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Committee on Resources
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Hearing on *Scientific Research and the Knowledge-base concerning Forest Management Following Wildfires and Other Major Disturbances*

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Introduction

Mr. Chairman and members of the Subcommittee, thank you for inviting me to talk with you today about science and forest management. Policy makers must consider both science and values in setting policies. Forest managers must consider science, experience and values to get their job done. Based on the values reflected in federal policy, federal forests produce a wide range of outputs including water, wildlife, timber, and recreation. In hotly debated policy issues, like the issues surrounding post-fire salvage, there is a tendency to mix science and values.

The controversy about the new study provides a perfect object lesson in the need to distinguish between science and values, each of which must play a role if we are to derive the greatest possible benefit from the richness of our forests. The experts who carry out forest management on the ground use science and their experience to achieve objectives that are based on values – the values of landowners, shareholders, or those of policy-makers like Congress who craft the law and policy that guide the management of public land. If a landowner wants to emphasize a particular forest objective – or to achieve a broad range of benefits – and is willing to leave the details to the forester, in most cases we have ample science and experience to provide satisfactory results.

However, science will not decide whether to salvage log and reforest, or not. That choice is not a scientific issue, but one of values. It is a choice that must reflect public policy in the case of public lands and the desires of forestland owners in the case of private lands. The proper role of science is to help inform people on the possibilities and consequences of those choices, and to do that the science must be thorough and well tested. It is not the role of science to tell people what those choices should be.

As the Oregon Board of Forestry has worked on a range of forest issues, they have strived to separate values and science while setting policy. In this effort they have recognized that scientific uncertainty is part of the problem and they have explored ways to better address science and its uncertainty in setting policy.

Dealing with Scientific Uncertainty

Science is often incomplete and sometimes even contradictory. Ecosystems are very complex, and there remains some scientific uncertainty about how to provide the values we want from our forests after a large fire or other disturbance. Some scientists suggest that aggressive salvage and reforestation will provide the “best” recovery of a burned area, while others suggest that the area will “best” recover without human intervention. While what is “best” is primarily a value based decision, scientific uncertainty has also played a role in the current debate.

There are many sources of uncertainty surrounding post-fire recovery. There is a degree of uncertainty related to our ability to predict future outcomes in the forest. Events like weather and climate introduce a range of random elements. Natural reforestation success and future stand development contain large random components that are not predictable at every scale. While we might be able to predict the average development of a large number of forest stands, we might not predict with certainty the outcome in any one particular stand. Ecosystems are dynamic and forest stands that start with similar characteristics can take a number of different successional pathways and end up with very different characteristics depending on random events like fire, wind-throw, and insect epidemics. There are substantial differences in the scientific community over how post-fire logging and reforestation studies should be designed and interpreted. All this adds to uncertainty.

Active Adaptive Management

Even though there is uncertainty about the outcomes of using different forest management treatments, there are ways that policymakers, scientists, and managers can deal with this uncertainty. Active adaptive management applies a variety of diverse treatments and allows us to learn from a range of actions on a diversity of sites. This approach recognizes that there is no single best option to achieve all our values. Active adaptive management speeds up our learning process by placing multiple treatments across the landscape in much the same way that a scientific experiment would. We can place a range of active and passive management options side-by-side on the landscape, measure the outcomes over time, and compare how the results of each option match our values. To be successful the resources must be in place and ready to go to capture learning moments like the Biscuit Fire.

"Systematic Evidence Review"

Another way to deal with conflicting science would be to develop a systematic approach for reviewing and synthesizing scientific literature. In many different management situations, like post-fire recovery, conflicts over what is or is not the "best available science" frequently occur. Problems also arise when interest groups use selective studies with conflicting results to challenge public land management decisions. Former Oregon Governor John Kitzhaber suggested to the Oregon Board of Forestry that natural resource decisions might benefit from developing a process similar to the *Systematic Evidence Reviews* used in the medical field. This process differs from a traditional literature review by using a pre-established, explicit protocol for finding, screening, grading and integrating primary research studies to answer specific narrowly defined questions. A key difference with a *Systematic Evidence Review* is that the protocol spells out in advance how information will be gathered to reduce bias in the selection and inclusion of studies, plus it includes an *evidence quality hierarchy* to guide researchers in assessing the quality and applicability of different studies. The Oregon Board of Forestry is currently evaluating the usefulness of incorporating a systematic approach into their decision-making and would welcome the participation of the federal agencies. Attached is the Executive Summary of an evaluation done about the applicability of *Systematic Evidence Review* to natural resource issues prepared for the Oregon Board of Forestry by the Institute for Natural Resources at Oregon State University.

Importance of an Expedited Salvage Process

If salvage is going to be a viable option, the processes leading to approval of a salvage operation needs to be expedited or the economic values will greatly diminish or be lost entirely. Post-fire salvage operations on federal lands have become increasingly contentious and difficult for federal forest managers to implement. The complexity and length of Environmental Impact Statements and other NEPA documents has grown to the point where post-fire salvage operations normally take between one and three years to implement. Because of this delay in implementation, much of the salvageable value in the burned timber stands is being lost to decay. It is worth noting that on state-owned land in Oregon, salvage can and does commence within a few weeks of a fire.

The merchantable value of small and mid-sized diameter trees is especially time sensitive, and delays in harvesting may result in substantial or complete loss of value from these trees. The reduced value of the smaller trees means that most or all of the economic value in the stand is contained in the larger trees that are also most valuable as future stand structure and wildlife habitat. This basic relationship of the large trees being the major source of both the economic and the environmental values is part of the value based controversy over recent salvage sales.

One way to help address this issue is to reduce the time associated with planning and implementing salvage sales. Reducing the time it takes to plan and implement a salvage sale would allow more of the value of the small and mid-diameter trees to be captured and allow greater flexibility to leave larger trees, while still maintaining the economic viability of the timber sale. However, to be socially acceptable, reducing the time it takes to implement a salvage operation must not cause a corresponding reduction in environmental protection. Therefore, a carefully crafted set of design criteria needs to be developed that will ensure both the provision of economic benefits and environmental protection.

Another value at the heart of this debate is reducing the risks of future wildfires. Speeding up the decision to salvage burned timber has the advantage of reducing the standing fuel load while leaving options to use natural regeneration available. If salvage is done promptly, natural regeneration can be used if it is desired. Experience with wildfire has taught us that snags are lightning ignition sources, burn for long periods of time, and increase fire spread though torching and spotting. Therefore, managing standing fuels through salvage logging can reduce both fire risk and hazard to some degree. If the salvage logging is done promptly, before natural regeneration occurs, land managers can take advantage of natural seedlings without causing the mortality that can be associated with logging equipment.

In Conclusion

Forests touch us all, providing benefits that contribute to our economic well-being, the health of our environment and the quality of our lives. Consequently, we are all *obligated to remember that science is always evolving, and to maintain a clear distinction between science and values. Conflicts over forests have often been perpetuated by ignoring this distinction.

In time, further scientific studies will likely calm the scientific divide over post-fire forest responses if the studies are sufficiently broad and long term. But science alone will not settle this policy choice. It is a choice that reflects public policy in the case of public lands and the desires of forestland owners in the case of private lands. Policy seeks certainty of outcome for complex issues. Science cannot deliver either certainty or solutions to complex problems that are beyond the realm of science or outside the data gathered, analyzed and debated. The proper role of science is to help inform people on some of the possibilities and consequences of choices; to do that the science must be thorough and well tested. People must understand and accept the limits of what science can do to inform complex social choices that must consider other non-scientific factors.

The lesson is this: Science must be addressed distinct from values. Science and values each have an important role to play if we are to agree on a course for managing our forests to provide a sustainable flow of a wide variety of benefits. Values shape our views about what we expect and cherish in our forests. Science, as it evolves, helps us achieve those results. Blurring the difference between science and values only fuels the conflict and rancor that is gripping our forest management decisions.

This concludes my statement, and I am glad to answer questions.

Appended Material

Behan, Jeff. December, 2005. Executive Summary: Applying systematic evidence reviews in Oregon forest policy: Opportunities and challenges. Institute for Natural Resources, Oregon State University, Corvallis Oregon. 10 pp.