

Pine Hollow Enclosures—a 19-year Record of an Aspen Stand Treated with 2,4-D

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Data from old Forest Service administrative studies can provide information and insight into current management problems. Photographs of the Pine Hollow aspen enclosures on the eastern edge of the Taylor Mountain Plateau on the Ashley National Forest in eastern Utah provide a look at the effects of 2,4-D, wildlife, and cattle on plant succession in an aspen ecosystem over a 19-year period (Fig. 1-6).

This area is summer range for livestock but is also used by elk year-round and deer in the spring and fall and during winters with low snowfall. Heavy grazing before 1950, primarily by sheep, resulted in poor range condition. In 1950, rest rotation grazing was implemented to improve the range condition. Livestock grazing has been moderate and wildlife numbers have not been high since the 1950's.

The resource managers believed these sites were not producing their full potential in resource products and anticipated that removing the aspen overstory with the herbicide 2,4-D would increase the vigor and production of grasses and aspen suckers. In June 1965, some 100 acres of aspen were sprayed by helicopter with low volatile 2,4-D ester at a rate of 2-lb acid equivalent per acre

with a diesel carrier. Depicted in the figures are the two enclosures, one built to exclude both livestock and wildlife grazing and the second built to exclude livestock but to allow wildlife grazing. These enclosures were compared with the outside sprayed open range.

The site was evaluated in 1984, 19 years following spraying. Exclusion of both wildlife and livestock grazing allowed the aspen to sucker and return to the site (Fig. 1-3). Exclusion of livestock grazing but with use by wildlife caused aspen suckers to be spotty and less vigorous in appearance (Fig. 4). Outside the fence where grazing by both livestock and wildlife occurred there were no aspen suckers (Fig. 4-5). Apparently, in scrubby aspen stands such as this where ungulates are not excluded, spraying with herbicides is not recommended if aspen regeneration is the primary goal.

These photographs show that aspen can reestablish on a site treated with herbicide if complete protection from browsing is provided. Where livestock were excluded, aspen were essentially eliminated from the site by deer and elk. In the open area (no protection) few aspen survived, and those that did were repeatedly browsed.

For a detailed analysis of this study see Bartos and Harniss (1989).

Literature Cited

Bartos, D.L. and Harniss, R.O. 1989. Pine Hollow Enclosure: Effect of Browsing on an Aspen Community Sprayed with 2,4-D. West. J. Appl. For. (in process).

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Fig. 1. 1965. Before spraying with 2,4-D in the wildlife and livestock enclosure. Note the sagebrush and open scrubby aspen stand.



Fig. 2. 1968. Same view as Figure 1, 3 years after spraying. Note the abundance of grasses and few shrubs and forbs among the dead aspen stems.



Fig. 3. 1984. Twenty years after spraying in the wildlife and livestock exclosure. Note the return of the scrubby aspen and a mosaic of shrubs (primarily sagebrush), forbs, and grasses.



Fig. 4. 1984. Fenceline contrast between the sprayed exclosure with no wildlife or livestock grazing (on right) and the sprayed outside range open to grazing (on left). No grazing by wildlife or livestock enhances the return of the aspen stand. Grazing appears to have inhibited aspen and promoted sagebrush.



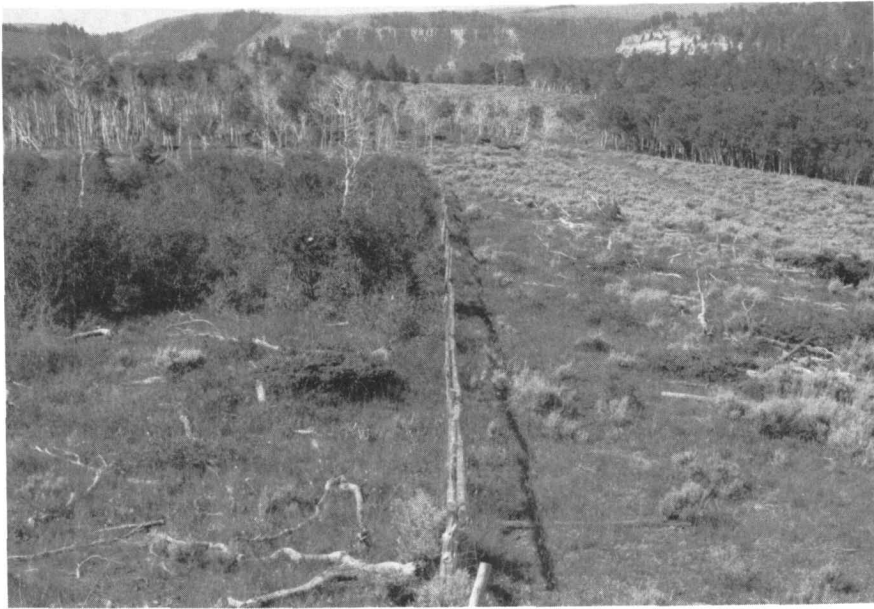


Fig. 5.1984. Fenceline contrast between the sprayed enclosure open to wildlife but closed to livestock grazing (on left) and the outside sprayed range open to grazing (on right). Aspen occurs on less than a quarter of the enclosure, and its distribution is attributed to different soil type (Davis, personal communication, 1989). Grazing by wildlife appears to inhibit aspen reproduction.

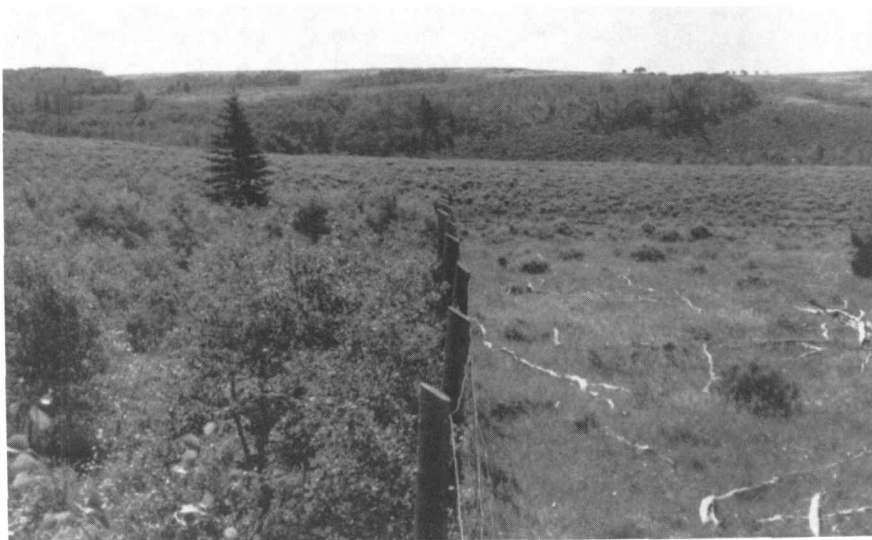


Fig. 6.1984. Fenceline contrast between enclosure closed to all use (left) and the enclosure closed just to livestock (right). Note the difference in aspen stems between the two sites. Area on right is in the same enclosure as area on left in Figure 5.