

**Alaska Department of Fish and Game
Wildlife Restoration Grant**

GRANT NUMBER: W-33-8

PROJECT NUMBER: 16.10

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

PROJECT DURATION: 1 July 2006–30 June 2013

REPORT PERIOD: 1 July 2009–30 June 2010

REPORT DUE TO HQ: 1 September 2010

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

WORK LOCATION: Central North Slope, Unit 26B

COOPERATOR: Patricia Reynolds (FWS-Arctic National Wildlife Refuge)

I. PROBLEM OR NEED THAT PROMPTED THIS RESEARCH

From 1999 to 2006, the population of muskoxen (*Ovibos moschatus*) in northeastern Alaska declined from 650 to approximately 200 animals. The decline was especially severe in Unit 26C (Arctic coastal plain between the Canning River and the Canadian border), and somewhat less in Unit 26B (between the Colville and Canning rivers). Causes for the decline are unknown, although predation by grizzly bears was prevalent. Understanding the causes of this decline is needed so as to determine appropriate management actions and to assess the likelihood that similar declines might occur in other parts of the state.

II. REVIEW OF PRIOR RESEARCH AND STUDIES IN PROGRESS ON THE PROBLEM OR NEED

Muskoxen occupy a limited range of habitat types, have a low rate of reproduction compared to many other ungulates, and are vulnerable to excessive mortality due to harvest by humans or predation. Thus, the species is susceptible to extreme fluctuations in abundance and was once extirpated from much of its range (Klein 2000). Considerable effort and funds were expended during the 1960s and 1970s to reestablish muskoxen in northeastern Alaska (Lent 1998). This population increased to a peak of approximately 800 muskoxen in 1995, including approximately 150 muskoxen that dispersed eastward into northern Yukon, Canada. Predation on muskoxen by grizzly bears (*Ursus arctos*) was prevalent in the northeastern Alaska population during the 1980s and 1990s (Reynolds et al. 2002). In addition, muskox blood and tissue samples collected during 2006 and 2007 indicated a high prevalence of a variety of infectious pathogens, including *Chlamydia*, *Pasteurella trehalosi* (pneumonia), Bovine Viral Diarrhea, contagious

ecthyma, and polyarthritic joint problems (indicative of disease). During the period when the northeastern Alaska population declined, increasing trends were documented for muskox populations on the Seward Peninsula and Nunivak Island, both in western Alaska (Alaska Department of Fish and Game 2005). A smaller muskox population near Cape Krusenstern, in northwestern Alaska, was stable during this period. A cooperative research project involving the National Park Service, U.S. Geological Survey, and Wildlife Conservation Society is currently underway to identify factors limiting growth of the northwestern Alaska population.

III. APPROACHES USED AND FINDINGS RELATED TO THE OBJECTIVES AND TO PROBLEM OR NEED

This study will assess calf production, age-specific survival rates, causes of mortality, and nutritional status of muskoxen from northeast Alaska.

IV. MANAGEMENT IMPLICATIONS

None.

V. SUMMARY OF WORK COMPLETED ON JOBS FOR LAST SEGMENT PERIOD ONLY

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

Accomplishments: We estimated the number of adult cows by counting and classifying muskoxen from all known groups on 15 and 16 April 2010. At that time, there were 88 cows aged 3 years or older. The number of births was estimated by weekly aerial observations of muskox groups between mid-April and the end of June. We observed 51 newborn calves, for a minimum estimated birthrate of 58%.

JOB/ACTIVITY 2: Estimate annual calf recruitment through October

Accomplishments: We assessed the number of calves present by aerial radiotracking and observing muskox groups approximately twice per month during July–September, 2009. During early October 2009, 43 calves were present, representing 77% of the minimum estimated number of births for that year.

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

Accomplishments: Muskox groups were observed by aerial radiotracking at 2-week intervals during July–early October 2009 and weekly during April–June 2010. No muskox deaths were recorded during summer 2009, although 7 calves disappeared and were presumed to have died during that period. One calf that was born during late summer 2009 was found dead (apparently of starvation) during March 2010. Weekly flights during April–June 2010 detected deaths of 17 adults (≥ 1 year old) and 4 newborn calves. An additional 19 calves born in 2010 disappeared and were presumed dead by the end of June 2010.

JOB/ACTIVITY 7: Assess prevalence of major diseases and parasites in muskoxen in each population

Accomplishments: Carcasses of dead muskoxen were examined and tissue samples were obtained for pathology tests.

JOB/ACTIVITY 9: Assess nutritional status of muskoxen in each area

Accomplishments: Muskox fecal and urine samples were obtained from 5 sites during April 2010. These samples will be analyzed for nutritional content by agreement with the University of Alaska Fairbanks.

JOB/ACTIVITY 11: Analyze and publish results

Accomplishments: Annual progress reports were prepared, and presentations were made at the February 2010 annual meeting of the Alaska chapter of *The Wildlife Society* and the March 2010 meeting of the Alaska Board of Game.

VI. PUBLICATIONS

None.

Literature Cited:

ALASKA DEPARTMENT OF FISH AND GAME. 2005. Muskox management report of survey and inventory activities 1 July 2002–30 June 2004. C. Brown, editor. Project 16.0. Juneau, Alaska, USA.

KLEIN, D. R. 2000. The muskox. Pages 545–558 in P. R. Krausman and S. Demarais, editors. Ecology and management of large mammals in North America. Prentice–Hall, Upper Saddle River, New Jersey, USA.

LENT, P. C. 1998. Alaska's indigenous muskoxen: A history. *Rangifer* 18:133–144.

REYNOLDS, P. E., H. V. REYNOLDS, AND R. T. SHIDELER. 2002. Predation and multiple kills of muskoxen by grizzly bears. *Ursus* 13:79–84.

VII. RECOMMENDATIONS FOR THIS PROJECT

Fieldwork is continuing.

Prepared by: Stephen M. Arthur and Patricia A. Del Vecchio

Date: 20 August 2010