

Alaska Department of Fish and Game
P. O. Box 209
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Patty Rost
Chief
Resource Management
Gates of the Arctic National Park and Preserve
U. S. National Park Service
P. O. Box 74680
Fairbanks, Alaska

Dear Patty;

I have completed the Dall sheep surveys within Gates of the Arctic National Park and Preserve. Following are all the data and results from those surveys.

Summary

I was able to completely survey Singer's (1984) counting units 1, 2, 3 and the southern part of 6a. I partitioned Singers' counting units into subunits to make the surveys more efficient. I was unaware that Layne Adams (1988) had also done sheep surveys in the park in 1987 and had subdivided the counting units. Fortunately almost all of my subunits were coincidentally the same as Adams' because of the natural topography features of the mountains.

In 16.7 hours of survey time I found 617 sheep in a 817 mi² area. Surveys in units 2 and 3 were complete and of good quality, however the number of sheep observed was less than found by Singer or Adams. In unit 1 smoke reduced visibility in half the area and the smaller number of sheep observed compared to prior surveys may have been due to this reason. High winds and fog prevented us from completing unit 6. The overall lamb:ewe ratio was 30:100 which is lower than Singer (50:100) or Adams (47:100) found but above or equal to other sheep surveys in Alaska in 1993.

The ram:ewe ratio was 40:100 and full curl rams comprised 39% of the ram total.

Methods

I used a Robinson-22 helicopter N404PR flown by Larry Larrivee (Pollux Aviation, 1740 East 5th Ave., Anchorage, Alaska 99501). We were able to fly for 3 hours without refueling and when we carried 10 gallons in jerry cans we were able to extend to 4 hours. We flew contour transects 100-200 feet above ground level mainly between 3000-4500 feet ASL. Our speed varied between 0-55 knots and almost all sheep were classified on the first pass. Most sheep reacted to the helicopter by moving away from us although some which were lying down only got up and resumed lying upon our passing. Their reactions varied depending on distance from the helicopter or terrain. Those on the steeper rock cliffs

tended to move less than those on flat terrain. Rams were identified into 5 classes: full curl 4/4, 3/4 curl, 2/4 curl, 1/4 curl and unknown male. Ewes included unidentified young rams and yearlings of both sexes. Most units were surveyed early in the morning when winds were not as strong but some surveys were flown in the afternoon (Table 1)

Results

We classified 617 sheep, including 158 rams, 393 "ewes" and 102 lambs during our 22.7 hour survey (Table 2). Density was estimated at 0.7 sheep/mi². The density is of half of what Adams (1988) and 2.5 times less than Singer (1984) found. However sheep density in counting units 1 and 6a should not be used for comparative purposes because of either sightability problems or incompleteness of the survey. In counting units 2 and 3 the area was covered completely and the declines in sheep numbers I found are probably real when compared to the previous surveys (Table 3).

Composition:

Although there are problems with the density data the sex and age composition of the sheep indicate a healthy population with a good ratio of rams, "ewes" and lambs. "Ewes" includes unidentified young rams and yearlings of both sexes and thus is used in quotes. The number of mature rams with full curl horns was 39% of the total rams counted. The lamb:"ewe" ratio was 30:100 which while lower than either Singer (1984) or Adams (1988) ratios of 50:100 or 47:100 respectively. Sheep surveyors in 1993 found a lamb crop failure throughout most of the Alaska Range and in the Brooks Range ratios ranged from 18-40:100 with even lower ratios in the western Brooks Range (Ken Whitten pers. comm.)

Survey Conditions:

In general survey conditions started off very good with high ceilings, light winds and good visibility but then deteriorated with smoke and then stronger winds and fog by the end of the week.

19 July: am high scattered clouds building to overcast in pm. Smoke rolled in from the north (large fire at Umiat) after noon. Increasing north winds. Flight hours: 7.5. Subunits surveyed: 031, 032, 033, 034, part 021, part 022, and part 024. We tried to survey 015 but were blown off SW corner.

20 July: am high scattered clouds, sun glare when surveying south slopes, no wind. pm solid overcast, no sun glare, no wind except SW corner of 014. Flight hours: 7.2. Subunits surveyed: remainder (rem) 021, rem 022, 023, rem 024, 025, 012, 013, part 015, part 016.

21 July: am thick smoke, clouds on mountains above 5500 feet in Subunit 015, visibility 0.5-1.0 miles due to smoke, light

north wind. pm smoke and fog rolling in on northern foothills, wind 20 mph. Flight hours: 3.9. Subunits surveyed: 011, 014, rem 015, rem 016.

22 July: am high fog from Giant creek north, clear south, winds 15-20 mph. pm winds 20-25 mph. Flight hours: 4.1. Subunits surveyed: 062, 063, 064 (western part only).

Cost:

I spent \$8418 in charter time to do this survey. National Park Service will pay \$5000 and the rest will come from my budget. I was allocated \$2500 for sheep survey and inventory activities and ran over budget by \$918. The helicopter cost \$230/hour dry with no daily minimum. I ran over budget mainly due to the 13.9 hour ferry time which was more than I had anticipated.

Other observations:

I saw 2 Gyr falcons, one of which was a white phase bird 024-19 (locations are coded by survey unit and observation number or map). Golden eagles were numerous and birds were seen at the following locations 011 nest north side mouth of Kongumavik Creek; 012 adult Akmagolik Creek; 013 2 adults on tributary to Confusion Creek; 1 adult west side; 014 east side; 022 one adult; 032 adult east side; 034 adult north side; 063 adult; 064 adult north side. We observed grizzly bears at the following locations as we passed over them. We made no attempt to fly closer to age cubs. Den seen 034-8 south side; 022-2 sow+ 2 cubs Akmagolik Creek; 012 sow+ 3 cubs; 063 sow+ 2 cubs; 062 male. We observed about 200 caribou total, they were usually on the tops of mountains and ridges (presumably seeking insect relief). All were bulls and the largest group size was 8, most were found singly. We only saw 3 moose, all were cows in the John River between Anaktuvuk Pass and Till Creek. One cow had twin calves. We saw no park visitors or subsistence hunters outside the immediate area of Anaktuvuk Pass. We saw one dead "ewe" in a steep gully with a hole into one hip where the ravens had been scavenging on it. It was too steep to land but the slope immediately above the sheep did not look steep enough that the mortality could have happen from a fall. The carcass looked fairly fresh.

Special Use Permit ARO GAAR 9500 312 :

This section of the survey report will be the report as required by the permit. Significant activities and events, including interactions with wildlife are detailed elsewhere in the body of this report. We landed the helicopter at the following locations for safety breaks and refueling: 68°15.05N, 152° 43.88W; 68°15.37N, 152°58.62W; 68°06.98N, 152°22.8W; 68°14.35N, 152°12.92W; 68°06.64N, 152°18.68W dead caribou location.

Conclusions and Discussion

Over all we conducted a good survey but I suspect sheep numbers observed are probably not a good estimate of population density. The weather was warm most of the time and some sheep may have

been seeking relief in caves and not visible. The visibility in parts counting unit 1 was very poor due to smoke. We checked out the licks but did not see any sheep at them, but did see sheep in the creeks above the licks. This was the first sheep survey I had done but my familiarity with numerous moose and caribou surveys helped with the search techniques. The use of a helicopter was indispensable in sexing and aging sheep. It would have been very difficult for me to correctly identify sheep had I used a Supercub without prior experience.

One of the sources of error for density estimations is the lack of clear boundaries for estimating the total area of each mountain range. For example counting unit 1 was estimated at 245 mi² by Singer (1984), 304 mi² by Adams (1988) and 293 mi² by me. This makes comparisons difficult. It would be best if a standard topographic boundary such as creeks or ridges or elevations were used. Just drawing lines down the middle of valleys will divide mountain units but the decision of whether to include large lakes or flat ground on the valley floor, which are not sheep habitat can skew the acreage. I tried to use the bottom of the slopes as the lower limits the mountain units.

Although the number of sheep I saw was less than previous surveys under less than ideal survey conditions in some of the area it is possible that a decline in sheep number has occurred since declines have occurred in the western Brooks Range in the Baird Mountains (Jim Dau, pers. comm.). If there has been a decline I doubt that hunting mortality has contributed very much since the decline also affected counting unit 3 where little hunting takes place. Also the 5-year average harvest from Anaktuvuk Pass has only been 23 sheep with 82% of it comprised of rams.

I used one inch to the mile USGS topographic maps to navigate and plot sheep locations. One initially confusing feature I found was in counting unit 1 where the Chandler Lake A-5 map uses a contour interval of 20 meters and the Chandler Lake B-5 map uses a contour interval of 100 feet, thus as you fly north across the map boundaries (using the two maps cut and taped together) the contours appear to indicate that the topography is getting smoother yet the mountains are still steep sheep habitat.

I would recommend that more sheep surveys be conducted in the immediate future to see if the sheep decline is real. I would recommend that the survey be restricted to counting units 1, 2 and 6a if more money is not available. The surveys should be conducted in early to mid July when the weather is generally best.

Literature Cited

Singer, F. J. 1984. Aerial Dall sheep count, 1982, 1983, and 1984, Gates of the Arctic National Park and Preserve. Nat. Res. Survey and Inventory Rep. AR/84-2. Natl. Park Serv., Anchorage AK. 20pp.

Adams, L. G. 1988. Dall sheep survey, Gates of the Arctic National Park and Preserve, Alaska-1987. Nat. Res. Survey and Inventory Rep. AR-88/15. Natl. Park Serv., Anchorage AK. 46pp.

Sincerely yours,

Timothy Osborne
Area Wildlife Biologist

cc: Taylor
Whitten
Dau

Table 1. Survey chronology of Dall sheep surveys in Gates of the Arctic National Park, 1993.

Unit	Date July	Time
031	19	0700-0800
032	19	0800-0830
033	19	0833-1045
015	19	2 minutes
022	19	1050-1105
021	19	1105-1130
034	19	1425-1510
022	19	1515-1545
023	19	1600-1630
025	20	0545-0605
024	20	0607-0630
023	20	0635-0730
022	20	0730-0755
021	20	0810-0818
016	20	0820-0850
015	20	0850-0940
016	20	0955-1015
012	20	1245-1320
013	20	1320-1510
012	20	1510-1555
015	21	0700-0715
014	21	0715-0840
011	21	0905-1010
011	21	1320-1325
016	21	1330-1345
063	22	0535-0623
064	22	0623-0750
063	22	0750-0805
062	22	0810-0815
062	22	1330-1425

Table 2. Results of Dall sheep survey Gates of the Arctic National Park, Game Management Units 24 and 26, 19-22 July 1993.

Unit	Miles ²	time (min)	4/4	3/4	2/4	Number of sheep				Total
						Rams	unk.	"Eves" ^a	Lambs	
						1/4				
031	43.6	70	0	0	0	0	0	0	0	0
032	62.3	80	5	2	2	0	0	54	13	76
033	40.1	50	0	0	1	0	0	30	7	38
015	55.1	75	9	11	5	0	0	21	3	49
022	51.4	65	1	0	0	0	0	23	3	27
021	40.8	77	8	4	4	0	2	4	1	23
Total	293.3	417	22	18	12	0	2	132	27	213
025	38.9	28	6	1	2	0	1	2	0	12
024	65.9	75	2	0	4	0	1	20	7	34
023	48.6	55	5	2	3	0	0	9	5	24
022	37.5	53	4	1	0	0	0	1	0	6
021	15.3	20	0	1	3	1	0	0	0	5
Total	206.2	231	17	5	12	1	2	32	12	81
016	45.7	60	0	3	2	2	0	19	4	30
015	26.8	30	0	3	0	2	0	14	3	22
014	51.9	57	5	8	2	6	0	29	7	57
013	50.1	45	3	0	1	0	0	14	4	22
Total	174.5	192	8	14	5	10	0	76	18	131
015	43.7	not flown wind and fog								
014	44.2	60	3	0	3	0	1	25	9	41
011	66.5	63	7	4	3	0	2	48	21	85
011	56.3 ^b	43	5	1	2	0	0	43	15	66
016	48.4	not flown wind and fog								
Total	259.1	166	15	5	7	0	3	153	45	192

^aEves includes unidentified young rams and yearlings of both sexes.
^bDue to high winds in the Tinayguk River drainages 23.4 mi² was not surveyed.

Table 3. Historical sheep surveys in Gates of the Arctic National Park and Preserve.

Survey Unit	1982 Singer Total sheep	1987 Adams Total sheep	1993 Present Total sheep
1	462	666	213 ^a
2	216	264	81
3	354	not flown	131
6a	501	not flown	192 ^b

^a Sightability poor, 1/2 mile visibility in northern area due to smoke.

^b Only 134.6 mi² out of 259.1 mi² flown.