

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-16

PROJECT NUMBER: 215647484

PROJECT TITLE: Kenai Moose Habitat Enhancement

PERIOD OF PERFORMANCE: May 3, 2016 – June 30, 2022

PERFORMANCE YEAR: July 1, 2020 - September 30, 2021; year 5 of a 6-year grant

REPORT DUE DATE: Submit to Coordinator December 1, 2021; due to FAC September 28, 2021

PRINCIPAL INVESTIGATORS: Sue Rodman, Program Coordinator; Dan Thompson, Wildlife Biologist

COOPERATORS: Mary Jo Hill, Wildlife Biologist II, and Miles Spathelf, GIS Analyst III, ADF&G

I. PROGRESS ON PROJECT OBJECTIVES DURING PERFORMANCE YEAR

OBJECTIVE 1: Construct fuel breaks to enable the use of prescribed and wildland fire to enhance habitat on a landscape scale.

ACCOMPLISHMENTS:

The Kenai Peninsula Fuel Break Working Group efforts continue. The Kenai National Wildlife Refuge has extended work on the Sterling Fuel Break on their lands near Spirit Lake. Chugachmiut's Yukon Fire Crew continued work on lands owned by the Kenai Natives Association (KNA) along the Robinson Loop Road and Swanson River Road. Through the Homer Soil & Water Conservation District, ADF&G contributed to extending this fuel break to the west toward Ridgeway on Salamatof and CIRI lands: permits were granted from both organizations to Homer SWCD to begin field work. Contracts are set up with Evergreen for implementation to begin in December 2021.

ADF&G staff support the Kenai Peninsula Borough's update to the Community Wildfire Protection Plans (CWPPs) through contributions at interagency virtual meetings and attended local meetings in July 2021 for public gatherings in Homer, Soldotna, and Nikiski. Through this

process, future fuel breaks and habitat enhancement projects may be designed in coordination with landowners and agency managers across the peninsula where these complementary objectives apply.

OBJECTIVE 2: Enhance habitat through mechanical treatments and prescribed fire on public lands.

ACCOMPLISHMENTS:

Homer SWCD and ADF&G were unable to secure an agreement with KNA to treat their lands in GMU 15A for moose habitat; Covid impacted their Board meetings. However, Homer SWCD did prepare three project areas in the Anchor River Fritz Creek Critical Habitat Area (CHA) north of Homer in GMU 15C in coordination with ADF&G biologist Jason Herreman in Homer. These sites all contain willow that can be reinvigorated through mechanical treatment. In fall 2020, the Fritz Creek site was completed on 27 acres. In October and November 2021, the North Fork and Beaver Creek sites were completed on 22 and 68 acres, respectively. Pre-treatment plots were sampled to assess the browse activity of the sites; post treatment vegetation sampling will occur next summer to assess regeneration. Homer SWCD staff met with Dominique Collet, local willow expert, to examine species composition on the site. Post treatment site review showed that initial willow response was excellent on the Fritz Creek site; this will be measured in FY22 to establish baseline regeneration data for this site.

OBJECTIVE 3: Monitoring moose movement, body condition and productivity, to specify best practices for managing fire on the landscape and mechanical enhancements for moose habitat.

ACCOMPLISHMENTS:

Per Amendment #1, we began the nutritional quality analysis of forage in the Funny River fire of 2014 to determine whether nutrition is limiting the moose population across GMU 15B. This work is also being done in the Swanson River fire of 2019 for GMU 15A. Staff developed a data collection protocol to characterize cover types by species composition and structure, extent of browsing on shrubs and saplings, and collection of forage plant samples by phenological stage throughout the year to analyze digestible protein and tannin concentration at the ADF&G lab in Palmer.

Work continued on the moose movement study; results from 2020 are updated below with additional information and analyses. This portion of the study is done in concert with AKW-5 to study moose movement in GMU 15B after the Funny River Fire of 2014; results are combined here for comparison.

In November 2016 and March 2017, we successfully captured 50 adult female moose and deployed all 50 Global Positioning System (GPS) collars. Evaluation of GPS data from moose in GMU 15A indicated that 21 of the GPS collared female moose potentially utilize the area of the

formerly proposed East Fork prescribed fire that was to burn 9,600 acres within the 2019 Swan Lake Fire that consumed 167,182 acres by the end of the season.

Body condition measurements of adult cows were completed during captures in autumn of 2016 – 2020, and during the spring of 2017, 2018, 2020, and 2021. Rump fat depths were similar between GMU 15A and 15B in 2016 and 2017; however, moose in GMU 15B started showing more rump fat than those in GMU 15A in the autumn (2018, 2020), and during the spring (2018, 2021).

Parturition surveys were completed in 2017 - 2021. Estimates of parturition rates have fluctuated in GMU 15A over the 4 years (68-91%), while parturition rates in GMU 15B have remained relatively stable (63-76%). Twinning rates have fluctuated for each GMU (15A 37-53%; 15B 42-63%), with both GMU's having the lowest twinning rates recorded in 2020. GMU 15B has had higher twinning rates than GMU 15A for 3 years (2018-2020); however twinning rates in 15B were slightly lower than 15A in 2021 (15A 47%; 15B 43%).

During March of 2018 (n = 27), 2019 (n = 30), 2020 (n=30), and 2021 (n=38) we captured and weighed 10-month-old calves and found no difference in mean body mass between GMUs. We also deployed expandable GPS collars on female calves in 2018 (n = 15), 2019 (n = 16), 2020 (n = 15) and 2021 (n=18). Additionally, we deployed GPS collars on male calves in 2020 (n=15) and 2021 (n = 20), which we will then photograph from a helicopter during autumn to determine antler configuration.

As we assess moose movement across both 15A and 15B (separate funding sources), ADF&G maintains that we do not have yet a population response to the 2014 Funny River fire. However, that is likely to occur in the coming years with the expectation that forage availability and nutritional quality will increase. The higher twinning rates in 15B may not yet correlate to the fire effects: these preliminary signs of increase are not yet substantial in 15B post fire. Monitoring of cow movements in 15A continues and trends before and after the Swan Lake Fire will be reviewed as vegetation returns.

While USFWS collected data in the area of the 2014 Funny River Fire and contributed to the new cover type map for the Kenai Peninsula, the 2020 vegetation survey done by ADF&G noted below will be correlated to moose movement in that area during this coming year. That information, a component of AKW-5, would have been used to comparatively analyze the pre-fire monitoring vegetation data within the East Fork prescribed fire area to the north in GMU 15A, which would have been funded under this grant. USFWS Fire Ecologist Lisa Saperstein supported ADF&G in developing the monitoring protocol that would have been implemented in June 2019 if the Swan Lake wildfire had not ignited.

From the assessment of the US Forest Service [Kenai Peninsula Existing Vegetation Map](#) (KPEVM), ADF&G conducted a new field survey in July 2020 of vegetation cover type in the Funny River Fire area to evaluate area classified as mesic herbaceous. The KPEVM classified 45% of the area burned in the Funny River fire in the mesic-herbaceous dominance class. GPS collared moose in GMU 15B were in the mesic-herbaceous class 43% of the time between 2015 and 2019.

The Forest Service developed a key to define the dominance type classes within each map group. Across the Kenai Peninsula, 5.8% of the land area (334,361 acres) is classified in the mesic herbaceous dominance type, one of five types within the herbaceous map group which has less than 10% tree cover, less than 25% shrub cover, and herbaceous vegetation accounts for at least 25% of the area. Specifically, the mesic herbaceous type is moderate in moisture and composed of bluejoint reedgrass, fireweed, and mixed forbs. While moose are known to occupy these areas and eat these plants, their nutritional requirements exceed what this community provides. The extent of this cover type does not coincide with visual observations of the burned area by ADF&G staff, nor does it match the preferred moose habitat characteristics to meet the objectives stated above.

In July of 2020, vegetation types were surveyed at 60 sites within the Funny River Fire in the four KVM classes that had the most recorded summer moose locations based on GPS collar data: mesic herbaceous, low shrub willow – dwarf birch, quaking aspen, and white/Lutz Spruce – birch. Locations were stratified in the classes based on proportional area of each class. Of the 38 plots defined as mesic herbaceous from the 2017 survey, the 2006 classification classified them as forest: 38% as black spruce, 34% as White/Lutz/Sitka spruce, and 22% as mixed forest.

2017 Kenai Vegetation Map Dominance Type	2006 O'Brien Vegetation Map	# of Plots
Mesic Herbaceous	Black Spruce	14
Mesic Herbaceous	White/Lutz/Sitka Spruce	14
Mesic Herbaceous	Mixed Forest	10
Low shrub willow – dwarf	-	10
Quaking aspen	-	6
White/Lutz Spruce - birch	-	6

At the sampling locations, two protocols were followed: 1) the Forest Service dominance type key confirmed if the 2017 designation was still applicable to the 2020 field survey, and 2) a vegetation plot was established that captured live vegetation composition and cover, tree density and size, browse species height, and browse architecture classifications, as well as photo documentation. Data was collected on the platform created the previous year in Survey 1-2-3 and then entered into the FFI software system and database. The draft field report was completed in May 2021 by Hill and Thompson; Rodman, Thompson, and Spathelf will finalize this report as a technical bulletin in the coming year that will be combined with results from moose habitat selection research in this area.

Nutritional quality and quantity sampling in GMU 15A continued in July and August of 2020, and March and June of 2021 within the 2019 Swan Lake burned area. Point intercept transects were used to tally species composition. Tree data by species, diameter, and height class tracks forest stand structure. Shrub data characterizes browse architecture and monitors average plant height. Plant samples from 2020 have been submitted for nutritional analysis, while samples collected in 2021 are being prepared for analysis.

Spathelf and Thompson analyzed moose locations and body temperatures with environmental covariates including vegetation classification, a digital elevation model and a digital surface model. This work is attributed to grant AKW-4 but applies vegetation information collected through AKW-16 and the KPEVM (Thompson et al. 2021).

II. SUMMARY OF WORK COMPLETED ON PROJECT TO DATE.

The work completed on AKW-16 has varied from our intentions over the years of this grant. The political outcome of the 2019 Swan Lake Fire encourages vigilance on behalf of the residents. ADF&G is not actively pursuing prescribed fire projects on the Peninsula as State Forestry staffing limitations make this endeavor infeasible unless substantial outside resources are brought in to manage a burn, and the interagency fire community decides they are able to competently complete a prescribed fire with the variable weather and drought conditions that we have experienced in recent years.

The partnership with the Homer Soil & Water Conservation District promotes community engagement in projects as their staff is diverse and suited for local dialogue with residents and other stakeholders.

In early November 2020 we relocated and photographed from a helicopter all of the remaining 1.5-year-old bull moose ($n = 8$) captured as collared as 10-month-old calves in spring of 2020. In November 2020 we recaptured 30 adult female moose for body condition assessment and to draw blood for pregnancy status. Mean rump fat of adult cows in November was different ($t_{28} = -3.50$, $P = 0.002$), with GMU 15A ($2.9 \text{ cm} \pm 1.1 \text{ SD}$) lower than GMU 15B ($4.3 \text{ cm} \pm 1.1 \text{ SD}$). In March 2021 we successfully recaptured 30 moose for body condition assessment. Mean rump fat of adult cows in March 2020 was different ($t_{28} = -3.40$, $P = 0.002$) with GMU 15A ($1.3 \text{ cm} \pm 0.6 \text{ SD}$) lower than GMU 15B ($2.2 \text{ cm} \pm 0.8 \text{ SD}$). We captured 38 calves during March 2021 (GMU 15A: $n = 18$; GMU 15B: $n = 20$) and weighed them. Weights of 10-month-old calves were no different ($t_{36} = -0.03$, $P = 0.976$) between GMU 15A ($185.3 \text{ kg} \pm 19.9 \text{ SD}$) and GMU 15B ($185.5 \text{ kg} \pm 15.1 \text{ SD}$). In addition, we deployed expandable GPS collars on 18 female calves ($n = 9$ in GMU 15A; $n = 9$ in GMU 15B) and 20 male calves ($n = 9$ in GMU 15A; $n = 11$ in GMU 15B). Parturition surveys were flown from early May through the middle of June 2021, which provided estimates of parturition rates (GMU 15A: 87%; GMU 15B: 63%) and twinning rates (GMU 15A: 47%; GMU 15B: 43%). We had 1 capture related mortality of an adult cows during November 2020 captures, and 2 capture mortalities in the spring of 2020 of 10-month-old calves, however one calf died within 18 days of capture and cause of death more than likely was related to nutritional condition. We also investigated 24 additional mortalities over the last year. Most were during winter and early spring and were due to predation by wolves ($n = 13$) and brown bears ($n = 4$); however, 5 deaths we could not determine cause of death, those in late winter could be due to poor nutrition with the deep snow conditions. Additionally, two collared moose were roadkill.

III. SIGNIFICANT DEVELOPMENT REPORTS AND/OR AMENDMENTS.

Not applicable.

IV. PUBLICATIONS

Three habitat enhancement projects in the Anchor River Fritz Creek CHA, article in the Homer News 2/25/2021.

<https://www.homernews.com/news/three-projects-on-southern-kenai-peninsula-aim-to-benefit-moose-habitat/>

The 2020 Field Report from vegetation surveys in the Funny River Fire area is yet in draft form to be published as a white paper in 2021 with a formal publication to follow that correlates vegetation data with moose location research funded by this grant and AKW-5.

Thompson et al. 2021. Behaviour influences thermoregulation of boreal moose during the warm season. Conservation Physiology 9:1–12

V. RECOMMENDATIONS FOR THIS PROJECT

Continuation of the existing partnerships will support benefits to moose habitat and research on moose populations, productivity, and eventually availability of this game species in response to wildland fire. The partnerships developed during this grant's lifecycle are expected to continue into the future as trust has been established among agencies and native landowners across the Peninsula. Developing a long-term vision of habitat, forest, and fire management is the goal of ADF&G as wildlife management supports the hunting and subsistence needs of residents. ADF&G intends to pursue increased management of habitat within its own land ownerships.

Kiosks at all project sites are in progress for development to be installed in spring of 2022.

Regarding the interagency meetings on the Kenai Peninsula, at the fall 2021 [Kenai Peninsula Borough's Community Wildfire Protection Planning \(KPB CWPP\)](#) core team meeting, Rodman commented on the Resilient Landscapes portion of our guiding principles. During the re-write of the [ALAH Action Plan](#) and now for the Kenai Peninsula Borough's CWPP planning sessions, Rodman promotes the concept of resilient landscapes. Since we model both of these efforts after the [Cohesive Strategy](#), that one of the three guiding principles applies to ADF&G and wildlife habitat enhancement. For reference, the other two principles are Fire Adapted Communities and Wildfire Response. The conversation always stops however at fuel breaks. Collectively, we have not explored how to make the forest resilient. Using other references as a guide, Rodman wrote in the ALAH Action Plan, that this means a mosaic of cover types that can absorb and heal from perturbations like spruce beetles and wildfire while also limiting the extent of those events - at least to a degree beyond what exists currently. ADF&G encourages the interagency community to think beyond fuel breaks. It is not ADF&G's mission to put prescribed fire on the ground, but rather to maintain stable moose populations over time which need early seral stage forests for forage mixed in with mature stands for cover. Prescribed fire happens to be one tool to achieve this. An option here is to use smaller prescribed burns after a fuel break is 'installed' to mix up

the species composition and age classes across the landscape over time. Since all of the agencies are limited on staff, capacity, expertise, and risk aversion are dominating reasons why prescribed fire enjoys little success in Alaska. With a new stream of federal funding coming to agencies in the next year to mitigate hazardous fuels and the re-establishment of the AWFCG Fuels Committee, there may be opportunities to advance application of prescribed fire toward the vision of resilient landscapes by expanding the fuel break concept into the greater forested landscape.

With much of GMU 15A and B burned in the last 7 years, we are gaining ground with respect to habitat and resilience as regenerating forests again establish pioneer species on the landscape. State Forestry and the Refuge however still have a huge fuel load to manage around Homer and Nikiski. ADF&G can be a value adding partner on ADF&G lands and the Ridgeway Extension (Sterling) fuel break. Incorporating prescribed fire into these projects could happen with agency coordination and appropriate funding.

Prepared by: Sue Rodman, Mary Jo Hill, Miles Spathelf, and Dan Thompson

Date: December 14, 2021