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-R-4-2019

PROJECT NUMBER: P2.0

PROJECT TITLE: CIP15 Intensive Management of Moose and Wolf Populations in Alaska, Region 2, Unit 15C

PERIOD OF PERFORMANCE: October 1, 2018 to June 30, 2019

REPORT DUE DATE: September 28, 2019

PRINCIPAL INVESTIGATOR: David Saalfeld, Jeff Selinger, and Jason Herreman

COOPERATORS: Cynthia Wardlow

Authorities: 2 CFR 200.328
2 CFR 200.301
50 CFR 80.90

I. SUMMARY OF WORK COMPLETED ON PROJECT

OBJECTIVE 1: Monitor forage abundance and utilization to evaluate browse abundance for moose and the habitat's capacity to support additional moose on the landscape in Unit 15C.

ACCOMPLISHMENTS:

FY2016 - 39 sites were sampled using the Seaton browse removal method and plants were dried to create species mass curves. Feces were collected at each site for microhistology/nutrient analysis.

FY2017 - 40 sites were sampled using the Seaton browse removal method, with feces collected at each site for microhistology/nutrient analysis. Additional plants were dried to improve mass curves for species with minimal numbers of plants sampled in 2016 and voucher specimens pressed, dried, and mounted for all major species.

FY2018 - 41 sites were sampled in the spring using the Seaton browse removal method and feces were collected at each site for microhistology/nutrient analysis. Samples of major browse species were also collected at these sights for nutrient analysis. Summer moose fecal samples were collected across Unit 15C for microhistology and nutrient analysis.

FY2019 – Nutrient analysis of browse and fecal samples and microhistology of fecal samples were completed by Washington State's lab. Results of these analyses were delivered to ADFG in June 2019.

OBJECTIVE 2: Monitor wolf abundance and demographics in Unit 15C using GPS collars.

ACCOMPLISHMENTS:

During the current period of performance (FY19), 9 wolves (2 females and 7 males) were captured in the 15C IM area. However, during this project (FY17 – FY19), 33 wolves (13 females and 20 males) have been collared in the 15C IM area. Flights have been conducted bi-monthly throughout the winter (FY17 – FY19) to identify number of packs and pack size.

FY17 – During February and March 2017, we captured and collared 18 wolves in Unit 15C to aid in wolf abundance monitoring. Preliminary late winter data from collared individuals suggest ≥ 30 wolves comprising 4 – 5 packs within the 15C IM area. Further flights were planned to improve estimates of wolf abundance and pack dynamics in Unit 15C.

FY18 – During February and March 2018, 6 additional wolves were captured and collared in 15C to supplement the 18 wolves collared in 2017. Preliminary data from collared individuals suggest ≥ 5 packs within the Unit 15C IM area. Additionally, preliminary data based on flights (i.e., data based on 10 complete flights where at least some members of each collared pack were observed) estimates an average minimum count of 31 wolves (range 23 – 36 individuals) within the 15C IM area. Further flights throughout the year have been planned to improve estimates of wolf abundance and pack dynamics in Unit 15C.

FY19 – During February and March 2019, 9 additional wolves were captured and collared in 15C to supplement the 24 wolves collared in 2017 – 2018. Preliminary data that considers flights conducted from FY17 – FY19 and collared individuals, suggest ≤ 4 packs within the Unit 15C IM area. Additionally, preliminary data based on flights (i.e., data based on 11 complete flights where at least some members of each collared pack were observed) estimates an average minimum count of ~35 wolves (range 25 – 45 individuals) within the 15C IM area.

SIGNIFICANT DEVELOPMENT REPORTS AND/OR AMENDMENTS.

OBJECTIVE 1: Monitor forage abundance and utilization to evaluate browse abundance for moose and the habitat's capacity to support additional moose on the landscape in Unit 15C.

Browse surveys were conducted to evaluate winter forage availability in Unit 15C to determine if the intensive management objectives are attainable and whether or not the moose population can be maintained at the current population size. Measurement of winter

forage availability and utilization in Unit 15C began in spring of 2016 and continued in 2017 and 2018. Protocols follow those established in Paragi et al. (2008) and Seaton et al. (2011). Survey design estimates current annual growth of forage species and the amount removed each year as an index of forage availability.

FY2016 - 39 sites were sampled using the Seaton browse removal method and plants were dried to create species mass curves. Feces were collected at each site for microhistology/nutrient analysis.

FY2017 - 40 sites were sampled using the Seaton browse removal method, with feces collected at each site for microhistology/nutrient analysis. Additional plants were dried to improve mass curves for species with minimal numbers of plants sampled in 2016 and voucher specimens pressed, dried, and mounted for all major species. During summer 2017 a collaborative effort, not under this grant, with the Kenai National Wildlife Refuge, Chugach National Forest, and Kenai Fjords National Park was launched to map and quantify habitat types on the Kenai Peninsula using fine-resolution digital photography and ground truthed vegetation plots. As part of this effort ground truthed plots were classified by dominance class (coniferous forest, broadleaf forest, mixed forest, shrub, herbaceous, non-vascular, or non-vegetated), overstory vegetative composition, understory vegetative composition, and tree cover diameter. Samples of major forage species were collected for nutritional analysis and moose fecal samples were collected for microhistology and nutrient analysis at sites visited in unit 15C.

FY2018 - 41 sites were sampled in the spring using the Seaton browse removal method and feces were collected at each site for microhistology/nutrient analysis. Samples of major browse species were also collected at these sights for nutrient analysis. Summer moose fecal samples were collected across Unit 15C for microhistology and nutrient analysis.

FY2019 – Nutrient analysis of browse and fecal samples and microhistology of fecal samples were sent to Washington State's lab. Analyses were completed by Washington State's lab and results delivered to ADFG in June 2019. Currently, we are analyzing data from these tests and preparing of a report detailing the results from this objective.

OBJECTIVE 2: Monitor wolf abundance and demographics in Unit 15C using radio collars.

During this project, 33 wolves (13 females and 20 males) have been collared in the Unit 15C IM area. Flights have been conducted bi-monthly throughout the winter (FY17 – FY19) to identify number of packs and pack size. So far, data from flights and collars have identified ≤ 4 packs. Preliminary data based on flights (2 flights in FY17, 10 flights in FY18, and 11 in FY19) estimate an average minimum count of ~35 wolves (range 25 – 45 individuals) within the Unit 15C IM area. Ten other flights were attempted, but due to poor weather conditions reducing visibility were not included in the minimum count estimates.

Wolf home range and movement estimates cannot be calculated at this time due to most collars not scheduled to be released until May 2021. When collars are recovered, we will estimate home range and movements using a combination of minimum convex polygon,

fixed kernel, or Brownian Bridge, survival rates using Cormack-Jolly-Seber models, population size, and dispersal of wolves in GMU 15C IM area.

II. PUBLICATIONS

Annual Report to the Alaska Board of Game on Intensive Management for Moose with Wolf Predation Control in Game Management Unit 15A.

III. REVIEW OF PRIOR RESEARCH AND STUDIES IN PROGRESS ON THE PROBLEM OR NEED

Field work for monitoring forage abundance and utilization to evaluate browse abundance and quality was completed during FY16 – FY18; however, results were not available in June 2019. Because samples are sent for analyses outside the department, the data from these samples was not available during this reporting period. We have recently received the results of these analyses and are now in the process of analyzing the data and report preparation.

Wolf population dynamics shift over short temporal periods, as such 3 years of data is inadequate to provide accurate estimates of number of packs and minimum population size. Additionally, wolves collared during this project are not scheduled to remotely release their collars until May 31, 2021. In order to take advantage of existing collars and provide a better estimate of number of packs and minimum population size, we initiated a longer-term project starting in FY2019 (AKW-R-7-2019 P1.0) to address these issues.

Prepared by: David Saalfeld
Date: 9/3/2019

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Alaska Department of Fish and Game
Wildlife Restoration Grant

GRANT NUMBER: AKW-R-4-2019

PROJECT NUMBER : 3.0

PROJECT TITLE: Intensive Management of Moose in Alaska, Game Management Units 20A, 20B, and 20D.

PERIOD OF PERFORMANCE: 1 October 2018 – 30 June 2019

REPORT DUE DATE: September 28, 2019

PRINCIPAL INVESTIGATOR: Bob Schmidt

COOPERATORS:

I. PROGRESS ON PROJECT OBJECTIVES DURING PERIOD OF PERFORMANCE

OBJECTIVE 1: Monitor moose nutritional status by assessing the weights of short-yearlings in GMUs 20A, 20B, and 20D. Moose nutritional status will be monitored in Units 20A, 20B, and 20D using short-yearling mass as an index of the nutritional condition of the moose population. The mass of short-yearlings after population reduction aided by liberal antlerless harvest will be compared to the mass of short-yearlings weighed during 1997–2003 (before liberal antlerless harvest and population reduction) and to the 385-pound threshold identified to substantiate low twinning-based nutritional status (Boertje et al. 2007).

ACCOMPLISHMENTS: During 20–24 February, we captured and weighed 47 short-yearling females in Unit 20D. This required 48 hours of fixed-wing and 20 hours of helicopter flight time and 4 staff members. Skies were clear with calm winds and temperatures in the mid-20s.

Intensive management (IM) activities focused on Unit 20D, as there were many other projects that required biologists time. Additionally, limited availability of qualified helicopter and fixed-wing contract pilots and aircraft that were in high demand created a shortage of qualified individuals and equipment to conduct this highly-technical and dangerous work. We planned to capture more animals, but these were the only days the helicopter was available. We hope to capture more animals in FY2020.

OBJECTIVE 2: Monitor forage abundance and utilization (browse surveys) to evaluate browse abundance for moose and the habitat's capacity to support additional moose on the landscape in Units 20A, 20B, and 20D. Browse surveys will be conducted to evaluate forage

availability in Units 20A, 20B, and 20D to estimate browse production and removal. Survey design will estimate current annual growth of forage species and the amount removed each year as an index of forage availability. Results of these surveys are important factors in evaluating Intensive Management.

ACCOMPLISHMENTS: No browse surveys were conducted due to unavailability of qualified staff during the timeframe needed to conduct these labor-intensive ground surveys. We hope to conduct these surveys in FY2020.

OBJECTIVE 3: Analyze data and report Intensive Management (IM) findings to Board of Game. It is important to analyze data and document the findings to provide a record of Intensive Management activities for moose in these areas. Findings will be reported to the Alaska Board of Game, Fish & Game Advisory Committees, federal committees, and other interested publics.

ACCOMPLISHMENTS: During the report period, we prepared data to present to the Alaska Board of Game, Fish & Game Advisory Committees, federal committees, and other interested publics. However, data were not presented due to the small timeframe between data collection and the end of the report period. These data and findings will be presented to these entities during FY2020.

II. SUMMARY OF WORK COMPLETED ON PROJECT TO DATE.

During 20–24 February, we captured and weighed 47 short-yearling females in Unit 20D. This required 48 hours of fixed-wing and 20 hours of helicopter flight time and 4 staff members. Skies were clear with calm winds and temperatures in the mid-20s. Sample size is too small to compare to the mass of short-yearlings weighed during 1997–2003 (before liberal antlerless harvest and population reduction) or to the 385-pound threshold identified to substantiate low twinning-based nutritional status.

III. SIGNIFICANT DEVELOPMENT REPORTS AND/OR AMENDMENTS.

None.

IV. PUBLICATIONS

V. RECOMMENDATIONS FOR THIS PROJECT Because we were unable to attain the desired sample size for objective 1 due to helicopter constraints and the need to conduct this project during March when calves are the proper age to compare with other studies and when snow and other weather conditions are likely to be most conducive to successful capture. We recommend continued funding for this project in another grant to increase the sample size to make adequate comparisons and assessments. Additionally, we hope to conduct browse surveys

(objective 2) and will report our preliminary findings to the Alaska Board of Game, Fish and Game Advisory Committees, and the public (objective 3) in FY2020.

Prepared by: Doreen Parker McNeill

Date: September 1, 2019

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Alaska Department of Fish and Game
Wildlife Restoration Grant

GRANT NUMBER: AKW-R-4-2019 Region 4 Intensive Management CIP15

PROJECT NUMBER: 1.0

PROJECT TITLE: Intensive Management for Moose Calf Survival in GMU 9 – Region IV

PERIOD OF PERFORMANCE: July 1, 2018 – June 30, 2019

REPORT DUE DATE:

PRINCIPAL INVESTIGATOR: Todd A. Rinaldi, Regional Management Coordinator

COOPERATORS: Dave Crowley, King Salmon Area Biologist
Chris Peterson, King Salmon Assistant Area Biologist

Authorities: 2 CFR 200.328
2 CFR 200.301
50 CFR 80.90

I. SUMMARY OF WORK COMPLETED ON PROJECT

Objective 1: Estimate calf production, twinning, survival and causes of mortality using radio collars to determine if a) calf mortality can be reduced to meet IM population and/or harvest objectives or b) to evaluate the effects of the IM treatment.

Accomplishments:

Ten additional adult cow moose were captured and fitted with very high frequency (VHF, Mod-600) radio telemetry collars in March 2019 via helicopter darting. Three fixed-wing aircraft were used to search portions of Units 9B and 9C (approximately 8,500 mi^2) for potential captures. Body condition for each captured cow was assessed using Franzmann evaluation criteria (Franzmann 1977). Six cow moose scored 8 – 9, good to choice with evidence by feel of rump fat and no bony prominences in back and loin; two cows scored 7.5, average with no evidence of rump fat and some bony prominences in back and loin but well fleshed; and two scored 4, moderate with obvious definition of neck and shoulder, upper foreleg musculature distinct and prominent rib cage. The proportion of cows (20%) with moderate scores correlated with a general aerial condition assessment of all moose seen during the capture work. No biological samples were taken. The 10 additional captures and adoption of seven collared cows from the

Becharof National Wildlife Refuge (Refuge) resulted in a total of 35 collared cows available for calf mortality and twinning rate assessment compared to 20 collars last year. Cost of monitoring the additional collars was partially offset by a Refuge pilot assisting with the monitoring. The larger sample size contributed to the success of the project during this third and final year. Cost of the captures was $22,375 including fuel. There was a cost savings associated with conducting moose captures along with caribou captures using the same aircraft.

Twinning rate is an index for nutritional body and habitat condition. Thirty-eight adult female moose were monitored during May–June 2019 using fixed-wing aircraft and classified based on the number of calves-at-heel. From that sample, a twinning rate was successfully calculated as the percentage of cows that twin calves in proportion of the total number of cows with calves. Twinning rate was high (69%), similar to the previous two years.

In addition to twinning rate, 55 calves born to 35 cows were monitored for neonatal (first two weeks of life) and monthly survival rate with daily flights in May–June 2019. Presence of yearlings with collared cows were recorded to determine annual survival rate of calves from the previous reporting period. Survival rates were calculated by month, season, and year as the number of calves that survive in proportion to those born. When possible, mortality sites were investigated on the ground to determine cause of death , however only one of these was accessible during this reporting period. Twenty-two calves survived the neonatal period (41.5%). Staff flew 25 days (172 hours) and used 1,466 gallons of fuel (about 59 gallons per day) for flying twinning and calf survival surveys at a cost of $18,429.

Survival rates for month, season and year have not yet been calculated for this reporting period, but we know from previous years that annual calf survival is low, brown bear predation is likely the largest source of calf mortality and therefore our intensive management programs that would target wolves probably do not adequately benefit moose calf survival enough to affect a change in the moose population.

Objective 2: Determine seasonal movements and survival of adult moose survival rates using radio collars.

Accomplishments: Thirty-eight radiocollared adult cow moose were tracked in October 2018, and March, May and June of 2019 during the course of other field work including moose composition surveys, moose captures and calf survival monitoring. Location and movement data were mapped using ArcGIS (ESRI, Redlands, CA). Annual survival rates of adult moose were calculated from previous reporting periods. Adult female survival of the 2018 moose to May 2019 was high (91%) based on 34 moose. Three cows died of unknown causes during the reporting period. As in 2017, we did not find three collared cows and we believe they migrated out of Unit 9 into Unit 17. The cost of locating radiocollared moose and retrieving 7 collars from dead moose in October 2019 was $3,853. There was a large cost savings associated with completing this portion of the project during moose composition surveys, maximizing how aircraft were used (*see* Significant Developments)

II. SIGNIFICANT DEVELOPMENT REPORTS AND/OR AMENDMENTS.

This grant award of $60,000 was allocated for the project during this reporting period however only $45,189 was spent. Several operations of this project were completed at less cost than anticipated by sharing resources, mainly aircraft-related, with other projects that are routinely completed each year. Scheduling projects to run concurrently or consecutively saved many hours of aircraft transit time from Anchorage and Palmer, as well as transit time throughout the 8,500 mi^2 study area on the Alaska Peninsula. Having the assistance of a Refuge pilot in King Salmon also contributed considerably to cost savings during the calf monitoring period.

III. PUBLICATIONS

In progress.

IV. REVIEW OF PRIOR RESEARCH AND STUDIES IN PROGRESS ON THE PROBLEM OR NEED

History of moose colonization, management and harvest in Unit 9 is available in our 2015 Moose Management Report and Plan:

http://www.adfg.alaska.gov/static/research/wildlife/speciesmanagementreports/pdfs/moose_2015_2020_smr_gmu_9.pdf

Prepared by: Dave Crowley, King Salmon Are Biologist

Christine Peterson, King Salmon Assistant Area Biologist

Date: 9/1/2019