

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-B-R3-2020

PROJECT NUMBER: P3.53

PROJECT TITLE: Nutrition, mortality, range use, and demographics of the Fortymile and Central Arctic caribou herds

PERIOD OF PERFORMANCE: July 1, 2019 - June 30, 2021

PERFORMANCE YEAR: July 1, 2020 - June 30, 2021; year 2 of a 2-year grant

REPORT DUE DATE:

PRINCIPAL INVESTIGATOR: Torsten Bentzen, Wildlife Research Biologist, ADF&G

COOPERATORS: Jeff Gross, Jeff Wells and Beth Lenart (ADF&G), Jim Herriges (U.S. Bureau of Land Management), and Mike Suitor and Martin Kienzler (Dept. of Environment Yukon).

I. PROGRESS ON PROJECT OBJECTIVES DURING PERIOD OF PERFORMANCE

OBJECTIVE 1: Map expansion and changes in seasonal use of the FCH range to assist explaining how, when, and where overgrazing may adversely affect nutrition.

ACTIVITY 1: Maintain a sample of at least 50 GPS collared cows to model annual FCH demographics.

ACCOMPLISHMENTS: In October 2020, 25 adult female caribou were fitted with new GPS collars and an additional 14 were deployed in April 2021. During this report period 41 short yearling female caribou were captured and fitted with VHF collars to maintain a sample (>20) of collared three-year-old cows to monitor parturition rate. This major collaring effort has brought the current sample of collared FCH cows to 132 (49 GPS, 83 VHF).

ACTIVITY 2: Conduct radiotracking flights to assess range size and use and evaluate adult survival rates.

ACCOMPLISHMENTS: Comprehensive radio tracking flights were conducted in July, October and December 2020, and April, May, and June 2021 to assess range size and use and to estimate adult survival rates.

ACTIVITY 3: Collar adult bull caribou and evaluate distribution and survival.

ACCOMPLISHMENTS:

- 1) Seven adult bull caribou were captured during this report period. There are currently only 12 bulls with functioning GPS collars in the herd. Due to collar failures, bull survival could not be evaluated during May 15, 2020 to May 15, 2021. Preliminary analysis indicates substantial variation in bull survival rates between years with survival rates estimated between 68-86% during the two year interval, May 15, 2016-May 15, 2018.
- 2) During this report period we continued to evaluate distribution of bulls relative to collared cows during Fortymile photocensus based population estimates and composition surveys.

OBJECTIVE 2: Determine change in the long-term nutritional status of the FCH.

ACTIVITY 1: Reassess newborn calf mass as index of changing nutritional condition in the FCH.

ACCOMPLISHMENTS: We captured and weighed 63 newborn (≤ 3 days old) calves throughout the calving area during May 19–May 31 which spanned the peak of calving (May 24). Females averaged 14.83 lbs. (6.73kg) (range=12.0–19.5, $n=27$) which was below the long term average (2015-2019). The males averaged 16.72 lbs. (7.58 kg) (range=12.0–22.0, $n=36$).

ACTIVITY 2: Model FCH demographics

ACCOMPLISHMENTS: All collared cows 3-years-old or older were observed from the air daily during 13 May–31 May to determine parturition. Out of 85 cows observed during the 2021 parturition survey, 60 (70.6%) were parturient. Five (33.3%) of 15 three-year-old cows observed were parturient. Among 70 cows ≥ 4 years old, 55 (78.6%) were parturient.

OBJECTIVE 3: Examine calf survival in the FCH 2016-2023.

ACTIVITY 1: Determine timing and source of mortality relative to changes in herd status and predator abundance.

ACCOMPLISHMENTS:

- 1) 63 newborn calves (27 females and 36 males) were collared during May 19-May 31.
- 2) All calves were radiotracked daily during May 19-May 31. Eighteen (28%) calves died during this period. All kill sites were visited ≤ 4 hours of first detection of a mortality signal and cause of death determined. During this period, 13 calves were killed by wolves, 3 by grizzly bears, and 1 by a golden eagle. One calf died of exposure when it became stuck between large rocks. We did not observe any capture-related abandonment.

- 3) We radiotracked all collared calves 5 times (roughly once per week) in June. An additional 11 (17%) of the collared calves died by June 30. All kill sites were visited the same day they were observed and cause of death determined. Wolves continued to be the primary source of mortality.
- 4) In FY22, we will continue to radiotrack all calves weekly during July and August and visit kill sites.
- 5) Monthly radiotracking was scheduled during September 2020 –April 2021 and all kill sites were visited as soon as possible. Among the 111 calves collared in 2020, 68 (61%) were killed by predators, of which 38 were killed by wolves and 10 by grizzly bears. In addition, 5 collars were lost or failed prior to one year, 3 were killed by hunters, and 26 survived through 15 May 2021.

ACTIVITY 2: Determine perinatal mortality rate.

PROCEDURE: Daily radiotracking of all parturient cows until calves were collared 24-48 hours after birth allowed us to determine perinatal mortality rates among a sample of 60 collared cows that gave birth to a calf in 2021. Four cases of perinatal mortality were observed. Three were likely attributed to predation, the fourth died in birth.

OBJECTIVE 4: Reassess newborn calf weights and survival as index of changing nutritional condition in the Central Arctic herd (CAH).

ACTIVITY 1: Weigh newborn calves.

ACCOMPLISHMENTS: No Central Arctic Herd calves were captured in 2021

ACTIVITY 2: Assess early calf survival.

ACCOMPLISHMENTS: No collars were deployed on CAH neonates in 2021.

II. SUMMARY OF WORK COMPLETED ON PROJECT TO DATE.

OBJECTIVE 1: Seasonal range maps and core area estimates for the FCH starting during calving 2014 are being routinely updated and archived. We used both VHF and GPS collar data to best compare current movement, range size and density information to data collected during 1992-2008. Evaluation of long-term change in seasonal distribution and caribou density is ongoing and annual adult survival rates among all collared cows continue to be monitored. Preliminary analysis of bull collar data suggests that they were adequately included in groups of collared cows in all recent photocensuses and composition surveys. However, further study and additional years data are needed to fully address this issue.

OBJECTIVE 2: Based on annual data and logistic regression (generalized linear model) long term three-year-old parturition rates have declined since the 1990s (1994-2021, Slope on the logit scale = -0.082, $P = 0.003$, $SE = 0.025$, $n = 3-26$) but any decline in adult parturition rate based on annual data and logistic regression is not statistically significant over this time period (1994-2021, $P = 0.28$, sample size 30-93).

OBJECTIVE 3: Analysis of FCH calf survival data are ongoing. Calf survival has declined during this study from 54% in 2016, to 44% (2017), 33% (2018), 19% (2019) and 24% in 2020. Both the 2019 and 2020 calf survival rates were below the range of annual survival rates previously reported for this herd (1994-2003).

OBJECTIVE 4: No calf survival data has been collected on the CAH since 2018. No further analysis of CAH calf survival data was conducted during this report period.

III. SIGNIFICANT DEVELOPMENT REPORTS AND/OR AMENDMENTS.

As parts of Objective 2: Determine change in the long-term nutritional status of the FCH.

FCH fecal samples were systematically collected while conducting other work throughout the year. This substantially improved the distribution of sampling sites in the core portions of the range. Approximately ten samples were collected at each site and analyzed for diet content by Jim Herriges (BLM) using the Wildlife Habitat Nutrition Laboratory at Washington State University. These data provide baseline FCH diet information during both summer and winter and will allow a comparison to winter diet information collected during 1992-1996. We continue to collect samples and analysis of 2016-2021 samples is ongoing.

IV. PUBLICATIONS

None. All specific results in this report are preliminary and will be discussed in a larger context in a final report.

V. RECOMMENDATIONS FOR THIS PROJECT

If budget allows, I recommend continued deployment of 90 neonate collars in the Fortymile caribou herd in May 2022 and 2023 to improve power to detect changes in predator specific causes of mortality.

A summary of existing bull movement data across Alaskan caribou herds is needed. The current number of functioning GPS collars deployed on adult bull caribou in the FCH is inadequate to monitor either bull survival or movements. Bulls are a poorly understood component of herd dynamics and movements remain largely unexamined. Maintaining >20 GPS collars on bulls would allow for detailed spatial analysis of seasonal bull movements and distribution relative to cows and improve techniques for estimating herd size and composition. No additional bull collaring is planned at this time.

Additional cow collaring is needed to increase the sample of GPS collared cows up to the objective of 50. Increasing costs of aviation have reduced money available for purchase and maintenance of GPS collars on adult cows. Additional collar purchases and collaring will be needed in April 2022 to maintain an adequate sample.

Prepared by: Torsten Bentzen

Date: 24 August 2021