

WOODY ENCROACHMENT IN THE CENTRAL UNITED STATES

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Abstract—The landscape of the central United States is dominated by cropland and rangeland mixed with remnants of short- and tall-grass prairies that were once prevalent. Since the last ice age, these areas had sparse tree cover due to cyclical severe droughts, intentional fires used by indigenous people as a land management tool, and natural fires caused by lightning. More recently, tree cover is suppressed by tillage or grazing. However, the combination of fire suppression and idling of farmland due to conservation programs and periodic downturns in the agricultural economy allows woody species to take hold where they were historically absent. As a result, woody encroachment is a topic of concern in these primarily nonforest areas. Using data from the Forest Inventory and Analysis program, we examine the expansion of eastern redcedar (*Juniperus virginiana*), as well as several other prevalent woody species, in the central United States. We compare the change over time for these woody species with respect to area, density, volume, and seedling abundance at both county- and state-levels. In addition, we examine the corresponding plot-level tree diversity in the presence and absence of these species over a range of densities. Our analysis shows the expansion is widespread but highly varied across the region in terms of rate, prevalence, and dominant species. Woody species are having an impact on the region's ecosystems and will likely play an increasing role if current trends continue.
