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COMPARISON OF NUMBERS OF SMALL MAMMALS CAPTURED IN FIELD AND FOREST HABITATS AT THE RAYSTOWN FIELD STATION

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ABSTRACT

We compared the number of small mammals captured in field and forest habitats at a secluded location in Huntingdon County, Pennsylvania. We hypothesized that the number of small mammal captures would differ between the field and forest settings. We tested this hypothesis by conducting a small mammal capture study, similar to a study done in 2000. We found that captures of small mammals in forest habitats were significantly greater than captures in field habitats (χ^2 = 13.333, df = 1, $P < 0.001$). We conclude that small mammals prefer forest areas to fields at the Raystown Field Station. The results of this study could have land-use implications regarding small mammal populations at this site.

Keywords: Small mammals, habitat selection, Peromyscus leucopus, *Raystown Field Station.*

INTRODUCTION

The white-footed mouse (*Peromyscus leucopus)* is the most abundant rodent in Pennsylvania (Merritt 1987). It is also a habitat generalist, meaning it will live in virtually any habitat from old growth forest to cultivated field (Bellows et. al. 2001). The species' actual habitat preference varies locally by population depending on a variety of factors, including food availability, suitable nesting locations, and cover. Soricid shrews, another common group of Pennsylvania small mammals, are habitat specialists, requiring a certain amount of humidity and insect prey that only a forest habitat with sufficient low cover can provide (Bellows et. al. 2001).

A study of *P. leucopus* habitat selection conducted at the Raystown Field Station in 2000 showed significantly more captures in forest habitats than fields (Olsen et. al. 2000). We believed several capture events in our short-term study would produce non-*Peromyscus* mammals, and so chose to include all species of small mammals captured in our data. It was the purpose of our study to determine the habitat selection of small mammals at two field and two forest sites at the Raystown Field Station, Huntingdon County, Pennsylvania (Fig. 1).

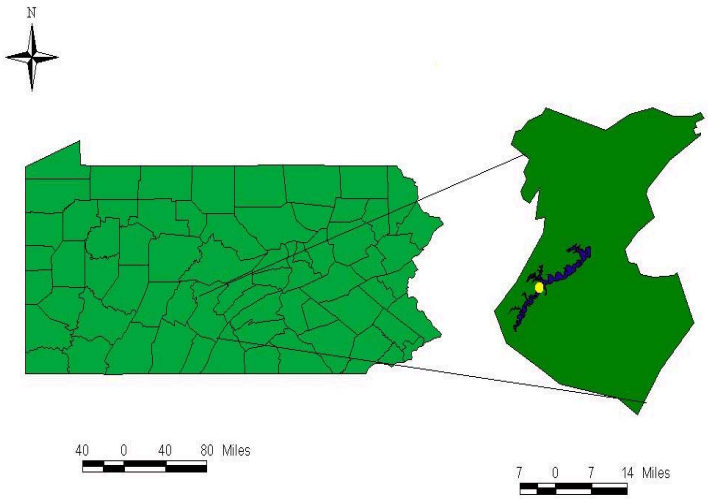

Figure 1 – Map showing location of Huntingdon County, Pennsylvania. Dot on west side of lake (Lake Raystown) represents location of Raystown Field Station.

METHODS AND MATERIALS

We selected four trapping sites at the Field Station: two forest plots and two field plots. Each plot was 25 yd wide by 15 yd deep and was divided into 11 blocks, each 5 yd^2. The shape of each plot was 3 rows of 3 blocks, forming a square of 15 yd^2, with an extra block on either end of the middle row. We placed 2 Sherman traps in each block, in close proximity to each other, for a total of 22 traps per plot (Chuck Yohn, personal communication). We placed the traps near structures (e.g., under leaf litter, near fallen trees, near grass clumps, etc.) to increase our chances of capture. Traps were baited with a mixture of peanut butter and oats, and we added Poly-fill for bedding to keep the animals warm on cold nights.

We collected data on 18 nights during March-April, 2002. Traps were set in the evening before 5:00 pm and checked before 7:00 am the following morning, at which time all captured animals were identified and recorded and all trap doors were closed. We recorded weather conditions and lowest nightly temperature each time we checked the traps. We compared actual number of captures between forest and field against expected numbers for each habitat by using a chi^2 test (Minitab), and considered differences to be significant if $P \leq 0.05$.

RESULTS

Four species of small mammals were captured during this study, *Peromyscus leucuopus* having the greatest number of captures (Table 1). Both live and dead animals were counted (three *Cryptotis parva* were found dead in traps). Capture night conditions varied over the course of our study (Table 2). Over twice as many small mammals were captured when overnight temperatures were $\geq 32\ ^{o}$ F ($n = 14$) than when overnight temperatures dropped below freezing ($n = 6$). We found no difference in capture numbers among clear, cloudy, and rainy nights.

All small mammals were captured in forest habitats. The number of captures made in field and forest was significantly different ($\chi^2 = 13.333$, df = 1, $P < 0.001$).

Table 1. Number of captures per species in forest habitats at the Raystown Field Station, Huntingdon County, Pennsylvania in spring of 2002.

Species captured		**Number of Captures**
White-footed mouse	*Peromyscus leucopus*	13
Least shrew	*Cryptotis parva*	5
Meadow vole	*Microtus pennsylvanicus*	1
Gray squirrel	*Sciurus carolinensis*	1

Table 2. Nightly capture conditions (weather conditions and lowest overnight temperature) and number of captures per night for small-mammal trapping study at the Raystown Field Station, Huntingdon County, Pennsylvania in spring of 2002.

Night	**# Captures**	**Low Temp**	**Weather**
1	0	26	clear
2	1	30	rain
3	2	32	cloudy
4	1	19	clear
5	1	33	clear
6	3	32	clear
7	2	50	cloudy
8	2	24	clear
9	0	19	clear
10	0	24	cloudy
11	0	32	cloudy
12	2	59	cloudy
13	2	40	cloudy
14	2	28	clear
15	0	35	cloudy
16	1	48	cloudy
17	1	48	rain
18	0	51	rain

DISCUSSION

Significantly more mammals were captured in forest than field, possibly due to differences in habitat structure. The more complex habitat structure (shrubs, tree trunks, fallen trees, and leaves) of the forest can provide protection from weather and predators, and create favorable nesting sites. Our field sites offered little complex structure, only grasses, briers, and scattered shallow depressions. *C. parva* requires forest habitats for survival, as does *S. carolinensis*. *M. pennsylvanicus*, typically found in field habitats,

may have come into the forest from a nearby field (Merritt 1987). Based on this study, we believe *P. leucopus* prefers complex versus simple habitats at the Raystown Field Station.

Our study was done in late winter through very early spring. Numbers of small mammals are lowest at this time of year due to predation and lack of food during winter. These mammals have not yet begun reproducing at this time, and so have not been able to replenish their population numbers. This probably led to our low capture numbers per night. Also, the mammals seemed to avoid moving about on nights when the temperature dropped below freezing, which generally led to lower capture numbers on the coldest nights.

During our study, *C. parva* were found dead in traps three out of five captures. According to Carey and Wilson (2001) this is not uncommon. Soricids are insectivores with very high metabolic rates. Being stuck in a trap overnight without sufficient insect prey, these creatures cannot survive long. We believe the shrews in our study entered the traps unknowingly, or possibly in pursuit of small insects attracted by our bait. Based on our frequent capture of shrews in certain traps, we also feel that these traps were close to shrew dens, and so after repeat captures we moved these traps in an effort to not deplete the local shrew population.

Toward the end of our study, an unknown animal (probably a raccoon) was cleaning the bait from most of the traps in our forest plots (Gustafson, personal communication). Some traps were severely damaged. We feel this disturbance led to low capture numbers toward the end of our data taking, when temperatures were warm enough to promote higher capture numbers.

The results of our study may have implications for conservation biology. Land development, timber harvesting, and even clearing fields in order to create habitat for other wildlife could have a devastating impact on species like *P. leucopus and C. parva*, especially during the winter months. A decrease in small mammal species like these could result in a decrease in food for predator species. This may force predators to leave their territories in search of prey elsewhere or to rely more heavily on another food source, thus impacting local populations of several species.

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