

**Wildlife Restoration OPERATING GRANT  
FINAL 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-23

**PROJECT NUMBER :** P1.72

**PROJECT TITLE:** Identification of factors affecting calf production, calf survival, and survival of female adult moose in Game Management Unit 15C

**PERIOD OF PERFORMANCE:** July 1, 2011 – June 30, 2018

**REPORT DUE DATE:** Sept 1, 2018

**PRINCIPAL INVESTIGATOR:** Thomas McDonough

**COOPERATORS:**

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Authorities: 2 CFR 200.328  
2 CFR 200.301  
50 CFR 80.90

**I. PROGRESS ON PROJECT OBJECTIVES DURING PERIOD OF PERFORMANCE**

**OBJECTIVE 1:** Quantify pregnancy rates, parturition rates, and parturition dates of adult cow moose.

**ACCOMPLISHMENTS:** We were successful in completing this objective of the project for the given year. We captured 16 female moose November 2017 and 0 in Feb./March of 2018. Pregnancy rate was 79% as determined through blood testing. Parturition rates were 71% based on aerially monitoring cows daily during calving. Parturition dates were from 12May through 26June with a median parturition date of 21May. Parturition dates were determined through daily aerially monitoring. Similar data will be collected again in 2019. These data, along with those of the other objectives, are provided to ADFG wildlife managers to make critical decisions on management direction of this moose population. These data, outlined in all these objectives, has resulted in ADFG proposing important regulatory changes to this moose population, specifically adding additional harvest opportunities which is the ostensible goal of intensive management.

**OBJECTIVE 2:** Determine twinning rates of adult cow moose.

**ACCOMPLISHMENTS:** We were successful in completing this objective of the project for the given year. We conducted aerial surveys of radio collared cows during calving to

determine a twinning rate of 41%. Similar data will be collected again in 2019. These data, along with those of the other objectives, are provided to ADFG wildlife managers to make critical decisions on management direction of this moose population. These data, outlined in all these objectives, has resulted in ADFG proposing important regulatory changes to this moose population, specifically adding additional harvest opportunities which is the ostensible goal of intensive management.

**OBJECTIVE 3: Determine cow and calf mortality rates.**

**ACCOMPLISHMENTS:** We were successful in completing this objective of the project for the given year. Radio collared cows were aerially monitored daily during calving. Since getting a visual confirmation on calves after green-up is difficult, calf survival for spring of 2018 will be fully assessed in the fall when visual confirmations can be done. Annual cow and 10-month calf survival in 2017 was 96% and 31%, respectively. These data, along with those of the other objectives, are provided to ADFG wildlife managers to make critical decisions on management direction of this moose population. These data, outlined in all these objectives, has resulted in ADFG proposing important regulatory changes to this moose population, specifically adding additional harvest opportunities which is the ostensible goal of intensive management.

**OBJECTIVE 4: Determine seasonal movements of radio collared cows.**

**ACCOMPLISHMENTS:** We were successful in collecting data for this objective for the project for the given year, but formal and rigorous analysis of the data has yet to occur. While biologically of interest, there are analyses that directly apply to critical management decisions that are a priority over this objective. Periodic aerial telemetry flights of collared cows have occurred since initial collaring.

**OBJECTIVE 5: Assess nutritional condition of cow moose at the yearly peak and nadir.**

**ACCOMPLISHMENTS:** We were successful in completing this objective of the project for the fall but spring captures did not occur due to budget constraints. Mean rump fat of adult cows, which index body condition, assessed during Nov. 2017 was 4.0cm. Data for this goal over years of the project have been important at showing the cost of reproduction in moose. Along with other data outlined above, nutritional condition of cows indicates that this population is experiencing initial stages of nutritional stress and needs to be managed accordingly. This information has resulted in an ADFG proposal to change the hunting regulations for moose to provide more opportunity and to not grow the population.

## **II. SUMMARY OF WORK COMPLETED ON PROJECT TO DATE.**

Since the initiation of this ongoing project started in 2012-2018, twinning rate has averaged 37%, parturition rate has averaged 79%, fecundity has averaged 1.05 calves/cow, 39% of sampled moose in the fall had <13% body fat while <2% of sampled cows in the spring had <6% body fat in the spring, adult cow annual survival has averaged 90%, and 10-month calf survival has

averaged 28%. Calf survival appears to be negatively correlated with spring snow-depths. Adult cow movements appear to be constrained when spring snow-depths exceed 20 inches.

### **III. SIGNIFICANT DEVELOPMENT REPORTS AND/OR AMENDMENTS.**

All project goals/objectives are being met according to the planned timeframe. Project costs have been met according to planned budgets.

### **IV. PUBLICATIONS**

The following reports/publications have been accepted, submitted, or are close to being ready for submission.

Wilson, R. E., S. D. Farley, T. J. McDonough, S. L. Talbot, and P. S. Barboza. 2015. A genetic discontinuity in moose (*Alces alces*) in Alaska corresponds with fenced transportation infrastructure. *Conservation Genetics* 16:791-801.

Wilson, R. E., T. J. McDonough, P. S. Barboza, S. L. Talbot, and S. D. Farley. 2015. Population genetic structure of moose (*Alces alces*) of south-central Alaska. *Alces* 51:71-86.

Thompson, D. P., J. A. Crouse, T. J. McDonough, O. H. Badajos, J. Adsem, and P. S. Barboza. 2018. Vaginal implant transmitters for continuous body temperature measurement in moose. *Wildlife Society Bulletin* 42:321-327.

Thompson, D. P., P. S. Barboza, J. A. Crouse, T. J. McDonough, O. H. Badajos, and A. M. Herberg. In review. Body temperature patterns vary with pregnancy and condition in moose (*Alces alces*). *Journal of Comparative Physiology B*.

McDonough, T. J., J. A. Crouse, D. P. Thompson, B. W. Dale, and O. H. Badajos. In prep. An evaluation of short- and long-term impacts of vaginal implant transmitters in moose. *Wildlife Society Bulletin*.

### **V. RECOMMENDATIONS FOR THIS PROJECT**

We recommend this project continue through FY2020 as management guidance for this moose population continues to demand the information.

**Prepared by:** Thomas McDonough

**Date:** Sept. 1, 2018