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ANNUAL REPORT OF SURVEY-INVENTORY ACTIVITIES

PART II. SHEEP

Edited and Compiled by
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Volume XVI

Federal Aid in Wildlife Restoration

Project W-22-4, Job 6.0

(Printed September 1985)

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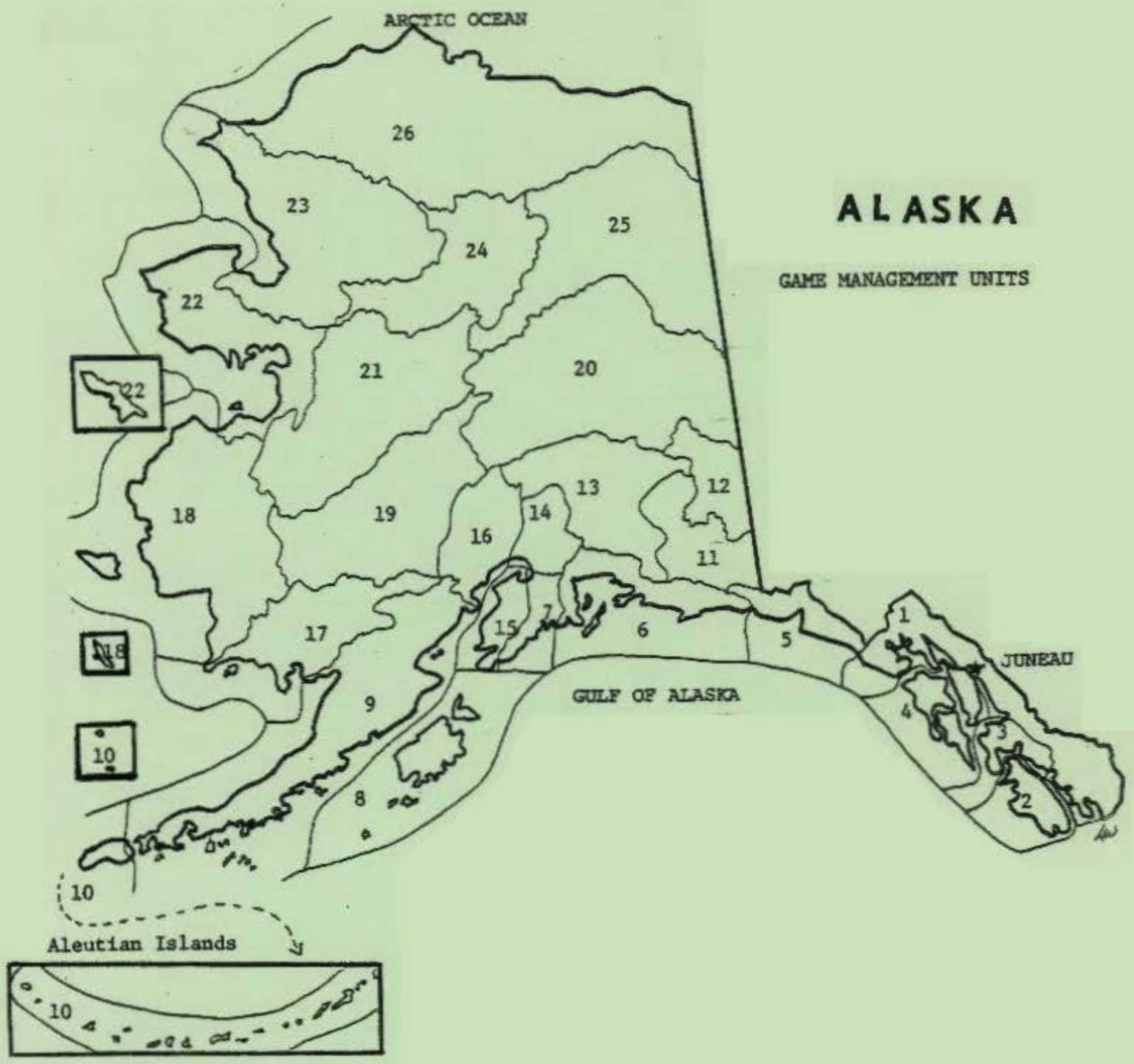
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STATEWIDE HARVEST AND POPULATION STATUS

Dall sheep in all mountain ranges were reported to be in healthy condition; populations were reported to be stable except in the Chugach Mountain Range and the Kenai, where they may be increasing. Populations in the Alaska Range may still be recovering from the severe winter of 1981-82.

Sheep harvest varied by area, largely as the result of inclement weather during the hunting season in some areas, and the imposition of a full-curl bag limit in certain units. The total reported state harvest was 862 rams, 7 ewes, and 35 sheep of unknown sex. Harvest was higher than last year in the Alaska Range West, Brooks Range, Chugach Range, and the Talkeetnas; it was lower in the Alaska Range East, Tanana Hills and associated areas.

Area	Harvest		
	Rams	Ewes	Unknown
GMU 12	134		
Tok Management Area	27	7	
Alaska Range West	110		
Delta Controlled Use Area	18		
Tanana Hills/White Mountains	10		
Alaska Range East	105		
Chugach Range	126		
Brooks Range	212		35
Talkeetna/Chulitna/Watana	101		
Kenai Mountains	19		

Robert A. Hinman
Deputy Director

SHEEP

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 12

GEOGRAPHICAL DESCRIPTION: Mentasta, Nutzotin, and North Wrangell Mountains

PERIOD COVERED: 1 July 1984-30 June 1985

Season and Bag Limit

See Hunting Regulations No. 25.

Population Status and Trend

Sheep numbers declined 18% from population levels determined in 1981. Winter 1981-82, which was characterized by deep, persistent snow cover, is presumed to have caused the high mortality of older sheep. This was documented in marked, known-age sheep in an adjacent mountain range with similar weather patterns (Tok Management Area). The population is probably stable and contains approximately 12,000 sheep.

Population Composition

During the period 16-17 July 1984, 17.8 hours were spent conducting an aerial contour survey of the northeast and northwest Nutzotin Mountains from the Nabesna River east to the Canadian border. This area was surveyed in 1981 by the same pilot-observer teams. Eighteen percent fewer sheep were classified in 1984 (n = 2,399) than in 1981 (n = 3,076). "Ewe" numbers (which include yearlings of both sexes and some young rams and ewes) were 33% lower than in 1981. Winter 1981-82 was severe and 2 cohorts of older ewes probably died as documented in the adjacent Tok Management Area. This resulted in a small lamb crop in 1982. Consequently, the lambs born in spring of 1982 contributed minimally to the "ewe" category in 1984 surveys. The decreased number of "ewes" in 1984 was probably also due to young rams classified as "ewes" in 1981 having grown large enough horns to be classified as rams in 1984. The total ram numbers in 1984 increased by 14%. Rams (897) composed 37% of the population (81 rams/100 "ewes"). The actual ratio was probably closer to 101 rams/100 "ewes" because usually 20% of the sheep classified as "ewes" are not females.

Production of lambs was good in 1984. There were 33 lambs/100 "ewes" classified during the survey. The actual ratio is probably closer to 42 lambs/100 ewes.

Mortality

Most sheep mortality is due to natural factors. Predators take an unknown number of sheep, and golden eagles, wolves, coyotes, wolverines, and grizzly bears have all been observed hunting sheep in the area.

A total of 354 hunters reported hunting sheep in Unit 12 during fall 1984, compared to 440 hunters in 1983. This is a 20% decline in the number of hunters. A total of 134 rams was reported taken in 1984, compared to 208 in 1983, a decline of 36%. Hunter success in 1984 was 38%, compared to 47% success in 1983. Mean horn length was 33.9 inches, essentially the same as in 1983, which indicates that the new full-curl regulation had little effect on mean horn length. Inclement weather was the probable reason for decreased hunter success.

Management Summary

Sheep numbers declined by 18% between 1981 and 1984, but this was probably due to the loss of 2 older age classes during the harsh winter of 1981. The population is expected to be stable. The management goal of providing for maximum opportunity to participate in hunting sheep is being met.

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SHEEP

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNITS: 12, 13, and 20

GEOGRAPHICAL DESCRIPTION: Tok Management Area, Alaska Range East of the Johnson River

PERIOD COVERED: 1 July 1984-30 June 1985

Season and Bag Limit

See Hunting Regulations No. 25.

Population Status and Trend

Approximately 2,000 sheep inhabit the Tok Management Area (TMA) and the population is stable. This sheep population is characterized by low density, but it contains rams capable of producing relatively large horns.

Population Composition

An intensive aerial contour census was conducted in that portion of the area lying north of the Tok River on 24 and 26 July 1984. A total of 998 sheep was classified during 11.8 hours of surveying. Rams (279) composed 28% of the sample, with a ratio of 53 rams/100 "ewes." The actual ratio of rams to ewes is higher because all yearling and some 2- and 3-year-old rams were classified as "ewes." Lambs (190) composed 19% of the sample (36 lambs/100 "ewes"). Based on observations at the Sheep Creek mineral lick, and corrected aerial survey data, the actual lamb/ewe ratio was 45 lambs/100 ewes. Sightability ranged from 71% minimum to 83% maximum based upon the observation of marked ewes.

Mortality

Because sheep hunting in the TMA is restricted by permits, natural factors are responsible for most sheep mortality in the area. Golden eagles, wolves, coyotes, wolverines, and grizzly bears are likely to be responsible for most of the predation.

In 1984, only 58 hunters reported hunting in the TMA although 120 ram permits were issued. The number of hunters seeking rams in 1984 declined 28% from those participating in 1983. Only 27 rams were reported taken in 1984 compared to 39 in 1983, a decline of 31%. Hunter success was 47%. The lower participation and harvest in 1984 are attributed to inclement

weather. Rams taken in 1984 had an average horn length of 36.6 inches, significantly greater than the 33.9 inch mean for the remainder of Unit 12. Four of the rams taken (15%) had horn lengths equal to or exceeding 39 inches.

An additional 64 registration permits for ewes were issued and 25 persons reported hunting. Only 7 ewes were taken in 1984.

Management Summary and Recommendations

The sheep population in the TMA is thought to be stable and comprised of approximately 2,000 sheep.

Based on the high interest in the trophy hunt and the above-average size of rams taken, the management objective of providing the opportunity to take large-horned rams is currently being met.

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SHEEP

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 9, 16, 17, and 19

GEOGRAPHICAL DESCRIPTION: Alaska Range West of Denali National Park

PERIOD COVERED: 1 July 1984-30 June 1985

Season and Bag Limit

See Hunting Regulations No. 25.

Population Status and Trend

The number of sheep in the Alaska Range west of Denali National Park is estimated to be at least 4,000. One thousand of these sheep reside in Lake Clark National Park. The trend of sheep populations across the western Alaska Range is unknown although they are thought to be stable.

Population Composition

One summer aerial survey was flown in the heavily hunted Sheep Creek drainage. The observer classified 485 sheep during 2.6 hours. The production of lambs appeared to be good, with 45 lambs/100 ewes. In this survey ewes included breeding ewes, young rams, yearlings, and nonbreeding 2-year-old ewes. The number of rams with 3/4-curl or larger horns was slightly up from past years. This was expected because of the 1979 regulation that increased the minimum legal size from 3/4- to 7/8-curl.

Mortality

A total of 183 hunters reported taking 110 rams in the western Alaskan Range. This was the 2nd consecutive year that harvest and number of hunters have increased. This increase followed a steady decline in the number of hunters and harvest that started in 1979 and reached a low in 1982. The 1984 harvest was well below the 6-year annual average of 124 rams and 242 hunters for this area recorded in the same area in the mid-1970's. This decrease was expected because fewer sheep were available for hunting. Hunter success (60%) was slightly higher than the previous 16-year average (55%). Success among nonresidents was 81%.

The average reported horn size of 35.0 inches was one-half inch longer than the previous 16-year average and probably reflects the change from 3/4- to 7/8-curl minimum horn size for legal rams. The mean age of rams harvested was 8.7 years, which was slightly up from the 1983 average of 8.5 years.

For all hunters, the mean number of days hunted (5.5) and days hunted per sheep taken (9.1) were similar to the long-term averages. Nonresident hunters, regardless of their success, hunted more days than resident hunters. The 1st and 5th week of the season were the best for all hunters and nearly 15% of the sheep harvested were taken on opening day of the season.

A breakdown of sheep harvest and number of hunters by Unit follows: Unit 9 - 2 sheep, 3 hunters; Unit 16 - 16 sheep, 32 hunters; Unit 17 - no hunters; Subunit 19B - 8 sheep, 15 hunters; and Subunit 19C - 84 sheep, 133 hunters. Sheep Creek and Windy Fork in Subunit 19C are also the most heavily hunted areas in the western Alaska Range. Other important hunting areas were the Skwentna, Tonzona, and Post Rivers, and the South Fork of the Kuskokwim River (Table 1).

Management Summary

The sheep population in a portion of the most heavily hunted area in the western Alaska Range appears to have remained stable and the percentage of rams with 3/4-curl or larger horns appears to have slightly increased. This may be due to the change in the legal minimum horn size. Better survey information is needed to monitor trends in the population.

Apparently sheep hunters are returning to the western Alaska Range following the uncertainty of the (d)(2) land settlement. The Lake Clark Park and Preserve has caused a shift in hunting pressure from areas in Units 9 and 17. Tlikakila River in Unit 9 and Twin Lakes in Unit 17 are no longer open to hunting. Most of this pressure has shifted to the Skwentna River (Unit 16) and Subunit 19B, as well as Pingston Creek and the South and Windy Forks of the Kuskokwim (Subunit 19C).

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Table 1. Number of sheep hunters and percentage of success in the western Alaska Range in 1984, compared to the 16-year average.

Area	Successful		Unsuccessful		Percentage of success	
	16-yr avg.	1984	16-yr avg.	1984	16-yr avg.	1984
Unit 9	5.2	2	5.6	1	48	67
Skwentna River	1.8	6	1.2	2	60	75
Happy River	8.6	3	5.9	3	59	50
Yentna River	3.9	1	2.7	4	59	20
Unit 17	3.8	0	10.6	0	26	--
Subunit 19B	3.2	8	4.1	7	44	53
Windy Fork	14.3[a]	13	10.4[a]	6	69	68
Sheep Creek	14.4	15	12.4	9	54	63
Post River	7.1	8	4.3	4	62	67
South Fork	8.1	14	3.2	6	70	70
Tonzona River	11.6	5	8.0	6	59	45
Pingston Creek	1.8	8	0.4	6	82	57

[a] Includes Windy Fork to Big River.

SHEEP

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNITS: 13 and 20

GEOGRAPHICAL DESCRIPTION: Delta Controlled Use Area

PERIOD COVERED: 1 July 1984-30 June 1985

Season and Bag Limit

See Hunting Regulations No. 25.

Population Status and Trend

The Dall sheep population in the Delta Controlled Use Area (DCUA) was estimated to be 1,500 in 1980. No estimates have been made since that time. The population trend is uncertain, but sheep numbers are believed to be relatively stable.

Mortality

In 1984, 675 persons applied for 150 drawing permits for the 2 DCUA sheep hunts. Slightly more than half applied for the "walk-in only" hunt. About half of the permittees hunted. Of those 71 hunters, 18 reported harvesting a ram.

This success rate is the lowest reported since 1973 and is the lowest since drawing permits were initiated in 1978. The increase in legal minimum horn size, and early snows, undoubtedly contributed to the reduced success.

Horn size increased from 34.8 inches in 1983 to 35.8 in 1984. This is the largest average horn size reported from this area since before 1968 and is most likely due to the new 4/4-curl regulation for this area.

Other mortality remains unquantified. The Jarvis Creek wolf pack is known to prey heavily on Dall sheep. Other packs undoubtedly prey on them elsewhere in the DCUA as indicated by wolf travel routes. The extent of this predation is unknown.

Management Summary and Recommendations

Sheep composition data should be collected in June 1985 at the Granite Creek lick. If time permits, additional data should be collected at the Little Gold and Pegmatite Creek licks.

A new program of radio- and visual-collaring sheep should be initiated at the Granite Creek lick to develop an improved understanding of the size, productivity, and mortality patterns of the population that uses the lick. These data will also make aerial survey data more useful for determining seasonal movements and distribution of this population. An efficient trend count area can be established from this information. Although hunter success was lower in 1984, the trend of the sheep population is believed to be relatively stable because of continued high hunter success in most years. Since drawing permit hunts were established in 1978, success has ranged between 25% and 55% for all hunters.

Questionnaires completed by DCUA sheep hunters in the 1984 season indicate that hunters are satisfied with the present regulatory framework. Most parties reported seeing at least 1 other hunting party, but that evidently did not detract significantly from hunt quality.

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SHEEP

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 20

GEOGRAPHICAL DESCRIPTION: Tanana Hills-White Mountains

PERIOD COVERED: 1 July 1984-30 June 1985

Season and Bag Limit

See Hunting Regulations No. 25.

Population Status and Trend

Tanana Hills sheep are characterized by disjunct, low-density populations which are probably continuing to decline slowly. Surveys in 1982 indicated about 650 sheep inhabited the area, a substantial decline from figures obtained a decade earlier.

Population Composition

No population composition and abundance surveys were conducted during 1984. The movements of 5 ewes radio-collared in 1983 were monitored monthly during 1984. One purpose of this movement study is to identify discrete populations. Once this has been done, trend count areas can be established for the purpose of better monitoring a sample population's size and its productivity and mortality patterns.

Movements of radio-collared ewes through summer and fall were similar to those of the previous year. The 2 collared sheep from Lime Peak moved to the Mt. Prindle/Preacher Creek area during the summer and returned to Lime Peak in the fall. The 3 collared sheep from Victoria Mountain moved to the Mt. Schwatka vicinity, used the Jefferson Creek lick, and returned to Victoria Mountain by fall.

Winter movements, however, were considerably different from the previous year. One of the 2 collared sheep from Lime Peak moved back to the summer range in the Mt. Prindle vicinity during midwinter, and 1 collared ewe from Victoria Mountain returned to the summer range of Mt. Schwatka during the same period. The reasons for the movements are unclear but may relate to snow conditions. Unlike winter 1983-84 when most of the ridges in the vicinity of Lime Peak and Victoria Mountain were snow-free, in winter 1984-85 these same areas were covered with snow. Snow depths may have been sufficient to hinder movements and feeding activity, and therefore could

have precipitated the change of wintering locations. None of the radio-collared ewes were observed with 1984 cohort lambs.

Mortality

Hunters reported taking 10 sheep in 1984, a 42% decline from the previous year's harvest. The reduced harvest was attributed primarily to the newly implemented permit system in most of Subunit 20E which effectively reduced hunting effort there. The overall number of hunters also declined from 45 in 1983 to 42 in 1984. Although hunting effort declined in Subunit 20E, it increased in the remainder of the mountain range. Hunter success (24%) was down from 38% recorded in 1983. According to information provided by hunters, mean horn length was 35.2 inches, which is about midway between the 1982 and 1983 averages. Sheep harvested averaged 8.8 years of age.

Ninety percent of the hunters were residents and resident hunters experienced a 70% success rate. Seventy-five percent of the few nonresident hunters were successful.

General harvest locations were reported as: Mt. Harper, 2; Mt. Sorenson, 2; White Mountains, 2; Tatonduk-Kandik Rivers, 3; and Unit 25 location unknown, 1. Successful hunts averaged 8.1 days.

Management Summary and Recommendations

Declining, low-density sheep populations exist in the Tanana Hills-White Mountains in areas of suitable habitat. Causes of the population decline in portions of the Tanana Hills-White Mountains should be thoroughly investigated and, if possible, remedied.

Hunting pressure is low and harvests are moderate relative to the population size. Future harvests and hunting pressure in the Tanana Hills should not increase significantly because of the newly instituted permit system in effect for this area.

Draft Wildlife Management Plans for this area call for maintaining aesthetic hunting conditions through controlling hunter numbers, access, and methods of transport. That goal is now being met through the present permit system.

Changes in land use practices may be the greatest single threat facing these sheep populations. Significant mineral discoveries have been located in the Tanana Hills-White Mountains, and, although plans for development have not been publicized, it is reasonable to expect that some of the claims will be developed in the not-too-distant future. When development occurs, it is essential that the Department work

closely with land management agencies so that impacts on important sheep range are minimized.

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SHEEP

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 20

GEOGRAPHICAL DESCRIPTION: Alaska Range East of Denali National Park Excluding the Tok Management Area and the Delta Controlled Use Area

PERIOD COVERED: 1 July 1984-30 June 1985

Season and Bag Limit

See Hunting Regulations No. 25.

Population Status and Trend

The central Alaska Range contains a moderately dense sheep population which is probably stable. Although lamb survival and subsequent recruitment have fluctuated in recent years, these variations have had a relatively minor effect on the overall sheep population.

Population Composition

Composition and productivity data obtained from observations at the Dry Creek mineral lick during June indicated that lamb production was good at 51 lambs/100 ewes. Data from the observations of marked ewes showed the incidence of consecutive year breeding has increased from 6% (1977-81) to 40% (1981-84) and the incidence of consecutive year nonbreeding has decreased from 44% (1977-81) to 15% (1981-84). These changes in reproductive patterns may be a result of increases in the legal minimum horn size for rams from 3/4- to 7/8-curl in 1979. There are more mature rams in the population than before.

Survival of the 1983 lamb cohort was poor. Only 25 yearlings/100 ewes were observed at the mineral lick. This was an improvement over last year's recruitment of 9 yearlings/100 ewes.

Mortality

Harvest data indicated 105 sheep were taken from the central Alaska Range during 1984, a decline of 13% from the previous year. The reduced harvest is probably due to the increase in

minimum legal horn size from 7/8- to full-curl for the 1984 season. A similar harvest reduction occurred in 1979 when the minimum horn size was increased from 3/4- to 7/8-curl. Because rams are harvested fairly heavily from this portion of the Alaska Range, it will be necessary for a year or two to elapse before rams develop to the new legal minimums.

The mean horn size was 34 inches, a very slight increase over the previous year's average of 33.7 inches. The largest mean horn size occurred in the Totatlanika River drainage (35.5 inches) while the smallest was in the Dry Creek drainage (32.9 inches).

Hunters averaged 5.1 days afield. Mean age of all sheep harvested was 7.8 years according to information provided by hunters. Horn length varied from 25 to 41 inches.

The largest harvest again occurred in the Wood River drainage (43), and the fewest sheep were taken from the Totatlanika River drainage (2). Table 1 summarizes harvest data.

Overall hunter success was 36% which equals the statewide average. The success rate declined from last year and is probably a reflection of the change in legal minimum horn size and the large amount of hunting pressure received by this section of the Alaska Range. The success rate should increase as more young rams have an opportunity to grow to full-curl horn size.

Management Summary and Recommendations

The sheep population in the central Alaska Range is stable and moderately dense. Lamb production was good in 1984. In the Dry Creek study population, the percentage of ewes demonstrating a consecutive year breeding pattern has increased. The yearling recruitment level, though low, was nearly 3 times that of 1983.

The central Alaska Range continues to be a popular hunting area for residents despite relatively low numbers of large horned rams and only average hunting success. Due to the change in the minimum legal horn size, the number of large horned rams available for hunting will increase within the next 2 years. The management goal of this area is for the maximum opportunity to hunt. Present regulations are satisfying this goal without endangering the sheep population.

Probably the greatest threat facing this sheep population is habitat degradation and/or changes in land management practices, either of which may cause sheep to abandon present ranges. Without adequate habitat protection, Alaska's sheep

populations face an uncertain future and ultimately may be doomed to the same fate as wild sheep in the continental United States.

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Table 1. Sheep hunter statistics for the Alaska Range east of Denali National Park (excluding the Tok Management Area and the Delta Controlled Use Area), 1984.

Drainage	Number successful	Number unsuccessful	Mean horn length (inches)
Nenana/Yanert	27	81	35.2
Totatlanika	2	11	35.5
Tatlanika	5	1	33.4
Wood	43	29	33.7
Dry Creek	6	4	32.9
Little Delta	14	8	34.0
Delta Creek	8	6	32.1
Delta	0	2	--
Unknown	0	8	--
Totals	105	150	

SHEEP

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNITS: 23, 24, 25, and 26

GEOGRAPHICAL DESCRIPTION: Brooks Range

PERIOD COVERED: 1 July 1984-30 June 1985

Season and Bag Limit

See Hunting Regulations No. 25.

Population Status and Trend

The total number of Dall sheep in the Brooks Range is estimated at 30,000. Sheep populations across the mountain range vary in density. Numbers are relatively low in Unit 23, the central portion of Unit 24, and in Unit 25. Western portions of Unit 24 support moderate sheep numbers, and higher numbers exist in eastern Unit 24. In Unit 26, high densities occur just east of the Canning River, and sparse numbers exist near the Canadian border. The trends of these populations are unknown.

Population Composition

The National Park Service conducted limited surveys in Gates of the Arctic National Park. Data from these surveys are not yet available.

Mortality

Two approaches to the harvest of Dall sheep are currently being practiced in the Brooks Range. A standard fall season for 7/8-curl or larger rams occurs from 10 August through 20 September. A registration permit hunt opens in Units 23 and 24 on 1 August and extends through 30 April. The registration permit hunt in Subunits 25A and 26C opens 1 October. These longer seasons are designed to provide the opportunity for local residents to hunt any Dall sheep for local use. Aircraft transportation of sheep meat or sheep hunters is not allowed during these registration permit hunts.

During the standard fall season, 370 hunters took 212 rams. Resident hunters took 111 rams, nonresidents took 86 rams, and 15 rams were taken by hunters of unreported residency.

The numbers of hunters and animals harvested were highest since 1978 when 426 hunters took 266 rams. Hunter participation and harvest decreased dramatically in 1979 when the broad application of the Antiquities Act and the subsequent passing of the Alaska National Interest Lands Conservation Act (ANILCA) created new national parks. More than one-third of the sheep in the Brooks Range became unavailable to hunters. Since 1979, hunter numbers and the harvest have slowly increased. Economic conditions may have contributed to the slow increase in the number of hunters willing to go to the Brooks Range.

It is interesting that hunters in 1984 took a slightly higher percentage of the sheep available to hunting than did hunters in previous years. Only 18,500 of the 30,000 sheep in the Brooks Range are currently available to hunting during the standard fall hunt. Hunters took 1.2% of the available sheep in 1984 compared to 1% in 1978.

Hunter participation, especially by residents, increased in Unit 23 (Table 1). The Eli River drainage received 25% of the hunting pressure. The sheep harvested from this area had the smallest horns (mean = 33.1 inches) and youngest ages (mean = 7.5 years) of sheep harvested in the Unit. Hunter success in all of Unit 23 was down from the 1980-83 mean of 48%. Mean age of all rams harvested in Unit 23 was 8.2 years.

The number of hunters in Unit 24 in 1984 was similar to numbers in previous years following the passage of ANILCA. Hunter success was down for all hunters, including nonresidents who generally have higher success rates than residents. Mean age of rams taken in Unit 24 was 8.6 years. Most of the sheep habitat in Unit 24 is within Gates of the Arctic National Park; consequently, hunters are concentrating in the remaining areas open to hunting. Forty-six percent of the hunters and 36% of the harvest came from the drainages of the Middle Fork of the Koyukuk River and the Dietrich River along the Dalton Highway.

In Unit 25, hunter participation and success were about the same as in recent years. Mean ram age (9.1 years) was the highest in this Unit. Fourteen (25%) hunters reported hunting the North Fork of the Chandalar River. Due to the length of this drainage, it is unlikely hunters experienced much crowding.

There has been a steady increase in hunting pressure in Unit 26 since ANILCA. The total number of hunters increased by 22% from last year and surpassed the 1978 pre-ANILCA high of 206 hunters (68% of which bagged 3/4-curl rams). Resident and nonresident hunters in the Brooks Range had their highest

success rates in Unit 26. Success rates for resident and nonresident hunters were up in all Subunits of Unit 26 including areas utilized by large numbers of hunters. Nonresidents especially had a high success rate (92% in Subunit 26B and 98% in Subunit 26C). The mean ages of sheep taken in Subunits 26A, 26B, and 26C were 8.3 years, 8.6 years, and 9.3 years, respectively. These are up from 1983.

Some areas within Unit 26 received more hunting pressure than others. In Subunit 26A, nearly half of the hunting and 40% of the harvest occurred in the mountains between the Nanushuk and the Anaktuvuk Rivers. This area is within Gates of the Arctic National Preserve and is one of the few areas open to sheep hunting in the Subunit.

In Subunit 26B, 32% of the hunting and 24% of the harvest were in the Atigun drainage through which a portion of the Dalton Highway runs. "Highway vehicle" was listed as the primary source of transportation by 65% of the hunters in this area despite the closure of the Dalton Highway to general traffic north of Dietrich. The number of hunters and the harvest in the Atigun area have increased over the past 10 years (Table 2). Resident hunters composed 80% of the hunters in the Atigun area and 50% of the hunters in the neighboring area between the Sagavanirktok and Saviukviaya Rivers.

The most recent data on the sheep population in the Atigun area are from 1980-83 surveys done by a consulting firm. They counted 544 sheep in over half of the area. A population of this size can probably sustain a harvest of only 16 rams a year. The actual sheep population is uncertain, and reliable and complete population information is becoming more important as the number of hunters increases.

In Subunit 26C, 40% of the hunting and 42% of the harvest were in the drainages of the Hulahula River. Another 24% of the hunter effort and 25% of the harvest occurred in the drainages of the Kongakut River. The sheep populations in both of these drainages have been estimated at about 2,000 sheep though their current status and trend are unknown.

Mortality data from the registration permit hunts are incomplete, but to date 15 sheep of unreported sex have been taken in Unit 24. This is half of last year's harvest. The harvest was anticipated to be greater in Unit 24 than in previous years because residents of more villages were eligible to participate in the hunt. Possibly, hunters decided to concentrate on caribou that migrated earlier than usual in this area. In Subunit 26C, 20 sheep were taken from the Hulahula River; about 25% of the sheep were rams and the remainder were ewes. This harvest is about the same as in previous years.

Management Summary and Recommendations

Sheep populations in the Brooks Range tend to be stable. The total number of sheep is estimated at 30,000. The number of sheep available to hunting is estimated at 18,500.

During the standard fall season, the number of sheep hunters in the Brooks Range was the highest since 1978 (before ANILCA). A higher percentage of the sheep available to hunting was harvested in 1984 than in previous years, even before ANILCA. Hunting pressure is increasing in specific areas and some of this pressure is associated with the ease of access along the Dalton Highway. There may be a need for better enforcement of the general traffic highway closure at Dietrich.

Better population composition and recruitment data are needed to assess the impact of current and increasing levels of hunting pressure on sheep populations, especially in certain areas. Trend count areas should be established so monitoring can be done on an economical basis.

The management goal, according to the Draft Management Plan for the Brooks Range (excluding Unit 23), is to provide aesthetic hunting conditions. It will become necessary to determine if this management goal is being met as the number of sheep hunters increases. The management goal for Unit 23 is to provide the greatest opportunity to hunt sheep. Localized overhunting may compromise the achievement of this goal.

Mortality data from registration permit hunts indicate the harvest is down in Unit 24 and unchanged from past years in Unit 26. However, these data are incomplete. Areas of localized harvest should be identified, and the sheep populations in these areas should be monitored annually. The situation where 3 sheep of either sex can be taken necessitates more careful monitoring than instances where only rams are hunted. More complete information on harvest location, composition, and population status is needed to assure the welfare of the sheep populations and the maintenance of the current management scheme.

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Table 1. Total numbers of sheep hunters and percentages of success in Game Management Units 23, 24, 25, and 26, 1984-85.

	Unit 23	Percent successful	Unit 24	Percent successful	Unit 25	Percent successful	Unit 26	Percent successful
Total hunters	44	41	56	25	58	57	208	69
Residents	34	29	42	14	35	43	137	58
Non-residents	10	80	7	43	20	80	63	94
Unknown residency	0	--	7	100	3	67	8	75

Table 2. Total hunters and the number of successful hunters (in parentheses) for the Atigun River drainages and the Sagavanirktok River to the Saviukviaya River drainages in Subunit 26B, 1975-84.

Year	Atigun River		Sagavanirktok River to Saviukviaya River	
	Total hunters	% Successful	Total hunters	% Successful
1975	0	(--)	9	(7)
1976	0	(--)	7	(6)
1977	1	(0)	0	(0)
1978	0	(--)	15	(13)
1979	3	(2)	23	(20)
1980	4	(2)	16	(7)
1981	14	(5)	13	(7)
1982	15	(7)	12	(11)
1983	27	(13)	7	(4)
1984	20	(10)	10	(10)

SHEEP

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 11, 13, and 14

GEOGRAPHICAL DESCRIPTION: Chugach Mountains

PERIOD COVERED: 1 July 1984-30 June 1985

Season and Bag Limit

See Hunting Regulations No. 25.

Population Status and Trend

The Chugach Mountains contain portions of 4 Game Management Units (11 and 13) or Subunits (14A and 14B) extending 350 miles from Anchorage to the Yukon border. Approximately 60 percent of all the sheep within the range are presently located within 2 areas, Subunits 14A and 14C, where extensive surveys were conducted in 1984.

Sheep surveys conducted within Subunit 14A indicated the population has increased 12% annually since 1982; within Subunit 14C the population has increased 15% annually since 1979. In contrast, the sheep population in Unit 13 has remained relatively stable since 1981. A total of 702 sheep was observed in Subunit 14A; 1,833 were observed in Subunit 14C, and 291 were observed in the extreme eastern portion of Unit 13. No surveys were conducted in Unit 11.

Population Composition

The composition of sheep observed within Subunit 14A was 8.0% legal rams (7/8 horn-curl or larger), 16.7% young rams and 21.2% lambs. Within Subunit 14C the composition was 8.6% legal rams, 14.7% young rams, and 19.5% lambs. These data indicate a young, growing population which will experience a substantial increase in the percentage of legal rams over the next 2-3 years. Within Unit 13, limited data suggest a low percentage of legal rams (5.8%) continued as a consequence of poor lamb production and survival during the late 1970's. Lamb production has improved substantially since 1981 and the percentage of legal rams should increase as these sheep mature.

Mortality

Six hundred seventy-four hunters killed 126 legal rams during the 1984 season, 26 more than the average kill from 1979-1983.

Of those sheep taken in 1984, 1 was killed in Unit 11, 57 in Unit 13, 27 in Subunit 14A, and 41 in Subunit 14C. The sheep from 14C were taken under 2 special permit hunts. A total of 341 hunters participated, including 271 in a late season (25 September-5 October) registration hunt. Mean horn size was 34.7 inches, 0.6 inch less than the 1979-83 mean. A record number of sheep hunters participated in the Chugach Mountain hunts during the 1984 season.

Management Summary and Recommendations

The sheep population within Subunit 14C continues to increase, and it now appears that those in Subunit 14A are increasing at a similar rate. In contrast, population information collected within Unit 13 suggests a stable population with a low number of legal rams. I recommend that annual surveys be flown in Unit 13 between the Nelchina and Klutina Glaciers to monitor the status of rams and lambs in that area.

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SHEEP

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 13 and 14

GEOGRAPHICAL DESCRIPTION: Talkeetna Mountains and Chulitna/Watana Hills (TCW)

PERIOD COVERED: 1 July 1984-30 June 1985

Season and Bag Limit

See Hunting Regulations No. 25.

Population Status and Trend

No data were available.

Population Composition

No data were available.

Mortality

A total of 296 hunters reported killing 101 rams. Of these rams, 52 (51.5%) were killed in Subunit 13A; 23 (22.8%) in Subunit 13E; 15 (14.9%) in Subunit 14A; 10 (10.0%) in Subunit 14B, and 1 (1.0%) in an unspecified area. The number of rams killed increased 47.6% from the 1983 harvest of 53 and was the 3rd highest kill on record. Hunter success was 34.1% which was the 4th highest on record.

Management Summary and Recommendation

Although no sheep surveys were conducted during 1984, surveys the previous year indicated a stable population. The sheep population in the TCW is believed to be stable.

The 26.4% increase in the number of sheep hunters reversed a 6-year trend of declining numbers of hunters. The reason for this increase in hunter numbers and success rate is unknown.

No changes in season or bag limit are recommended.

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SHEEP

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 7 and 15

GEOGRAPHICAL DESCRIPTION: Kenai Mountains

PERIOD COVERED: 1 July 1984-30 June 1985

Season and Bag Limit

See Hunting Regulations No. 25.

Population Status and Trend

Comparison of sheep composition survey data from 1979 to 1983 (Table 1) suggests an increasing sheep population in the Kenai Mountains. No data are available to determine if this trend continued in 1984.

Population Composition

No composition counts of sheep in the Kenai Mountains were conducted in 1984.

Mortality

Nineteen rams were killed in the 1984 season, compared to the 1979-1983 mean harvest of 24 rams. One hundred and seventy-nine hunters spent a total of 672 days sheep hunting in 1984, for a success rate of 10.6%.

Mean horn length of rams taken in 1984, as reported by hunters, was 32.7 inches, and ranged from 27.5 to 39.0 inches. Mean age of harvested rams, as estimated by hunters, was 7.0 years; 6 rams were estimated to be 8 years of age or older.

Management Summary and Recommendation

The number of legal rams (7/8 curl or larger) in the Kenai Mountains should steadily increase in the remaining 1980's. The percentage of legal rams decreased from 1979 through 1981 and remained low through 1983 (Table 1). The number of rams harvested by hunters also exhibited a declining trend between 1979 and 1984. These trends are attributed to high winter losses which occurred in the early and mid-1970's in all sex and age classes of sheep. However, the percentage of lambs and the lambs/100 ewes and yearlings has steadily increased from

1979 through 1983 (Table 1). Rams in the Kenai Mountains generally attain 7/8 curl at 6 years of age. In 1985, survey composition and harvest data should begin to reflect an increase in legal rams resulting from the increasing lamb crops since 1979.

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Table 1. Composition of sheep observed in the Kenai Mountains from Kenai River to Sheep Creek, 1979-83.

Year	% Legal rams of total observed	% Sublegal rams of total observed	% Lambs of total observed	Lambs/100 unclassified	Sheep/ hour	Sample size
1979	8.3	16.0	14.0	22.6	45	551
1980	6.6	10.0	16.6	24.8	41	452
1981	5.3	16.2	17.5	28.6	36	395
1982	6.1	9.9	20.4	32.2	87	372
1983	5.9	13.9	22.0	37.5	58	563

SHEEP

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 23

GEOGRAPHIC DESCRIPTION: Kotzebue Sound

PERIOD COVERED: 1 July 1984-30 June 1985

Season and Bag Limit

See Hunting Regulations No. 25.

Population Status and Trend

No surveys were conducted in 1984. Comments from the public and from University of California personnel conducting a sheep research project, and observations made by Game Division staff suggest no radical change since the last reporting period. National Park Service and Game Division surveys indicated a minimum of 778 and 912 sheep in the Baird and DeLong mountains, respectively, and about 1,000 sheep in the Schwatka and Endicott mountains within the boundaries of Gates of the Arctic National Park and Unit 23 (Quimby 1984). Survey data and other information also suggested that the number of sheep in the Baird and DeLong mountains had increased significantly over a 6-year period, perhaps by as much as 54% (Quimby 1984).

Mortality

Hunters reported killing 19 rams during the 1984 fall season. This fell within the annual harvest range of 13-25 animals that has occurred since the 7/8 curl regulation went into effect in 1979. An additional 26 hunters were unsuccessful. Although no harvest reports for registration hunt No. 1185 were turned in for the 1983-84 season, there were unsubstantiated reports of 2 ewes and 2 rams killed in the Agashashok River drainage in April 1984.

Mean age and horn length of the reported harvest were 8.2 (SD = 1.6) years and 34.4 (SD = 2.4) inches, respectively. Eight of 20 hunters were successful in the Baird Mountains and 8 of 20 killed rams in the DeLong Mountains. Five hunters, including 3 successful ones, did not specify the area hunted.

Management Summary and Recommendations

The 1984 reported harvest was representative of harvest levels over the past 5 years, during which time the sheep population

increased. Regulation changes, therefore, seem unnecessary at this time. The most immediate management need is to establish 2-4 trend-count areas to serve as indices of sheep population status. Results from past and recent surveys and from the nearly-completed University of California research project will be analyzed and used to establish trend-count areas and other aspects of the Unit 23 sheep management program in 1985.

Literature Cited

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