Grant W-24-2
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Research Progress Report
1 July 1993 - 31 December 1994

Influence of Body Condition on Productivity of Adult Female Caribou in the Porcupine Caribou Herd

by
Kenneth R. Whitten

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PROGRESS REPORT (RESEARCH)

State: Alaska

Cooperator: Thomas R. McCabe, U.S. Fish and Wildlife Service; Donald E. Russell, Canadian Wildlife Service; Robert G. White, University of Alaska Fairbanks

Project No.: W-24-2 Project Title: Wildlife Research and Management

Study No.: 3.39 Study Title: Influence of Body Condition on Productivity of Adult Female Caribou in the Porcupine Caribou Herd

Period Covered: 1 July 1993-31 December 1994

SUMMARY

Biologists from cooperating agencies captured, weighed, measured, sampled, and determined body condition scores of cow and calf caribou (*Rangifer tarandus*) from the Porcupine Caribou Herd (PCH) during early June, late June, mid July, late September/October, and mid November, 1992-1994. Calves were collected for necropsy during early June, early July, and early October 1992. Changes in weight and body condition parameters are being analyzed relative to parturition or lactation status, time of year, and habitat use. Results of these studies should enable management agencies to make more informed decisions on the importance of specific habitats on the coastal plain of the Arctic National Wildlife Refuge to the well-being of the PCH. If petroleum development should ever occur on the coastal plain, these baseline data will also be useful in identifying and mitigating impacts on caribou.

Key words: Arctic National Wildlife Refuge, body condition, caribou, Porcupine Caribou Herd, productivity, *Rangifer tarandus*

CONTENTS

BACKGROUND

The coastal plain of the Arctic National Wildlife Refuge (ANWR) is the most promising onshore prospect for a major new petroleum discovery in the United States (Clough *et al.* 1987). Both the federal government and the state of Alaska favor petroleum leasing and development within ANWR, but only if it proceeds in a manner sensitive to the environmental needs of the Porcupine Caribou (*Rangifer tarandus*) Herd (PCH) and other wildlife.

The PCH is an important international resource and a major food source for Native villages in northeastern Alaska and in the Yukon and Northwest Territories of Canada. Porcupine Herd caribou are also used by sport hunters in both nations and are becoming increasingly popular with hikers, river floaters, wildlife watchers, and photographers in ANWR and the Ivvavik and Vuntut National Parks in the Yukon. An International Agreement between the United States and Canada recognizes both nations' commitment to preserving these animals for present and future generations.

Proposed petroleum development on the ANWR coastal plain could affect use of calving and summer habitats by the PCH. Because of consistent and long-term use, these habitats are presumed to be important to caribou. Previous research has documented higher calf survival when the PCH uses coastal plain habitats during calving, apparently as a consequence of lower predator densities on the coastal plain relative to adjacent foothills and mountains (Fancy and Whitten 1991, Whitten *et al.* 1992). The coastal plain may also provide higher forage quality and quantity (White *et al.* 1989, Fancy and Whitten 1991). If caribou access to preferred habitats is

reduced due to oil development on the ANWR coastal plain, the PCH might be adversely affected through increased mortality and/or lower nutritional status.

We lack baseline data on caribou body condition relative to specific habitat use within the proposed development area and adjacent areas to which caribou might be displaced. Agencies managing the PCH must have reliable baseline data on caribou use of ANWR habitats to plan adequately for responsible development and to detect and mitigate adverse effects from development. Such baseline data will be necessary to determine whether any future declines in caribou body condition are human-caused or fall within the range of natural variation and whether these declines will reduce productivity or lower calf survival. Therefore, the Alaska Department of Fish and Game (ADF&G), the National Biological Survey (NBS), the Yukon Wildlife Branch (YWB), the Canadian Wildlife Service (CWS), and the University of Alaska Fairbanks (UAF) are investigating relationships between caribou habitat use and population dynamics.

OBJECTIVES

To characterize and compare oversummer weight gain of female caribou and their calves and examine relationships between fall body weight/condition and subsequent calf production and survival. To determine what patterns of summer range use may cause insufficient weight gain leading to pregnancy failure or lowered calf survival.

METHODS

Biologists from cooperating agencies captured, weighed, measured, sampled, and determined body condition scores of 74 cow-calf pairs during late June 1992-1994. The NBS staff had already collared the calves as neonates, and we placed radiocollars on the cows. Seventy previously collared cows that had given birth, but lost their calves, were also captured and handled during late June. Newborn calves were run down on foot. We used net-guns fired from helicopters for all other captures. Habitat use of the collared cow-calf pairs was monitored daily by NBS staff from early June through mid July. In late September and/or early October 1992-1994, we recaptured 76 cows and 32 calves that had been caught the previous June. In early November 1993 and 1994, we recaptured 12 additional cows and 13 calves that had been caught during June and 6 cows and 5 calves caught in both June and September/October. In November 1993, we also captured and radiocollared 7 cows not previously sampled, but whose calves had been caught in June. We monitored all cows captured between June and November again in late May and early June of the next year to determine parturition status and, if appropriate, calving date and early calf survival. We collected 40 calves from the Central Arctic Herd with the sample

divided evenly from early June (near birth), late June, mid July, and late September 1992.

RESULTS AND DISCUSSION

All captured animals have been weighed, measured, and sampled according to the protocols described in the methods section. The calves collected from the CAH have been necropsied at UAF for correlation of body composition with in vivo measurements. Data and specimens are currently being analyzed and results will be presented in the final report for this project, due 30 June 1995.

ACKNOWLEDGMENTS

T. C. McCabe, D. B. Griffith, N. E. Walsh, and D. Young of NBS captured and radiotracked calves during the summer and assisted in radiotracking all caribou during the remainder of the year. D. E. Russell and D. van de Wettering of CWS captured cows and calves. B. Gilroy and D. Cooley of YWB and G. Lortie of Whitehorse, Yukon Territory also assisted in capturing cows and calves. R. D. Cameron of ADF&G assisted in collecting calves. K. Gerhart of UAF performed calf necropsies and assisted with caribou captures and calf collections. D. C. Miller, D. Sowards, and R. Kaye piloted fixed-wing planes. D. Washington, R. Warbelow, and J. Hodges flew helicopters.

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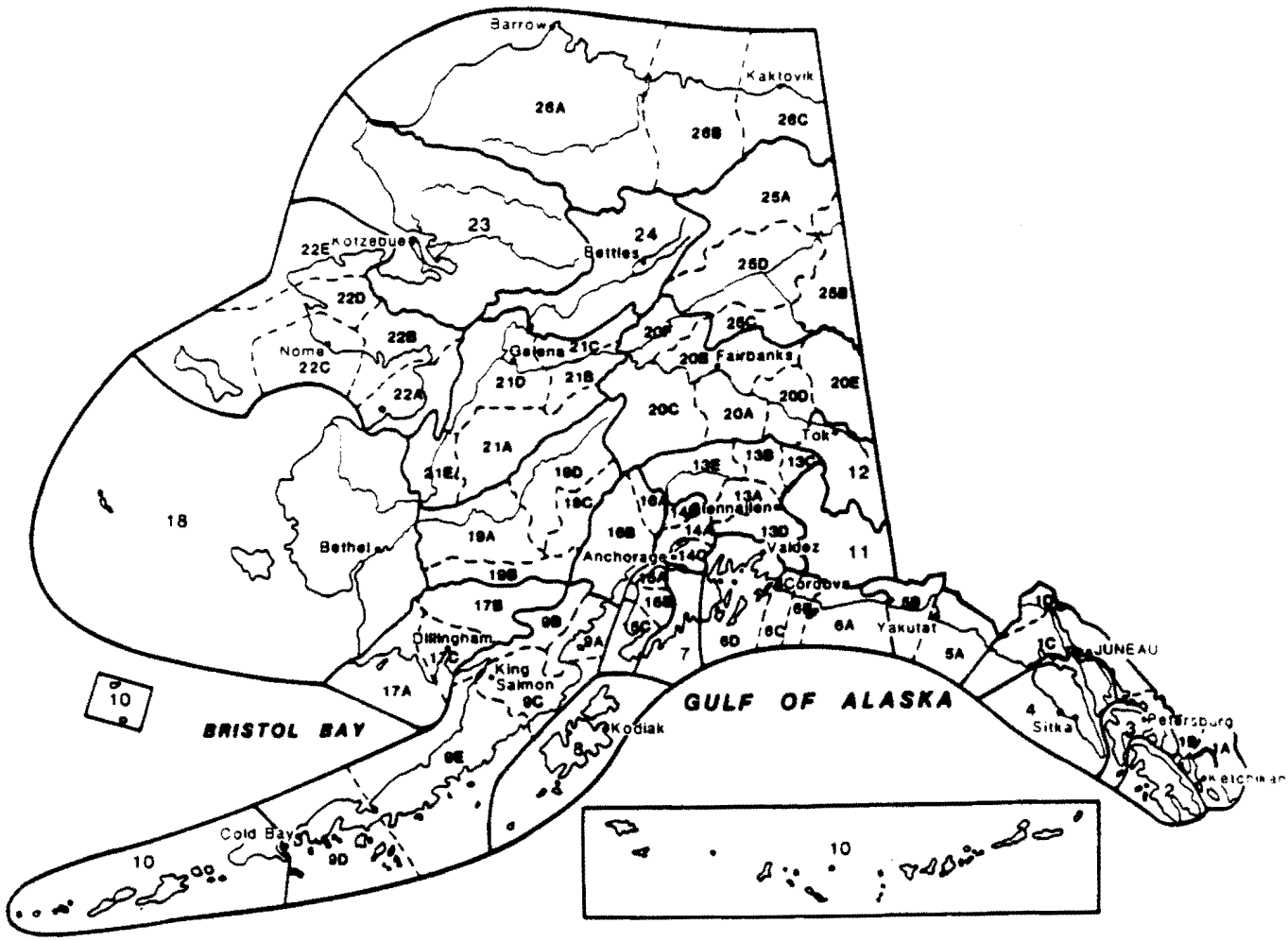

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