A Comparison of Small Mammal Movement Distances Pre- and Post-Disturbance

C. Michael Irvin
Washington and Jefferson College-HHMI Student Researcher

Introduction

• Small mammals are a very important part of the ecosystems in which they live, increasing both the functional diversity and species richness of their given ecosystems while also playing a key role in the distribution of plant and fungi species as well as serving as prey for many other species of mammals, reptiles, and raptors (Kaminski et al., 2006).
• It is hypothesized that there is a connectivity threshold for many small mammal species, meaning that there is a maximum gap size that a given species will cross (Bowman & Fahrig, 2002) and that home range size can be used as a strong indicator of the productivity of the habitat (Rosenberg & Anthony, 1993).
• I hypothesized that there would be a significant difference between the mean movement distance of small mammals in Summer 2009 and Summer 2010 due to the disturbance created by the right-of-way (ROW) construction.
• I predicted that the mean movement distance for small mammals would be greater pre-ROW (Summer 2009 data) than post-ROW (Summer 2010 data).

Methods

• The results of this experiment do not support my prediction that the mean movement distance for small mammals would be greater pre-disturbance than post-disturbance. The sample size in my study was very small (N=18).
• For the Summer 2009 trapping session there were 9 movement distances to analyze (3 Peromyscus spp., 6 Tamias striatus) of which 4 movement distances were 0.0 meters with a maximum distance of 328.15 meters. For the Summer 2010 trapping session there were 9 movement distances (2 Peromyscus spp., 6 Tamias striatus, with 1 Southern Flying Squirrel (Glaucomys volans) of which 1 movement distance was 0.0 meters, the maximum movement distance of 109.62 meters.
• In Bowman & Fahrig (2002), a translocation study was performed where chipmunks were moved various distances away from their original trapping point, in order to return to their initial trapping point individuals had to cross a gap 0 – 240 meters.
• In the study, chipmunks crossed the entire range of gap sizes successfully (Bowman & Fahrig, 2002).
• The results of this study suggest that while chipmunks may prefer to cross using corridors, they do not necessarily require them (Bowman & Fahrig, 2002). This may explain why there was not a significant difference in mean movement distances between years.

Results

• In the study, chipmunks crossed the entire range of gap sizes successfully (Bowman & Fahrig, 2002).
• The results of this study suggest that while chipmunks may prefer to cross using corridors, they do not necessarily require them (Bowman & Fahrig, 2002).
• The results of this experiment do not support my prediction that the mean movement distance for small mammals would be greater pre-disturbance than post-disturbance. The sample size in my study was very small (N=18).

Discussion

• A future application I hope for this study to have is in the use of this data and data collected in the future in assessing home range sizes of the chipmunk population present at the field station.
• Assessing the home range size of chipmunks at the field station would be very useful in attempting to quantify the population demographics of the local population, and also to examine possible relationships with home range size and disturbance.

Future Projects

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Literature Cited


Figure 1. Sherman folding aluminum live trap (H.B. Sherman Traps, Inc., Tallahassee, Florida) used to capture small mammals.
Figure 2. Eastern Chipmunk (Tamias striatus) shown in processing bag being sexed prior to being weighed.
Figure 3. Eastern Chipmunk shown in processing bag receiving unique hair clipping in order to be identified if recaptured in the future. The mark-recapture method was used.
Figure 4. ArcMap GIS map of the Abernathy Field Station showing the 3 - 325 meter transects designated for small mammal trapping. Each transect contains 14 points spaced 25 meters apart.
Figure 5. Graph showing the observed and expected frequencies for small mammals crossing the ROW and not crossing. Blue = expected values and Red = observed values.
Figure 6. Graph showing mean small mammal movement distances for recaptured animals in Summer 2009 and Summer 2010.