

# **The Effects of Trapping Methods on Estimation of Population Parameters for Small Mammals**

by

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## **ABSTRACT**

Small mammal population and community studies are typically based on trapping. Removal and mark-recapture techniques are used to sample populations and estimate the probability of capture. The purpose of this study was to determine the effects of various sampling strategies on estimates of community and population level parameters. I used the removal-by-mark method and varied the number of traps used on a 1 ha grid to determine how the number of traps, duration of trapping, and level of replication affected estimates of species richness and abundance. No significant differences were detected in the estimated abundance or the precision of the estimate relative to the density of traps used for my spring captures, suggesting that the number of replicates in this season were too small relative to the high variability of the data. In fall, the estimated abundance increased with trap densities from nine trap stations per ha to 144 per ha for both prairie voles and deer mice, indicating that the lower densities of traps (nine to 100 per ha) were not sufficient to accurately survey these species. No trend was detected for western harvest mice abundance estimates, however the coefficient of variation of the abundance estimate steadily decreased with number of traps used. Increasing duration of trapping beyond four days generally did not change abundance estimates, suggesting that four days of trapping may be sufficient to accurately estimate abundance. Trap density had no effect on estimates of species richness. An increase in average number of species detected per grid with each of two additions of two days of trapping occurred for most densities of traps.

To determine if bait choice affected capture probability I used peanut butter, rat chow, and sunflower seeds as baits on separate trap grids using mark-recapture techniques. Bait type did not affect the capture probability for deer mice, but it did have a significant effect on the capture probability for western harvest mice. Sunflower seeds provided the highest estimated capture probability and peanut butter resulted in the lowest. Bait may affect capture probabilities for specialized feeders, but all three baits that I used were suitable for omnivorous species.