Testimony of Dr. Peter Kolb
Extension Forestry Specialist and Associate Professor of Forest Ecology
Montana State University
On behalf of the Society of American Foresters

Before the
House Resources Committee, Subcommittee on Forests and Forest Health
November 10, 2005

Good Morning.

My name is Peter Kolb, and I am the Montana State University Extension Forestry Specialist and an Associate Professor of Ecology at the University of Montana College of Forestry and Conservation. I'm here today speaking on behalf of the Society of American Foresters (SAF), an organization of over 15,000 forest managers, researchers, and educators. I've been a SAF member for 23 years.

SAF supports the *Forest Emergency Recovery and Research Act* (HR 4200) (FERRA) because it provides federal managers with the tools to respond quickly to catastrophic events on the nation's federally owned forests and provides the flexibility to work with adjacent landowners following these events. Across the country, we have experienced increasing catastrophes in forests over the last several years, due to a variety of factors including 100 years of fire suppression in forests, severe drought in parts of the country, lack of management to reduce abnormal fuel loads in some forests, and an influx of invasive species that have altered forests. These catastrophes, many outside the natural occurrence of such events, cause immense damage to forests, watersheds, wildlife habitat, and other forest resources and values.

Additionally, we have seen a growing reforestation backlog on federal lands as the agencies get bogged down in time-consuming process and have limited resources to reforest or apply management practices to better enable natural regeneration. While forest recovery and reforestation is not always necessary after catastrophes, quick action can help recover, more quickly, the forest values such as clean water, wildlife habitat, recreation, and aesthetic beauty we all desire.

The processes authorized in FERRA will allow the agencies to quickly respond while still maintaining environmental review, public participation, and opportunity to appeal and litigate projects. Additionally, we believe the authority in the bill to develop independently peer-reviewed "pre-approved" management practices through a regulatory process, involving the public, offers a valid alternative to conducting lengthy environmental review for each project, when we already know the implications of certain practices.

FERRA also respects pre-determined direction given in forest management plans, meaning that all actions taken in response to catastrophic events must comply with forest management plans. This is extremely important, given that these plans are developed with extensive public involvement and analysis, taking years and sometimes decades to develop. These plans provide "sideboards" for forest management in the nation's forests and will help to ensure that recovery and reforestation efforts meet the publicly vetted goals and objectives for each forest.

The bill includes language which recommends limiting the creation of "plantation forests" in reforestation activities. Plantations are not appropriate for every forest type and may not achieve certain management objectives. However, in some regions of the country, reforesting in plantations helps to ensure survival of newly planted seedlings and is an option for achieving forest management objectives. We encourage modification of this language to allow for differing forest types and the flexibility to reforest using different reforestation techniques that are appropriate to specific forest types and management objectives.

In addition to the burdensome and time-consuming process hurdles that federal forest managers must go through, they also are faced with limited resources both in terms of technical expertise and funding. FERRA takes steps to address this issue, offering additional flexibility to use funds from other accounts to pay for recovery and reforestation. We urge the Agencies to ensure that they are hiring employees with the necessary forestry expertise to meet the growing needs for prompt recovery and reforestation from the increasing and more severe forest catastrophes of late.

SAF supports the research and landscape assessment components of the Act. The landscape assessments will allow federal forest managers to coordinate responses to catastrophic events with other landowners, working across ownership boundaries. Coordinating management across the landscape, rather than focusing on a single ownership, is critical to ensuring effective watershed and wildlife habitat protection. For example, Montana is currently experiencing insect outbreaks in most forested areas. Photo 1 shows a landscape on the Lolo National Forest with the orange-colored trees killed by a mountain pine beetle outbreak that started on federal lands and has spread across multiple ownerships. These insects do not respect ownership boundaries.

The research aspect of the Act will help to improve the body of knowledge that is currently available regarding forest recovery and reforestation. We encourage Congress to permit all forestry schools and colleges who have the expertise to address this issue to be eligible to participate in Forest Health Partnerships. Catastrophic events, such as the wildfires across the western United States have been the focus of numerous research projects. In many cases, however, the research conducted focuses on the basic study of individual organisms rather than the overall impacts and effectiveness of applied restoration practices on ecosystem integrity. Forest managers have both the science and field experience to show that taking quick action after catastrophic events can improve forest conditions. More research will help improve these practices and tailor them to meet specific needs for the incredibly diverse forest ecosystems across the United States. SAF has numerous examples from across the country to show the benefits of prompt forest action and the consequences of inaction or delay. All are available on the SAF website at http://www.safnet.org/policyandpress/forestrecovery.cfm. Also, I've attached to my testimony a photo essay developed by SAF that outlines issues with forest recovery and reforestation.

Montana and Idaho Forests

I'd like to provide some examples of this science and experience that demonstrates the need for FERRA, based on my work in Montana and Idaho forests. For the past 21 years I have studied and worked in the forests of Idaho and Montana specializing in forest regeneration, restoration, and the roles of disturbance processes on forest ecosystem health. Over the past 9 years I have worked specifically on applied research and restoration practices following wildfires and insect and disease outbreaks with private landowners, industry foresters, and public land managers. I would like to present a brief overview of some of the impacts that different forest management strategies have had across these varied ownerships.

Forests in this region are largely limited in their growth rates by water availability. The weather and precipitation in this area can be fickle. Naturally, forests respond to these changes. Not only do tree growth rates vary, but perhaps more importantly, their ability to regenerate and colonize different sites varies. This latter part is an often overlooked but critical component since extended hot-dry periods have been well correlated to wildfire events. Currently, the Inland Northwest forests are in a period of a hot-dry trend. As conditions have become hotter and drier, these dense forests, with growth built up from previous cooler, wetter periods, have become drought stressed, helping insect outbreaks develop and of course, fuel wildfires of catastrophic proportion (see pictures 2 and 3). The infamous fires of 1910 that burned over 3.5 million acres in a span of two weeks also occurred during a hot-dry period that followed a cool-wet trend. Following these events, the continued hot dry climatic conditions do not favor forest regeneration across all of the areas that have burned.

Although there are many examples of excellent post-fire natural regeneration, there are also significant areas where natural regeneration has not occurred. Research has shown several factors can affect natural post-fire tree regeneration. Fires can be so severe that all seed sources are destroyed; competing vegetation can negatively affect tree seedling survival; and blackened post-fire conditions promote soil surface temperatures as high as 180ºF which is well over the lethal high temperature threshold for tree seedlings (see pictures 4 and 5). I have personally examined many wildfire affected forested areas across Montana and Idaho and have found significant areas that have been converted from forest to grass or shrublands (see pictures 6 and 7). Even Yellowstone National Park, which is often shown to be the model for natural post-fire recovery has significant areas that do not have natural tree regeneration resulting in a loss of overall forested area (see picture 8).

Another phenomenon that prevents reforestation is often referred to as the "reburn effect." Fire killed trees eventually topple creating large fuel accumulations. Fires that burn through this type of condition tend to have very severe effects (see pictures 9 and 10). Reburned areas may require centuries or longer to return to a forested condition because seedlings that may have colonized the site following the first fire are usually killed and there are no mature trees that can provide any seed following the reburn. Although some of this land-cover conversion may be beneficial for some wildlife species, the magnitude of wildfire affected areas should be cause for concern if forested lands are to be conserved.

The presence of aggressive noxious weeds also slows native vegetation recovery, promotes soil erosion, and contributes to loss of wildlife habitat. For example, the Selway River Canyon, which lies within a designated wilderness area that burned in the late 1970's, was rapidly colonized by a dense cover of knapweed which remains uncontrolled today (see picture 11). Noxious weeds such as knapweed are poor soil stabilizers and contribute to long-term chronic soil erosion.

Bitterroot Fire and beetle outbreak: consequences of inaction

In the summer of 2000, 356,000 acres in the southern Bitterroot valley of Montana burned in a complex of wildfires started by a dry lightning storm. Approximately one-third of the wildfire affected area experienced stand replacing fires that left black skeleton forests. The remainder burned as either a lethal understory fire where the fire did not climb into the tree crowns but the surface fire was hot enough to kill or severely injure mature trees, or a surface fire that did not injure most mature trees.

Pictured in photos 12 and 13 are examples of these types of fires. Roughly 50,000 acres of the area that burned was either state trust land or non-industrial private forestland. Following the fires, private and state foresters as well as landowners were very quick to respond to the fire effects by immediately assessing the fire damage, removing fire killed trees, and implementing a variety of soil stabilization practices such as orienting logging debris along contours to slow water movement, seeding preferred grass species, planting trees, and using herbicides to selectively control noxious weed invasion. Although some forest owners used federal cost-share money, many financed their own practices with revenues generated from the trees removed during the restoration process. Having surveyed many of these lands, the recovery process has gone smoothly with good soil stabilization, revegetation, and reforestation where needed. Such "salvage logging with restoration" is a model for future wildfire restoration practices.

The Bitterroot National Forest, despite federal forest managers' best attempts to implement recovery operations across approximately 44,000 acres out of the 307,000 acres burned, was immediately litigated on the proposed projects. The outcome, which took almost two years to achieve, allowed for the harvesting of dead and dying trees on 12,700 acres. To date, 5 years after the fire, only 8,000 acres have been harvested and only about 50% of the initial log volume has been recovered because the delay caused significant log degradation on standing fire-killed trees.

In addition to this loss in value, the Douglas-fir beetle outbreak that developed in fire injured trees caused severe damage (see pictures 14 and 15). Since a Douglas-fir beetle requires a year to complete its life cycle, harvesting infested trees in a timely manner can be an effective tool to control outbreaks. Prompt harvesting of beetle-infested trees was not accomplished on most of the fire affected federal lands in the Bitterroot Valley, therefore a 30,000 acre Douglas-fir beetle outbreak has developed. In many areas 50 to 80% of the mature forest has been killed by the beetles, resulting in 80 to 150 dead trees per acre that will eventually topple and create a fuel bed conducive for very severe future wildfire effects.

Erosion on Recovered vs. Non-recovered Forests

During the summer of 2001 a storm-cell moved across the southern Bitterroot Valley and deposited several inches of rain over a 2-4 hour period. The results in some areas were devastating. The Laird Creek Drainage, where several houses destroyed by the 2000 fires were being rebuilt, was hit by a wall of water over six feet high that had been funneled into a stream bottom by the burned mountainsides (see pictures 16 and 17). Houses in various states of repair were re-damaged and significant soil erosion on the mountain slopes occurred (see picture 18). I had vegetation recovery study plots in the Laird Creek drainage as well as on the Sula State forest which was hit by the same storm cell. The State forest had been salvage logged that previous winter immediately after the fires, and had logging debris left in a manner designed to impede soil surface water flow (see pictures 19 and 20) but not hinder natural vegetation recovery (see picture 21). The Laird Creek Drainage had not had any salvage related treatment following the fires. Although I was not measuring soil erosion, I was visually monitoring soil impacts and visited both sites immediately after the storm. No soil erosion was evident on the recovered sites such as that which took place in the Laird creek and adjoining drainages.

The Sula State Forest recovery treatments implemented under the supervision of professional foresters generated over 5 million dollars for Montana Schools. Whereas mitigation procedures such as contour felling on the Bitterroot National Forest (see picture 22), cost between $500 and $2,000 per acre. Modern logging practices and technology coupled with restoration practices can be a very effective means of mitigating the identified undesirable effects such as soil erosion while also conserving the beneficial attributes of wildfire such as snag creation and nutrient cycling in a cost effective manner. It is also important to note that salvage logging by itself cannot address every situation in a wildfire-affected landscape. Practices such as contour felling, straw wattles and hydromulching (see picture 23) and others in sensitive areas such as riparian corridors may be required. The key is allowing land managers to implement such practices immediately following wildfires before vegetation starts to reclaim the site and merchantable log quality degrades.

Fridley Fire: Recovery saved the Ranch

The 25,000 Fridley fire occurred just north of Yellowstone National Park, burning across national forest system lands and private lands. One particular ranch had almost 3,000 acres of forest killed by the fires. Pictured here (photo 24) are the landowners--third generation ranchers-- surveying their fire damage. Immediately after the fire they were so devastated they considered selling the ranch which is prime real-estate for development. Along with several other foresters, I helped them develop an action plan for their fire affected lands. Photo 25 shows their land right after the fire and Photo 26 shows this same land two years later following extensive salvage logging and restoration practices. These landowners, in contrast to their adjoining national forest neighbors (photo 27), were able to act quickly and removed dead and dying trees on much of their lands, leaving ample snags for wildlife. They reinvested the money into reseeding the burned area with a preferred native grass mixture and controlling weeds. In addition, one of their land management objectives has always been to provide habitat for a resident elk herd – which has moved back because they now have the best grass in the area.

Moose Fire

The Moose fire burned 71,000 acres in 2001 west of Glacier National Park, of which 35,750 acres were on the Flathead National Forest (see picture 28). Although 4,300 acres were proposed for salvage logging only 2,015 acres were actually approved and sold 18 months after the fires. Alternatively, state and private lands were treated immediately after the fire (see pictures 29 and 30). Logging practices designed by industry foresters left debris along contours to help prevent soil erosion. After logging was complete, natural regeneration of native vegetation and trees was plentiful. Salvage operations several years following fire events could damage such natural regeneration of trees if done improperly. Some private landowners also salvage logged immediately following the fire and used a slightly different approach by leaving clumps of fire killed trees as opposed to dispersed trees and replanting portions of their land with alternative native tree species to promote a more diverse forest (see picture 31). Although not measured, it appears that logged areas actually had greater overall native vegetation recovery rates.

Black Mountain Fire: Timely Private Land action

The Black Mountain fire which occurred just outside of Missoula, started on national forest land and moved onto private lands, destroying the house of this landowner and killing 90% of the trees on her 23 acre property (see photo 32). She was devastated by the loss of her forest, and after researching her options and employing a forestry professional, salvage logged her dead and dying trees (see photo 33). This was followed by seeding the site with preferred native grass species and later plans to replant tree species where natural regeneration is inadequate (see photo 34). No federal cost-share was sought and she realized a net income from the harvest. Having surveyed this land, I have found a greater vegetative species diversity and cover on the treated sites versus adjoining untreated sites.

Conclusion

Although wildfires have been and are a component of maintaining the ecological functions of natural forestlands, the severity and scale of wildfires that the Inland North West is experiencing vastly exceeds the type of disturbance that is beneficial to the forest ecosystems and functions that most human inhabitants hold important. If the climatic trend remains warm and dry for an extended period of time, as most predictions indicate, wildfires will continue to burn on a catastrophic scale, and the future of our forests, as they currently exist, will depend on our ability to respond effectively.

These observations of rapid and well-planned recovery efforts of state and private land managers in the Inland Northwest generally demonstrate that rapid management actions, often including salvage logging, can return wildfire affected lands to a forested condition more quickly, and with a greater diversity of native species, when compared with recovery practices that are delayed or never completed. In addition, rapid and well-planned restoration practices reduce the potential for negative fire effects such as soil erosion, water degradation, flood events, noxious weed invasion, insect pest outbreaks, and loss of wildlife habitat. Moreover, permitting salvage logging on appropriate sites as part of a restoration plan allows the restoration to pay for itself, or even generate funds for public services – such as the Montana Schools Trust Fund.

Timely action after catastrophic events can benefit the environment, the economy, and communities. SAF urges swift action to pass FERRA and enable the federal forest managers to respond promptly and effectively to fulfill their stewardship responsibilities on federal lands.

I invite all of you to come to Montana and I will personally give you a first-hand look at such forest recovery practices for you to judge for yourselves. We could start at Glacier National Park and end at Yellowstone National Park, visiting 5 or 6 different fire affected areas, both salvaged and non-salvaged along the way.

Thank you for the opportunity to testify before you today. I’m happy to answer any questions you may have.