

**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:** Factors limiting moose at low density in Unit 19D East, and response of moose to wolf control and increased bear harvest

**PRINCIPAL INVESTIGATORS:** Mark A Keech, Toby A Boudreau, and Patrick Valkenburg

**COOPERATORS:** Eric Post, Pennsylvania State University

**FEDERAL AID GRANT PROGRAM:** Wildlife Restoration

**GRANT AND SEGMENT NR.:** W-27-5

**PROJECT NR.:** 1.58

**WORK LOCATION:** The eastern portion of Unit 19D, the Kuskokwim River drainage upstream of the Selatna River.

**STATE:** Alaska

**PERIOD:** 1 July 2001–30 June 2002

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**I PROGRESS ON PROJECT OBJECTIVES**

**OBJECTIVE 1A:** Estimate moose numbers and population composition in Unit 19D East.

In October 2001 we conducted aerial surveys within the eastern portion of Unit 19D and completed a census of the moose population with the EMMA.

| Year | Area (mi <sup>2</sup> ) | Population estimate     | Calves:100 Cows | Bulls:100 Cows | Yearling bulls:100 cows |
|------|-------------------------|-------------------------|-----------------|----------------|-------------------------|
| 2001 | Unit 19D East (5200)    | 1863 <sup>a</sup> ± 485 | 29 ± 14         | 37 ± 18        | 9 ± 5                   |
| 2001 | EMMA (520)              | 440 <sup>a</sup> ± 0    | 34 ± 0          | 18 ± 0         | 8 ± 0                   |

<sup>a</sup> Estimates are not corrected for sightability (2001 estimate is 2247 for Unit 19D East and 531 for the EMMA when a 83% sightability correction factor is applied).

**OBJECTIVE 1B:** Determine primary causes of mortality of moose calves, and determine if the pattern of calf mortality is similar to previous studies in the Nowitna and Koyukuk drainages and the Yukon Flats (Osborne et al. 1991; Bertram and Vivion 2002).

In May 2001 we captured and radiocollared 66 newborn moose calves in Unit 19D East. We monitored those calves through their first year of life and investigated causes of mortality for those individuals. The overall survival rate for our collared sample of calves was 26% (17 of 66). We attributed 18 deaths (37%) to black bears, 17 deaths (35%) to

grizzly bears, 12 deaths (24%) to wolves, 1 (2%) death to drowning, and 1 death (2%) to unknown cause.

In May 2002 we captured and radiocollared 81 newborn moose calves in Unit 19D East. Survival for those calves through the end of this reporting period (30 Jun 2002) was 56% (45 of 81 lived). We attributed 14 deaths (39%) to black bears, 8 deaths (22%) to grizzly bears, 12 deaths (33%) to wolves, and 2 deaths (6%) to unknown cause.

These results are similar to those previously reported by researchers working in comparable habitat types in Alaska, however, grizzly bear mortality appears to be higher in Unit 19D East than in other areas.

**OBJECTIVE 1C: Determine condition, movements, and mortality rates of yearling and adult moose.**

In March 2001 we captured 25 adult and 15 yearling moose within the study area. In March 2002 we captured 15 adult and 15 yearling moose. During processing moose had a blood sample taken, a tooth pulled (adults only), morphometric measurements obtained, rump fat determined via ultrasound (adults only), weight taken (yearlings only), and radio collar affixed. These collared individuals were then monitored to determine reproductive indices, movements and mortality rates.

| Year | Observed rate of parturition (%) | Observed twinning rate (%) | 10-month calf weight in kg | Average adult rumpfat depth in cm (median) |
|------|----------------------------------|----------------------------|----------------------------|--|
| 2001 | 70                               | 30                         | 179.1                      | 0.71 (0.55)                                |
| 2002 | 92                               | 59                         | 191.8                      | 1.51 (1.58)                                |

For this reporting period, monthly locations of study animals indicated that moose within the EMMA are relatively nonmigratory, and no discernable large-scale movement pattern was evident. However, some moose that reside in the Pitka Flats (east of the EMMA) during calving season are apparently migratory, spending spring and summer in the Pitka Flats and then moving to the Farwell Burn/Alaska Range foothills in fall and winter.

Survival of collared adult females from May 2001 to May 2002 was 88% (30 of 34). Deaths were attributed to grizzly bears (1), wolves (1), and humans (2). Survival of collared yearling females from May 2001 to May 2002 was 83% (10 of 12). All yearling deaths were attributed to wolves (2).

No adult or yearling mortality occurred between May 2002 and the end of this reporting period (Jun 2002).

**OBJECTIVE 1D: Determine twinning rates and age at first reproduction of moose in Unit 19D East.**

Collared adult females had an observed twinning rate of 59% during this reporting period. In addition to collared individuals, we recorded sightings of uncollared cows with calves we

saw within the study area. Twinning rate observed for these uncollared moose was approximately 50%.

No data was collected for age of first reproduction during this reporting period. We will obtain age of first reproduction data as our collared yearling cohorts age.

**OBJECTIVE 1E: Survey snow depth and density within the EMMA and adjacent areas.**

No data in addition to that collected by the National Weather Service was obtained during this reporting period.

**OBJECTIVE 2: Characterize winter moose browse in Unit 19D East.**

No data was collected during this reporting period.

**OBJECTIVE 3A: Estimate wolf numbers in Unit 19D East and identify wolf packs that hunt moose within the EMMA.**

In the March 2001 survey, 103 wolves (no estimate of survey precision was possible) were estimated in Unit 19D East and 19 wolves were taken from the area prior to the survey (Boudreau, ADF&G unpublished memo). Results of this survey indicate that 33 wolves in 5 "core packs" were largely resident within the EMMA.

No wolf survey data in addition to that collected incidentally during moose work or from local trappers was obtained during this reporting period.

**OBJECTIVE 3B: Determine reproductive rates and condition of wolves in Unit 19D and compare rates with other wolf populations in Alaska.**

During this reporting period we purchased 25 hunter- and trapper-killed wolf carcasses for necropsy. Necropsies were performed during spring 2002 and reproductive tracts were preserved for later analysis.

**OBJECTIVE 4: Document the distribution of black bear and grizzly bears numbers within and adjacent to the EMMA and characterize bear predation on moose calves.**

In a collaborative project with Pennsylvania State University, we captured 20 black bears during May and June 2002 within the study area. Resulting data indicates movements have been restricted to riparian areas within the central portion of the study area.

We did not observe any grizzly bears within the study area during this reporting period. However, kills and other sign indicate that they are present within the study area at a lower density than black bears.

**OBJECTIVE 5: Write annual progress reports and a final report, and publish results in peer-reviewed journals.**

No results were reported or published during this reporting period.

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

### **JOB 1A: Surveys of moose in treatment and comparison areas.**

This job was accomplished during the reporting period. Federal Aid funds were used to pay for flight time of 3 Piper Super Cubs used during moose surveys in the study area and the comparison areas. Federal Aid funds were also spent on lodging for pilots and for fuel for State of Alaska fixed-wing aircraft, and salary for Alaska Department of Fish and Game employees.

### **JOB 1B: Calf mortality study.**

This job was accomplished during the reporting period. Federal Aid funds were used to pay for 70 moose calf collars and flight time of a Robinson R-44 helicopter used during moose calf capture operations in May and June 2002. Funds were also used to pay for lodging, for aviation fuel for State of Alaska fixed-wing aircraft and boats used during the capture project, and the subsequent monitoring of collared animals. Funds were also spent on helicopter time (both R-22 and R-44) needed to retrieve mortalities from the field and salary for Alaska Department of Fish and Game employees.

### **JOB 1C: Radiocollaring and tracking moose.**

This job was accomplished during the reporting period. Federal Aid funds were used to pay for 15 yearling and 5 adult moose collars and flight time of a Hughes 500 helicopter used during moose capture operations in March 2002. Funds were also used to pay for lodging, for aviation fuel for State of Alaska fixed-wing aircraft used during the capture project, and the subsequent monitoring of collared animals. Funds were also spent on helicopter time (both R-22 and R-44) needed to retrieve mortalities from the field and salary for Alaska Department of Fish and Game employees.

### **JOB 1D: Calving/twinning surveys in treatment and comparison areas.**

This job was accomplished during the reporting period. Federal Aid funds were used to pay for fuel for State of Alaska fixed-wing aircraft used during the monitoring of collared study animals and the observation of uncollared moose in May and June 2002. Funds were also used to pay for lodging of survey crews and salary for Alaska Department of Fish and Game employees.

### **JOB 1E: Snow surveys.**

This job was not accomplished during the reporting period. No Federal Aid funds were used for snow surveys. Funds allocated for this job were used to help pay for the 2002 calf capture project.

### **JOB 2: Browse surveys and habitat mapping.**

This job was not accomplished during the reporting period. No Federal Aid funds were used for browse surveys and habitat mapping. Funds that were allocated for this job were used to help pay for the 2002 calf capture project.

**JOB 3A: Wolf population estimation.**

This job was not accomplished during the reporting period. No Federal Aid funds were used for wolf population estimation. Funds that were allocated for this job were used to help pay for the 2002 calf capture project.

**JOB 3B: Wolf carcass collection and necropsy.**

This job was accomplished during the reporting period. Federal Aid funds were used to pay trappers and hunters for carcasses they brought in during winter 2001–2002, and salary for Alaska Department of Fish and Game employees.

**JOB 4: DNA analysis of hair samples.**

Currently hair samples are at a lab for analysis and were not completed by the end of this period. Funds from this reporting period were redirected to the calf capture project. Funds will come from the 2003 fiscal budget to pay for the 2002 samples.

**JOB 5: Literature review, data analysis, report writing.**

This job was accomplished during the reporting period. Federal Aid funds were used to provide salary for people working on literature review, data analysis, and report writing.

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

None.

**IV PUBLICATIONS**

None.

**V RECOMMENDATIONS FOR THIS PROJECT**

This project was initially set up as part of an adaptive management plan that was based upon continual changing of methods and goals as determined to be necessary by the public, Alaska Department of Fish and Game, and other stakeholders. We recommend this project continue to be flexible in the study design and protocol as more information is gathered and circumstances change.

**VI APPENDIX**

**LITERATURE CITED**

BERTRAM MR AND MT VIVION. 2002. Moose mortality in eastern interior Alaska. *Journal of Wildlife Management* 6:747–756.

OSBORNE TO, TF PARAGI, JL BODKIN, AJ LORANGER, AND WN JOHNSON. 1991. Extent, cause, and timing of moose calf mortality in western Interior Alaska. *Alces* 27:24–30.

**VII PROJECT COSTS FOR THIS SEGMENT PERIOD**

FEDERAL AID SHARE \$169.5 + STATE SHARE \$56.5 = TOTAL \$226.0

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