

**Alaska Department of Fish and Game
Wildlife Restoration Grant**

Grant Number: W-33

Segment Number: 12

Project Number: 1.68

Project Title: Factors affecting moose forage quality and subsequent reproductive success.

Project Duration: 1 July 2009 to 30 June 2014

Report Due Date: 1 September 2014.

Partner:

PRINCIPAL INVESTIGATOR: William B. Collins

COOPERATORS: Don Spalinger, University of Alaska Anchorage

WORK LOCATION: Matanuska Research Farm, Togiak Valley, Colville River, Nelchina Basin, Game Management Units 15, 17.

I. PROGRESS ON PROJECT OBJECTIVES DURING LAST SEGMENT

OBJECTIVE 1: Nitrogen as a potentially limiting nutrient to moose. We have completed laboratory analyses of nitrogen, tannin, and digestible protein in principal moose forages for the Coleville, Goodnews, Togiak, Nushagak, Placer, Denali, and Nelchina ranges, and we are in the process of comparing all of these ranges to each other and the productivity of their respective herds.

We have extended our analysis of forages in the Nushagak and Togiak drainages to determine the effects of insect defoliation on forage nitrogen and protein binding. Recent large scale defoliations of browse species in those areas have caused local citizens and biologists to become concerned about the effects of defoliation on moose nutrition. We are collaborating with Togiak National Wildlife Refuge biologists in this effort.

OBJECTIVE 2: Effects of climate and utilization on browse quality. We 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*. We cloned 128 plants of each species and subjected them to all 4 treatments for this period.

We have now analyzed these treatments for nitrogen and tannin concentrations.

OBJECTIVE 3: Hormonal link between diet quality and reproductive performance. A manuscript for publication of these results is in review.

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

JOB/ACTIVITY 1: Moose forage nitrogen and protein binding

We completed all laboratory analyses of forage samples from each of our study areas, and we are summarizing results.

JOB/ACTIVITY 2: Diets by fecal alkane analysis

A manuscript regarding analysis of moose diets by the fecal alkane technique has been completed and is in review.

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

Treatments have been maintained during the 2014 growing season and a second set of samples collected.

JOB/ACTIVITY 4: Hormonal link

Manuscript in review.

JOB/ACTIVITY 5: Forage availability by remote sensing

Two manuscripts based on remote sensing of Nelchina and Placer Valley habitats have passed through peer review and one has been accepted for publication.

III. COSTS INCURRED DURING THIS SEGMENT

75% federal, 25% state.

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

None

V. PUBLICATIONS

Walton, K., D. Spalinger, N. Harris, and W. Collins. In press. High Spatial Resolution Vegetation Mapping of Wildlife Habitat.

VI. RECOMMENDATIONS FOR THIS PROJECT

Publish results.

Prepared by: William B. Collins

Date: 13 August 2014