Rodent Abundance and Home Range Characteristics within Loblolly Pine Plantations Managed for Biofuels Production

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Abstract: Changes to forest understory composition and structure may affect ecologically important rodent communities which reflect vertebrate diversity across a diverse range of ecosystem types. Interest in growing biofuel feedstocks is increasing to help meet demands for renewable sources of energy for transportation fuels. However, potential effects of biomass options on biodiversity are not well known. This includes treatments that may be subject to removal of woody debris for biomass and/or establishment of biomass crops. Therefore, we examined response of rodents to combinations of switchgrass (*Panicum virgatum* L.) intercropping and biomass removal within intensively managed loblolly pine (*Pinus taeda*) stands on Weyerhaeuser Company lands in eastern North Carolina. We assessed rodent abundance and diversity conducting a mark-recapture study by capturing rodents on 20 experimental plots within newly established pine plantations subjected to five different intercropping treatments (pine with woody biomass in place, pine with woody biomass removed, pine intercropped with switchgrass and woody biomass in place, pine intercropped with switchgrass and woody biomass removed, and switchgrass only with woody biomass removed). We trapped each plot for 24 nights from July–December 2009 which resulted in 1,832 rodent captures during 13,428 trap nights. We captured white-footed mice (*Peromyscus leucopus*; *n*=390 tagged individuals), house mice (*Mus musculus*; *n* = 278 tagged individuals), cotton rats (*Sigmodon hispidus*; *n*=149 tagged individuals), and eastern harvest mice (*Reithrodontomys humulis*; *n*=11 tagged individuals). Preliminary results revealed that only house mice were influenced by treatment type (number of individuals: $\chi^2 = 11.01$, d.f. = 4, $P = 0.03$; total captures: $\chi^2 = 13.55$, 4 d.f. = 4, $P < 0.01$), with more house mice in treatments containing switchgrass. Examination of the effect of intercropping treatment on home range size and overlap of individual resident rodents will be presented. A better understanding of the impacts of producing biofuels feedstock in managed pine forests on rodent communities will assist managers with maintaining biodiversity.

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