# THE EFFECTS OF FIRE ON UNDERSTORY VEGETATION IN PONDEROSA PINE FORESTS

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## Objectives

This was the second year of our study designed to evaluate the nature of vegetation occurring under *Pinus ponderosa* canopy in Wind Cave National Park and to define the relationship between this vegetation and fire. Fire is known to be a natural phenomenon in ponderosa pine forests (Wright 1978), and to play a major role in determining the position of the pine-grassland ecotone in the Black Hills (Gartner and Thompson 1973). Wind Cave personnel are developing a fire management plan allowing for prescribed burning, in hopes of bringing the park ecosystems back under a "natural" fire regime. Results of our study will help park management predict the effects of such prescribed burning on the ponderosa pine community.

## Methods

Sixteen 200 ft. x 60 ft. study plots were established in 1979. In May and June, 1979, each was sampled for overall vegetation cover, densities of all tree and shrub species, and sizes of all tree and shrub species.

In October 1979 four plots were control burned as part of an approximately 40 ha prescribed fire. In April 1980 four additional plots were burned as part of a prescribed 225 ha fire. The remaining eight plots were left unburned as controls.

In summer, 1980, we repeated data collection of vegetation cover, size, and density on all 16 study plots. We hope to repeat data collection in 1981, to follow post-fire succession through two growing seasons.

## Results and Conclusions

We have not completed analysis of the 1980 vegetation data, and cannot at this time describe the effects of the controlled burns. Qualitatively, the effects of the fires appeared mild. There was

some kill of ponderosa pine seedlings and saplings; crown scorch was minimal on our study plots. Grasses and herbs appeared to suffer little mortality.

## Literature Cited

Gartner, F.R., and W.W. Thompson. 1973. Fire in the Black Hills forest-grass ecotone. Proc. Tall Timbers Fire Ecol. Conf. 12: 37-68.

Wright, H.A. 1978. The effects of fire on vegetation in ponderosa pine forests. Texas Tech. College of Agriculture and U.S. Forest Service.