

Lake States Fire Science Consortium

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PHRAGMITES AND FIRE

Written by: Shelby A. Weiss
(Applied Sciences Program, Seney NWR)

Phragmites australis, known as “common reed,” is found in marsh ecosystems world-wide. In the northern Lake States, there are both native and nonnative European lineages present. Recently, there have also been native-nonnative hybrids documented. The rapid expansion of *P. australis* in North America in recent years is largely attributed to the introduction of the nonnative lineage and its associated characteristics that make it successful at excluding competitors where it colonizes.

A study in south central Manitoba sought to assess the effects of summer, fall, and spring burning on *P. australis* (no lineage was specified) using a blocked design in which a grid of twenty 22 x 22 yd plots were laid out within a stand. Four rows contained five plots each, with each row separated by a 16 ft fire break. Prescribed fire (summer, fall, and spring) and a control were randomly assigned to plots within each row. Researchers measured aboveground biomass, total and flowering shoot density, standing canes, accumulated litter, and belowground biomass. Results were measured the first year after burning.

P. australis shoot density was greater following all prescribed fire treatments, compared with controls, with between 31-33 shoots/ft² for summer, fall, and spring burns. Controls had 5 shoots/ft². Shoot heights were also shorter, including those that flowered, for all prescribed fires compared with controls. Shoot weight was greatest for the fall and spring burns, lower for summer and much lower for the control plots. Summer burns resulted in different shoot morphology characteristics than the other burns or controls and had lower mean values for every



Photo Credit Lindsey Landowski

MANAGEMENT IMPLICATIONS

- 1) There are three lineages of *Phragmites australis* in the northern Lake States: a native, nonnative, and newly recognized hybrid. Recent rapid spread of the reed is attributed to the nonnative lineage, which forms dense stands and can dominate marsh emergent zones.
- 2) Fire effects on *P. australis* depend on the season of the burn. Summer burning has the potential to thin dense stands whereas fall and spring burning promote its spread.

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Greg Corace
Seney National Wildlife Refuge
(greg_corace@fws.gov; 906-586-9851 x14)

characteristic measured, which included shoot height, basal diameter, inflorescence and leaf length, and leaf number. Belowground production was greatest for the fall and spring burns and these yielded a greater number of buds than the summer or controls.

Researchers suggest that the overall higher density in shoots after all burns can be attributed to fire removing the litter mat and increasing light to the soil surface. Despite shoot heights being shorter, the greater shoot biomass following the fall and spring burns was due to the high density of shoots within the plots. The greater number of buds present following the fall and spring burns suggests that shoot density will also be high in the second season following the treatments, whereas summer burning may have depleted the bud bank. This suggests that summer burning has thinning potential for dense stands of *P. australis*, and fall or spring burning likely enhances its spread.

These results may be applied differently by managers depending on the lineage of the *P. australis* being managed and whether management goals are to promote or prevent its spread. Additionally, the researchers acknowledge that these results may be sensitive to the specific burn dates chosen for this experiment.

References

Thompson, D. J., and J. M. Shay. 1984. The effects of fire on *Phragmites australis* in the Delta Marsh, Manitoba. *Canadian Journal of Botany* 63:1864-1869

For more reading on the hybrid lineage of *Phragmites australis*:

Saltonstall, K., H. E. Castillo, and B. Blossey. 2014. Confirmed field hybridization of native and introduced *Phragmites australis* (Poaceae) in North America. *American Journal of Botany* 101:211-215