

## Small Mammal Diversity: Prairie versus Forested Habitats

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### Abstract

We examined the difference in diversity between prairie and forested habitats. Natural prairies have been in a steady decline since Europeans settled North America. Along with losing its wonderful aesthetic beauty, we are losing the plants and animals unique to prairies. This study shows that prairies actually have higher small mammal diversity than forests. As woody vegetation increases, species richness decreases.

## Introduction

Prairie grasslands have historically been abundant across much of the United States. Due to many factors, native prairie has drastically declined (Samson and Knopf, 1994). Prairie is being replaced by forest and cropland. By losing natural prairies, we are losing some of the unique animals and biodiversity that exist there (Matlack et al., 2008). This study looks at the small mammal diversity and numbers in a forested area and prairie grassland. I originally thought forests would have more diversity, but after a little research I found that prairie tend to have higher small mammal diversity (Matlack et al., 2008). I would predict this to be the same for our two study sites.

## Methods

We trapped small mammals in twelve different sites. Six were forested areas within Itasca State Park (MN) while the other six were in natural prairie grasslands about an hour Northeast of Itasca in and around Frenchman's Bluff. We had a total of 50 trap stations (ten rows by five lines) in each area. Each line had nine Sherman traps as well as one Russian and Longworth (placed next to each other) for a total of 55 traps at each location. Each habitat (prairie or forest) had a total of 330 traps. We checked each trap three times for a total of 990 traps checked at the forest. It was the same for the prairie (except for two lines that got checked in the afternoon one day), for a total of 1100 traps checked.

## Results

We caught a total of eleven different species of small mammals for both areas. These species were: *Peromyscus xx* (PEXX), *Spermophilus tridecimlineatis* (SPTR), *Spermophilus franklinii* (SPFR), *Microtus pennsylvanicus* (MIPE), *Microtus ochrogaster* (MIOC), *Mustela erminia* (MUER), *Blarina brevicauda* (BLBR), *Zapus hudsonius* (ZAHU), *Myodes gapperi* (MYGA), *Tamiasciurus hudsonicus* (TAHU), and *Tamias striatus* (TAST).

A total of six species were found in forest habitat, while eight were found in prairie (*Figure 1*). 3 small mammals were common to both habitats (PEXX, BLBR, ZAHU). Prairie had more diversity, but less total small mammals caught than forest. Prairie had 5.63 captures per 100 traps while forest had 9.79 captures per 100 traps (*Figure 1*).

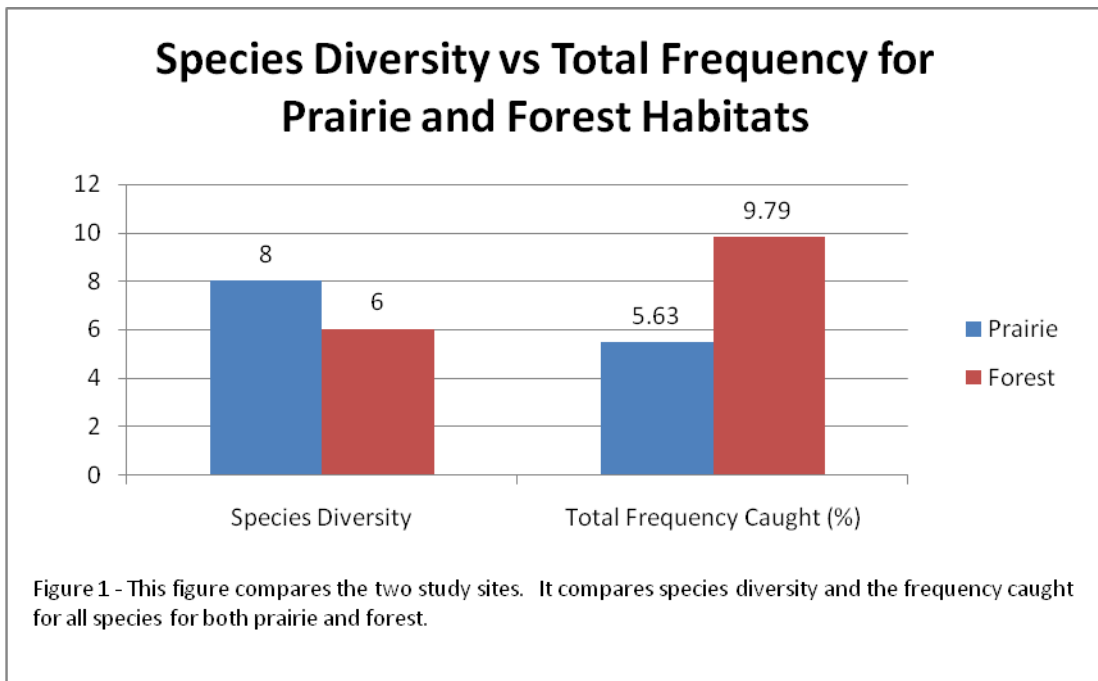
Forest had two species that made up almost 90% of forest species caught, these being PEXX and MYGA (*Figure 2*). TAST was the next most common species while TAHU, ZAHU, and BLBR had just one capture each. Prairie had similar results just a few more species. SPTR and MIPE made up 86% of all small mammals (*Figure 3*). PEXX, MUER, SPFR, ZAHU all had two captures while BLBR and MIOC just had one capture each.

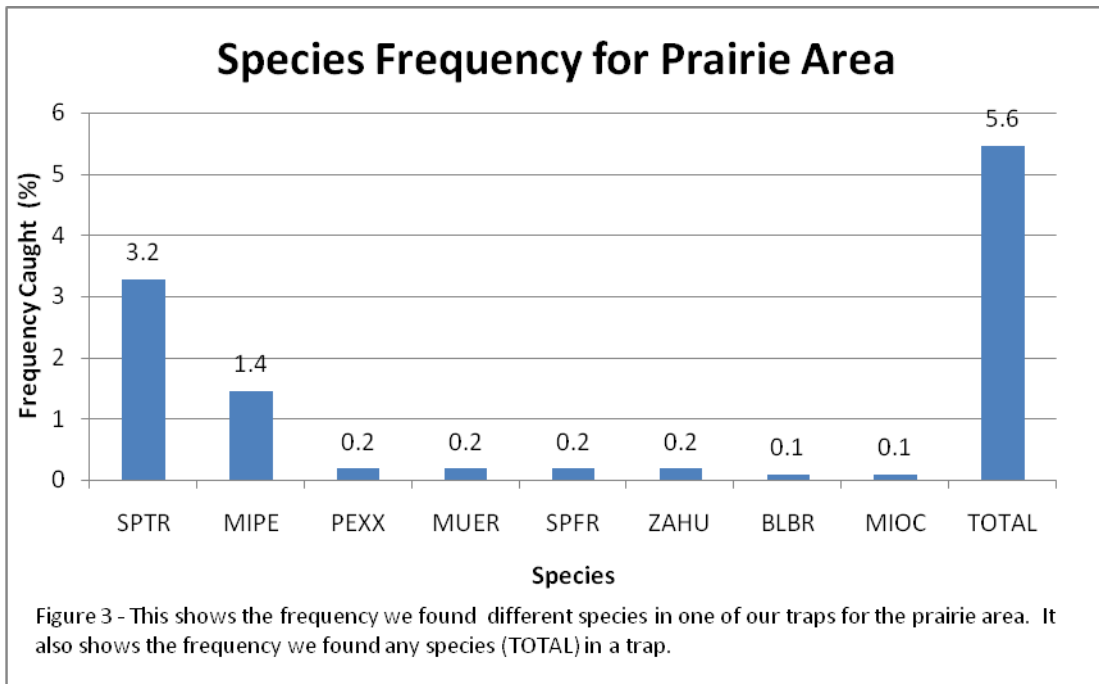
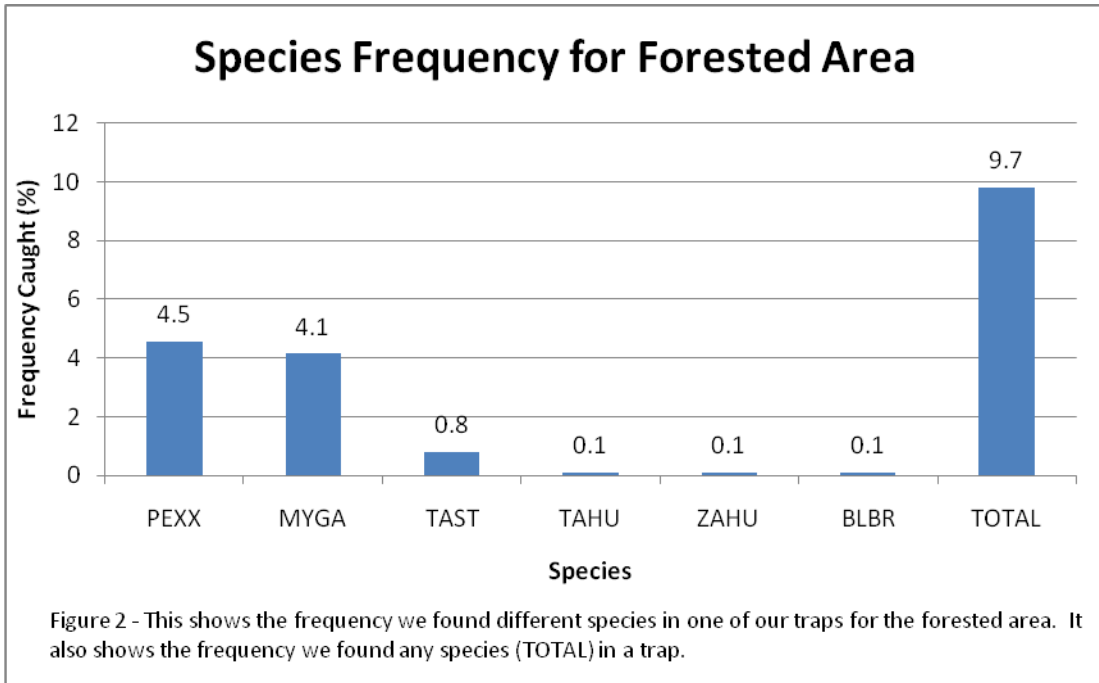
## Discussion

Our study followed what was to be predicted. This study, as well as other studies shows that prairie contains higher small mammal diversity compared to forested areas (Matlack et al., 2008). Higher diversity doesn't always equate to higher total numbers; forest had a higher frequency of species caught compared to prairie.

There is a negative relationship between woody vegetation cover and small mammal diversity (Briggs et al., 2002). In one study, there was relatively high small mammal diversity with very little to no woody vegetation cover. Diversity decreased with woody vegetation cover until it reached one species, PEXX, at 100% cover (Matlack et al., 2008). Our forest site still had a decent number of species and we did not see such drastic results. Our forest site had a high wood vegetation cover, but we sampled different types of forest sites (coniferous, deciduous, aspen, and bog) which gave higher vegetation diversity within our forest habitat. If we would have just sampled one forest type we may have gotten results closer to the other studies.

This study shows the importance of prairie management in the United States. With only 14% of original prairie remaining (Sampson and Knopf, 1994), we need to protect what is left to help protect the higher small mammal diversity and other unique animals the prairie holds.





Literature Cited

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