

Small Mammal Diversity Across Habitat Types in Northern Minnesota

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Intro

The structure and composition of a small mammal community is largely shaped by that of the plant communities in which they reside. Even closely related species may have substantially different requirements or preferences for food and cover. Northwestern Minnesota has a variety of habitats in relatively close proximity. The prairies and forests merge most noticeably in what is sometimes referred to as a vegetation tension zone; an approximately 90km wide band that runs up through the state (Eggers&Reed1997). The tension zone's eastern edge just reaches Itasca State Park. Glacial activity and the subsequent effects of hydrology and climate have created this wide spectrum of plant communities. These include, but are not limited to: dry, mesic, and wet prairies, deciduous, mixed, and coniferous forests, swamps and bogs, as well as riverine and shallow water aquatic habitats. Not surprisingly many species of small mammals have found niches within these varied habitats.

Methods

To compare the small mammal diversity these habitats contain, we established a series of 4x10 trap station grids across the vegetative tension zone. Each grid was used for 144 trap nights. Our objectives were to: 1) Identify and inventory all small mammals captured, 2) Perform a mark-recapture population estimate on selected members of Cricetidae, and to 3) Collect protein samples from members of the genus *Peromyscus* for genetic analysis at a later date. We used two different styles of live traps, the "Sherman" baited with sunflower seeds and the "Longworth," baited with cat food.

Results

Small Mammal Diversity at the Trap Stations

PEXX	Peromyscus (unknown species)
SOHA	Sorex haydenii
BLBR	Blarina brevicauda
MUER	Mustela ermine
SPTR	Spermophilis septentrionalis
MIOC	Microtus ochrgaster
PEMABA	Peromyscus maniculatus bairdii
MYGA	Myodes gapperi
TAST	Tamias striatus
MIPE	Microtus pennsylvanicus
TAHU	Tamiasciurus hudsonicus
GLSA	Glaucomys sabrinus
COCR	Condylura cristata
ZAHU	Zapus hudsonius

Unburned Red Pine PEXX,MYGA,TAST
Burned Red Pine PEXX, MYGA, TAST
Unburned Deciduous PEXX, MYGA, MIPE
Burned Deciduous PEXX, MYGA,TAST
Bog MIPE,TAHU
Aspen GLSA
TOTAL SPECIES IN FORESTED SITES= 6

Waubun Wet COCR, MIPE, ZAHU, MUER
Waubun Dry ZAHU, SOHA
Coburn East MIPE, MIXX, BLBR
Coburn West SPTR, MIPE
Rush North PEMABA, MIPE, MIOC, SPTR, PEXX
Rush South ZAHU, PEMABA, SPTR, MIPE, PEXX
TOTAL SPECIES IN PRAIRIE SITES= 9

Discussion

Because there is some ambiguity within the *Peromyscus* genus, I will treat them all as one species even though there was strong evidence of the capture of *Peromyscus maniculatus bairdii* on the prairie sites. A conservative estimate is that six species were found throughout the woodland sites, and nine species were present in the prairie sites. The wet prairie sites in particular appear to be the most species rich. The Meadow vole (*Microtus pennsylvanicus*) was found in both locations, forest and prairie. It is very likely that *Peromyscus maniculatus* was as well, although we would need to confirm this by testing the saliva samples. All of the sites where *Microtus pennsylvanicus* was found were wet prairies and sedge meadows, essentially wetlands, with periodically saturated soils. *Microtus pennsylvanicus* has the most extensive distribution of all North American voles, and found mainly around wetlands. It eats grasses, sedges and forbs through most of the year, but will also eat bark and roots in the winter when food is scarce (Animal Diversity Website). Although the food sources in these two wetland types may be similar, the availability of cover is not. The sedge meadow in the forest seems to have better cover because of the shrubs and woody debris nearby. A drawback of the sedge meadow is the fact that the trees surrounding the meadow provide perches for avian predators. Population estimates might reveal which wetland type is preferred by *Microtus pennsylvanicus*.

The results of the diversity grids indicate that there are many niches present in the small mammal community and that many species are capable of coexisting in the same habitat. The abundance and diversity of seed producing grasses, sedges, and forbs in the wet prairie sites probably allows the wider variety of small mammals found there, compared to the shrub and tree dominated forested sites.

References

Eggers S.D. and D.M. Reed. 1997. Wetland Plants and Plant Communities of Minnesota and Wisconsin. U.S. Army Corp of Engineers, St. Paul District.

Neuburger, T. 1999. "Microtus pennsylvanicus" (On-line), Animal Diversity Web.

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