EFFECTS OF PRESCRIBED BURNING ON GROUND-FORAGING ANT ASSEMBLAGES

Elizabeth W. Wright

Dr. Rose-Marie Muzika, Thesis Supervisor

ABSTRACT

Missouri has a long history of anthropogenic and naturally induced fire aiding the establishment of oak and pine-dominated woodlands and savannas. Fire has been reintroduced through forest management in the region after a period of fire suppression to help retain oak-dominance in forests throughout Missouri. Research on the effects of fire is ample for many wildlife species and plants but virtually excludes insects including ants, especially in Missouri and most of the United States. Ants are considered ecosystem engineers for their contribution to soil turnover, aeration and chemical and structural modification and are important seed dispersers. The effects of prescribed burning on ant assemblage diversity, abundance, composition and function were examined in oak-hickory and oak-pine forests in the Missouri Ozark Highlands. Where fire was present annually for over sixty years, ant abundance, Generalized Myrmicinae, soil and litter nesters and small ants increased. Fire every four years for over sixty years resulted in higher Shannon diversity, Cryptic Species, litter nesters and small and medium ants. In addition, this treatment shared ants with both the control and annually burned plots. Control plots were dominated by Subordinate Camponotini, Cold Climate Specialists, wood nesters and medium sized ants. Ants were also assessed after just two fires over the course of ten years. Five and six years after fire ant assemblages were more affected by topographic position than by prescribed burning. In summary, long term fire implementation results in more lasting changes in ant communities because habitat alteration is maintained over time. Habitat heterogeneity produces a more diverse assemblage of ants at the landscape scale and hence higher
functional diversity. Finally, categorization of ant communities may simplify ant sampling so that the natural history of each species need not be known in order to assess ecological effects of ant assemblages associated with burn treatments.