

Small Mammal Diversity: Around Itasca State Park and Agassiz Prairie Habitats

Abstract

We compared the small mammal diversity of a forest and a prairie biome. An aspen forest, red pine forest, a burnt area, and a bog were studied in Itasca State Park and in Agassiz we studied burnt prairie both by a road and away from it, an oak prairie, and an aspen prairie. Grids were set up to live trap using Sherman, Longworth, and Russian traps for three trap nights in each biome. A total of 85 small mammals were captured. *Peromyscus* (deer and white-footed mouse) was consistently found in both biomes within their burnt areas. We concluded that the eastern chipmunk preferred a forest environment and the thirteen-lined ground squirrel preferred the prairie to the forest.

Introduction

Small mammals are found throughout Minnesota's diverse habitats. Some of the animals that live in these forests and prairies are *Myodes gapperi* (red-backed vole), *Peromyscus* (deer and white-footed mouse), *Tamias striatus* (eastern chipmunk), *Zapus hudsonius* (meadow jumping mouse), *Microtus pennsylvanicus* (meadow vole), *Sorex* (shrew), *Tamiasciurus hudsonicus* (red squirrel), and the *Spermophilus tridecomlineatus* (thirteen-lined ground squirrel). Comparison of the Itasca State Park forest habitat and the prairie of Agassiz Sand Dunes were done. Grids were set up in the two different biomes. To get an idea of which species these different habitats are currently supporting we caught and released several small mammals. Due to more ground coverage in the forest habitat I hypothesize that there will be more total small mammals caught and that there will be greater diversity within the forest biomes than that of the prairie biomes.

Methods

The class was divided into four different groups. Each group set up a 5 x 10 trap-station grid in four of Itasca State Park's forest habitats, a bog, an aspen forest, a red pine forest, and a burnt pine area. One Russian trap and one Longworth trap, baited with wet cat food, was set up in each of the five rows along with nine other Sherman traps, baited with a seed mixture. The 55 traps at each sight were set every afternoon and checked every morning for three consecutive mornings (165 trap nights). The mammals that were captured at each sight were identified, weighed, measured, marked, and released. Any *peromyscus* that was caught also had saliva taken from it for further identification in the lab. After the three days, all the traps in the sights were removed.

At the Agassiz Sand Dunes the same four groups set the same 5 x 10 grid using the same method with Sherman, Longworth, and Russian traps. A burnt prairie located close to the road, an oak prairie, an aspen prairie, and another burnt prairie away from the road were all set with grids for three consecutive days. However, all of these traps were checked twice a day. The traps were checked once in the morning and again in the afternoon. Once again, the small mammals captured were identified, weighed, measured, marked, and released and all of the *peromyscus* gave saliva. After the three trap nights, all of the traps were removed from each grid.

Results

A total of 85 small mammals were caught over the six night period of trapping. There were 14 red-backed voles, 37 deer and white-footed mice, 8 eastern chipmunks, 7 meadow jumping mice, 3 meadow voles, 1 shrew, 1 red squirrel, and 12 thirteen-lined ground squirrels. The number of mammals caught varied among the different habitats

(figure 1). The burnt pine forest had the most mammals captured and the least were found in the bog. The burnt prairie by the road and the aspen prairie had the same amount of small mammals captured. The forest biome of Itasca State Park had more small mammal captures than that of the Agassiz sand dunes (figure 2). The white-footed deer mouse was found in significant numbers in both the forest and the prairie (figure 3). The total number of different types of species in each biome was consistent except for the aspen forest which showed low diversity and the red pine forest which showed higher than average species diversity (figure 4).

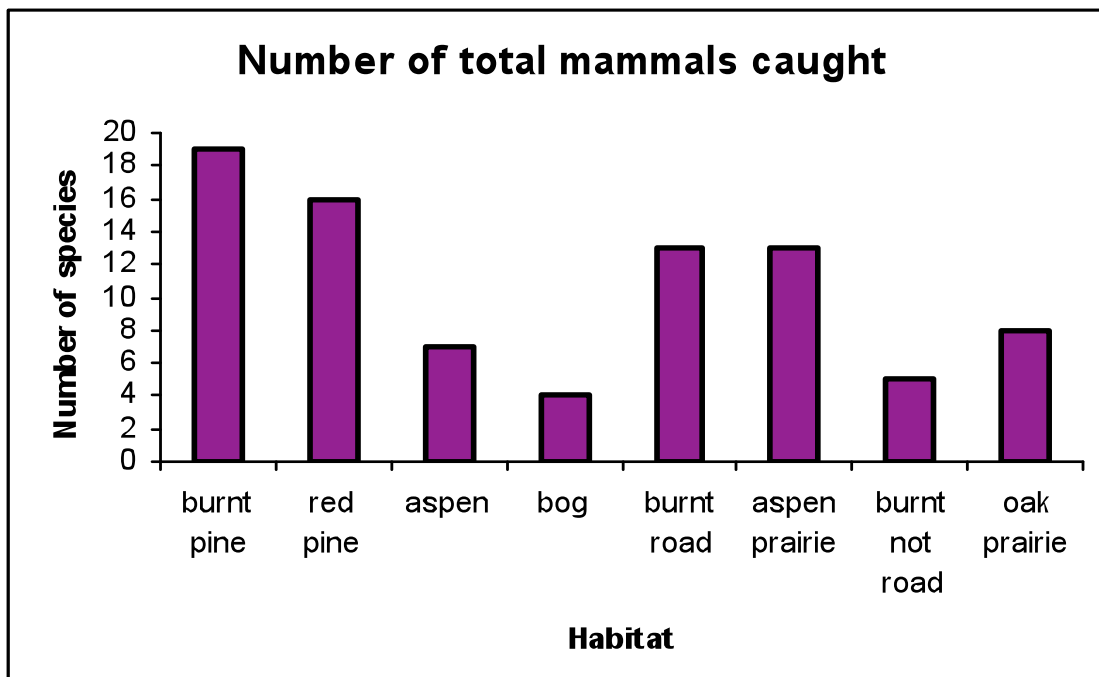


Figure 1. Number of total mammals captured at each diversity grid.

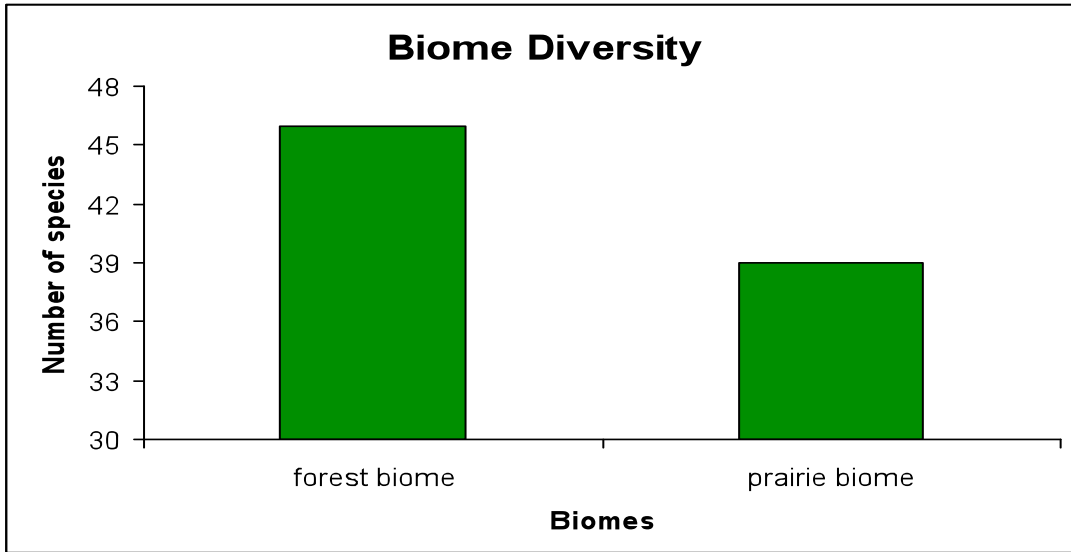


Figure 2. Number of total mammals caught in both the forest habitats and the prairie habitats.

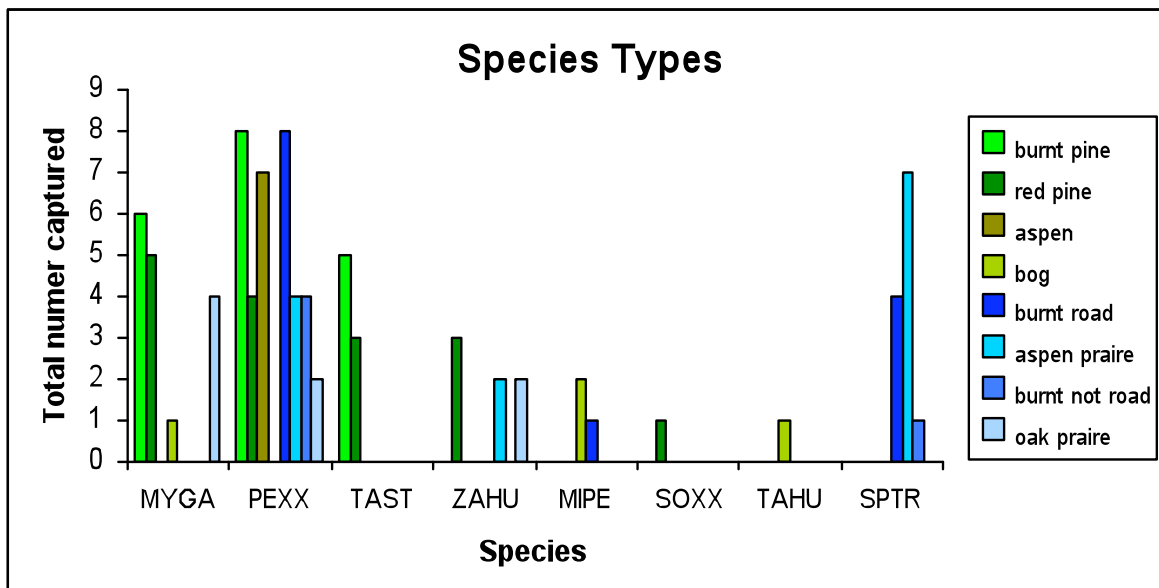


Figure 3. The specific mammal species and where it was captured. MYGA= *Myodes gapperi* PEXX= *Peromyscus* TAST= *Tamius striatus* ZAHU= *Zapus hudsonius* MIPE= *Microtus pensylvanicus* SOXX= *Sorex* TAHU= *Tamiasciurus hudsonicus* SPTR= *Spermophilus tridecomlineatus*. Greens represent forest biomes and blues represent prairie biomes.

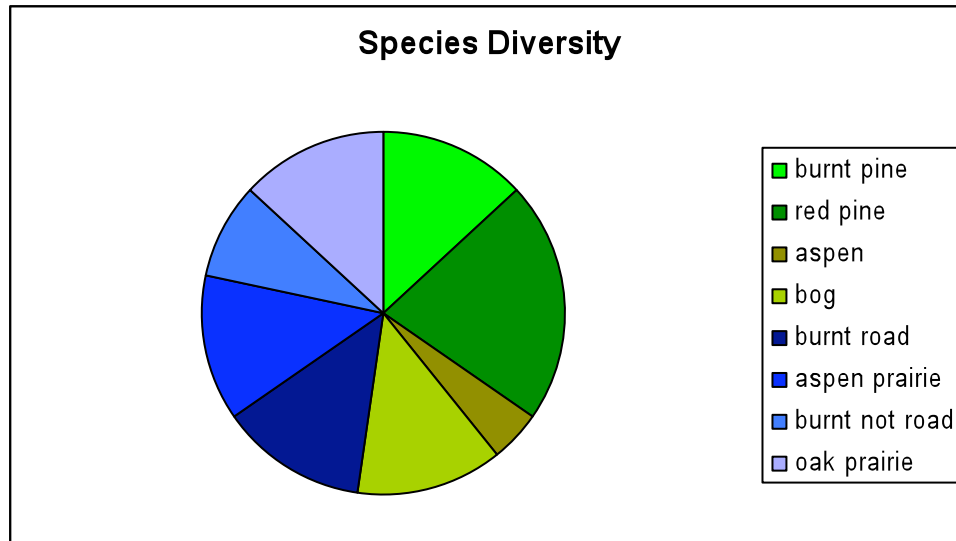


Figure 4. Number of different kinds of species in each grid area. Greens represent forest biomes and blues represent prairie biomes.

Discussion

The forest communities had more total number of small mammals caught than the prairie communities (figure 2). This could be because the forest offers many places for small mammals to hide and nest. These habitats have a lot of understory which could provide more variety of recourses and would allow for greater protection from predators.

Peromyscus were common in both the forest biomes and the prairie biomes (figure 3). In Itasca State Forest 19 *Peromyscus* were found and in Agassiz 18 *Peromyscus* were found. Unfortunately, due to the need of saliva tests needed to determine if they were the *Peromyscus maniculatus* (deer mouse) or *Peromyscus leucopus* (white-footed mouse), no conclusion can be made as to their preference of biomes at this time. However, a previous study has shown that the white-footed mouse preferred the habitat of the forest's wooded areas and that the deer mice prefer the prairies (Schnell et al. 1980). All of the *Peromyscus* did show high preference to burnt

habitats in both the forest and the prairie giving the indication that they may prosper in an area where the vegetation is changing (Kaynas et al. 2002). The eastern chipmunk seemed to prefer the forest environment since none were found in the prairie. The thirteen-lined ground squirrel also had preference but preferred the prairie to the forest (figure 3).

My original hypothesis, that there will be more total small mammals caught and that there will be greater diversity within the forest biomes than that of the prairie biomes, is supported by this study. The number of small mammals caught was significantly more in Itasca State Park's forest biome and we also saw more species diversity within the forest.

Literature Cited

- Kaynes, B.Y. Tavsanoğlu, C. Gurkan, B. 2002. Species diversity of small mammals community in different stages of post-fire succession in Marmaris National Park, Turkey. Forest Fire Research & Wildlife Fire Safety. Hacettepe University, Department of Biology, Ecology Section 06532, Beytepe-Ankare, Turkey.
- Schnell, Gary D. Owen, Robert D. Chesser, Ronald K. Risser, Paul G. 1980. Populations of Small Mammals in North-Central Oklahoma. *The Southwestern Naturalist* 25:67-80.