Testimony of Dr. William Wallace Covington

regarding the Wildland Firefighting and National Fire Plan

before the US Senate Energy and Natural Resources Committee

Tuesday, July 16, 2002

Chairman Bingaman, and members of the Committee, thank you for this opportunity to testify on a subject of personal importance to me and of critical importance to the health of our nation's forests and the people and communities that live within them.

My name is Wallace Covington. I am Regents' Professor of Forest Ecology at Northern Arizona University and Director of the Ecological Restoration Institute. I have been a professor teaching and researching fire ecology and restoration management at NAU since 1975. I chair Arizona Governor Jane Dee Hull's Forest Health/Fire Plan Advisory Committee and am a member of the National Commission on Science for Sustainable Forestry.

I have a Ph.D. in forest ecosystem analysis from Yale University and an M.S. in ecology from the University of New Mexico. Over the past 27 years I have taught graduate and undergraduate courses in research methods, ecological restoration, ecosystem management, fire ecology and management, forest management, range management, wildlife management, watershed management, recreation management, park and wildland management, and forest operations research. I have been working in long-term research on fire ecology and management in ponderosa pine and related ecosystems since I moved to Northern Arizona University in 1975. In addition to my publications on forest restoration, I have co-authored scientific papers on a broad variety of topics in forest ecology and resource management including research on fire effects, prescribed burning, thinning, operations research, silviculture, range management, wildlife effects, multiresource management, forest health, and natural resource conservation.

My testimony will focus on the implementation of the National Fire Plan and the urgent need to increase the pace and size of forest restoration treatments to reverse the trend of increasing catastrophic wildfires. I will outline a three-step approach to help achieve this goal.

Although the general principles that I will discuss apply to the vast majority of the West's dryer forest types, I will focus my testimony on ponderosa pine forests. As the GAO has pointed out over 90 percent of the severe crown fire damage nationally is in this forest type. Although there is plenty of blame to go around, much of the burden for the failure of wildland management policies must rest on natural resource professionals and scientists, who work hard but always seem to offer too little too late in the way of practical advice.

Knowing what we now know, it would be grossly negligent for us not to move forward with large-scale restoration based fuel treatments in the dry forests of the West.

It is an unfortunate set of circumstances that have led to this hearing. Scientists have predicted the current forest crisis for the last 75 years. In 1994 I was senior author on a review paper in which I stated that we could anticipate exponential increases in the severity and extent of catastrophic fire. It is not a prediction I ever wanted to come true. In that same paper, I also suggested that we have a narrow window of 15-30 years to take preventative actions to restore forest health,

minimize the loss of civilian and firefighter lives, and the mounting damage to our nation's natural resources.

Although scientists have long foreseen the increase in fire size and severity in ponderosa pine ecosystems, the scale of the fires we have seen so far this year is staggering. Years of neglect are coming home to roost. The Rodeo/Chediski fire in Arizona consumed 469,000 acres and is Arizona's largest wildfire to date. Prior to the 1960s a fifty-acre crown fire was considered a "large fire". In addition, the fire behavior these fires are exhibiting make suppression efforts exceptionally challenging—demonstrating that there are limits to our ability to fight them. The Heyman Fire in Colorado and the Rodeo/Chediski Fire in Arizona are major wakeup calls to all of us.

Clearly, we have to do something quickly on a larger scale to reverse the trend of exponentially increasing fire suppression costs, increases in fire severity, and destruction of what should be a healthy legacy for future generations. Thus far, the National Fire Plan has not resulted in the implementation of large-scale, comprehensive restoration treatments that are required to prevent catastrophic fire. In addition, implementation must focus on the greater landscape as well as the wildland/urban interface to achieve success.

Why forest restoration treatments work

We have been in open revolt against nature in the dry forests of the West since settlement. It is time to start managing in harmony with natural tendencies. Science-based forest restoration treatments are consistent with natural tendencies. Comprehensive restoration is superior to forest thinning alone for one significant reason—restoration treatments simultaneously improve forest health (the underlying cause of catastrophic fire) while reducing fire risk. Restoration treatments permit the safe reintroduction of fire and present a long-term strategy for fixing forests.

Research across the Intermountain West has shown that restoration treatments substantially reduce fire hazard by thinning trees to decrease tree canopy density, break up interconnected canopy fuels, raise the crown base height (the distance from the ground to the crown), and then reduce accumulated forest floor fuels and debris with prescribed fire. Fire alone in the unnaturally dense forests that dominate so much of the West today is inadequate. Without thinning, prescribed burning is an exceedingly dangerous way to get the amount of thinning done that is needed and it can lead to increased mortality, especially among old growth trees. Furthermore, the probability of a prescribed fire escaping its planned burn area are increasingly likely as fuels continue to accumulate.

There is abundant scientific research that began in the 1890's and continues today that provides a sound scientific framework for implementing the science and practice of restoration. We have solid information about forest conditions prior to Euro-American settlement, changes in fire regimes over the last century, deterioration of overall ecosystem health, and ecological responses to thinning and prescribed burning—the key elements of any attempt to restore ecosystem health in ponderosa pine and related ecosystems. We know that current overcrowded stands of trees do not sustain the diversity of wildlife and plants that existed a century ago. We know this by examining the data of early naturalists and scientists. We also know this to be true from primary research. Scientists that have compared biological diversity of overstocked stands—stands that have had decades of fire exclusion--with open, park-like stands that have not had severe fire regime disruption, have found greater plant diversity, greater insect diversity, and greater bird diversity. Similar studies have also found greater old-growth tree vigor and resistance to insect attack in open, park-like stands—stands similar to those present before settlement. We also know

that stopping ecologically based forest restoration that includes thinning, is not saving the forest as some would like you to believe, but only contributing to its demise and causing severe losses to the wealth of species that depend on it.

Restoration thinning enhances the productivity (growth) of trees, allowing young trees to develop old-growth characteristics such as large size and full crowns. Perhaps most importantly, restoration has been shown to increase rapidly the productivity of native understory grasses and herbs, the species that make up 90-99% of the plant biological diversity in western fire-adapted forests. The resources provided by abundant understory vegetation—seeds, flowers, fruits, and cover—translate into key wildlife habitat components. For example, the number of butterfly species and individuals increased within two years in Arizona sites that had received ecological restoration treatments.

Why attention must be paid to both the wildland/urban interface and the greater forests

The fires of 2002 and 2000 have focused policy attention on the need to create defensible perimeters around communities in the wildland/urban interface. Without a doubt we need to take action to secure communities. However, defining the "urban/wildland interface" as some sort of narrow ring around a town to protect property will not prevent fires like we have just seen in Arizona to impact towns. In addition, this definition will miss the whole reason for the existence of forest communities.

A town is not just the place where people have homes. Communities are in the forest because they are emotionally, economically, and socially linked and dependent on the forest. When we consider the areas that need immediate treatment we should consider the human community "impact area"--the entire area that if impacted by a catastrophic fire, will undermine the health and livelihood of a community.

Following is a quote from one of the many e-mails and telephone calls I have received from residents in the region burned so severely by the Rodeo/Chedeski fire in Arizona this season:

"Many homeowners in the Overgaard community who lost our homes are anxious to make decisions about the possibility of rebuilding. While we know our homes can be reconstructed, we are more concerned about the beautiful forest, now blackened, in our back yards..."

The Forest Service Cohesive Strategy includes one aspect of this greater impact area I've mentioned by identifying watersheds as important areas of focus. An excellent example is the Santa Fe Watershed, a 17,000-acre area that provides 40% of the water supply for the city. The fact that the City of Santa Fe, the Forest Service, the Santa Fe Watershed Association (including the Sierra Club, the Audubon Society, and the Nature Conservancy), and citizens are actively designing pre-suppression treatments is commendable.

A second example of an important impact area beyond the town site itself is the San Francisco Peaks north of Flagstaff, Arizona. Recreation and tourism contributes significantly to the Flagstaff economy. A wildfire at the Snowbowl ski area or along one of the many popular trails on the peaks could have a significant impact on many small businesses dependent on recreation dollars. Although it is critical that we design treatments to protect the property of Flagstaff residents, it will be fruitless in the long run if their economic livelihood and quality of life disappears.

Another reason that attention cannot be narrowly focused on a ring around the city is because it will fail to address one of the most contentious issues of our time, the protection of endangered species. Wildfire in the Southwest contributes to the loss of essential habitat for many of these vulnerable species because they are not adapted to stand replacing fires. According to a recent draft plan by the Coconino National Forest, over the last ten years the nesting habitats of six northern goshawks and eight Mexican spotted owls have been eliminated or severely altered by stand replacement fires in the vicinity of the San Francisco Peaks.

Towns are inextricably linked to the greater forest. To treat one and not the other will fail to solve the problem.

Steps to implement landscape scale treatments

I have been advocating forest restoration over the past 20 years, but my sense of urgency has greatly increased. We need to break the logjam that impedes progress. A logjam that is rooted in distrust, personal preferences and a legal process (NEPA) that should contribute to the design of solutions but is sometimes used to obstruct them. I believe that with thoughtful action, adequate resources and public and private leadership we can solve this logjam and emerge victorious from our current crisis. The three key steps are:

1. DESIGN TREATMENTS STARTING WITH SOLID SCIENCE AND SET STANDARDS FOR EFFECTIVENESS. Ideological issues have been impediments to advancing treatments. Research to date indicates that alternative fuel reduction treatments (e.g., diameter caps for thinning) have strikingly different consequences not just for fire behavior but also for biodiversity, wildlife habitat, tree vigor and forest health. Treatment design should be based on what the forest requires to maintain health and reduce catastrophic fire. Science-based guidelines should be developed and become the foundation for treatments. In addition, they should be the criteria for evaluating the effectiveness of treatments. Guidelines will help guide managers and provide a base of certainty to those that are distrustful of land management agencies. The standard should be clear—if a treatment does not permit the safe reintroduction of fire and simultaneously facilitate the restoration of the forest it is not a solution.

2. REDUCE CONFLICT BY USING AN ADAPTIVE MANAGEMENT FRAMEWORK TO DESIGN AND IMPLEMENT A SERIES OF TREATMENTS. We can wait no longer. Solutions to catastrophic wildfire must be tested and refined in a “learning while doing” mode. Two of the barriers preventing the implementation of landscape scale treatments are the unrealistic desire for scientific certainty and a fear that once an action is selected it becomes a permanent precedent for future management. Scientific certainty will never exist and the past century of forest management demonstrates the need for applied research and active adaptation of management approaches using current knowledge. We should expand our environmental review process to provide approval of a series of iterative treatments, provided they are science based, actively monitored and committed to building from lessons learned and new information.

3. REBUILD PUBLIC TRUST IN LAND MANAGEMENT AGENCIES. SUPPORT A BROAD VARIETY OF PARTNERSHIP APPROACHES FOR PLANNING AND IMPLEMENTING RESTORATION-BASED FUEL TREATMENTS. The lack of trust that exists between some members of the public and land management agencies is the genesis for obstructionist actions. The only way to rebuild trust is to develop meaningful collaborations between the agencies, communities and the public. There are emerging models of various forms of collaborative partnerships working to reduce the threat of fire while restoring the forest for its full suite of values. Their success depends on respectful community collaboration, human and financial

resources and adequate scientific support to make well informed management decisions. Congress, federal agencies, universities, and non-governmental organizations must support these communities to help them achieve success. STEP ONE: DESIGN TREATMENTS STARTING WITH SOLID SCIENCE AND SET STANDARDS FOR EFFECTIVENESS

If we wanted to destroy our ponderosa pine forest landscapes, we could hardly come up with a more devastating plan than what we have done and continue to do—make a series of management mistakes and then engage in lengthy ideological debates instead of rolling up our sleeves and working to solve the problem. The fires of this year, and the past several decades, have forged a consensus that the problem of catastrophic wildfire is severe. Almost everyone agrees that restoration is the most scientifically rigorous and environmentally and economically reasonable way to proceed. Nonetheless, there is a lot of poorly informed speculation about how it should be applied, by activists, members of the lay public, and even some within the academic community. Some of the arguments are founded on differences of opinion about desirable ecological conditions for western forestlands. Others stem from differences of opinion about whether public lands should be used for consumptive resource use, especially by wood products or grazing interests, or for individual uses and/or non-consumptive uses.

We are now at the point where we must move beyond ideologically based rhetoric to apply restoration fuel treatments in such a way that we can simultaneously work to solve fire problems and restore ecosystem health.

We have a solid body of scientific information to design and test large-scale forest restoration that will protect people, communities and the forest. This knowledge should be synthesized into management guidelines that are scientifically solid and immediately useful to managers and others who want to work to solve the crownfire problems of the West.

An important outcome from the guidelines will be a set of performance standards. Since 2001 many treatments have been applied on federal land, however, the effectiveness of many of these treatments to reduce fire risk has been questioned. Treatments that do not provide long-term protection against unnatural wildfire and repair the forest are a waste of money and effort.

STEP TWO: REDUCE CONFLICT BY USING AN ADAPTIVE MANAGEMENT FRAMEWORK TO DESIGN AND IMPLEMENT A SERIES OF TREATMENTS

A variety of restoration options is being investigated at research sites across the West, applying treatments developed locally by scientists, managers, environmental activists, resource users, and members of the public. It is important to continue and expand the research effort, but at the same time it is imperative that we accept the responsibility to apply the extensive knowledge we already have, before more forests are lost.

The actions that others and I believe should be taken to restore the ecological integrity of ponderosa pine forests and therefore reduce the threat of crown fire are well known. I do not advocate a “one-size fits all approach” but rather crafting management approaches based on the location under analysis, its presettlement condition, and its relationship to the broader ecosystem and the communities that live within it. In this sense, ecological restoration should not be viewed as a strict recipe or a rigid set of prescriptions.

The safest way to advance treatment design and implementation is to apply scientifically rigorous adaptive management principles. By scientifically rigorous I mean that the design of landscape scale restoration treatments must be based on:

1.Comprehensive awareness of solid science (not ideologically driven, selective citation of existing knowledge).

2.Implementing large-scale, adaptive management experiments to test ideas.

3.Monitoring fundamental parameters to determine treatment effectiveness.

4.Objective scientific analysis of the results.

5.Further adaptation of management experiments suggested by these monitoring observations.

6.Sharing, publicizing and publishing results for lay audiences, policy makers, resource management professionals, and the scientific community.

The scientific community could help this effort by developing monitoring protocols that are simply applied, affordable, understandable to land managers and that can be quickly synthesized to inform adaptive management.

Consideration should be given to a new form of environmental review and approval for projects committed to adaptive management. If the project design is sufficiently rigorous to test different approaches that will then be used to improve the design of the next set of approaches—and monitoring is actively employed—then perhaps a series of actions could be approved in advance under one environmental review. For example, the Greater Flagstaff Forest Partnership has spent years in the environmental review process to implement the first phase of a ten-year effort that will protect the city and surrounding communities. The second phase is now going through the same long environmental review process even though it is explicitly incorporating many lessons learned from the first phase and was developed with full community participation. Perhaps something can be done to allow projects that show this much rigor, community involvement, solid science and monitoring a simplified review.

STEP THREE: HELP REBUILD PUBLIC TRUST IN LAND MANAGEMENT AGENCIES BY SUPPORTING A BROAD VARIETY OF PARTNERSHIP APPROACHES FOR PLANNING AND IMPLEMENTING RESTORATION-BASED FUEL TREATMENTS

Some individuals and organizations have obstructed forest restoration because they do not trust the land management agencies to apply good ecologically based management in the forest. Restoring respect and trust in the land management agencies is central to breaking the logjam. One approach to rebuilding this trust is through the meaningful engagement of members of forest communities and other stakeholders.

Numerous community-based models exist. Each is unique because of the community it represents and the priorities each community defines (jobs, economic, environmental etc). Congress and the federal agencies should continue to support and respect inclusive approaches to designing and implementing forest treatments.

What Congress Can Do

There are several constructive steps Congress and the federal agencies can take to improve our current situation.

1.Strategically located landscape scale treatments to reduce fire threat and restore the ecological integrity of forests should become the single biggest priority of forest management policy and the land management agencies working in the Intermountain West.

2.Congress should continue its commitment to provide adequate resources to the agencies to maximize restoration treatments that will prevent wildfires. In turn, the agencies must act swiftly to implement preventative treatments. A simple extrapolation of recent rates of increase in crown fire damage suggests that within the next decade acres burned could easily double whereas costs for fire suppression, rehabilitation of burned area, lost resource values, and compensation could average five to ten billion dollars annually.

3.Wherever possible, Congress and the land management agencies should support the positive collaboration of partnerships to design ecologically based restoration treatments

4.Support the implementation science-based restoration treatments, adaptive management approaches and restoration guidelines to ensure quality control.

5.Consider adding a new environmental review process that simplifies the approval of projects using adaptive management, monitoring, solid science and community involvement.

Senator Jon Kyl, with the support of Secretary of Interior Gale Norton and Forest Service Chief Dale Bosworth, has recognized the need for good science and has actively supported the work of the Ecological Restoration Institute at NAU. His support for science-based solutions has allowed us to design, test, and refine restoration treatments that are the underpinning of the development of socially acceptable approaches to forest restoration underway in Flagstaff and other forest communities.

We are at a fork in the road. Down one fork lies burned out, depauperate landscapes—landscapes that are a liability for future generations. Down the other fork lies health, diverse, sustaining landscapes—landscapes that will bring multiple benefits for generations to come. Inaction is taking, and will continue to take, us down the path to unhealthy landscapes, costly to manage. Scientifically-based forest restoration treatments, including thinning and prescribed burning, will set us on the path to healthy landscapes, landscapes like the early settlers and explorer saw in the late 1800s.

Thank you very much for asking me to appear before the Committee.