

# Lake States Fire Science Consortium

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## LARGE HERBIVORES AND FIRE IN NORTHEASTERN MINNESOTA

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A study in northeastern Minnesota looked at initial responses of white-tailed deer (*Odocoileus virginianus*) and moose (*Alces alces*) for two growing seasons following the Little Sioux Burn of May 1971. Approximately half of the burn area was within the Boundary Waters Canoe Area Wilderness (BWCAW). The remainder was on private or other state and federal lands primarily managed for timber production. Forest communities were dominated by northern hardwoods and boreal conifers, and prior to burning, the area was composed primarily of balsam fir (*Abies balsamea*) and paper birch (*Betula papyrifera*). Portions of the area had been logged up to 10 years before the fire, harvesting red pine (*Pinus resinosa*), white pine (*Pinus strobus*), and jack pine (*Pinus banksiana*). Access routes within the burned area were driven or walked once a week and habitat use (based on tracks seen in the road) by white-tailed deer and moose was classified by forest community and environmental characteristics.

There was a five-fold increase in the number of moose for the two growing seasons following the Little Sioux Burn. Both white-tailed deer and moose most frequently used aspen-birch stands, which also produced the most biomass per unit area and were dominated by aspen suckers and sprouts. The highest frequency of use within these stands was in the late fall. In July and August, stands of balsam fir-birch were most frequently used. From April to June, white-tailed deer and moose were increasingly associated with one another. The overlap in their use decreased in July and August, and after November, any overlap in use was insignificant. Both white-tailed deer and moose moved to the peripheries of



### MANAGEMENT IMPLICATIONS

- 1) Moose populations increased dramatically following a wildfire in northeastern Minnesota despite the presence of white-tailed deer.
- 2) Recently burned areas dominated by aspen-birch or balsam-birch had the greatest biomass per unit area and were most frequently used by both white-tailed deer and moose.

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the burned areas in the winter. There was moderate overlap in their diets throughout the study, but white-tailed deer did not begin to browse as heavily until the fall.

White-tailed deer population numbers did not respond as dramatically to fire as moose numbers did, suggesting that any positive response they may have to fire could occur in later successional stages. Habitat selection of these species appears to be related to quantity of food available, with both moose and white-tailed deer using the burned aspen-birch and balsam fir-birch communities most often. Although there was overlap in diet, competition did not appear to influence the interactions of the species. The nematode *Parelaphostrongylus tenuis*, which is carried by white-tailed deer, has been thought to limit moose populations where white-tailed deer are present. However, in this instance, the separation of moose and white-tailed deer during the winter months may be limiting infection of moose and allowing their numbers to increase despite the presence of the primary host.

Overall, fire in this region likely favors moose populations, while white-tailed deer may be less capable of utilizing recently burned areas. Moose have potentially evolved mechanisms for colonizing areas of burned vegetation to take advantage of large quantities of browse following a fire.

#### Reference

Irwin, L. L. 1975. Deer-moose relationships on a burn in northeastern Minnesota. *Journal of Wildlife Management* 39:653-662