

**FEDERAL AID  
ANNUAL PERFORMANCE REPORT**

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

**MUSKOXEN  
ANNUAL SURVEY AND INVENTORY**

**STATE:** Alaska

**GRANT AND SEGMENT NO.** W-33-9

**PROJECT NO.** 16.0

**PERIOD:** July 1, 2010 – June 30, 2011

**PROJECT LOCATION:** Statewide (Region III and V)

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

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**Region III**

**Regionwide Activities:**

ACTIVITY 1: Monitor harvest and analyze harvest data

Did not monitor harvest because the season was closed.

ACTIVITY 2: Monitor natural mortality and analyze natural mortality data.

Research project monitored natural mortality and analyzed and shared data.

ACTIVITY 3: 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.

ACTIVITY 4: Prepare a muskox management report.

Prepared a muskox management report.

**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 preliminary percent calves in June (17%).

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.

No muskoxen were in Unit 26C during the report period.

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

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Captured 2 adult females in March 2011 with no mortalities and classified 171 muskoxen in April 2011, resulting in 32 bulls > 3 years old:100 cows > 2 years old and 37 yearlings:100 cows > 2 years old.

ACTIVITY 4: Conduct a census.

In cooperation with research project, estimated population of approximately 190 animals.

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

**Region V**

**Regionwide Activities:**

ACTIVITY 1: Prepare biennial regional muskox management reports.

A muskox management report was prepared during this reporting period.

ACTIVITY 2: Provide information to State and Federal regulatory processes on muskox management.

Area management staff reviewed State and Federal regulatory proposals, attended regulatory process meetings, and presented muskox 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 July 2010, we counted 517 musk ox on Nunivak Island using fixed-wing aircraft. In September 2010, we counted 561 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.

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

We talked with residents, local pilots and USFWS personnel about incidental sightings of muskox on the mainland in the winters of 2010 and 2011. A minimum count of 89 was established on Unit 18 mainland.

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

Thirty-six muskox were harvested on Nelson Island during the report period; 21 were bulls and 15 were cows. Sixty-seven musk ox were harvested on Nunivak Island during this period; 47 bulls and 20 cows.

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

We discussed muskox at the Lower Kuskokwim 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 muskox was not brought up during the meetings.

ACTIVITY 6: Capture, collect samples, and radiocollar female muskoxen in Unit 18 to determine body condition and disease profiles and to determine seasonal movements of mixed sex-age groups. Up to 10 animals will be captured and collared in March and April.

No capture work was conducted during this reporting period due to lack of availability of capture aircraft (R44 helicopter).

ACTIVITY 7: Continue to develop and utilize the ongoing cooperative muskox management plans (such as the *Nelson Island Muskox Herd Cooperative Management Plan*) in cooperation with the public and other agencies.

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

**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 2 years (next census scheduled for 2010).

The next census is scheduled for February/March of 2012. Results from the February/March 2010 census were reported in the last report.

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

In March and April 2011, we used an R-44 helicopter to conduct an age/sex composition survey in Units 22C, 22D, 22E, and 23SW. We observed 319 muskoxen in Unit 22C and classified 34 bulls 4-years-old or older (11%), 8 3-year-old bulls (3%), 27 2-year-old bulls (8%), 120 cows 4-years-old or older (38%), 45 3-year-old cows (14%), 28 2-year-old cows (9%), 53 yearlings (17%) and 4 muskoxen were unclassified (1%). We observed 467 muskoxen in Unit 22D and classified 72 bulls 4-years-old or older (15%), 20 3-year-old bulls (4%), 28 2-year-old bulls (6%), 190 cows 4-years-old or older (41%), 59 3-year-old cows (13%), 27 2-year-old cows (6%), 60 yearlings (13%) and 11 muskoxen were unclassified (2.0%). We observed 375 muskoxen in Unit 22E and classified 72 bulls 4-years-old or older (19%), 21 3-year-old bulls (6%), 23 2-year-old bulls (6%), 95 cows 4-years-old or older (25%), 40 3-year-old cows (11%), 41 2-year-old cows (11%), 79 yearlings (21%) and 4 muskoxen were unclassified (1.0%). We observed 127 muskoxen in Unit 23SW and classified 17 bulls 4-years-old or older (11%), 4 3-year-old bulls (3%), 5 2-year-old bulls (3%), 61 cows 4-years-old or older (42%), 17 3-year-old cows (18%), 9 2-year-old cows (8%), 8 yearlings (11%) and 6 muskoxen were unclassified (3.0%).

Also, we used an R-44 helicopter to conduct an age/sex composition survey in Units 22E during an additional time periods (August 2010), with the following results:

August 2010. We observed 182 muskoxen in Unit 22E and classified 18 bulls 4-years-old or older (10%), 7 3-year-old bulls (4%), 12 2-year-old bulls (7%), 51 cows 4-years-old or older (28%), 16 3-year-old cows (9%), 11 2-year-old cows (6%), 29 yearlings (16%), 38 calves (21%), and 0 muskoxen were unclassified (0.0%).

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 10 animals will be captured and collared in March and April.

Twelve muskoxen were captured during the April 2011 and fitted with VHF radio collars. Seasonal movements of previously collared muskoxen were monitored using biweekly fixed-wing aircraft telemetry flights; 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. Telemetry flights found that radiocollared muskoxen increased their movements throughout the summer as collared muskoxen moved seasonally between Units 22DSW, 22C, 22B, and 22D Remainder. 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. Four adult female muskox died during the 2010 calendar year, and no collars failed or were missing during the radio-tracking interval yielding an estimated 23% annual mortality rate 95% C.L. (7.82% to 45.37% n=22). This is the highest mortality rate found since the collaring project began in 2008 when we found 9% annual mortality or in 2009 when we found 4% annual mortality. Mortality estimates of adults are likely conservative from the perspective of the population because the collared cohort, adult females, is likely to have 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 2010, 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.

ACTIVITY 4: Collect tooth samples from muskox harvested in Unit 23 Southwest to help determine age-structure of harvested animals.

Hunters voluntarily submit tooth samples. These samples are compared with hunter assessment of the age of the harvested animal based on horn development.

ACTIVITY 5: 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 has 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 6: 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 as follows: 62% success in the RX099 hunt which included Unit 22C, 22D Southwest, and 22D Kuzitrin Drainage (48 of 77 permits); 57% success in the RX104 hunt which included Unit 22D Remainder and Unit 22E (37 of 65 permits), 100% success in the RX105 hunt which included Unit 22B (27 of 27 permits), and 75% success in the RX106 hunt which included Unit 23SW, west of the Buckland River drainage (6 of 8 permits).

Drawing hunts were administered in Units 22D and 22E and success rates were determined, as follows: 100% success in Unit 22D (7 of 7 permits), and 92% in Unit 22E (11 of 12 permits).

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 muskox 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. Staff completed a hard copy muskox identification booklet for use by hunters and wildlife viewers during the reporting period; it is available to public from ADF&G offices.

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

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

The Cape Thompson population (Unit 23 NW) was surveyed during March 2011 by ADF&G and NPS using distance sampling techniques slightly modified from the Seward Peninsula survey of 2010. Instead of focusing exclusively on the traditional count area, the survey was expanded to 65,833km<sup>2</sup>, including a large portion of western Unit 26A. This expanded survey effort was used to capture population information on a range-wide basis and document increased observations of muskoxen outside of the traditional count area. The traditional count area estimate was 208 (95% CI 176-248) muskoxen. The estimate for Unit 26A was 226 (95% CI 187-279) muskoxen. The estimate for Unit 23 NW was 290 (95% CI 244-355) muskoxen. These surveys were highly dependent on information from Seward Peninsula surveys to elevate the number of detections used in

the analysis. Use of these observations assumes a higher level of similarity between the two areas than may exist. As more surveys are completed in the Cape Thompson population, analyses can be based only on area-specific information and should improve results.

ACTIVITY 2: Coordinate with researchers from Region 3 to census and conduct muskox composition surveys 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 in Units 26A, 26B, and 26C. 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 15 adults and 8 calves northwest of Teshekpuk Lake in 2011.

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

See Activity 1 for a description of survey activities of the Cape Thompson population including large portions of Unit 26A. Raw counts from these surveys found 167 muskoxen in winter habitat which confirms their western expansion. Additionally, group size in 26A was the largest observed in the study with average mixed sex groups that were twice as large as those found in the remaining area.

ACTIVITY 4: Collect tooth samples from muskox harvested in Unit 23 Northwest to help determine age-structure of harvested animals.

Hunters voluntarily submit tooth samples. These samples are compared with hunter assessment of the age of the harvested animal based on horn development.

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 six hunters reported hunting; 4 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 2010-2011.

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.

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 conducted cooperative composition surveys in August 2010 finding 53 bulls(4 year and older):100 cows( 3 year and older) and again in March 2011 finding 66 bulls(4 year and older):100 cows( 3 year and older). These data are not directly comparable and the change in observed bull cow ratios likely demonstrates the decreased sightability of bulls in summer. For this reason, composition surveys will be

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conducted in the spring in the future. ADF&G also provided data from the March population estimate surveys 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 Borough Fish and Game Management Committee 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 muskox 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