Alaska Department of Fish and Game
Division of Wildlife Conservation

Investigation of Regulating and Limiting Factors in the Delta Caribou Herd

T. Boudreau
R. Tobey
J. Woolington
J. Ver Hoef

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RESEARCH PROGRESS REPORT

STATE: Alaska STUDY NO.: 3.37

COOPERATORS: T Boudreau, R Tobey, J Woolington, and J Ver Hoef

GRANT NO.: W-24-4

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

PERIOD: 1 July 1995-30 June 1996

SUMMARY

Only 3819 caribou were counted during the 1996 census of the Delta Caribou (*Rangifer tarandus*) Herd (DCH), and this was probably an underestimate of herd size. Computer modeling using approximate mortality and recruitment rates indicated herd size should have been 4700.

Other work accomplished during the report period included a fall composition count in October, monthly monitoring of mortality in adults and yearlings, collaring 15 female calves in October and monitoring body weight in a sample of 10-month-old female calves, and a calf mortality study in which 50 newborn calves were collared and causes of death monitored. Because a final report is due in December 1996, only methods and results are briefly summarized here.

Key words: body condition, calf mortality, diversionary feeding, mortality, natality, *Rangifer tarandus*.

CONTENTS

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 (see 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. (1993).

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. One of the objectives of the program, which began in October 1993, was "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 expanded 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.

STUDY OBJECTIVES

To evaluate the influence of weather, density, food limitation, hunting, and predation on the population dynamics of the DCH and other Interior herds.

JOB OBJECTIVES

- Census the DCH from 1991 to 1995 annually.

- Determine the annual natality rate and timing of calving in the DCH.
- Determine recruitment from annual fall and spring composition counts.
- Monitor harvest annually.
- Collar male and female calves in fall to assess the accuracy of April composition counts and timing of mortalities.
- Determine weight and size of calves in April to determine the influence of summer versus winter weather on body condition, and test a model that predicts recruitment (i.e., fall calf:cow ratio) from April calf weights in the Delta, Fortymile, and Nelchina herds.
- Collar female calves in fall to maintain known-aged cohorts in the DCH.
- Determine if weather is a factor that limits growth of the DCH.
- Assess and analyze food habits of the DCH and other Interior herds.
- Monitor movements, dispersal, and mortality in the DCH.
- Recollar adult females to maintain cohorts of collared, known-age females.

METHODS AND RESULTS

Five aircraft were used to census the DCH in late June 1996. Three aircraft were equipped with radiotracking gear. All groups of caribou larger than 100 were photographed with a Zeiss RMK-A aerial camera. Other groups were counted visually as in past years. Only 3819 caribou were counted although we expected to find about 4700, based on computer modeling. We believe some caribou were not located during the census, probably primarily bulls, and we will conduct another census in October if conditions allow.

Natality rate was estimated by monitoring radiocollared caribou 2 years old and older during late May 1996. Thirty-five of 37 females older than 2 years were pregnant (95%). Thirty of 32 females older than 3 years were pregnant (94%). For the first time since the mid-1980s, a 2-year-old was pregnant but its calf was lost near birth and never seen.

On 3 October we used a Robinson R-22 helicopter to conduct fall composition counts in which 1567 caribou were classified. There were 20 calves:100 cows and 24 bulls:100 cows.

Using methods developed in previous years, on 3 October 1995 we weighed, measured, and collared 13 female caribou calves in the DCH, and on 1 April 1996 we weighed and measured an additional 15 female calves. Mean weight of calves was 131.1 lbs in fall and 120.8 lbs in spring. Calves again lost weight over winter. Weights were virtually identical to those measured the previous year.

Mortality rates of collared caribou and caribou movements were monitored and will be reported in the final report.

For the second year in a row, newborn calves were collared to determine causes of mortality. As of 31 August, 29 (58%) of the collared newborn caribou calves had died. Of these, 8 were killed by wolves (*Canis lupus*), 11 by grizzly bears (*Ursus arctos*), 6 by

golden eagles (*Aquila chrysaetos*), 1 by a coyote (*Canis latrans*), and 3 from unknown causes. In an experimental attempt to reduce wolf predation on caribou calves, we provided carcasses of 10 bull caribou and 2 cow moose to a pack of wolves that denned within 5 miles of the calving area. A GPS (global positioning system) collar was placed on the alpha male, and we radiocollared all others of the pack. They were located once or twice per day during the calving period. The wolves consumed all carcasses provided and traveled to the nearby calving area only twice. Wolf predation on Delta Herd calves was down by about 50% over 1995. A more thorough analysis of the data and results of the fall 1996 composition count will be presented in the final report.

Work from previous years was published in 2 papers which appeared in print in summer 1996 (Boertje et al. 1996; Valkenburg et al. 1996)

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PREPARED BY:

Patrick Valkenburg
Wildlife Biologist III

SUBMITTED BY:

Kenneth R Whitten
Research Coordinator

APPROVED BY:

Wayne L Regelin, Director
Division of Wildlife Conservation

Steven R Peterson, Senior Staff Biologist
Division of Wildlife Conservation