

**FEDERAL AID  
ANNUAL PERFORMANCE REPORT**

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

**MUSK OX  
ANNUAL SURVEY AND INVENTORY**

**STATE:** Alaska

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

**PROJECT NO.** 16.0

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

**PROJECT LOCATION:** Statewide

**PROJECT TITLE:** The Status of Musk Oxen and Factors Influencing Their Populations

**REPORT DESCRIPTION:** This performance report describes musk ox survey and inventory activities. Regionwide activities are listed before specific activities by game management unit.

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**The Status of Musk Ox  
and Factors Influencing Their Populations in Region III**

**Regionwide Activities:**

ACTIVITY 1: Prepare a muskox management report.

Prepared muskox management reports.

ACTIVITY 2: Monitor harvest and analyze harvest data

Did not monitor harvest because the season was closed.

ACTIVITY 3: Monitor natural mortality and analyze natural mortality data.

Research project monitored natural mortality and analyzed and shared data.

ACTIVITY 4: Provide muskox management information to State and Federal regulatory processes.

Provided information to 2 State fish and game advisory committees, the Alaska Board of Game, and 2 Federal regional advisory councils.

**Activities by Unit:**

**Unit 26B and 26C**

ACTIVITY 1: Determine distribution and percent calves in Unit 26B during June.

Determined distribution of muskox groups in Unit 26B during June via radiotracking flights; and determined percent calves in June 2009 (27.5%).

ACTIVITY 2: Review information obtained by the U.S. Fish and Wildlife Service (FWS) on population size, and sex and age composition in Unit 26C, and on movements of radio-collared animals.

Worked with USFWS staff to monitor Unit 26C muskoxen.

ACTIVITY 3: Capture approximately 5 muskox to deploy radiocollars and maintain an adequate sample size of collared animals for surveys

Conducted no capture because adequate number of radiocollars already deployed.

**Submitted by:** Roy A. Nowlin, Region III Management Coordinator

### **The Status of Musk Ox and Factors Influencing Their Populations in Region V**

#### **Regionwide Activities:**

ACTIVITY 1: Prepare biennial regional musk ox management reports.

A muskox management report was prepared during this reporting period.

ACTIVITY 1: Provide information to State and Federal regulatory processes on musk ox management.

Area management staff reviewed State and Federal regulatory proposals, attended regulatory process meetings, and presented musk ox information to the State Board of Game, State Fish and Game Advisory Committees, Federal Subsistence Board, and Federal Subsistence Regional Advisory Councils.

#### **Unit 18:**

ACTIVITY 1: Conduct annual aerial censuses of the Nunivak and Nelson Island populations to estimate population size and determine age-sex composition.

In June 2009 we counted 541 musk ox on Nelson Island. These censuses were flown using a fixed-winged aircraft so the animals were classified as bulls, cows, 2-year-olds or calves. Due to poor weather and lack of aircraft availability no survey was completed of Nunivak Island during the reporting period.

ACTIVITY 2: Monitor the population size, distribution, and dispersal of musk ox onto the mainland through harvest reporting, contacts with the public, and field observations.

We flew a survey on the Ingaksluguat Hills and Kulzivak Mountain in April of 2009. This is north and a little east of Nelson Island.

ACTIVITY 3: Monitor hunting and other mortality factors through harvest reporting, contacts with the public, and field observations.

Thirty-two musk ox were harvested on Nelson Island during the report period; 22 were bulls and 10 were cows. Seventy-six musk ox were harvested on Nunivak Island during this period; 38 bulls and 38 cows.

ACTIVITY 4: Work with local Advisory Committees, village representatives, and other agencies to promote the establishment of a huntable musk ox population on the mainland.

We discussed musk ox at the Lower Kuskokwim, Central Bering Sea and Lower Yukon Advisory committee meetings.

ACTIVITY 5: Work with local residents to rescue stranded muskoxen as needed and reduce kills of nuisance animals.

No work was completed toward this activity during this reporting period because the discussion on stranded musk ox was not brought up during the meetings.

ACTIVITY 6: Continue to develop and utilize the ongoing cooperative musk ox management plans (such as the *Nelson Island Musk ox Herd Cooperative Management Plan*) in cooperation with the public and other agencies.

Except for Advisory Committee meetings, we did not hold any public meetings where musk ox were discussed during the reporting period.

**Units 22 and 23SW (the portion of Unit 23 west of and including the Buckland River drainage):**

ACTIVITY 1: Census muskox and evaluate population sex/age composition at least once every 3 years (next census scheduled for 2010).

This activity is next scheduled in 2010 and no work toward this activity was completed during the reporting period. The previous census, completed in 2007, found 2688 muskox in Unit 22 and Unit 23SW.

ACTIVITY 2: Conduct on-ground age/sex composition surveys during March and April to determine population structure and yearling recruitment in selected portions of the Seward Peninsula.

In March and April 2009 we used an R-44 helicopter to conduct an age/sex composition survey in Units 22B and 22C. We observed 176 muskoxen in Unit 22B and classified 27 bulls 4-years-old or older (15%), 15 3-year-old bulls (9%), 8 2-year-old bulls (5%), 54 cows 4-years-old or older (31%), 25 3-year-old cows (14%), 13 2-year-old cows (7%), 22 yearlings (13%) and 2 muskoxen were unclassified (1.0%). We observed 348 muskoxen in Unit 22C and classified 56 bulls 4-years-old or older (16%), 31 3-year-old bulls (9%), 19 2-year-old bulls (5%), 109 cows 4-years-old or older (31%), 53 3-year-old cows (15%), 33 2-year-old cows (9%), 31 yearlings (9%) and 13 muskoxen were unclassified (4.0%).

Also, we used an R-44 helicopter to conduct an age/sex composition survey in Units 22E and 23 Southwest during additional time periods (August 2008 and June 2009), with the following results:

August 2008. We observed 199 muskoxen in Unit 22E and classified 37 bulls 4-years-old or older (19%), 13 3-year-old bulls (7%), 9 2-year-old bulls (5%), 59 cows 4-years-old or older (30%), 14 3-year-old cows (7%), 12 2-year-old cows (6%), 19 yearlings (10%), 35 calves (18%), and 1 muskoxen were unclassified (1.0%). We observed 141 muskoxen in Unit 23Southwest and classified 19 bulls 4-years-old or older (13%), 8 3-year-old bulls (6%), 7 2-year-old bulls (5%), 52 cows 4-years-old or older (37%), 8 3-year-old cows (6%), 8 2-year-old cows (6%), 16 yearlings (11%), 20 calves (14%) and 3 muskoxen were unclassified (2.0%).

June 2009. We observed 117 muskox in Unit 23 SW and classified 12 mature bulls (10%), 7 3 year-old bulls(6%), 5 2 year old males(4%), 42 mature cows(36%), 12 3 year old females(10%), 5 2 year old females(4%), 15 yearlings(13%), and 19 calves(16%).

ACTIVITY 3: Capture, collect samples, and radiocollar female muskoxen in Units 22B, 22C, and 22D to determine body condition and disease profiles and to determine seasonal movements of mixed sex-age groups. Up to 5 females will be captured and collared in November.

In October 2008 staff placed 9 VHF collars on adult cows in Unit 22B, Unit 22C, and Unit 22D to expand the sample size of collared animals in Unit 22. Previously, 15 VHF collars were deployed on adult cows in March 2008. During the collaring operation, staff used a PA-12 aircraft to locate muskoxen groups and then used Robinson R-44 based chemical immobilization to capture muskoxen. There were no capture mortalities during collaring activities.

Seasonal movements of collared muskoxen have been monitored using biweekly fixed-wing aircraft telemetry flights beginning in April 2008, however several flights were missed due to poor flying weather common along the southern Seward Peninsula coast. During winter, collar locations were associated with wind swept ridge-tops free of deep snow. After snow-melt and during calving, muskoxen were observed at down-slope locations in proximity to lush, and more fertile, river bottoms where browse included grasses and willows exposed from melting snow and ice. Initial movements during the reporting period were minimal and generally consisted of muskoxen moving to side slopes and river bottoms within several miles of their winter habitat, but telemetry flights completed outside the reporting period found radiocollared muskoxen increased their movements throughout the summer. An adult cow collared near Venetia Creek in the Eldorado River drainage during March 2008 was observed on a ridge-top between the Casadepaga River and Niukluk River drainages in October 2008, approximately 22 miles east of the original capture location. A second adult cow collared during March 2008 near Council, Alaska (Niukluk River drainage) was observed approximately 35 miles to the north in the upper Kuzitrin River in Unit 22D near the lava beds during an August 2008 telemetry flight. The remaining collars stayed within 15 miles of their capture site. These movements support census results that suggest muskoxen groups make annual movements between subunits and managers should consider a broader based geographical approach to hunt management if human harvest patterns allow.

Three collared adult females died between April 2008 and April 2009, and no collars failed or were missing during the radio-tracking interval. The 13% annual mortality rate 90% C.L. (4.7% to 37.67% n=18) annual adult mortality rate is likely conservative from the perspective of the population as a whole as adult females are likely to have a higher survival rate than any other age-sex grouping. This small sample of collared muskoxen represents less than 1% of the Seward Peninsula population as of 2007, and is not randomly distributed throughout the population, so localized events such as icing, or different predator regimes may preclude the use of this mortality rate as representative of the entire population. Lastly, the selection of animals for capture is not truly random, as obviously injured or diseased animals were intentionally not selected.

Blood, fecal, and hair samples were collected from nine Seward Peninsula muskoxen during October 2008 capture work and tested for presence of minerals, parasites, and disease. Results show the Seward Peninsula muskoxen population tested negative for

zoonotic diseases and is a healthy population and subsistence resource. Samples tested negative for Toxoplasma, Neospora, Giardia, and Cryptosporida which can decrease reproduction in muskox populations. All muskoxen tested negative for Mycoplasma, a type of pneumonia and Coxiella which can have negative reproductive effects. Muskox serum were tested for copper levels and results found levels between 0.78 ppm- 1.11ppm ( $\bar{x}=0.95$  ppm), which suggest the potential for copper deficiency exists. However, Seward Peninsula muskoxen tested negative for additional trace elements (iron, zinc, selenium) present in other Alaskan muskox populations adversely impacted by trace element deficiencies. Results from all testing did not find disease exposure or parasite prevalence that indicates Seward Peninsula muskoxen health is at risk; however, disease surveillance should continue to monitor population health.

ACTIVITY 4: Participate in Seward Peninsula Muskox Cooperators Group meetings and facilitate exchange of information and ideas between agencies and user groups.

The Seward Peninsula Muskox Cooperators Group have not met since January 2008. Information related to on-going hunt management has been made available to the Cooperators Group (through the Chair) and another meeting will likely occur in the future.

ACTIVITY 5: Monitor hunting and other mortality factors through harvest reporting, contacts with the public, and field observations.

Hunting was by Tier I subsistence permits in Units 22B, 22C, 22D, 22E, and 23SW. We monitored Tier I hunts and success rates of permittees, as follows: 40% success in Unit 22B (8 of 20 permits); 33% in Unit 22C (33 of 100 permits), 26% in Unit 22D (24 of 91 permits); 41% in Unit 22E (19 of 46 permits); and, 32% in Unit 23SW (16 of 50 permits). Monitoring of hunts and harvest quotas were coordinated (in applicable hunt areas) with federal staff administering federal subsistence hunts on federal public lands. Total harvests reached 56% of quota in Unit 22B, 94% of quota in Unit 22C, 80% of quota in Unit 22D, 32% of quota in Unit 22E, and 89% of quota in Unit 23SW.

Drawing hunts were administered in Units 22C, 22D, 22E, and 23SW and success rates were determined, as follows: 50% success in Unit 22C (1 of 2 permits); 71% in Unit 22D (5 of 7 permits); 75% in Unit 22E (15 of 20 permits), and 0% in Unit 23 SW (0 of 2 permits).

ACTIVITY 6: Collect tooth samples from harvested musk ox to help determine age-structure of harvested animals.

In Unit 23 SW, we collected tooth samples to add to our understanding of the age structure of harvested animals. Teeth have been sent to Matson's Lab and tooth-age results have not been received.

ACTIVITY 7: Work with local reindeer herders to identify and minimize conflicts between reindeer and muskoxen in an effort to conserve muskoxen and allow for population growth and expansion.

Activities related to reindeer herding occurred in Units 22 and 23SW. Nome staff provided information for the annual Reindeer Herders Association meeting.

ACTIVITY 8: Encourage cooperation and sharing of information among agencies and users of the resource in developing and executing management and research programs.

Nome staff works closely with BLM and NPS staff to coordinate management activities. Staff attended Seward Peninsula Regional Advisory meetings and reported on muskox population status and hunt administration.

**ACTIVITY 9:** Provide hunter orientation materials for registration and drawing permit musk ox hunters in Units 22/23SW.

Department staff used in-person and telephone interviews and web-based orientation information on the ADF&G website to provide hunters and the public with muskox identification, sex and age classification and hunting information.

**ACTIVITY 10:** Investigate causes of declining recruitment in portions of the Seward Peninsula using calving surveys and analysis of Nitrogen from urine samples collected from winter range in Unit 22.

No calving surveys were conducted during this reporting period. No urine and fecal samples were collected from muskox groups on winter range during composition surveys. Analyses of previous data collections are on-going.

### **Units 23NW and 26A:**

**ACTIVITY 1:** Census muskox and evaluate population sex/age composition at least once every 3 years in Unit 23NW.

We were unable to complete a census on the Cape Thompson muskox population due to extremely unfavorable winter weather. The next scheduled survey will be early 2010.

**ACTIVITY 2:** Census and conduct muskox composition surveys annually in eastern Unit 26A (ANWR population).

Biologists from the Fairbanks ADFG office are conducting a study of total numbers, mortality, composition, and health assessment of the ANWR population. There was a fairly high level of calf and adult mortality due of bear predation and other causes. There was a high level of disease among the animals that were sampled. In Unit 26A there are a small and varying number of groups along the Colville River and a group of 13 adults and 3 calves northwest of Teshekpuk Lake in 2009.

**ACTIVITY 3:** Conduct muskox distribution surveys periodically (every 2-3 years) in selected portions of Unit 26A to document range expansion of the population.

We surveyed the eastern portion of Unit 26A and looked for muskoxen in the western section during moose and caribou surveys. Approximately 52 adult and 11 calf muskoxen were found during caribou and moose surveys in June/July 2008 in the south-western region of Unit 26A, indicating an eastward expansion of the Cape Thompson Population into Unit 26A.

**ACTIVITY 4:** Capture muskox in Unit 26A to attach satellite, GPS, or conventional radiocollars. Up to 2 muskox will be captured in Unit 26A in 2008-2009.

As part of the study being conducted out of the Fairbanks office, several muskoxen were captured and VHF radiocollars were attached in March in Unit 26A and Unit 26B. We monitored the radiocollared muskoxen in the group found NW of Teshekpuk Lake (formerly known as the Fish Creek group).

ACTIVITY 5: Monitor hunting and other mortality factors through harvest reporting, contacts with the public, and field observations.

*Unit 23:* Six Tier II muskoxen (TX107) permits were issued during the reporting period and 6 hunters reported hunting; 5 hunters each took a bull muskox.

*Unit 26A:* All muskox hunts were closed in 2006 in Units 26A and 26B due to declining numbers and remained closed during 2009.

ACTIVITY 6: Use public education to improve understanding of the conservation value of hunting regulations and obtain better harvest data through increased harvest reporting.

We talked to students, hunters and other individuals regarding hunting, wildlife management, and conservation of muskoxen in Units 23 and 26A.

In Unit 23, department staff taught a two day class on muskox research and management to high school biology students.

ACTIVITY 7: Encourage cooperation and information exchange among agencies and muskox user groups to develop and implement management objectives.

*Unit 23:* ADF&G and NPS planned and scheduled cooperative composition surveys for August 2009 (next reporting period). ADF&G also provided data from the February 2008 census (previous reporting period) to NPS to facilitate exchange of population information.

*Unit 26A:* We assisted staff from ADF&G Region 3 to conduct the muskox study in Units 26A and 26B. We worked with the North Slope Muskox Working Group to make recommendations for management decisions.

ACTIVITY 8: Record sightings of muskoxen to monitor range use and expansion.

Numerous observations of muskoxen, including latitude and longitude as well as group size, were recorded during wildlife surveys and other activities in Units 23 and 26A.

Widely scattered mixed sex/age groups of muskox observed far from their 'core' range suggest muskox are slowly expanding into previously unused range.

ACTIVITY 9: Evaluate whether musk ox population growth will adversely affect resident reindeer and caribou populations.

In both Units 23 and 26A we noted and photographed several instances of caribou and muskoxen grazing peacefully in close proximity to each other. We noted reports by local residents of muskoxen displacing caribou.

**Submitted by:** Peter Bente, Survey and Inventory Coordinator, Region V