

THE EFFECTS OF FIRE FREQUENCY ON BIG BLUESTEM DOMINANCE AND PLANT DIVERSITY IN A MICHIGAN PRAIRIE RESTORATION

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Abstract: At the eastern edge of the prairie biome, there have been few published studies of long-term prairie management or studies that go beyond species inventories. Dow Field is an approximately 10-acre tallgrass prairie remnant in the University of Michigan's Nichols Arboretum in Ann Arbor, Michigan that has been systematically managed by a combination of annual and triennial spring (April) and fall (November) burns since 1990. In 45 1x2 m plots (15 in each of three management units), count and percent cover of all species were recorded each September from 1991-2003 and 2007. Through correlation, regression, and path analysis, we evaluated which factors best predict plant diversity in Dow Field over the 16-year period. Across all management units, the strongest single predictor of species density (species richness per m²) was percent cover of big bluestem (*Andropogon gerardii*), which reduced species density by about 1 species for every 24% percent increase in cover. In contrast, percent cover of Kentucky bluegrass (*Poa pratensis*), the most common exotic invasive grass in Dow Field, was positively correlated with species richness across all treatments. Burn season had no effect on diversity or big bluestem dominance. Unexpectedly, percent cover of big bluestem was significantly higher in triennially burned units than in annually burned units, and species density was highest in annually burned treatments. These initial results suggest that big bluestem may act as a control on diversity in Dow Field by outcompeting more conservative species.