

# FEDERAL AID ANNUAL RESEARCH PERFORMANCE REPORT

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

## Alaska Department of Fish and Game Wildlife Restoration Grant

**GRANT NUMBER:** W-33

**SEGMENT NUMBER:** 11

**PROJECT NUMBER:** 1.63

**PROJECT TITLE:** Evaluation and testing of techniques for ungulate management and operation of the Kenai Moose Research Center

**PROJECT DURATION:** 1 July 2011 – 30 June 2013

**REPORTING PERIOD:** 1 July 2012 – 30 June 2013

**REPORT DUE DATE:** 1 September 2013

**PRINCIPAL INVESTIGATOR:** John Crouse

**COOPERATORS:** USFWS Kenai NWR; Dr. Perry Barboza, University of Alaska – Fairbanks; Drs. John and Rachel Cook (National Council of Air and Stream Improvement); Dr. Tom Stephenson (California Department of Fish and Game)

**WORK LOCATION:** Kenai Moose Research Center

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### I. PROGRESS ON PROJECT OBJECTIVES DURING LAST SEGMENT

#### OBJECTIVE 1: MRC maintenance and operations.

Job/Activity 1a-c: We maintained and cared for 19 moose, including 5 males. One adult male died post-rut during October of an unknown (non-predator) cause. One 2 ½-year-old female died during late-March and fresh tissues were submitted to the Wyoming State Veterinary Laboratory for diagnosis. The pathological findings concluded a sub-acute to chronic pneumonia with lesions consistent with a bacterial pneumonia (features suggested *Pasturella/Mannheimia* and/or superimposed *Arcanobacterium pyogenes* infection). From our captive herd within the MRC enclosures, we removed 6 calves (all were twins; 4 female and 2 male) from their mothers within 48h of birth and began bottle feeding them. An additional orphaned female calf was obtained from the Soldotna area. The 2 male calves were subsequently transferred to the Alaska Wildlife Conservation Center in Portage. The 5 females will be trained and accustomed to handling by humans to facilitate future research.

We removed the aged and failing exterior log sealant from the Lab building and refinished with a two-part sealant that will protect the logs from further deterioration. To one of the residence cabins we applied a flexible, textured acrylic chinking to seal the open gaps between logs to eliminate heat loss and air infiltration.

Because we are currently not using the holding pens near the Lab, the repairs to the fence in this area were deferred and we opted instead to repair the perimeter fence in the southeast corner of

Pen 3. We replaced approximately 200ft of fence with new materials. Rotted and falling wooden posts that have remained attached to the fence were removed from approximately 1.5 miles of the north and east perimeter fence of Pen 3.

OBJECTIVE 2-5: Moose nutrition, physiology, and reproductive research.

Job/Activity 2a-2c: We measured weight, rump fat and loin muscle thickness and collected blood, urine and feces from 4 non-pregnant adult female moose in December, April and June to further assess how well the proportion of urea nitrogen from body nitrogen (pUrea-N) indicates winter body protein loss in moose. The natural abundance of  $\delta^{15}\text{N}$  in metabolite samples will be determined by Dr. Perry Barboza's lab at the University of Alaska – Fairbanks. We collected direct observations of intake for 6 hours during 1 day each month December through April.

Job/Activity 3a-3d: We were able to obtain 10 GPS telemetry collars with activity sensors at little or no cost (from other researchers' field studies that had retrieved collars from dead animals and, in some cases, from manufacturers with a beta version ready for testing by customers). GPS collars were fitted on moose at the MRC and we have observed animals to record activity during summer and winter periods (~250 hours). The preliminary data from these collars will be downloaded in fall 2012 and compared to direct observation measures. The results will be used to design experiments using 2-3 sampling modes and 2-3 sampling intervals to determine which are most appropriate to describe moose activity patterns.

Job/Activity 4a-b: Feces and plant material to be used for the analyses of dietary fiber, energy, protein and tannin content were prepared for laboratory analyses (approximately 3 months of Fish and Wildlife Technician III time). Samples will be submitted to the Wildlife Habitat Analysis Lab at Washington State University during fall 2012.

Job/Activity 5a-c: No VITs were utilized during this segment, so the 3 pregnant cows were located by radio telemetry and directly observed every other day from mid-May until parturition (last birth was 1 June). All calves were removed from their mothers for bottle feeding efforts.

OBJECTIVE 6: Vegetation management.

Job/Activity 6a-c: We acquired a 1996 digital orthorectified photograph and began building a GIS database of the MRC enclosures. We are currently determining the availability of imagery best suited to describe the existing vegetative cover. We purchased 2 handheld Garmin GPSMAP 76S to aid fieldwork.

OBJECTIVE 7: Drug testing.

Job/Activity 7a: Thiafentanil (A-3080) remained unavailable during this period and as a result we were unable to evaluate its efficacy in Alaskan moose.

OBJECTIVE 8: Preparation of study plans, reports and publications.

Job/Activity 8a-c: The final performance report on project 1.63 was submitted.

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

JOB/ACTIVITY 1A-C: We maintained and cared for 17 adult moose, including 4 males. In addition, MRC staff and volunteers spent approximately 920 hours raising 5 female moose calves to weaning at 16 weeks. Calves were fed milk formula 20% solids by weight as a mixture of water, Zoologic® Milk Matrix 32/50, and Foal-Lac® Powder. Feedings began at 7 per day (6am-12am) and decreased over the 16 weeks to 1 feeding per day prior to weaning. Fresh fireweed and browse (willow, aspen and birch) was collected daily and made available to calves in a small (0.05 hectare) feeding/holding pen. Calves, as a group, were taken on walks each day by their handlers in a larger 23 hectare enclosure and allowed to feed on a variety of natural vegetation. Calves were introduced to a pelletized alfalfa-based ration at 3 weeks of age and consumption was gradually increased from 380g/d to 1900g/d at weaning. Average calf mass at weaning and 1-year was 160kg and 210kg, respectively. The 5 females continue to be trained and accustomed to handling by humans to facilitate future research.

We applied a flexible, textured acrylic chinking to the Lab building and the second residence cabin to seal the open gaps between logs to eliminate heat loss and air infiltration.

We replaced approximately 300ft of the northwest perimeter Pen 2 Enclosure fence with new materials.

JOB/ACTIVITY 2A-2C: We measured weight, rump fat and loin muscle thickness and collected blood, urine and feces from 5 non-pregnant adult female moose in August, December, April and June to monitor resource allocation to fat and lean mass. During August immobilizations, we collected rumen content samples from 3 adult females and shipped them to Dr. Wright and PhD candidate Susan Ishaq who are investigating the molecular diversity and evolution of the gut microbiome of herbivorous animals.

JOB/ACTIVITY 3A-3D: We observed and recorded the activity of 2 male moose concurrent with collar activity sensor data acquisition during 6h periods twice monthly during July – September 2012 (72h total).

JOB/ACTIVITY 6A-C: We purchased a May 11, 2011 Digital Globe, World View 2 color satellite image (63 sqkm, digital orthophoto, 50cm resolution) and began classifying the existing vegetative cover within each of the MRC enclosures. We used current vegetation age structure and composition in conjunction with information from historic enhancement efforts to identify areas suitable for treatment to increase forage availability to moose. We developed a vegetation management plan for the MRC and during December 2012 through March 2013 mechanically treated a total of 240 acres using a hydro-axe (9 acres), bulldozer (215 acres) and feller-buncher (16 acres).

JOB/ACTIVITY 7A: Thiafentanil (A-3080) was purchased during this period but we were unable to evaluate its efficacy in Alaskan moose.

**IV. SIGNIFICANT DEVIATIONS AND/OR ADDITIONAL FEDERAL AID-FUNDED WORK NOT DESCRIBED ABOVE THAT WAS ACCOMPLISHED ON THIS PROJECT DURING THIS SEGMENT PERIOD**

Collaborative effort to assess caribou body condition and nutritional status through morphometric and physiological indices continued with Drs. John and Rachel Cook (National Council of Air and Stream Improvement) and Dr. Tom Stephenson (California Department of Fish and Game). During October 2012 we collected an additional 15 adult female caribou from Interior Alaska herds. Samples of caribou body tissues were packaged for submission to the Wildlife Habitat Analysis Lab at Washington State University for fat, protein, mineral and water content analyses. A summary of this work is currently being prepared.

Research to better understand moose reproduction and survival on the Kenai Peninsula continued. I was included in the capture and collaring operations 10 days each during November 2012 and March 2013 to provide assessments of moose body condition and deploy vaginal implant VHF transmitters to detect moose birthing events.

**V. PUBLICATIONS:** Kevin White, Neil Barten, Stacy Crouse, and John Crouse *In press*. Benefits of migration in relation to nutritional condition and predation-risk in a partially migratory moose population. Ecology. <http://dx.doi.org/10.1890/13-0054.1>.

**Prepared by:** John Crouse

**Date:** October 2013