DALL'S SHEEP HARVEST IN THE RICHARDSON MOUNTAINS

NORTHWEST TERRITORIES

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ABSTRACT

Aerial surveys were undertaken in 1971 and 1972 to determine the general distribution, abundance, and seasonal range of Dall's sheep in those parts of the Richardson Mountains that are most commonly hunted by Mackenzie Delta residents. Interviews of hunters residing in Fort McPherson and Aklavik were conducted to determine sheep hunter success and hunting patterns.

Dall's sheep have been most often killed in the late winter during annual caribou hunts. At this time the sheep are low on canyon and ravine rims. At least 212 sheep have been taken by 25 hunters from Aklavik during the past six winters. The sheep harvest has increased each year since 1968. Most of the sheep have been killed in the area west of Mount Goodenough, an area which constitutes the best sheep range. The ratio of rams to ewes killed during the past five winters was 74:100. Based on population dynamics information from the Mackenzie Mountains, the residents of Aklavik may have harvested 11 per cent more than the annual increment (yearlings) of sheep during the winter of 1972/73. A high percentage of the 1972/73 kill consisted of females and juveniles (79%). Recommendations are made to improve data collection processes so that well-founded management practices can be instituted, and to obtain the cooperation and understanding of hunters through discussions of the problem of overharvest.

Introduction

In late 1970, some concern was expressed by residents of communities in the Mackenzie River delta area that Dall's sheep (Ovis dalli) females and young were being overharvested in the Richardson Mountains, N.W.T. The Canadian Wildlife Service was asked by the N.W.T. Game Management Division to investigate the validity of that concern.

During mid-August, 1971, interviews were conducted with Game Division officials and native hunters in Fort McPherson and Aklavik and an aerial survey of part of the Richardson Mountains was undertaken to determine:

1. The general abundance and distribution of Dall's sheep in that part of the Richardson Mountains which is commonly hunted by residents of the delta area,
2. The seasonal range of Dall's sheep in the same area,
3. The management requirements for Dall's sheep in the Richardson Mountains.

The Study Area

Generally, the Richardson Mountains resemble the southern foothills of the Rocky Mountains in the bareness of their slopes and their gentle profile. The most rugged terrain in the Richardsons is west of Mount Goodenough where peaks exceed 5000 feet ASL in elevation. This central area is characterized by sharp ridges with steep, rocky slopes and spurs, separated by deep V-shaped valleys. Surrounding the rugged area is the more extensive, gentler terrain that typifies the range. Commonly these mountains have relatively steep, smooth slopes, only a few rough outcrops, and long ridges that, from the air, resemble huge road embankments.

The dry, cold climate of the Richardson Mountains has confined the forest to sheltered mountain valleys below 2000 feet in elevation. Porsild and Cody (1968. Checklist of vascular plants of the continental Northwest Territories, Canada. Ottawa: Plant Res. Inst., Can. Dept. Agriculture. 102 pp.) found that this range differs markedly from the Mackenzie Mountains in its lack of Cordilleran plant species. Such plants, common in the alpine zone of the Mackenzie Mountains, are replaced in the Richardson Mountains by Amphi-Beringian species that are more common in alpine tundra farther to the west.

There are no published mammal or bird lists from the Richardson Mountains, and until recently few biological investigations had been conducted in the area. Dall's sheep are the most prevalent large mammal in the more rugged part of the range from Mount Goodenough west to the Territorial boundary and southwest to McDougall Pass in the N.W.T. North of Mount Goodenough, barrenland caribou (Rangifer tarandus) are the common game mammal, and sheep are not often seen. Large herds of caribou stream back and forth through the Canoe Lake area, north of Mount Goodenough, following the gentle north-south ridges.

Methods and Materials

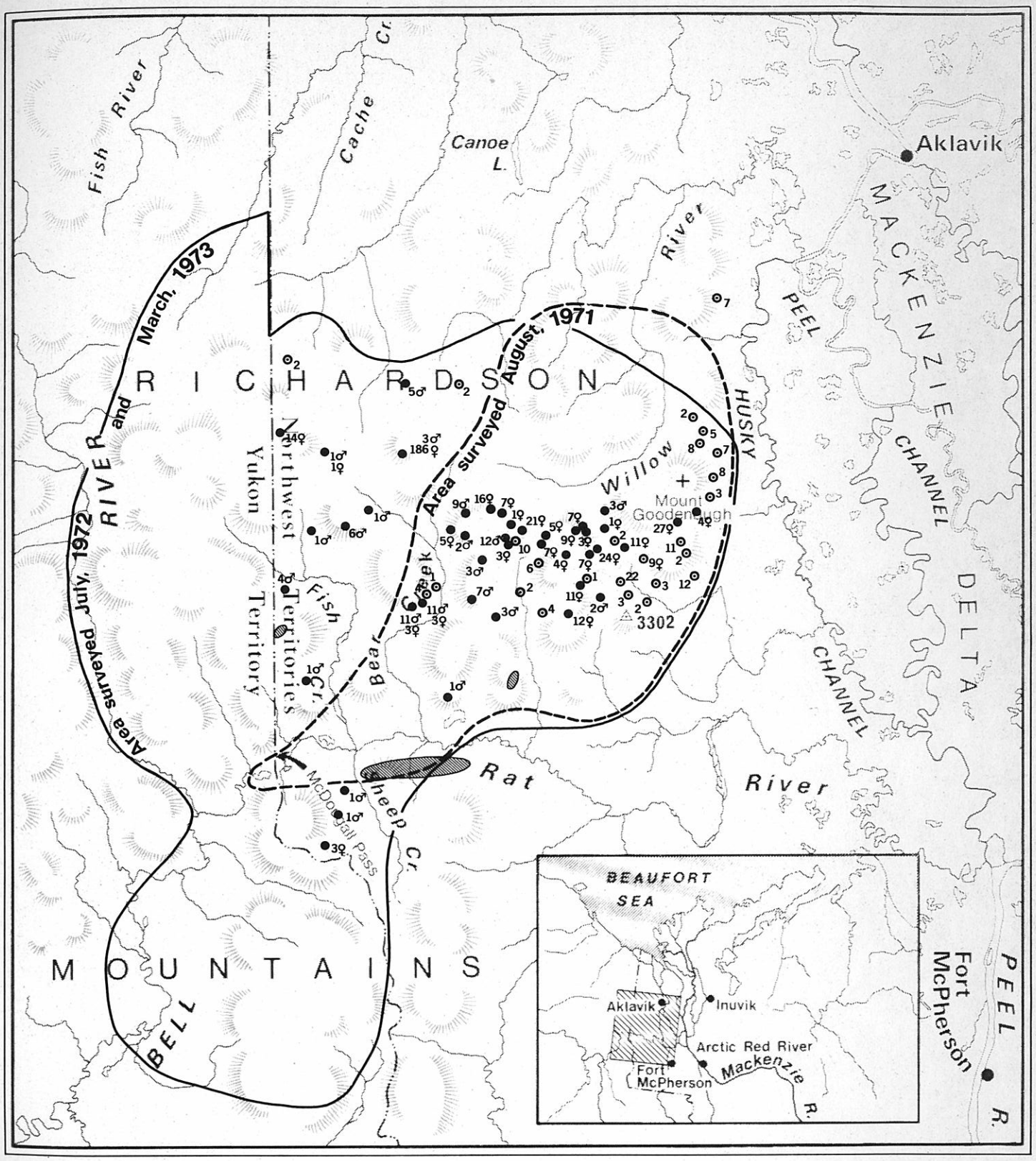
Most of the information about the general distribution and abundance of Dall's sheep in the area between Mount Goodenough and

the Territorial boundary in the Richardson Mountains was obtained by aerial surveys. On 12 August, 1971, the area of Mount Goodenough and the mountains southwest of there to the Rat River were searched by Helio Courier aircraft (Fig. 1). Surveys were conducted during July, 1972, and March, 1973 by J. Nolan, B. Goski, and E. Debock in Bell 206 helicopters in the area outlined in Fig. 1. The aerial survey data were supplemented by interviews of hunters and N.W.T. Game Management Division officers in Aklavik and Fort McPherson.

Information about harvests of Dall's sheep by resident hunters was obtained through interviews of hunters by myself and N.W.T. Game Management Division officers. We were unable to obtain sheep incisors from hunters for age determination, although we offered payment to hunters through the Game Management Division for tagged mandibles.

Distribution and Abundance of Dall's Sheep in the Richardson Mountains

Figure 1 illustrates the general distribution and abundance of Dall's sheep in the survey area during mid-summer and late winter. In August, 1971, 193 sheep were seen within the area delineated, most of them south and southwest of Mount Goodenough and north and northwest of Benchmark 3302. Classification of the sheep by sex was incidental to the survey and not rigorously



LEGEND

- ●7♂ Number of adult (3+ years old) rams in summer (July-August)
- ●6♀ Number of sheep of "ewe groups" (ewes and juvenile rams) in summer
- ⊙8 Number of unclassified sheep in winter (March)
- ⊙9♀ Number of sheep of "ewe groups" in winter
- Area in which sheep tracks were seen in winter

Figure 1. Composite of winter and summer aerial surveys, 1971 - 1972, showing general distribution of Dall Sheep in the Richardson Mountains, N.W.T.

pursued. Thirty-seven adult rams were seen. The remaining classified sheep were listed as belonging to "ewe groups" (groups of ewes and juveniles).

A more thorough survey conducted by J. Nolan and E. DeBock resulted in a count of 447 sheep in July, 1972. Of these, 104 were identified as rams, and the remaining 309 as belonging to ewe groups. Sixty-eight of the rams identified bore horns of at least three-quarter curl and were 4 years old or older.

During mid-summer, most of the sheep in the Richardson Mountains occupy the precipitous terrain south of the Willow River and north of the Rat River. Although groups of adult rams are most often seen apart from ewe groups, the country both groups occupy is interspersed.

During the winter, the sheep are generally found in smaller groups than in the summer. Their winter range usually is along canyon and ravine rims, particularly along the east edge of the range overlooking the Mackenzie Delta. Large areas of summer habitat, especially west of Bear Creek, are vacated by sheep during winter.

Jack Nolan commented that during their July, 1972, aerial survey, they counted 160 sheep in the Richardson Mountains west of the

Yukon - N.W.T. border. However, in a March, 1973, aerial survey of the same area, they counted only nine sheep west of the boundary. He speculated that most of the sheep that spend the summer west of the border move east to the Mount Goodenough area to winter (personal communication, 21 September, 1973, in author's files).

Harvests of Dall's Sheep in the Richardson Mountains

The Richardson Mountains are closed to sport hunters. The only persons permitted to hunt in the range possess general hunting licenses which permit them to hunt any time of the year and kill as many animals of any species as they desire.

Because harvests of Dall's sheep in the Richardson Mountains are not well monitored, it was necessary to reconstruct past hunts through interviews. The harvest figures are probably imprecise.

Fort McPherson. Only rarely are hunts for Dall's sheep organized by the people of Fort McPherson. The residents of that village are almost always after caribou when they hunt in the Richardson Mountains. They usually hunt the east slope of the range within 40 miles of the community after spotter aircraft have located the caribou. Motor toboggans transport most hunters to the mountains.

Fort McPherson hunters report that the caribou move south into the mountains west of the village in October, and that they move north in February and March. Once alerted to the presence of caribou in the nearest mountains, the hunters guide their motor toboggans and a few dog teams up the Peel River and then into the mountains along Stony Creek and the Vittrekwa River. The hunters may kill several hundred caribou during such a winter hunt, but usually no sheep.

Occasionally the Fort McPherson people hunt in the mountains during the summer. Also infrequently, their summer or winter hunts may take them into the Mount Goodenough area. In 1965, for example, four or five hunters threaded their way by canoe down the Husky Channel to a point opposite Mount Goodenough, and then made the difficult hike into the mountains. They killed 5 or 6 caribou and one sheep. Such unusual hunts in the area north of the Rat River produce the only sheep taken by the people of Fort McPherson.

Aklavik. The most Dall's sheep by far are taken by the approximately 20 hunters living in Aklavik. Nevertheless, the hunters claim that Dall's sheep are not actively hunted but are taken only incidentally during caribou hunts.

The people of Aklavik normally hunt caribou northward from the Rat River to the Cache Creek drainage. Occasionally, however, hunters have ranged well into the Yukon, even to the headwaters of the Rock River.

Even though the harvest of Dall's sheep by the people of Aklavik is the heaviest in the Northwest Territories north of the Gayna River (Mackenzie Mountains), only sketchy records of the kills are available. Tables I and II are a reconstruction of sheep harvests by the Aklavik people. Most hunts were conducted in the late winter.

Table I shows that there has been an increase in the number of sheep killed in the Richardson Mountains each year since 1968. Although there were nearly three times as many sheep killed during the winter of 1972/73 as compared with the winter of 1968/69, this did not reflect a significant increase in the number of hunters in the field. It probably reflects instead a change in the hunting pattern that resulted in more man days being spent in sheep habitat. The sharpest increases in sheep kills since the winter of 1968/69 have been in the Sheep Creek and Mount Goodenough areas. There has been a decrease in the number of sheep taken in the Cache Creek area. In six winters, 212 sheep were killed, and Table II shows that most of them were taken from the Mount Goodenough area (43%). Thirty-three

Table I -- Dall's sheep reported killed by hunters from Aklavik, N.W.T., in the Richardson Mountains, 1967-1973.

Date	Location	Sheep Killed ♀	♂	Uncl. juv.	Uncl.	Total
1967/68	Not specified				25	25
1968/69	Sheep Creek	6	4			10
	Mount Goodenough	4	2			6
	TOTALS	10	6			16
1969/70	Sheep Creek	2	2			4
	Mount Goodenough	4	8			12
	Cache Creek	11	3			14
	TOTALS	17	13			30
1970/71	Sheep Creek		2			2
	Mount Goodenough	11	13			24
	Cache Creek	9	2			11
	Fish River		2			2
	TOTALS	20	19			39
1971/72	Sheep Creek	7	6			13
	Mount Goodenough	8	6			14
	Cache Creek	12	1			13
	TOTALS	27	13			40
1972/73	Sheep Creek	6	5	23		33
	Mount Goodenough	6	7	11		24
	Cache Creek		2	3		5
	TOTALS	12	14	37		62
GRAND TOTALS		86	65	37	25	212

Table II -- Dall's sheep killed by Aklavik hunters, summarized by geographic area, 1968-1973.

Area	♀	♂	Uncl. juv.	Total
Sheep Creek	21	19	23	62
Mount Goodenough	33	36	11	80
Cache Creek	32	8	3	43
Fish River		2		2
TOTAL				187

per cent of the sheep came from the Sheep Creek area, and 23 per cent from the Cache Creek area.

The ratio of rams to ewes killed during the past five winters was 74:100. The ratio in the Mount Goodenough area was nearly even (109:100), while in the Cache Creek area it was 25:100.

Only two of the 25 hunters that have hunted sheep since 1968 killed animals every year. Those 2 hunters each killed from 2 to 10 sheep each year, or at least 70 sheep in 5 years. They harvested nearly 3 times as many sheep as the next most successful hunters.

Discussion

In the area delineated in Fig. 1 as having been surveyed during the summer of 1972, 447 sheep were counted. Experience has shown that one can expect to miss about ten per cent of the sheep in an area during an aerial survey. Based on that assumption, we can estimate that there were roughly 500 sheep in the 1972 survey area.

A breakdown by sex and age class of the sheep seen during the aerial surveys was not attempted, so it was necessary to extrapolate data from other Dall's sheep ranges to arrive at an

estimate of population structure in the Richardson Mountains. In the Mackenzie Mountains, 78 groups of sheep (553 individuals) were classified in June, July, and August, 1971. The following ratios resulted:

Tertiary sex ratio - 85 ♂♂:100 ♀♀

Annual increment - 69 lambs: 100 adult ♀♀

36 yearlings: 100 adult ♀♀

The above ratios are too refined for comparison with data from the Richardson Mountains, so it is sufficient to say that 22 per cent of the total sample population in the Mackenzie Mountains were lambs and 11 per cent were yearlings.

If we assume that the annual increment in the Richardson Mountains has been the same as that found in the Mackenzie Mountains, then 110 lambs and 55 yearlings were part of the 1972 population of 500 sheep in the Richardson Mountains. Because sheep that have survived their first winter have a greater chance of surviving during subsequent winters, the annual increment estimate of 11 per cent (55 yearlings) is the more significant figure.

If the above extrapolations are correct, then during the 1972/73 winter hunt in the Richardson Mountains, the Aklavik residents took about 11 per cent more than the estimated annual increment

of Dall's sheep. Of some significance is the fact that nearly half of the adults killed were females and over half of the total kill consisted of juveniles. If like hunter success and ratios of females and juveniles to totals killed are maintained in future years, we can expect a decline in the sheep population in the survey area.

Recommendations

Considering the unreliability of the data presented, this report should serve mainly as a warning that Dall's sheep may be over-harvested in the Richardson Mountains, and that such overharvest is occurring in the best sheep habitat in the mountain range. In response to that warning, the Northwest Territories Game Management Division should:

1. Improve the quantity and quality of the information gathered about Dall's sheep hunting in the Richardson Mountains. The minimum information that should be collected is:
    a. Hunter success by area,
    b. Dates and locations of kills,
    c. Sex and ages of kills.

    Such monitoring will reflect the effect of continued hunting on the sheep population and will generally portray population structure.

2. Discuss the possibility that hunters are overharvesting sheep with the Aklavik Trappers Association to gain their support and understanding of management programs.
3. Conduct further aerial and ground surveys to determine more precisely:
    a. the seasonal distribution and general abundance of sheep in the areas most commonly hunted,
    b. yearling survival (recruitment).

    Such information will form a basis for recommendations about harvest quotas for specific areas.

If it becomes evident that Dall's sheep hunting is no longer incidental to caribou hunting, more intensive management surveys, including population estimates, and strict harvest controls may be called for. At present, however, we are faced mainly with a need for more and better information about the Dall's sheep of the Richardson Mountains and the nature of man's use of this resource.

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