on file with Canadian Wildlife Service
M. Hoefs	(1974a)	Game surveys in south-central Yukon and an evaluation of the present degree of exploitation Report of file with Yukon Game Branch
M. Hoefs	(1974b)	Ecological investigations of dall sheep and their habitats University of British Columbia

APPENDIX

Table: 13

Sizes of survey units and estimated sizes of sheep habitat

Survey Area	Total size in square miles	Estimated sheep habitat in square miles (area above 4500' elevation)
A 1,2,3,	22.6*	15.0
A 4	14.5	12.0
A 5	47.5	45.0
Total A		72.0
Total B	52.5*	52.5
Total C	48.3	35.0
Total F	98.2	40.0
ET 1	14.5	12.0
E-2	6.4	6.0
E-3	17.7	17.0
Total E		35.0
G-1	6.4	5.0
G-2	26.6	25.0
G-3	33.0	33.0
G-4	6.4	5.0
G-5	6.4	4.0
G-6	21.7	15.0
G-7	58.0	50.0
G-8	116.0	115.0
G-9	16.1	15.0
Total G		267.0

* Only portion of mountain range on Yukon side of border

Survey Area		
H-1	10.4	8.0
H-2	34.6	30.0
H-3	35.4	30.0
H-4	106.5	100.0
H-5	19.3	15.0
H-6	43.5	40.0
H-7	3.2	3.0
H-8	10.5	10.0
Total H		236.0
I-1	92.0	90.0
I-2	38.0	35.0
I-3	48.4	40.0
Total I		165.0
J-1	126.5	125.0
J-2	145.0	140.0
J-3	113.0	110.0
J-4	80.5	40.0
Total J		415.0
K-1	148.5	70.0
K-2	124.0	60.0
K-3	116.0	100.0
K-4	98.5	70.0
K-5	24.2	24.0
Total K		324.0

Survey Area		
L-1	25.8	5.0
L-2	116.0	60.0
L-3	137.0	110.0
L-4	168.0	150.0
Total L		325.0
M-1	108.0	50.0
M-2	142.0	90.0
M-3	201.0	100.0
M-4	234.0	80.0
Total M		320.0
Total N	88.5	70.0
Total O	140.0	120.0
Total P	185.0	170.0
Total Q	79.0	50.0
Total R	90.0	50.0
Total S	135.1	120.0
Total T	70.8	60.0
Total U	56.4	50.0
Total V	29.0	10.0
Total W	98.2	70.0
Total X	145.0	120.0
Total Y	57.2	40.0

1974 SHEEP SURVEY AREAS

Area	
A	Gates Ridge on the north, Alaska Highway and White River on the east, Tchawasahmon Lake and valley on the south and Alaska-Yukon boundary on the west.
B	Tchawasahmon valley on the north, White River on the east and south and Alaska-Yukon boundary on the west (includes 2 miles of Alaska).
C	White River on the west, Donjek River on the east, Fish Hole Lake on the north, Wolf Lake valley on the south.
D	Donjek River on the west, Grayling Creek on the north, Kluane River and Grace Lake on the south and east.
E	Kluane River on the north and east, Donjek River on the west, Alaska Highway on the south.
F	Wolf Lake valley on the north, Donjek River on the east and south and Alaska Highway on the south and west.
G	Kluane River on the west and south, Tincup Creek on the north, Brooks Creek and Brooks Arm on the east.
H	Dwarf Birch Creek on the southeast, Redtail Lake and Tincup Creek on the south and west, Swanson Creek on the northwest and the Nisling River on the north.
I	Dwarf Birch Creek on the northwest, Tyrell Creek on the east and Talbot Creek on the southwest.
J	Talbot Creek on the north, Talbot Arm and Kluane Lake on the west, Alaska Highway on the south, Alaskite Creek, Fourth of July Creek, Jarvis River, Venus Creek and unnamed creek coming into the 4th Gladstone Lake, on the east.
K	Tyrell Creek, Alaskite Creek, unnamed creek (4th Gladstone Lake), Venus Creek, Snyder Creek, Fourth of July Creek, on the west; Twelfth of July Creek, tributary of Isaac Creek, Sekulmun Lake, Stevens Creek on the southeast and northeast and Nisling River on the north K5 is the ridge north of the Nisling at Long. 138° West.

L Isaac Creek on the north, 12th of July Creek on the west, Jarvis River on the southwest, Alaska Highway on the south, Aishihik and west Aishihik River on the east and northeast, Sekulmun Lake on the east.

M1 West Aishihik River and Sekulmun Lake on the west and south, Canyon Lake and Aishihik Lake on the east, Lester Creek on the north.

M2 Alaska Highway on south, Aishihik Road on the west as far north as Giltana Lake, Nordenskiold River on the east.

M3 Uplands around Long Lake.

Original Flight Records

PILOT: C.E. FORD July 17, 1974

OBSERVER: G. LORTIE

HOURS: 4.8

HELICOPTER: Hiller 12E CF-OKQ

OBSERVATION CONDITIONS: Excellent, sunny, winds calm

ESTIMATED COVERAGE: 90%

An inspection of the daily summary looks OK to me save for two statistics - the rams: (1) The detailed group counts show a ratio of 14/30 for legal and "other" rams. The total counts for these categories however show a ratio of 65/97, which seems to me to be a little high. I think the later ratio should be adjusted to conform to the one shown for the detailed count. This population "seems" to have a large no. of less than full curlrams and deciding from the helicopter as to where to put them is difficult. I think I will use a full curl in distinguishing these two categories from now on.

(2) Immature rams associated with the necessary bands, as well, is doubtful in the total figures - ie 13♂/43♀♀ and yearlings. This percentage - 3% seems awfully low to me. The detailed group counts show a percentage of young rams of 4.3% which is apparently better - but not much. Is this figure of 4.3% in line with that found in other populations? I suspect that it is not.

17 July 1974

Area	NURSERY BANDS			RAM BANDS		
	♀ &yrling	lambs	young	unknown	legal	other
A	77	19	4	2	20	25
A1	2 ewes				9	7
A2	16	14	-	-	-	-
A3			No sheep seen			
A4	No sheep seen - But have been seen on this ridge in other years (later in season)					
tal	95	33	4	2	29	32
"B"	336	103	9	6	36	65
	431	136	13	8	65	97
	Three groups were classified from the ground with a 20x Bausch and lamb spotting scope:					
oup 1	33	14	2		3	13
oup 2	94	41	3		8	13
oup 3	57	8	3		3	4
	184	63	8		14	30

18 July 1974

PILOT: C.E. FORD
OBSERVER: G. LORTIE
HOURS: 7.0

HELICOPTER: Hiller 12E CF-OKQ
OBSERVATION CONDITIONS: Excellent to locally fair
ESTIMATED COVERAGE: 80%

Long range reconnaisance: 0830 departure:

North from White River Lodge we followed the height of land between White River and Scottie Creek as far north as Katrina Creek. These highlands are decidedly not sheep range as they are rounded hills more than mountains. No escape terrain is evident on any of it. Along the N-S axis of this long ridge are many old caribou trails and I believe this country to be good caribou winter range if snow conditions permit.

At the mouth of Katrina Creek we crossed the White River to the northern limit of a 5000' ridge between the head of Los Angeles Creek of the Yukon River and Wolf Creek of the White River. We proceeded S.E. along this system of alpine ridges to a point between the head of Home and Coffee Creeks where we spotted 2 caribou (Observation #1). From here we more or less proceeded eastward along the same ridge system to the site of the Casino camp. Here we "borrowed" 28 gals. of 100/130 aviation fuel of some 7 years ventage belonging to Quintana Minerals. Again, this latter leg of the trip was three good caribou range, and as well, old trails of many caribou were oriented along the axis of the ridges.

/2

From Casino, we proceeded SE for a look at the Mt. Cockfield and a ridge to the SE of the peak. No sheep. Mr. Ford says he has never seen sheep on this Mtn. in all the years he has flown in this country.

From here to Apex Mtn. again no sheep, but our visibility was howered by a severed hail storm. We did get to look at most of the Mtn. however.

From Apex Mtn. we proceeded SE along an extended highland to Prospector Mtn. and again no sheep were seen. It seems to me a large ram was shot on this Mtn. about 15 years ago, but his progeny were not in evidence.

From Prospector Mtn. we crossed the head of Big Creek to the highlands around Mtn. Klaza. Again, no sheep.

From Mt. Klaza we turned westward along a ridge system immediately north of the Klaza River, to a point where observations: (2) and (3) were made. Observation (2) was a group of 13 caribou which included 1 calf and 1 enormous bull. Just 2 miles further to the west we made Observation #3 on sheep. 26 sheep in a nursery band included 4 lambs and one young male for certain. An associated ram band had 2 legal rams, one a full curl, the other 7/8; the remaining 7 rams were 3/4 or less. These sheep were feeding near a steep coarse tolus slope. Observations (2) and (3) were at map coordinates (138° 05' W, 62° 15' N).

From this point we surveyed the highlands in the vicinity

of Mt. Pattison. No sheep were seen, but Mr. Ford says that in August—September 1966 and August-September 1967, he saw a mixed band of approximately 30 sheep on Mt. Pattison. From here we returned to Casino camp directly where we "borrowed" 20 gals. of 100/30 fuel from the same people.

From Casino, we proceeded directly south to a N-A oriented 5000' ridge between the Klotassin and Nisling Rivers. This ridge was similar to the other highlands surveyed this day - rounded with no firm exposed bedrock save for a few out crops and chimney dyke rock along ridges, with coarse tolus slopes here and there and finer screes prevelant along the spenes and spurs. At (138° 55' W; 62° 20'N) we observed (#4) 7 fine rams on a ridge top. Of these 4 were legal rams, one an exceptional one, being a full curl and the remaining 3 rams were 3/4 curls.

From this point, we proceeded SW to White River lodge, picking up a few high points south of the Nisling River and northeast of Grayling Creek.

This country surveyed to day is very marginal sheep range, due previously to the physiography. The whole of it, however, is good caribou country, and all of it still shows the old trails of thousands of caribou having used it in some time past.

From a game viewpoint, this country is disappointing, particularly so, as we did not see one grizzly in 7 hours of flying.

19 July 1974

PILOT: C.E. Ford OBSERVATION CONDITIONS: Excellent

OBSERVER: G. Lortie COVERAGE: 95%

HELICOPTER: Hiller 12E CF-OKQ FERRY TIME TO BURWASH: 1.1

Only the western-most ridge of the area marked "D" was surveyed. No sheep were in evidence.

In Area "C" between the White River and the Donjek River, south of Fish Hole Lake no sheep were seen. Two male moose seen feeding on a high ridge.

Area "E", the ridges between the Kluane and Donjek Rivers and south of their confluence to the Alaska Highway, surprisingly did not have once sheep on them. This is good sheep range with eastward and westward facing steep escape terrain. Sheep trails on E_3 testify to former inhabitance and no doubt periodically sheep move to these ridges from adjacent ranges.

Area "F": F, the small ridge immediately west of the Donjek Road ridge had 13 member ram band on it. 6 legal and 7 smaller rams were bedded above the River on the top of the vertical face. 2 rams were very large.

This area is characteristically different from other areas in the region in that the soils as far west as F_2 on this upland are mostly a light coloured coarse sand. The flora is much more verdant and lush. Plant growth (standing crop) is at least twice that found in adjacent areas.

One male moose was seen on F_3

On F_4 we located 11 ewes & yearlings, and 3 lambs.

20 July 1974

PILOT:	C.E. FORD	OBSERVATION CONDITIONS:	Excellent
OBSERVER:	G. LORTIE	HELICOPTER:	12E CF-OKQ
HOURS:	AM 3.8 PM 3.1	COVERAGE:	90%

Area "G" Morning.

No sheep were found on G1, G2, G4, G5 or G6. One half curl ram was on G3 above Tincup Lake.

Area "G7":

Female & Yrlings	Lambs	male	Legal rams	Other	Unknown
49	7	-	11	16	3

These ranges are similar to those of the E group although higher. We seem to be finding the sheep on the higher limits of the various ranges, usually on a SE facing slope or spur. Manfred Hoefs is writing up the afternoon's work on G8 and G9.

On G5 this morning I picked up a specimen of Baykinia.

21 July 1974

PILOT: C.E. FORD OBSERVATION CONDITIONS: Excellent

OBSERVER: G. LORTIE HELICOPTER: 12E CF-OKQ

HOURS: AM 4.8 COVERAGE: 90%
PM 3.7

Area "H" was covered today.

H1: No sheep - caribou country. Two male moose were seen on this ridge.

H2: No sheep - caribou country. Three male moose.

H3: No sheep - caribou country.

H5: Was not surveyed. This ridge is low and rolly with brush to the top over most of its extent.

	Female &yrling	Lambs	Male	Legal	Other
H4:	9	4	2	4	3

5 caribou were seen on this upland.

H6:	46	21	3	5	3

H7: No sheep.

H8 No sheep. 5 male moose.

22 July 1974

PILOT: C.E. FORD

OBSERVER: G. LORTIE

HOURS: 3.9 A M

OBSERVATION CONDITIONS: Fair to good high overcast with the peaks in fog. Occasional showers.

COVERAGE: 90% on J1 & 75% on J2

HELICOPTER: CF-OKQ

J1: Talbot Creek on the north, Alaskite Creek on the east Rockslide and Raft Creeks on the south, and Talbot Arm on the west.

AIR:	segregated	Nursery Sheep:	83	25	2
SCOPE	"	"	" : 32	12	3
	Unsegregated	"	" : 114		
	Total		229	37	5 Σ = 271 sheep

All ram bands were segregated:

Legal rams: = 22 Other: = 30 & 5 unclassified

OBSERVATIONS:

1^{22} Female & calf caribou.

2^{22} Female grizzly & yearling.

J2: Raft and Rockslide Creeks on the north, Tributory of Gladstone Creek with lake at the head on the east, Gladstone Lakes & Creek on the south, Talbot Arm on the west.

Western portion of J2:

Unsegregated nursery sheep: 77

Segregated ram bands: 10 legal 7 other

No incidental observations.

23 July 1974

I did not fly today - messed around juggling fuel drums, packing for the move, etc.

24 July 1974

PILOT:	C.E. FORD	OBSERVATION CONDITIONS:	Excellent
OBSERVER:	G. LORTIE	HELICOPTER:	CF-OKQ
HOURS:	2.7	COVERAGE:	95%

Area J4, the Kluane hills from Kluane Lake to Kloo Lake, was surveyed as J2 was obscured. We have yet to do J2. This range of hills is not sheep range, but good caribou country. Several shed moose antlers were noted in parts, indicating a good moose wintering area, particularly on the Cultus Creek and Jarvis River side. At observation point (1^{24}), 5 bull caribou were seen, two of them large specimens. Also in this area, a bull moose was seen.

Manfred Hoefs used 1.4 on Mt. Wallace.

25 July 1974

Visibility obscured down to 3000' elevation.

I did not fly today, as Manfred and Pilot Ford left for 1016 to pick up Fitzgerald for the inspection tour of outfitters camps.

Survey work above 4000' not possible.

Casual rate for Fitz on outfitter inspection - 5.6 hours.

Took a drum of aviation 100/130 to Burwash in PM for OKQ as Allinger was out of fuel.

26 July 1974

PILOT: C.E. FORD OBSERVATION CONDITIONS: Poor to good.

OBSERVER: G. LORTIE HELICOPTER: CF-OKQ

HOURS: 1.8 COVERAGE: 90%

Poor weather prevented us from doing any survey work at elevations above 4500'. We did however do lower elevation work in that portion of L4 west of Garnet Creek and the ridge between McKinley and Dixie Creeks. Two ram bands (unclassified) were spotted on the south flank of L3 but a heavy rain storm prevented our continuing.

On L4 a ram band of 7 animals, all legal, two being real good animals were located. They were on the SW side of the high peak between the heads of Garnet and Cripple Creeks.

27 July 1974

PILOT: C.E. FORD OBSERVATION CONDITIONS: Very good

OBSERVER: G. LORTIE COVERAGE: 90%

HOURS: 4.1 HELICOPTERS: CF-OKQ

J2 again evaded us due to poor weather.

In Area K4, we found very few nursery sheep (9 females and yearlings, and 2 lambs), but a large number of rams in small bands:- (29 legal rams, most of which were large class IV's and 14 illegal rams, 5 of which were 1/2 curls for sure and 2 were certainly 3/4 curls).

We encountered 9 caribou on this area.

Area L2 was completely barren of sheep. A lack of escape terrain might indicate a poor wintering area as well. This area however, provided the largest no. of caribou we've seen so far - 29 including 2 medium bulls.

On the way home we flew the ridge west of Killermun and Shutdummun Lakes: Female & yearlings 65, lambs 16, legal rams 9, and illegal rams 5. The legal rams noted here probably do not include the group of 6 observed at long range on July 26.

Shuttled 4 drums of fuel in the PM.

INTERESTING NOTE: By observation, it appears that rams are not as excitable as nursery sheep with regards to the helicopter. One can approach all-ram bands very closely and their movement, although a ram is not the panicked flight

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evidence in nursery sheep. Nursery bands may react to the helicopter at a distance of 2 - 3 miles by climbing rapidly and breaking into a run as one approaches.

28 July 1974

PILOT: C.E. FORD OBSERVATION CONDITIONS: Excellent

OBSERVER: G. LORTIE COVERAGE: 90%

HOURS: 4.1 HELICOPTER: CF-OKQ
4.2 (Manfred in PM 4.2)

Area K3:

Total female & yearlings and young males =	177
Total lambs =	56
Total young males for certain =	14
Total legal rams =	18
Total other rams in ram bands =	9
Unclassified rams =	10
	284 sheep

Included in the above were the following ground segregations:

Female & yearlings =	28
Lambs =	17
Young males =	10

Area L1:

Female & yearlings =	8
Lambs =	3
	11

Total sheep 295

1^{28} 12 caribou at the head of Twelfth of July Creek

2^{28} 1 caribou in K3

29 July 1974

PILOT: C.E. FORD OBSERVATION CONDITIONS: Excellent

OBSERVER: G. LORTIE HELICOPTER: CF-OKQ

HOURS: 4.0 COVERAGE: 95%
4.8 (Manfred in PM)

Area L4:

Total female & yearlings = 10

Total lambs = 0

Total male assoc. with nursery sheep = 3

Total legal rams = 27

Total other rams = 10

Unclassified rams = 2

52 sheep

This area has very little winter range

Area M1:

Mt. Aranus:

Female & yearlings = 7 Legal rams = 9 (4 very large)

Lambs = 0 Other rams = 15

Assoc. male = 0

Total = 31

Mt. Creeden:

Female & yearlings + Assoc. = 81 Legal rams = 7 (3 large)

Lambs = 12 Other rams = 8

Total = 108

Other sheep in M1: Female & yearlings 12, Young rams 1

Total sheep for M1: 31 + 108 + 13 = 152

30 July 1974

Manfred flew K1, K2 and the ridge north of the Nisling River today. I ferried 2 drums of fuel: 1 to Aishihik airport and the other at the south end of Locelle Lake on the Aishihik Road. 15 gals. remain in our drum at the airport, the drum at Locelle Lake will be used tomorrow on a survey east of the Road.

We used 55 gals of forestry fuel at Aishihik airport, in addition we earlier used 48 gals. of Quntana Minerals fuel at Casino.

To date (30th inclusive) we have used 84.2 hours.

31 July 1974

PILOT: C.E. FORD OBSERVATION CONDITIONS: Excellent

OBSERVER: G. LORTIE HELICOPTER: CF-OKQ

HOURS: 7.0 COVERAGE: M1: 90%, M3: 75%, M4: 90%

Area M2:

Total female & yearlings =	46	
Total lambs =	14	
Total assoc. male =	3	
Total legal rams =	32	
Total other rams -	10	
Total	105	sheep

Included in the above were the following ground segregations:

Female & yearlings =	28	
Assoc. males =	3	
Lambs =	4	

Area M3:

Total female & yearlings & Assoc. males =	119	
Total lambs =	21	
Total Assoc. males =	4	
Total legal rams =	9	
Total other rams =	41	
Total unclassified =	7	(4 female & 3 nursery)
	200	

/2

Area M3 cont'd

Inclusive ground segregations: the following were in one band:

Female & yearlings = 6

Young rams = 34 (3 or 4 may be legal)

Mt. Vowels:

Female & yearlings = 6

Lambs = 1

7

Mtn. south of Satosha Lake :

Nursery sheep = 3

Ridge west of Kukland Creek and Trangulation Mtn.:

Female 1

Lambs = 1

Rams = 1

3

Total sheep seen between the Aishihik Road and the Mayo Road = 105 (M2) = 200 (M3) + 13 (Scattered) = 318 sheep.

The area north of Hutshi we at least as far as Trangulation Mtn. and west of the Nordenskiold River to the height of land has pockets of sheep and individual sheep scattered all over it. Sheep trails extend along ridges west from the Nordenskiold for 20 miles or more. Although generally rolling, the terrain is broken frequently by small canyons and truncated cliffs along ridges which parallel generally the stream courses. The region described is open to the north as far as its utilization by sheep is concerned. (More work required). Mt. Bach and Mt. Cooper east of Hutshi Lake should be surveyed as well.

GAME SURVEY - July 28, 1973

A survey was made of the Sifton Range in the morning between 8:30 and 11:30 AM, with a G-2 helicopter. The total flying time was 2.6 hours.

The southern portion of this range (south of a fairly large lake) has no sheep habitat to speak of and we did not see any sheep here.

The eastern portion of this range has been made accessible through an exploration road that leaves off the old Dawson Trail and goes into alpine elevations. This portion of the range does have some sheep habitat, but no sheep were observed, possibly because of the activity on this road. We saw two exploration vehicles and a few people active near the end of this exploration road.

The northeastern half of the Sifton Range is excellent sheep habitat. We saw a total of six bands ranging from 2 to 36 animals.

The total count was as follows: 12 mature rams, of which possible 6 were of legal size; 41 nursery sheep with 17 lambs and 11 unclassified sheep. The coverage was fairly good and I assume that 80% of the sheep on this range were located. I assume that the true number will be somewhat as follows: 20 mature rams (perhaps 8 of legal size) 60 nursery sheep and about 25 lambs. There is the possibility of interchange of sheep between the Sifton Range and the Miners Range.

Alec van Bibber also claims that there is an interchange of sheep between this range and the To-To Lake area, west of the Alaska Hwy.

Manfred Hoefs,
Biologist.

GAME SURVEY in Ruby Range on July 20, 1974

OBSERVER: M. HOEFS HELICOPTER: Hiller 12E CF-OKQ

PILOT: C. FORD WEATHER: Sunny but very windy

HOURS: 3.1 NAVIGATOR: G. LORTIE

The area surveyed during this afternoon's flight is part of TEMPLE'S (Ostashek) outfitting area. It is bordered by Kluane Lake in the south, Brooks Arm in the east and the Serpenthead Lake valley in the north. This area is catalogued under "G8". Three small mountains immediately north of the Serpenthead valley were also surveyed and are catalogued under "G9".

The elevation flown it was generally above 5000 to 6000 feet; therefore only animals utilizing the alpine and sub-alpine zones at this time of the year could be observed.

In area "G9" no sheep were observed even though part of this range is typical sheep country and a small population of perhaps 50 could live here. Two caribou were observed in this area. Coverage was very good (90%), and it is very doubtful that any sheep were missed.

In area "G8" the sheep were essentially concentrated in one very large band around a high mountain (7000') northeast of Mineral Creek. The total number of sheep observed in area "G8" was 154, consisting of 25 rams,

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104 nursery sheep and 30 lambs. Only 16 of the 25 rams could be classified, of these 11 were of legal size (3/4 curl or better), but none of these was a full curl ram. The remaining 9 rams could not be classified.

Even though coverage during this flight was fairly good (about 80%) it is assumed that some rams must have been missed. The ratio of only 25 rams to 104 nursery sheep is out of proportion, even though this area might be heavily hunted. The outfitters base camp is at Serpenthead Lake, between Areas "G8 and G9".

The lamb crop is low (about 29 lambs to 100 nursery sheep).

It is assumed that the total population of this range is about 200 sheep, before the onset of the hunting season, and that most of the sheep missed were probably rams.

The winter range of this population, which appears to be fairly discrete, is mainly along Brooks Creek valley on west facing slopes and also on a few south facing spurs along Talbot Arm.

No other big game animals were observed during this flight in area "G8".

GAME SURVEY in Ruby Range on July 28, 1974

OBSERVER: M. HOEFS HELICOPTER: Hiller 12E CF-OPQ

PILOT: C. FORD WEATHER: Sunny, very warm, calm

HOURS: 4.0

The area surveyed in the Ruby Range is referred to as area L3 on the survey maps, is portion of Vic HOTTE'S outfitting area, and is bordered by Jarvis River, McKinley Creek and an unnamed creek, flowing from the headwaters of McKinley Creek to the east into the west Aishihik River, in the south and east, the west Aishihik River and a continuation of that valley in a westerly direction toward two unnamed, small lakes, in the north, and the Twelfth of July Creek and Fireworks Creek in the west. The size of this area is approximately 25 miles in length and 10 miles in width, or 250 square miles, of which perhaps half is sheep habitat.

This area is one of the best sheep habitat so far surveyed in the Yukon. Sheep were located in 25 different bands on all of the mountains of this range.

The total number of sheep counted and classified was 385.

Coverage was excellent and it is doubtful that many sheep were missed. The total population is therefore estimated to about 400 sheep.

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The classification was as follows: 220 nursery sheep accompanied by 55 lambs; 110 rams consisting of 32 legal rams and 78 young rams. The number of rams in this population should be higher - when compared to the number of nursery sheep - but it likely that dispersal of male bands across the headwaters of McKinley Creek and also across Twelfth of July Creek takes place.

The ranges west of Shutdunman Lake and Killermun Lake also have caribou, a total of 12 were located in 4 bunches, consisting of 1 bull; 13 cows and young bulls and 2 calves. Most of these caribou were observed because they were lying on snow patches at alpine elevations.

A wrecked DC 3 airplane was located near the eastern end of this survey area. Most of the individual mountains of this survey area have winter ranges on steep, exposed slopes usually facing east or south.

GAME SURVEY in Nisling Range on July 30, 1974

OBSERVER: M. HOEFS HELICOPTER: Hiller 12# CF-OPQ

PILOT: C. FORD WEATHER: Sunny, cloudy, showers

HOURS

The area surveyed in the Nisling Range is part of Vic HOTTE'S outfitting area and is bordered by Albert Creek in the south, Tyroll Creek in the west, Nisling River in the north and the Stevens Lake and Stevens Creek in the east. This area is referred to as region K1 and K2 on the survey map.

In addition a small range north of the Nisling River, opposite the mouth of Dwarf Birch Creek and Rhyolite Creek was surveyed, because it was known to support a small sheep population. This area is referred to as K5 on the survey map.

Only this letter small area supports a "discrete" sheep population and will be discussed first. This size of this range is only about 10 miles by 3 miles on the average, or 30 square miles of sheep habitat, but it supports a population of about 100 sheep.

The sheep were located in two distinct groups, one large mixed group at alpine elevations, consisting of the entire nursery component of the population as well as 6 mature legal rams. Another band of rams was located at low elevation on winter range, were they presumably

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used a lick. Twelve rams were observed here, but since they moved up through heavy aspen forest, some may have been missed.'

A total of 94 sheep were observed and classified, consisting of 59 nursery sheep with 17 lambs, and 18 rams of which an estimated 12 were of legal age.

Coverage of this area was very good, and it is estimated that the entire population does not exceed 100 animals. Only a few young rams may have been missed.

The range of this population is surrounded by wide timbered valleys and it is assumed that this population is "discrete". Winter ranges are located at very low elevation along the Nisling River on south-facing "bluffs".

The other large area covered (K1 & K2) consists almost entirely of caribou habitat. No other area surveyed showed so much caribou signs (trails, terrains of slopes etc.). A total of 5 caribou were observed in 3 groups, consisting of two young bulls, two cows and one calf.

The only sheep in this area were located in the southwestern corner, on a high mountain opposite the mouth of Alaskite Creek, and all these sheep were rams. The total number was 24 rams, consisting of 8 legal rams and 16 young rams. No winter range was observed in this area and it is assumed that these rams crossed over from the west, where winter ranges occur along Talbot Creek in

survey area I1. The letter survey area also had only rams on it, and it is presently not known where the nursery component of this population spends the summer. Considering the total number of rams observed along Talbot Creek on its north side, the total population wintering here must be around 150 sheep.

Furtheron the possibility exists that some of the rams counted today in area K2 may have previously been counted in area I1 and have crossed Tyroll Creek in the meantime.

Besides these sheep and caribou 1 single grizzly bear and two bull moose were observed in area K2.

GAME SURVEY on Miners Range - August 2, 1974

OBSERVER: M. HOEFS HELICOPTER: Hiller 12E

PILOT: C. FORD WEATHER: Sunny with some short showers

HOURS: 4.0

Essentially the same route was flown as in late July 1973 and the sheep were located in almost identical locations.

Sheep were located in 7 different bands, 3 of these consisted of single, isolated, nursery sheep and one consisted of one ewe accompanied by her lamb. The other three bands consisted of one band of 67 sheep (2 rams about 3 years old, 53 nursery sheep, 12 lambs) and one band of 22 sheep (16 nursery sheep with 6 lambs), both of these bands were on the Mountain immediately north of Pilot Mtn. No sheep were observed on Flat Mt. or Pilot Mt. As was the case last year the rams were located at the northern extremity of the Miners Range in gently-rolling country for the most part below 5000' in elevation. One band consisted of 19 rams (3 legal and 16 young).

Productivity or lamb to ewe ratio is poor (19 lambs to 73 nursery sheep, or 26%), but it is not worse than in most other sheep populations checked this summer.

The following table shows a comparison between the surveys of the last two years.

1973: 9 rams (1 legal, 8 young) 71 nursery 22 lambs

1974: 21 rams (3 legal, 18 young) 73 nursery 19 lambs

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This comparison shows that our surveys are fairly accurate. The numbers of nursery sheep and lambs are almost the same in the two years, and the increase in rams consisted almost entirely of young rams (3-year olds), which were still with the nursery sheep last year, when they were two-year olds. Inspite of the low lamb crops, the male sequent of this population appears to be slowly building up. However, the ewe to ram ratio is still greatly unbalanced in favour of females, and emigration out of this area by rams can not be ruled out.

GAME SURVEY IN DAWSON RANGE ON AUGUST 7, 1974

OBSERVER: M. Hoefs HELICOPTER: Hiller 12E OPQ

PILOT: C. Ford WEATHER: Sunny with some high overcast

HOURS: 6.0

This survey covered the remaining portions of the Dawson Range, not formerly done, as well as s few areas north of the Yukon River.

Starting off at Minto airstrip we surveyed the triangle bordered by the Klondike Highway in the east, the Pelly River in the north, and the Yukon River in the south and west.

This triangle is part of Belle Desrosiers' outfitting area, but it is not hunted by her. It is also the area where J. Lammers has his recreation enterprise. The hills of this area do not exceed 3200 feet in elevation; therefore all this area is well below treeline. A few cliffs are found along the banks of the Yukon River immediately northwest of Minto as well as at the confluence of the Pelly River into the Yukon River. Both have the typical makeup of sheep winter ranges - escape terrain is close proximity to exposed, grassy slopes. A few signs of sheep were observed at both places, but only at the one near Minto were three sheep (2 nursery sheep and one lamb) found. Since the ewes were accompanied by a lamb at least one ram must be in the vicinity of this little band during the

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rutting season. These sheep have no summer range to go to and appear to hang around in these cliffs throughout the year. J. Lammers reported that the cliffs near the mouth of the Pelly River also have at times sheep on them, however, we did not see any at this survey. The range is large enough to perhaps support 10 to 15 sheep, if they were protected. There are also a few cliffs along the Pelly River's north shore starting at Pelly's farm, but it is doubtful whether sheep use these cliffs so close to human habitation. We proceeded north and checked the Vaolcano Mt. area, which has no sheep on it, but old caribou signs. This entire area north to the Stewart River has large expansion of old as well as recent firest fires. Coldspring Mt. also has no sheep but the White Mountains have a unique small population of sheep varying in colour from white to very dark.

This area was surveyed in great detail and it is doubtful that any sheep were mixed.

We classified 37 sheep, which consisted of 10 rams (4 legal 6 young), 21 nursery sheep and 8 lambs. This population is not in any outfitting area and has not been hunted by residents, because it is not accessible. There is no large lake, suitable for float planes, within 12 miles of the area.

This population is therefore very valuable for comparative purposes and it should efficially be protected.

The lamb crop is better than in most areas surveyed this summer, and it appears that this little population is expanding. Chuck Ford, pilot with Yukon Air, told me that he saw only 18 sheep in this area about 10 years ago. It is not known at present, where these sheep spend the winter.

Of the 37 sheep looked at 10 were fairly dark, and a few more showed some grey on them. All sheep that were looked at closely, had black tails.

This population offers a great opportunity to study changing in coloration of sheep. Most lambs looked at closely were white.

Of the 21 nursery sheep an estimated 6 were yearlings and 2 or 3 more were 2-year old rams, This leaves 12 for mature ewes. Therefore the sex ratio of 11 mature rams to 12 mature ewes is almost balanced, which can be expected in an ~~unlimited~~ unhunted population.

Should hunting ever be considered in this area, not more than one ram can be taken here per year to maintain this population at its present status. The entire range available to these sheep is less than 20 square miles, and it therefore doubtful that this population can expand beyond 40 to 50 animals.

On the return trip to Minto the Ptarmigan Mt. area east of Pelly Crossing was surveyed. This range reaches an altitude of 4900. It has no sheep habitat but some old caribou signs. This area north to Diamain Lake appears to be good moose habitat.

After supper the mountains west of Carmacks were surveyed that had not been done previously. These include Miller's Ridge, Klaza Mt. Range, Tritop Peak, Mt. Nansen and Victoria Mountains: ~~Par~~ few areas in the Yukon have been so damaged by previous and present uncontrolled mining activity. There are trails, trenches, old camps and abandoned mines everywhere. Fortunately this area is not good sheep country, even though the mountains are high enough. They are all gently, rolling types, with little or no escape terrain and no winter range. No sheep signs were observed, and it is doubtful that any of these mountain did have sheep (in any number), even in "pre-~~minius~~ mining" days. However, caribou signs are common in certain areas, and a large bull caribou was observed on Victoria Mt. This entire area is accessible by trails from Carmacks and many hunters go in here per vehicle to get their moose.

GAME SURVEY in Ruby Range on July 21, 1974

OBSERVER:	M. HOEFS	HELICOPTER:	Hiller 12E OKQ
PILOT:	C. FORD	WEATHER:	Overcast
HOURS:	3.7	COVERAGE:	80%

The area surveyed is about 200 square miles in size and is bordered by Talbot Creek in the south, Tyrrel Creek in the east, and Dwarf Birch Creek in the north and west. For the purpose of this survey it was subdivided into three regions, referred to as I1 in the southeast, I2 in the east, and I3 in the north (see map for details of boundaries).

Both, subdivision I2 and I3, do not have any sheep. These areas consist of gently rolling hills with no great elevations, no escape terrain and winter range. They are caribou habitat areas, even though no caribou were seen.

Area I1 is good sheep country, with winter ranges found along Talbot Creek on southfacing slope. Only 14 rams could be located of which 10 were legal. None was exceptional (full curl). Judging from the size of the sheep habitat, the number of trails observed, and the number of old rams seen, I estimate that a small population of about 80 sheep (including lambs) are utilizing this range, I have at present no explanation as to whether the ewes had left the area or whether we missed them.

GAME SURVEY in Ruby Range on July 22, 1974

OBSERVER: M. HOEFS HELICOPTER: Hiller 12E CF-OKQ

PILOT: C. FORD WEATHER: Overcast

HOURS: 2.0

The area surveyed consisted of three small mountains ranges located the Kluane River and Donjek River north of the Alaska Highway. Only one of these ranges, that one located in the southeast corner of the area surveyed supports a small sheep population. We observed 14 rams in one band, of which 3 were legal, and in a large nursery band we counted 44 nursery sheep and 10 lambs. The total number of sheep therefore was 68, and it is doubtful that any more are present, since the area was intensively surveyed twice.

None of the other two ranges supports sheep at present, even though some suitable habitat exists on both. Guide Phil TEMPLE shot one 40 inch ram on the northern range during last season, but it was an individual isolated animal which most likely had moved there during the stir-up of the hunting season. The terrain between these three ranges is covered by either tundra or open spruce forest, and it is likely that all three ranges may at times be used by the small population observed. Dispersal into or out of this area across the Donjek and Kluane rivers is highly unlikely.

GAME SURVEY in Ruby Range on July 23, 1974

OBSERVER: M. HOEFS HELICOPTER: Hiller 12E CF-OKQ

PILOT: C. FORD WEATHER: Sunny alternating with overcast

HOURS: 3.7

The area surveyed is one of the best sheep habitats in the Yukon. It is bordered by Gladstone Creek in the north, Venus Creek and Fourth of July Creek in the east, Cultus Creek in the south, and Kluane Lake in the west.

This 120 square mile area is referred to as area "J3" on the maps and it is comparable in sheep densities to the best areas in Kluane National Park. Sheep were observed in 18 different bands spread over the surveyed area, except on the areas bordered by Snyder Creek and Venus Creek in the east and an unnamed creek paralleling the 138° 12' longitude in the west, which consists of gently rolling country with little escape terrain and no high peaks. Most rams were located between this latter, unnamed creek and Swanson Creek in the west. While most nursery bands were located west of Swanson Creek as well as along Cultus Creek, all at fairly high altitudes. The winter ranges are located on three different "spurs" along Cultus Creek on south-facing slopes and on one cliff facing Kluane Lake west of a 5719 foot peak, on a south-west facing slope.

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The coverage of this survey was excellent and it is assumed that 90% or more of the sheep in this area were located. No other big game animals besides sheep were observed during this survey.

A total of 278 sheep were located of which 186 were classified. All ram bands were classified. The total number of sheep estimated to inhabitat this range at this time is about 300.

A total of 71 rams were observed in ram bands, of these 34 were legal, 37 were young. Some of the legal rams were good trophies. Of the total number of nursery sheep of 205 a total of 81 were nursery sheep with 34 lambs, the remaining 92 nursery sheep could not be separated but a photograph of most of these were taken which would allow further separation of adult and young.

GAME SURVEY - Ruby Range, July 27, 1974

OBSERVER: M. HOEFS HELICOPTER: Hiller 12E CF-OKQ

PILOT: C. FORD WEATHER: Mainly sunny, some showers

HOURS: 4.1

The area flown is referred to as area "J2" on the map and is bordered by Raft Creek and Rockslide Creek in the north, Talbot Arm of Kluane Lake in the west, Gladstone Creek and Gladstone Lakes in the south, and an unnamed creek between Gladstone Lakes and the headwaters of Rockslide Creek approximately at longitude 138° 07', in the east.

Besides for sheep, no other big game animals were observed during this flight.

Sheep were observed in 18 different bands, ranging in size from single animals to nursery bands of 18, 19, 26 and 30. Ram bands were usually smaller, 5 to 7 animals per band being the most commonly found band size.

A total of 171 sheep were observed and classified, consisting of 86 nursery sheep with 18 lambs and 21 legal rams as well as 46 young rams.

The coverage was very good, about 90%, and it is estimated that the total population in this area may be about 200 sheep. Most sheep were located around the centre of the survey area among the high mountains. Some winter ranges were located along the Gladstone Lakes. The

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small isolated mountain range north of the mouth of Gladstone Creek does not have any sheep, but a few trails were located.