I. PROGRESS ON PROJECT OBJECTIVES DURING LAST SEGMENT

OBJECTIVE 1: Nitrogen as a potentially limiting nutrient to moose. We have made steady progress in measuring digestible protein across a variety of moose ranges in Alaska. We have developed refined assays for evaluating the protein quality of browses for moose, and we have quantified the effects of tannins on protein digestion by moose.

OBJECTIVE 2: Effects of climate and utilization on browse quality. We have established a set of controlled experiments which will enable us to begin assessing the effects of soil temperature, soil fertility, soil moisture, and solar radiation on the productivity and quality of two important willow forages—an upland species, *Salix pulchra*, and a riparian species, *Salix alaxensis*.

OBJECTIVE 3: Hormonal link between diet quality and reproductive performance. We have established baseline concentrations of leptin, ghrelin, and corticosterone in moose throughout the annual cycle of this seasonally synchronous breeder. We have completed 3 feeding trials enabling us to begin examining the effects of nutrition on production of ghrelin, leptin, and corticosterone, which in turn, affect the production of progesterone and reproductive performance.
II. SUMMARY OF WORK COMPLETED ON JOBS IDENTIFIED IN ANNUAL PLAN THIS PERIOD

JOB/ACTIVITY 1: Moose forage nitrogen and protein binding

We completed most chemical analyses of forages for the Nushagak-Togiak-Goodnews gradient, but we were unable to complete our second sampling of forages in the Colville drainage due to lack of access in summer 2011.

JOB/ACTIVITY 2: Diets by fecal alkane analysis

Diet analysis has not been started but not completed at this time.

JOB/ACTIVITY 3: Climate/utilization effects—potted willows

Treatments have been maintained during the 2011 growing season, and problems restricting root growth to soil in pots has been corrected.

JOB/ACTIVITY 4: Hormonal link

We completed high energy-low protein, and low energy-high protein trials, completed hormonal assays, and have begun data analysis.

JOB/ACTIVITY 5: Forage availability by remote sensing

Low level aerial photography of moose habitat near Cooper Landing was completed and measurements of forage availability at corresponding points on ground have been completed. Two manuscripts based on remote sensing of Nelchina and Placer Valley habitats have been completed and submitted.

JOB/ACTIVITY 5: Tractable calves for nutrition/habitat research

Rearing of tractable calves as replacement stock for research was completed.

V. PUBLICATIONS


Walton, K., D. Spalinger, N. Harris, and W. Collins. In review. Landscape scale quantification of wildlife habitat using landsat imagery and hierarchical classification techniques.

VI. RECOMMENDATIONS FOR THIS PROJECT

Continue as planned

Prepared by: William B. Collins

Date: 30 August 2011