

# Calving and Post-calving Habitat Selection by the Teshekpuk Caribou Herd

Lincoln Parrett<sup>1,4</sup>, Brad Griffith<sup>1,4</sup>, Geoff Carroll<sup>2</sup>, Craig George<sup>3</sup>, Robert Suydam<sup>3</sup>

<sup>1</sup> Alaska Cooperative Fish and Wildlife Research Unit, <sup>2</sup> Alaska Department of Fish and Game, Barrow, <sup>3</sup> North Slope Borough Department of Wildlife Management

<sup>4</sup> Institute of Arctic Biology, Department of Biology and Wildlife, University of Alaska Fairbanks

## Introduction

➤ The Teshekpuk Caribou Herd (TCH) is an important subsistence resource for several villages on the north slope of Alaska. Annual harvests are about 2,800, or 6% of the population (Carroll, in press).

➤ Planning for petroleum exploration and development in the National Petroleum Reserve – Alaska, which contains most of the TCH summer range, is currently underway.

➤ Previous work with this herd has focused on the calving period (Kelleyhouse 2001). Research beyond this period will provide a more complete picture of the summer ecology, allowing managers to determine potential areas and habitats that may require protection.



## Objectives

➤ Estimate herd distribution at two week intervals.

➤ Estimate diet content at two week intervals from fecal samples.

➤ Evaluate bi-weekly habitat selection.

## Methods

➤ Weather permitting, 20-50 radio-collared female caribou were located every two weeks from the initiation of calving until rut.

➤ The 99% utilization distributions and concentrated use areas (CUA) for each two-week period were estimated using KernelHR 4.27 (Seaman et al.)

➤ Following each radio-tracking bout, an attempt was made to collect fecal samples from areas of concentrated use. These composite samples were analyzed for diet composition (Sparks and Malachuk 1968), and corrected for digestibility (Duquette 1984, Russell et al. 1993).

### Literature Cited

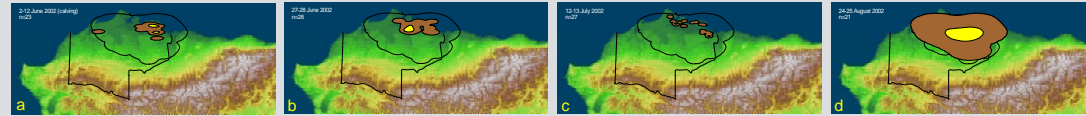
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## Results and Discussion

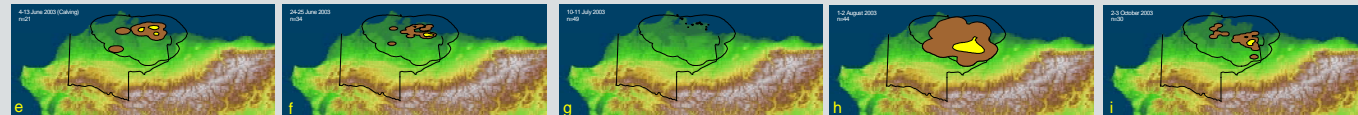
### Distribution

➤ Distribution patterns were spatially and temporally similar in 2002 and 2003. Calving cows were concentrated to the northeast and southeast of Teshekpuk Lake in 2002 (Fig. 1a). The overall distribution was similar two weeks later (Fig. 1b), but by mid-July caribou were aggregating along the coast (Fig. 1c). By late August, caribou were widely dispersed across the central coastal plain (Fig. 1d).



Figures 1a-d 99% distributions (brown) and concentrated use areas (yellow) during 2002 and 2003. The thin black line is the combined extent of summer use from 2002 and 2003. The thick black line is the NPR-A boundary. Number of individuals located (n) is indicated on each map.

Calving caribou were again concentrated near Teshekpuk Lake in early June, 2003 (Fig. 2a), with moderate changes in distribution occurring by late June (Fig. 2b). Caribou were again tightly aggregated in mid-July, with wide dispersion achieved by early August (Figs. 2c and 2d). There was some indication of grouping by early October (Fig. 2e), when rut was occurring. The goal of eight distributional surveys per year was not achieved in either year due to poor weather.



Figures 2a-e. See caption for Figure 1.

### Diet

➤ Fecal samples collected in the calving areas in 2002 and 2003 contained large proportions of lichens and sedges (Fig. 2), especially *Eriophorum* spp.

➤ Willows were not a substantial diet component until late June/early July in 2002, or early August in 2003, although gaps in sampling may have missed the actual dates in either year when willows become more prevalent in the diet. Snowmelt was also later in 2003 than 2002.

➤ Samples collected in early September, 2002, show a diet very similar to that during calving. This may reflect a return to a winter-like diet that prevails for the remainder of the year, and well into calving.

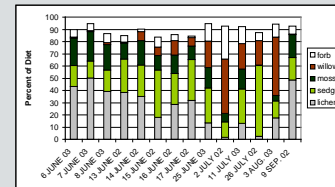


Figure 2. Major diet components from fecal samples collected in 2002 and 2003. Note that the years are combined for visual continuity of the time series.

### Habitat Selection

➤ Habitat selection analyses are underway. Preliminary results from analysis of vegetation type may support conclusions by Kelleyhouse (2001) that the TCH are habitat generalists with respect to vegetation type, as measured in both studies. Wet habitats dominate the landscape in this part of the coastal plain.

## Conclusions

➤ The northeastern portion of the NPR-A was heavily utilized by the TCH between the calving and rut periods.

➤ The TCH appears to rely less on *Eriophorum* than the Western Arctic (Kuropat 1984) and Porcupine Herds, and shift to a willow-dominated diet 10 or more days later than the Porcupine Herd (Griffith et al. 2002). The calving diet as estimated here would be very low in digestible nitrogen, an important component in milk production. This result may have implications with respect to the importance of the calving ground in the annual energy budgets of TCH females.

## Future Work

➤ Habitat selection will be analyzed with a multivariate model that predicts utilization distribution using remotely sensed landscape features. Features included in habitat selection analyses will be vegetation type (Fig. 3), vegetation greenness and green-up rate (NDVI), snow cover, terrain ruggedness, and land surface temperature.

➤ Kelleyhouse (2001) found no trend in relative green biomass (NDVI) on the TCH calving ground between 1985-2001, when spring temperatures were increasing in the area. Her analysis was focused on June 21, which is very early in the growing season in the TCH range. We will reevaluate this relationship, but focus on July 15, when the growing season is likely to be more advanced.