

MS Thesis Defense

Candidate: Meredith Penthorn

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Title: The Effects of Fragmentation on Habitat Usage in Native Small Mammals

Thesis Director: Dr. Thomas Lovejoy

Committee Members: Dr. Larry Rockwood, Dr. Bill McShea (Smithsonian Conservation Biology Institute)

ABSTRACT

Habitat fragmentation removes original habitat and creates a matrix of new habitat with remnants of original habitat embedded within. Small mammals such as *Peromyscus leucopus*, *Blarina brevicauda*, *Microtus pennsylvanicus*, *Zapus hudsonius*, and *Tamias striatus* may not be able to cross the matrix habitat to access continuous forest habitat or other forest fragments if the amount of cover is insufficient, because the benefits of acquiring new resources do not justify the predation risk. A combination of sampling techniques, including live trapping, giving-up density (GUD) trials, plant surveys, and camera trapping were employed to assess the relative importance of habitat type (fragment, matrix, or continuous forest), vegetative composition and structure, demographic attributes, fragment size, and matrix distance in determining foraging behavior over two summers. Trapping and GUD indicate where animals are foraging, and GUD gives a more specific measure of the relative amount of time spent in each habitat. Predator and plant surveys and camera trapping illuminate possible drivers of this behavior. Results indicated that habitat type most strongly affected animals; most species displayed some aversion to foraging in the matrix as opposed to the fragments and forest ($p < 0.05$). Removing matrix structure further delineates fragment, forest, and matrix ($p < 0.0001$). Year also had a strong effect, with significantly fewer captures and higher GUD's in 2012 as opposed to 2013 ($p < 0.001$). Fragment size and isolation did not have a significant effect on foraging behavior ($p > 0.05$), but plant diversity was significantly different between habitat types ($p < 0.001$). Results suggest that maintaining connectivity and structural complexity in fragmented habitats are most beneficial to small mammals.