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The effects of eastern hemlock removal on rodent community composition

The eastern hemlock is considered to be a foundation species which is responsible for controlling community structure by creating stable local conditions for other resident species; therefore, the loss of foundation species can potentially influence the structure of animal communities. The eastern hemlock, *Tsuga canadensis*, is declining in abundance from the effects of logging and the invasive sap-sucking insect hemlock woolly adelgid *(Adelges tsugae*) and this loss may impact community composition of rodents. In order to elucidate how rodent species richness and composition differ among logged and invaded hemlock stands, I have examined rodent communities at Harvard Forest's Long-Term Experimental Research plots. The replicated two-block experimental design includes four forest treatments 1) hemlock control, hemlocks dominate, 2) hardwood control, mid-successional hardwoods dominate, 3) girdled treatment, hemlocks have been girdled using chainsaws to simulate the effect of woolly adelgid invasion, and 4) logged treatment, hemlocks have been removed to simulate the effect of commercial logging. Grids spanning 0.49ha and consisting of 49 Sherman live-traps were placed within the plots and were set from June-August (2,352 trapping nights per block). Using Schnabel's mark-recapture methods, an estimated population size was calculated for each species. To date, six rodent species have been captured at varying abundances among the four treatments. Notably, in hemlock and hardwood plots, *Peromyscus spp.* were more abundant than *C. gapperi;* however, in logged and girdled treatments *C. gapperi* was more abundant than *Peromyscus spp.* These data suggest that successional transformation within hemlock stands may alter rodent communities. In their late successional phase, hemlocks support the more generalist *Peromyscus* species rather than the herbaceous *C. gapperi.*