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-7

PROJECT NUMBER: 2.0

PROJECT TITLE: Statewide Intensive Management for Moose Populations Identified as Important for Providing High Levels of Harvest for Human Consumptive Use and Predators Influencing Moose Population Status.

PERIOD OF PERFORMANCE: April 1, 2015 – March 31, 2018 (amended end date)

REPORT DUE DATE: Submit to Coordinator August 24, 2018; due to FAC Sept 1, 2018

PRINCIPAL INVESTIGATOR: Todd A. Rinaldi

COOPERATORS: David Crowley, Tim Peltier and Frank Robbins

Authorities: 2 CFR 200.328
2 CFR 200.301
50 CFR 80.90

I. SUMMARY OF WORK COMPLETED ON PROJECT

Objective 1: Conduct more frequent and more robust surveys to estimate the population size and composition (bulls, cows and calves) of moose to evaluate if IM treatments are successful in Units 13 and 16.

Principle investigators (PIs) will conduct more frequent and robust (with sightability estimates) moose surveys to evaluate the effects of IM treatments in Units 13 and 16 where predator control has been previously conducted. Wherever it is feasible to do so, these surveys will normally be conducted using techniques described in the GeoSpatial Survey Operations Manual (GSPE; Kellie and DeLong, 2006).

Accomplishments:

Unit 13

A Geospatial Population Estimator (GSPE) estimate of moose abundance was conducted in Unit 13B during the fall/winter of 2015. The survey area was stratified through use of

a C-185 over two calendar days and 11.7 hours of flight time. The survey was flown using a variable number of Super Cub and pilot-observer teams (4–6), due to limitations on pilot availability and was interrupted by several periods of un-flyable weather (mainly fog). Due to the size of the unit and the desire to sample at a relatively high intensity, Unit 13B was split into two surveys with the Denali Highway roughly forming a dividing line. The southern survey area consisted of 297 sample units and the northern survey area consisted of 229 sample units, for a total of 526 sample units (3,189.4 mi^2 of area). The survey was conducted during late November and early December with good ground snow coverage. The southern portion was surveyed in its entirety, but the northern portion was only 60% complete before deteriorating weather, short daylight and a decaying stratification ended the survey. The survey was conducted over five days, and survey time totaled 134.3 hours.

A lack of suitable survey conditions (i.e., snow cover, flying conditions) precluded the completion of a GSPE in Unit 13 during the fall of 2016 and 2017; however, aerial moose composition surveys were conducted with fixed-wing aircraft (Super Cubs) during the fall of 2017 to document sex and age composition and population trends in large count areas (CA) in Units 13A, 13B and 13C. Each CA was flown by a contract pilot and an ADF&G employee as observer recording data and notes. The experienced pilot /observer teams flew transects within each CA at 70–80 mph at 300–800 ft. above ground level searching for moose. Each moose observation was recorded, along with age (calf, yearling bull, adult), antler observations (spike/fork, <50", >50"), survey flight times, and survey condition data. Flight paths and waypoints for each moose observation were recorded on Global Positioning System (GPS) units and saved in electronic files for each survey. Total survey time for all CAs was 91.8 hours.

Unit 16

No work was completed on this objective between April of 2015 and the fall of 2017 due to a lack of suitable conditions for conducting moose surveys.

GSPE surveys of Unit 16A, 16B-South and 16B-Middle were completed in the fall of 2017 and winter of 2018 under AK-23 1.0 *The Status of Alaska Moose and Factors Influencing Their Populations in Region IV.*

Objective 2: Does not pertain to Region IV.

Objective 3: Estimate adult moose survival rates using radio collars to evaluate the effects of the IM treatment.

A sample of radiocollared adult female moose will be maintained within Unit 9 to evaluate reproductive rates, adult survival, nutritional status, and to estimate calf survival. The PIs, along with other research and management staff will capture and radiocollar moose in November, March and June using a helicopter and standard capture techniques (Adams et al. 1989) and conduct monitoring flights from a fixed-wing aircraft.

Accomplishments:
Unit 9

2017

Twenty-four radio collars, visuals, and the necessary immobilizing chemicals were purchased ($16.6 k) for use on moose in February 2017. Moose (24) were captured in April 2017 using two fixed-wing aircraft and one helicopter. Cost of aircraft charters for captures was $21.0 k.

All adult cow moose survived from May 2017 to May 2018, although two departed the study area and one collar failed. Moose calves were monitored daily (weather permitting) beginning May 18, 2017 for the 1st two weeks of life, or until death if within the two-week neo-natal period. If cause of death was not obvious, some calf mortalities were interpreted from behavior of the cow, i.e., the cow moved 5–12 miles overnight and did not have calf(s) in the morning (unknown predator), or cow remained onsite but crossed a river and calf(s) disappeared (drowning likely). Site of mortality was assessed for presence of any remaining body parts, bones, hair, pattern of dispersal of remains, and presence of predator sign such as caching. Twenty calf mortalities occurred from May 2017 through May 2018, but most occurred during the neonatal period. Two mortalities were assessed from the ground.

Calves surviving the two-week period were then monitored monthly until it became apparent that forested habitat was too dense to enable visual sighting of calves despite hours spent in the attempts. The monthly search effort was then deemed too ineffective and inefficient to repeat. Monitoring calf survival was then scheduled for once in late fall-early winter when brown bears are mostly denned, and again in late winter-early spring prior to their emergence from dens. This partitioned monitoring of calf survival within periods likely to be individually dominated by brown bear predation, and wolf predation. All 22 monitoring flights were conducted from the air with a Super Cub, and pilot/observer team.

2018

Plans to capture 10 additional cow moose and deploy radio-collars was scheduled for April 2018. Shortly before captures were scheduled, daytime temperatures increased too much for safe capture of pregnant cows and was cancelled.

Monitoring of collared cows in 2018 began on May 12 with 21 of the original cows from 2017, and 16 additional collared cows we began monitoring in cooperation with Becharof National Wildlife Refuge staff. All cows survived through the end of the study period. Fifty-three moose calves were monitored daily (weather permitting) using the same methods above, with 27 surviving the neonatal period at which time the reporting period ended. Thirty-four cows and 53 calves were monitored over 28 flight during 2018 through the end of the reporting period.

We found that moose calf parturition began one week earlier than expected. Changing the starting date of cow monitoring from May 18 to May 12 resulted in observation 17 new-borne calves during the week of May 12–18 in 2018 and suggested that we missed observing some neo-natal calves in 2017.

High annual variation in calf survival from predation during 2017 versus 2018 warrants further study of calf survival in Unit 9.

Objective 4: Monitor moose nutritional status to evaluate the influence of nutrition on moose population's status.

Accomplishments:

Unit 9

We monitored nutritional status of moose based on three indicators: body condition of captured cows, pregnancy rate and twinning rate. Pregnancy rate was high (100% in 2017, 91% in 2018), as was twinning rate (56% in 2017, 68% in 2018); and body condition of 24 captures was reported as 21 cows in excellent condition and three in good condition. Pregnancy testing in 2017 for 22 cows cost $420.00. These indices suggest that moose nutritional status is excellent.

Unit 13

During the spring of 2018 a survey was conducted to sample browse utilization across all of Unit 13A. Prior to the survey Unit 13A was partitioned into 731 sample units averaging 6.2 sq. mi. Sample units were then stratified as low or high based on expected moose density. Units to be sampled were randomly determined (60% high expected, 40% low expected). Browse data were collected, as described by Seaton (2002) and Seaton et al. (2011), by two teams of biologists from April 3–April 56, 2018. A Robinson R-44 helicopter was used to access the area. Browse was sampled at 30 plots (seven additional plots had no browse, or no moose browse species).

Units were sampled by first flying to the southeast corner, then continuing on a northwest bearing until a safe landing zone was found. When a landing zone was found a random number and direction table was used to determine the distance and direction of the area to be sampled. Teams then flew the selected distance and direction and hovered over the area to determine the presence of moose browse within the plot. A digital photo of the center of the plot was then taken and a GPS waypoint. The pilot then landed as close as possible to the plot center, and teams navigated back to the plot center using a GPS.

Teams of two surveyed each 15-m radius plot by collecting a waypoint for the plot, recording slope, aspect, snow depth, and the presence or absence of bark stripping before tallying the number of individuals for each vegetative species located within the plot. Mean height was recorded for non-preferred species (i.e., spruce, alder, dwarf birch) as well as number of individual plants for each species that were broken or browsed. Number of individuals that were broken was recorded for preferred browse species and

three plants for each preferred species were randomly selected to be measured. Only plants with current annual growth (CAG) between 0.5 and 3.0 m above ground level were considered. For each randomly selected plant, 10 random twigs were selected and the diameter at the base of CAG was recorded, as well as the diameter at point of browsing, if applicable. The total number of CAG twigs between 0.5 m and 3.0 m above ground level were recorded for each of the three plants surveyed per species. For every browse plant surveyed, height, the relative amount of dead material on the plant, and the architecture of the plant as related to past browsing pressure was recorded also.

Seven plots were surveyed on April 3rd, nine plots on April 4th, nine plots on April 5th, and five plots were completed on April 6th for a total of 30 plots. Random plots were predominantly located in mixed-spruce habitat and *Salix pulcra* was the most common browse species encountered. Browse data will be analyzed to determine the proportional removal of browse biomass.

Unit 16

No work was completed on this objective during this reporting period due to higher priority tasks taking precedent during the time period when sampling of browse would have been accomplished. We intend to address this objective in a future grant.

Objective 5: Does not pertain to Region IV.

Objective 6: Investigate and monitor wolf, black bear and brown bear abundance relative to defined IM objectives.

Wolves will be marked with radio collars to estimate wolf population size and compare it to the intensive management objectives established to increase the moose population in Units 13 and 16.

Accomplishments:

Unit 13

Minimum wolf surveys were conducted in Units 13A, 13C, and 13E using Piper PA-18 fixed-wing aircraft and contract pilots experienced in identifying and following wolf tracks. An observer assisted in spotting wolves and wolf tracks, and recorded data and notes. Multiple aircraft were utilized to complete each survey area as quickly as possible to minimize the effects of movements.

13A

During January 24–28, 2018 one pilot/observer team surveyed the eastern portion of Unit 13A. A total of 26 wolves were directly observed, with pack sizes ranging from two to eight. The survey area was completed in 22.9 hours

A second pilot/observer team began surveying the western portion of Unit 13A on January 26, 2018, though deep snow and poor tracking conditions precluded a successful survey. A second attempt was launched February 16–18, 2018. Persistent winds throughout the survey period prevented further coverage in the southwest portion of the survey area, but conditions were otherwise excellent in the remainder of the survey area. A total of 10 wolves were directly observed, with pack sizes ranging from two to four. Survey time, including the aborted attempt on January 26 was 20.5 hours.

13C

Two pilot/observer teams began surveying Unit 13C on January 18, 2018 but ice fog delayed the survey attempt. Both teams did eventually take-off but were forced to land early due to increasing ice fog later in the day. Clouds, fog, and wind persisted preventing any further survey attempts until late January.

On January 26 and 27 a second attempt was made to survey Unit 13C by two pilot/observer teams. Conditions were excellent in the western half of the unit, however excessive winds in the eastern half of 13C resulted in wind-blown conditions, obscured tracks, and difficult flying. A total of 28 wolves were directly observed, with pack sizes ranging from three to eight. Including both attempts the survey area was completed in 30.3 hours.

13E

Four pilot/observer teams surveyed Unit 13E on February 16–17, 2018. A total of 74 wolves were directly observed, with pack sizes ranging from two to 21. Survey time was 53.3 hours.

Unit 16

This work was completed under AKW-23 P14.0 *The Status of Alaska Wolves and Factors Influencing Their Populations.*

II. SIGNIFICANT DEVELOPMENT REPORTS AND/OR AMENDMENTS.

Unit 9

We found that moose calf parturition began one week earlier than expected. Changing the starting date of cow monitoring from May 18 to May 12 resulted in observation 17 newborn calves during the week of May 12–18 in 2018 and suggested that we missed observing some neo-natal calves in 2017. High annual variation in calf survival from predation during 2017 versus 2018 warrants further study of calf survival in Unit 9.

Unit 13

This is the first time in several years that a GSPE was conducted for moose in Unit 13, and formalized minimum wolf counts were conducted across multiple subunits of Unit 13. Funding, staffing and weather/survey conditions have previously precluded past efforts.

USFWS approved an amendment to decrease the grant duration, ending the grant on June 30, 2018. After extensive investigation by DWC and USFWS staff into performance reporting and financial accounting of the 5-year AKW-7 Intensive Management award for projects Caribou 1.0, Moose 2.0, and Deer 3.0, it was determined it is in the State's best interest to cease work on and terminate the entire AKW-7 award, first Caribou on Dec. 1, 2017, and then moose and deer projects on June 30, 2018.

III. PUBLICATIONS

Crowley, D. W. 2017. Moose management report and plan, Game Management Unit 9: Report period 1 July 2010–30 June 2015 and plan period 1 July 2015–30 June 2020. Alaska Department of Fish and Game, Species Management Report and Plan ADF&G/DWC/SMR&P-2017-5, Juneau.

Brockman, C. J., and T. C. Peltier. 2018. Wolf management report and plan, Game Management Unit 16: Report period 1 July 2010–30 June 2015, and plan period 1 July 2015–30 June 2020. Alaska Department of Fish and Game, Species Management Report and Plan ADF&G/DWC/SMR&P-2018-24, Juneau.

Hatcher, H. L. 2018. Wolf management report and plan, Game Management Unit 13: Report period 1 July 2010–30 June 2015, and plan period 1 July 2015–30 June 2020. Alaska Department of Fish and Game, Species Management Report and Plan ADF&G/DWC/SMR&P-2018-26, Juneau.

Peltier, T. C. 2017. Moose management report and plan, Game Management Units 16A and 16B: Report period 1 July 2010–30 June 2015, and plan period 1 July 2015–30 June 2020. Alaska Department of Fish and Game, Species Management Report and Plan ADF&G/DWC/SMR&P-2017-7, Juneau.

Robbins, F. R. 2017. Moose management report and plan, Game Management Unit 13: Report period 1 July 2010–30 June 2015, and plan period 1 July 2015–30 June 2020. Alaska Department of Fish and Game, Species Management Report and Plan ADF&G/DWC/SMR&P-2017-X, *In Press*.

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

None

Prepared by: Todd A. Rinaldi

Date: 9/17/2018