

Conversion of tall fescue pastures to tallgrass prairie in southeastern Kansas: Small mammal responses

by

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ABSTRACT

I examined small mammal responses to a new method of converting fescue pastures to native tallgrass prairie at the Kansas Army Ammunition Plant near Parsons, Kansas. The conversion method include removing cattle from fescue pastures, halting nitrogen fertilization and implementing spring burning one year following cattle removal. Five treatments were identified to study the trajectory of prairie restoration; 1) ungrazed, mowed native prairie, 2 currently grazed, unburned fescue pastures receiving annual nitrogen fertilizer and 3-5) fescue pastures from which cattle and fertilizer were removed on 1 Jan. of 1997, 1998, and 1999 with annual spring burning initiated one year following cattle removal. Small mammals were sampled on all five treatments to assess how this method of conversion affects small mammal populations.

Of the 11 species captured, the hispid cotton rat (*Sigmodon hispidus*), deer mouse (*Peromyscus maniculatus*) and white-footed mouse (*Peromyscus leucopus*) were the most abundant followed by the western harvest mouse (*Reithrodontomys megalotis*), least shrew (*Cryptotis parva*), plains harvest mouse (*Reithrodontomys montanus*), eastern woodrat (*Neotoma floridana*), Elliot's short-tailed shrew (*Blarina hylophaga*), prairie vole (*Microtus ochrogaster*), house mouse (*Mus musculus*) and eastern cottontail (*Sylvilagus floridanus*). the species captured and their relative abundances were associated with vegetation structure, plant litter and burning regime. Cotton rats were most abundant in restoration sites with relatively dense vegetation and were most associated with thick plant litter layer. Deer mice were present across most sites and responded positively to burning and grazing, while least shrews were most abundant in native prairie grasslands and were captured in other sites that were not grazed or burned. White- footed mice and eastern woodrats were found in or near woodlands. Western harvest mice were present in plots with considerable cover and plant litter and were not captured in currently grazed or newly burned sites, whereas plains harvest mice were most abundance in sites with relatively low vegetative cover.

Small mammal species richness and abundance of individuals were highest in 1998 and 1997 cattle removal sites and lowest in a grazed sites and a native prairie site. The vegetative structural heterogeneity present in the restoration sites likely provides the nesting areas, cover and food resources to support a variety of small mammal species. This

study suggests that the fescue conversion method is effective in creating habitats where small mammal species can increase in richness and abundance.