

STATE OF ALASKA

DEPARTMENT OF FISH AND GAME

Division of Wildlife Conservation

TONY KNOWLES, GOVERNOR

P.O. Box 209
Galena, Alaska 99741
907-656-1345

Oct. 24, 1997

Patty Rost
National Park Service
Gates of the Arctic National Park and Preserve
201 1st Ave., Doyon Building
Fairbanks, ALASKA
99701

Patty,

I'm finally able to put some numbers together for 1996-97 sheep harvest in Gates park. I was still getting a few returns in mid-September, so waited until I thought I had all the returns I was likely to get.

Anaktuvak Pass:		
20 hunters registered	9 hunters reported	7 hunters took 11 sheep
		10 males, 1 female
		6 -August, 4 -Oct., 1 -Jan

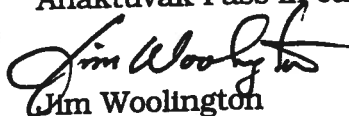
(I suspect there were more sheep than this taken)

Allakaket/Alatna:
No hunters registered

Bettles:		
5 hunters registered	4 hunters reported	3 hunters took 1 sheep
		1 male
		1-August

Wiseman:		
6 hunters registered	6 hunters reported	6 hunters took 8 sheep
		7 males, 1 female
		1-Sept., 1 -Nov, 5 -Mar., 1 unk.

I sent registration materials to Allakaket/Alatna, Bettles and Wiseman again this summer for the 1997-98 season. I we discussed, I will send the materials to Anaktuvak Pass in early December.



Jim Woolington
Alaska Dept. Fish & Game
Galena

ISSUES:

1. Disperse the sheep harvest throughout the Anaktuvuk area
2. Increase bag limit to six sheep
3. Change opening and closing dates and season length

SURVEY AREA

1. Exact description, and proportion in GMU's 24 and 26(A):
See map.
2. Proportion of sheep habitat covered within Gates by the survey:
Approximately 60% of the sheep habitat within GAAR was surveyed.
3. Quality of habitat within the survey area: Frank Singer's surveys in 1982-84 indicated that Wrangell-St. Elias and Denali had better sheep habitat than GAAR. GAAR has no area akin to the Hula-hula River area in Arctic National Wildlife Refuge.
4. Quality of the habitat within the survey versus the balance of the habitat in Gates: We included all of the area which Frank Singer considered the very best habitat in GAAR. We also included the moderate quality habitat which was important for hunting. We included no poor quality habitat.
5. Relationship of survey area to the sheep hunting area by Anaktuvuk Pass residents: At the request of sheep hunters from Anaktuvuk Pass, the area which we intended to survey included all of the sheep hunting areas. These areas were marked on a survey map before we completed drawing the units. During the survey, when budgets constrained us, these same sheep hunters assisted us in prioritizing which were the most important hunting areas so that they would not be dropped from the survey. In the end, the survey we conducted included most of the prime subsistence hunting areas.

SURVEY

1. Type of survey: Aerial survey to estimate abundance and population composition of sheep in previously surveyed areas.
2. Survey Technique: Our technique used low-intensity fixed-wing surveys to quickly search all sheep habitat in the survey area. We then flew higher intensity searches of some sample units by helicopter to develop

a sightability correction factor (SCF) for adjusting the low-intensity counts. Our final estimate was comparable to what we would have counted in a high-intensity helicopter search of the entire area, except that our estimate gave statistical confidence intervals. We also made detailed and accurate composition classifications from the helicopter.

3. Dates, number of aircraft, number of observers: The survey was conducted July 7-17, 1996. We used 4 Supercubs and 2 Robinson R-22 helicopters. One observer was in each aircraft with the pilot.

DATA

1. Number of sheep found and number of sheep classified:
 - In subsistence use area: 1092 sheep found, 450 classified by sex and age class.
 - In entire survey area (including subsistence area): 2539 sheep found, with 1106 classified.
2. Composition data:
 - Subsistence area - 56 lambs:25 yearlings:100 ewes
43 rams:100 ewes
 - Entire survey area - 47 lambs:25 yearlings:100 ewes
42 rams:100 ewes
3. Data from previous surveys in the same areas: Singer conducted sheep surveys in GAAR in 1982, 1983, and 1984. We used Singer's survey units, so that we could make direct comparisons between the surveys, but we sub-divided them into much smaller units in order to improve the quality of the survey. We conducted a more thorough search; Table 1 compares our search times. (Singer's search times for some of the units were unavailable for this analysis.) Adams conducted a sheep survey in 1987. His survey concentrated around AKP. Adams also used Singer's units, but sub-divided them into smaller units. We did some further sub-division of Adams units. We spent as much time, or more time searching than did Adams. Despite our more thorough search, we found 25% to 80% fewer sheep than Springer found in 1982-84. The decline was even greater from Adams' 1987 survey. The decline was greater in the west than in the eastern part of GAAR.

- Data from surveys in nearby areas: See staff Analysis 94/95-07. "As is the case throughout the Brooks Range, Dall sheep in Unit 23 are declining. Surveys have indicated that the Baird Mountain Sheep Herd has declined by 57% since 1989. Surveys ... of the DeLong Mountains have shown a 40% decline from 1983 to 1993; the decline between 1991 and 1993 was 24%." Etc.

4. Conclusions of survey, eg. Population condition and trend:

There are far fewer sheep now than there were 10 years ago.

However, there are still enough sheep to support the traditional harvest by Anaktuvuk residents. Harvest did not cause the drop in sheep numbers, and the sheep population now seems to be recovering. In fact, high lamb and yearling counts indicate that there could now be higher harvests, providing the increase is spread over the entire area hunted by Anaktuvuk residents.

SUMMARY OF SHEEP SURVEY:

- In 1996, we received funding for a sheep survey. First we interviewed sheep hunters in Anaktuvuk Pass to identify those areas which are important for subsistence harvest. Then we looked at historical sheep survey data. Frank Singer surveyed all potential sheep habitat in Gates of the Arctic in 1982, 83, and 84. We took Singer's survey data, identified areas where sheep were found in high concentrations and subject to harvest, and re-surveyed those areas more thoroughly in July, 1996.
- Our survey showed a significant and substantial decline in sheep numbers in all units (an overall decrease of 50 - 75% from the 1982-84 surveys, and a 65% decline from a 1986 survey around Anaktuvuk Pass.) , despite the fact that the 1996 survey was much more thorough than the 1982 survey.

Table 1. Counts of sheep from aerial surveys conducted in Gates of the Arctic N. P. in 1982-4, 1986, and 1996 (Singer 1984, Adams 1987, ADF&G and NPS 1996).

Sample Unit	1982 (Singer)	1987 (Adams)	1996
89-93	354	-	184
76-87	462	666	227
68-75	216	264	80
63-67*	204	-	51
53-62	501	-	271
47-52	334	-	206
21-46	1456	-	1100
12-20	367		227
1-11	521	-	385
Subtotal (Units 68-87)	678	930	307
Total	4415	-	2731

- This decline in sheep numbers corresponds with other data collected in the Brooks Range and throughout the State, in hunted and un-hunted areas, indicating it is a widespread phenomena. This indicates the decline is not due to increased harvest pressure. The likely explanation for the widespread decline is a series of hard winters in the early 1990's.
- Even though harvest did not cause this decline, harvest of ewes will prevent as rapid a recovery [as if ewes were not harvested.]
- The biological staff at GAAR would prefer to see harvest remain at the traditional level of 20-30 sheep (Brower and Opie). However, due to (1) concern about caribou migration patterns and the importance of a subsistence lifestyle to local residents and (2) good lamb production and survival indicating a currently increasing population (47 lambs:25 yearlings:42 rams:100 ewes), the staff at GAAR believes (with some caveats) that the population could sustain an increased harvest to 60 sheep per year. We can support the increase with the following qualifiers:
 - the harvest is well-distributed. This can be assured by allowing no more than 2 or 3 sheep per day, as long as the people don't go back to the same group of sheep to hunt, or it can be assured by using zones, with a village quota for each zone. We think the zone system is too intrusive and is not warranted at this time.
 - the number of ewes harvested is minimal so that the population can continue to increase.

- It is recognized that a ewe harvest WILL slow the recovery of the population, while an increased ram harvest will quickly change the ram:ewe ratio in the sex composition of the population. (This will result in what might not be considered a “natural” population, although it may be healthy.)
- If we have another hard winter, the bag limit must be reconsidered.
- NPS should be involved in gathering or have ready access to harvest information. Currently the North Slope Borough conducts harvest monitoring, but we don't have access to the information during the hunting season when it would be possible to avert any problems. Northwest Alaska uses a registration permit system with geographical zones. The number of permits per zone is allotted annually based on the annual sheep survey.

BASIC SHEEP BIOLOGY and COMMUNITY HARVEST PATTERNS:

- Home range fidelity: Sheep are not like caribou or moose. Sheep have distinct home ranges between which they make seasonal migrations. The seasonal home ranges are small (often just one mountain or part of a mountain), the migrations short (often just across a valley), relative to other ungulates such as caribou or moose. Reproductive sheep rarely deviate from their established patterns. Radio-telemetry studies of Dall sheep in the Brooks Range have shown seasonal home ranges often limited to a single side drainage, and seasonal migrations of 1 to 3.5 miles in the Baird Mts. and 5.5 to 12 miles in the DeLong Mtns in GMU 23, (Ayers 1986). Just east of the Dalton Hwy, in GMU 25, radio-collared sheep had seasonal home ranges as small as one mountain side, and migrations as far as 18 miles (Fran Mauer, pers. comm.). To compare, caribou are nomadic. Their seasonal movements are much less predictable than sheep movements, and are characterized by major shifts of populations, sometimes over hundreds of miles (Geist). Moose appear to establish home ranges by individual exploration, whereas sheep transmit home range knowledge from generation to generation and do very little exploration.
- Migrations between summer ranges and winter ranges occurred during the last two weeks of August and the first week in September in the Baird and DeLong Mtns. in the Brooks Range west of GAAR (Ayers 1986). During these migrations, often between mountains, sheep are more vulnerable to predation and harvest.
- Sexual segregation: Sheep social behavior leads to sexual segregation of rams and ewes and formation of both maternal and nonmaternal bands of ewes and bands of rams (Geist 1971).
- Harvest practices include taking sheep in the fall as hunters are traveling by ARGO through the valleys near the community. Caribou hunters also opportunistically take sheep caught in the valleys as they move between mountains (Ben Hopson, pers. comm.).

The implications are that with a large bag limit, it is possible for a group of hunters to quickly eliminate a band of sheep from a mountain, and it would take a very long time for sheep to expand their ranges to that area again. It is also possible that if a band of ewes is harvested, the reproductive potential of a local population can be seriously affected. This type of hunting, over a few years, could eliminate sheep from the accessible areas around the village.

LITERATURE CITED

- 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.
- ADF&G Harvest Reports.
- Ayers, L. A. 1986. The movement patterns and foraging ecology of Dall sheep (*Ovis dalli dalli*) in the Noatak National Preserve, Alaska. M.S. Thesis. Univ. of Calif. Berkeley, Calif. 94pp.
- Brower, H. K. & R. T. Opie. 1996. North Slope Borough subsistence harvest documentation project. Dept. of Wildl. Mgmt., N. Slope Borough, Barrow, Alaska.
- Campbell, J. M. Effects of late prehistoric and early historic Eskimo hunting of Dall sheep in North Alaska: Examples of aboriginal overkill.
- Geist, V. 1971. Mountain sheep: a study in behavior and evolution. Univ. Chicago Press. 383pp.
- Singer, F. J. 1984. Aerial Dall Sheep Count, 1982, 1983, 1984, Gates of the Arctic National Park And Preserve. Nat. Res. Survey and Inventory Rep. AR-84-2. Natl. Park Serv., Anchorage AK. 20pp.

