

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

GRANT NUMBER: AKW-29

PROJECT NUMBER: 12.0

PROJECT TITLE: Identifying metrics for evaluating nutritional stress in muskox.

PERIOD OF PERFORMANCE: 7/1/2018 – 3/30/2021

PERFORMANCE YEAR: March 23, 2018 – March 23, 2019; year 1 of a 4-year grant

REPORT DUE DATE: Submit to Coordinator June 1, 2019

PRINCIPAL INVESTIGATOR: Brynn Parr, WBIII

Authorities: 2 CFR 200.328
2 CFR 200.301
50 CFR 80.90

I. PROGRESS ON PROJECT OBJECTIVES DURING PERFORMANCE YEAR

OBJECTIVE 1: Investigate field and analytical techniques used to date to evaluate nutritional condition of muskox and all allied species.

ACCOMPLISHMENTS: We conducted a thorough a literature review of field and analytical techniques used to date to evaluate nutritional condition of muskox and all allied species.

OBJECTIVE 2: Evaluate pregnancy and parturition-based indicators to nutritional condition and establish baseline values for populations with high productivity and reproductive potential.

ACCOMPLISHMENTS: We asked hunters to provide the pregnancy status (i.e. presence/absence of a fetus and lactation status) from female muskoxen harvested during the 2019 spring hunting season. We also asked hunters to provide back and rump fat depth measurements, kidney/liver samples, and femurs from both male and female muskoxen harvested during the spring season. Information and samples from the harvest had not yet been received by the end of this reporting period.

OBJECTIVE 3: Evaluate forage and diet-based indicators to nutritional condition and establish baseline values for populations with high productivity and reproductive potential.

ACCOMPLISHMENTS: We asked hunters to provide fecal samples from muskoxen harvested during the spring hunting season that will be used to determine winter diet. We had not yet received any samples by the end of this reporting period.

OBJECTIVE 4: Evaluate stress-based indicators to nutritional condition and establish baseline values for populations with high productivity and reproductive potential.

ACCOMPLISHMENTS: We asked hunters to provide hair and fecal samples from muskoxen harvested during the spring season that will be used to evaluate cortisol levels. Samples from the spring harvest had not yet been received by the end of this reporting period.

OBJECTIVE 5: Engage advisory committees and BOG to explore incremental adjustments to stocking density on Nunivak Island.

ACCOMPLISHMENTS: We traveled to Mekoryuk to speak with hunters directly. We explained the research project, the methods, and the desired outcome. We also mailed letters to all the Nelson Island hunters highlighting the same information, as we were unable to fly to Newtok due to weather to talk to hunters in person.

II. SUMMARY OF WORK COMPLETED ON PROJECT TO DATE.

Year 1 of a 4-year project.

We conducted a thorough literature review of field and analytical techniques used to evaluate nutritional condition of muskoxen and allied species. We worked with local muskoxen hunters to obtain samples from harvested muskoxen as this method has proven successful for several muskox populations in northern Canada and is a commonly used approach for marine mammals in the region. We traveled to Mekoryuk and provided sampling kits directly to hunters. We also mailed a letter and sampling kits to individual hunters who obtained a Nelson Island muskox registration permit. The hunting season was extended through March 31; therefore, we did not receive any samples by the end of this performance year. After we receive the samples during the next reporting period, we will send kidney and liver samples to the Washington Animal Disease Diagnostic Laboratory in Pullman, WA, to test for trace minerals. Fecal samples will be sent to the Washington State University Wildlife Habitat and Nutrition Laboratory in Pullman, WA, for fecal microhistology and to the Smithsonian Conservation Biology Institute in Front Royal, VA to test for cortisol levels. Femurs and hair samples will be evaluated in an ADF&G laboratory for femur marrow content and cortisol levels, respectively.

III. SIGNIFICANT DEVELOPMENT REPORTS AND/OR AMENDMENTS.

Annual abundance surveys conducted in the summer of 2018 indicated the Nelson Island population greatly decreased while the Nunivak Island population continued to show a steady increase. Therefore, we shifted our primary focus of this study to Nunivak Island. As we conducted our literature search and began to determine the techniques we would use to address the primary study questions, it became obvious we would likely be unable to conduct live-animal captures for direct evaluations given the budget and the logistical hurdles to working in this remote area. We decided to take advantage of the opportunity presented by the spatially and temporally localized harvest on Nunivak to attempt to obtain information on body condition and

pregnancy through hunters. In order to encourage hunter participation, we purchased pre-paid debit cards to distribute to hunters in exchange for their participation.

IV. PUBLICATIONS

No publications have resulted from this project to date.

V. RECOMMENDATIONS FOR THIS PROJECT

This project will continue 3 more years.

Prepared by: Brynn Parr

Date: 5/29/19