Committee on Resources

Subcommittee on Forests & Forest Health

Witness Statement

Testimony for the U.S. House of Representatives, Committee on Resources, Subcommittee on Forests and Forest Health

Testimony of Carl E. Fiedler, Research Associate Professor, School of Forestry, University of Montana, Missoula, MT 59812 (406) 243-5602; fiedler@forestry.umt.edu

Supporting Witness: Charles E. Keegan III, Director of Forest Industry and Manufacturing Research and Research Professor, Bureau of Business and Economic Research, School of Business Administration, The University of Montana, Missoula, MT 59812 (406) 549-7482

September 16, 2000

Chairman Chenoweth-Hage, distinguished committee members.

The testimony we present today parallels testimony that we provided to another congressional committee in early July, before this past summer's fires began to dominate the nightly news. The focus of that testimony was the monumental scope of hazardous conditions in western forests, and the urgency and potential for restoration treatments. However, the ground on which that kernel landed was not as fertile as it is today. While the wildfires of summer, 2000 have been a tragedy in many ways, their magnitude and intensity may have a silver lining. Akin to the launching of Sputnik in the late 1950s that served as a wake-up call for the U.S. space program, this summer's fires have raised the national consciousness about hazardous conditions in the West. The questions of "Who cares?" or "Do we really need to do anything?" have been made irrelevant. The question now becomes "What is the best way to accomplish hazard reduction *and forest restoration*?" The fortuitous meeting of need and opportunity provides the basis for a broadscale, strategic effort that can fundamentally change the structure and reduce the fuels in western forests, while placing these forests on a trajectory toward long-term sustainability.

Our comments will be focused on ponderosa pine and pine/fir forests, for several important reasons. First, these forests collectively comprise the largest acreage of any forest type in the West. Second, they are the predominant forest type at the lower elevation wildland/urban interface, the place on the landscape where humans and property are at greatest risk. Third, they occur primarily within the roaded base, and can be treated with the least controversy. Fourth, ponderosa pine forests have undergone the most fundamental changes of any forest type as a result of decades of fire suppression and past high-grade logging of large pine. Historically, pine forests were sustained by frequent, low-intensity fires that kept them relatively open, primarily ponderosa pine in composition, and large-tree dominated. Fire exclusion has allowed open stands to fill in with smaller trees, greatly stressing all trees (large and small) on these moisture-limited sites. Other changes include gradual successional replacement of ponderosa pine with more shade-tolerant species (if present), and increased risk of intense, stand replacement fire. Collectively, these changes in forest conditions have created a regional tinderbox -- with catastrophic fire potential on a combined area

approximately the size of New England.

Compelling reasons for immediately initiating a comprehensive restoration program include:

1) The ecological function and long-term sustainability of huge acreages of pine forest are at risk. Ponderosa pine forests historically sustained themselves in place under a low-intensity fire regime. Ponderosa pine trees have deep roots, thick bark, large fleshy buds, and exceptionally long needles arrayed so as to deflect rising heat away from lateral and terminal buds -- adaptations which are admirably suited to minimize damage from surface fires, but which afford this species little protection from intense crown fires. Ponderosa pine is also a heavy-seeded species, with seed dispersal distances of little more than the width of a football field, an adaptation which is a decided disadvantage following large, stand-replacement fires. Indeed, catastrophic fires in pine forests may result in virtual deforestation (e.g., 120,000-acre Hawk Creek fire in Montana). Conversely, on sites where pine occurs with more shade-tolerant species, periodic low-intensity disturbance are required to reduce stand density and allow shade-intolerant pine to regenerate. Otherwise, ponderosa pine forests will gradually convert to more shade-tolerant associates such as Douglas-fir, true firs, or incense cedar -- species that are better adapted to dense, shady conditions. The take-home point here is that small firs do not develop into old-growth pine, and small pines will not develop into large pines without sufficient growing space.

2) The landscape-scale, catastrophic fires that have charred pine forests in recent years (Cerro Grande - New Mexico, Early Bird - Montana, Lowman Complex - Idaho) are harbingers of things to come. Whether the next event will be in the Tahoe Basin, Show Low, Arizona, or Ruidoso, New Mexico is unknown. That such events will occur under existing conditions is not a question of if, but when. Will the next event claim human life? Will property damage and rehabilitation costs exceed the $660 million for the Los Alamos fire? Will we wait to find out?

3) Proactive hazard-reduction treatments can limit severe damage from wildfire, which has substantial value in terms of wildland resources and amenities retained, and fire-fighting costs avoided. Wildfires will still occur, and in "fire" years like 2000 they will burn hundreds of thousands of acres. The critical question is "With what intensity will these fires burn, and with what effect?" It is here that treatments can make a fundamental difference. Will safety zones around homes serve their purpose? Will old-growth pines become scorched survivors or blackened sticks? Will soils remain on mountain slopes, or will white-ash fire intensity result in sheet erosion?

4) The fuels buildup in the interior West is not going away. However, the opportunity to use prescribed fire as the primary means of reducing fuels or restoring sustainable conditions in today's dense forests is largely past. Heavy fuel accumulations, strict air quality regulations, limited personnel and funding levels, restricted burning windows in terms of weather and fuel conditions, and potential liabilities associated with residential developments drastically limit fire use. Mechanical treatments to reduce fuels are generally needed to allow the important use (or occurrence) of fire as an ecological process, not as a destructive aberration. Wildland fire use may be appropriate in remote locations, although these "let burn" applications will commonly be in moister forests at higher elevations.

Two widespread misperceptions of hazardous conditions in western pine forests are that the problem is solely one of too many small trees, and that restoration treatments are expensive. Agency officials routinely recommend an approach called "thinning-from-below" to address these conditions, which involves removing most or all small trees up to 6 inches diameter (or 8 or 10), followed by prescribed underburning. Thinning-from-below, while necessary, is a one-dimensional approach that is typically not sufficient to

address the multiple problems in threatened forests. It does not reduce overstory density sufficiently to slow crown fires, significantly improve tree vigor, or promote regeneration of ponderosa pine. Instead, what is needed is a comprehensive approach that reduces composition of undesirable species (if present), limits the development and spread of lethal crown fires, lowers overall stand density enough to induce regeneration of pine, and spurs development of large-diameter trees.

Over the past decade we have profiled a variety of forest conditions in Inland northwest forests, and evaluated alternative restoration approaches for a number of them. We would like to report on one such analysis, in which we compared a thinning-from-below prescription (up to 9" trees) with a more comprehensive treatment approach aimed at addressing the full range of density, structural, and species compositional problems that typify high-hazard forests. Both prescriptions were applied to an "average" or composite stand condition based on Forest Service inventory records from hundreds of high-hazard stands in western Montana.

A comprehensive restoration prescription was developed for this analysis in consultation with silviculturists and ecologists from various federal, state, and tribal organizations. The comprehensive prescription includes the following silvicultural treatments:

- low thinning, in which many of the sapling- and pole-sized trees (ladder fuels) are cut,
- modified selection cutting, to reduce density which promotes regeneration of ponderosa pine and spurs development of large pines
- improvement cutting, to remove most Douglas-fir/true firs (if present) and low-quality trees of all species not reserved for other purposes.

A hallmark of the comprehensive approach is the focus on the trees that will remain following treatment. Trees are marked to be left in the number, species, size, and juxtaposition that best sets the stage for the sustainable stand of the future. All trees that contribute to this objective are designated for leave -- if not they are cut. This is a diametrically different way of approaching long-term sustainable management than the thin-from-below approach. Thinning-from-below simply prescribes the trees to be cut.

Based on research conducted at the University of Montana, the University of Idaho, and Northern Arizona University, the benefits that accrue from comprehensive restoration treatments are varied and many. Besides the most obvious and desired effect, which is significantly reduced potential for crown fire, other benefits include increased growth and vigor of old-growth trees, greater regeneration of pine than fir, increased needle toughness, and improved water relations, among others.

FINANCIAL CONSIDERATIONS

We developed the potential value of timber products generated from these prescriptions based on their value delivered to mills in the region, less removal and haul costs. The potential timber products were based strictly on trees to be eliminated as parts of treatments to reduce hazard and restore ecological conditions; they were not designated for removal based on their value as commercial timber products.

Besides moving the stand more rapidly to an ecologically desirable and sustainable condition, the comprehensive restoration approach illustrated here generates positive revenues from timber products ranging from a few hundred dollars to over $1000/acre, depending on stand conditions, terrain, logging

systems, and market conditions (Figure 1). Our analysis indicates that the thin-from-below prescription fails to fully accomplish key ecological goals and typically requires a subsidy of hundreds of dollars per acre.

We have evaluated a number of forest types/conditions and potential prescriptions, and found that the timber products produced in restoration treatments often have a substantial positive value that can be used to underwrite treatment costs. Further, we have found that implementing these treatments in the stands most in need of treatment commonly results in increased timber product values and less need to subsidize the restoration activities. That said, not every restoration prescription will generate a positive revenue flow, nor should treatments be restricted to those that do. Immediate restoration efforts are needed in many areas that may not generate positive revenue, such as wildland/urban interface areas, stands comprised primarily of small trees, and areas lacking industry infrastructure to utilize the trees removed in restoration treatments. Conversly, restoration treatments should not be compromised just because they involve removing trees with commercial value - sometimes considerable numbers of such trees. These trees are designated for removal because they hinder development of long-term sustainable conditions - not because they have commercial value.

We do not suggest that the restoration approach we have outlined here should be implemented in all ponderosa pine forests everywhere; however, we highly recommend strategic-level implementation based on location, extent, and relative severity of hazardous conditions. Initially, treatments would be focused on areas along the wildland/urban interface and on strategic topographic features in areas that are accessed. Longer term, the objective would be to implement restoration treatments across broader areas, so that the restored forests on the larger landscape can serve as a natural buffer to intense fires, just as they have historically. In broader scale applications, patches of uncut forest would be left within treated areas to provide functions that only dense forests can serve.

In summary, the ponderosa pine/fir forests extant on the western landscape are not the forests that regenerated and sustained themselves for centuries. Instead, they exhibit significant, often remarkable departures from historically sustainable conditions. They are dense rather than open, they support ladder fuels that leave them vulnerable to lethal crown fires, and in many locations are undergoing fundamental changes in composition from ponderosa pine to forests dominated by more shade-tolerant species.

The ponderosa pine and pine/fir forests that have been the focus of much wildfire-related debate were borne and maintained over a preponderance of their range by frequent, low-intensity fires. That process is now virtually absent from the landscape in its natural frequency and intensity. The challenge to managers is to integrate a series of restoration treatments that provide the necessary disturbances in pine forests to produce a semblance of historic structures and conditions - not because they are historic, but because they are sustainable (i.e., vigorous, self-perpetuating, pine-dominated, and at low risk to fire and insects). If we do not take action immediately and at an appropriate scale, we will oversee the gradual demise of a resource that has been the ecological and visual backbone of the West - its magnificent ponderosa pine forests.

# # #