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Division of Wildlife Conservation

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DALL SHEEP

Mary V. Hicks, Editor

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STATE OF ALASKA
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DEPARTMENT OF FISH AND GAME
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Project Title: **Southcentral Alaska Dall Sheep Management**

Project Location: Units 7, 11, 13, 14, and 15

Sheep populations in the region are managed by mountain range or special hunt area. Mountain ranges frequently divide Game Management Units; therefore, unit numbers may be repeated in sections of the text.

Kenai Mountains (Units 7 and 15):

Project Objectives and Activities: Maintain a population of sheep that will sustain an annual harvest of 25 rams.

- Conduct midsummer aerial surveys to assess population size, sex and age composition.
- Monitor harvest with assistance from Fish and Wildlife Protection and U.S. Fish and Wildlife Service.

Work Accomplished During the Project Segment Period: We surveyed 2 count areas in Unit 15 (856, and Round Mountain) and 2 areas in Unit 7 (838 and 853) during July and August of 1994. We observed 861 sheep, consisting of 211 rams, 121 lambs, and 529 ewes. Three percent of the sheep observed were legal rams and 14% were lambs.

Preliminary harvest reports indicate 262 hunters harvested 32 rams in Units 7 and 15 during 1994. Hunter success rate was 12%. Mean horn length from reported harvest was 35.5 inches and ranged from 32 to 39 inches. Average age was 8.2 years, with a range of 7 to 11 years. Alaska residents harvested 32 (97%) rams and nonresidents killed 1 (3%) rams.

In 1993 the Round Mountain count area in Subunit 15A was open for hunting ewe sheep by a permit drawing. In 1994, we issued 20 permits: 13 permittees reported hunting; 5 permittees were successful. Alaska residents using highway vehicles to access hunt areas were the successful hunters.

Progress Meeting Project Objectives: The 1994 harvest met the management objective of maintaining a population of sheep in the Kenai Mountains that sustains an annual harvest of 25 rams. Unlike elsewhere in the state, the Kenai Peninsula has had mild winters, allowing sheep numbers to remain stable or slightly increase. The sheep population estimate for the Kenai Mountains was 1650 animals.

Hunting pressure in the Kenai Mountains has increased, resulting in the annual harvest of most legal rams. In an effort to satisfy the increasing interest in harvesting large rams, the harvest should be reduced in certain areas to allow the average age of rams to increase. Hunting should be limited by permits to accomplish this objective. The limited harvest of ewe sheep was successful and should be expanded to include Count Area 856, north of Tustumena Lake.

Talkeetna Mountains (Subunits 13A, 13E, 14A, and 14B):

Project Objectives and Activities: Maintain a population of sheep that will sustain an annual harvest of 75 rams.

- Identify critical sheep habitat (e.g., mineral licks and lambing areas).
- Monitor the harvest through hunter contacts and harvest reports.
- Conduct composition surveys.

Work Accomplished During the Project Segment Period: We did not conduct composition surveys during this report period. No work was directed specifically at identifying and documenting critical sheep habitat in the Talkeetna Mountains.

Sheep surveys were flown in 11 count areas, from the southern Talkeetna Mountains to the Jack River area in the Chulitna Hills (south of Cantwell). Using a PA-18 Supercub aircraft, we observed 1804 sheep including 160 legal rams in 30.1 hours.

Progress Meeting Project Objectives: A total of 503 hunters reported harvesting 88 sheep in 1994, meeting our harvest objectives for the Talkeetna Mountains. Surveys revealed significant differences between sheep populations in the western and eastern portions of the Talkeetna Mountains. Although ram:ewe and lamb:ewe ratios were average, the observed number of sheep declined 40-50% in the western Talkeenta Mountains since 1988. Low number of young rams indicate recruitment has been poor for several years. We speculate a series of harsh winters has increased mortality of young animals, directly or by predisposing sheep to predation. In a few years the number of legal rams can be expected to decline. In contrast, sheep numbers and ratios are stable in the eastern Talkeetna Mountains. Wolf densities are high in both areas.

Chugach Mountains (Units 11, 13D, 14A, and 14C):

Project Objectives and Activities: Maintain a population of sheep that will sustain an annual harvest of 120 rams.

- Identify critical sheep habitat (e.g., mineral licks and lambing areas).
- Monitor the harvest through hunter contacts, harvest or permit reports, and aging/measuring sheep horns.
- Conduct composition surveys.

Work Accomplished During the Project Segment Period: Biologists flew aerial surveys in Subunits 13D and 14C. In Subunit 13D count area 5, above Klutina Lake, was flown. The count of 180 sheep was 25% less than the last count in 1990; however, it was slightly higher than numbers observed in 1973 and 1981. Since 1990, the number of rams has increased from 19 to 20 legal animals and 17 to 51 sublegal, but the number of ewes and unidentified young rams has declined from 131 to 95. Lambs have also declined, from 74 in 1990 to 14 (8% of the total

population) in 1994. The decline in the Klutina drainages was matched by a decline in the Tonsina Controlled Use Area during the same time.

Surveys were not conducted in Subunit 14A.

Biologists tallied 2255 sheep in Unit 14C in late July. This included 298 7/8-curl or larger rams, 337 1/2-curl to 3/4-curl rams, 329 lambs, and 1291 ewes and 1- or 2-year-old rams. Lambs composed 15% of the population.

Staff analyzed harvest reports for all subunits. Subunit 14C sheep hunters were required to bring their permit and horns to an ADF&G office within 10 days of taking a sheep. Horns were aged by horn annuli, and we recorded length and base measurements.

The sheep harvest for the Chugach Mountains was 186 sheep: 162 7/8l rams, 14 young rams (less than 7/8-curl), and 10 ewes. The hunter success rate was 32%. In Subunit 13D 247 hunters shot 88 full-curl rams, and the hunter success rate was 36%. In Subunit 14A 111 hunters shot 30 full-curl rams. The success rate was 27%.

All sheep hunting in Subunit 14C was by drawing permit. In 1994 we issued 345 permits (105 archery only permits), 224 hunters went afield, and 68 hunters (30% success rate) harvested sheep. Forty four of the sheep taken were 7/8-curl rams, 14 were young rams less than 7/8-curl and under 6-years-old), and 10 were ewes. The success rate for the archery permits, including the 80 issued for the late season (1-10 October), was 7%. The hunter success rate for the remainder of the hunts was 42%.

Progress Meeting Project Objectives: We met the harvest objective for the Chugach Mountains. Recent declines caused mainly by winter conditions have affected sheep populations differently in the northern (Unit 13D) and western (Unit 14C) units. The winter of 1992-93 had the highest mortality rate since areawide surveys began in Subunit 14C in 1968. That morality, with the large numbers of sheep that died during the 1989-90 and 1991-92 winters, has substantially reduced recruitment of young rams in Unit 14C. On the other hand, a record number of large rams has survived recent winters in Unit 14C. In Unit 13D ewes are declining. Low numbers of lambs, especially in Unit 13D, and depressed numbers of young rams in Unit 14C ensure low recruitment of large rams in the near future. We will conduct mineral lick surveys early June 1995 to better understand survival of lambs to yearlings and to differentiate between young rams and ewes.

South Wrangell Mountains (Unit 11):

Project Objectives and Activities: To allow the population to fluctuate according to available habitat, climate conditions, and predation. To allow harvest of mature rams as they are available in the population; to allow very limited harvest of other sex and age classes on a sustained-yield basis.

- Identify critical sheep habitat (e.g., mineral licks and lambing areas).
- Monitor the harvest through hunter contacts and harvest reports.

Work Accomplished During the Project Segment Period: We conduct sheep surveys periodically in the southern Wrangells. Sheep surveys in 1994 were in Count Areas 11 (Dadina River to Long Glacier) and 14 (the Crystalline Hills). Count area 11 has been surveyed more frequently than any other in Unit 11. The number of sheep (321) was 20% more than observed in 1993. The increased count was due primarily to better lamb production and survival. Lambs composed 26% of the flock in 1994, compared to 13% in 1993. Ram numbers, however, declined 36% from 35 rams:100 ewes in 1993 to 20:100 in 1994. Count area 14 was also surveyed in 1993. The total number of sheep dropped from 124 observed in 1993 to 79 in 1994. We saw reductions in all sex and age categories, but lamb production, and/or survival, was especially low at 11 lambs:100 ewes.

Hunters reported taking 113 sheep during 1994. The harvest included 80 mature rams taken by sport and subsistence hunters, 12 small rams and 18 ewes taken by subsistence hunters, and 3 sex and age unspecified. The mature ram harvest was substantially lower (26%) than the previous 5-year mean harvest of 111 rams. The number of small rams taken by subsistence hunters decreased by 55% from last year's take of 27. The subsistence ewe harvest was down 10% from 20 the previous year and down 47% from a peak harvest of 34 ewes in 1992.

Progress Meeting Project Objectives: Sheep populations have been high in Unit 11 throughout the early and mid 1980s. Surveys conducted during the late 1980s and early 1990s indicate sheep numbers have declined in Unit 11. Most notable in recent surveys was a decline in lamb production and/or survival. There has been, however, a decline in all sex and age categories.

On one count area survey, results compiled in 1994 indicated a slight increase in both ewes and lamb production but a decline in rams. The second area showed a continued decline in all sex and age categories. In portions of Unit 11, sheep numbers are still declining. The reasons for this decline in sheep numbers are unknown. During years when declines were observed in the Wrangells, other portions of the state also had a decline in sheep numbers, and severe winters seemed the common factor. Certainly severe winters in Unit 11 and 13 over the past five years could have caused the decline. During this same period wolf numbers increased in Unit 11, and wolf predation on sheep was high. Killing of sheep by wolves was observed the winters of 1989 and 1992. Sheep hunters have also reported observing wolves in the high country as well as wolf scats containing sheep hair.

The sport harvest of mature rams as well as the subsistence harvest of small rams and ewes all declined in 1994. Declines in the sport and subsistence harvest may reflect reduced sheep numbers over portions of Unit 11. Hunting pressure remained virtually unchanged, with 371 hunters reported in 1993 and 365 in 1994. Hunter success rates dropped from 39% in 1993 to 31% in 1994. The subsistence take of small rams and ewes seems to vary from between 30 and 50 animals a year and reflects the subsistence demand at this time. The definition of a subsistence hunter in Unit 11 was broadened under state law during 1990 to include all state residents,

whereas only local rural residents were considered subsistence sheep hunters in previous years. The current subsistence harvest of small rams is relatively low, dispersed throughout the unit and has little effect on ram numbers. The subsistence ewe harvest is also low but not as well dispersed throughout the unit. Fifty percent (9) of the ewes taken in 1994 came from areas adjacent to the Chitina-McCarthy Road; 33% (6) came off the Nabesna Road. Ewe and small ram harvests at the present level are not considered a biological problem. Harvest objectives were met for Unit 11 and no changes in season dates or bag limits are recommended at this time for either the sport or subsistence hunt.

Segment Period Project Costs:

	Personnel	Operating	Total
Planned	4.0	7.0	11.0
Actual	4.0	7.0	11.0
Difference	4.0	0.0	0.0

Submitted by:

Jeff Hughes
Survey-Inventory Coordinator

Project Title: **Region III Dall Sheep Population Management**

Project Location: Units 12, 19, 20, 24, 25 and 26

North Wrangell, Nutzotin, and Mentasta Mountains (Unit 12)

Project Objectives and Activities:

1. Provide the greatest level of sustainable annual opportunity to participate in hunting Dall sheep and provide the greatest level of sustainable annual harvest of Dall sheep.
   - Monitor the harvest through hunter contacts and harvest reports.

Work Accomplished During the Project Segment Period: Preliminary harvest statistics indicate 371 hunters (290 residents, 80 nonresidents, and 11 unknown residency) harvested 164 full-curl rams during FY95 for a hunter success rate of 44%. Harvest and success rate were comparable to FY93 and FY94. The average annual harvest between FY93 and FY95 (171) has declined substantially compared to the period between FY87 and FY92 (243). Success rates have also declined during the past 3 years (43%), compared to the previous 6 years (53%). The mean horn length and average age of harvested rams were 34.3 inches and 8.5 years, comparable to the 5-year average.

Progress Meeting Project Objectives: We met the human use objectives of providing maximum opportunity to participate in sheep hunting and allowing the greatest sustainable harvest. Hunter satisfaction with the current management objectives may be changing based on the number of negative comments received concerning crowded hunting conditions and lack of legal rams. Sheep populations in Unit 12 have declined due to poor lamb production during the past 5-6 years and to high adult mortality during the severe winter in 1992. There will be even fewer legal rams in 1997 due to poor recruitment, and during the next 3 years harvest is expected to decline. Although hunting is not the cause of this decline, some hunters have expressed interest in regulations restricting the number of hunters, reducing competition for the declining number of rams, and enacting tougher wanton waste regulations. At this time, I do not recommend any changes in seasons and bag limits, but this may change depending on sheep population trend and hunter satisfaction. Requiring hunters to bring all meat out of the field regardless if blood-shot or spoiled may help reduce wanton waste.

Tok Management Area (Units 12, 13, and 20)

Project Objectives and Activities:

1. Manage for a harvest of 30-45 rams each year with a mean horn length of 36-37 inches among harvested rams and a mean age of 8-9 years.
   a. Monitor the harvest through hunter contacts and harvest reports.
   b. Conduct aerial or ground composition surveys.

2. Manage to achieve an average of 7-10% of rams with 40-inch or greater horns in the harvest.

3. Manage to prevent unacceptable increases in hunter concentration and maintain the aesthetic qualities associated with sheep hunting in the Tok Management Area (TMA).

Work Accomplished During the Project Segment Period: We conducted a sex and age composition survey in the Tok Management Area during FY95. Similar to other sheep populations around the state, the TMA population has declined. Sex and age classes most affected were older ewes and rams due to the severe winter in 1992 and the younger age classes due to poor recruitment during the past 4 years. No change is apparent in the number of mid-aged animals (based on the number of sublegal rams) compared to the 1980 survey. Harvest should remain average for the next years, except fewer large-horned rams may be available.

We issued 120 drawing permits for fall 1994; 85 hunters reported taking 39 full-curl rams for a hunting success rate of 46%. The participation rate was below the 5-year average of 76%. Hunter success rate has declined the past 3 years ($x = 43\%$) compared to the previous 5-year average of 58%. Average horn length was 36.9 inches, which is equivalent to the 5-year average. The mean age of rams harvested was 9.2 years. Three (7.7%) rams harvested had horn lengths of 40 inches or more. The total harvest, horn size, and age of harvested rams met the project objectives.

Progress Meeting Project Objectives: We have achieved management objectives in the TMA throughout the last decade, and objectives were maintained this year. Continued attainment is due to the current drawing permit system.

Tanana Hills (Unit 20)

Project Objectives and Activities:

1. Manage for aesthetic hunting conditions.
   a. Monitor the harvest through hunter contacts and harvest or permit reports.

Work Accomplished During the Project Segment Period: We issued 4 drawing permits to hunters for the Mount Harper (DS106) area. Hunters needed only a sheep harvest ticket to hunt in the Glacier Mountain Controlled Use Area and the Charley and Seventymile Rivers areas. Three resident hunters participated in the Mt. Harper hunt but were not successful. Preliminary harvest statistics indicate 8 hunters (5 residents and 3 nonresidents) harvested 3 full-curl rams outside the permit area during FY95 for a hunter success rate of 38%. Average horn length was 34 inches and average age was 8.3 years.

Progress Meeting Project Objectives: Positive comments from hunters indicate we have achieved the objective of an aesthetic hunting opportunity. Sheep hunting aesthetics are expected to remain high due to the remoteness and limited accessibility of these areas.

The sheep population in this area has declined due to higher than normal adult mortality because of adverse weather conditions during the early 1990s and poor lamb recruitment. The number of legal rams is lower than it was in the 1980s and is expected to remain low, possibly until the late 1990s because of poor lamb recruitment in the early 1990s.

Delta Controlled Use Area (Unit 20D)

Project Objectives and Activities:

1. Manage a population of approximately 1800 sheep to provide a mean annual harvest of 35 full-curl rams with a mean horn length of more than 36 inches and mean age exceeding 8 years.
   a. Monitor the Dall sheep harvest through hunter contacts and permit reports.
   b. Conduct aerial and/or ground composition surveys of Dall sheep.
   c. Capture Dall sheep in the Delta Controlled Use Area in Unit 20D; collect and analyze blood samples.
   d. Mail a questionnaire to hunters and quantify their satisfaction with aesthetics of Dall sheep hunting in the Delta Controlled Use Area.

2. Manage to provide aesthetically pleasing hunting conditions.

Work Accomplished During the Project Segment Period: Sheep harvest was monitored with permit reports for drawing permit hunts DS203 and DS204. Preliminary data indicate that 42 hunters killed 11 sheep during hunt DS203, and 51 hunters killed 17 sheep during hunt DS204. Combined harvest totaled 28 sheep. Preliminary data indicate mean horn length of sheep killed during hunt DS203 was 34.73 inches and mean age of sheep was 7.7 years. During hunt DS204, mean horn length for sheep killed was 35.5 inches and mean age was 8.0 years.

No aerial or ground surveys were conducted during this reporting period because funds were used in Unit 20A. Aerial surveys are planned for July 1995 in Unit 20D.

The DCUA serological survey has an adequate sample size; therefore, the serological survey has been terminated and no further data will be collected until needed.

We mailed questionnaires to hunters during the 1994-95 season to quantify hunter satisfaction with aesthetics. At this time, data from the questionnaire have not been analyzed.

Progress Meeting Project Objectives: We monitored harvest through permit reports and hunter contacts. The number of sheep harvested, mean horn size, and mean age of sheep were below management objectives during the 1994-95 season. Aerial surveys are planned for summer 1995 to assess population status. The serological survey has been completed, and no additional work was accomplished for that objective. This objective will be deleted for FY96. Hunter questionnaires were mailed to hunters to monitor hunter satisfaction and aesthetics.

Central Alaska Range (Unit 20A)

Project Objectives and Activities:

1. Manage for 3000-5000 Dall sheep in Unit 20A.
   a. Conduct aerial or ground sheep composition surveys.
   b. Evaluate the need for management actions if the population is estimated to include less than 3000 sheep.
   c. Identify the factors limiting growth of the Dall sheep population in Unit 20A.
   d. Monitor response of the Dall sheep population to the wolf control program by comparing Unit 20A data with data from other Interior sheep populations.

2. Provide for the greatest sustainable annual opportunity to hunt and harvest full-curl Dall sheep rams.
   a. Monitor the sheep harvest through hunter contacts and harvest reports.
   b. Maintain a hunting season for full-curl rams throughout all of Unit 20A.

3. Provide for the sustainable opportunity for the public to view and photograph Dall sheep.
   a. Identify suitable sites for viewing and photographing sheep and promote these sites by 1995.

Work Accomplished During the Project Segment Period: Based on a survey completed from 25-30 July 1994, we estimate at least 1942 ±17% (90%CI) Dall sheep in Unit 20A (excluding the DCUA). We conducted a low intensity search (1.9 min/mi^2) of all sheep habitat (1,256.5 mi^2) from a fixed wing, and a high intensity search (2.7 min/mi^2) of one-third of this area from a Robinson R-22 helicopter for a sightability correction factor and composition data. The lamb:"ewe" ratio (50:100 ±11%, 90%CI) has improved dramatically from the previous 3 years (5-18:100). Most rams were larger than 1/2-curl, which reflects the poor recruitment during the last 4 years. I estimate the population includes 1011 "ewes," 506 lambs, and 425 rams (59 full-curls).

Preliminary data for 1994 indicate 49 Dall sheep rams were harvested by 148 hunters in Unit 20A. This harvest represents the 5th year of declining or low harvests since the peak harvest of 163 rams in 1989. In 1994 nonresidents took 45% (22/49) of the harvest, with an extremely high success rate of 88% (22/25).

Progress Meeting Objectives: We estimate the minimum population size (1942 ±17%, 90%CI) of sheep in Unit 20A. For the first time, we have a population estimate that has statistical properties that will allow us to document the magnitude of population changes in the future. Because we had not completed surveys of the entire unit during the last 16 years, it is difficult to determine how much of a decline the population has experienced and over what length of time. Although we are not currently meeting our management objectives for 3000-5000 sheep, I expect

the population to increase because of higher recruitment and presumably lower mortality from predation and weather. We do not know the magnitude of wolf predation on the sheep population; however, the wolf control program in 1993-94 reduced the wolf population in Unit 20A by about 50%. A lamb mortality research project will begin May 1995 to help determine factors limiting sheep population.

We obtained an unbiased estimate of the 1994 lamb:"ewe" ratio (50:100 ±11%, 90%CI). Lamb:"ewe" ratios were similar or a little lower in adjacent Denali National Park (36-51:100) and in the western Alaska Range (38:100). Very low lamb:"ewe" ratios had been observed in Unit 20A in 1991 (18:100), 1992 (5:100), and 1993 (9:100) during a period of relatively severe winters and high wolf population. Poor recruitment and a population decline were not unique to Unit 20A; lamb:"ewe" ratios were low in many areas throughout Interior and western Alaska during this time. Next year there will likely be a lot of yearling sheep that will fall into the "ewe" category. We should consider surveying earlier next summer to detect as many of these "ewes" as possible.

We now have a map of relative distribution of sheep that we can use for comments on land-use decisions and to advise the public regarding viewing opportunities.

We continue to meet our objective to provide for the greatest sustainable opportunity to hunt and harvest full-curl sheep by maintaining a general open season from 10 August through 20 September. I anticipate very low harvests for several years beginning in 1997 as weak cohorts from the relatively severe winters of 1989-90 through 1992-93 mature to legal size for hunting.

White Mountains (Unit 25C) and Tanana Hills (Unit 20B)

Project Objectives and Activities:

1. Manage for the sustained opportunity to harvest full-curl rams from a population of at least 250 sheep.
   a. Conduct aerial or ground composition surveys.
   b. Monitor the sheep harvest through harvest reports and/or hunter contacts.

2. Cooperate with BLM and potentially affected interest groups to protect sheep habitat.
   a. Provide input to interagency fire-management plans when necessary.
   b. Review and comment on the proposed plans for trail development associated with the Nome Creek Development in 1994.

Work accomplished During the Project Segment Period: We cooperated with BLM and USFWS Yukon Flats National Wildlife Refuge staff to conduct annual aerial surveys of the sheep population in Unit 25C. On 4 August 1994, 262 sheep were observed; including 151 "ewes," 49 lambs, 8 legal rams, and 54 sublegal rams. The lamb:ewe ratio was 33 lambs:100 ewes. The Mount Prindle area was not completely surveyed due to severe turbulence. However, ground counts completed in early July indicate an additional 82 sheep, assuming there was no

movement of sheep out of the Prindle area. The estimated population size in this area is 344 sheep.

White Mountains: In 1994, 4 rams were reported harvested by 24 hunters in the White Mountains. The average longest horn length was 36.3 inches (range 34.5-39.4 inches) and the average age from counting horn rings was 10 years (range 9-13).

Tanana Hills: In 1994, 2 rams were reported harvested by 7 hunters. The two sheep harvested had horn lengths of 35 and 36 inches and were 9 and 10 years old respectively.

No activities specifically to protect sheep habitat were conducted.

Progress Meeting Project Objectives: We are meeting our population objective of 250 sheep. We estimate the population is between 325 and 375 sheep. We are planning a sheep survey for summer 1995, making this cooperative survey an annual project.

Reported sheep hunting pressure in the White Mountains continues to be minimal. The total number of hunters has declined from the 1993 high of 45 to 27 in 1994. Prior to 1993 and since 1984, reported harvest had not exceeded 6 rams/yr. and the number of hunters had not exceeded 26/yr. Declines in other interior sheep populations are causing hunters to look elsewhere for sheep hunting opportunities. This situation should be monitored closely.

DOT/PF has started work on the Nome Creek development including a road along Nome Creek, associated campgrounds, and hiking trails. DOT/PF is cooperating with BLM and will be constructing the road using federal ISTEA money. BLM is conducting more surveys this summer to evaluate proposed trail routes. Monitoring of the development and expansion of facilities in the Nome Creek area should be conducted to protect and maintain existing sheep habitat. This should be accomplished by trail plan assessment to ensure that sheep are not displaced from their current range by the new trail system.

We recommend that objective 2b be changed to: Review and comment on the proposed plans for trail development associated with the Nome Creek Development in 1996.

Alaska Range West of Denali National Park (Units 9, 16, 19)

Project Objectives and Activities:

1. Manage for a sustained opportunity to harvest full-curl rams from a population of at least 3000 sheep.
   a. Conduct aerial surveys to assess population trends, lamb production, and proportion of rams in the various subherds in the area.
   b. Monitor the sheep harvest through harvest reports and/or hunter contacts.

Work Accomplished During the Project Segment Period: We surveyed 6 count areas totaling 479 mi^2 during summer 1994. These areas had not been surveyed in the past, so making comparisons with previous data was impossible. We observed 827 sheep with 54% "ewe-likes," 20% lambs, and 26% rams. Of the rams, 9% were legal (full-curl).

Reported harvest was 142 sheep in the Alaska Range West (ARW) during 1993. Overall success rate was reported at 54%. Mean horn length of harvested rams was 35.8 inches. The success rate and mean horn length are not significantly different from the previous 5-year mean for the ARW. Final data from the 1994 season have not been analyzed.

Progress Meeting Project Objectives: We monitored sheep harvests, contacted hunters, and flew aerial surveys. More surveys in portions of Unit 19 were planned and funded for FY96.

Central Brooks Range (Unit 24)

Project Objectives and Activities:

1. Maintain or increase the sheep population within the Gates of the Arctic National Park and provide for opportunities to view and photograph sheep, allowing for a subsistence harvest of up to 50 sheep per year.
   a. Monitor subsistence sheep hunting success through periodic visits to villages in the unit.

2. In other areas of the unit, maintain or increase the sheep population to provide an average annual harvest of at least 5 rams under aesthetic hunting conditions.

Work Accomplished During the Project Segment Period: Within the Gates of the Arctic National Park, 18 hunters signed up to hunt sheep under a subsistence season. Hunters reported harvesting 17 sheep, 15 of which were adult rams. Most were harvested between August and October, but 4 were taken in March. We collected harvest data through posthunt direct contact and letters.

Outside the park, 47 hunters harvested 17 rams; 6 of the successful hunters were nonresidents.

No sheep composition surveys were conducted.

Progress Meeting Project Objectives: Objectives to monitor harvest through harvest tickets and permits were met. Management objectives are being met through the low harvest.

Eastern Brooks Range (Units 25 and 26)

Project Objectives and Activities:

1. In cooperation with FWS, continue to monitor sheep population status using trend indicator areas.

2. Manage for a harvest of Dall sheep rams with full-curl or larger horns

3. Monitor the effects of the full-curl minimum size limit that took effect in fall 1993.

4. Work with ADF&G Subsistence Division and FWS to manage subsistence sheep harvests.

Work Accomplished During the Project Segment Period: During 1994-95, cooperative efforts to monitor radiocollared sheep continued in the upper Chandalar and Hulahula drainages. Adult mortality seemed generally low, and lamb production and survival were moderate to high in Units 26B and 26C in spring 1994. Adult mortality was high and lamb production was very low in Unit 25 in 1994. Hunters seem adapted to the full-curl regulation implemented in 1993 as well as to the decline in sheep populations.

While the eastern Brooks Range continues to be a popular hunting area, preliminary review of 1994 harvest reports indicates hunting pressure and harvest success have declined in response to generally lower sheep numbers. We continued to monitor subsistence sheep harvests. Harvests in Unit 26C are fairly well known due to the efforts of Subsistence Division interviews with residents of Kaktovik.

Progress Meeting Project Objectives: Management objectives continue to be met in this area, although numbers of sheep have declined in recent years.

Segment Period Project Costs:

	Personnel	Operating	Total
Planned	40.5	51.0	91.5
Actual	68.3	61.1	129.4
Difference	-27.8	-10.1	-37.9

Explanation: A Dall sheep lamb mortality study was initiated during this period which increased personnel costs above those budgeted. Additionally, new sheep survey techniques were investigated in Unit 20A which resulted in cost overruns.

Submitted by:

Kenton P. Taylor
Management Coordinator

Project Title: **Western Alaska Sheep Management**

Project Location: Unit 23 and Subunit 26A (99,000 mi^2)
Kotzebue Sound and Western Brooks Range

Project Objectives:

1. Maintain a posthunt population in the Baird Mountains of 450-600 adult sheep and a minimum ratio of 7-10 7/8+ curl rams: "ewes" (includes adult female, yearling, and 1/4 curl ram) unitwide.
2. Obtain 5 years of survey data in the Delong Mountains and establish management objectives for a prehunt population.

Work Accomplished During the Project Segment Period: Aerial sex and age composition surveys were conducted in the Baird and DeLong Mountains during July 1994.

	Baird Mt.	Kugururok/Trail Cr.	Wulik Peaks
Rams 1/2+	93	27	
Rams 7/8+4	1	12	
"Ewes"[a]	204	93	47
Adults	297	120	56
Lambs	20	1	
Total	317	121	63
Lambs:100 "Ewes"	10	1	38
Total Rams:100 "Ewes"	46	29	56
Rams 7/8+:100 "Ewes"	20	13	23

[a] "Ewes" defined as adult female, yearling, and 1/4 curl ram.

As a result of the low number of sheep observed during surveys, hunting was closed in the DeLong and Baird Mountains. For the first time the fall and winter season in the DeLong Mountains were closed by emergency order. Fall and winter hunts in the Baird Mountains, closed in 1991, continued to be closed. The only area open to hunting in 1994-1995 was east of the Cutler and Redstone rivers. Four local Upper Kobuk residents registered to hunt in this area; however, no sheep were reported taken.

Progress Meeting Project Objectives: Based on aerial survey data, numbers of adult sheep in the Baird Mountains have slowly declined, following the severe decline during the winter of 1990-91. Lamb production in the Baird Mountains has continued to be low to nonexistent. Sheep

in the Delong Mountains are following a similar trend. The fourth year of standardized survey data was collected in the Delong Mountains. We made some modifications to count areas boundaries in the Wulik Peaks to include an area reported to contain ewes. Predation and winter snow conditions are significant factors affecting the recovery of Unit 23 sheep populations. Progress has been made toward project objectives through monitoring and management actions. Hunting mortality has been almost eliminated by closure of hunting seasons in the Baird and Delong mountains.

Segment Period Project Costs:

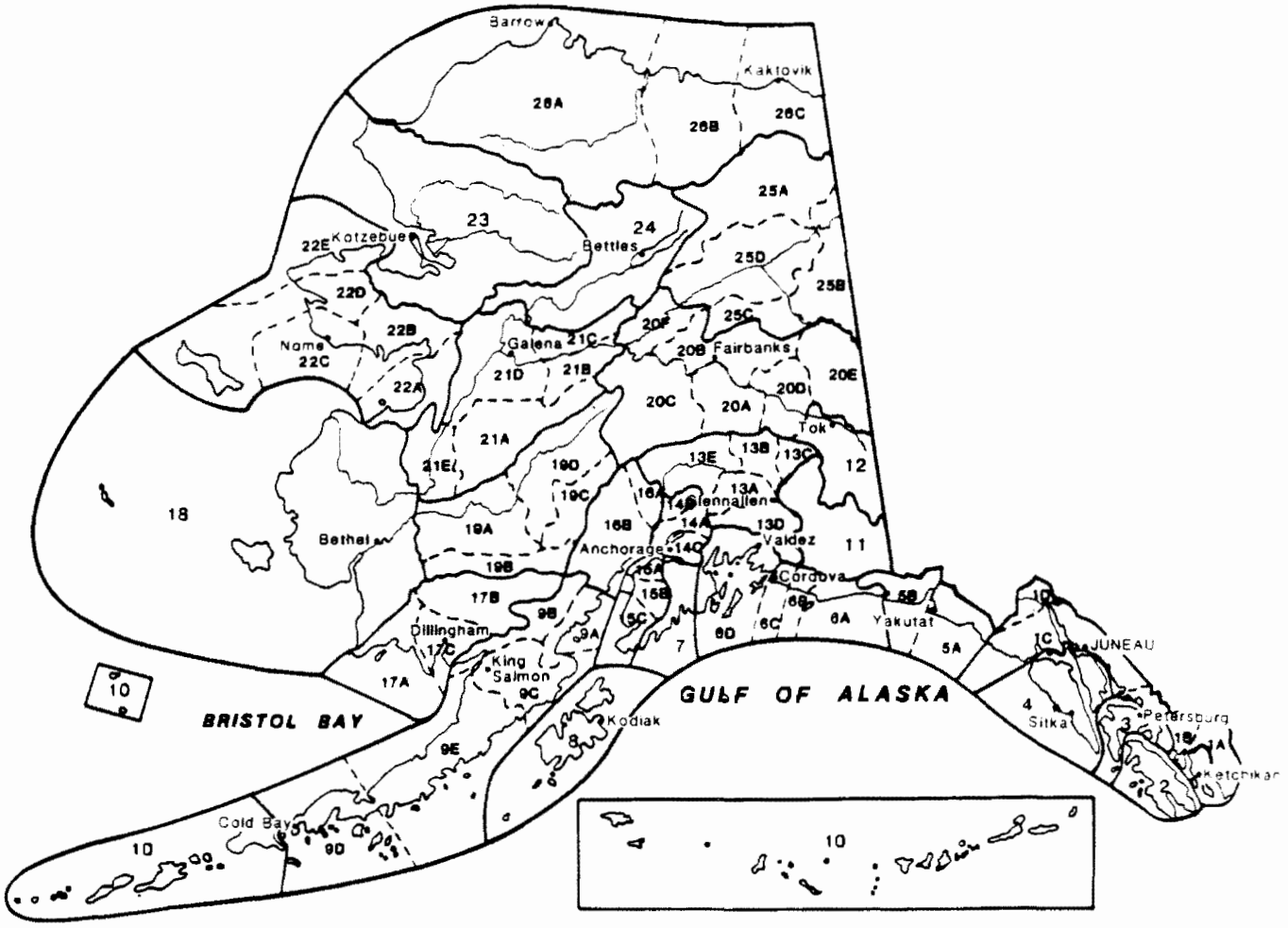
	Personnel	Operating	Total
Planned	10.0	5.7	15.7
Actual	10.0	11.2	21.2
Difference	0.0	-5.5	-5.5

Explanation: Population declines in Unit 23 required surveys to monitor the population size.

Submitted by:

Steve Machida
Survey-Inventory Coordinator

Alaska's Game Management Units



The Federal Aid in Wildlife Restoration Program consists of funds from a 10% to 11% manufacturer's excise tax collected from the sales of handguns, sporting rifles, shotguns, ammunition, and archery equipment. The Federal Aid program allots funds back to states through a formula based on each state's geographic area and number of paid hunting license holders. Alaska receives a maximum 5% of revenues collected each year. The Alaska Department of Fish and Game uses federal aid funds to help restore, conserve, and manage wild birds and mammals to benefit the public. These funds are also used to educate hunters to develop the skills, knowledge, and attitudes for responsible hunting. Seventy-five percent of the funds for this report are from Federal Aid.

PAT COSTELLO