



Research Brief for Resource Managers

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Prairie Burn Management and Native Species Diversity

Milbauer, M. L., and M. K. Leach. 2007. Influence of species pool, fire history, and woody canopy on plant species density and composition in tallgrass prairie. J. Torrey Bot. Soc. 134: 53-62. 2007.

The varying effects of fire frequency on native prairies continues to be the subject of study and interest among restorationists and ecologists in the Upper Midwest. **This study, in the eastern tallgrass prairie region, took a close look at species composition changes over a 45-52 year period in remnant prairies.**

The authors used their expert knowledge of prairie remnants from the Curtis study* to resurvey 21 sites that met certain qualifications. They interviewed managers to document fire history on each site and grouped the sites almost evenly into three classes based on number of fires in the last 20 years: 4-17 fires, (8 sites), 1-2 fires (7 sites), and no fires (6 sites). They then sampled 20, one square meter quadrats for plant species, as well as gathered species data for the entire site, including canopy cover for woody species over 2 meters in height. Their survey took place in 1999.

They found that in the intervening roughly 50 years time, these **prairies gained more species than they lost, but the gain was in both non-native species and native habitat generalists.** There was a significant loss of prairie specialist species with the lowest such loss on sites burned most often. They also found that **the processes of losing and gaining species was more controlled by factors other than fire,** and so

Management Implications

- Continue to burn remnants. A burn regime of 4-17 fires in 20 years had the greatest influence on keeping species composition similar to 1950.
- Put monitoring emphasis on rare species rather than species diversity, as diversity does not always indicate a decrease in rare species.
- Managers may not need to go to great effort to remove all woody species. The most stable prairies had less than 50% canopy cover.

even frequent fire did not preserve the rarer species.

Among several crucial findings, they **caution against site monitoring protocols based on diversity**, which in their study remained stable despite the clear shift toward common species and away from conservative specialist species. They also caution against attempting to remove all tall brush, as their sites with 25-50 percent canopy had the most stable composition after 50 years, with those over 50% dropping significantly in similarity to 1950.

Pros: excellent use of prior survey data, a suite of important findings for prairie conservation.

Cons: lack of descriptions of prairie types used this study (e.g. dry, dry-mesic, mesic, etc).