

U.S. House of Representatives
Committee on Resources
Subcommittee on Forests and Forest Health

Oversight Hearing

Scientific Research and the Knowledge-base Concerning Forest Management Following Wildfires and Other Major Disturbances

Medford , Oregon

February 24, 2006

Science and the Management of Areas Following Large Disturbance Events: A Strategic
Research Proposal

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Recent scientific reports on the potential and actual effects of various management actions following large fires have generated enormous interest in the scientific community, the media, and the public on such topics as post-fire logging, fuel treatments, and reforestation. While the reports to date are informative and useful, they also reveal how little peer-reviewed science has been focused on forest recovery after fires with various management interventions. Extensive recent scientific studies have been made on the natural responses of forests to major disturbance events, results of which have not yet been fully assimilated by resource managers and agencies. Systematic scientific studies of the impacts of various management interventions following disturbances are not as rich, although forest managers have decades of practical knowledge on effects of post-fire management actions on production forests. We need to use that knowledge and build on the body of relevant ecological and management science to improve our capabilities for more reliable forecasting of treatment approaches and effects.

We believe that any legislation that provides policy direction regarding post-disturbance management activities should contain provisions to mandate and fund short- and long-term research, as well as long-term monitoring of ecological, fire, and other management responses to forest recovery projects--essential elements of any credible adaptive management strategy.

Before proceeding, we want to reiterate from previous testimony on HR 4200 by Salwasser and Franklin *that management objectives for the area in question are the primary consideration in any decision regarding post-fire logging, reforestation, or any other activities*. Much of the ongoing controversy over post-fire logging and active reforestation results from inadequate attention to management objectives. The relevant scientific and technical knowledge to inform post-disturbance management decisions depends upon clarity regarding management goals for the forest property in question. Hence, "recovery" and related activities must be defined in terms of the management goals for a post-event landscape. Those goals, together with information on the forest type (or plant association group), post-event conditions in disturbed areas, and future climate trends will largely determine what actions, if any, are appropriate. If management plan direction is not clear for appropriate actions following large disturbance events, plan revisions should provide such clarity. Major disturbances should not be the basis for *de facto* changes in land allocations or management objectives.

With a clear view of the management objectives, science can play a vital role in helping managers sort out the type and appropriate levels of activities to achieve those objectives. Retrospective and experimental research on post-event landscapes can also help managers, policy makers, and the public better understand when and how actions can help move that landscape toward these goals. Toward that end, we make the following suggestions:

1. Management plans should make clear the primary goals for different areas and provide general guidance for appropriate post-event interventions in those areas, giving due consideration to plant association groups and disturbance event effects on soils, plants, animals, and aquatic ecosystems.
2. Scientifically credible experiments should be undertaken to provide quantitative information on the consequences of different post-fire management activities on ecological, protective, social, and economic objectives. Experimental studies should be replicated and include random assignment of treatments and controls. Treatments should be conducted at scales sufficient to assess and contrast plant (tree, shrub, and herb), fungal, insect, small mammal, songbird, and aquatic ecosystem responses. In addition, focused research is needed on survival of event-damaged trees to provide credible and practical indicators for predicting whether damaged trees will live or die.
3. Reasonable combinations of post-event strategies should be included, with care to insure that assessments of the effects of logging and of reforestation are independent and not confounded. Strategies could include: management to assist post-event forest recovery without post-event logging; forest recovery actions with varying levels of post-event logging and biomass treatments to reduce impacts of subsequent disturbances; and randomly assigned control areas that are untreated, i. e., no logging or actions to reduce biomass or influence forest recovery. This research should have strategic representation of major plant association groups and fires associated with different historic fire regimes, i.e., low, mixed, and high severity and extent.
4. An additional scientific need is synthesis of existing knowledge and additional research on the ecological roles and functions of large disturbed areas in regional landscapes, including their role in maintenance of regional biodiversity, and short- and long-term natural forest ecosystem responses following major disturbance events.
5. Because forests are highly dynamic ecosystems, post-event management must be adaptive, i.e., responding to feedbacks from monitoring and research. Thus, post-event research and monitoring should be directly integrated into post-event management strategies.
6. Management agencies need to be encouraged and funded to collect and maintain better management records. On large fires, such as the Biscuit, record keeping tends to be quite uneven--much of it is not useful because of its variable quality and the lack of a central depository available to researchers. Good, spatially explicit records of pre- and post-fire management would strengthen retrospective research and supplement experimental studies, which because of budget and management realities will be limited.
7. A permanent and stable funding source should be created to support post-event research, outreach and monitoring. Long-term research and monitoring may require data collection for several decades after the event to fully understand forest responses to management actions, thus the need for dedicated, stable funding. With dedicated funding plans for long-term research and monitoring become credible.
8. Linked with establishment of a funding source, authority should be provided to develop and conduct the research and outreach program outlined here, including rapid implementation of post-event experiments, in conformity with management plan direction.
9. University and agency collaborations should be strongly encouraged in post-fire research, outreach education and monitoring as such collaborative programs have been highly successful. Consideration should be given to establishment of interdisciplinary centers of excellence, based on teams of university and federal agency scientists working closely with forest resource managers.
10. As a final point, development and administration of the research and outreach education program outlined here needs to be transparent to stakeholders and incorporate regular review from a broadly representative scientific community, perhaps facilitated by the National Academy of Sciences or some other organization with impeccable scientific credentials.

We believe that the approach to post-event research and outreach described above will produce the science needed to better inform policy makers and the public about the rationale for, and effects of, post-disturbance-event actions and their relation to previously adopted management objectives.