Tallgrass Prairie and Oak Savanna Fire Science Consortium

JOINT FIRE SCIENCE PROGRAM

Research Brief for Resource Managers

Release:	Contact:	Phone:	Email:
October 2015	Tracy L. Hmielowski	608-890-4713	thmielowski.tpos.firescience@gmail.com

Fifty years of prairie fire – a case study from Iowa

Dornbush, Mathew E. 2004 Plant community changes following fifty-years of management at Kalsow Prairie Preserve, Iowa, U.S.A. American Midland Naturalist 151:241-250.

Small, isolated prairie remnants often show a decline in native species over time, and their sustainability is questioned. Given the rarity of tallgrass prairie in the upper Midwest, it is important to monitor changes over time to determine the long term impacts of land management.

This case study sought to document changes in the vegetation at Kalsow Prairie, one of the largest virgin prairies remaining in Iowa. Management at Kalsow, prior to 1950, was predominantly annual summer mowing, after 1950 management was gradually shifted to spring burning. Kalsow was sampled in 1949 and results published by Moyer in 1953, the author of this study replicated the sampling process in 1999/2000 to determine how the plant community at Kalsow has changed with 50 years of prescribed fire management.

The author identified 81 plant species representing 64 genera. Four of these species were non-native. The species composition had changed since the 1950 survey, in that 35 species were found to have a significant change in frequency. Of these 35 species, 19% increased and 14% decreased, it was notable that none of the non-native species increased.

Management Implications

- Use of uniform management (e.g., fire every 2 years) may not maximize biodiversity of the plant community due to the strong selection pressure
- Larger isolated prairie sites may be less prone to establishment of non-native species when managed with fire
- Prescribed fire may stabilize prairie communities, and keep non-native species from establishing

It is expected that plant communities will change over time, and this study was not conducted in a way to determine if changes in management shaped the changes in the plant community. However, this information can help researchers to develop new hypotheses about the long term impacts of fire on prairie habitats. For example, there was a decrease in the frequency of xeric species, and the author speculates this attributable to the change in litter accumulation when management shifted from mowing to burning as there was no change in annual precipitation from 1950 to 200. The author also observed a decrease in the frequency of cool season grasses and increase in the frequency of late flowering forbs. These trends are commonly seen at sites where prescribed fire is used as a management tool.