

**Alaska Department of Fish and Game
Division of Wildlife Conservation
July 1997**

Investigation of Regulating and Limiting Factors in the Delta Caribou Herd

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**Federal Aid in Wildlife Restoration
Research Progress Report
1 July 1996–30 June 1997**

**Grant W-24-5
Study 3.42**

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RESEARCH PROGRESS REPORT

STATE: Alaska **STUDY NO.:** 3.42

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GRANT NO.: W-24-5

STUDY TITLE: Investigation of Regulating and Limiting Factors in the Delta Caribou Herd

AUTHOR: Patrick Valkenburg

PERIOD: 1 July 1996-30 June 1997

SUMMARY

A final report for the previous 5 years work included all data collected through October 1996 and was completed in February 1997 (Valkenburg 1997). The project is scheduled to continue for another 5 years. The study objectives are to evaluate the influence of weather, density, food limitations, hunting, and predation on the population dynamics of the Delta Caribou Herd. We conducted fall composition counts in October on the Delta and most other Interior caribou herds. Fifteen female calves were collared from the Delta Herd. We also collected 15 female calves from the Nelchina and Northern Alaska Peninsula herds. In April 1997 we handled 15 female calves in the Delta Herd, collared 15 in the Nelchina Herd, and collected 10 each in the Nelchina and Northern Peninsula herds. We conducted a calf mortality study in the Delta Herd for the third year in a row. A census is scheduled for late June 1997. Results of fieldwork conducted in October were reported in Valkenburg (1997). Results of fieldwork from April through June 1997 have not been analyzed and will appear in the next progress report.

Key words: body condition, body weight, caribou, Delta Herd, Nelchina Herd, Northern Alaska Peninsula Herd, *Rangifer tarandus*.

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BACKGROUND

A continuing long-term population dynamics study of the Delta Caribou (*Rangifer tarandus*) Herd (DCH) began in 1979. Results of the first 11 years of research were presented in 8 progress reports, 2 final reports (each covering 5 years) (Davis and Valkenburg 1985, Davis et al. 1991), and numerous scientific papers (Davis et al. 1991). Predator-prey relationships and human harvest of moose (*Alces alces*), caribou, sheep (*Ovis dalli*), grizzly bears (*Ursus arctos*), and wolves (*Canis lupus*) within the range of the DCH were reviewed by Gasaway et al. (1983) and Boertje et al. (1996).

Since 1979 the DCH has gone through 4 growth phases. Herd size rapidly grew from 1979 to 1982 ($r = 0.18$), with high recruitment and low mortality from hunting and natural causes. The herd grew slowly ($r = 0.05$) from 1982 to 1985, with moderate to high recruitment, low to moderate natural mortality, and high hunting mortality. The herd also grew slowly ($r = 0.07$) from 1986 to 1988, with moderate recruitment, moderate to high natural mortality, and low hunting mortality. Then the herd rapidly declined ($r = -0.20$) from 1989 to 1992, with low recruitment, high natural mortality, and low hunting mortality.

In June 1993 the Board of Game approved a 3-year ground-based wolf predation control program for a portion of Unit 20A. Two objectives of the program, which began in October 1993, were to reverse the decline of the Delta Caribou Herd and increase the midsummer population to 6000-8000 caribou, with a sustainable annual harvest of 300-500 caribou. To better evaluate the effectiveness of intensive management (i.e., control of wolf numbers) of the DCH, we extended the project with state funds to include annual calf mortality studies. Results of these studies will be reported in this and future Pittman-Robertson documents.

Population decline in the Delta Caribou Herd stopped in 1994, coincident with the wolf control program. However, declines also stopped in other adjacent herds where wolf control did not occur. Weather conditions moderated, and weights of 5- and 10-month-old caribou calves increased. Comparison of population parameters in the Denali and Delta herds indicate that herd density before and during the decline played a role in animal condition and productivity. Even after the wolf control program, wolves continued to be a major predator of caribou calves, particularly on the calving area. During the present 5-year plan of research on the Delta Herd, we will continue to investigate patterns of calf and adult female mortality; prey selection

by wolves; trends in weights of newborn, 5-month-old, and 10-month-old calves; and age-specific parturition rates. There is a companion study to determine population response in wolves after wolf control in an area of high prey density. In addition, we have extended work on other caribou herds where very high or low densities will help us evaluate the influence of density-dependent factors on population growth and predation.

STUDY OBJECTIVES

- Evaluate the influence of weather, density, food limitation, hunting, and predation on the population dynamics of the Delta Caribou Herd.

JOB OBJECTIVES

- Census the Delta Herd annually from 1997 to 2001.
- Determine natality rate of females in the Delta Herd and compare rates with other Alaskan herds.
- Determine timing of peak calving in the Delta Herd and compare with the timing of calving in other herds.
- Determine recruitment of calves in the Delta Herd annually.
- Determine causes and timing of mortality in calves and adults in the Delta Herd.
- Monitor movements and distribution in the Delta Herd and determine when and how mortality occurs.
- Monitor body condition and changes in body size and weight of calves and adults and determine if weight and condition is related to recruitment.
- Annually monitor winter food habits of the Delta and other herds.

METHODS

We censused the Delta Herd using 5 aircraft on 22 June 1996. Methods were described in the final report for the previous reporting period (Valkenburg 1997).

From 12 May to 29 May 1997, we used an R-22 helicopter to monitor radiocollared Delta cows and determine pregnancy rate. Glennallen Area Biologist Bob Tobey also flew surveys every few days in the range of the Nelchina Herd where the first cohorts of known-aged cows are of breeding age. King Salmon Area Biologist Dick Sellers flew similar surveys in the range of the Northern Peninsula Herd, and Fairbanks Area Biologist Bruce Dale monitored the White Mountains Herd.

We used an R-22 helicopter to conduct October composition counts in the range of the Delta, Macomb, White Mountains, Nelchina, Northern Peninsula, and Mulchatna herds.

We used an R-22 helicopter to capture and radiocollar 5-month-old female calves in October 1996 in the Delta and Macomb herds, and we collected samples of female calves in the Nelchina and Northern Peninsula herds. In April 1997 we captured a sample of female calves in the Delta, Nelchina, and Northern Peninsula Herds, and sampled calves in the Nelchina Herd. Standard body measurements were recorded, calves were weighed, and blood samples were collected for disease and genetics work.

We continued to monitor snow stations established in 1992 and deployed 5 remote temperature recording instruments in the ranges of the Delta and Nelchina herds in May 1997. These data are being used to supplement weather data from NOAA climate stations to build a model that will integrate elevation and spatial data for use in future correlations of body weight, pregnancy, and other parameters with weather.

Fecal pellets were collected opportunistically in the ranges of several caribou herds during winter 1996-1997. Past samples have not been analyzed due to delays at the processing lab in Fort Collins, Colo.

In October 1996 we changed collars on 10 adults in the Delta Herd.

From 12 May to 29 May 1997, we collared 75 newborn caribou calves. Twenty-five calves had collared mothers, and 50 were collared at random. Calves were monitored every day from the day of collaring until they died or until 5 June. After 5 June they were monitored every few days as weather allowed. This was the third year of the calf mortality study and the second year in which we provided supplemental food to a wolf pack adjacent to the main calving area of the Delta Herd to keep wolves from hunting on the calving area. We used 2000 lbs of beaver carcasses, 8 caribou, and parts of 2 moose that died adjacent to the study area.

RESULTS

Results of fieldwork conducted in October were reported in Valkenburg (1997). Results of fieldwork from April through June 1997 have not been analyzed and will appear in the next progress report.

ACKNOWLEDGMENTS

I thank J Larrivee, B Scotton, B Dale, B Booysen, T Boudreau, E Lenart, and S Murley for help with fieldwork.

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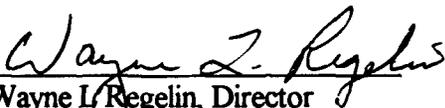
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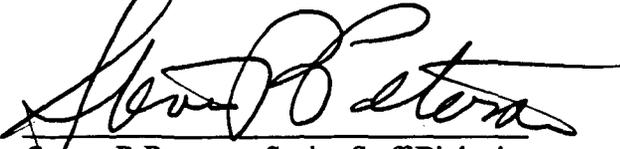
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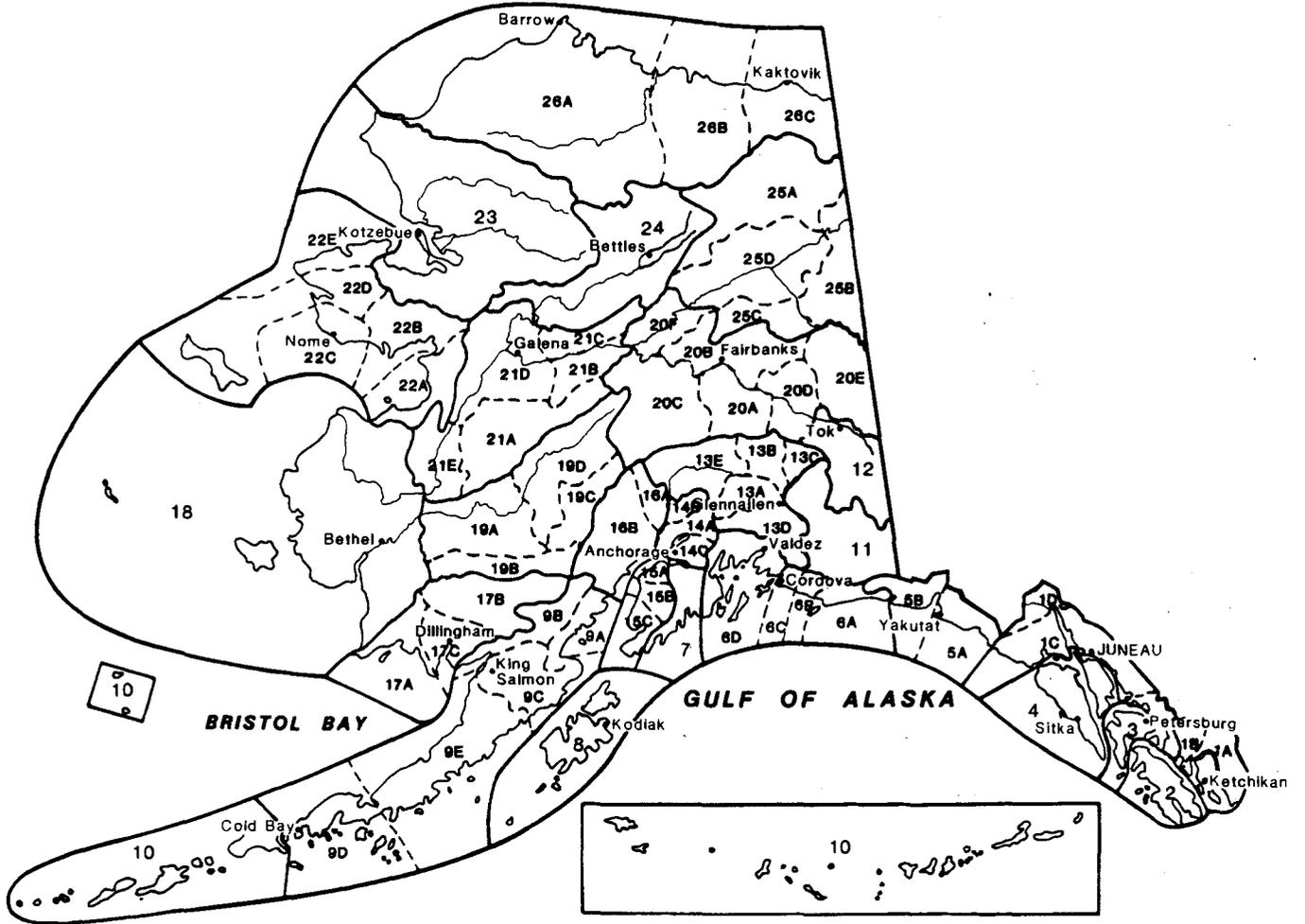
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