

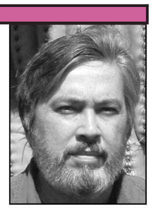


A 21st Century Perspective on Postfire Seeding

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Wildfires elicit a perceived need for emergency action to stabilize denuded landscapes. Aerial seeding of rapidly growing nonnative grasses is used routinely in an attempt to control postfire erosion, despite limited scientific basis for its effectiveness and with little consideration for its unintended ecological impacts. As fire size and magnitude have increased in recent decades, so has the prevalence and cost of postfire seeding and the potential footprint of its unintended impacts. We see a growing consensus in the research community on two important points: this management practice often is not cost-effective and it appears to create more problems than it solves.

Burned Area Emergency Rehabilitation (BAER) is a federal land management response with the goal of minimizing negative impacts of wildfires. One focus in the BAER process is how to best stabilize burned landscapes to reduce soil erosion and landslides. It seems logical to reestablish vegetative cover as rapidly as possible after wildfire because vegetation plays a critical role in soil stabilization. However, US Forest Service research scientists recently reviewed the efficacy of different slope stabilization techniques and found that seeding often was the least effective of all the methods commonly used (RMRS-GTR-63, 2000). Seeding has been particularly ineffective in the Southwest and California.

There are several reasons why seeding is ineffective and, thus, not cost-effective. First, seeding of grasses does not prevent the erosion of rocks and soil that come off slopes as dry ravel during and immediately after fire because this erosion occurs before the rainy season. When rains do occur, they often arrive as short intense storms that cause significant erosion before any vegetation cover can be established. In California and the Southwest, seeding commonly fails because intense storms either wash much of the seed off the slope before germination or episodes of rainfall are followed by dry periods that result in death of the young grass seedlings.

Seeding also has potential negative ecological consequences. Most fire-prone ecosystems include many native species adapted to rapid regeneration after fire, and seeding can inhibit the germination and survival of these species. Often, the natural regeneration in the first growing season on unseeded sites equals or exceeds that of seeded sites. In addition, seeding has been shown to inhibit forest regeneration, reduce natural biodiversity, and enhance nonnative plant invasion. Seeding also can create favorable conditions for the subsequent invasion of other nonnative plant species, because bare soil conditions often result after death of the introduced stock, and native seed pools are depleted. Of particular concern is the observation that the act of seeding is sometimes responsible for nonnative plant introductions. For example, after the 2000 Cerro Grande Fire near Los Alamos, NM, it was estimated that contamination of aerial seeding sources inadvertently broadcasted over 1 billion cheatgrass seeds on recently burned sites (1,302 cheatgrass seeds/lb × 800,000 lb of seed, Report of Seed Analysis, Agri Seed Testing, Inc., July 2000). Another unintended result of seeding is the production of dense stands of fine fuels that promote future fires.

An approach thought to avoid some of these problems is the broadcast seeding of native grass species. This practice is potentially useful in a limited number of cases. However, because of issues of genetic compatibility and contamination, local seed sources are required by many agencies, and, usually, these are either unavailable for postfire rehabilitation work or they are insufficient in volume. In cases where natural regeneration processes are compromised or where ecosystems are threatened with invasion by nonnative species or both, locally intense seeding of native grasses may be justifiable. However, widespread use of this type of revegetation threatens the diversity and fine grain mosaic of natural communities and still leaves the land manager a long way from community restoration.

A recent General Accounting Office report (General Accounting Office [GAO] 2003) noted, ". . . it could not be determined whether emergency stabilization and rehabilitation treatments were achieving their intended results." To address this shortcoming, GAO recommended that federal agencies specify procedures to be used to monitor treatment effectiveness and develop an interagency system to collect, store, and disseminate information on monitoring results. We hope that such monitoring is truly integrated in the BAER process, but we worry that the challenges facing fire management are too near term to risk a wait-and-see attitude. As the scale and intensity of fires continue to increase in the future, be it because of climate change, increased human ignitions, or long-term fire suppression, there will be increased demand for postfire rehabilitation. Presently, there is little scientific basis for postfire seeding, and what little there is would tend to discourage it. We support the establishment of funded monitoring programs to provide resource managers and researchers with the information needed to make informed and ecologically responsible decisions on postfire landscapes. In the case of shrublands and ponderosa pine forests in California and the Southwest, we feel that enough is already known about its ineffectiveness and unintended impacts to strongly discourage routine seeding after fire.

Literature Cited

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