

Publication Brief for Resource Managers

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Prescribed Fires Can Successfully Replicate Burn Patterns Produced by Natural Fires

Prescription burning has been widely utilized by fire managers as a forest management option for correcting the perturbations caused by previous fire exclusion policy. But there are still questions about how closely prescribed fires mimic these patterns compared to natural wildfires.

In a study in *Forest Ecology and Management* authored by University of California-Berkeley, National Park Service and USGS, researchers compared burn patterns of prescribed fires and managed unplanned wildfires to understand how the differing burning regimes affect ecosystem properties.

Measures of forest structure and fire severity were sampled in three recent prescribed fires, versus three wildfires managed for resource objectives (as a proxy for natural fires). All fires were in Sequoia and Kings Canyon National Parks. Fine-scale patterns of fire severity and heterogeneity were compared between fire types using ground-based measures of fire effects on fuels, overstory and understory vegetation.

Results suggest that prescribed fires can provide burned landscapes that approximate natural fires in many ways, displaying similar patterns of overstory/understory fire severity, heterogeneity and seedling/sapling survival.

Understandably, particular constraints dictate whether a managed unplanned wildfire is allowed to burn freely. These constraints may result in conditions different from those experienced under more natural fires.

Overall, however, the similarity in fire effects observed between prescribed fires and managed wildfires indicate that when assessed on a fine spatial scale, prescribed fires appear to be creating post-fire conditions that approximate natural fires.

Management Implications

- Prescribed fires do create burned landscapes that approximate natural fires in pattern and severity in Sequoia and Kings Canyon mixed-conifer forests.
- When assessed on a fine spatial scale, the similarities between the results suggest that prescribed fires are creating post-fire conditions that approximate natural fires.
- Study results may not exactly mimic natural wildfires, since managed unplanned wildfires are only allowed to continue under certain constraints — ones that may not be shared by natural wildfires.

THIS BRIEF REFERS TO:

Nesmith, J.C.B., A.C. Caprio, A.H. Pfaff, T.W. McGinnis, J.E. Keeley. 2011. A Comparison of Effects from Prescribed Fires and Wildfires Managed for Resource Objectives in Sequoia and Kings Canyon National Parks. *Forest Ecology and Management* 261(7): 1275–1282. doi: 10.1016/j.foreco.2011.01.006

<http://www.werc.usgs.gov/seki>
<http://www.werc.usgs.gov/ProductDetails.aspx?ID=4202>



Prescription burn in *Sequoiadendron giganteum* forest of Kings Canyon National Park in response to more than a century of fuel accumulation due to highly effective fire suppression management. (Image courtesy of National Park Service).