

**Alaska Department of Fish and Game
Division of Wildlife Conservation
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Distribution, movements, and survival of muskoxen in northeastern Alaska

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**Research Annual Performance Report
1 July 2007–30 June 2008
Federal Aid in Wildlife Restoration
W-33-6
Study 16.10**

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FEDERAL AID ANNUAL RESEARCH PERFORMANCE REPORT

ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF WILDLIFE CONSERVATION
PO Box 115526
Juneau, AK 99811-5526

PROJECT TITLE: Distribution, movements, and survival of muskoxen in northeastern Alaska

PRINCIPAL INVESTIGATOR: Stephen M. Arthur

COOPERATORS: None

FEDERAL AID GRANT PROGRAM: Wildlife Restoration

GRANT AND SEGMENT NO. W-33-6

PROJECT NO. 16.10

WORK LOCATION: Central North Slope

STATE: Alaska

PERIOD: 1 July 2007–30 June 2008

I. PROGRESS ON PROJECT OBJECTIVES SINCE PROJECT INCEPTION

OBJECTIVE 1: Estimate annual birth rates for muskox cows.

Twenty radiocollared muskox cows were monitored during 2007 and 27 were monitored during 2008. All known muskox groups were classified according to age and sex during early April each year. Muskox groups were observed repeatedly during April and May to detect births of calves. In addition, blood samples were obtained from 5 muskox captured in late March 2007 to determine pregnancy based on serum progesterone levels.

OBJECTIVE 2: Estimate annual calf recruitment through late June.

Calf production was assessed by aerial radiotracking muskox groups during April and May and with ground-based age/sex composition surveys conducted in June 2007 and 2008.

OBJECTIVE 3: Determine rates and causes of mortality of muskox during April–June.

Muskox groups were observed by aerial radiotracking approximately weekly during April–mid June 2007 and several times per week during mid April–late May 2008. Muskox calves died due to suspected bear predation, disease, and unknown perinatal causes. Bear predation of adult muskoxen was common; other deaths were due to disease, accidents, and malnutrition.

OBJECTIVE 4: Evaluate relative importance of mortality of adult cows vs. calves.

Population size and age-specific mortality rates were estimated during 2007 and 2008. These estimates will be used to model the muskox population.

OBJECTIVE 5: Monitor movements of muskox to evaluate habitat use and range fidelity.

Muskox locations were recorded during radiotracking flights. GPS collars were not utilized as originally planned, because funding for this work was not available.

OBJECTIVE 6: Determine effective methods for monitoring muskox abundance using aerial surveys.

Muskox movements and distribution were assessed by radiotracking collared animals during April–September. These data will be used to determine the most appropriate seasons and design for aerial surveys.

OBJECTIVE 7: Analyze and publish results.

No activity during this period.

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

JOB/ACTIVITY 1A: Estimate annual birth rates for muskox cows.

Two adult muskox cows were captured and radiocollared during July 2007 by management staff from Region 5, and 10 adult cows were captured during October 2007. Including animals collared during previous years, a total of 27 muskoxen were monitored during this period. No muskox died as a direct result of capture activities, but 2 radiocollared cows apparently died after falling through newly-formed ice within a few days after they were captured in October. One additional radiocollared adult cow that was not captured this year also died after falling through ice at approximately the same time. Muskox were counted and classified according to age and sex during October 2007 and April and June 2008. Sixty-eight adult cows were counted in April 2008 and 83 were counted during June (including 8 from a group that was not included in the Apr count). Repeated observations of muskox groups during spring indicated that at least 57 calves were born, and minimum estimated parturition rate was 69%.

JOB/ACTIVITY 2A: Estimate annual calf recruitment through late June.

The number of calves was assessed by aerial radiotracking muskox groups and with a ground-based age/sex composition survey conducted in late June. At this time, 39 calves were present, representing 68% of the minimum estimated number of births.

JOB/ACTIVITY 3A: Determine rates and causes of mortality of muskox during April–June.

Muskox groups were observed by aerial radiotracking approximately daily (weather dependent) during mid April–late May and the numbers of adults and calves were recorded on each trip. The first calves were observed on 18 April and the last births occurred around 27 June. Six newborn calves died from causes other than predation: one calf from septic peritonitis; one calf was euthanized and found to have severe arthritic infections of the leg joints after it was observed to be unable to stand; and cause of death could not be determined for 4 calves that were observed dead soon after birth. Two calves were abandoned and likely died after a grizzly bear disturbed their group and killed 3 adult cows. Eleven other calves disappeared during periods when bears were present near the groups. During April and May, at least 11 adult cows were killed by grizzly bears. One young bull was found dead with both bear and snowmachine tracks nearby, but

cause of death could not be determined and it had not been fed on by a predator. One adult cow died from starvation, 1 mature bull died from an unknown systemic infection, and 9 other adults disappeared from known groups, but their fates could not be determined.

JOB/ACTIVITY 4A: Evaluate relative importance of mortality of adult cows vs. calves.

Survival and productivity data were collected for use in future population models.

JOB/ACTIVITY 5A: Monitor movements of muskox to evaluate habitat use and range fidelity.

Muskox locations were recorded during radiotracking flights. GPS collars were not utilized as originally planned, because funding for this work was not obtained.

JOB/ACTIVITY 6A: Determine effective methods for monitoring muskox abundance using aerial surveys.

Aerial radiotracking data on distribution and movements of muskox groups were collected for use in determining the most effective design and timing for aerial surveys.

JOB/ACTIVITY 7A: Analyze and publish results.

No activity during this period.

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

Blood and tissue samples from captured muskox and from carcasses of muskox that died were analyzed for occurrence of various pathogens and concentrations of trace minerals. Pathogens found or suspected include *Chlamidiophila*, *Pasturella trehalosi*, *Brucella*, parapox virus, parainfluenza 3, and bovine viral diarrhea. In addition, serum and liver concentrations of copper and selenium were found to be low in comparison to levels recommended for domestic livestock and captive muskox.

IV. PUBLICATIONS

None.

V. RECOMMENDATIONS FOR THIS PROJECT

Additional monitoring of radiocollared muskox and the collection of blood and tissue samples for disease and nutritional analyses are needed to ascertain the relative importance of disease, nutrition, and predation as potential causes of the declining muskox population in Units 26B and 26C. A comparison of trace nutrient content of preferred forage plants between ranges of this population and others that are not declining would be useful in evaluating the importance of forage quality to muskox population dynamics.

VI. APPENDIX

None.

Project No. 16.10 – Muskox
FY08 Annual Performance Report

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