

**FEDERAL AID
ANNUAL RESEARCH PERFORMANCE REPORT**

ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF WILDLIFE CONSERVATION
PO Box 25526
Juneau, AK 99802-5526

PROJECT TITLE: Interrelationships of Dall sheep and predators in the Central Alaska Range

PRINCIPAL INVESTIGATOR: Stephen M. Arthur

COOPERATORS: Alaska Chapter, Foundation for North American Wild Sheep, University of British Columbia

FEDERAL AID GRANT PROGRAM: Wildlife Restoration

GRANT AND SEGMENT NR.: W-27-5

PROJECT NR.: 6.13

WORK LOCATION: Central Alaska Range, Unit 20A

STATE: Alaska

PERIOD: 1 July 2001–30 June 2002

I. PROGRESS ON PROJECT OBJECTIVES

OBJECTIVE 1: Estimate annual pregnancy and birth rates for adult ewes.

Ewes were captured and radiocollared, and blood samples were obtained for pregnancy determination. Nineteen ewes were captured in March 1999, 22 in March 2000 (includes 13 recaptures), 23 in March 2001 (includes 19 recaptures), and 19 in March 2002 (all recaptures).

OBJECTIVE 2: Estimate lamb survival to yearling age class and determine causes of mortality.

Lambs were captured and radiocollared during late May–early June, and monitored during June–April to estimate survival and mortality causes. Twenty-four lambs were captured in 1999, 23 in 2000, 23 in 2001, and 24 in 2002.

OBJECTIVE 3: Estimate annual survival and determine causes of mortality of adult ewes.

Radiocollared ewes were monitored approximately twice per month from March 1999 to June 2002 to estimate survival and causes of mortality.

OBJECTIVE 4: Monitor movements of coyotes in relation to sheep distribution to determine proportion of coyotes that forage in sheep habitat.

From March 1998–May 2002, 17 coyotes were captured and radiocollared, then located approximately twice per month to determine home ranges, habitat use, movement patterns, and reproductive success. These included 13 resident adults (5 M:F pairs, plus 3 mortalities), 3 pups (2 M, 1 F; aged 10–13 months), and 1 dispersing 2-year-old male.

OBJECTIVE 5: Assess spatial and temporal variability in coyote predation on lambs.

Timing and locations of lamb mortalities due to coyote predation were recorded. These data will be compared among years.

OBJECTIVE 6: Assess trends in sheep population and reproductive success over time.

The sheep population in the study area was surveyed annually during June 1995–2002. Surveys consisted of intensive searches conducted with R-22 helicopters. Sheep were counted and classified as lambs, yearlings, adult ewes, or rams (4 horn size classes).

OBJECTIVE 7: Analyze and publish results.

Analysis of survival rates and home ranges has begun. Additional work is scheduled to occur in FY03.

II. SUMMARY OF WORK COMPLETED ON JOBS IDENTIFIED IN ANNUAL PLAN THIS PERIOD

JOB 1: Estimate annual pregnancy and birth rates for adult ewes.

Blood samples were obtained from 19 radiocollared adult ewes in March 2002. One additional radiocollared ewe could not be recaptured. Serum samples will be sent to the University of Alaska Fairbanks for progesterone analysis. Fifteen (75%) of the 20 ewes were seen with lambs in late May or early June. This 75 % lambing rate in 2002 was similar to 1999 (76%) and greater than during 2000 (68%) or 2001 (55%).

JOB 2: Estimate lamb survival to yearling age class and determine causes of mortality.

Three of 23 lambs collared in 2001 shed their collars. Of the remaining 20 lambs, 3 (15%) survived through May 2001. All but 1 of the deaths were due to predation; 1 lamb drowned in a small stream. Coyotes caused at least 5 and possibly 7 deaths, eagles killed 4 lambs, wolverines killed at least 2 and possibly 3 lambs, and wolves may have killed 1 lamb. There were 5 cases where the predator could not be identified. Twenty-four lambs were captured and radiocollared during May 2002. The peak of lambing occurred during mid-May. One lamb shed its collar, and 14 (61%) of the remaining 23 lambs survived through 30 June. Seven deaths were due to predators (3 were caused by eagles, 3 by coyotes, and 1 by an unknown predator). One lamb drowned in a stream, and the fate of 1 lamb was not determined, although some evidence of eagle predation was found.

JOB 3: Estimate annual survival and determine causes of mortality of adult ewes.

Twenty-four ewes that were radiocollared during previous years were monitored in FY02. Four ewes died, 3 most likely were killed by wolves, and 1 was killed by a wolverine.

JOB 4: Monitor movements of coyotes in relation to sheep distribution to determine proportion of coyotes that forage in sheep habitat.

Movements of 9 radiocollared coyotes were monitored during some or all of FY02. These included 4 resident adult pairs and 1 adult female whose previous mate was killed by a trapper. Data on home ranges and habitat use were collected and will be compared with sheep distributions to assess coyote foraging behavior. In addition, University of British Columbia graduate student Laura Prugh collected coyote scats and assessed populations of hares and small rodents as part of a cooperative study of coyote foraging behavior in the study area.

JOB 5: Assess spatial and temporal variability in coyote predation on lambs.

Locations of known or suspected coyote kills were recorded and the spatial and temporal distribution will be compared among years.

JOB 6: Assess trends in sheep population and reproductive success over time.

The sheep population was surveyed during 20–22 June using an R-22 helicopter. The population in the survey units increased from 552 in 2001 to 597 in 2002. Within the study area, 130 lambs but only 27 yearlings were counted during 2002 (\bar{x} = 112 lambs, 77 yearlings from 1995–2000). The low yearling count supports radiotracking data that indicated poor lamb production in 2001.

JOB 7: Analyze and publish results.

Work on this job will occur in FY03.

III. ADDITIONAL FEDERAL AID-FUNDED WORK NOT DESCRIBED ABOVE THAT WAS ACCOMPLISHED ON THIS PROJECT DURING THIS SEGMENT PERIOD

In cooperation with the National Park Service, helicopter surveys of eagle nests in part of the sheep study area were conducted during April and June 2002. One occupied nest was found during the April survey, but this nest had been abandoned by the June survey. Thus, no successful eagle nests were found this year, compared to 8 active nests found in the same area during July 2000.

IV. PUBLICATIONS

None.

V. RECOMMENDATIONS FOR THIS PROJECT

Predation by eagles has been a major cause of death of lambs during all years of this study. Research elsewhere has suggested that eagle nesting success is greatly influenced by population cycles of hares, which have recently crashed in Unit 20A. Further research concerning the relationships among hare populations, eagle nesting success, and survival of Dall sheep lambs would be a valuable addition to the present study.

VI. APPENDIX

None.

VII. PROJECT COSTS FOR THIS SEGMENT PERIOD

FEDERAL AID SHARE \$8400 + STATE SHARE \$26,300 = TOTAL \$34,700

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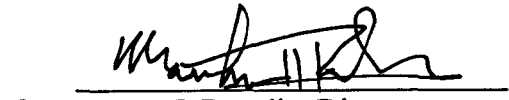
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