

Lake States Fire Science Consortium

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Prescribed Fire Helps Control Spotted Knapweed

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Infestations of the exotic perennial *Centaurea stoebe* L. (spotted knapweed) hinder the restoration and management of native ecosystems on droughty, infertile sites throughout the Midwestern United States. We studied the effects of annual burning on knapweed persistence at a degraded, knapweed-infested site in western Michigan. Our experiment included 48, 4-m² plots seeded with native warm-season grasses in 1999. Species included big and little bluestems, Indian grass, and switchgrass. Beginning in 2003, we incorporated fire as an experimental factor and burned half of the plots in late April or May for three years (2003-2005).

Burning increased the dominance (% of total biomass) of warm-season grasses and decreased both biomass and dominance of knapweed. Burning also reduced adult, juvenile, and seedling knapweed densities. Knapweed density and biomass also declined on the unburned plots through time, suggesting that warm-season grasses may effectively compete with knapweed even in the absence of fire. By the end of the study, mean adult knapweed densities on both burned (0.4 per m²) and unburned plots (1.3 per m²) were reduced to levels where the native grasses should persist with normal management, including the use of prescribed fire. In this study, late-April to late-May burns reduced knapweed and favored the growth of native warm-season grasses.

MacDonald, Neil W., Brian T. Scull, and Scott R. Abella. 2007. Mid-spring burning reduces spotted knapweed and increases native grasses during a Michigan experimental grassland establishment. *Restoration Ecology* 15(1):118-128.



MANAGEMENT IMPLICATIONS

- 1) Annual mid-spring burning reduced knapweed densities and biomass and increased native warm-season grass dominance.
- 2) Burning impacts on knapweed can be affected by knapweed densities, grassy fuel loads, burn timing, and plant community responses to fire. Burning appears to be effective in fire-adapted plant communities with low knapweed densities and abundant fuel.
- 3) Prescribed burns need to be carefully timed to optimize the negative impacts on spotted knapweed populations while producing the desired effects on native plant communities.

Want to learn more?

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