

EFFECTS OF FIRE AND FIRE SURROGATE TREATMENTS ON
SMALL MAMMALS IN THE SOUTH CAROLINA PIEDMONT

A Thesis

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by

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ABSTRACT

Current fuel loading levels in forests across the United States have prompted research on ways to reduce these levels while maintaining or enhancing ecological integrity. This study examines the effects of four treatments, denoted as fire and fire surrogate treatments, on small mammal communities in the Piedmont of South Carolina. These treatments include: control (no treatment), spring prescribed burning, and commercial thinning, and thinning followed by burning. Small mammals were sampled throughout the year in pitfall traps of three different designs, beginning before treatments were implemented in the fall of 2000 and continuing until December of 2001. Small mammals were also trapped during the fall of 2000 using Sherman® and Tomahawk® live traps and during the summer and fall of 2001 using Victor® mouse and rat snap traps.

Six species of small mammals were captured over the course of the study. The use of snap traps proved to be more effective than the use of live traps, and pitfall traps provided for a broader array of species captured. Several factors contributed to a low capture rate, and an extensive analysis of the effects of treatments on small communities was not possible.

Observed treatment effects included changes in grass cover, shrub cover, 10-hour fuels, 100-hour fuels, and litter depth. Short-term responses of northern short-tailed shrews (*Blarina brevicauda*), white-footed mice (*Peromyscus leucopus*), and golden mice (*Ochrotomys nuttalli*) to habitat changes were predicted. Habitat suitability for white-footed mice was predicted to be improved by the three non-control treatments. Northern short-tailed shrew use of areas treated with burn-only and thin/burn treatments was predicted to decrease and use of areas treated with the thin-only treatment was predicted to be unaffected. Thin-only and burn-only treatments were predicted to decrease suitability of habitat for golden mice in the short-term, and the thin/burn treatment was predicted to have no effect on habitat suitability for this species.

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