

VEGETATION RESPONSES TO SEEDING AND FERTILIZATION TREATMENTS AFTER WILDFIRE IN NORTH-CENTRAL WASHINGTON STATE

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ABSTRACT

As part of Burned Area Emergency Response, the USDA Forest Service and other federal land management agencies often prescribe slope stabilization treatments for steep, severely burned slopes in forests and rangelands to reduce risks of erosion. Despite widespread acceptance and use of these slope stabilization treatments, their efficacy for increasing vegetation cover and reducing soil erosion has not been well established.

In fall 2002, we established a field experiment on severely burned areas of the Deer Point Fire in north-central Washington State to examine the effects of two slope stabilization treatments, seeding and fertilization, on development of vegetative cover and recovery of native vegetation during the first 3 y after fire. We were also interested in longer-term effects on species diversity and the recovery of native plant communities. At each of four sites, we established 32 or 64 experimental plots (48 m²) and assigned plots to one of four seeding treatments (winter wheat, mixed perennial grasses, both, or neither) and one of two fertilization treatments (fertilization or nothing) in factorial combination. We measured plant functional group cover during each of the first three growing seasons after fire, and plant cover by species during the first and third growing seasons after fire.

Sprouting shrubs and grasses provided a large proportion of total vegetation cover during the first year post-fire. The winter wheat seeding treatment was generally ineffective and had no significant effect on vegetative cover. The mixed-perennials seeding treatment increased mean herbaceous plant cover and total vegetation cover by 4–5% at three of four sites during the first growing season after fire; however, differences in total vegetation cover were statistically significant at only one site. Fertilization treatments altered the relative cover of herbaceous and woody plants, but produced a significant increase in total vegetation cover at only one site. Seeding treatments appeared to be most necessary and effective on sites with sparse pre-fire understory vegetation and sparse soil seed banks. More experimentation and better monitoring is needed, however, to select appropriate species (preferably native) for different habitats.

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