



Research Brief for Resource Managers

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Post-fire Restoration Framework for California's National Forests

Meyer, Marc, Jonathan Long, and Hugh Safford (editors). 2021. Postfire restoration framework for national forests in California. U.S. Department of Agriculture, Forest Service, Pacific Southwest Research Station General Technical Report PSW-GTR-270. Albany, CA. www.fs.fed.us/psw/publications/documents/psw_gtr_270/

Postfire management on national forests in California often relies on a set of conventional and tactical approaches that may not address the diverse challenges and issues associated with large, severe wildfires and other interacting stressors. However, a technical report by Meyer and others (2021) proposes a new framework to help guide postfire management efforts on California's national forests, using ecological restoration principles and current agency policy direction as the basis for landscape-scale analysis, evaluation, and project planning.

The authors describe a set of ecological restoration principles, a landscape assessment process, and a framework for decision-making to plan and implement restoration projects. The postfire restoration framework is rooted in six science-based guiding principles, including: (1) restore key ecological processes, (2) consider landscape context, (3) promote regional native biodiversity, (4) sustain diverse ecosystem services, (5) establish a prioritization approach for management interventions, and (6) incorporate adaptation to agents of change, including climate change. These guiding principles set the stage for the development of postfire restoration efforts on national forests.

Management Implications

- Restoration of landscapes affected by uncharacteristically large and severe wildfires in California requires a science-based framework to address a complexity of issues and concerns.
- A postfire framework based on several ecological restoration principles and a stepwise process will lead to the development of a restoration portfolio that informs project planning in postfire landscapes.
- This framework can inform future postfire management, monitoring, and research on national forests in California, including those landscapes dominated by forest, chaparral, and sagebrush steppe ecosystems.



Postfire landscapes, such as the 2015 Rough Fire on the Sequoia National Forest, illustrate a wide array of fire effects and postfire management opportunities, such as areas prioritized for the restoration of forest cover and habitat. *Image Credit: Marc Meyer, USFS*

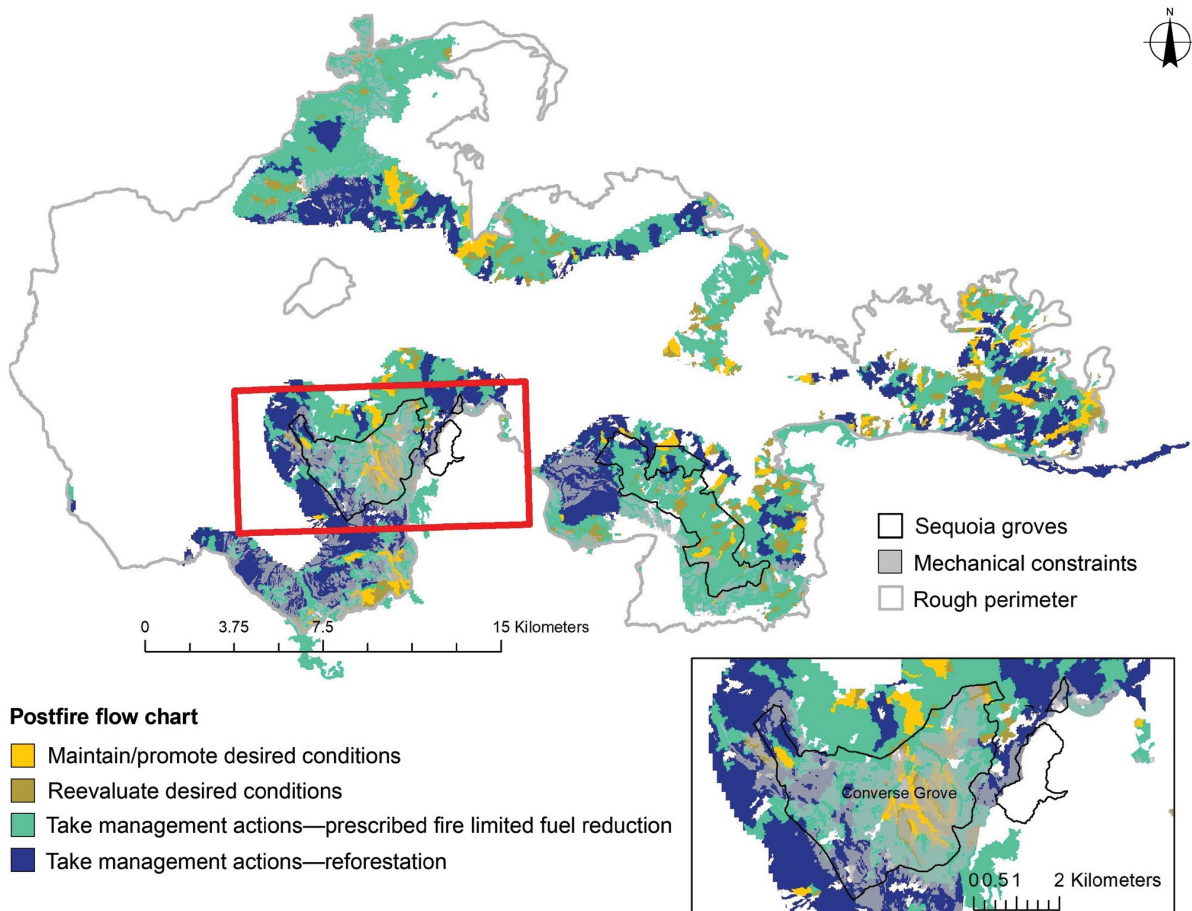
The landscape assessment process involves assessing postfire ecological condition, considering other factors that may influence postfire ecosystem recovery, and incorporating additional analysis tools. Next, a postfire flow chart, in combination with spatial outputs from the landscape assessment process, directs the user to identify three types of restoration opportunities on a postfire landscape, including areas to (1) maintain or promote desired conditions (areas with beneficial/neutral fire effects), (2) take management actions to restore desired conditions (areas with negative fire effects where management is feasible), and (3) reevaluate desired conditions (areas with negative fire effects where management is infeasible or undesirable considering climate change and other stressors).

To illustrate application of the restoration framework, the authors include three case studies that address postfire management issues in different ecosystem types of California. This

includes the potential failure of mixed conifer forests to regenerate following large and severe wildfires, the loss of key ecosystem services in chaparral ecosystems resulting from repeated burning, and the invasion of sagebrush steppe landscapes by nonnative annual grasses following fire. In addition, the authors provide several detailed appendices with data sources for landscape analysis; a sample of spatial analysis tools for ecosystem assessment and evaluation following disturbance; and a summary of U.S. Forest Service legislation, regulations, policy, and direction pertaining to ecological restoration.

Suggestions for further reading:

Long, J.W., and others. 2020. Post-fire restoration to avert novel conditions in Sierra Nevada Forests. Joint Fire Science Program summary report, project ID: 16-1-05-20. [JFSP report link.](#)



Spatial representation of a postfire restoration portfolio in the 2015 Rough Fire landscape derived from the postfire restoration framework. This simplified example of a restoration portfolio includes a subset of recommended restoration opportunities and actions in Pacific fisher habitat and giant sequoia groves.