

FEDERAL AID ANNUAL RESEARCH PERFORMANCE REPORT

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

PROJECT TITLE: Evaluation and testing of techniques for ungulate management

PRINCIPAL INVESTIGATOR: John Crouse

COOPERATORS: US Fish and Wildlife Service Kenai National Wildlife Refuge

FEDERAL AID GRANT PROGRAM: Wildlife Restoration

GRANT AND SEGMENT NO. W-33-7

PROJECT NO. 1.63

WORK LOCATION: Moose Research Center

STATE: Alaska

PERIOD: July 1, 2008 – June 30, 2009

I. PROGRESS ON PROJECT OBJECTIVES SINCE PROJECT INCEPTION

OBJECTIVE 1: Kenai Moose Research Center (MRC) maintenance and operations.

We held and cared for 22-25 moose and 0-9 caribou. We constructed a 0.5 mile long by 30 feet wide fenced alleyway across the northeast portion of Pen 2 to direct the movement of animals between enclosures and from Pen 3 to our animal holding, processing and weighing facilities. Shrubs and trees have been removed from 8000 linear feet of enclosure fence. A 3,200-square foot uninsulated steel shop building has been constructed and electrical, gas, and water lines have been put in place. Conifers have been thinned around existing structures and fire suppression equipment (gasoline powered water pump, hose and sprinklers) has been purchased and is on-site.

OBJECTIVE 2: Drug testing.

We evaluated the combination of medetomidine and ketamine to immobilize a male moose.

We evaluated the combination of butorphanol, azaperone, and medetomidine (BAM) to immobilize 11 moose.

OBJECTIVE 3: Moose nutrition, physiology and reproductive studies.

We developed and evaluated techniques to estimate food acquisition rates of foraging moose. Acquisition rates can further be combined with plant nutrient content and time-activity budgets to estimate total nutrient intake.

We evaluated the use and physiologic effects of a TASER[®] energy device to immobilize moose.

We evaluated the use of vaginally inserted radio transmitters (VITs) to detect moose birthing events.

OBJECTIVE 4: Caribou nutrition, physiology and reproductive studies.

The original objective of these studies was to examine the extent to which nutritional factors influenced reproduction in caribou, and how that relationship might have contributed to the decline of the Southern Alaska Peninsula caribou herd. The caribou studies have been concluded. The remaining 4 animals were euthanized in 2007. Necropsies were performed and carcasses were sampled for chemical determination of body composition (protein, fat, and ash). Data from all caribou body composition analyses will be analyzed and prepared for publication.

Objective 5: Preparation of reports and technical publications.

Annual research performance reports and Institutional Animal Care and Use (IAUC) documents have been submitted. Initial results of remote parturition monitoring with vaginally inserted radio transmitters (VITs) were summarized and presented at the 2007 annual meeting of the Alaska Chapter of the Wildlife Society. Further use and evaluation of VITs was completed after that time and a manuscript is being prepared.

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

JOB/ACTIVITY 1A: Maintain captive moose at the MRC.

We cared for 22 moose during this period. One adult male died in February from injuries incurred during the previous rut. One adult female died in March from malnutrition brought about by old age. We attempted to hand-raise 4 orphaned female moose calves (non-MRC stock) and a set of twins (1 male and 1 female) taken from an MRC female. All but 1 female calf died during July 2008 when 32 – 53 days old. One female calf died from a pasteurella pleuropneumonia septicemia. Pathologic bone fractures, histopathologic bone maturation defects, low serum phosphorus, and elevated serum calcium:phosphorus ratio without decreased Vitamin D levels confirmed a phosphorus deficiency in all others. This was contradictory to the preliminary diagnosis of a trace mineral deficiency. The only change in our calf raising protocols was the addition of a coccidiostat to the milk replacer formula. Sulfadimethoxine (generic Albon) was added at 5-7mg/kg body weight for 21 days. No side effects had been previously reported for this drug; however, a related sulfonamide (sulfamethazine) caused lowered serum phosphorus levels in domestic sheep. We continue to investigate a mechanism that could account for the phosphorus deficiency as a result of the sulfadimethoxine treatment.

In May 2009, we took 3 female and 2 male calves born to MRC moose and began hand-raising them. Fecal samples were examined weekly to detect and enumerate internal parasites. Low numbers (generally 1-8 per view) of coccidia oocysts were found in all calves by 21 days of age. Appreciable numbers of oocysts (100s – 1000s) were never found and no coccidiostat was used. All calves were alive at time of reporting (100 days old).

JOB/ACTIVITY 1B: Cabin repair and upgrades.

We replaced an inoperative gas cooking range/oven in one of the residence cabins.

JOB/ACTIVITY 1C: Fence repair and replacement.

We worked alongside an Anchorage Boy Scout troop to remove shrubs and trees from 1,600 feet of fence at the southwest corner of Pen 2 and the northwest corner of Pen 4.

JOB/ACTIVITY 2A: Evaluate the use of medetomidine and ketamine in 6-8 moose.

This job was inactive during the FY09 reporting period. Evaluation of a drug combination not previously used in moose is more commonly conducted on animals considered “of lesser value.” During this reporting period, only highly valued hand-raised and pregnant females were immobilized with standard drugs. We plan to use the medetomidine and ketamine combination on non-pregnant females and males during FY10.

JOB/ACTIVITY 3B: Develop a statewide database of moose forages and their nutritional content.

Techniques to visually estimate diet composition and nutrient acquisition rates were used to quantify activity, diet composition, and nutrient intake (bite size, bite rate) of foraging moose at the Moose Research Center July-August 2008 (4 moose; 50 hours of direct observation). Representative samples of plants eaten by moose were collected for species-specific biomass regressions and analyzed for nutrient content (digestibility, protein, energy, and tannin content; 57 samples).

JOB/ACTIVITY 3C: Using stable isotopes as indicators of protein balance in female moose.

Measurements were made and samples collected from six female moose (3 pregnant and 3 unbred) over a 3 day period around 10 November, approximately 4 weeks after the average date of breeding, and again over a 3 day period around 1 April, approximately 7 weeks before the average date of parturition. Moose were held in a 2.5km² enclosure (Pen 3) and foraged on natural browse. Body mass was recorded to the nearest 0.5kg on an electronic scale in a handling chute. Animals were chemically immobilized with an injection containing carfentanil and xylazine. Subcutaneous fat over the rump was measured to the nearest 1mm by ultrasound. Blood was withdrawn from the jugular vein. Samples of spontaneously voided urine and feces were collected. All pregnant females delivered healthy calves. Ratios of ¹⁵N/¹⁴N in urea, blood cells, creatinine, and fecal N will be determined.

JOB/ACTIVITY 5B: Design and write a collaborative proposal with the USFWS and USFS to develop techniques that allow successful, cost-effective long-term monitoring of moose health and reproductive status on the Kenai Peninsula.

This objective was inactive during the FY09 reporting period. Staff turnover at both the USFS and the MRC pre-empted a collaborative proposal in FY09. Recent Alaska Board of Game (BOG) decisions (March 09), however, will necessitate a review of Intensive Management options available for moose on the Kenai Peninsula. MRC staff will be involved in this process during FY10.

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

We collaborated with Dr. Kimberlee Beckmen (ADF&G staff veterinarian) to determine trace mineral, serum phosphorus and vitamin D levels in moose calves. Blood samples were collected from 8 calves (4 female and 4 male). One orphan female calf (non-MRC stock) and 2 male calves taken from MRC moose were euthanized and shipped to either Dr. Beckmen or Alaska Veterinary Pathology Services for further pathologic and histopathologic findings.

Vaginally inserted radio transmitters (VITs) were purchased and deployed in 7 bred MRC moose to facilitate the taking of their calves 48 hours post-parturition.

The quality and quantity of forage available to moose within the enclosures has declined as a result of succession and browsing by moose. The capacity for the MRC to overwinter moose in a healthy condition is compromised and further degrading. We are working with the Kenai National Wildlife Refuge (Refuge) to use vegetation management techniques to return and maintain at least 35% of each enclosure in deciduous woody vegetation less than 15 years old. We paid to transport a bulldozer, hydro-axe, and feller/buncher to the MRC which Refuge staff used during March and April 2009 to prepare three 40 acre blocks for burning and remove 9 acres of mature hardwoods.

IV. Publications

None.

V. RECOMMENDATIONS FOR THIS PROJECT

None.

VI. APPENDIX

None.

PREPARED BY:

John Crouse
Wildlife Physiologist II

SUBMITTED BY:

Earl Becker
Research Coordinator

APPROVED BY:

Clayton R. Hawkes
Federal Assistance Coordinator
Division of Wildlife Conservation

Douglas N. Larsen, Director
Division of Wildlife Conservation

Approval Date: _____