

## CNPS Statement on Seeding Following Wildfire

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**Abstract.** Postfire seeding in burned areas of Mediterranean-climate chaparral and coastal sage scrub vegetation fails to provide erosion control and may retard native vegetation regeneration. The California Native Plant Society opposes postfire seeding in native vegetation to control erosion. Numerous other measures are available to responsible agencies to minimize postfire erosion. Many of these are more effective than applying seeds of grasses.

**Keywords:** California Native Plant Society; erosion; fire; postfire seeding.

### Introduction

The California Native Plant Society is an organization of 10,000 members in 31 chapters. The purpose of the Society is the study and preservation of California's native flora. California Native Plant Society membership consists of scientists, professionals, conservationists, landscape architects, and laypersons united by their interest in the native flora.

The California Native Plant Society strongly opposes seeding in native plant communities following wildfires, especially in chaparral and coastal sage scrub communities. No body of evidence supports the need for or effectiveness of seeding after wildfire in these natural communities. In fact, scientific evidence and direct observations, including data presented at this symposium, suggest that seeding can have detrimental effects on the environment and may increase erosion and fire hazard.

Although most resource protection and management agencies agree that postfire seeding has little beneficial effect and can cause adverse effects, some local government bodies, the U.S. Forest Service, and the California Department of Forestry and Fire Protection, continue to broadcast seeds on burned areas to "protect property and lives". To consider their perspective, these agencies are

responsible for protecting people and property. If they do nothing, they may be liable for damages from property owners. By seeding, they are perceived as "doing something". The problem with this approach is that, as the evidence presented throughout this symposium shows, applying seeds to burned areas has little or no effect on erosion hazard, does not protect people and property, and, in the end, may cause environmental damage.

### Arguments Against Postfire Seeding

The arguments against seeding after wildfire include the following:

1. There is no scientific evidence that seeding provides erosion protection when compared to natural regeneration.

The rationale behind seeding with grasses is to quickly provide foliage to protect the soil from raindrop impact and to provide plant roots that bind soil in place. Natural revegetation following wildfires performs both short-term functions as well as seeding, if not better. Fire is a normal part of Mediterranean-climate ecosystems such as exist in California, and native plants are well adapted to survive, and in fact depend on, periodic fires (Beauchamp 1994). Many shrubs resprout quickly from root crowns (Hanes 1971), often within days of burning. Other species require fire to crack their seed coats or chemically stimulate germination.

Additionally, numerous annual and perennial herbs are present in the soil as seed (the seed bank) waiting decades for fire to stimulate germination (Keeley et al. 1981; Dunne et al. 1991). Therefore, additional seeding is not necessary to provide either soil cover or root growth in undisturbed soils. Studies by U.S. Forest Ser-

vice, California Department of Forestry and Fire Protection, and universities have repeatedly shown that seeding does not significantly reduce postfire erosion (e.g., Booker et al. 1993). In fact some researchers have observed increased erosion in seeded areas following fire (Taskey et al. 1989).

2. Over the long term, chaparral and scrub vegetation may provide better erosion control than annual grasses.

Shrubs provide better protection from rain-drop impact than grass because their foliage is thicker and stronger. Annual grass is dead most of the year and so provides weaker canopy and root structure, particularly during the autumn rains. Shrub roots have better soil holding properties than grass because they are stronger and penetrate more deeply into the soil. Studies have shown that conversion of shrubland to grassland results in significantly increased erosion and sediment discharge (Pitt et al. 1978). Therefore, increasing the grass component of the post fire plant community may increase long-term erosion hazard in burned areas.

3. Seeding of annual grass requires specific environmental conditions to be effective.

Seeding relies on a single species or, at most, a mixture of a few species. These species may be poorly adapted to the environmental conditions in the target area. Observations have frequently shown, for example, that heavy rains wash seeds off of slopes on which they were broadcast. On the other hand, too little rainfall does not stimulate their germination.

Native plant communities are made up of diverse mixtures of species that are specifically adapted to fire and to the climate and soil conditions in the area. The naturally occurring plant community is much more likely to establish successfully than are the introduced species.

4. Annual grasses provide fuel for future fires.

After spring growth and flowering, annual grasses die and dry out, producing a thick layer of highly flammable thatch. This thatch can create excellent conditions for repeated fires in the seeded areas. Researchers have noted that seeded annual grasses may increase the danger of flash fires in the first years following wildfire (Griffin 1992; Zedler et al. 1983).

5. Grass seeding inhibits reestablishment of native vegetation.

Native fire-following seedlings, which include unusual, rare, and endangered species, appear only in the unique environmental conditions that are produced by wildfires (Hanes 1971; Keeley et al. 1981). These species experience intense competition from seeded grasses and forbs. Seeding has been found to decrease the diversity and vigor of native species following fire (Keeley et al. 1981; Conard and Beyers 1993; Franklin 1994). Seeded grasses can compete with germinating fire-followers and resprouting shrubs for water, light, and nutrients (Griffin 1982).

Young seedling shrub species that were not outcompeted by the seeded grasses would be killed, with a very low probability of being replaced by ungerminated seeds remaining in the seed bank, if another wildfire occurred before they reached maturity. The seeds of most "obligate seeder" shrub species germinate the first season after a wildfire. These shrub species do not mature and set seed until they are several years old. If another wildfire occurs before these obligate seeders have a chance to replenish the seed bank, a second fire may cause a partial or complete conversion of the vegetation from scrub to herbaceous plants or annual grasses (Zedler et al. 1983). Sites typically dominated by scrub communities, however, will not adequately support grassland-type vegetation. As a result, the soil and substrate may erode more than if the area was covered by scrub vegetation.

Native plant communities provide habitat for rare and endangered, as well as common, indigenous plant and animal species; these communities also improve soil fertility, increase the water and sediment holding capacity in a watershed, and create aesthetically pleasing landscapes.

In conclusion, more effective methods than applying seeds are available for controlling or minimizing damage from postfire erosion and flooding. Drainage ways should be monitored during rainfall and kept clear of debris so runoff can flow freely. Erosion control structures should be installed at strategic locations to catch falling rocks and soil. Small, temporary sediment catchment basins can be installed along drainages and upslope of structures. These methods offer a much more cost-effective response to postfire erosion problems than applying seeds. Southern California jurisdictions such as Ventura County Flood Control

Department are generally following these guidelines and have constructed (or are constructing) five sediment/debris catchment basins following the fall 1993 fires (Lockard personal communication).

Seeding has not been shown to be effective in erosion prevention or flood control; in some cases it can, in fact, increase potential erosion (Taskey 1989; Booker et al. 1993). In addition, seeding damages native plant communities. Especially in these economically difficult times, to spend scarce public funds on ineffective and destructive action would be poor public policy and fiscally irresponsible.

The California Native Plant Society urges all government bodies with authority to permit or deny postfire seeding to act appropriately to minimize erosion in the short and long run and to spend public funds in the manner that is known to be most effective. It is time that public officials listen to the scientists and practitioners who have conducted years of study and direct observations on this issue. The California Native Plant Society is pleased to provide any information or assistance it can and looks forward to working with decision makers on this issue.

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