

AERIAL DALL SHEEP SURVEY  
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Aerial Dall Sheep Survey  
Yukon-Charley Rivers National Preserve  
June-August 1983

Introduction

An extensive aerial survey of Dall Sheep (Ovis dalli - white and fannin color phases), summer range and escape habitat was conducted from June through August 1983 using a Bell 206B Jet Ranger on contract for FIREPRO field operations. Pilot Mark Murray (Kenai Air Alaska) and I were the principle observers - aided, as logistics permitted, by Bill Goebel or Bryan Pittman of the preserve staff. Seven separate flights totalling 11.18 hours were flown. Disturbance of and stress to the sheep was avoided to the greatest extent possible at all times. Overall, survey conditions were considered to be good to excellent except in the Crescent Creek block where a violent frontal passage prevented completion of the count.

Purposes of the Survey

- Familiarization with the extent and condition of summer and winter range and escape terrain in each of the six areas of extensive sheep habitat in Yukon-Charley.
- Location of mineral licks.
- Obtain baseline data on sheep numbers, distribution and sex/age composition.
- Estimate percentage of fannin-phase sheep to the north of the Yukon River along the international border.
- To delineate regularly used trails traversing through wooded habitat to distant outcrops and water.
- To relate the extent of sheep range and encroaching alpine woodlands to ongoing fire management planning.
- Locate STOL aircraft access areas.

Previous Surveys

ADF&G biologists have surveyed the 5 areas of extensive sheep habitat south of the Yukon and within the preserve on several occasions. Most recently (July 1982) this portion of the "Tanana Hills" was flown by PA-18 pilots and observers for some 8.2 hours recording 113 sheep with a +0.3 correction factor yielding an upper estimate of 147 animals for these areas south of the Yukon River.

To our knowledge the Ogilvie unit to the north of the river has never been formally surveyed until the efforts by NPS personnel in 1982 and 1983. The Yukon Territorial Government carried out an aerial inventory of sheep populations in the Ogilvie Mountains in 1980 but did not classify individuals except rams 2 years and older and lambs.

## Methods

We delineated 6 counting units; 5 south of the Yukon River and 1 to the north using larger watercourses and lowlands as natural boundaries between units. Sheep were classified in one of the following categories; ewes, lambs, yearlings and rams as either 1/4, 1/2, 3/4, 7/8, or full curls. We feel accurate figures were obtained using the helicopter in a conscientious manner, landing to classify sheep with a 20-45x spotting scope to avoid disturbance and scheduling flights during stable survey weather whenever possible.

## The Units and Results

The Dall sheep of the Tanana Hills have been aptly characterized as "highly dispersed, low-density populations limited by predation rather than forage" (Kellyhouse ADF&G, 1982) due to the nature of the terrain in these rolling uplands. Summer and winter range forage appears to be abundant however, escape cover is often limited and I have, on numerous occasions, observed sheep, or their sign, up to 15 miles from the nearest "typical" sheep habitat.

As a consequence lamb production/survival tends to be very low. Adjacent areas (i.e., Glacier Mountain 1949-1982) of more extensive steep, rocky terrain supported larger populations and significantly greater lamb survival rates.

In contrast to the Tanana Hills the montane habitat to the north of the Yukon River is significantly different. The "front" ranges of the Ogilvie Mountains in the Yukon Territory make their most western extension across the border and into the preserve in the Tatonduk and Nation River drainages. Rugged highlands of extensive limestone spires and ridge systems characterize this area. Limestone outcrops provide escape terrain throughout the "foothills" and along watercourses. Summer and winter range forage appears abundant. The seasonal movement of sheep in this area is not well understood.

## Habitat Descriptions

### Tanana Hills

#### Diamond Fork/Copper Creek

The preserve boundary runs along the divide in this area. Due to limited funding we were unable to survey the slopes outside the preserve thus no confidence limits can be placed on this unit count. This unit is characterized by steep terrain with elevations to 6,239. Historically, the sheep population here is one of very low density, lamb survival is low and forage appears limited. The terrain between this unit and Mt. Sorenson is easily traversed and not thickly wooded so some exchange of animals probably occurs. Sport and subsistence hunting harvests appear minimal. Good aircraft access is the rule on the low elevation ridges to the west.

#### Mt. Sorenson (5,618')

The eastern slopes are characterized by rolling terrain with little escape rock and abundant forage. The western aspect is very rugged with limited forage available in the heads of the drainages and along the ridges. A well-used sheep trail follows the Essie/Highland Creeks ridge down to the bluffs on the Charley River. Some subsistence and sport harvest has been recorded by individuals using river boats with jet units or powered canoes to ascend the Charley during moderately high waters. There is good STOL aircraft access on the lower flanks of Sorenson and a moderate amount of sport hunting occurs. High elevation springs occur in almost every drainage.

#### Copper Mountain (6,367')

A low density sheep population with historically low lamb/ewe ratios. Forage appears abundant on the lower flanks and glacial features provide plenty of steep escape terrain and tarn lakes - especially on the eastern side. Caribou use this habitat spring, summer and fall and have been observed at the highest elevations. It is unknown whether the presence of caribou has any affect on the sheep. Some exchange of sheep probably occurs with the Cirque Lake highlands to the west across the mainstream of the Charley River. Sport/subsistence hunting pressure is minimal. STOL equiped aircraft access is fair on lower elevation ridges.

#### Twin Mountain (5,784')

This area of limited sheep habitat is nearly devoid of precipitous escape terrain. The ridges radiating from the mountain appear to provide good forage for both summer and winter range. As with the Mt. Sorenson population to the east, these sheep appear to utilize bluffs on the Charley River year around. The gentle terrain makes access easy in STOL equipped aircraft. Sport and subsistence hunting harvests are probably minimal.

#### Cirque Lakes

This area of the preserve contains the most extensive contiguous alpine habitat to elevations of 6,435' and supports about 35% of YUCH's Dall sheep. Glacial features provide steep escape routes and abundant water sources throughout the higher elevations. As with the majority of the other units forage does not appear to be a limiting factor. Access to STOL sport hunters is good on the flanking ridges and at "Gelvins" gravel strip on a bend of the Charley River. A great expanse of sheep habitat lies immediately to the west across Crecent Creek. This area contains a very low density population and is difficult to delineate as some movement must occur across Crescent Creek into the core habitat.

#### The Ogilvies

This unit north of the Yukon is significantly different from the previously described Tanana Hills units south of the Tintina fault and Yukon basin. This scenic region is characterized by limestone palisades, spires and ubiquitous caves in deeply dissected mountains rising to 4,800'. This westernly extension of the Ogilvie Mountains appears to provide adequate forage and substantial escape habitats. The Ogilvies are known for the fannin color phase Dall's sheep that occur in varying degrees of coloration and as unknown percentages of the population(s). Although, several other

areas produce black-tailed sheep (Mentasta Mountains, Mt. Harper) and full color fannins have been recently recorded for the Glacier Peaks/Mt. Eldridge area, the Ogilvie ranges in Yukon-Charley Rivers contain the only known full color phase fannins in an NPS management area.

This area was unsurveyed until our efforts of 1982 and 1983. This area is very difficult to survey and draw reliable conclusions from for several reasons; the population appears to fluctuate greatly due to seasonal and migratory movements of sheep across the U.S./Canadian border, the availability of escape rock along the heavily forested watercourses allows sheep to travel between areas of more typical habitat unseen by aerial observers and no previous survey data exists for comparative purposes. Access by STOL aircraft is fair throughout the area and some hunting occurs by individuals ascending the Tatonduk River by boat and hiking into the front ranges.

### Results

A comparison of data from 1982 ADF&G and 1983 NPS Tanana Hills surveys indicates a low reliability of population figures due to one or a combination of the following factors; sheep in vegetational cover during surveys, sheep utilizing marginal fringe habitat usually overlooked by observers and exchange of animals between adjacent areas. I believe a correction factor of +0.3 in the Tanana Hills and +0.4 in the Ogilvies should be applied. A corrected estimate brings the total number of Dall sheep in Yukon-Charley to 237 animals.

The same reliability factors held true to an even greater degree in the Ogilvies with the additional effect of seasonal/migrational sheep movement across the international border. No confidence limits can be placed on this data without a further census for comparative purposes.

Previous ADF&G surveys did not differentiate age classes of "sub-legal" rams, band size/composition or habitat information. Although NPS surveys are not conclusive, the additional data collected establishes extent of range, STOL aircraft access, general habitat descriptions, getting a handle on lick locations/utilization and detailed sex/age composition breakdowns.

Although fire occurrence in the Tanana Hills is low fire suppression for the past three decades has probably allowed an elevation in treeline to occur in some portions of these areas and has undoubtedly reduced viable winter range at lower elevations. Fire Management Plan revisions will take this aspect of the effect of wildfire on sheep habitat into consideration.

Although no mineral licks were identified, further attempts to locate them should be made in the course of further surveys.

The nature of the terrain and limited sheep habitat in the Tanana uplands makes these populations highly vulnerable to disturbance and predation.

Recommendations:

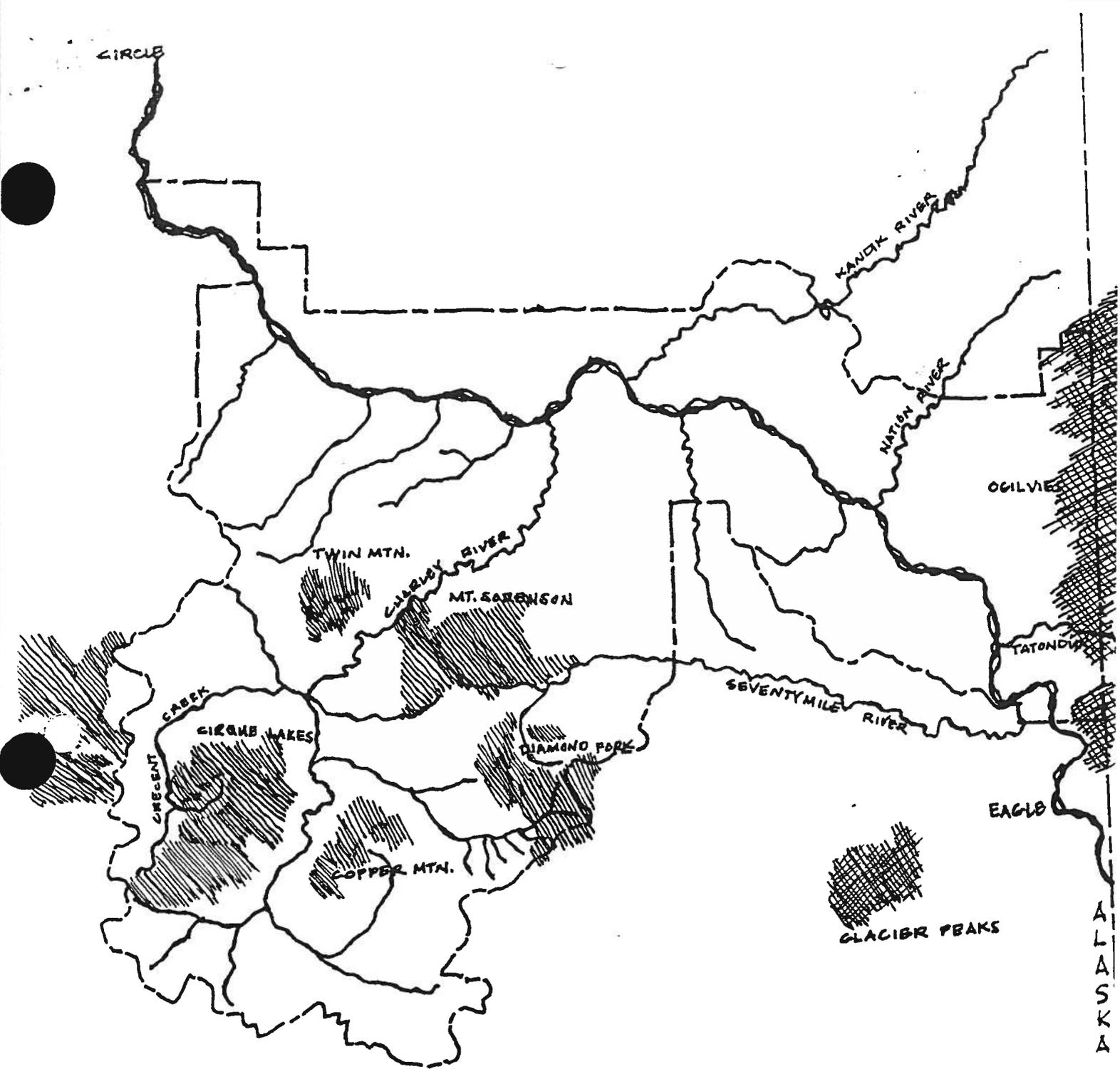
It is essential to increase the accuracy and reliability of our data base with selective aerial and ground surveys in FY 84. Of primary importance are; 1) a complete survey of the Cirque Lakes unit and adjacent habitat along the preserve boundary in the vicinity of Crescent Creek to accurately estimate the population and composition as well as identify lambing areas, 2) survey the Ogilvie unit in early June and again in early August to compile comparative sex/age composition, ewe/lamb ratios, population fluctuations due to international movement, identify lambing areas and quantify the occurrence of fannin color phase animals in this population. In addition this portion of the preserve has the highest lightning activity level and wildfire occurrence of any region in this vicinity. Limited suppression of frequent wildfire in this area should increase what is presently marginal winter range in the sub alpine zone.

I believe that the Tanana Hills sheep are unique and deserve a closer look. Some of these areas of limited habitat extent offer excellent predator/prey relationship study opportunities in a biogeographical "island" context. Since this region of very low precipitation was minimally affected by glaciation during the last three glacial periods, these populations have probably evolved in this environment for a considerably longer period than most interior sheep populations.

If we can complete this survey in Yukon-Charley Rivers in a thorough manner at this time I believe the NPS can effectively manage this unique habitat, monitor the population changes on a five year survey frequency, provide useful information to local advisory game boards and ADF&G for decisions regarding regulation and harvest level proposals and fulfill our legislative mandate to protect habitat for and populations of Dall sheep.

cc:  
Dave Kellyhouse  
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S.ULVI:lf:12/20/83



YUKON-CHARLEY RIVERS  
 NATIONAL PRESERVE  
 DALL SHEEP UNITS

-  white phase
-  fannin phase occurrence

 MT. HARPER

1983 DALL SHEEP SURVEY  
Yukon Charley Rivers National Preserve

AREA	DATE 1983	TOTAL SHEEP #	# OF BANDS	LAMBS	YEARLINGS	2 YR.	EMES	UNCL. +	TOTAL RAMS	2 YR.	1/4	1/2	3/4	7/8	FULL +	UNCL. %	% LEGAL RAMS IN POPULATION <sup>a</sup>	LAMBS/100 EMES
Diamond Fork/ Copper Creek	8/02	7	2	0	0	0	0	0	7	1	1	2	0	1	2	0	47%	N/A
Mt. Sorenson (including ESSIE CRK. BLUFFS)	7/29	31	10	2	0	1	8	0	20	0	0	5	2	3	5	5	25%	25
Copper Mtn.	7/26	13	4	2	1	0	1	0	9	2	0	3	4	0	0	0	0	N/A
Twin Mtn.	7/27	35	5	10	3	1	10	1	10	2	2	3	2	0	1	0	11%	100
Cirque Lakes <sup>b</sup>	8/09	66	13	10	9	6	19	1	21	0	1	4	1	5	10	0	22%	52
The Ogilvie Mtns.	6/15	29	5	7	0	0	12	3	7	1	0	4	0	0	1	1	3%	58
TOTALS <sup>c</sup>		181	39	31	13	8	50	5	67	6	4	21	9	9	19	6	N/A	N/A

a. <sup>1</sup>Legal rams<sup>a</sup> denotes 7/8 curl or larger.

b. Incomplete survey due to high winds and low visibility.

c. A correction factor of +0.3 for the Tanana Hills and +0.4 for the Ogilvies yields a corrected estimate of 237 sheep in the Preserve.