

**Wildlife Restoration MULTI-YEAR GRANT
INTERIM 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: AKW-29 Research & Management

PROJECT NUMBER: 13.0

PROJECT TITLE: Analysis and interpretation of ungulate dietary composition and forage nutritional quality in Alaska

PERIOD OF PERFORMANCE: 04/01/2018 - 12/31/2022

PERFORMANCE YEAR: March 23, 2019 - March 23, 2020; year 2 of 3-year grant

REPORT DUE DATE: Submit to Coordinator 1 June 2020; due to FAC 29 June 2020

PRINCIPAL INVESTIGATOR: William B. Collins – ADF&G Wildlife Physiologist II

COOPERATORS: Don Spalinger – ADF&G
Melissa Parry – ADF&G

Authorities: 2 CFR 200.328
2 CFR 200.301
50 CFR 80.90

I. PROGRESS ON PROJECT OBJECTIVES DURING PERFORMANCE YEAR

OBJECTIVE 1: Complete dietary composition analyses for previously collected samples from the Togiak, Goodnews, Nushagak, and Coalville River moose populations.

ACCOMPLISHMENTS: We continued to operate the nutrition laboratory created through AKW-R-1-2018 Project 1.0. We hired a full-time laboratory biologist who is skilled in all the laboratory analyses we conduct and hired a Wildlife Biologist III to assist with process refinement and data analyses. Since the inception of the project, we completed analyses for the following projects: Nelchina caribou, Nelchina moose, Colville River moose, Southern Alaska Peninsula caribou, Region III's western Alaska moose habitat project, and Northern Alaska Peninsula caribou. We have completed analyses of all samples collected for the Alphabet Hills project (AKW-30 P1.0) to date, some of which were used in a recently completed master's thesis at the University of Alaska - Anchorage.

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OBJECTIVE 2: Determine forage nutritional quality for the diets determined in Objective 1.

ACCOMPLISHMENTS: We have continued testing DNA barcoding as a means for determining diet composition, and we are comparing that technique with micro histological, fecal alkane-alcohol, and bite-count methods for moose and caribou sample sets. During the current performance period, we continued to refine DNA-metabarcoding techniques with an emphasis on bioinformatics (analyzing the complex output from DNA analyses). This has proved more difficult than anticipated in part due to limited processing capabilities at the laboratory (located at the University of Alaska), and in part related to labor restrictions associated with the covid-19 pandemic. Processing is ongoing, however, and we expect to fully evaluate this method within the next performance period and complete the comparisons across methods.

OBJECTIVE 3: Determine winter diets for Nelchina caribou wintering in the Tanana Hills from previously collected samples.

ACCOMPLISHMENTS: Laboratory analyses of these samples have been completed, with data processing ongoing.

II. SUMMARY OF WORK COMPLETED ON PROJECT TO DATE.

Completion of laboratory analyses necessarily precedes evaluation of ungulate diets and nutritional quality of browse samples. Upon completion of the comparison of laboratory techniques (e.g., metabarcoding vs. micro-histological), we will be able to determine needs for reanalysis of samples and finalize the determination of diet composition and quality across the various datasets we have developed.

III. SIGNIFICANT DEVELOPMENT REPORTS AND/OR AMENDMENTS.

No SDRs or amendments were submitted during this performance year.

IV. PUBLICATIONS

We are still in the data collection and analysis phase of the project and do not yet have any publications associated with this project.

V. RECOMMENDATIONS FOR THIS PROJECT

This project should be continued at least one more year to allow us to complete all laboratory analyses, interpretation, and reporting for our current state-wide collections of more than 7,000 fecal and forage samples. Per the previous recommendations, we have recommended these services to other ADF&G researchers, and are continuing to develop greater analytical capacity in terms of both volume, types of samples, and methods (e.g., DNA analyses), thereby enhancing

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the Department's ability to assess various large herbivore habitats by standardized means that allow legitimate comparisons to be made across areas and time periods.

Prepared by: William B. Collins, ADF&G Wildlife Physiologist II, and
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Date: 29 June 2020