

# FEDERAL AID ANNUAL RESEARCH PERFORMANCE REPORT

ALASKA DEPARTMENT OF FISH AND GAME  
DIVISION OF WILDLIFE CONSERVATION  
PO Box 115526  
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**PROJECT TITLE:** Distribution, movements, and survival of muskoxen in northeastern Alaska

**PRINCIPAL INVESTIGATORS:** Stephen M. Arthur and Patricia A. Del Vecchio

**FEDERAL AID GRANT PROGRAM:** Wildlife Restoration

**GRANT AND SEGMENT NO.** W-33-7

**PROJECT NO.** 16.10

**WORK LOCATION:** Central North Slope, Unit 26B

**STATE:** Alaska

**PERIOD:** 1 July 2008 – 30 June 2009

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## 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, 27 during 2008, and 20 during 2009. 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 muskoxen 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 groups of muskoxen during April and May and with ground-based age/sex composition surveys conducted in June and October 2007 and 2008.

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

Groups of muskoxen were observed by aerial radiotracking approximately weekly during April–mid June 2007 and several times per week during mid April–late May 2008 and 2009. 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 each year. 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.

Annual progress reports were prepared.

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

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

The number of calves present was assessed by aerial radiotracking muskox groups during summer and with a ground-based age/sex composition survey conducted in early October 2008. At this time, 37 calves were present, representing 65% of the minimum estimated number of births.

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

Muskox groups were observed by aerial radiotracking at 2-week intervals during July–early October. No muskox deaths were recorded during this period.

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.

Annual progress reports were prepared, and a presentation was made at the April 2009 annual meeting of the Alaska Chapter of *The Wildlife Society*.

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

Calf production and survival were estimated during spring 2009 (jobs 1a and 2a). 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. Fifty-four births were documented. The first calf was observed on

24 April and the last newborn calf was observed on 23 June. Nine calves disappeared during periods when bears were present near the groups and 45 (83%) survived through late June. During April and May, at least 5 adult cows died: 4 were killed by grizzly bears and 1 drowned after falling through thin ice during a bear attack on the muskox group. Fourteen other adults disappeared from known groups, but their fates could not be determined. Most of these are expected to rejoin the known groups during summer 2009.

A population estimate and age/sex classification survey was conducted in April 2009 (job 1a). One hundred ninety-six muskoxen (164 adults and 32 yearlings) were counted.

Samples of muskox forage plants and soils were collected at 34 sites known to be used by radiocollared muskoxen either currently or in the recent past (based on radiotracking data collected by ADF&G and the U.S. Fish and Wildlife Service). These samples were sent to the University of Alaska Agricultural Experiment Station in Palmer, Alaska, for analysis of trace mineral content. These results will be compared to nutrient recommendations established for domestic livestock and captive muskoxen.

#### **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 – Muskoxen  
FY09 Annual Performance Report

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