

SMALL MAMMAL DISTRIBUTION ALONG THE KOBUK RIVER, GATES OF THE
ARCTIC NATIONAL PARK AND PRESERVE, ALASKA - SUMMER 1991 REPORT.

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ABSTRACT

The National Park Service conducted a small mammal survey along the Kobuk River in Gates of the Arctic National Park and Preserve, Alaska, 10-16 July 1991. Sherman live traps baited with peanutbutter and rolled oats were set in 5 trapping units. Eight yellow-cheeked voles (Microtus xanthognathus) (2 adult females and 6 subadult males) and 8 red-backed voles (Clethrionomys rutilus) (3 subadult males, 4 subadult females, and 1 unknown) were captured and examined for sex, age, breeding condition, molt, and weight. 88% of the voles were juveniles and subadults ($n = 14$), with mean weights of 31.5 g for yellow-cheeked voles and 18.7 g for red-backed voles. Five subadults and 1 adult were molting. One adult was in breeding condition. Trap success was low due to time constraints and rain.

INTRODUCTION

The Alaska National Interest Lands Conservation Act (ANILCA) established Gates of the Arctic National Park and Preserve "to maintain the wild and undeveloped character of the area", however, ANILCA also allows for development of surface transportation access across the Kobuk River Preserve Unit. Prior to this potential development, an environmental and economic analysis is required to determine right-of-way alternatives to minimize impacts on the Kobuk River. In order to evaluate and comment on these alternative routes, the National Park Service (NPS) needs to assess the natural resources of the area, particularly wildlife populations which may be heavily impacted by development.

Section 201 of ANILCA specifically directs the NPS to "protect the habitat for and the populations of...raptorial birds." To collect baseline information on the Kobuk raptor populations, NPS conducted a raptor/small mammal survey in July 1991. The goal of the small mammal project was to assess the status of small mammal populations in different habitat types along the Kobuk River and evaluate these populations as a prey base for resident nesting raptors. In order to obtain this goal, the following objectives were devised: 1) to determine small mammal species diversity and abundance in various habitat types along the Kobuk River in the Kobuk Preserve Unit and 2) to examine population dynamics for small mammal species through age, sex, weight, and reproductive condition data.

STUDY AREA

The study was conducted along the Kobuk River in the Kobuk Preserve unit of Gates of the Arctic National Park and Preserve, Alaska from the Walker Lake outlet to the confluence of the Pah River (Fig. 1). The Kobuk River, a designated "National Wild and Scenic River", is located in a heavily glaciated region along the southern foothills of the Brooks Range. Topography ranges from low rolling tundra to the high hills/low mountains that form the valley sides. Open, low-growing black spruce (*Picea mariana*) forest occurs on the valley floor and small black and white (*P. glauca*) spruce with occasional birch (*Betula* spp.) on the valley slopes; open moist tundra vegetation often separates tree groves. Willow (*Salix* spp.)/alder (*Alnus crispa*) thickets and tall white spruce, balsam poplar (*Populus balsamifera*), and willow associations occur along the river banks. A detailed description of the upper Kobuk River is found in "The Upper Kobuk River--a Wild and Scenic River Analysis" compiled by the Bureau of Outdoor Recreation (1974).

METHODS

Five small mammal trap sites were selected along the Kobuk River during a joint raptor/small mammal survey (Fig. 1 and Table 1). Trapping units 2A/2B, 4, and 5 consisted of 50 Sherman live traps

set out in 4 rows with 10 m between each trap in the row and >20 m separating the rows. In trapping units 1 and 3, with 50 and 25 traps respectively, traps were placed randomly within areas well-defined by vole holes and runways. Traps were baited with a peanutbutter and rolled oats mixture. Plastic flagging was tied to overhead trees and shrubs to mark trap locations.

Weight, sex, molt, and breeding condition data were recorded for each animal handled. Animals were aged as juvenile, subadult, or adult based on pelt color, presence of molt, and animal weight. Females were examined to determine if the vulva was open or closed and if mammaries were lactating, large, or small. Representative species were photographed. Specimens dying in traps were prepared as study skins and skeletons and housed in the University of Alaska, Fairbanks Museum on indefinite loan. Small mammal trapping and collection of voucher specimens for this project was approved under State of Alaska Department of Fish and Game Scientific Permit Number 91-97.

RESULTS AND DISCUSSION

Eight red-backed voles (Clethrionomys rutilus) and 8 yellow-cheeked voles (Microtus xanthognathus) were trapped during the 5 trapping sessions (Table 2). One adult yellow-cheeked vole was in breeding condition with vulva open and mammaries large and the other had large mammaries but vulva closed. A large ectoparasite, possibly a warblefly larvae, was found on the second adult. Average weights for subadults and juveniles were 31.5 g for yellow-cheeked voles ($n = 6$) and 18.7 g for red-backed voles ($n = 7$). None of the subadults were in breeding condition. Four of the yellow-cheeked voles (including 1 adult) and 2 red-backed voles were molting.

The revegetated gravel bar in trapping unit 1 produced the most animals ($n = 10$; Table 2), but no animals were captured in a floodplain shrub thicket (unit 5) or a densely vegetated island (unit 3). Latrine piles and feeding sites in the sedges were found in trap unit 1 and a high density of trails and burrow entrances were found in trap units 1, 2A, and 3. A northern harrier (Circus cyaneus) was observed hunting over trap unit 5, indicating some presence of small mammals in the area.

Trap success was low and too few animals were captured to analyze population dynamics or diversity and abundance in different habitat types. Time constraints for the trapping portion of the raptor/small mammal survey and near continual rain were contributing factors to poor trap success. Traps were set only from 2000 - 1000 h at each trap unit except trap unit 1 (1800 - 1300 h); if voles were inactive during this time period, trap success would be low. Rain also may have restricted their activity levels.

To determine species diversity and more accurately sample the small mammal population, snap traps and cone traps as well as

Sherman live traps should be used; this would maximize the potential for capturing trap-shy animals and shrews (Sorex spp.), which are seldom caught in Sherman traps. If adult voles are trap shy, which the high proportion of subadults seems to indicate, different trap types and, possibly, baits would increase their likelihood of capture. Traps also should be set for 24 - 48 hours at each site to ensure that all small mammal activity periods are covered and to allow time for the animals to acclimate to the traps.

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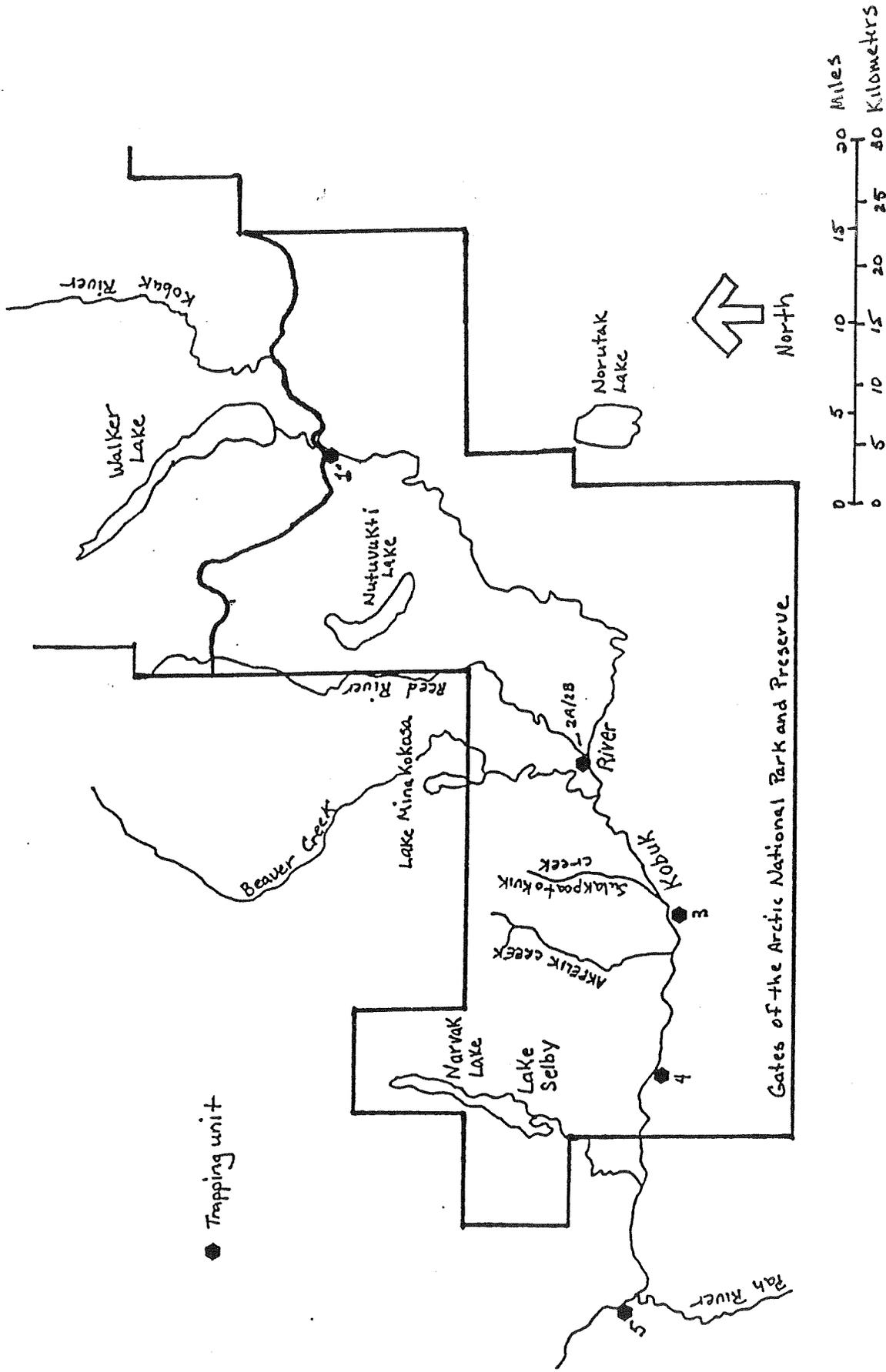


Figure 1. Small mammal trapping sites along the Kobuk River, Gates of the Arctic National Park and Preserve, Alaska, 10-16 July 1991.

Table 1. Site Descriptions for 5 small mammal trapping units along the Kobuk River, Gates of the Arctic National Park and Preserve, Alaska, 10-16 July 1991.

Site Number	Site Description
1	<p>T19N, R21E, Sec. 30, NW1/4, SW1/4. Revegetated gravel bar located 0.8 km down stream from the confluence of Walker lake outlet and the Kobuk River. A shallow water channel separated the southern end of the bar from the shore, but the northern end was connected by a narrow strip of land covered with shrubs. The trap area consisted of willow (<u>Salix</u> spp.)/alder (<u>Alnus crispa</u>) thicket with a small clone of aspen (<u>Populus balsamifera</u>) and scattered white spruce (<u>Picea</u> spp.) in the center. The outer edge of the thicket was bounded by sedges, <u>Equisetum</u> spp., pussy toes (<u>Antennaria</u> spp.), mosses, liverworts, and small willow shrubs. Vole holes, runways and droppings were prominent and vocalizations were heard.</p>
2A	<p>T16N, R18E, Sec. 3, NW1/4, NW1/4. High gravel knoll located at the confluence of the Reed and Kobuk Rivers. Traps (25) were set in open low-growing spruce with shrub birch (<u>Betula</u> spp.), blueberry <u>Vaccinium</u> spp.), lichen, and <u>Sphagnum</u> spp. in the understory. Sphagnum areas were entrenched with vole runways.</p>
2B	<p>T16N, R18E, Sec. 4, NE1/4, NE1/4. Revegetated gravel bar 0.1 km south of the knoll in trap site 2A. 25 traps were set along a narrow water channel lined with alder, willow, and sedge. Voles were heard in the shrubs, but no trails were observed.</p>
3	<p>T16N, R17E, Sec. 20, SE1/4, SW1/4. Densely vegetated island 0.3 km south of the confluence of Sulakpoatokvik Creek and the Kobuk River. Vegetation consisted of large spruce, willow and alder thicket, and sedges. Deadfall trees and river deposited logs were abundant. 25 traps were randomly set out along vole trails and burrow entrances.</p>

Table 1. (Continued).

Site Number	Site Description
4	T16N, R15E, Sec. 25, SE1/4, NE1/4. Poorly drained bench with rolling topography. Vegetation consisted of sphagnum, willow, birch, and alder in the low areas and open spruce with a lichen ground cover on the higher sites. Very little vole sign in the area except for trails in sphagnum patches.
5	T16N, R13E, Sec. 22, NW1/4, NW1/4. Shrub thicket on Kobuk River floodplain. Clumps of willow, alder, and aspen ranged from sparse to very dense. The ground topography was rough due to numerous gravel piles, trenches, and river-deposited logs.

Table 2. Sex, age, weight, and molt data for 8 yellow-cheeked voles (*Microtus xanthognathus*) and 8 red-backed voles (*Clethrionomys rutilus*) live-trapped along the Kobuk River, Gates of the Arctic National Park and Preserve, Alaska, 10-16 July 1991.

Species	Sex ^a	Age ^b	Weight (gm)	Molt ^c	Trapping Unit
Yellow-cheeked vole	M	J	30.0	0	1
Yellow-cheeked vole	M	J	27.5	0	1
Yellow-cheeked vole	M	S	27.5	1	1
Yellow-cheeked vole	F	A	101.0	0	1
Yellow-cheeked vole	M	S	30.0	0	1
Yellow-cheeked vole	M	S	41.0	1	1
Yellow-cheeked vole	F	A	118.0	1	2A
Yellow-cheeked vole ^d	M	S	33.5	1	2B
Red-backed vole	M	S	19.5	0	1
Red-backed vole	F	S	21.5	0	1
Red-backed vole	F	S	18.5	1	1
Red-backed vole	M	S	19.0	0	1
Red-backed vole	M	S	17.0	0	2A
Red-backed vole	F	S	18.0	0	2A
Red-backed vole ^e		S			2A
Red-backed vole	F	S	17.5	1	4

^aF = female, M = male.

^bJ = juvenile, S = subadult, A = adult.

^c0 = no evidence of molting, 1 = molting.

^dStudy skin and skeleton prepared and stored at the University of Alaska Museum, Fairbanks, Alaska.

^eIndividual escaped during examination.