

**Alaska Department of Fish and Game  
Wildlife Restoration Grant**

**GRANT NUMBER:** AKW-23 Wildlife Restoration FY2018

**PROJECT NUMBER :** 12.01

**PROJECT TITLE:** Mountain goat population dynamics in southeastern Alaska

**PERIOD OF PERFORMANCE:** 1 July 2010–30 June 2018

**REPORT DUE DATE:** 1 September 2018

**PRINCIPAL INVESTIGATOR:** Kevin S. White

**COOPERATORS:** Bureau Land Management, City of Sitka, Coeur Alaska, Glacier Bay National Park, U.S. Forest Service

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

**OBJECTIVE 1:** Capture and radiocollar a sample of mountain goats in each study area.

**ACCOMPLISHMENTS:** We captured and deployed GPS/VHF radio-collars on mountain goats in Lynn Canal (n = 8), Haines (n = 6) and Baranof Island (n = 8 during August 2017). All mountain goats were captured using helicopter darting methods. In addition, Kevin White participated in capture and handling of 16 mountain goats on the Kenai Peninsula, as part of a collaborative project funded by the USFWS.

**OBJECTIVE 2:** Annually estimate mountain goat population size and composition in each study area.

**ACCOMPLISHMENTS:** We conducted aerial surveys during September-October 2017 in order to estimate mountain goat population size and composition (Lynn Canal, n = 4; Haines, n = 4, Baranof, n = 3, Cleveland Peninsula, n = 0). During these surveys mountain goat sighting probabilities were estimated based on data collected from radio- marked mountain goats.

**OBJECTIVE 3A:** Monitor reproductive success of female mountain goats in each study area

**ACCOMPLISHMENTS:** We conducted aerial surveys in May-June 2018 (Lynn Canal, n = 2; Haines, n = 2; Baranof, n = 1; Cleveland Peninsula, n = 0) to determine kid status of radio-marked adult female mountain goats (Lynn Canal, n = 13; Haines, n = 10; Baranof, n = 7; Cleveland Peninsula, n = 0).

**OBJECTIVE 3B:** Monitor survival of adult female mountain goats in each study area.

**ACCOMPLISHMENTS:** We monitored survival of radio-marked mountain goats (Lynn Canal, n = 28; Haines, n = 24, Baranof, n = 33; Cleveland Peninsula, n = 0) via air-based radio-telemetry surveys and/or from examining GPS-telemetry data. During 2017–2018, we investigated 18 mortality events involving radio-marked mountain goats (Lynn Canal, n = 7; Haines, n = 3; Baranof, n = 8; Cleveland Peninsula, n = 0).

**OBJECTIVE 3C:** Monitor/estimate survival of mountain goat kids in each study area.

**ACCOMPLISHMENTS:** We conducted aerial surveys in May-June 2017 to determine kid status of radio-marked adult female mountain goats. We subsequently monitored these radio-marked females throughout the year to determine survival of their kids.

**OBJECTIVE 4:** Determine seasonal habitat selection patterns.

**ACCOMPLISHMENTS:** Data collected from all GPS radio-marked mountain goats were archived in a geospatial database. A two-stage resource selection function (RSF) modeling framework was developed and described in White et al. (2012). Further refinements to the modeling framework (i.e. computer programming) were conducted in 2017–2018. We conducted RSF analyses examining mountain goat resource selection patterns in the vicinity of the Kensington Mine (White and Gregovich 2016, White and Gregovich 2017). In addition we developed winter and summer RSF models in the Haines-Skagway area in order to inform land management decision making processes in the context of helicopter tourism regulation (White and Gregovich 2018).

**OBJECTIVE 5** Analyze data and prepare reports.

**ACCOMPLISHMENTS:** We prepared an annual progress report detailing activities conducted in Lynn Canal, as required by funding agreements with Coeur Alaska. We prepared a wildlife research report related to RSF modeling analyses in the Haines-Skagway area. We had two papers published in a peer-reviewed journals.

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

Since 2010, we have captured and handled 213 mountain goats in the Lynn Canal (n = 60), Haines (n = 77), Cleveland Peninsula (n = 13) and Baranof Island (n = 63) study areas. In each area, we have annually conducted aerial surveys to derive population estimates via mark-resight and sightability modeling techniques. In addition, we have monthly and seasonally monitored survival and reproduction of radio-collared mountain goats in order to derive estimates of survival and fecundity. Vital rate estimates (i.e. survival and reproduction) along with population estimates have enabled development of population models that can be used to project population

trajectories into the future and are used for research and management purposes (White et al. 2018). In addition, we have collected high resolution GPS location data from each radiocollared mountain goat in order to develop predictive habitat models in a remote sensing framework. These models have been used to inform land management decisions.

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

None

### **IV. PUBLICATIONS**

Lowrey, B., C. Butler, W. Edwards, M. Wood, S. Dewey, G. Fralick, J. Jennings-Gaines, H. Killion, D. McWhirter, H. Miyasaki, S. Stewart, K. S. White, P. White, and R. Garrott. (In Press). A survey of bacterial respiratory pathogens in native and introduced mountain goats. *Journal of Wildlife Diseases*.

White, K. S. 2018. Mountain goat population ecology and habitat use near the Kensington Mine, Alaska. Research progress report. Alaska Department of Fish and Game, Juneau, AK.

White, K. S., D. P. Gregovich. 2018. Mountain goat resource selection in the Haines-Skagway area: implications for helicopter skiing management. Research Final Report. Alaska Department of Fish and Game, Juneau, AK

White, K. S., D. P. Gregovich and T. Levi. 2018. Projecting the future of an alpine ungulate under climate change scenarios. *Global Change Biology*, 24: 1136-1149.

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

This project should be continued as described in the study plan and project statement.

**Prepared by:** Kevin White

**Date:** 1 September 2018