

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, 2019 - June 30, 2020; year 4 of a 6-year grant

REPORT DUE DATE: Submit FAC September 28, 2020

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:

Objective 1 was modified in Amendment #1, approved 03/05/2020 by USFWS WSFR, to continue working on fuel breaks as the partnership of agencies on the Kenai Peninsula collaborated with one another and landowners were interested in this effort. Chugachmiut's Yukon Fire Crew resumed work on lands owned by the Kenai Natives Association (KNA) in the neighborhood of the Robinson Loop Road and Swanson River Road where hazardous fuels mitigation supported the fuel break to protect Sterling along this stretch. Further, ADF&G staff support the Kenai Peninsula Borough's update to the Community Wildfire Protection Plans (CWPPs) through contributions at interagency meetings and will attend local meetings when public gatherings again resume. ADF&G formalized a partnership with the Homer Soil & Water Conservation District (HSWCD) to deliver direct habitat enhancement treatments and fuel breaks

on the landscape; this effort applies mostly to objective 2 but allows for the option to serve this objective with fuel breaks.

Chugachmiut's Yukon Fire Crew did treat hazardous fuels on a parcel owned by the Kenai Peninsula Borough at the northwestern corner of the Refuge. Each of these contributions to mitigating wildland fire hazard support wildlife habitat while protecting the community. As spruce beetle killed trees are processed, openings in the forest allow for regeneration of hardwood trees and shrubs that provide food and cover for mammals and birds alike.

Extending the fuel break beyond the Swanson River toward Point Possession is currently on hold; the remainder of this grant will be devoted to direct habitat treatments where the forest stand structure would best result in moose habitat through mechanized operations. At the time of ADF&G's agreement with HSWCD, State Forestry had secured funding to continue mitigating hazardous fuels statewide. With that obligation and opportunity, they directed their efforts toward fuel breaks and ADF&G will focus on habitat treatments for the Kenai Peninsula. These complementary activities will serve the community and wildlife well.

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

ACCOMPLISHMENTS:

Amendment #1 adjusted the focus of Objective 2 toward mechanical treatments to benefit wildlife habitat. By September 2019, the Swan Lake fire burned 167,182 acres across the Kenai NWR and the Chugach National Forest. No further prescribed fires are being planned on the Kenai Peninsula by the Refuge or other agencies at this time.

In October 2019, staff visited areas where winter habitat enhancement is desired on state land by ADF&G wildlife management biologists in GMU 15C. These maps and preliminary habitat evaluations were then submitted to HSWCD in May of 2020 for final treatment site selection and implementation under their contract.

In March 2020, WHESAP staff met with Homer SWCD to initiate the project. Staff provides Homer SWCD input on proposed mechanical treatments and help ensure questions on habitat priorities or potential are addressed through weekly meetings.

Also in March 2020, ADF&G met with KNA to discuss mechanical treatments on three of their parcels in GMU 15A. In April and May 2020, ADF&G evaluated these parcels, determining that two of the three had potential to enhance winter moose browse. A preliminary proposal with potential treatment units and methods was submitted to KNA. This proposal was shared with Homer SWCD for follow up site consideration and treatment implementation.

Lands within the Anchor River – Fritz Creek Critical Habitat Area were also selected for treatment. With the common management goal of improving habitat for wildlife, implementation of this grant supports the ADF&G Refuge system.

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 2019 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; 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 – 2019, and spring of 2017 – 2018, and 2020. Rump fat depths were similar between GMU 15A and 15B through 2017; however, moose in GMU 15B had more rump fat than those in GMU 15A during the spring of 2018. In the autumn of 2018 through the spring of 2020, rump fat was again similar between both populations.

Parturition surveys were completed in 2017 - 2020. 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 (70-76%). 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 the last 3 years.

During March of 2018 (n = 27), 2019 (n = 30), and 2020 (n=30) 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), and 2020. Additionally, we deployed GPS collars on male calves in 2020 (n=15).

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, we have not yet evaluated how vegetation response there may correlate to moose movement in that area. 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.

After the US Forest Service completed the [Kenai Peninsula Existing Vegetation Map](#) (KPEVM) in December 2018, ADF&G reviewed the final product to determine if the objective to use the map for assessing moose habitat preferences, as well as correlate moose condition with their habitat, in GMU 15A & B was met. Much of GMU 15B burned in the 196,610-acre Funny River fire, where moose movement and body condition assessments are being recorded through GPS collars and annual recapture efforts funded by AKW-5. 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. ADF&G decided to conduct its own vegetation sampling within the Funny River fire area. Staff planned a field survey to collect vegetation composition and browse characteristics within the KPEVM dominance classes that correlated to recorded summer moose locations. The field work was implemented in July 2020 with data to be analyzed in the following winter.

To collect data in the 2014 Funny River Fire and the 2019 Swan Lake Fire, Spathelf and Hill designed and implemented a digital data collection application, with additional input from Rodman, to facilitate vegetation plot sampling. In December 2019, Hill and Spathelf attended FEAT / FIREMON Integrated (FFI) training provided by Fire Research And Management Exchange System (FRAMES) for storage, analysis, and data sharing of collected vegetation plot data. In conjunction with additional ADF&G GIS staff, work continues to adapt FFI's database schema to integrate with our Survey123 vegetation data collection application to reduce time spent transitioning data from one platform to the other. The actual data collection occurred in FY21 and will be reported on next year.

Nutritional quality and quantity sampling in GMU 15A began in June 2020 within the 2019 Swan Lake burned area. Road based sampling sites were established in four paired burned and unburned sites by forest type, yielding eight sites. The sites will be sampled again in July, August, and late fall. Each site has a permanent vegetation plot that was installed in July 2020 to annually monitor vegetation characteristics.

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. 2020 Hot days in the boreal forest: behavior influences thermoregulation in Alaskan moose during the summer. Submitted to Journal of Thermal Biology).

II. SUMMARY OF WORK COMPLETED ON PROJECT TO DATE.

The work completed in AKW-16 reflects the changing environment in which we work: maturation of agency relationship, impacts of natural wildland fires on how we do business and plan for future projects, and opportunities that arise from perturbations and new relationships across agencies and landscape features.

Working with the Homer Soil & Water Conservation District will help considerably in implementation of habitat enhancement projects on the ground. The complexity of land ownership and moose habitat on the Kenai Peninsula required focused attention on developing treatments that would complement the surrounding land uses and that could be administered by local staff.

In November 2019 we recaptured 23 adult female moose for body condition assessment and to draw blood for pregnancy status. Mean rump fat of adult cows in November was not different ($t_{21} = -1.02$, $P = 0.318$) between GMU 15A ($3.0 \text{ cm} \pm 1.2 \text{ SD}$) than GMU 15B ($3.6 \text{ cm} \pm 1.9 \text{ SD}$). In March 2020 we successfully recaptured 20 moose for body condition assessment and captured 20 new moose to supplement adult sample size due to the older age structure of the collared population. Mean rump fat of adult cows in March 2020 was not different ($t_{38} = -0.36$, $P = 0.723$) between GMU 15A ($1.5 \text{ cm} \pm 0.7 \text{ SD}$) than GMU 15B ($1.6 \text{ cm} \pm 1.0 \text{ SD}$). We captured 30 calves during March 2020 (GMU 15A: $n = 14$; GMU 15B: $n = 16$) and weighed them. Weights of 10-month old calves were slightly higher in GMU 15A ($193.0 \text{ kg} \pm 20.2 \text{ SD}$) than GMU 15B ($179.6 \text{ kg} \pm 17.5 \text{ SD}$), but not statically different with simple t-test analysis ($t_{28} = 1.95$, $P = 0.062$). In addition, we deployed expandable GPS collars on 15 female calves ($n = 7$ in GMU 15A; $n = 8$ in GMU 15B) and 15 male calves ($n = 7$ in GMU 15A; $n = 8$ in GMU 15B). Parturition surveys were flown from early May through the middle of June 2019, which provided estimates of parturition rates (GMU 15A: 91%; GMU 15B: 70%) and twinning rates (GMU 15A: 37%; GMU 15B: 42%). We had 2 capture related mortalities in adult cows during November 2019 captures, most likely due to low snow conditions and older animals. We also had 2 capture mortalities in the spring of 2020, one was a 10-month-old bull calf, while the other was an adult cow. We also investigated 17 additional mortalities. Most were during winter and early spring and were due to predation by wolves or brown bears; however, a 3 to 4 deaths appeared to be due to poor nutrition in later winter, including 2 bull calves.

III. SIGNIFICANT DEVELOPMENT REPORTS AND/OR AMENDMENTS.

Amendment #1 to this grant allows for the admission of complexity in implementing this project. Applying prescribed fire on the landscape always involves a partnership of agencies and stakeholders, and support to another agency (in this case the USFWS), to burn their lands involves much more planning because of the federal land ownership. That said, implications of wildland fire on the landscape dramatically change the sentiment of the land managers, public stakeholders, and policy makers.

IV. PUBLICATIONS

The Kenai NWR produced a story map of the 2019 Swan Lake Fire at <https://www.arcgis.com/apps/MapSeries/index.html?appid=8ab1e7c87c294afb90c101cc4ca38e41>. This interagency effort provides many details of the fire itself along with ecological and social implications of a fire this large on a landscape filled with values enjoyed every day by local residents and tourists alike. The ecological benefits will be weighed against the social and economic consequences for years to come and will certainly influence future fire management as well as any plans for use of prescribed fire in the vicinity.

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.

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

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