



Research Brief for Resource Managers

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Contact:
Tracy L. Hmielowski

Phone:
608-890-4713

Email:
thmielowski.tpos.firescience@gmail.com

Evaluating sixteen years of restoration in prairie

Heslinga, Justin L., Robert E. Grese. 2010. Assessing plant community changes over sixteen years of restoration in a remnant Michigan tallgrass prairie. American Midland Naturalist 164:322-336.

Long-term studies can track changes over time, and provide examples of expected community trajectory under similar restoration activities. In this study, authors focused on tallgrass prairie remnant at the University of Michigan Nichols Arboretum in Ann Arbor. This 4-ha prairie had undergone at least 40 years of fire suppression prior to the return of fire as a management strategy in 1988. Plant community sampling and application of different fire regimes started in 1991. Annual surveys and accurate record of management history provide opportunity to see if changes in plant community related to application of fire and evaluate long term restoration goals of site.

After 16 years of prescribed fire treatments, the authors observed an increase in the abundance of native species, primarily the dominant *Andropogon gerardii*, and a decrease in exotic species. However, the authors did not find an increase in species diversity of native plants over time.

Rainfall in a given year had significant effects on the plant community, which was most noticeable in drought years. The influence of climate on the plant community demonstrates the need for monitoring of restoration sites, to determine if changes need to be made to meet objectives or if

Management Implications

- Climate conditions have strong influence on plant community composition and can change trajectory of sites undergoing restoration
- In the absence of other management, prescribed fire alone is unlikely to increase species diversity on isolated remnant sites
- Decreasing exotic species can increase abundance of dominant natives, but may not increase diversity
- Reducing the abundance of dominant grasses like *Andropogon gerardii* may be important for increasing species diversity in restoration sites

objectives need to be changed to match the trajectory of the site.

In this study the authors did not observe changes in dominance or richness related to differences in fire frequency. Minimal differences between annual fires and fires every three years at this site could be because both fire regimes fall within the historical range of fire return intervals, or could be that detecting differences in a set fire return interval would take longer than 16 years to become significant.

The authors concluded that after 16 years of fire this site was not moving toward greater species diversity. This suggests that isolated remnants and restoration sites may need seeding, in addition to fire, to increase species diversity.



Photos of prescribed burns being conducted at the study site, provided by Justin Heslinga.