

# EVERGREEN



The Magazine of the Evergreen Foundation, Winter, 2000

**Should We Let Diseased  
National Forests Die and Burn?  
Is Restoration Forestry  
A Better Idea Than Zero Cut?**






Jim Peterson

**The Largest Forest Fire in American History** - On the night of August 20, 1910, a forest fire of almost unimaginable ferocity crossed the summit in the distance, headed east from Idaho into Montana. In two terrifying days and nights, fires from perhaps a thousand lightning strikes merged into one conflagration, destroying more than two million acres of National Forest timber in northern Idaho and western Montana. In the aftermath, an outraged nation demanded that Congress put the U.S. Forest Service in the fire-fighting business. Although the policy of "excluding fire" from forests has had disastrous environmental consequences, especially in fire-dependent ecosystems, it still enjoys wide public support. It has taken almost 90 years for the still young forest pictured here to re-establish itself on Lookout Pass near the Idaho-Montana state line, and it will be another century or more before this forest begins to take on publicly desired old growth features.

**On the cover** - Lightning and fire illuminate the night sky in northern Arizona's Coconino National Forest. (USFS)





Environmentalism increasingly reflects urban perspectives. As people move to cities, they become infatuated with fantasies of land untouched by humans. This demographic shift is revealed through ongoing debates over endangered species, grazing, water rights, private property, mining and logging. And it is partly a healthy trend. But this urbanization of environmental values also signals the loss of a rural way of life and the disappearance of hands-on experience with nature. So the irony: as popular concern for preservation increases, public understanding about how to achieve it declines.

**Alston Chase**, Ph.D., Philosophy of Science,  
Syndicated columnist and author of *Playing God in  
Yellowstone* and *In A Dark Wood*  
*Evergreen*, September, 1990



# Should Logging Be Outlawed In National Forests?

A coalition of the nation's most powerful environmental organizations has asked Congress to approve legislation that would outlaw logging in National Forests. Their proposal appears to turn on two assertions. First, logging “destroys” forests, and second, the best way to “save” National Forests is to leave them alone.

We have sifted through hundreds of government-funded studies and can find no peer-reviewed scientific evidence that supports these claims. But there is compelling evidence that about half of the West's National forest land base is in big trouble. Not because of logging or livestock grazing, which have both altered the character of western forests, but more significantly because of an *absence* fire—a direct result of the nation's well-intended

**The timing of the “Zero Cut” proposal appears to underscore a disagreement in principle involving at least two environmental factions.**

policy of excluding fire from forests. More than any other natural agent—wind, insects, diseases or flooding—it was fire that energized the West's plant and animal communities for eons. Minus fire, millions of forested acres are dying. Worse yet, the *low-intensity* fires that sustained that helped maintain species diversity have given way to *stand replacing* fires that burn so hot they destroy everything, including nutrient rich topsoil, which is melted into a wax-like substance that water cannot penetrate.

The so-called “Zero Cut” proposal underscores a looming debate *between environmentalists* over what to do about this situation. Environmental groups that are heavily invested in the no-harvest campaign say the best thing to do is leave these troubled forests to nature. But new environmental coalitions are taking shape in western communities. Remarkably, they see harvesting—in this case a less intrusive refinement called “restoration forestry”—as a way to circumvent the disastrous environmental impacts associated with increasingly destructive forest fires. Reducing the risk of such fires is—in turn—seen as the first step in the long process of restoring forest conditions and natural disturbance patterns that were prevalent before white settlement began.

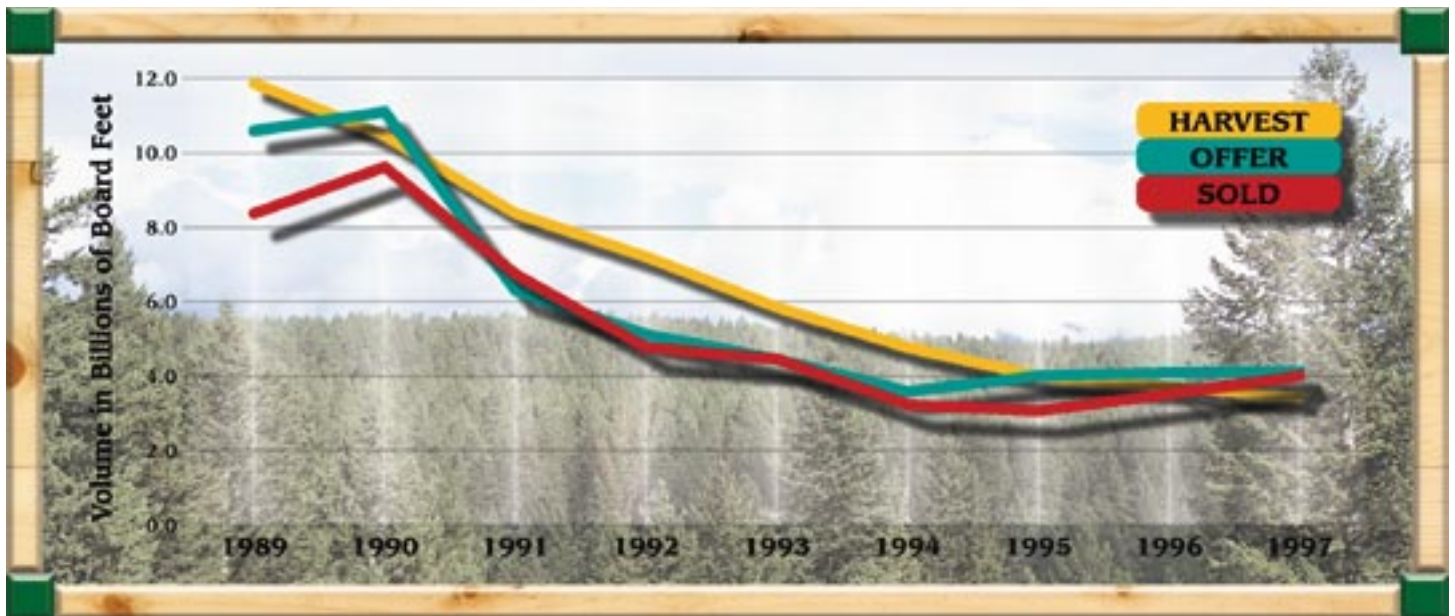
For perspective, we asked forest scientists most familiar with western National Forests to explain why these forests are dying and burning up in increasingly destructive fires, what will happen if nothing is done, and what could be done to alleviate the underlying causes of these conflagrations. Their answers punctuate this issue. Absent is any discussion of the “forest health debate.” There is no agreed upon definition for what constitutes a healthy forest, though most scientists agree it is one in which desired future conditions (e.g. more old trees) are not threatened by current conditions (e.g. the increasing risk of catastrophic fire). After reading this report, you can make your subjective judgement as to the health of the West's National Forests.

It is easy to be cynical about the very nature of this debate. Environmentalists despair over the loss of forests; timber families mourn the loss of hope; and the Forest Service is vilified from all sides. But judging from what we learned in the course of this investigation, moderate voices representing timber and environmental interests could really help each other if they can learn to trust one another. We hope they can because the future of the West's forests is riding on their ability to convince skeptical publics that restoration forestry is not simply the latest disguise for perceived logging excesses.

Jim Petersen, Editor  
*Evergreen* Magazine

**Headed for Grants Pass**—A Grants Pass-bound log truck winds its way out of southern Oregon's Siskiyou National Forest in 1992. The Siskiyou has been the scene of frequently bitter public debate over the future of timber harvesting in the National Forest System. This truck belonged to the late R. B. Slagle. Mr. Slagle hauled logs for more than 50 years and was one of his community's most admired and most generous citizens. Faced with plummeting harvest levels he reluctantly liquidated his 20-truck operation in 1995, three years before his death.



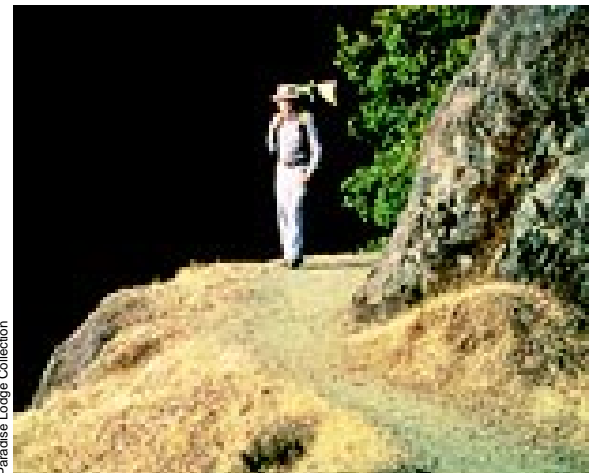


**Declining harvests**—Since 1989, the amount of National Forest timber harvested has declined 72 percent, from 12.0 to 3.5 billion board feet annually. (USDA Forest Service timber sale reports)



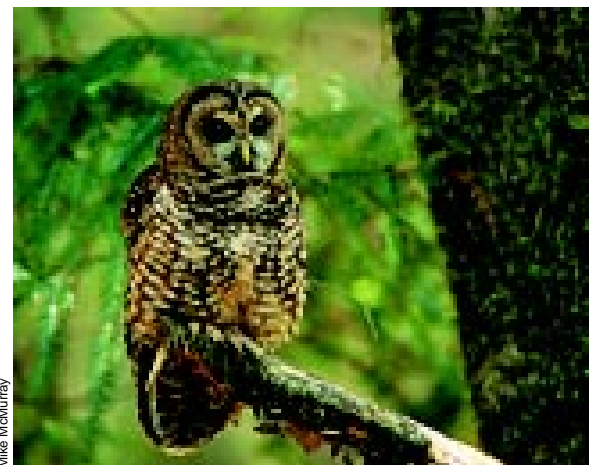
Jim Petersen

**Habitat worries**—Anglers drift the North Fork of the Flathead River in northwest Montana. Many see timber harvesting in the adjacent Flathead National Forest as a threat to fish habitat.



Paradise Lodge Collection

**Solitude**—A hiker pauses along southern Oregon's historic Rogue River Trail. About 50 miles of the Rogue was designated a Wild and Scenic River in the 1960s. Harvesting is forbidden here.



Mike McMurray

**Threatened species**—The National Forest timber sale program began its long decline after the Northern Spotted Owl was listed as a threatened species in June 1990.





**Smoldering ruin**—the aftermath of the 100,000-acre Silver Fire, a 1987 conflagration on the southern Oregon's Siskiyou National Forest.

**T**he deer was hairless and purple. Where the skin had broken, the flesh was in patches. For a time, the deer did not look up. It must have been especially like Joe Sylvia, who was burned so deeply that he was euphoric. However, when a tree exploded and was thrown as a victim to the foot of a nearby cliff, the deer finally raised its head and slowly saw us. Its eyes were red bulbs that illuminated long hairs around its eyelids.

Since it was August, we had not thought of taking a rifle with us, so we could not treat it as a living thing and destroy it. While it completed the process of recognizing us, it bent down and continued drinking. Then either it finally recognized us, or became sick at the stomach again. It tottered to the bank, steadied itself, and then bounded off euphorically. If it could have, it probably would have said, like Joe Sylvia, “I’m feeling just fine.” Probably its sensory apparatus, like Joe Sylvia’s, had been

dumped into its bloodstream and was beginning to clog its kidneys. Then, instead of jumping, it ran straight into the first fallen log.

My brother-in-law said, loathing himself, “I forgot to throw a rifle into the cab of the truck.” The deer lay there and looked back looking for us, but, shocked by its collision with the log, it probably did not see us. It probably did not see anything—it moved its head back and forth, as if trying to remember at what angle it had last seen us. Suddenly, its eyes were like electric light bulbs burning out—with a flash, too much light burned out the filaments in the bulbs, and then the red faded slowly to black. In the fading, there came a point where the long hairs on the eyelids were no longer illuminated. Then the deer put its head down on the log it had not seen and could not jump.

*Young Men and Fire*, Norman Maclean,  
University of Chicago Press, 1992

# Blow Up

Next to a nuclear explosion, there is no more lethal killing force on earth than a big forest fire. The most violent are called “blowups” because they are capable of exploding. Just how they perform such a terrifying feat remains a mystery, but fire behavior experts think it has something to do with a convergence of weather patterns and hurricane-force winds big fires often generate.

Fanned by such fearsome winds, flames become blast furnaces, then the furnaces explode. Trees that are not incinerated where they stand are often sucked from the ground and tossed hundreds of feet into the air. Only a handful of firefighters have survived a blowup, but from their accounts we know that blowups can outrun birds in flight, melt soil, boil stream water, crack open boulders, detonate old, pitch-filled trees like sticks of dynamite and incinerate entire mountainsides in seconds. Mercifully, most who fall before them suffocate before fire consumes their bodies.

Big forest fires have become the focal point in the West’s National Forest harvesting debate because harvesting—in this case restoration forestry—deals with the underlying cause of today’s blowups: vast stands of diseased, dying and dead trees. Whether still standing or lying in rubble, these stands are fueling some of the largest and deadliest forest fires ever to burn in the West. Environmental groups that oppose harvesting



USFS photograph

**Firestorm**—a blowup in southwest Idaho’s Payette National Forest.

on principle say allowing dying forests to burn naturally is less harmful than logging. But new coalitions—whose members often live in or near at risk forests—see thinning as a way of slowing defusing an ecological time bomb. Most, but not all, forest scientists agree with them.

Over the last 50 years, two blowups have ended in great tragedy. Thirteen smokejumpers died in Mann Gulch in Montana, August 5, 1949. Then on July 6, 1994, fourteen firefighters died on Colorado’s Storm King Mountain. Norman Maclean (*A River Runs Through It*) turned the Mann Gulch

tragedy into his second great book: *Young Men and Fire*. Maclean marks as Stations of the Cross the final fiery moments in the lives of thirteen young men caught in a race they cannot win—moments Maclean marks as Stations of the Cross.

Maclean: “Dr. Hawkins, the physician who went in with the rescue crew the night the men were burned told me that, after the bodies had fallen, most of them had risen again, taken a few steps, and fallen again, this final time like pilgrims in prayer. When the fire struck their bodies, it blew their watches away. The two hands on a recovered watch had melted together at about four minutes to six. For them, that may be taken as the end of time.”

Maclean again: “When Jansson, Roos and Sallee reached him, Sylvia was standing on a rock slanting

heavily downhill. Hunched over and wobbling to keep his balance, he couldn’t stop talking. “Please don’t come around and look at my face; it’s awful.” Then he said, “Say, it didn’t take you fellows long to get here.” He thought it was about 5:00 in the morning.

Jansson pulled out his watch and said, “It’s 2:00 a.m. on the nose.” Then in his report, Jansson speaks to us. “Since his hands were burned to charred clubs, I peeled an orange and fed it to him section by section.” Sylvia said, “Say, fellows, I don’t think I’ll be able to walk out of here.” Jansson told him his walking days were over for the time being and he was “going to get a free



ride out.” He tried to make this a joke, although it is hard to make jokes at night on a hillside that smells of burned flesh.”

Maclean spent almost 30 years trying to reconstruct a moment-by-moment account of what happened when Mann Gulch blew up. The result is one of the most vivid and meticulously crafted descriptions of a blowup ever written. “A fire can set up a whirling action by drawing the cooler and heavier air from the outside into the vacuum left by its own hotter and lighter air constantly rising and escaping,” he explained. “In case this seems like a theoretical and theatrical construction, you might go to your basement furnace when it is roaring and open its door, put your face in front of it, and feel the sudden alarm that you are about to be drawn into your own furnace.”

“Fire whirls both intensify existing fire

**“All of them tried to get at the very end of a small hole and they were piled up in an awful heap. When we tried to remove their bodies they fell apart.**

- David Bailey

and cause new fires,” he wrote. “Their rotating action is that of a giant vortex, and, as giants they can reach two thousand degrees in temperature. Fires that become giants are giant smoke rings with a downdraft in the center that is full of deadly gases and, what is more deadly still, heat so great that it has burned out much of the oxygen; the

outer-ring is an updraft sometimes reaching the edge of the atmosphere. Some fire whirls, not all of them are flame-throwers. Some pick up burning cones and branches. Some of the giants pick up burning logs and toss them ahead, starting spot fires sometimes a long way ahead. When these spot fires unite, firefighters can be trapped between two fires.”

Firefighters were trapped between fires three times during the Great 1910 Fire, widely believed to be the largest forest fire in U.S. history: 86 perished. In two terrifying days and nights, a convergence of perhaps 1,000 fires raced across three million acres in northern Idaho and western Montana. The survivors told stories of almost unimaginable terror. Joe Halm, who held his crew at gunpoint to keep them from fleeing a fire he knew they could not outrun, described “a roaring furnace,



**86 dead**—Portal of the War Eagle Mine near Wallace, Idaho. Ranger Ed Pulaski hid his 45-man crew here during a firestorm the night of August 20, 1910. The survivors walked and crawled to Wallace the next day. Note the size of the trees that were uprooted by the force of fire-generated winds. Eighty-six firefighters were killed in two days. Five of Pulaski's men and two horses died from carbon monoxide.



a threatening hell.”

“The wind had risen to hurricane velocity,” Halm later recalled. “Fire was now all around us, banners of incandescent flames licked at the sky. Showers of large flaming branches were falling everywhere. The quiet of a few minutes before had become a horrible din. The hissing, roaring flames, the terrific crashing and rending of falling timber was deafening, terrifying. Men rushed back and forth trying to help. One giant, crazed with fear, broke and ran. I dashed after him, he came back, wild-eyed, crying hysterically. The fire had closed in and the heat became intolerable.”

On Big Creek, a tributary of northern Idaho’s St. Joe River, 30 men lost their lives while others lay prone for hours in the chilly waters of a tiny stream—great forest giants falling around and across them. A falling tree—in flames—crushed three men, while a fourth man—caught only by his foot—struggled to free himself. Men a few feet away heard his cries and prayers, but were powerless to help. “If the wind had changed, a single blast from the inferno would have wiped us out,” Halm said in a 1938 radio interview.

It was no better upriver. On Seltzer Creek, 29 died trying to outrun the inferno. And down-river, at Beauchamps’ cave, David Bailey saved himself by diving into a small creek. Fire burned his hands while he covered his head with them, but he lived to tell about it. Seven others on his crew were not so lucky. “They were cooked alive,” Bailey told an interviewer. “All of them tried to get at the very end of a small hole and they were piled up in an awful heap. When we tried to remove their bodies they fell apart.”

Ranger Ed Thenon described his crew’s brush with death on Moose Creek, two day’s walk south of the cave that became a grave. “Trees were crashing down all around us and the sight and sound of the fire was something terrible. The smoke lifted a little on the west side of the creek, and there, half-way up the mountain, was a whirlwind of fire just like a waterspout, only it was all fire and burning gas and a thousand feet high. It moved back



**“Dr. Hawkins, the physician who went in with the rescue crew the night the men were burned told me that, after the bodies had fallen, most of them had risen again, taken a few steps, and fallen again, this final time like pilgrims in prayer. When the fire struck their bodies, it blew their watches away. The two hands on a recovered watch had melted together at about four minutes to six. For them, that may be taken as the end of time.”**

—Norman Maclean,  
*Young Men and Fire*

USFS

**Forest Service smokejumper** drifts downward through a Montana sky in July, 1967—not unlike the twelve who died in Mann Gulch August 5, 1945.

and forth and up and down the slope, and the roar of it was like a million blowtorches. If it had ever moved down on us we would have gone out just like when you touch a candle flame to a mosquito.”

Eighteen members of Lee Hollingshed’s crew became Thenon’s mosquitoes. Panic-stricken, they took refuge in Henry Dittman’s cabin on Big Creek, only to have the cabin explode in flames. The roof collapsed and they were burned alive. Ed Pulaski’s crew was luckier. They huddled in a mine tunnel while Pulaski calmly hung wet blankets over the portal. “The men were in a panic of fear, some crying, some praying,” he later said. “Many of them fell unconscious from the terrible heat, smoke and fire gas. I, too, finally sank down unconscious.” The crew later walked and crawled into what was left of Wallace. “Our shoes were burned off our feet and our clothes were in parched rags.”

The nation was outraged, no one more so than Gifford Pinchot, then the (first) chief of the Forest Service, and a frequent critic of Congress’ failure to appropriate money for trail and road development.

“For want of a nail, the shoe was cast, the rider thrown, the battle lost,” he told a reporter from *Everybody’s Magazine*. “For want of trails the finest white pine forests in the United States were laid waste and scores of lives were lost. It is all loss, dead irretrievable loss, due to the pique, the bias, the bullheadedness of a knot of men who have sulked and planted their hulks in the way of appropriations for the protection and improvement of these national forests.”

In the decade that followed, the federal government, several state governments and the West’s major timberland owners joined forces to create a network of forest fire fighting cooperatives that still exists today. The government’s decision to “exclude fire” from western forests was widely supported by a public that had come to view forest fires as killers of both people and timber. It would be another 50 years before the ecological consequences of the decision began to surface.



# Why the West's Forests are Burning Up

Of all the human events that have altered the character of western forests, including a century of timber harvesting and livestock grazing, none has had a greater impact than the federal policy making process itself. Two seemingly unrelated congressional decisions combined to alter the character of western forests more than any other single event. First, Congress' 1911 decision to put the Forest Service in the forest fire-fighting business—a decision made in the aftermath of the Great 1910 Fire. And earlier, its 1851 decision to force Indians off their land and onto reservations—a decision that removed so-called “native fire” from the western landscape.

The ecological impacts of the two decisions were first observed in eastern Washington in the early 1950s. Minus frequent ground fires, set by Indians or lightning, fire-resistant (thick-barked) ponderosa pine, a species that thrives in sunlight, was being pushed aside by white fir, a shade tolerant species that because of its thin bark was easily killed by fire. Once open forest canopies were closing, and the big pines—said to have been spaced so far apart the pioneers could drive their wagons between them—were dying. Range grass was once so tall that it brushed the bellies of their teams.

Today, in some western forests, more than a thousand firs can be counted on single acres where once only a dozen or so big ponderosas stood. And now the fir is dying too, killed off by its own prolific growth. Minus adequate moisture, sunlight and soil nutrients, millions of acres are succumbing to insect and



USFS photograph

**Unintended reminder**—Flathead Indian Chief Paul Charlo poses with Smokey Bear in a September, 1956 promotional event—an unintended reminder that, for thousands of years, Indians routinely set fire to western forests and prairies before the federal government forced them onto reservations. Smokey Bear—symbol of the same government's all too successful effort to extinguish every forest fire.

disease infestations. In some places, sunlight has not reached the forest floor for 50 years. Here, woody debris accumulations, often knee-deep, fuel some of the largest, more destructive forest fires in recent western history.

Along the West Coast, the crisis is not yet as visible as it is in the Southwest and Intermountain regions, but it is only a matter of time. In moist coastal forests where a century ago fires were infrequent but intense, they are now more frequent and more intense. And in drier forests in southwest Oregon and California, where fires were frequent but

not as intense, they are now more frequent and very intense.

Throughout the West, so called “intermix” fires pose the greatest threat to humans. Intermix fires draw their name from a trend as dangerous as the fires themselves: the construction of new homes in at risk forests from Colorado to California and Arizona to Montana. In 1994—a bad fire year in the West—some 75 percent of the federal fire suppression effort was tied up protecting homes and communities within what fire fighters call the “wildland-urban interface.”

In recent years, fires on the outskirts of Spokane, Washington; Bend and Medford, Oregon; Flagstaff, Arizona; Reno, Nevada; and Missoula, Montana have prompted frantic calls from homeowners demanding that the government “do something.”

But the U.S. Forest Service is not the agency it once was. Long years of experience with fire and its aftermath have given way to self-doubt. Indeed, the agency seems to have become a microcosm of the larger debate, with some employees arguing that fire should be allowed to resume its natural role while others say they would rather thin ailing forests than deal with the after effects of catastrophic fire. It is no wonder the public does not know who or what to believe. But this much is true: the low-intensity fires that frequented the West before white settlement began have given way to raging infernos that bear no resemblance to fires set by Indians or lightning. Does saving these forests mean we must first allow them to burn to the ground?





**Torched aftermath**—In National Forests across the West dead and dying timber stands are fueling some of the most explosive forest fires ever witnessed. The underlying cause is exclusion of fire from fire-dependent forest ecosystems. While the nation's fire policy still enjoys wide public support, it has caused western forests to grow much too dense. On millions of acres, fire-sensitive fir species are crowding out once dominant fire-resistant ponderosa pine. Stressed by insects, diseases and drought, these overly dense forests have been pushed far beyond their ability to sustain themselves. Here, the torched aftermath of the August 1994 Freeze Out Fire in eastern Oregon's Wallowa Whitman National Forest.

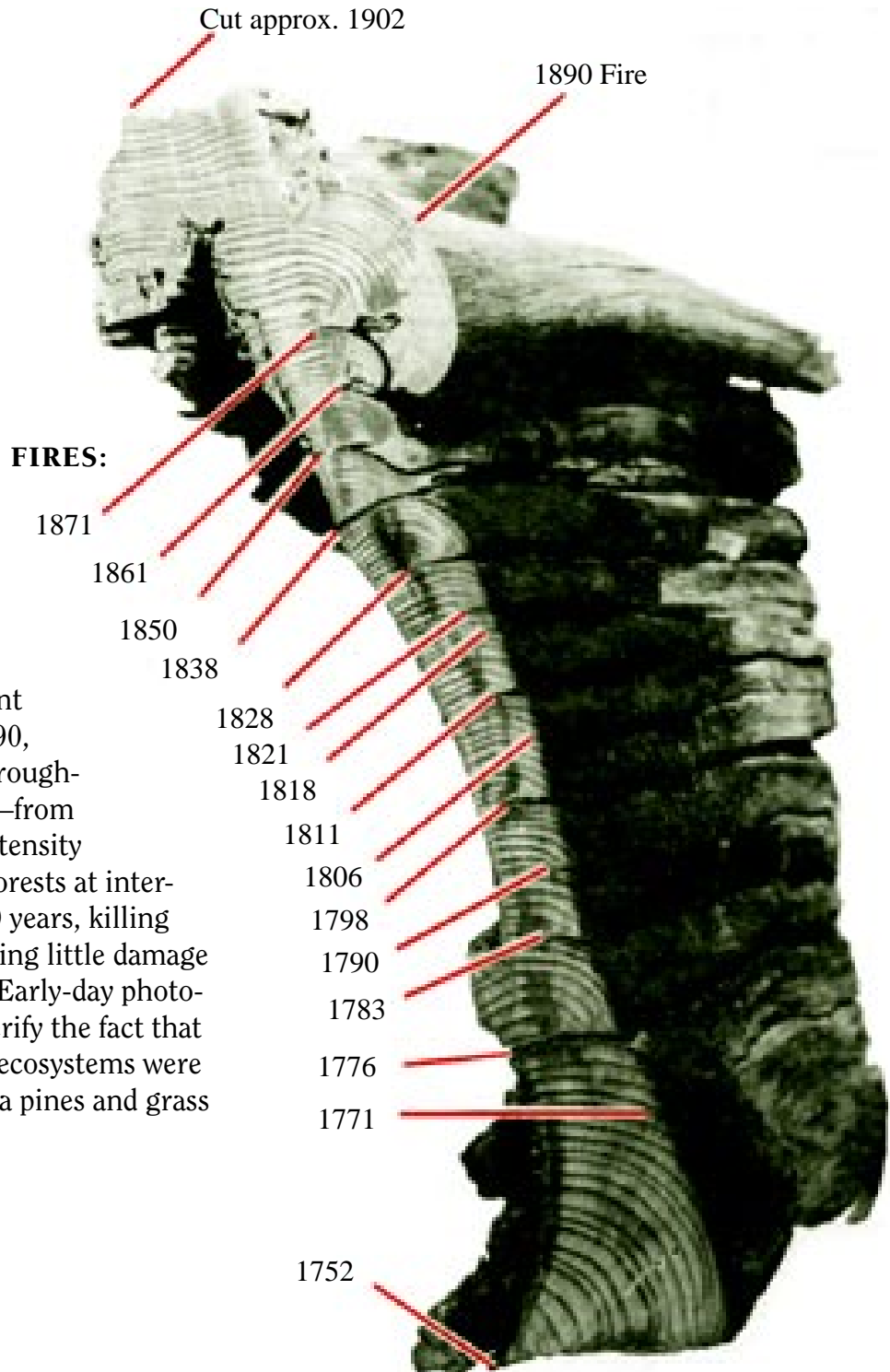


“The assertion is often made that today’s western forest health problems are the result of the aggressive fire suppression activities initiated by the Forest Service and other federal agencies in the 1930s, coupled with the extensive harvest of western pine forests after World War II. While there is some truth in these assertions, they tell only a partial story. A substantial reduction in ecosystem fire had already occurred over much of the West by the late 1880s or even before. It coincided with the disintegration of the cultures of native peoples in the area, virtually all of whom actively used fire as a major land management tool. [Other factors included] settlement of western valley areas and, especially, with increased livestock grazing, which broke up fuel continuity.”

**Doug MacCleery**, Assistant Director, Forest Management, U.S. Forest Service,  
*The Way to a Healthy Future for National Forest Ecosystems in the West*, March 1995:

### A Slice of History—

This cross-section from a ponderosa pine stump in Montana’s Bitterroot Valley illustrates the role wildfire played in western forests before white settlement began. Between 1752 and 1890, the tree survived 16 fires. Throughout the Intermountain west—from Montana to Arizona—low intensity surface fires swept through forests at intervals ranging from three to 30 years, killing most tree seedlings, but causing little damage to taller, more mature trees. Early-day photographs and pioneer diaries verify the fact that low elevation fire dependent ecosystems were dominated by large ponderosa pines and grass savannas.







# What if we do nothing?

“Letting nature take its course in these forests implies a willingness to accept the consequences of catastrophic fire. Are we willing to accept the ecological consequences of huge, unusually severe fires? We can’t restore the forests that were here 150 years ago, but we can restore the natural processes that created them, and that is what we are trying to do in our research work.”

**Steve Arno**, Ph.D., Fire Ecologist,  
Intermountain Fire Sciences Laboratory, USFS, Missoula, Montana,  
*Evergreen* Winter 1994

**T**he claim that ailing western forests can heal themselves if they are left alone seems based on a belief that pre-European forests and prairies were naturally functioning ecosystems uninfluenced by humans. But an enormous and growing body of physical, biological and anthropo-



**Jack Ward Thomas**, Ph.D., wildlife biologist, retired Chief of the U.S. Forest Service, Boone and Crockett Chair, School of Forestry, University of Montana, Missoula:

“Those who support the ban [on harvesting] seem to believe it will prompt natural restoration of pre-settlement forest conditions. I think that is highly unlikely. Unless we soon begin the long process of dealing with diseased forests that are prone to very hot stand-replacing fires, restoring natural ecosystems as we do, Yellowstone-scale fires are a serious probability.”



**Dense, diseased and dying**—(From left) A stand of lodgepole pine in western Montana; a blowup in a dead lodgepole stand lost to the 1988 Yellowstone Fire; and a recently thinned stand of 35-year-old lodgepole near Condon, Montana. Photographs by the late Peter Koch, author of *Lodgepole Pine in North America* a three-volume set.

logical evidence suggests this was not the case. In fact, millions of Indians were already here when white settlement began—and had been here for at least 12,000 years. Many lived in advanced, mainly agrarian, societies based on exploitation of natural resources including soil, water, minerals, trees, fish and game. They planted millions of acres annually and, where water was scarce, constructed elaborate irrigation systems. Fire was routinely used to clear land for crops, drive game animals, encourage berry production, clean campsites, ward off enemies and promote grass production, which attracted foraging animals, mainly elk and buffalo.

But if pre-European forests were not naturally functioning ecosystems, what then might happen if harvesting is banned and western National Forests are left alone to heal themselves?

“You don’t have to return to pre-settlement forests to see the likely result of a ban on harvesting,” says Steve Arno, Ph.D. fire ecologist at the Forest Service’s Intermountain Fire Sciences Laboratory in Missoula,

Montana. “The years 1992, 1994 and 1996 were big fire years in the Intermountain west. They provide very visible evidence of what happens when forests are neglected: severe fires in ponderosa pine forests that historically had lower intensity burns, major losses of fish and wildlife habitat and degradation of air and water quality.”

Minus some form of management, Dr. Arno predicts “large damaging fires, a futile fire fighting effort costing hundreds of millions of dollars and possibly taking firefighter lives, and massive insect and disease infestations.”

Assuming eventual resolution of the harvest debate, Dr. Arno sees a more hopeful outcome. “With management—thinning, harvesting and a carefully controlled burning program designed to encourage growth in native plant and tree species—we can slowly reduce the risk of severe wildfires and disease, creating a more natural range of forest conditions, which is the first step in ecosystem restoration.”

Dr. Arno is not alone in his concern for the consequences of leaving western

National Forests to heal themselves. Two of the country’s best known scientists agree with him: Jack Ward Thomas, Ph.D., wildlife biologist and former chief of the U.S. Forest Service and Chadwick Oliver, Ph.D., forest ecologist at the University of Washington and a contributor to the Clinton Administration’s Northwest Forest Plan.

“For ecological, biological and moral reasons, I oppose the ban on timber harvesting in National Forests,” Dr. Thomas said in a December interview. “Those who support the ban seem to believe it will prompt natural restoration of pre-settlement forest conditions. I think that is highly unlikely. Biologically speaking, eliminating harvesting, while continuing to control wildfires, would have significant adverse effects on bird and mammal species that thrive on early succession forest conditions.”

According to Dr. Thomas, a harvest ban accompanied by legislation that also permitted fires to run free would indeed open up overly dense forests, but it would also degrade air and water



**Steve Arno**, Ph.D., fire ecologist, U.S. Forest Service, Intermountain Fire Sciences Laboratory, Missoula, Montana:

“With management—thinning, harvesting and a carefully controlled burning program designed to encourage growth in native plant and tree species—we can slowly reduce the risk of severe wildfires and diseases, creating a more natural range of forest conditions, which is the first step in ecosystem restoration.”



Jim Petersen



**Before and after**—Photographs of a diseased fir stand on Lick Creek in western Montana’s Bitterroot Valley. After thinning, the site was burned to rid it of excess woody debris. The right-hand photograph was taken a year later. The best trees were left to grow larger and provide a future seed source.

quality – environmental impacts he doubts the public would tolerate.

“If we ban harvesting, but continue to fight fires, we also move toward what we call mid-succession forests, which are far less diverse than young or old forests,” he explained. “I know of no species that finds its sole habitat in mid-succession forests. In managed forests, we solve the mid-succession problem by thinning, allowing light to reach the forest floor, thereby adding to biological diversity. But such thinnings would not be permitted were a harvest ban enacted.”

Dr. Thomas also has serious doubts about the government’s ability to successfully deal with the kinds of wildfires the West is now experiencing.

“The Yellowstone fire was a wakeup call for many scientists, including me,” he says. “Unless we soon begin the long process of dealing with diseased forests that are prone to very hot stand-replacing fires, restoring natural ecosystems as we go, Yellowstone-scale fires are a serious probability. I know many people distrust thinning, fearing a return to the days when too much

harvesting was occurring in National Forests, but I don’t see how it could happen. Far greater risks lie in accepting the idea that the best way to protect National Forests is to set them aside in no-harvest reserves. I’m a wilderness fan and would favor adding appropriate lands to the Wilderness system, but major portions of the National Forest System are not suitable for Wilderness designation and ought to be managed for multiple benefits, including commercial timber production.”

Dr. Oliver holds similar views concerning the probable environmental impacts that would likely accompany a decision to place National Forests in no harvest reserves.

“To minimize the risk of environmental degradation, I suppose we would still try to control wildfires, but increasingly these fires are simply too large and dangerous to be put out as we would extinguish a house fire,” he said in a recent interview. “Until we start dealing with the underlying problem—overly dense stands of dead and dying timber—I’m afraid this situation will only get worse.”

Short of “blending harvesting and thinning programs designed to restore native species,” Dr. Oliver expects the onset of wildfire regimes “on a scale not seen since early in this century.”

“In a few hundred years, a more natural range of forest species and conditions would probably re-emerge,” he says, “but there would be great suffering in the meantime. In many places, the air we breathe and the water we drink would be polluted; exotic plants, animals and pathogens would invade our forests; lives would be lost and millions of acres of native habitat would be destroyed. Fortunately, restoration ecology offers many more acceptable alternatives. By carefully blending thinning, harvesting and wildland vegetation management programs, we can eliminate pests, protect habitat, reduce the danger of catastrophic fire and encourage recovery of native plant and animal species. Moreover, we can create many of the structural features and processes associated with old-growth forests, and we can do it in substantially less time than nature requires.”



# The National Forest S

**Douglas MacCleery**, Assistant Director of Timber Management, USFS, National Forest Mission Shift: *How to Respond to Changing Public Preferences*, March 1998:

“Over the last two decades, public debate over how National Forest System lands should be used and managed has become ever more intense and polarized, reflecting a lack of public agreement on the overall mission that should govern these lands. This lack of agreement, coupled with implementation of federal environmental laws, has had the effect of substantially reducing commodity outputs from National Forest lands, increasing emphasis on amenity values, and on maintaining and restoring ecosystem function, biological diversity and health.”



**Turn-of-the-century cabin**— This Forest Service photograph is thought to be of one of the first Ranger cabins constructed in Montana. Back then, District Rangers traveled their vast territories on horseback, and often fought forest fires with nothing more than shovels and axes. The children are unidentified but are probably the Ranger's.

Listening to the National Forest harvest debate from the sidelines, one might easily conclude not much has changed in the Forest Service over the last 25 years, but the agency and its mission are both very different than they were—even ten years ago. Unfortunately, these changes—which reflect changing public values, scientific advancements and changes in the Forest Service culture—don't make news in the same way anti-logging protests, mill closings and endangered species listings make news.

Gone is the half-century when most Americans believed harvesting National Forest timber was good for the country. Gone too are the days when the West's

sawmills could rely on a steady and generous flow of timber from National Forests. Today, most living outside the rural West probably think it is wrong to log in National Forests. So do many of the rural West's newest emigrants—transplanted city dwellers whose technology-based businesses are not tied to the timber economies that have sustained their newfound communities for most of this century. The fact that the National Forest timber sale program is gripped by political and legal chaos, and is nearing zero, poses no economic hardship for them.

These changes—political and scientific—transect five distinct eras in the history of the National Forest

System: 1905–1950, the 50s and 60s, the early 1970s, the mid-70 to mid-80 period and the mid-80s forward.

The 1905–1950 period is often called “the custodial era.” Little harvesting occurred and few people ventured into National Forests. Between 1896, when Congress created the first Forest Reserves, and 1910, the emerging National Forest System grew from 18 to 168 million acres. The System was created for two reasons: to protect watersheds and to serve as a future source of timber for a fast growing nation. But until the post-World War II era there was little demand for National Forest timber. Controlling wildfires—prerequisite to long-term management



# System: Then and Now

—was a priority, and livestock grazing was the primary commercial activity. During the Depression years, the Civilian Conservation Corps (1933–1942) built most the trails and campgrounds found in National Forests today. CCC boys also fought fires and thinned forests, but most notably they planted 1.365 billion trees.

Things changed quickly following the end of World War II. GI's returning from the war got married, started families and bought homes.

Demand for timber soared and with it the National Forest harvest level. From the late 1940s to the mid-1960s, the annual harvest level rose from 2.0 to 14 billion board feet, a harvest sufficient to meet 20 percent of total U.S. wood consumption.

During this same period, an increasingly mobile and affluent population began putting a new kind of pressure on National Forests. Demand for recreation soared, rising from 18 million visitor days in 1946 to 233 million in 1975.

In 1960, Congress passed the Multiple Use-Sustained Yield Act mandating that National Forests be managed for multiple values: recreation, wildlife, timber, grazing and watershed protection. The act was the first of several new laws reflecting increased social unrest and growing public concern for the environmental impacts of timber harvesting. Others passed between 1960 and 1976 included the

Wilderness Act, 1964; the National Environmental Policy Act and the Clean Air Act, 1970; the Clean Water Act, 1972; the Endangered Species Act, 1973; the Forest and Range Lands Renewable Resources Planning Act, 1974; and the National Forest Management Act, 1976. Despite these protections the increas-

ingly rancorous National Forest debate has come to focus solely on whether *any* harvesting should be permitted in these forests, no matter the reason.

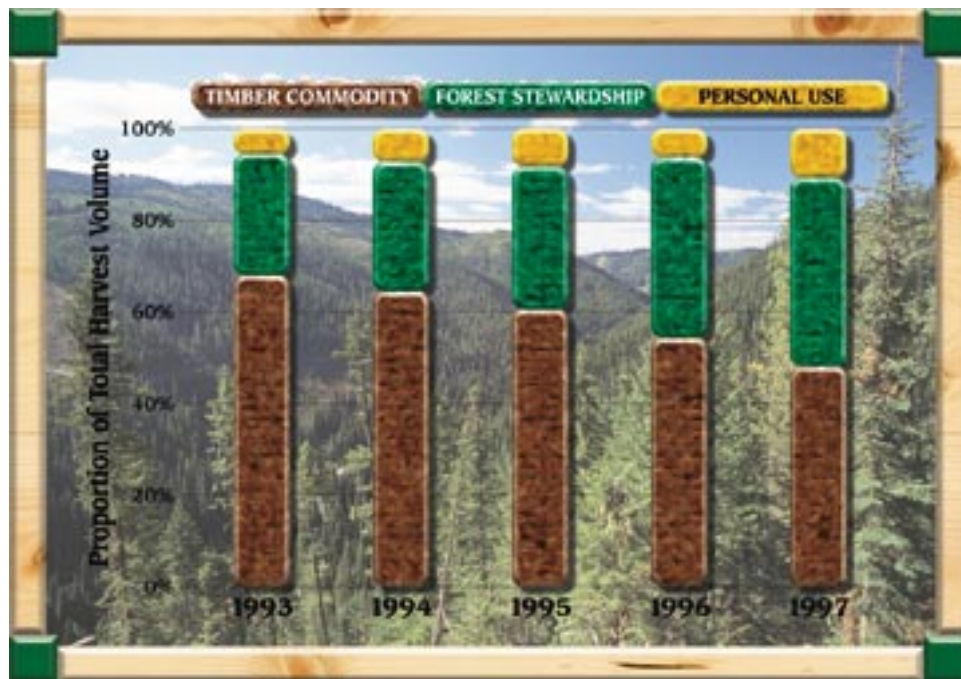
Between 1987 and 1995, National Forest harvest levels in Oregon, Washington and California—the epicenter of the spotted owl-old growth debate—

dropped 89 percent, from 6.86 to 0.78 billion board feet annually. Elsewhere in the National Forest System, the harvest level dropped 53 percent, from 4.46 to 2.10 billion board feet a year. Even more revealing is *the kind* of harvesting that is occurring.

Between 1988 and 1996, the area harvested by clearcutting dropped by 80 percent, from 283,000 acres annually to 57,000 acres; and the area in which

any kind of harvesting occurred declined by 44 percent, from 838,000 acres to 473,000 acres. Equally revealing is the shift in the kinds of trees that are being harvested. Between 1990 and 1996, the harvest of saw-log size trees declined from 77 to 56 percent while the harvest of dead and dying timber increased from 26 to 47 percent.

Today, 42.8 million acres—23 percent of the 191 million-acre National Forest System—is statutorily set aside in no-harvest areas. These include the National Wilderness Preservation System, 34.6 million acres; National Monuments, 3.4 million acres; National Recreation Areas, 2.7 million acres; National Game Refuges



**Harvest decline**—Since 1993, National Forest commodity harvesting—harvesting in response to consumer demand—has declined from 71 to 52 percent of total harvest volume. Meanwhile, “stewardship harvesting”—harvesting to improve forest health, create wildlife habitat or reduce the risk of catastrophic fire—has increased from 24 to 40 percent of total harvest. (*Changing Economics of National Forest Timber Sale Program*, USFS, 1999)

**In the Interior West, more than twice as much timber dies annually than is harvested: 2.0 billion board feet died in 1997 and 744 million board feet were harvested. This is the forest health problem expressed in numbers—and what they reveal is that western National Forests are no longer able to function naturally.**



and Wildlife Preserves, 1.2 million acres; Wild and Scenic Rivers and Scenic and Primitive areas, .9 million acres.

Where harvesting is still permitted, the shift toward selective removal of dead and dying trees underscores both a recognition of changing public values and a steady ecological decline in the West's National Forests. In the Interior West, more than twice as much timber dies annually than is harvested: 2.0 billion board feet died in 1997 and 744 million board feet were harvested. This is the "forest health problem" expressed in numbers—and what the numbers reveal is that wide areas within the western National Forest System are no longer able to function naturally—meaning the presence of natural agents such as insects and diseases often lead to catastrophic consequences, usually fire. But because restoring forest health is often linked to a need to thin dense stands, many environmentalists view it as little more than an excuse to harvest timber. Skepticism notwithstanding, the increasing frequency of increasingly destructive forest fires suggests many of the West's National Forests are unhealthy.

Big fires tell only the most visible part of the forest health story. Less visible but ultimately more dangerous is the startling increase in the number of small trees. The volume of trees less than 17 inches in diameter has increased 52 percent since 1952—in part because replanted forests were rarely thinned before they became commercially viable. Moreover, the public's aversion to fire made controlled burning politically undesirable, even in fire-dependent ecosystems where it would have helped control insects, diseases and stand density.

System-wide, National Forest net annual growth (gross tree growth minus mortality) has been increasing steadily since the 1950s and is nearing 16 billion board feet per year. Meanwhile, annual harvest hovers between three and four billion feet, meaning that growth exceeds harvest by about 400 percent. Most forest scientists agree that such outsized net growth is not sustainable. The Forest Service estimates that between 39 and 43 million National Forest acres could benefit from a long-term thinning program designed to reduce the risk of catastrophic fire, but if Congress approves the proposed harvest ban such thinning would be illegal.



**Ponderosa pine**—Transplanted seedlings at Savenac Nursery near Haugan, Montana, August 1941.



**The next forest**—A tree planting crew at work in the aftermath of the Sleeping Child Fire on the Bitterroot National Forest, June 1964.

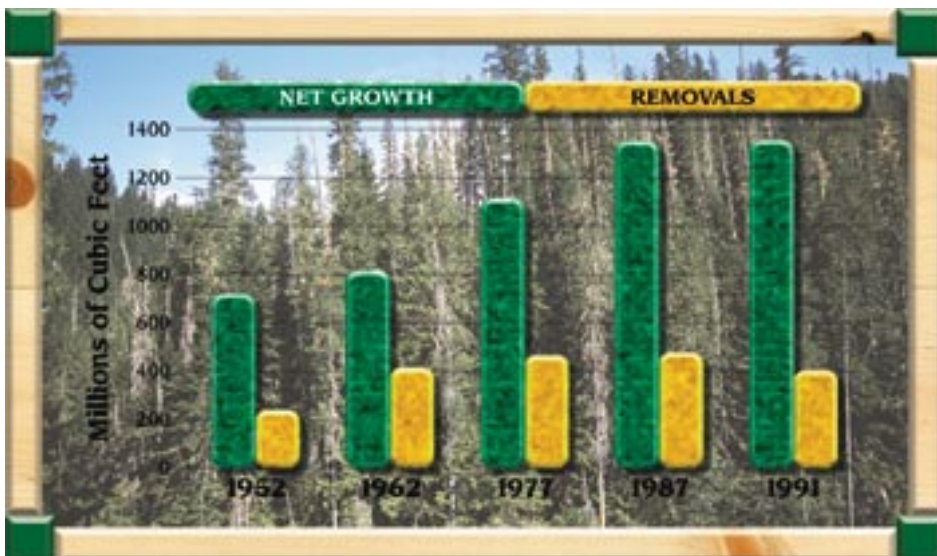


**Salvage logging**—A truck loaded with dead spruce (killed by spruce bark beetles) climbs out of Clarence Creek on the Kootenai National Forest, October 1952..



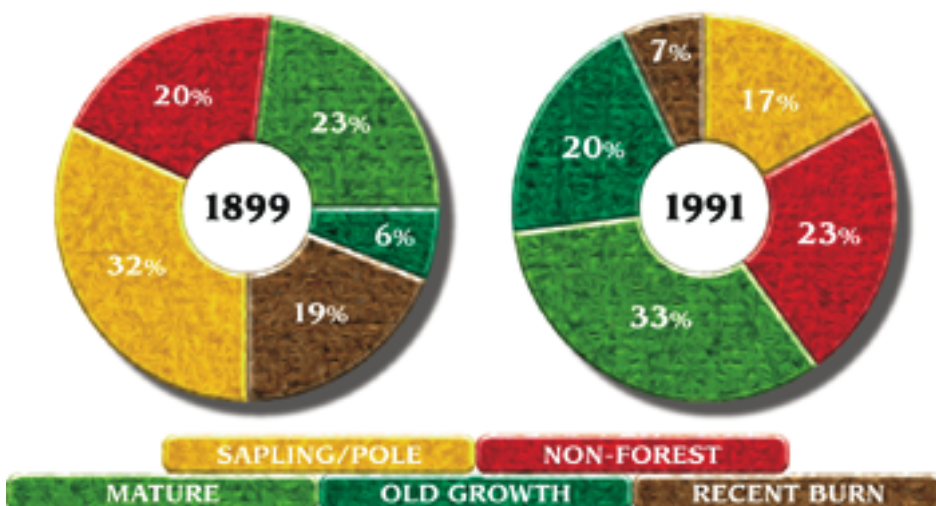


**National Forest System Growth and Removals: 1952-1991**—Since the early 1950s, net annual forest growth in National Forests has exceeded harvesting by a wide margin. Meanwhile, average forest biomass per acre has increased steadily—in 1994 by 2.8 billion cubic feet, almost 3 times harvest volume. Shown here, a second growth Douglas-fir stand on Oregon's Umpqua National Forest. (USFS cut and sold reports)



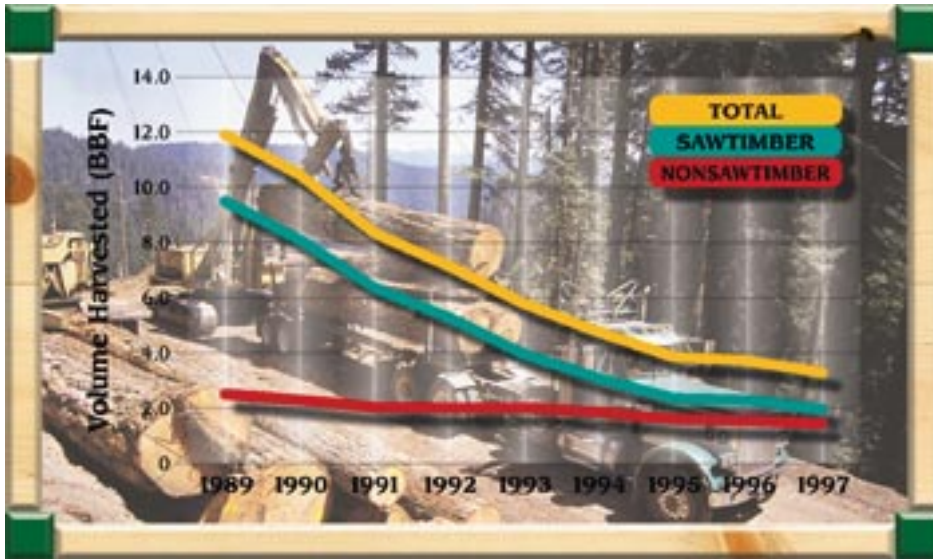
**National Forest Net Growth and Removals, Interior West: 1952-1991**—Green biomass accumulations are greatest in Intermountain National Forests, a result of the exclusion of fire from fire-dependent ecosystems. Since 1952, the volume of trees less than 17 inches in diameter has increased 52 percent. Today, such trees account for two-thirds of total stand volume in the Interior West. As biomass increases, so too do the risks posed by insects, diseases and wildfires. Shown here, dense—and dying—stand on Idaho's Nez Perce National Forest. (Forest Resources of the U.S., USFS, 1992)

### Forest Structures - 1899 & 1991

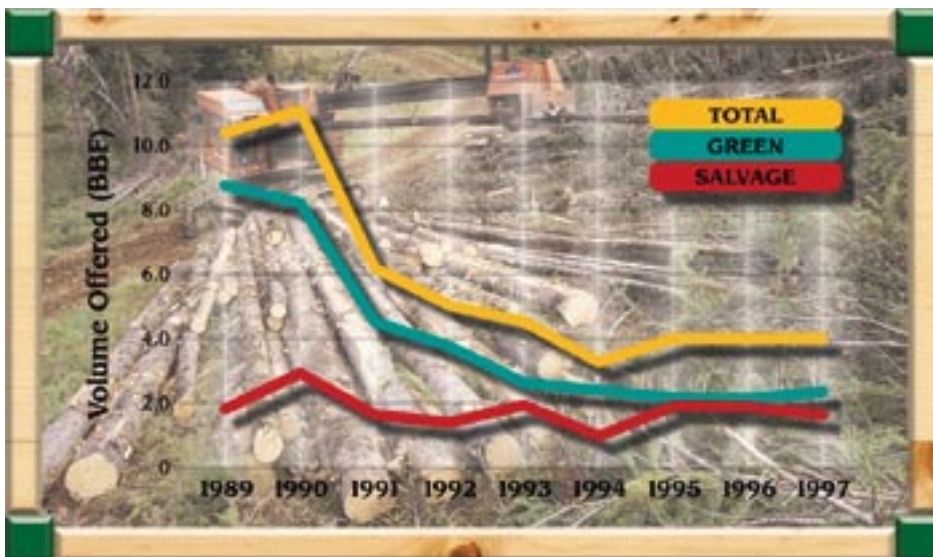


**Trends in Forest Structure, Flathead National Forest: 1899-1991**—The absence of fire is not just causing forests to become more dense; many forests are also older on average than they would have been had fire been more prevalent in this century. In 1899, 18 percent of western Montana's Flathead National Forest was mature and 6 percent was old growth; but by 1990, 33 percent of the forest was mature and 20 percent had achieved old growth status. Just how long this publicly desired condition can be retained in the face of increasing disease and fire is an unanswerable question. (USFS, Flathead National Forest)

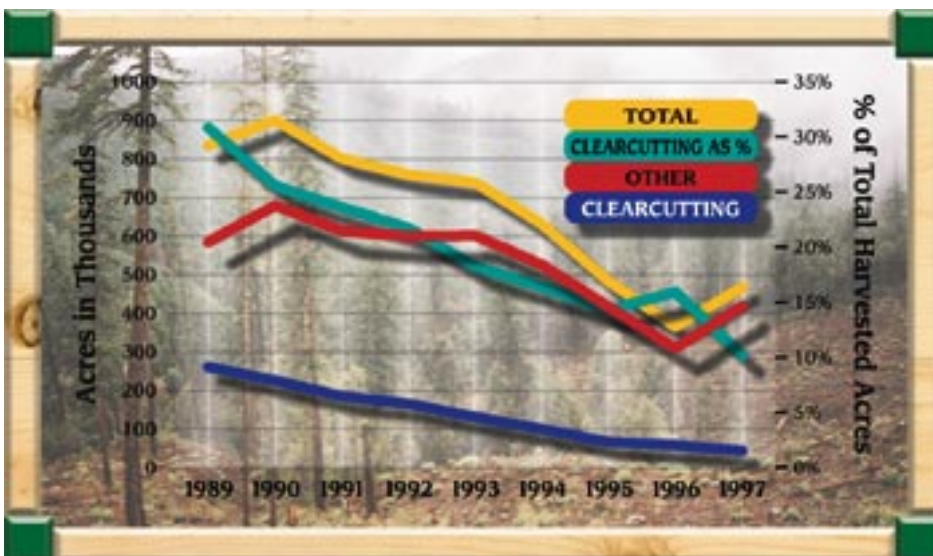




**Trends in National Forest Harvesting:**  
Sawtimber versus Non-Sawtimber—Since 1989, the volume of “sawtimber”—softwood trees at least 9 inches in diameter breast high—has declined from about 12 billion board feet annually to less than 4 billion board feet. Meanwhile, non-sawtimber volume—trees less than 9 inches in diameter—has increased from 20 to 40 percent of total annual harvest. Shown here, big logs moving off Oregon’s Rogue River National Forest in 1990. (USFS)



**Trends in National Forest Harvesting:**  
**Green versus Salvage Volume—**Historically, most of the trees harvested from National Forests were live or “green,” but now “salvage” harvesting—the removal of diseased, dying or dead trees that pose a fire hazard—accounts for 40 percent of National Forest harvesting. The shift from “green” to “salvage” volume is consistent with the shift from “commodity” harvesting to “forest stewardship” management practices designed to improve habitat, reduce the risk of fire or conserve biological diversity. Shown here, delimber works on small logs harvested from a 1996 thinning in Montana’s Lolo National Forest in 1996. (USFS)



**Trends in National Forest Harvesting:**  
the Decline in Clearcutting—Since 1989, the number of National Forest acres harvested annually has declined by 55 percent and, since 1992, the acres that are clearcut annually has declined 72 percent. Today, less than one percent of all National Forest acres classified suitable for harvesting are harvested annually. Shown here, a mid-1980s clearcut on Oregon’s Siskiyou National Forest. (USFS)





Jim Petersen

**Standing fire-killed timber** – In California's Tahoe National Forest near Lake Tahoe mute testimony to disease and fire.



**Tom Bonnicksen**, Ph.D., founding member, International Society of Ecological Restoration, Professor of Forestry, Texas A&M, unpublished *Evergreen* interview:

“The proposed harvest ban—however well intended—chases an unachievable ideal. It says that if we leave forests alone, the result will be a more natural landscape. But reality presents a much different picture. Our forests are byproducts of 12,000 years of dominance by Native Americans, mainly through their use of fire. Removing human influences—by imposing a harvest ban in National Forests—would have horrendous impacts on native forests and species. Many early and mid-succession plant and animal communities would be lost, creating very *unnatural* landscapes, a significant decline in biological diversity and a significant increase in the size of wildfires, resulting in further losses to native forests.”

# Restoring the West's National Forests: Part 1

Since its inception in the aftermath of the Great 1910 Fire, the nation's forest fire-fighting policy has been closely tied to a conservation ethic of near biblical proportion: waste not, want not. Among the articles of faith: prevent forest fires, salvage dead timber and promptly replant lost or harvested forests. The economic and environmental payoffs have been huge,

but nowhere are the benefits more in evidence than in northwest Oregon. The Tillamook forest, scene of four horrific fires between 1933 and 1951, is today valued at more than \$2 billion—166 times the state's \$12 million investment in salvage and reforestation. Thirteen billion board feet of timber were salvaged and 73 million

seedlings were planted.

The benefits of prompt salvage and reforestation can be seen all over the Pacific Northwest. In northern Idaho, a new forest has risen from the ashes of the 1967 Sundance Fire, which destroyed more than 200,000 acres of old-growth cedar and hemlock. It is the same in southwest Washington, where 68,000 Weyerhaeuser acres



Jim Paterson

**Barely visible thinning**—A half-mile across this canyon, dead center in this photograph, lies the Sugarloaf Timber Sale. It took a Supreme Court ruling to bring an end to years of protests, death threats, timber sale appeals and litigation. The sale—on southern Oregon's Siskiyou National Forest—was finally harvested in September 1995. The purpose of the barely visible thinning was to maintain old growth forest conditions for northern spotted owls that nest in the area. A diseased white fir understory was removed, creating additional growing space for old growth Douglas-fir.



were flattened by the 1980 eruption of Mount St. Helens. And west of the Cascades in both Oregon and Washington it is hard to find evidence of the 1962 Columbus Day Storm, despite the fact that hurricane-force winds leveled 30 million acres of timberland *in just five hours*. More than 70 percent of the 17 billion board foot blow-down was salvaged over five years.

Caring for forests is not as simple as it once was. Gone are the days when big fires were followed by big salvage logging and replanting operations—often begun before the smoke cleared. Gone too is the Forest Service's belief that if it simply took care of the trees—growing, harvesting, replanting and increasing per acre growth yields—the rest of the forest would follow along. Now the agency is turning its attention to a far more perplexing problem: how to conserve the natural processes that power life, death and rebirth in forests. The sum total of these processes is thought to add up to something called “biological diversity,” a two-word term for which there are at least 85 different definitions, all of them conceptual, none of them quantifiable. Despite an agreed-upon definition or a means of measurement, a new kind of forestry is emerging. Some call it ecosystem management, while others call it *sustainable forestry*. Either way, the objective is the same: *conserve the natural processes that make forests diverse*.

But long before the term “ecosystem management” was in vogue, the Forest Service was conducting field experiments in overstocked ponderosa pine forests, trying to figure out what combinations of thinning and prescribed fire worked best. Examples of this work can be found all over the West, but two



Jim Petersen

**Promoting diversity**—This photograph, taken in southern Oregon's Siskiyou National Forest, illustrates the use of shelterwood harvesting—a thinning technique that mimics small-scale natural disturbances—to promote plant species diversity. Plant species present in this photograph include Douglas-fir, incense cedar, sugar pine, knob cone pine, grand fir, madrone, chinkapin, canyon live oak and maple. Residual trees—the natural seed source for the next forest—will grow larger and older in the spaces created by this recent thinning. Biological diversity is often associated with the aging process, but there is no direct connection between the age of a forest and the amount of diversity present. In fact, some scientists think there may be as much diversity in very young forests as there is in old ones.

of the more notable ongoing experiments are the Boise Basin Experimental Forest in southwest Idaho and Lick Creek in western Montana's Bitterroot Valley. After years of periodic thinning and careful use of fire, both forests are beginning to look like the great ponderosa pine stands described by early day explorers, naturalists and westbound pioneers.

Such field experiments are of enormous value, not just because they show what is possible, but also because fire behaves differently in different types of forests, so forest restoration tech-

niques must vary accordingly. For example, in warm, dry ecosystems, which make up about half the forest area in the Interior West, fires were frequent, but of low intensity. While favoring ponderosa pine—a thick-barked species that thrives in full sunlight—such fires also limited the spread of thin-barked white fir, a prolific species that grows easily in its own shadow. But after fire was excluded, stand density began to increase and pine began to die out, leaving the fir to compete with itself. After decades, the result is plainly visible. The carcasses of dead trees litter insect and disease-ridden forests. They are destined to burn repeatedly, until there is nothing left to burn.

In cooler, higher elevation ecosystems, which are generally wetter, past wildfires were less frequent but more intense. (It was not uncommon for entire forests to be destroyed). But in the absence of fire, these forests are living longer. Montana's Flathead National Forest is a case in point: eighteen percent of the Flathead was mature in 1899 and another six percent was old, but today 33 percent of the forest is mature and 20 percent is classified as old growth.

As these forests have aged, insect and disease infestations have become more widespread. The result: larger, more intense stand replacing fires, not just in Montana or Idaho but also along the West Coast.

Few—if any—restoration projects have drawn more strident protests than a 1995 thinning in southern Oregon's Siskiyou National Forest. Amid death threats and an Earth First demonstration, the Supreme Court allowed loggers to remove diseased timber surrounding an old growth fir stand the Forest Service wanted to protect. The thinning,



which is not visible from a facing viewpoint less than a mile away, is expected to extend the life of the residual stand by many years, providing critical habitat for northern spotted owls that nest in the area.

Despite 30 years of successful field testing, and some visibly pleasing results, “Zero Cut” proponents still insist the best way to save National Forests is leave them alone and let nature do the healing. But because forests would presumably be allowed to burn down before naturally reseeding occurred, the healing process could take 200 years—perhaps longer—with no clear picture as to what the next forest might look like. Meanwhile, westerners would be forced to endure long years of smoke-filled skies, impacting both human health and tourist industries that depend on clear, sunny skies.

Among the West’s new environmentalists a more hopeful and more certain strategy is emerging. Rather than allow catastrophic fire to clear the way for the next forest, a variety of thinning techniques would be used to reduce the density of diseased and dying forests to naturally sustainable levels. Once density is reduced, controlled fire could be reintroduced to mimic the ecological effects of low-intensity burns that frequented these forests before white settlement began. Among the benefits such a strategy would have over catastrophic fire: far less loss of wildlife habitat, no loss of aesthetic or recreational values, minimal smoke, increasing diversity in plant and animal species, and no 200-year wait for the next forest.

As the thinnings are envisioned, most trees 100 or more years old would be left to grow larger while serving as a natural seed source for the next forest. There is some disagreement over just how many trees can be removed at a time without adversely impacting wildlife, and there is also some discussion about what to do with large trees that are infected with contagious diseases. Some argue they should be left to become snags, which provide habitat for birds and small mammals, while others say they should be removed before they infect healthy trees. Either choice seems infinitely better than simply allowing entire forests to burn up in increasingly ferocious fires.



Jim Petersen



Jim Petersen

**Two views of the same forest**—The stand on the left has not been thinned but the stand on the right has. These stands lie directly across the road from one another in northwest Montana’s Flathead National Forest. There are no shrubs or small trees growing inside the dense stand on the left because no sunlight reaches the forest floor. Now look at all the grasses and shrubs growing in sunlight on the right. Reducing stand density increases plant diversity while reducing the risk of fire and disease.



Jim Petersen



Jim Petersen

**The power of restoration**—These two Idaho photographs taken a mile apart illustrate the power of forest restoration. On the left, a long ago abandoned mining claim, and, on the right, the adjacent Boise Basin Experimental Forest. The old mining claim is diseased and dying. “Ladder fuel”—broken limbs that reach the ground—provide fire with a fast route to treetops. Now look at the restored stand on the right: no ladder fuel, ample grasses, shrubs and saplings, and abundant growing space for a fine residual ponderosa pine stand.



# Lessons in Nature

**T**he difference between “Zero Cut” and “Forest Restoration” is perhaps best illustrated in terms of nature’s three most intractable lessons: It is not possible to save or preserve a forest. The only constant in nature is change.

Nature is indifferent to human need. Some trees live a long time, but eventually they all die. Sometimes they die enmasse—as they do in big blowups—and sometimes they die one at a time leaving only the space in which they stood. No matter the manner of death, new trees eventually take their places.

By one estimate, the West’s forests have come and gone 16 times since the last Ice Age ended some 10,000 years ago.

Photographs of trees that are older than America would seem to deny this truth, but the fact is forests live in turmoil. No two days are the same. No two minutes are the same: a leaf falls, a bud sprouts, a seed germinates and an old tree falls to earth. The rhythms of life and death play on.

The fact that big fires are once again big features on the western landscape demonstrates nature’s indifference. Old-time fire bosses used to brag about “running smoke out of the woods.” But today’s fire bosses say the old timers went overboard in their efforts to “exclude fire.” They look forward to a time when fire can “more nearly play its

natural role.” What they are acknowledging in the language of fire fighters is the very positive role fire once played in western ecosystems.

In recent years, nature’s three lessons have converged on a fourth lesson: To get the things we want and need from forests we must first learn how to mimic natural disturbance patterns that have been powering forests since the last Ice Age ended. In western forests, the most common disturbances are fire, wind, insects and disease. Of these the most significant has been fire, though the three forces often work in concert.

**Nature is indifferent to human need**—Few events in this century have more dramatically demonstrated nature’s indifference than the May 1980 eruption of Mount St. Helens. The blast leveled 150,000 acres of forestland, including about 80,000 acres in the Gifford Pinchot National Forest. Among the dead: 57 people, 5,000 black-tail deer, 1,500 Roosevelt elk, 200 black bear and countless millions of small mammals, birds, salmon and steelhead. Here, a Weyerhaeuser forester surveys the damage on company lands about 10 miles north of the mountain.

Jim Petersen







**Big trouble**—This ponderosa pine forest in eastern Oregon's Wallowa-Whitman National Forest may look healthy, but it is big trouble. The white fir understory is diseased and is slowly killing a fine stand of mature ponderosa pine. Unless the fir is removed, the pine will eventually die. White fir should not be growing here in such abundance, but it is because of the long absence of wildfire. Reintroducing fire to such forests is very risky without first removing some of the dead and dying timber.



**Meadow restoration**—This dying pine stand was once a New Mexico meadow, and the Forest Service is trying to turn it into a meadow again. Loggers felled the dead trees lying on the ground. Several more thinnings are needed in years to come before the meadow is restored. Finding commercial markets for wood removed from such thinnings has proven to be a daunting task. The Forest Service even tried giving this wood to firewood gatherers but there were no takers.



**Ample growing space**—a coalition of environmental groups was involved with the Forest Service in this pilot thinning on northern Arizona's Coconino National Forest. Stand density was reduced from 400 to 70 trees per acre, providing ample growing space for residual pine and a seedling crop that will begin to grow in a few years. Environmentalists who distrust harvesting have challenged such projects on the grounds that thinning so many trees disrupts squirrels—a staple in the diet of threatened goshawks. Some opponents say they would accept thinning if fewer trees were removed, but fire ecologists warn that the risk of catastrophic fire would remain high in forests where too few trees are removed.



# Restoring the West's National Forests: Part 2

In northern Arizona, along the north and south rims of the Grand Canyon, the National Park Service is considering the unthinkable: logging in a National Park. Federal law prohibits logging in National Parks, but the risk of catastrophic fire has become so desperate the Park Service wants to do it anyway—and in its decision it has the support of Interior Secretary Bruce Babbitt, perhaps the nation's most influential environmentalist.

"This experiment (in cutting trees) is an attempt to learn how to return the

forests to their natural, healthy state and eliminate the danger of catastrophic fire," Secretary Babbitt said in a recent interview with *Arizona Republic* writer, Steve Yozwiak.

"This is a science experiment," explains Grand Canyon Park Superintendent, Rob Arnberger. "It is not an effort by the National Park Service to start logging practices in national parks."

Maybe not, but the fact the Park Service would even consider logging underscores the seriousness of the forest

health problem along the Grand Canyon rim. The plan has shocked "Zero Cut" proponents, who fear the Grand Canyon decision will set a precedent for logging in other parks, and might well undermine their campaign to ban harvesting in National Forests. If conducted, the \$900,000 Grand Canyon test will involve mechanical thinning on an 80-acre tract. So dense is the stand to be thinned that the Park Service estimates 16,000 trees will have to be removed. "We want to do everything we can to save the oldest trees," explains Park Service

**There must be a better way to manage the West's National Forests than this.**





scientist Bob Winfree. Mortality in the oldest trees is on the rise, both inside the Park and in the neighboring Kaibab and Coconino National Forests. Weakened by disease and related stress, they are losing out to fir in the battle for soil nutrients and moisture.

Apart from ecological calamity, milling capacity—or the lack of it—is the most vexing problem facing Southwest environmentalists who favor forest restoration. Many of the region's largest companies went out of business when the National Forest timber sale program collapsed. In the entire four-state region—Arizona, New Mexico, Utah and Colorado—only three of 34 surviving sawmills possess the technology needed to process small logs in volume. The rest are very small and many still use circle saws, a technology unsuitable for small log milling. In the course of this investigation, not a single mill in the four-state region expressed interest in investing in small log technology.

“A new small log mill would cost us at least \$10 million,” one mill manager estimated. “We would not make such an investment without a legally binding 20-year timber contract. Besides, we already buy enough timber from state and private landowners to run profitably.”

Unless small log markets can be found, forest restoration cannot pay for itself without taxpayer subsidy. Environmentalists and fiscal conservatives have both been ardent critics of so-called “below cost” timber sales. One environmental group, the Grand Canyon Trust, is actively searching for markets for small logs removed from a pilot thinning project in the Coconino National Forest near Flagstaff. “If we are going to get (the trees) out of the woods, we’ve got to find a way to use (the lumber). Otherwise, you just can’t come up with enough money to pay people to pull it out,” Trust Program Director Brad Ack told the *Arizona Republic*. The Trust is one of 18 groups involved in the Grand Canyon Forest Partnership, a public-private pilot project that hopes to fire proof at risk forests on the perimeter of Flagstaff. Apart from reducing the looming risk of a firestorm that could easily sweep through downtown Flagstaff, the group hopes to protect the San Francisco Peaks, a spectacular range that rises above the community.

“The peaks are the signature of Flagstaff,” Mr. Ack told the *Republic*. And if that was all just one big blackened place, this town’s economy would really suffer.”



Jim Petersen

**Small logs like these**—harvested from a pilot thinning project on northern Arizona’s Coconino National Forest—could fuel a new highly automated forest products industry in the Southwest, so why aren’t any of the West’s major companies interested in investing? Answer: political instability. The West’s new environmentalists see removing trees like these as key to reducing the risk of catastrophic fire in overly

The Trust’s search for markets is not going well. Log prices plummeted when Asia’s economy collapsed, so even distant mills capable of milling small logs aren’t buying right now. Worse yet, Stone Container recently converted its Arizona’s pulp mill to recycled fiber operation, so no market remains for the smallest and poorest quality wood. Rumors persist that another firm may construct a

pulp mill in the area, but none of the West’s largest companies will confirm such a plan.

“Until there is strong, broad-based community support, we would not be interested,” reported a spokesman for an Idaho concern that has pioneered several leading edge technologies that utilize small logs. The political process has some distance to go before it catches up





dense and often diseased forests. But the region's few remaining sawmills say they won't risk the millions required to install new small log milling technology until Congress corrals radical environmental litigants. (There are only three small-log mills in the four-state region.) Minus major investments in small log technology, restoration forestry will remain a distant dream in the Southwest.

with technology.”

Indeed, few outside scientific circles seem aware that the forest monitoring technologies needed to proceed with forest restoration are already being used by most of the West's major private forest landowners. Among the latest advancements: computer simulation models that allow scientists and foresters to test hundreds of different thinning,

reforestation and restoration techniques—or combinations of techniques—to see which ones best resemble historic patterns of natural disturbance. “What if we do this?” Questions that 20 years ago could only have been answered with a chainsaw can now be answered using desktop computers.

The milling technology needed in the Southwest is also in use else-

where in the West. Several companies operating in Idaho, Montana, Oregon, Washington and California could handle most of the small logs organizations like the Grand Canyon Trust are trying to market. But transportation costs are prohibitive, and, until the political climate improves, it is unlikely any of these technologically advanced companies would consider investments in the Southwest. Moreover, of the West's remaining sawmills most have—of necessity—significantly reduced their dependence on federal timber. Few now obtain more than 25 percent of their logs from federal sources. Since 1990, many that for generations bought only federal timber have purchased timberland and hired forestry staffs. All look to the day when they will not need to buy any federal timber.

“It takes millions of dollars in investment capital to be competitive in this business today,” one mill owner told us. “Lending institutions want to know that your wood sources are reliable. We still hope to buy a little federal timber now and then to keep our sources of supply in balance, but I don't know anyone in this business who still counts on the federal government to sell timber.”

Meanwhile, old timers in the Forest Service, those who know first-hand what big fires can do, privately await “a teaching event”—code for the million-acre fire they believe to be inevitable. When it comes, CNN will provide viewers with a ringside seat for “The Big Show.” Smoke will fill western skies, borate bombers will swoop down mountain ridges, yellow-jacketed firefighters will take their places on fire lines, homes will be evacuated and millions of taxpayer dollars will again pour into rural staging areas that will be glad for the business. Hundreds of thousands of acres of wildlife habitat will be incinerated in firestorms, 400-year-old ponderosas will explode like roman candles, creeks will run black with ash and mud, fish will suffocate, birds will be fried alive and terrified deer will race by—on fire. And someone on the fire line will likely go home in a body bag. “Zero Cut” in real time. There must be a better way to manage the West's National Forests than this.



# Toward A Global Environmental Ethic

If we stop managing National Forests, they will decline and die, just as they've done at least 16 times since the last Ice Age. As they move toward death, they consume less carbon dioxide, which means atmospheric carbon dioxide levels rise, which means more air pollution and maybe global warming.

I'm fairly certain society has no interest in sitting around while this happens, so we must ask ourselves, "What's the alternative?" The one-word answer is "Management." Management—periodic harvesting followed by long periods of re-growth and renewal—provides humankind with the

only known tool for arresting inevitable decline in forests. What's more, by using the wood we harvest, rather than fossil-fuel intensive substitutes like steel and concrete, we store carbon indefinitely thereby preventing its return to the atmosphere. These are global environmental considerations meriting serious discussion before lawmakers vote to ban harvesting in National Forests.

**Benjamin Stout**, Ph.D., retired dean, School of Forestry, University of Montana, Missoula, unpublished *Evergreen* interview, October 1998

**I**n the course of researching this report, we worked closely with several scientists whose contributions to conservation we admire—Jack Ward Thomas, Steve Arno, Chad Oliver, Tom Bonnicksen, Ben Stout, Lauren Fins and Jim Bowyer.

Although their disciplines vary widely, each stressed the need for the nation to embrace a more global environmental ethic.

Dr. Bowyer, a University of Minnesota Professor of Forestry, first broached the subject in a 1993 *Evergreen* interview. "Most of the raw materials consumed in the U.S. come from impoverished Third World countries that lack the money, technology and political will needed to regulate their own extractive industries," he said. "A nation that consumes more than it produces is in effect exporting its environmental impacts to other nations that provide what is consumed. It is like shipping your garbage to a town that needs the money and is willing to put up with the stench."

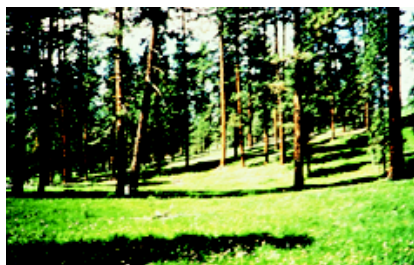
For an everyday perspective on what Dr. Bowyer is talking about, visit a supermarket, shopping mall or home building center. In the entire history of civilization, no nation has ever been better fed, better

clothed or more comfortably housed. Living in such abundance, we seem to have lost the ability to think critically about *the sources* of our myriad comforts and conveniences. We oppose logging, but insist on living in bigger houses. We oppose oil drilling, but prefer the safety of big, gas-guzzling vehicles. We oppose mining, but can't imagine a world without computers which run on circuits of gold, copper and platinum. We oppose the use of fertilizers and pesticides, but demand a safe and abundant food supply.

Even worse, we seem unaware of the global environmental consequences of our own political actions. The government's 1996 decision

to reduce National Forest harvest levels in Oregon and Washington by 43 million cubic meters was seen as good news in most quarters.

What went unreported was that the demand-driven shift to nonrenewable wood substitutes (mainly steel and concrete) boosted oil consumption by 12.9 billion liters *in that year alone*—enough oil to power six million cars for an entire year. *Nothing* adds carbon dioxide to the Earth's atmosphere faster than burning coal or oil. "In the emerging global economy,"



Jim Petersen

The future meets the past in this Boise Cascade forest in southwest Idaho.



USFS

Dr. Bowyer advised, "nations should be increasing, not decreasing, their dependence on wood fiber because wood is renewable, recyclable, biodegradable and far more energy efficient in its manufacture and use than are products made from steel, aluminum, plastic or concrete. Furthermore, growing forests and the lumber they provide store large amounts of carbon dioxide that would otherwise escape into the atmosphere, adding to the potential for global warming."

It would be nice if such a global perspective became part of a more scholarly discussion about what to do about the West's ailing National Forests. We aren't suggesting that these forests become wood





**A firestorm** in Idaho's Boise National Forest. Compare this to the small photograph nearby taken on Boise Cascade timberland in the same area. The difference: a 25 year-long thinning program.

factories, but there ought to be some consideration of the global impacts associated with allowing the West's National Forests to burn to the ground as a first step in their centuries long natural recovery. How much will air quality suffer in the meantime? Who will answer for the sharp rise in pulmonary disease? Where will western communities get their municipal water after forest watersheds burn? And what about lost fish and wildlife habitat? Can western states clamoring to diversify their resource-based economies expect that technology and tourist-based businesses will want relocate to communities engulfed in smoke all summer? Will courts hold taxpayers liable for fires that spread from

untended federal lands to neighboring privately owned forests? And as more and more timberland is set aside in no-harvest reserves will builders switch from renewable wood to nonrenewable steel, fashioning the nation's homes from junk cars as the steel industry urges?

We hope journalists will demand that "Zero Cut" proponents answer these questions. And if they answer, the follow-up question should be "Where is the peer-reviewed science that supports your position?" Peer reviews are important for two reasons. First, science is not perfect. The credibility of a particular study often rests on the scrutiny of qualified third-party scientists whose work is consistently accurate and

reliable. There is no better defense against junk science. Second, we know a few scientists out there now who make their living traveling between press conferences and courtrooms saying whatever their clients want them to say. Journalists thus need to make the distinction between peer-reviewed science and public relations stunts staged by special interest groups.

We also hope the press will contact Ted Turner for his views on forest restoration. Though he frequently contributes money to environmental groups, Mr. Turner has approved an impressive multi-year thinning project at Vermejo, his New Mexico ranch. A local sawmill is buying the logs, and neighboring landowners are said to be so pleased by what they see that they want to join in next year. Why can't similar programs be implemented in western National Forests? Even if diseased trees aren't sold (many environmentalists think no one should be permitted to profit from the sale of publicly owned natural resources) the timber must still be removed from forests, presumably at taxpayer expense. Otherwise it remains a fire hazard, undermining any hope for forest recovery.

Finally, we hope the national press will seek out the West's new environmentalists. Their desire to link science and technology with so many public interests embodies a far more certain and more hopeful outcome than anything we discern from the worn out rhetoric established environmental groups are still dispensing daily. Saving forests by first allowing them to burn to the ground—all the while enduring long years under smoke-filled skies—makes absolutely no sense. The nation does not need to wait 200 years for the next forest to appear in the West. It is already in the ground and growing, but it needs some help. Restoration forestry is the answer.

The past as prologue: Sixty years ago, the government paid loggers to remove rocks and logjams from Oregon stream channels. Back then, biologists believed such obstructions impeded fish passage. Now biologists and loggers are again working side by side—only this time they are putting rocks and logs back into stream channels, where they provide hiding cover and spawning habitat for fish. A similar irony will soon unfold in western National Forests. Faced with unstoppable wildfires, the government will hire loggers to do the thinning and pruning work necessary to create and protect publicly desired old growth forests. The public will side with the West's new environmentalists and the old environmental movement will simply fade away.



**Worth protecting**—Ponderosa pine monarchs like these in northern Arizona's Coconino National Forest are the focal point of a forest protection program being advanced by the West's new environmentalists. By thinning overly dense stands that crowd these trees, environmentalists hope to protect them from wildfire, insects and disease. Ponderosa pine thrives in full sunlight but cannot adequately regenerate itself in overly dense forests that dominate much of the Intermountain West and Southwest. Sadly, countless thousands of these Southwest giants have already succumbed to insects and disease. More will die if a large-scale thinning program is not implemented soon, but numerous political and legal barriers remain.



Jim Petersen

*Evergreen* Magazine is published quarterly by The Evergreen Foundation, a national non-profit forestry research and education organization dedicated to the advancement of science-based forestry and forest policy.

In their research, the editors work closely with forest ecologists, silviculturists, soils scientists, botanists, hydrologists, fish and wildlife biologists, archeologists, anthropologists, historians, economists, forest landowners and state and federal agencies responsible for protecting the nation's forest resources.

To ensure accuracy, all *Evergreen* articles undergo a two-stage pre-publication review. In Stage 1, interviewees are

required to review draft manuscripts for errors in fact or interpretation. In Stage 2, scientists who are familiar with the subject matter review manuscripts for accuracy and completeness. While not a peer review, this process makes for strong, fact-based presentations on which the Foundation stakes its reputation.

All statistical information that appears in *Evergreen* comes from federally maintained forest databases that have been in place since the early 1950s. Industry data is used periodically, but only when it can be independently verified.

The Foundation operates under IRS 501(c)(3) regulations that govern the

conduct of tax-exempt organizations created for charitable, educational, religious or scientific purposes. Funding comes from members and other non-profit organizations that share the Foundation's commitment to advancing public understanding of science-based forestry and forest policy. Support for this special issue of *Evergreen* was provided by Boise Cascade Corporation, Potlatch Corporation, Intermountain Forest Industries Association and its member companies and their suppliers, the American Pulpwood Association, the Northwest Forest Resources Council, the LeMatta Foundation and the Evergreen Foundation.

**EVERGREEN**  
M A G A Z I N E

5000 Cirrus Dr., Suite 201  
Medford, OR 97504

Bus: 541-773-2247 • Fax: 541-773-2882

Non-profit  
Organization  
U.S. Postage  
**PAID**  
Permit No. 348  
Medford, OR