

**1996 DALL SHEEP AND CARIBOU SURVEYS IN THE WEST
CENTRAL ALASKA RANGE**

GAME MANAGEMENT UNITS 16B, 19C, AND 20C

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BACKGROUND

Little is known about Dall sheep and caribou populations inhabiting that portion of the central Alaska Range encompassed by Game Management Units (GMUs) 16B, 19C, and 20C from approximately the Kahiltna and Muldrow glaciers on the north to the Chakachamna River on the south. Few aerial surveys have been conducted, probably due to the logistics of working in this distant and rugged area, and from the perception that sheep and caribou numbers were too low to warrant the expense. With passage of the Alaska National Interest Land Conservation Act in 1980, portions of this area were included in an extension to Denali National Park and Preserve (DNPP) and in the newly-created Lake Clark National Park and Preserve.

Lack of extensive surveys and numerous requests for baseline information prompted a desire for intensive sheep surveys in this area. Limited aerial surveys were conducted in 1970 (Didrickson 1971), and 1977 (Didrickson and Taylor 1979) encompassing portions of the Styx, Happy, Skwentna, Kichatna and Yentna Rivers. During these surveys, biologists saw 148 and 152 sheep, respectively. NPS biologists attempted to survey DNPP during 1981 (Singer 1981), however the survey did not include areas in the south west portions of the park and preserve. When discussing information needs, Alaska Department of Fish and Game (ADFG) and DNPP biologists wishing to increase their knowledge of wildlife populations on the south side of the Alaska Range, saw an opportunity to coordinate survey efforts to maximize survey efficiency and use of resources. Coordinating survey efforts maximized the information derived from the survey.

The caribou in this area are considered to be part of the Rainy Pass caribou herd, of which very little is known about population size or distribution (Whitman 1993b). During a statewide planning process in 1975, biologists stated that they felt the size of this herd was static at approximately 1500 caribou during the 1960s and early 1970s (Rausch 1976).

The area of the Denali Preserve and west is commonly used by sheep and caribou hunters. Most hunters access the area with aircraft, and most sheep hunters are nonresidents accompanied by guides (Whitman 1993a). Sheep harvest has been restricted to rams since statehood, but a legal ram has varied from 3/4-curl to full-curl. Harvest is currently restricted to full-curl rams. During 1962-1970 harvest averaged 11 rams (range 4-20) per year (Didrickson 1971).

Prior to 1977 the caribou bag limit for GMUs 16 and 19 was 3 and 5 caribou, respectively. Biologists felt caribou distribution precluded an extensive harvest (Bishop 1971). By 1977 the bag limit in both GMUs had been reduced to one caribou, and caribou hunters were required to report their activity on a harvest ticket (Didrickson and Taylor 1979). That year 37 caribou were reported taken from GMU 16. Concern about increasing female harvest (Whitman 1993b) recently led to a restriction in the bag limit (from one caribou to one bull) in GMUs 16 and 19C.

OBJECTIVES

1. Estimate size, composition and distribution of the sheep population inhabiting the southeastern portion of the west-central Alaska Range (west of the Kahiltna and Muldrow glaciers to Mystic Pass, and south of Shellabarger Pass to Kenibuna/Chakachamna Lakes) in GMUs 16B, 19C, and 20C.
2. Estimate minimum number and distribution of "Rainy Pass" caribou in sheep count areas.

METHODS

Sheep

During 30 June - 11 July 1996, observers from both the ADFG and DNPP surveyed 12 Dall sheep count areas in the Yentna, Tonzona, Kuskokwim, and Skwentna River drainages flowing from the eastern portion of the west-central Alaska Range. These count areas lie primarily in GMU's 16B, 19C, and 20C (Fig. 1). The survey area was bounded on the east by the Kahiltna and Muldrow glaciers, on the west by the Tatina, South Fork Kuskokwim, Styx and Chilligan Rivers, and on the south by Kenibuna and Chakachamna Lakes. Six count areas (16-01, DENA-03, DENA-04, DENA-05, DENA-06, DENA-07) lie primarily within DNPP.

Unfortunately, it was generally difficult to delineate count area boundaries to facilitate immediate comparison with surveys flown in 1977 (ADFG) and 1981 (NPS) due to differences in unit boundaries and survey areas between the surveys. Boundaries for 1996 count areas were generally drawn along river and creek bottoms, to reduce the effect of sheep movements on survey results.

Sheep were counted by teams consisting of a pilot and observer using Piper PA-18 aircraft. Survey units were flown by following drainages and contouring along the slope. When possible, opposite sides of a ridgeline were surveyed consecutively to minimize the likelihood that sheep of sheep moving across a ridge from one drainage to another. When a group of sheep was first encountered, and still undisturbed, the observer determined total group size. The pilot would then maneuver closer and the observer would classify sheep as lambs, rams, "ewe-like" (adult ewes and rams less than 1/4-curl) or unidentified. Rams were further classified, by horn size, as 1/4-curl, 1/2-curl, 3/4-curl, and full-curl rams. Group locations and flight lines were plotted on 1:250,000 and 1:63,360 topographic maps.

Total survey time was 55.7 hours, and aircraft charter costs were \$6,000 for ADFG and \$6,000 for DNPP. Observers were H. Griesse and M. Masteller (ADFG), and K. Fox, K. Stahlnecker and A. Smith (DNPP). Pilots were D. Filkill, S. Steck, H. Twitchell, and W. Wiederkehr.

Caribou

Caribou observations were recorded incidental to sheep surveys. Groups were generally small enough to permit exact count, however, to save time, some larger group sizes were estimated. When possible, individuals within groups were classified as bulls, other adults and calves. Group locations were plotted on 1:250,000 and 1:63,360 topographic maps.

RESULTS

We observed 1786 sheep in 11 of the 12 count areas; no sheep were seen in count area DENA-04 (Table 1). Numbers were highest in those count areas encompassing the crest of the Alaska Range. Overall, the population was composed of 22% lambs, with 39 lambs:100 "ewes" and 37 rams:100 "ewes." Of 373 rams observed, 114 were classified as full-curl or larger. There were 11 full-curl and >full-curl rams per 100 "ewes" and 26 <full-curl rams per 100 "ewes". Generally, those areas on the north side of the Alaska Range within DNPP had a lower percentage of full-curl rams and a higher lamb:ewe ratio (45:100).

We observed 1130 caribou in 6 of the 8 sheep count areas (Table 2). No caribou were seen in count areas DENA-03 and DENA-04, within DNPP. Count areas DENA-05 through DENA-07 were not included in the tally because these caribou are members of the Denali herd. Of 720 caribou classified, 17% were calves (or 20 calves:100 adults). Little effort was made to ascertain gender on most adults, so the number of bulls should be considered an absolute minimum.

DISCUSSION

Sheep

Differences in survey intensity, methods and coverage make broad comparisons between 1970, 1977, 1981, and 1996 surveys difficult. These differences, the 26-year span between surveys, and the lack of systematic surveys in adjacent areas (Whitman 1993), make it impossible to identify a recent trend in population size.

However, there are two indications that sheep numbers were greater in some areas on the south side during 1996 than in 1977. First, the number of sheep observed per hour of survey time increased for south side count areas from 15.2 sheep/hour during 1977 to 25.4 sheep/hour during 1996. Second, in those portions of four count areas where survey coverage was similar in 1977 and 1996, examination of the raw data allowed comparisons between years. In two of these count areas (16-04 and DENA-03) sheep numbers increased dramatically. In 16-04, the common areas searched included the drainages of Portage, Muddy, Emerald and Crystal Creeks, which flow into the west side of the upper Skwentna River. In these areas, three sheep (all ewes) were seen during 1977, compared with 72 sheep (37 rams, 24 ewes and 11 lambs) during 1996. In the portion of DENA-03 bounded by the headwaters of the West Fork of the Yentna on the west and south, Mt. Dall on the east and Mystic Pass on the north, 18 sheep were seen during 1977 and 66 sheep were seen during 1996. In count areas 16-01 and 16-02, the distribution and number of sheep was roughly equivalent between 1977 and 1996. In areas common to both surveys within 16-01, four sheep were seen in 1977 versus zero in 1996. In common areas within 16-02, observers saw 60 sheep in 1977 and 49 sheep in 1996. Direct comparisons between the 1981 and 1996 surveys within DNPP are difficult due to differences in survey techniques, boundaries, and search intensities. The 1981 survey utilized a helicopter. Singer (1981) stated that 180 sheep were observed west of the Muldrow glacier, however, the western extent of this survey is not clearly articulated in the survey report and it is impossible to determine the locations of sheep observations.

Overall, the observed lamb:ewe ratio (39:100) was very similar to the average of 38 lambs:100 ewes (range 25-45) reported for five surveys conducted from 1972 to 1984 in various portions of the western Alaska Range (Whitman 1993a). Although sheep are more numerous on the western side of the Alaska Range, there have been no recent surveys in GMUs 19 or 17, nor is there a systematic aerial survey program to help elucidate trends in population size and composition.

Sheep harvest in areas open to harvest is limited by access, and is well below sustainable levels. Landing sites for aircraft are sparse, and during 1990-1994 an average of 15 rams (range 12-18) were reported taken by hunters. We estimated at least 90 full-curl rams present in the areas open to harvest during July 1996. Whitman (1993a) estimated a harvest rate of approximately 3% for the entire western Alaska Range. This population is probably regulated strictly by weather. Winter conditions on the south and east flanks of this portion of the Alaska Range can be quite severe, which probably explains the rapid decline in sheep density as one travels south or east of the crest of the range.

The search area was more extensive, and more thoroughly searched, during 1996 than in either 1970 or 1977. Biologists in 1977 appeared to have adhered strictly to GMU boundaries, which generally follow ridge lines. Thus they intentionally did not search areas where many sheep were seen during 1996. Sheep count areas should be delineated using natural barriers to sheep movement, such as large river valleys. This serves to better isolate subpopulations and minimize the possibility of duplicate observations when search effort is spread over several days. The standardization of count areas would greatly facilitate comparisons of results between different surveys.

Caribou

The Rainy Pass caribou herd is perhaps the least understood in the state (Whitman 1993b), and these were the first surveys to estimate minimum population size. The herd is thought to be resident in the Rainy Pass area and headwater drainages of the South Fork of the Kuskokwim River. While the distribution and movements of this herd are unknown, few caribou were seen north of the Kichatna River during our surveys. No caribou were seen north of Shellabarger Pass, the area which appears to separate the Tonzona and Rainy Pass herds (J. Whitman, pers. commun.) On the west, we did not survey the upper South Fork Kuskokwim and Hartman River drainages, which are known to contain caribou. It is likely this herd consists of at least 1500-2000 caribou.

Harvest of caribou is typically reported for the herd, not for the GMU. In the Rainy Pass area, concern about possible overharvest of females (Whitman 1993b) resulted in a change in bag limit, from one caribou to one bull, beginning during the 1993-94 season. During 1988-1992 an average of 82 (range 56-110) caribou were reported taken from this herd. In the two years following the restriction in bag limit, an average of 46 bulls were reported killed by hunters. If there are 1500-2000 caribou in this herd, the harvest rate in recent years has been 2-4%. This harvest regime should have no impact on the dynamics of this herd.

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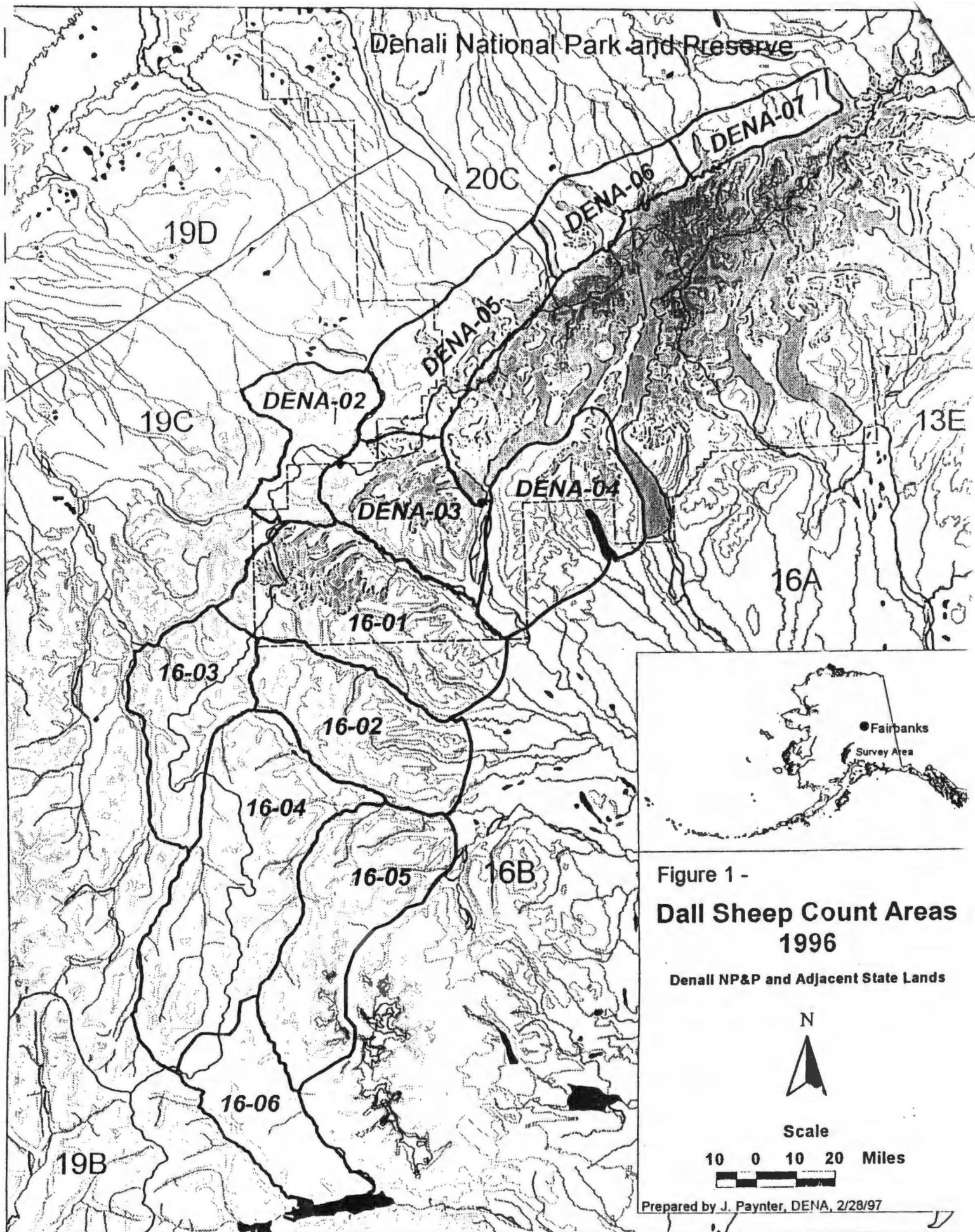


Table 1. Results of Dall sheep surveys Game Management Units 16B, 19C, and 20C in the west-central Alaska Range, during 30 June - 11 July 1996.

Area	GMU	Date	<Full-curl Rams					Total		Full-Curl Rams			Total Rams	"Ewe-like" Lamb	Unid.	Sheep	Total Survey Time (hrs)	Observer/Pilot	Crest Side
			Unk		1/4		3/4	<4/4		>4/4		Total Rams							
			0	1	2	3		0	1	2	3								
DENA-02	16B/19C	3-Jul	0	28	24	21	73	18	91	389	179	0	659				6.5	Stahnecker/Twitchell	North
DENA-03	16B/19C	2-Jul	0	8	1	8	17	19	36	59	27	0	122				5.00	Smith/Steck	South
DENA-04	16B	30-Jun	0	0	0	0	0	0	0	0	0	0	0				2.00	Stahnecker/Twitchell	South
DENA-05	19C	4-Jul	0	6	10	11	27	4	31	31	16	0	78				3.90	Stahnecker/Twitchell	North
DENA-06	20C	4-Jul	0	2	2	2	6	2	8	22	9	0	39				3.50	Smith/Steck	North
DENA-07	20C	11-Jul	0	1	1	5	7	0	7	5	1	0	13				2.50	Fox/Twitchell	North
16-01	16B/19C	2-Jul	0	8	8	7	23	3	26	89	29	0	144				6.30	Stahnecker/Twitchell	South
16-02	16B	2-Jul	2	2	2	2	8	2	10	32	7	0	49				4.40	Masteller/Wiederkehr	South
16-03	19C/16B	2-Jul	11	3	8	7	29	24	53	149	38	1	241					Griese/Filkill	
		3-Jul	4	0	5	9	18	15	33	58	15	3	109					Griese/Filkill	
	subtotal		15	3	13	16	47	39	86	207	53	4	350				7.05		South
16-04	16B/19C	3-Jul	29	0	0	2	31	16	47	88	39	0	174					Masteller/Wiederkehr	
		6-Jul	0	0	0	1	1	2	3	3	0	0	6					Griese/Wiederkehr	
	subtotal		29	0	0	3	32	18	50	91	39	0	180				5.70		South
16-05	16B	3-Jul	0	0	2	2	4	0	4	13	5	0	22					Griese/Filkill	
		6-Jul	4	1	0	4	9	1	10	54	19	1	84					Masteller/Wiederkehr	
	subtotal		4	1	2	6	13	1	14	67	24	1	106				4.15		South
16-06	16B/19C	8-Jul	6	0	0	0	6	8	14	20	12	0	46				4.70	Masteller/Filkill	South
GRAND TOTAL			54	59	74	81	259	114	373	1012	396	5	1786				55.70		
													Combined		North		South		
Total Rams:100 ewes													36.86		30.65		41.77		
Rams <4/4:100 ewes													25.59		25.28		25.84		
Full-Curl Rams:100 ewes													11.26		5.37		15.93		
Percent Lambs													22.17		25.98		19.16		
Total Lambs:100 ewes													39.13		45.86		33.81		
Full-Curl Rams:100 Rams													30.56		17.52		38.14		