# Pre-European fire history of North American tallgrass prairie

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## Abstract

Fire was an important component of the historical maintenance of the North American Tallgrass Prairie. Three aspects of the natural (pre-European) fire conditions have recently been studied. First, fires were estimated to have occurred an average of every 4.8 + 0.56 years based on fire-scarred trees growing along the margin of extant native prairies. Second, while not optimal for present objectives such as domestic livestock, fires occurring during the growing season may have been important in maintaining the natural diversity of the ecosystem. The herbs, false sunflower (*Heliopsis helianthoides*) and white aster (*Aster ericoides*), for example, increase with summer and fall burning; big bluestem (*Andropogon gerardii*), the dominant grass of the tallgrass prairie, responds best to spring burning. Fires routinely applied during the same season ultimately may reduce ecosystem diversity. Thirdly, simulated grazing designed to approximate the effect of large grazers such as bison (*Bison bison)* on fuel distribution, resulted in a significantly greater fire temperature heterogeneity ($P<0.001$) than occurred without grazers. Fire in the pre-European tallgrass prairie thus appears to have been a complex factor involving frequent and seasonally-variable occurrences and heterogeneous fire-temperatures across a grazed landscape.