Research Work Order 32: Coastal/Inland differences in caribou summer habitat on the Arctic coastal plain

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INTRODUCTION

Central Arctic Herd (CAH) caribou (*Rangifer tarandus granti*) move in response to the level of insect activity during July and early August (Smith and Cameron 1985). When mosquito (*Aedes* spp.) harassment intensifies, caribou will aggregate and move upwind to the coast where they may continue travelling into the wind along the coast. In response to lower temperatures or increased wind velocities, mosquito activity abates and caribou disperse and move inland (Dau 1986, Roby 1978, White et al. 1975).

The tendency for caribou to move inland when mosquito activity subsides suggests that foraging conditions there are better than at the coast. The warmer, drier conditions inland may lead to higher plant biomass and a greater proportion of forage species important to caribou. Klein (1970) suggested that caribou feed selectively on high quality forage. For example, White et al. (1975) documented the selection by CAH caribou in Prudhoe Bay for willows (*Salix* spp.), which are superior in quality to monocots for caribou during midsummer (Chapin et al.,1975). Also, Walker (1987) has shown that willow height (*S. lanata richardsonii*) increases with distance from the coast, from 10±2 cm at the coast to 147±25 cm 70 km inland. A greater abundance of willows and other forage species should allow caribou to forage more successfully. If so, free access to both coastal and inland areas may be critical to caribou in terms of both mosquito avoidance and summer growth and fattening.

The research objective is to compare the quality and quantity of forage in coastal vs. inland habitats used by CAH caribou during the summer mosquito season. The hypothesis proposed for this study is that inland areas provide significantly better feeding habitat for caribou than coastal areas. To test this hypothesis several field hypotheses were formulated.

(1). Quality of key forage species, in terms of digestibility and nutrient content, increases significantly with distance from the coast.

(2). Quantity of key forage species, in terms of available biomass and vegetative cover, increases significantly with distance from the coast.

(3). Diversity of habitat, in terms of species occurrence, increases significantly with distance from the coast.

DATA COLLECTION

The field season was conducted from June-August, 1989. Sampling was done in 3 sites in and adjacent to the Kuparak Developmewnt Area, with a site at the coast, 60 km inland, and in a mid-inland area (30 km) approximately halfway between. Each area is 6.2 km long (EW) and 3.1 km wide (NS). The sampling season coincided with peak insect activity (July 1-July 30). The sampling season was further divided into 3 time periods (July 1-6, July 13-18, and July 25-30). Four line transects, running 6.2 km EW, were randomly located at each site during each time period. Vegetation cover was estimated by sampling every 100 m on the transects by use of a point frame (10 pin). Community type at each sampling point was classified based on Webber-Walker (1975) community types.

The relationship between cover and biomass was estimated by clipping and point framing of key forage species along transects in each area from August 1-10.

Table 1: Key caribou forage species to be clipped for biomass estimation on the Kuparuk Development Area of the Prudhoe Bay oil development complex, Alaska.

Eriophorum angustifolium
Eriophorum vaginatum
Salix arctica
Salix planifolia
Carex bigelowii
Carex aquatilis
Pedicularis spp.

Forage biomass will be estimated from cover determination by applying a predictive relationship between cover and biomass (Johasson 1983). During 1-10 August, biomass for each key species was estimated in each site by clipping key species along transects established during the July period. For each key species at each site, a regression describing the relationship between cover and biomass will be established.

Estimates of forage quality were made by clipping key forage species. Samples were clipped opportunistically along the

transect until enough was collected for analysis (2-3 g dry weight). Forage parameters analyzed (Table 2) will be those identified as being important in influencing habitat selection by caribou.

Data collected during the 1989 field season has been compiled and entered into computer files. Data and laboratory analyses are presently being conducted.

Table 2: Components of caribou habitat to be measured in Kuparuk Development Area, Alaska

Hypothesis	Variable	Analysis
1: Quantity	% Cover	Point frame
	Biomass	Clip & Weigh Key Species Regression analysis
2: Quality	%N, %Na, %Ca, TNC, ADF, Digestibility (in vitro)	Clip Key Species Lab Analysis
3: Diversity	Species Occurrence	Point frame

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TERRESTRIAL RESEARCH

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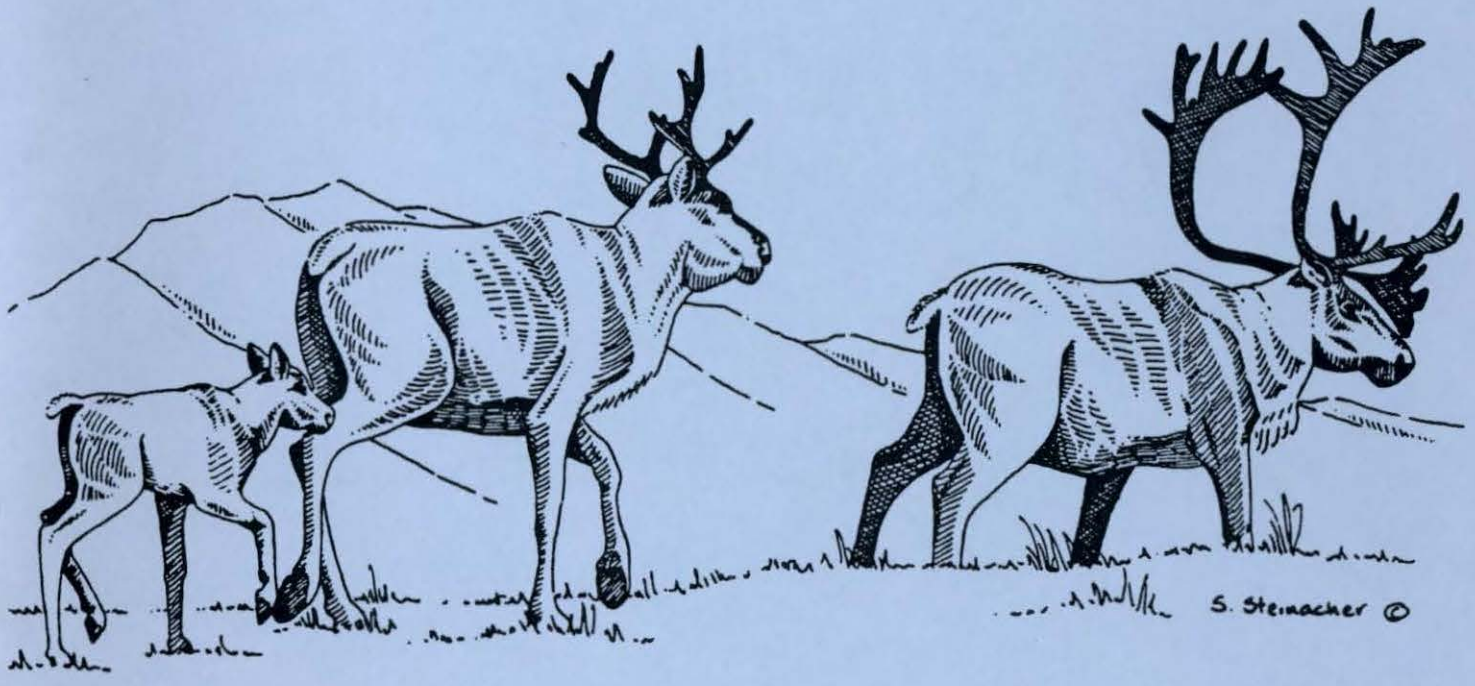

Annual Progress Report

Field Season - 1989

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