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Impact of Postfire Hydroseeding on Sensitive Plant Communities in Laguna Canyon, California

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Abstract. Postfire remediations in Laguna Beach caused damage to sensitive plant habitats, riparian corridors, and ground inhabiting lichens, bryophytes and soil-holding crusts. Lack of CEQA or NEPA analysis, a lack of coordination of remediation efforts, and the failure to avoid critical habitat in postfire erosion control, resulted in damage to the primary population of *Dudleya stolonifera* (Laguna Beach *Dudleya*), a state-listed threatened plant within the Laguna Ecological Preserve. The construction of cement drop structures and retention basins in riparian corridors also caused permanent but avoidable habitat loss. Postfire remediation activity continued for over three months after the October, 1994 fire. Better control of erosion reduction activities and deliberate avoidance of sensitive plant habitats is needed to reduce postfire damage by agencies. A postfire activity and staging plan within a NEPA and EIR context for fire prone areas should be developed before the fire season to identify and mandate avoidance of sensitive resources.

Keywords: Bryophytes; *Dudleya stolonifera*; erosion control; hardscaping; hydroseeding; lichens; postfire remediation; riparian habitats; soil crusts.

Introduction

The fire that swept the Laguna Wilderness Park, including all of the northwest and most of the southwest sides of Laguna Canyon on 27-28 October, 1993, reduced thousands of acres of coastal sage scrub, grassland, and riparian habitat to ashes. Because of the fear of erosion impacts on the canyon, and on Laguna Beach, a number of measures, though unproven (Barro and Conrad 1987; Booker, et al. 1993), were initiated to reduce erosion and sediment shedding in the burned area. There was a strong sentiment, and some fear of legal liability, particularly among state and federal agencies, that "something" had to be done. The availability of emergency federal funding stimulated a rapid response by state and federal agencies, which had lasting ecological damage on a number of sites in the burn area.

The City of Laguna Beach responded to the postfire potential for erosion in a number of ways. The California Conservation Corps (CCC), directed by Federal Emergency Management Agency (FEMA), staked bales of straw along many of the steep streets within the City, and straw check dams were installed in small gullies. Straw was also scattered on some burned slopes like mulch. Hardscaped (cement) basins were installed in numerous riparian areas. Aerial seeding was applied to some restricted areas, but not in the Laguna Canyon drainage. However, hydroseeding was undertaken on a large scale, and an estimated 160 ha (400 ac) were treated in the months following the burn. Hydroseeding was applied along the urban fringe on the steep slopes which burned in Laguna Beach, and also on slopes in Laguna Canyon nearly as far east as El Toro Road.

Although both state and federal agencies participated in the postfire action, there was no attempt to examine potential impacts, through either a California Environmental Quality Act (CEQA) compliant Environmental Impact Report (EIR) or a National Environmental Policy Act (NEPA) directed Environmental Impact Statement (EIS) or Environmental Analysis. Had this consideration been given, damage to the Laguna Beach State Ecological Reserve, purchased by the State as critical habitat for the primary population of a State-listed threatened plant, *Dudleya stolonifera* Moran (Laguna Beach *Dudleya*), would not have occurred since it is up a canyon several miles from downtown Laguna Beach with no structures for several kilometers on its side of Laguna Canyon Road. The Department of Fish and Game requested that the Ecological Reserve not be hydroseeded. Ecologists throughout southern California had protested the use of exotic taxa for aerial seeding after the burn, arguing that

coastal sage scrub and fire co-exist and that natural recovery (Malanson and O'Leary 1982, Scott and Allen 1993) would occur but could be disrupted by artificial seeding efforts.

Despite this request, the Ecological Reserve was the last area to which hydroseed treatment was applied. There was no ecologist on site directing seeding and there appeared to be no coordination at this site between the crew applying the treatment and those directing the effort, which had been identified by Fish and Game as a sensitive habitat site. Hydroseeding applications along the tops of cliffs dislodged many *D. stolonifera* plants, and others were hydroseeded in place but did not fall off the cliff micro-habitats. Local conservationists were baffled as to the rationale for hydroseeding cliffs which held no flammable material, and dubbed the effort "recreational hydroseeding," suggesting that material was simply being used up as this was the last site to be treated. At sites where heavy hydroseeding was applied, lichens and bryophytes beneath the encrusting layer did not survive. If the dry layer of hydroseed material was scrubbed off, vascular plants such as *Dudleya stolonifera* do survive, however, and local conservationists were able to rescue many of the plants knocked off the cliff faces. After the *Dudleya* hydroseeding episode was brought to the attention of agency officials, each agency blamed another or the applicators.

In this case ecological damage by ameliorative actions to soften potential fire induced erosion far exceeded the impacts of the fire itself to at least one listed plant species, *Dudleya stolonifera*. Lasting degradation was caused by hardscaping riparian areas. After the fire, wheat was abundant along slopes and in riparian areas where straw bearing exotic seed had been used. Lichen and bryophyte populations did not survive on hydroseeded rocks and at the base of cliffs which weren't burned because heat was deflected upward. These impacts could have been avoided with better postfire consideration of sensitive plant communities, better coordination of hydroseeding efforts, and with attention being paid to not causing lasting damage through constructing cement impoundments at the sacrifice of riparian habitat in valley floors. Developing an ecologically appropriate inter- and postfire staging plan through CEQA and NEPA should be undertaken before the fire season begins to minimize damage to local sensitive resources.

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