

**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-30 Habitat Enhancement

PROJECT NUMBER: P1.0

PROJECT TITLE: Evaluation of the effects of fire on moose and forage quantity and quality in the southcentral Alaska area of Alphabet Hills

PERIOD OF PERFORMANCE: 23 March 2019 – 23 March 2020

PERFORMANCE YEAR: Year 3 of a 5-year grant

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

PRINCIPAL INVESTIGATOR: Jeff Stetz – ADF&G Wildlife Biologist IV

COOPERATORS: William Collins – ADF&G Wildlife Physiologist II (retired)
Don Spalinger – ADF&G Wildlife Biologist III
Katie Anderson – UAA Graduate Student

Authorities: 2 CFR 200.328
2 CFR 200.301
50 CFR 80.90

I. PROGRESS ON PROJECT OBJECTIVES DURING PERFORMANCE YEAR

OBJECTIVE 1: Quantify moose browse quality, quantity, and proportional browse removal within the 2003/2004 Alphabet Hills burn area (Burn Area A; BAA), the planned Alphabet Hills burn area (Burn Area B; BAB), and the unburned area (UA).

ACCOMPLISHMENTS: Browse quality, quantity, and proportional removal within BAA, BAB, and the UA were sampled a total of six times during early-, mid-, and late-summer, and again in late-winter. Sample and data analyses are ongoing. See Section 2 for more details.

OBJECTIVE 2: Document body condition, productivity, twinning rates, and survival of collared moose that are using BAA and the UA.

ACCOMPLISHMENTS: 60 GPS collars were deployed on bull and cow moose in the vicinity of BAA and the UA between Fall 2018 and Spring 2019. Two of the collared

moose (1 bull, 1 cow) were lost to wolf predation during the previous performance period. This summer we will retrieve (and possibly redeploy) collars that have dropped or are associated with moose mortalities ($n=6$). We are currently conducting productivity/ twinning surveys of the collared cows.

OBJECTIVE 3: Monitor spatial habitat selection of moose in BAA and the UA, the immediate response of moose to prescribed fire in BAB, and the moose colonization rate of BAB if it is ignited.

ACCOMPLISHMENTS: Data collection to be used for this objective is still ongoing. As such, no spatial analyses have been completed. Hourly GPS fixes from collared moose are currently being collected and will be used to evaluate spatial selection and response to a burn in BAB if it occurs (see Objective 6 for an update on the proposed prescribed burn).

OBJECTIVE 4: Compare moose densities and composition between BAA and the UA.

ACCOMPLISHMENTS: Fall moose composition surveys were flown in BAA and moose pellet counts were conducted in BAA and the UA to estimate relative moose densities. These efforts will continue, with being consolidated to dampen interannual effects of relative density measures across the treatment and control areas.

OBJECTIVE 5: Model the effects of fire on browse quality; moose nutrition, fitness, and movements; and moose abundance.

ACCOMPLISHMENTS: The data needed for these analyses is still being collected. As such, no modeling has been accomplished to date.

OBJECTIVE 6: Evaluate the usefulness of prescribed fire as a tool for habitat enhancement in GMU 13.

ACCOMPLISHMENTS: No analysis of data or evaluation of the usefulness of prescribed fire as a tool for habitat management has been accomplished to date. At the time of this report, the intention is to proceed with the prescribed burn in the Alphabet Hills area during summer of 2020. Weather conditions and other extrinsic factors will ultimately determine if the fire can be attempted and/or be successful.

II. SUMMARY OF WORK COMPLETED ON PROJECT TO DATE.

Related to Objective 1: we sampled the Alphabet Hills burn (BAA) on six occasions: five times across the summers of 2018 and 2019 and once in the winter of 2018-2019. Samples for nutritional analyses were collected among 20 random sites in the burn perimeter, and 20 random sites in the adjacent unburned forest. We collected over 500 plant samples, and measured canopy coverage of moose browses from randomly selected plots in burned ($n = 16$) and unburned habitats ($n = 10$) to help characterize relative availabilities of foods in both habitats. We found that the total canopy cover and available bite frequencies of moose browses were higher in forested sampling sites than in the burned sites. There was a significant difference between browse canopy cover in the forest compared to the burn (forest % cover = 10%, SE =

0.019, $n = 10$, burn % cover = 9%, SE = 0.01, $n = 16$; $t = 19.18$, $p = 0.033$). Average frequency of available bites in the forest was 13.22/100 points (SE = 1.48) and 9.48/100 points (SE = 0.88) in the burn, which was not significantly different. Diamond leaf willow, one of the important browses for moose, was sparse in the burn, with cover representing less than 10%, while in the forest, average cover of diamond leaf willow was approximately 20%. The greater cover of an abundant food source such as diamond leaf willow could explain the significantly higher bite frequency found in the forest.

The burned area had a higher diversity of species (burn $H = 1.709$, forest $H = 1.509$), with four species (fireweed, quaking aspen, little tree willow, and various mushrooms (*Boletus* spp.)) that were found only in the burned areas. Overall, forage digestible energy concentration (DE) of browses was significantly higher in the forest than in the burn, but digestible protein (DP) concentration was not significantly different. DE of diamond leaf willow was significantly higher in forested sites than in burned sites. Although DE was higher in the forest than in the burn, burned areas had a greater diversity of species than forest areas, many with higher DE than the same species in the forest. As a consequence of the apparent higher quality of foods in the forest, but the higher diversity of foods available in the burn, moose are expected to benefit nutritionally from the juxtaposition of burned and unburned habitats. Further work on the nutritional quality of winter foods and modeling the overall impact of yearlong nutritional changes in abundance, diversity, and quality of foods on moose nutritional fitness remains to be completed.

We are currently in year 3 of this 5-year project. We are still in the data collection phase of the project and do not have any results or findings to report related to the other objectives.

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 phase of the project and do not yet have any publications associated with this project.

V. RECOMMENDATIONS FOR THIS PROJECT

No changes to the project statement are required at this time. There have, however, been staffing changes recently that we will address during the subsequent performance period.

Prepared by: Jeff Stetz, Wildlife Biologist IV

Date: 10 June 2020