

IMPACT OF FIRE ON SOIL RESOURCE PATTERNS IN MIXED-CONIFER FORESTS IN THE SOUTHERN CASCADE RANGE OF NORTHERN CALIFORNIA

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The montane ecosystems of the Cascade Range have been subjected to repeated manipulation and active fire suppression for more than a century. This has resulted in changes in community structure that contribute to increased wildfire hazard and severity. Ecosystem restoration to reduce the wildfire hazard has received substantial attention in recent years, though many ecological questions remain unanswered. This study addresses below-ground impacts of restorative treatments. We report preliminary results of the application of prescribed fire and the combination of fire and thinning on soil chemical and microbial parameters in treatment units of 10 ha each in the Klamath National Forest of northern California. Soil pH and total inorganic N increased in burned units (with and without thinning) one year after treatment, but differed significantly between treatments. Soil organic C decreased and C:N ratio increased as a result of fire in the burn-only treatment; no significant changes were observed for thin+burn treatment plots. Nitrogen mineralization rates did not change as a result of fire for both burn-only and thin+burn plots. Activity of acid phosphatase was reduced by fire, with and without thinning, whereas activity of chitinase was reduced by fire in thin+burn plots only. Changes in levels of phenol oxidase activity as a result of fire were not significant for treatments with or without fire. Our study contributes to an understanding of the ecological effects of fire on soil chemical and microbial properties. This project is part of the interdisciplinary national Fire and Fire Surrogate Network study and will provide information for informed land management decisions.

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