

SPECIAL DOUBLE ISSUE

EVERGREEN

M A G A Z I N E

Winter 1994 -1995



The West Is Burning Up!

*Should we stop these fires
or should we let nature take its course?*



The Evergreen Foundation exists for only two reasons: *To help restore public confidence in forestry and to help advance public understanding and support for scientifically based forest policies and practices.*

To these ends, we publish *Evergreen*, a bi-monthly journal designed to keep foundation members and others abreast of issues and events impacting forestry, forest communities and the forest products industry. At 100,000 circulation, *Evergreen* is the most widely read forestry publication in North America.

In our research and publishing activities, we work closely with forest scientists, wildlife biologists, historians, economists, policy analysts, representatives of business and industry, elected officials, and state and federal agencies responsible for protecting the nation's public and privately owned forest resources.

The foundation was incorporated in Oregon in 1989 under Internal Revenue Service 501(C)(3) guidelines, which govern the conduct of non-profit, tax-exempt, charitable organizations.

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Night scenes like this one are becoming all too common in western forests. In this issue, we explore the reasons why our beautiful forests are going up in flames. Can anything be done to save these forests from a fiery end? Yes, but what scientists are suggesting is already stirring controversy. Ultimately, the public will have to choose between fires like this and smaller, controlled fires that can help restore the health and beauty of the western forests.

This is the largest and most important issue of *Evergreen* we have ever published. The subject is death in western forests.

Death is one of nature's two unbroken rhythms. The other is life. Together, they make up a two-count rhythm – some might say a symphony – that has been echoing across mountaintops and down canyon walls for so long now that the first western forests have turned to stone and are scattered across high windswept deserts.

Nature's rhythms have always been chaotic. Sometimes they are quiet and peaceful, like a Brahms lullaby. At other times, they are loud and raucous, like the Boston Pops' version of the *1812 Overture*, complete with canons and fireworks. You never know which tune nature will play next, but it is almost always entertaining. *Almost always.*

In some places in western forests, the music is dying, and the rhythms we are hearing no longer sound like natural rhythms. They are not natural, and that is both the problem and the subject of this issue of *Evergreen*.

In the world of sound bites and power lunches what is happening in western forests is called the "forest health" problem. As we say elsewhere in this issue, the causes and possible cures would be more easily understood by the public if it were called the "forest sickness" problem, but then nothing about what is happening in forests is ever as easily explained as it should be.

Across the West, millions of acres of once-green forest now stand dead, or are soon to die. The immediate cause of this calamity is drought, but the root causes go much deeper. No amount of sunlight or rainfall or snowpack will bring these forests back to life. But the power and creative genius of the human spirit can. In this issue, we write about unleashing this power.

It will probably take you longer than usual to read this issue of *Evergreen*, but to make the job easier we have broken life and death into eighteen separate stories written by fourteen different authors. Some are – in the words of the late Norman Maclean – "still on the oxygen side of Earth's crust." Others [authors] are not.

In This ISSUE

Please be sure to read *Forty Years A Forester*, by the late Elers Koch. His story begins on page 26 and reveals much about what it was like "to ride the high lonesome" for the U.S. Forest Service ninety years ago. This is real history, written by a man who lived it, and made it as well.

A defining moment

This issue divides itself into two main parts – events surrounding the 1910 fire, and everything that has happened since. The 1910 fire was a defining moment in the history of the United States Forest



The 1910 fire was the largest in American history. Three million acres burned in two days. This scene – typical of the devastation – is on the West Fork of Placer Creek near Wallace, Idaho. (USFS photograph)

Service. In two savage days and nights, it destroyed more than three million acres of virgin forest in northern Idaho and western Montana. It was the largest and most destructive forest fire in American history. In its aftermath, an outraged nation demanded an end to forest fires. Congress obliged, and in 1911 the Forest Service went into the fire fighting business. We have been putting out forest fires ever since.

In this issue, we reprint the writings and recollections of many who fought the 1910 fire, and lived to tell about it. We do so for historic perspective because later on in our story you will hear some very knowledgeable people say the firefighting job was done too well, by people who did not know there was such a thing as a good forest fire. When you get to this part in our story, we want to remind you that when the Grim Reaper is chasing you through a fire storm, it is hard to think of anything good to say about it.

The experts we interview will also tell you some of the fires we put out should have been allowed to burn, for reasons they explain in great detail. As these details unfold, and settle into a rhythm of their own, we do not want you to lose sight of the reason why the Forest Service has been putting out forest fires for eighty-three years. We thus provide a forum for the dead, so they can tell you in their own words what it was like the night the rhythm of the wind turned three thousand forest fires into a flame thrower that arced across mile-wide canyons in one fluid motion. *What should alarm you the most about these accounts is the fact that we veered very close to 1910-scale fires this past summer in Idaho and Montana.*

There are too many trees

After fire, the other great force at work in this story is the westward march of progress. Early-day logging and land clearing practices – and nature's own chaotic rhythms – changed the species composition and structure of many western forests, disrupting other natural rhythms that had drifted through big pine country for thousands of years before the westward migration began in

the 1850s. We write about these lost rhythms in this issue, and we visit with scientists who are listening for ways to bring them back.

You will probably be surprised to learn that the problem is not that we have too few trees in western forests, but that we have too many. Where once you might have found a dozen big pines standing in a grassy meadow, you will now find hundreds of trees and no meadow at all. Crowded together on sites where they should not be, these trees are dying of thirst and disease. Where the dead fall, the debris is often knee deep.

When you get to this point in our story, you will hear a new rhythm, and it will say that a hundred years ago fire would have kept these sick forests healthy, maintaining the beautiful pine-dotted meadows described in many pioneer diaries. If only we had been smart enough to recognize the ecological benefits of these fires. When you hear this rhythm, ask yourself this question: *If a big fire was closing in on my town would I (a) call a town meeting to discuss the ecological benefits of fire, or (b) fight like crazy to keep the fire from burning down the town.*

The solution stirs controversy

In our many conversations with fire scientists and forest ecologists, we heard one message more than any other. *The sickness we are seeing in western forests is not a natural condition. Thus, leaving these forests to nature – allowing them to burn up in fires because fire is natural – will not bring back the forests that were here a hundred years ago. The fires next time will be bigger and hotter and more frequent. We could lose the forests we love and are trying to save.*

The solution we heard from these scientists is already stirring controversy, primarily because some logging is recommended as a way to thin out timber stands that are too dense. Logging is also viewed as the safest way to reduce the danger of big fires, to a point where some



The Star Gulch Fire, near Idaho City, summer 1994. Is the West headed toward a repeat of the 1910 fire? Many fire experts fear the worst. 1994 was a close call. (USFS photograph)

smaller fires could be allowed to burn, or even be set, allowing fire to more nearly play its natural role in forest ecosystems. Eventually – we are told – forests would begin to recover and look more like they looked a hundred years ago.

Most environmentalists reject these recommendations and say that the forest health issue is only an excuse to cut down more trees. By itself, fire is fine with environmentalists because it is “natural;” but salvaging burned timber is opposed because it is “like mugging a burn victim.”

Our stories are arranged in the order in which you should read them, from front to back. We begin in the present, with Dr. Stephen Pyne’s provocative essay on fire. Then we turn back the clock to 1910 and slowly come forward through time, probing issues and events that add up to today’s forest health crisis. By the time you finish our back-page essay, you should have a fairly good understanding of how this crisis developed, and what can be done to end it.

Many to thank

There are many we want to thank for their help and encouragement with this issue. Among them, Bob Mutch and Dr. William Moore, both retired from the

Forest Service and both experts where big forest fires are concerned; Jim Rathbun, another Forest Service veteran who, like Mutch, began his Forest Service career as a smokejumper; Jud Moore, USFS, Region 1, who helped us select photographs from the 1910 fire, and gave us a copy of Elers Koch’s *Forty Years A Forester*; Dr. Steve Arno, a research forester with the Inter-mountain Fire Sciences Laboratory in Missoula, Montana, for his prescribed fire photographs and for sharing a copy of Gifford Pinchot’s 1899 *National Geographic* article; Idaho State Representative, Judi Danielson, for her assistance in locating photographs of Boise and Payette national forest fires; Jay O’Laughlin, whose description of the West’s forest health crisis is the best

we’ve read; Boise Cascade Corporation forester, Tom Goodall, for writing “A View From Walla Walla,” describing forest health gridlock; Arizona State University historian, Stephen Pyne, for granting permission to reprint *Flame and Fortune*; the National Agricultural Library, for its help in locating John Leiberg’s earliest descriptions of western forests; the Forest History Society, for publishing George Morgan Jr.’s penetrating analysis of W.B. Greeley; Bill Hagenstein, who knew Mr. Greeley well and is one of forestry’s greatest living historians; for excerpts from their histories of the 1910 fire, Sandra Crowell and David Asleson for *Up the Swiftwater*; Stan Cohen and the late Don Miller for *The Big Burn*; Betty Goodwin Spencer for *The Big Blowup*; and the late Orland Scott, for *Pioneer Days on the Shadowy St. Joe*.

In this issue you will discover we do not live in a risk-free world. No matter the choice, there will be consequences. We can choose to do nothing about sick forests and hope 1910 does not pass our way again; or we can unleash the power and creative genius of the human spirit and hope to hear again the two-count symphony we all cherish.

— Jim Petersen

FLAME and FORTUNE

by Stephen J. Pyne

Editor's note: Dr. Stephen Pyne is a history professor at Arizona State University. He has written several books about fire, including *Fire on the Rim*, a memoir of his fifteen seasons on a Grand Canyon fire crew, and *Burning Bush*, a fire history of Australia. *Flame and Fortune* is reprinted from the September 1994 edition of *Wildfire*, a publication of the International Association of Wildland Fire, and *The New Republic*, August 1994. He earned his Ph.D. in American Studies at the University of Texas.

As Smokey reminds us, forest fires kill more than trees. Revealingly, the archived records for fire control in the U.S. Forest Service begin with the deaths of 79 firefighters during the 1910 fires. Since that lethal inauguration, approximately two firefighters have died by fire annually and eight fires have killed crews of ten or more. The 14 firefighters who recently perished on Colorado's Storm King Mountain join a long, portentous roll of those who have died under fire. Fire protection does not demand that firefighters die but they do. The house odds are that a small fraction will continue to do so.

The firefight as battlefield, the crew as paramilitary unit—these are the common prisms, the journalistic and philosophic set pieces, through which the country has viewed the recurring tragedies. Fire control by the federal government began when the U.S. Cavalry rode into Yellowstone National Park in 1886. They were greeted with fires, which they fought; their example inspired eager successors. In 1897 the National Academy of Science recommended that the army take over the new forest reserves and that West Point teach forestry, since the principal problems were fire control and trespass. The same month that the 1910 fires devastated the northern Rockies - the August that Ranger Edward Pulaski, a direct descent of Count Pulaski of Revolutionary War fame, saved his panicky crew by holding them at gunpoint in an abandoned mineshaft while the firestorm raged around them - William James published his celebrated essay, *"On the Moral Equivalent of War,"* in which he urged a national conscription of youths to sublimate the martial spirit into a war against the forces of nature. If war, as the pacifist James argued, was "the romance of history," then firefighting would become the romance of forestry. Ranger Elers Koch explained that a "forester in the Northwest dates the events of his life by fire years," that he remembers "individual fire campaigns... as the soldier remembers the separate engagements of the war." After World War I, American Forestry Associ-

campaigns for "suitable headstones with bronze tablets" for dead firefighters as "heroes of peace," who "died as truly in the service of their country as did those of Flanders' poppy-covered fields." Chief foresters routinely petitioned for the seasonal cantonment of army units on the national forests as a method of fire control. That plea only ended in 1933 with the creation of Franklin Roosevelt's "Tree Army," the Civilian Conservation Corps. The CCC promised better results than pick-up crews of the unemployed, the ill-disciplined mob that loosed a backfire during the 1933 Griffith Park fire in Los Angeles, 25 firefighters died and 125 more hospitalized. Even so, 29 CCC enrollees died by fire. After, the 1937 Blackwater fire in Wyoming burned over two crews, killing 15, the American Forestry Association helped create a forest fire medal for heroism; the first awards were posthumous. The need for better trained elites led in 1939 to the creation of smokejumpers, parachute smokechasers to grapple with small fires in remote locales, and the 40-man crew, self-styled "shock troops" who could travel to large campaign fires. By then forest defense, as the patriotic posters read, was national defense. When the U.S. Army wanted to establish a paratrooper base, they studied Forest Service smokejumper operations: when fire broke out in 1943 at Hauser Creek on the

Cleveland National Forest, the marines who fought it left behind 11 dead and 72 injured; amidst fears of incendiary attacks, the Wartime Advertising Council created Smokey Bear to promote fire prevention. The Mann Gulch fire of August 1949 that killed 13 firefighters burned the same month in which the Soviet Union exploded its first atomic bomb, effectively announcing a cold war on fire. The 1952 movie it inspired, *Red Skies of Montana* climaxed with smokejumpers improbably digging foxholes in their firefight - a clear parable of the Korean War then raging. The next summer the Rattlesnake fire killed a crew of 15. The wholesale conversion of surplus military hardware to fire control reinforced the sense that firefighting was indeed the moral equivalent of war as B-17's and PB4Y2's filled the sky, and retrofitted jeeps and even halftracks prowled firelines, an iconography better suited to Guadacanal than the national forests. Chief Forester McArdle memorialized the 11 firefighters who died in the 1956 Inaja fire as heroes "in the defense of the free world." Thereafter the U.S. hurled aerial fire control into Alaska, now a cold war frontier with the "red menace," at precisely the same time, with the same technologies, and for the same reasons as the Soviet Union did in Siberia. In 1961 it organized its best crews into a rapid deployment force. Before the 1966 Loop fire exploded through their ranks, killing 12, the El Carriso hotshots habitually wore berets in imitation of the Special Forces then in Vietnam. After that large fatality fires receded, the rhetoric cooled, and fire management fixated on the question of fire in wilderness, for which classic firefighting was anathema. Even so the firefight-as-battlefield motif persisted, rekindled dramatically during the so-called Siege of '87 and the Yellowstone conflagrations of 1988, when the military again mobilized for fireline duty bringing the saga full circle.

The recent tragedy in Colorado is stirring the ashes of analogy once again, though warily, because both the context of fire protection and that of America's

post-cold war military have changed. To pursue the old analogy would place the firefighters who died on Storm King Mountain in the position of army rangers killed chasing General Mohammed Aided in Mogadishu – brave warriors in a compromised cause. There are better alternatives.

The fire-as-war metaphor fails, as all metaphors must. It fails first because, without a human antagonist, the moral drama centers within people, not between them. Firefighters get killed but don't kill. The metaphor fails more tellingly because warfare is not a good model for fire practices.

Our relationship to fire is profoundly symbiotic. We are the one species that can start and, within limits, stop fires. Historically the first ability has enabled the second; the best way to control fire is with controlled fire; humans prevented wildfires by igniting their own. Not until the industrial revolution put fire into machines and reordered our relationship to the natural world did people assume that free-burning fire could be suppressed and, if necessary, eradicated.

Not surprisingly it was the millennial 1910 fires that prompted a national debate on fire policy. Aggressive fire suppression had the sanction of European forestry; controlled "light" burning was, as poet Joaquin Miller ingenuously put it, "the Indian way." Folk philosophers could not face down academic science, and as the body count mounted and federal troops poured into the northern Rockies to restore order, the suggestion that hostile fire was somehow friendly fire, that the philosophy of firefighting was wrong, seemed not only ignorant but traitorous. Fatalities hardened ideology; to question public policy was to question the private sacrifices of the dead. The problem was fire, and the solution was less of it, not more. The cost in lives seemed, in retrospect, a downpayment on the Great War. The cost in money came through the Forest Fires Emergency Act of 1908, which authorized the Forest Service to spend whatever was necessary, subject to supplemental appropriations, to combat the emergency. The prospect of a blank check frightened many early fire officers. But of course the money was irresistible. The American fire Establishment grew around it like crystals on a string. Not only had firefighting its own logic but its own treasury. Whatever else the fire establishment did or wanted to do,



Fire in Hells Canyon August 1994 – Mike McMurray photo

actual firefighting paid the freight.

Fire protection thus became an institution of American affluence. But there are some things money can't buy. It can't keep fires from starting or big fires from breaking loose. For several decades approximately 2% - 3% of fires have accounted for over 95% of the total burned area, a quantum that reflects irreducible environmental conditions. The Yellowstone firestorm of 1988 sucked in \$130 million with no appreciable effect on fire size or behavior. Meanwhile the cost of suppressing fires has risen, with more and more of that expense absorbed by supplemental appropriations. Even as the fire community recognized that fire control alone was inadequate, even as the federal agencies in the 1970s reformed their policies to accommodate controlled burning, even as ecological analysis has demonstrated that the plunging curve of burned area traced equally the curve of an environmental deficit, a fire famine, state and federal agencies have continued to dispatch crews to the front lines.

The environmental tragedy was not that wildfires were suppressed but that controlled ones were no longer kindled, because withholding fire is as powerful an ecological act as applying it. The exclusion of fire has, in many landscapes, catalyzed a crisis in biotic health, the environmental equivalent of the S&L scandal. One manifestation is a catastrophic buildup of

fuels. More fires burn more intensely than in the past, and any attempt to restore a different regimen of fire must operate within ever-shrinking margins, the equivalent to running with vials of nitroglycerin. The costs to reintroduce fire into millions of acres of public wildlands would require a combustion Superfund and a new CCC, a commitment devoid of any significant political constituency. The fire rehabilitation of Oregon's Blue Mountains alone calls for a down payment of 100,000 acres burned a year.

Social circumstances too are worsening. Pressures on the public lands have intensified. The vanishing rural landscape has removed a once-useful buffer and stuffed it with houses – still more fuel and more critics of any policy other than all-out firefighting. Legal liabilities for escaped fires, air quality standards, endangered species considerations, and impassioned interest groups have extended the national gridlock to such backcountry locales as the Three Sisters, Little Tujunga Canyon,

and the Mogollon Rim. The agencies that oversaw the debacle implausibly ask a skeptical public for money and trust to set things right. Wildfires will continue as long as there are wildlands; the issue is not whether fires burn but how. In the past few years fire officers have struggled to kindle a thousand points of light with fusees and helitorches, but the amount control-burned is minuscule; the ecological darkness grows. That leaves the burden on firefighting, now ever more essential, isolated, and desperate. But by itself it can only temporize. It cannot eradicate the volatile legacy of the past or dissolve the clotted confusion of the present. Increasingly it must struggle to justify its sometimes fatal obsessions.

Perhaps a better trope is the motto adopted by the North Rim Longshots, "flame and fortune." Money and action, fire season as a rite of passage – these are the motivations behind seasonal firefighting, a life as compelling as any ever imagined. Flame and fortune also spot weld public rhetoric to private purpose. Fire agencies will follow the money. Firefighters will follow the action, the best crews eager to go to the worst fires, even if, tragically, that pursuit from time to time acquires a more existential meaning and leads them to a final rite of passage, through the trying fire and to the fate that awaits us all.

THE 1910 FIRE

By Jim Petersen

It was the largest forest fire in American history. Maybe even the largest forest fire ever. No one knows for sure, but even now, it is hard to put into words what it did.

For two terrifying days and nights – August 20 and 21, 1910 – the fire raged across three million acres of virgin timberland in northern Idaho and western Montana.

Many thought the world would end, and for 86, it did.

Most of what was destroyed fell to hurricane-force winds that turned the fire into a blowtorch. Reconstructing what happened leads to an almost impossible conclusion: Most of the cremation occurred in a six-hour period.

A forester named Edward Stahl wrote of flames shooting hundreds of feet in the air, “fanned by a tornadic wind so violent that the flames flattened out ahead, swooping to earth in great darting curves, truly a veritable red demon from hell.”

Among the 86 who perished were 28 or 29 men – no one knows for sure – who tried to outrun their fate in a straight up-straight down canyon called Storm Creek.

Two men too terrified to face death took their own lives. One jumped from a burning train and the other shot himself when he feared an approaching fire would overtake him. Two fire fighters fled into flames before the very eyes of horrified comrades huddled in a nearby stream.

Hundreds more survived, many by the grace of God. Ranger Edward Pulaski, who became a hero at a place called the War Eagle Mine, led men with prayers on their lips through a pitch-black darkness punctuated by exploding trees and waves of flames that arced across the night sky.

Perhaps, Edward Stahl would later say, “the men thought the small fires flickering dimly in the darkness were candles burning for the dead.”

“The fire turned trees and men into weird torches that exploded like Roman candles,” one survivor told a newspaper reporter.

Depending on who was doing the counting, there were either 1,736 fires burning in northern Idaho and western Montana on August 19, or there were 3,000. It did not much matter which number you picked because on August 20 it seemed like there was only one fire burning, and it was the sum total of all the others that had been burning the day before.

It was called “The Great Lone Land,” and those who first rode it for the old Division of Forestry were said to be “hitting the high lonesome.” Indeed it was. For as far as you could see, there was nothing but mountains and more mountains, divided by deep canyons, roaring rivers and forests so thick you had to hack your way through them.

Those who rode the high lonesome were cut from a different cloth. Frontiersmen, cowboys, trappers and woodsmen – they were the last of a breed trailing after the last thin edges of what remained of the American wilderness. There were no roads across this great expanse, and until 1905, when the old Division of Forestry became the United States Forest Service, it didn’t even have a name. Then it became District One,

and those who rode it were called Rangers. Their job was to tame the high lonesome. It would not be easy.

On a frosty September morning in 1908, the first District One district forester stepped off the train in Missoula, Montana. Suitcase in hand, he walked briskly to his new office a few blocks away. His name was William Buckhout Greeley, and he would go on to become the third chief of the U.S. Forest Service and one of the most influential men in the history of forestry.

W. B. Greeley grew up in California’s Carmel Valley, the son and grandson of New England Congregational ministers. Except for Sundays, he spent his boyhood days exploring nearby woods, fishing and swimming in the Carmel River. The Sabbath was reserved for reading *The Life of Christ*, or a Sunday school lesson laid out for him by his father. Much later in life, he confessed to still having “a terrible New England conscience.” He never smoked or drank and rarely swore.

Greeley graduated from the University of California at Berkeley, where he became a Phi Beta Kappa scholar and earned honors as a member of the college’s debate team. He taught school briefly, but his boyhood love of forests overcame him, and he abandoned teaching in favor of a graduate degree in forestry from Yale University.

On July 1, 1904, Bill Greeley went to work for the Bureau of Forestry, a renamed version of the old Division of Forestry. He quickly became one of “Gifford Pinchot’s boys” – a name given to young lions hand-picked by Pinchot, who headed the Bureau. More important though was the fact that Pinchot was a great friend of President Theodore

Roosevelt, who in 1905 engineered the creation of the U.S. Forest Service, and named Pinchot its first chief forester.

Allies at first, Pinchot and Greeley later became the chief protagonists in a bitter and frequently very public debate over the Forest Service's relationship with private forest landowners. Pinchot did not trust them, and wanted their every move regulated by law; Greeley's experiences with lumbermen convinced him they could be trusted. Whatever doubts he may have had were erased by the 1910 fire. And looking back now, it is clear no single event did more to mold the U.S. Forest Service in its historic image than did the 1910 fire.

In 1908, District One included 22 national forests and spanned 41 million acres in four states. Its eastern boundary

was in South Dakota and its western edge in northeast Washington state. Between these outer edges stood some of the greatest stands of virgin white pine and western red cedar in the world. So vast was this land that each man under Greeley's command was directly responsible for 600 square miles of wild land, most of it unmapped.

In her 1956 book, *The Big Blowup*, Betty Goodwin Spencer interviewed the last men to first ride the high lonesome for Bill Greeley. Their answers to her questions reveal much about what it was like to work for the U.S. Forest Service when it was all new and still trying to figure out what to do and where to begin.

How did you join the Forest Service?

"By tests. The written test consisted

of questions pertaining to the knowledge of cattle, horses and sheep, and knowledge of the different brands and locations of ranches and the different ranges where stock were run; also how to cook, the making of baking powder bread and how to take care of oneself in the mountains and woods. The field test included timber estimating, riding and packing a horse, shooting with rifle and pistol, surveying, mapping, pacing a measured distance, cutting down a tree with an ax and compass reading."

Where did you live?

"My first headquarters was an old guard cabin which hadn't been used since the preceding fall, and in the meantime a family of skunks had made a home under the floor. We got along fine together, but finally the skunks couldn't stand it and



The most oft-repeated scene from the 1910 fire: huge white pine and spruce trees toppled by wind and cooked by flames. Enormous amounts of woody debris were left behind, fueling frequent large-scale re-burns, the last one in the early 1930s. Ranger Joe Halm took this photograph on the Little North Fork of the St. Joe River. (USFS photograph)

moved out. I felt real lonesome for some time until a pack rat showed up and filled in the niche in my existence."

What were you paid?

"Forest guards, rangers and supervisors had to furnish their own horse and equipment, our own subsistence and lodging, feed our horses and pay all of our own expenses, whether we were at headquarters or in the field. Forest guards received sixty dollars a month. The only equipment furnished was an ax, a notebook and a book of regulations called the Use Book."

What types of work did you do?

"We had a swarm of timber homesteads to check on, and most of those so-called claims we knew to be fraudulent, but it was our job to get the evidence. In the Little North Fork, Marble Creek and Big Creek, we were extremely unpopular as rangers and had to use discretion and diplomacy. We never knew when a bullet might meet us in a thicket or on the trail."

How much country did you patrol?

"The supervisor gave me a double-bitted ax and a box of ammunition for my 45-70 and told me to 'go to it and good luck.' He said, 'The whole country is yours from Belton to Canada and across the Rockies to the prairie of Waterton Lake and the foot of St. Maries Lake.' It comprised nearly all of Glacier National Park. Instructions were to look out for fires, timber thieves, squatters and game violators. I sure had my hands full and then some."

What did you look like, or wear?

"Take Ranger F. Herrig, for example. Herrig was originally one of Roosevelt's Roughriders, and quite an imposing figure. He generally rode a dark bay horse, decked up with a silver-studded bridle and martingale. He wore mostly high-topped boots, a big 44 strapped on his belt and a 45-70 in a scabbard, and he wore a ranger's badge always in plain sight, and a big Russian wolfhound was his steady companion."

Did you fight fires?

"...I'd been fighting fire up there for two days with nothing to work with but my hands. Skinned both of my knees climbing up there over the rocks. Both of my hands were burnt and skinned, too. My God, I thought, how much longer can



The written-in-pencil inscription on the back of this photograph reveals the sense of despair that gripped the — after fire and hurricane — enough said. White pine, cedar and Englemann spruce, Lolo N.F., 1910." (USFS)

I stand it? Got the fire under control. My knees scabbed over and felt pretty good, but my hands were in a hell of a shape. Damned if I'll ever fight fire with my bare hands again."

By Bill Greeley's count there were three thousand fires burning in his district by early August of 1910, with less than one man per fire to put them out. Equipment was scarce, too. At Avery, Idaho on the Coeur d'Alene National Forest, Cliff Theriault reported his inventory of fire fighting tools included forty hand shovels, ten axes, five cross-cut saws, ten grubhoes, four horses, bedding for four men and no supplies. Still, Greeley's men managed to see it through. By August 19, most of the fires were under control. The worst seemed to be over.

Then, on Saturday afternoon, August 20, all hell broke loose. Hurricane-force winds, unlike anything seen since, roared across the rolling Palouse country of eastern Washington and on into Idaho and Montana forests so dry they crackled underfoot. In a matter of hours, fires became firestorms, and trees by the millions became exploding candles. Millions more, sucked from the ground, roots and all, became flying blowtorches. It was dark by four in the afternoon, save for wind-powered fireballs that rolled from ridgetop to ridgetop at seventy miles an hour. They leaped canyons a half-mile wide in one fluid motion. Entire mountainsides ignited in an instant. It was like nothing anyone had ever seen before.

By noon on the twenty-first, daylight was dark as far north as Saskatoon,



young Forest Service after the 1910 fire; "Silver Creek photograph)



Near Falcon, Idaho, September 1910. Downed timber marks the path of swirling wind and fire. (USFS photograph)

freight train 2,400 miles long. Eighty-six people perished, most burned beyond recognition. When it was over, W. B. Greeley told a colleague he now understood "in cold terms the size of the job" confronting the fledgling U.S. Forest Service.

A ranger put one pathetic sight he had seen into words not easily erased from the imagination. "If you could see a little black bear clinging high in a blazing tree and crying like a frightened child, you could perceive on a very small scale what happened to the forest and its creatures."

No official cause was ever listed for the 1910 fire. A bad electrical storm the night of July 15 touched off more than 3,000 fires in District One, but by August 19 - the night before the big blowup - the worst seemed to be over. But 1910 was also the driest year in anyone's memory. Snows melted early and the spring rains never came. By August, normally swift-running

Saskatchewan, as far south as Denver, and as far east as Watertown, New York. To the west, the sky was so filled with smoke, ships 500 miles at sea could not navigate by the stars.

Before it was over, 10,000 men were on fire lines that stretched from eastern Washington across the Idaho panhandle well into western Montana. The names of the fires they fought sounded more like the names of Civil War battlefields than anything else: Big Creek, Setzer Creek, Stevens Peak, Storm Creek, Bullion Mine, Cedar Ridge and Little North Fork. In some canyons, you could not tell where one battlefield ended and the next one began.

Every able-bodied man fought the fire. Most were Idaho loggers, miners from Butte, Montana, and skid row bums

brought in on trains from Spokane. The pay was 25 cents an hour, plus a bedroll, sourdough pancakes, coffee and canned tomatoes.

Even the army was called up, including members of Company G, Twenty-fifth Infantry, an all-black regiment that fought the fire near Avery, then buried the twenty-nine Storm Creek dead in a sixty-foot-long trench. So impressed by them was Ranger Thaddeus Roe that he told a *Seattle Times* reporter he had "never known a whiter set of men to breathe." What may seem awkward and insensitive now, was then considered a high compliment for men who had fought with the best of them and done as much as any man could.

The 1910 fire burned three million acres and killed enough timber to fill a

rivers had slowed to a crawl and many streams had simply disappeared into bedrock.

"There was a burning dryness in the air," Orland Scott would recall years later in *Pioneer Days on the Shadowy St. Joe*, a book he wrote about turn-of-the-century northern Idaho. "Everywhere the heat was intense and stifling."

By June, the woods were on fire in a hundred different places. Some of the blazes were started accidentally by loggers, homesteaders and campers. Others were thought to be the work of arsonists. However, it appears the largest single contributor was the newly constructed Chicago, Milwaukee and Puget Sound Railway, which followed the St. Joe River east from St. Maries to Avery, Idaho, then disappeared into the

The 1910 fire burn area



This map shows where the 1910 fire burned. To fully appreciate its size, compare this map to Idaho and Montana highway maps. This is drawn from two books: *Up the Swiftwater* and *The Big Burn*.

densely timbered Bitterroot Mountains, emerging again near Taft, Montana.

In a 1911 report, Roscoe Haines, who was acting forest supervisor on the Coeur d'Alene National Forest, estimated more than 100 fires were started by coal-powered locomotives that frequently spewed red-hot cinders into tinder-dry forests. The railroad hired spotters to walk the tracks and douse flare-ups, but as summer wore on the inevitable drew near.

It did not help that there were no lookouts from which to spot new fires, and no roads for speeding men and equipment to the scene. That summer, some crews spent more than a week hacking their way through dense timber stands, just to reach the fires they had been ordered to put out.

Although the 1910 fire was the largest ever to burn in America, it was not the deadliest. That distinction belongs to the

Peshtigo fire, which killed more than 1500 in Wisconsin in 1871, while burning through more than one million acres of forest land.

Beyond its size, the 1910 fire burned its way into the American conscience as no other fire had done. "Not ever before had a forest fire been given headlines so big or so black," wrote Stewart Holbrook in *Burning an Empire*. "It managed to burn its way through public indifference and to emerge as what most conservationists consider a charred but positive landmark along the road to forest protection."

Journalists of the day took considerable license with the fire. Their headlines were bold, the drama gripping, and – in the style of the day – the details were frequently over-exaggerated. A story in the October 1910 edition of *Everybody's Magazine* typified the amplification of real events.

"...the poor roasting wretches took

many means to preserve from the flames letters, cards, trinkets by which they might be known. Some scraped with the last strength of their burning hands little holes in the earth, put their papers in them, then flung their shriveled bodies down upon the cache to die..."

Ever the opportunist, a politically savvy Gifford Pinchot managed to focus public anger on who he felt deserved most of the blame for the 1910 fire: the United States Congress.

"For the 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 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."

There is no complete record of how much dead timber was salvaged. The best estimate is about 300 million board feet, less than 10 percent of what was killed. Most of the salvage work was completed by 1918, though the Forest Service did sell some cedar burned in 1910 as recently as 1979.

It took years to clear away dead timber that clogged trails. My father worked on a CCC crew in the 1930s and recalled walking across narrow canyons on the backs of huge logs left behind by winds so powerful trees were sucked from the ground, roots and all, and tossed into the bottoms of canyons. In one place he estimated the wreckage was 50 feet deep, with a creek running beneath it.

There is also no clear record of the amount of land that was replanted, though it is known that the Forest Service and major private landowners planted millions of seedling trees; but there were few nurseries operating then, so it was not possible to grow enough seedlings to replant all that had been lost.

Years later, Elers Koch, who fought the 1910 fire, described the aftermath in a book he wrote about his 40 years with the Forest Service. The fire was only the beginning, he said. Between thirty and forty percent of what burned in 1910 burned again in subsequent fire seasons, destroying a good deal of what had been replanted or had grown back naturally. Where once there had been great forests, there were now great brush fields.

Erosion was also a problem. "The fall rains brought down a vast amount of sheet erosion and many steep gullies were scoured out to bedrock," Koch wrote. To make matters worse, "nearly all of the scorched trees were immediately attacked by bark beetles."

By 1914, the beetles had moved into green timber. What Koch called "the vicious circle of fire" went on for thirty more years.

Most of what was burned black in 1910 is green again; but even now, eighty-four years later, there are still places in northern Idaho where forests that rode ash clouds into the heavens have yet to float back down to earth.



These five-hundred-year-old western red cedars are in Settler's Grove on the West Fork of Eagle Creek, near Murray, Idaho. They escaped the 1910 fire, but thousands more did not. (Jim Petersen photograph)

Eyewitness Accounts From The

1910 FIRE

Editor's note: Many books have been written about the 1910 fire. Reprinted here are excerpts from what we believe are the five best books. These eyewitness accounts describe the terror experienced by those who fought the fire and lived to tell about it. Reading these accounts, it is easy to understand why an outraged citizenry subsequently demanded action from a Congress that had been reluctant to appropriate money to fight forest fires.

Excerpts from an interview with a Mr. Swain, taken from *The Big Burn: The Northwest's Great Forest Fire of 1910*, by Don Miller and Stan Cohen, Pictorial Histories Publishing Co. Missoula, Montana, 1978.

"Our worst fears"

Before three o'clock p.m., it became so dark from smoke [in Mullan, Idaho] we were obliged to turn on the lights... The air became hot and oppressive and the reflection of fires all around us made danger feel uncomfortably near. The falling fragments were now veritable brands, many of the great twigs bearing live fire; and all agreed that our worst fears were about to be realized...

The wind came up with a fury. It seemed to blow in whirls carrying sparks in every direction, but the general trend was northeast. As if by magic, new fires would spring up, there and everywhere. In every direction, a mountain of flame faced us. One side of our gulch would be aflame and in an instant the fire would be borne across to the other side, and by leaps and bounds from tree to tree, the terrible destruction continued...

It took courage to start more fires with surrounding country already a sea of fire and the wind a veritable fury, but it was our only chance; so a line of men was stationed just a few feet apart, forming a letter "s", from the Morning to the Hunter mills, just a few feet in the rear of the buildings. At the signal each started a blaze. These fires united in less time

than it takes to relate it, and traveled up the mountains, leaping, foaming, rippling over the brush and grass, then bursting into crimson towers as they passed over stately pines and firs. It was a most beautiful sight yet a most terrible one...Midnight was as light as day.

Excerpts from Joe Halm's account. Halm graduated from Washington State College in 1909, and worked as a surveyor on the Coeur d'Alene National Forest. In a 1938 radio interview, he was asked what had been the greatest handicap faced by those who battled the 1910 fire. "There were no trails or roads, and we had to go in 65 miles to get to the fire when we were first sent out," he recalled. "In those days one spent the first week trying to get to the fire. It took more time to get into the country than to put out a small blaze." He did not mention that he held his terrified 1910 crew at gunpoint to keep them from fleeing a fire they could not possibly outrun.

"Deafening and terrifying"

The wind had risen to hurricane velocity. 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, hysterical. The fire had closed in; the heat became intolerable.

All our trust and hope was in the little stream and the friendly gravel bar. Some crept beneath wet blankets, but falling snags drove them out. There was wet air over the water. Armed with buckets, we splashed back and forth in the shallow stream throwing water as high as our strength would permit, drenching the burning trees. A great tree crashed across our bar; one man went down, but came up unhurt. A few yards below, a great log jam, and acre or more in extent, the deposit of a cloudburst in years gone by, became a roaring furnace, a threatening hell. If the wind changed, a single blast from this inferno would wipe us out...

"Melancholy wreckage"

The green, standing forest of yesterday was gone; in its place a charred and smoking mass of melancholy wreckage. The virgin trees, as far as the eye could see, were broken or down, devoid of a single sprig of green. Miles of trees – sturdy, forest giants – were laid prone...

Men, who quenched their thirst from small streams, immediately became deathly sick. The clean, pure water running through miles of ashes had become a strong, alkaline solution, polluted by dead fish, killed by the lye. Thereafter we drank only spring water...

"Finally death"

On Big Creek, thirty men lost their lives while others lay prone for hours in the chilling waters of a tiny stream, great forest giants falling around and across them. Here three men were crushed by a falling tree. One of these unfortunates was caught only by the foot. Men a few feet away heard his cries and prayers, but were powerless to assist. He dug and fought to tear away, but the thing which he had come to save held him fast until coma and finally death relieved his sufferings. On Seltzer Creek the ghastly human toll was twenty-nine. An entire crew was annihilated. The men fell as they ran before the merciless fire.

"Excerpts from Ed Thenon's harrowing account describing what happened to his crew on Moose Creek in Idaho's Clearwater River drainage. Thenon was the Ranger on what was then the Selway District of the Clearwater National Forest. His boss, W. B. Greeley, described him to a tee. [He was] "tall and spare with a little sandy mustache. A very fine type of frontiersman – the ideal type to put in charge of a bad situation." Excerpts are from *Forty Years A Forester*, by Elers Koch (See Editor's note, page 26)

"A candle flame to a mosquito"

The fire was coming on fast, already it was beginning to throw shadows in the camp, and we could hear a rumble like a railroad train crossing a bridge. I roused the men up and ran out into the creek to see what our chances were...

"Whirlwind of fire"

It was light as day now in the camp, and the timber on the mountains on both sides of the creek was all afire. 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 and forth and up and down the slope, and the roar of it was like a million blow torches. If it had ever moved down on us we would have gone out just like when you touch a candle flame to a mosquito...

Excerpts from Arthur Hogue's letter to his mother, August 25, 1910. Hogue worked for the Milwaukee Lumber Company, which lost 100

million feet of virgin white pine in the Big Creek drainage. The letter appears in *The Big Blowup*, by Betty Goodwin Spencer, Caxton Printers, Caldwell, Idaho, 1956; reprinted, 1994, by the International Association of Wildland Fire, Fairfield, Washington

"A continuous stream of fire"

Looking down the valley, one could see the fire coming on with a rush and a roar that once seen and heard can never be forgotten, and the flames leaping 300 feet high meet in an arch extending from one hill top to the other. A fierce gust of wind would strike the summit and flames would leap clear across from one summit to the other in one continuous stream of fire for a distance of over a half mile. It would have been a most beautiful sight had one not realized that in the next moment you might be caught in its fiery folds and know no more...



The War Eagle Mine tunnel, on Placer Creek near Wallace, Idaho. Ranger Edward Pulaski hid his forty-five-man crew here during a firestorm the night of August 20, 1910. Five men and two horses died in the tunnel. The survivors walked and crawled to Wallace the next day. Pulaski was partially blinded by the flames he faced extinguishing burning mine timbers. (USFS photograph)

Excerpts from W. G. Weigle's report concerning the deaths of 18 members of Lee Hollingshead's crew on the West Fork of the Big Creek of the St. Joe River. Panic-stricken, they fled into Henry Dittman's cabin, where they perished when the cabin exploded in flames. The rest of Hollingshead's sixty-man crew worked its way to safety in a burned over area.

"Hissing shower of sparks"

Smoke-gagged and breathless, they wrenched open the door and crowded into the one small room. In utter terror they huddled on the floor until the burning roof caved in with a hissing shower of sparks and blazing shakes. Then, knocking each other aside, they shouldered madly out of the cabin and tried to beat their way through the line of fire, but the terrific heat brought eighteen of the men to their tragic death only a few feet from the cabin...

Excerpts from Ranger Edward Pulaski's accounting of the fire on Placer Creek near Wallace, Idaho. Pulaski was a Ranger on the Coeur d'Alene National Forest in 1910. His personnel file included this evaluation, written by his boss, Forest Supervisor, W. G. Weigle: "Mr. Pulaski is a man of most excellent judgement; conservative, thoroughly acquainted with the region, having prospected through the region for over twenty-five years. He is considered by the old-timers as one of the best and safest men to be placed in charge of a crew of men in the hills."

True to form, Ranger Pulaski guided his crew through darkness and a raging inferno driven by hurricane-force winds, to the safety of the War Eagle Mine tunnel. In the years following the fire, he was lionized for his heroism, perhaps in part because he was everyone's vision of what a hero ought to look like. He bore a remarkable resemblance to the actor, Gregory Peck, stood six-foot three, had steel-blue eyes, and struck a commanding presence everywhere he went. When he retired from the U.S. Forest Service in 1930, a story in the Missoula, Montana *Sunday Missoulian* bore this headline: "Hero Of Great Fire Will Leave Service." Shortly after his retirement, he died from injuries suffered in a car accident.

"Some crying, some praying"

The mine timbers at the mouth of the tunnel caught fire, so I stood up at the



U.S. Forest Service photographer, R.H. McKay, left, took most of the photographs of the 1910 fire. With him in this photograph is Ranger Joe Halm, who held his fire crew at gunpoint to keep them from fleeing a firestorm he knew they could not outrun. Halm also took many photographs of the 1910 fire. (USFS photograph)

entrance and hung wet blankets over the opening, trying to keep the flames back by filling my hat with water, which fortunately was in the mine, and throwing it on the burning timbers. The men were in a panic of fear, some crying, some praying. Many of them soon became unconscious from the terrible heat, smoke and fire gas...I, too, finally sank down unconscious. I do not know how long I was in this condition, but it must have been for hours. I remember hearing a man say, 'Come outside, boys, the boss is dead.' I replied, 'Like hell he is.' I raised myself and felt fresh air circulating through the mine. The men were all becoming conscious. It was five o'clock in the morning...

"Shoes burned off"

We had to make our way over burning logs and through smoking debris. When walking failed us we crawled on our hands and knees. How we got down I hardly know. We were in a terrible condition, all of us hurt or

burned. I was blind and my hands were burned from trying to keep the fire out of the tunnel. Our shoes were burned off our feet and our clothes were in parched rags...

Excerpts from Thaddeus Roe's description of the wall of flames he faced in the fight to save Avery, Idaho. Roe was a member of the rescue team sent to Storm Creek to bring out the bodies of 29 men who stood their ground, rather than flee the raging fire. Later, a man who knew him described Roe's appearance at the rescue scene.

"His outer garments had been burned from his body. His heavy woodman's boots had been burned through and only a remnant of a hat hung from his scorched head. His arms and legs were a mass of burns, the scars of which he will carry to his grave. He was thirty-two years old when he went into Avery six weeks ago. Today, he looks like a man of fifty, and gray has marked his hair."

"Babbling incoherent thanks"

In order to save anything at all we had to begin firing the buildings on the outskirts of the town, and then the terrible work of forcing the backfire towards the big blaze began. I will never forget the sight. An impassable wall of fire was eating its way down the hillside. Our backfire, which had assumed huge proportions, was creeping up towards it. In exactly four and one-half minutes after we started our fire, the two met. Never have I seen anything like it. Plunging at each other like two living animals, the two met with a roar that must have been heard miles away. The tongues of fire seemed to leap up to heaven itself and after an instant's seething sank to nothingness.

We had won, but the strain of those four and a half minutes had exhausted us and we sank down and lay there in the ashes babbling incoherent thanks to God.

The rest of the world didn't know what we were going through. It couldn't, and that was the terrible part of it. We might have been the only men in the world for all it mattered. Alone, we were left with nothing but our bare hands and the help of our Creator to bring us out alive.

A description of the scene on Storm Creek, where 29 firefighters were burned to death, from *Up the Swiftwater*, by Sandra Crowell and David Asleson, published by the authors, 1980.

"Helpless flight"

The main part of the large crew headed for Avery around 6:30 that evening, the flames traveling so fast after them that at times trees above their heads were on fire. They were singed and burned, and one man's shoes had burned through when they arrived at Avery.

They were the lucky ones. Pat Grogan and his followers were cremated within seconds after the fire struck them. Grogan and his dog stood their ground at

the camp site and died; his watch stopped at 7:27 p.m. The remains of the others dotted the canyon for half a mile. The one the longest distance from the camp had added seven minutes to his life by running. His watch stopped at 7:34 p.m. Some had attempted to climb the canyon wall in their helpless flight. Burned flesh, skulls and skeletons were all that was left of most of the men. A few were found with their faces turned grotesquely backward toward the oncoming fire. Even the silver found in their pockets was melted, along with their watches and pocketknives.

"Cooked alive"

David Bailey survived at Beauchamp's cave by diving into a creek instead of the cave. Here he describes what he saw.

"It was while holding a covering over my head that I burned my hands. We were in the creek for about two hours, I believe, and we were all shaking from the cold as though we

were suffering from the fever when we piled out. It was pretty tough up on the summit without any covers and soaked to the skin. One of the boys contracted pneumonia."

Bailey and the others who survived had their hair burned off, and seven comrades who fled into a cave were, in Bailey's words, "cooked alive."

"All of them tried to get at the very end of the small hole and they were piled up in an awful heap," he recalled. "It was impossible to take out their bodies, for they would fall to pieces."

Excerpts from a chapter titled, "A Ride Through Hell," describing one of three daring rescues involving trains that raced through blazing forests to rescue townspeople surrounded by fire.



What remained of downtown Wallace, Idaho, August 22, 1910. More than 200 homes and many businesses were destroyed, including a hotel, the railroad station, two breweries and an iron foundry. Women and children fled the flames on trains. Able-bodied men stayed behind to fight the fire. (USFS photograph)

"A ride through hell"

Bridges behind them were crackly with fire; way ahead another burst into flames. There was no way they could make it back to the St. Paul Tunnel or Falcon and Marshall. Tunnel 22 was closest, a short bore but their only hope. They opened the throttle wide – it was now or never.

The train pushed through the first wave of fire, the varnish on the coach blistering in the intense heat. Would they be able to make it through the second wave? They were blocked – the fire was too thick! They had to turn back. The first furnace had expanded, and now the train could not get through it, either. They were caught between fires!

Lieutenant Lewis in his report noted: "The scenes of the fires, the dense smoke, the intense, blinding heat and the crackling flames were indescribable. The flames seemed to be over a mile and a half high. We traveled back and forth, attempting to get through at one end or another, but it was impossible. Progress was constantly impeded by landslides or rocks, or burned logs."



Rev. Orland Scott, who was a Methodist minister for many years, witnessed the 1910 fire near St. Maries, Idaho, and wrote about what he saw in a book titled *Pioneer Days on the Shadowy St. Joe*.

Pioneer Days on the Shadowy St. Joe, published in 1967 by Caxton Printers, Caldwell, Idaho. Scott grew up on the St. Joe River, and lived for many years in St. Maries, a logging and farming community on the banks of the St. Joe. Reading his description of how panicked St. Maries residents reacted to the wall of flames they faced, it is easy to see why pioneers living in frontier timber towns feared forest fires more than anything else.

Finally at 5:30 a.m. on Monday, August 22, the train made it back to Avery. It was their last chance.

Orland Scott describes the scene around St. Maries, Idaho, the afternoon of August 24, 1910. The account is taken from a book he wrote titled

"Lullabies and prayers"

Frightened people moved many of their valuables out of their homes, down to the riverbank below the town. Some set up temporary quarters in tents and took their families to the riverside for safety. Silver and other prized possessions were buried in yards in town, or basement cellars, for preservation. Bedding and cooking utensils were moved along with other household equipment. Amid falling sparks and shrieking treetops in the wind of flame, the whole world seemed afire that first desperate night. Mothers held their babies close, muttered lullabies and prayed, while their husbands and sons fought to halt the roaring tide...

"Merciless velocity"

The wind swept up the main valley from the west and south that late afternoon of August 24. It drove the red-hot flames in searing blasts across the dividing ridges between the creeks, leaping from crest to crest across mile-wide chasms in walls of flame. The generating heat from these ridge fires created vast heat-chimneys with terrific suction from the bottoms of the creeks upward so that roaring furnaces of fire, hot ash, smoke and exploding fumes from the thousands of burning trees, shrubs and brush moved with merciless velocity up the narrow gorges, generating infernos of heat and suffocation beyond description...

"Seething caldron"

It was then that we saw a wall of bright-red flame leap from the west ridge to the east ridge of Thomas Creek, a mile-wide jump, in a moment of time. Then the flames sucked down into the depths of the canyon of Thomas Creek and swept upward toward Round Tom Mountain in a seething caldron of falling trees, with soot and smoke and flaming branches soaring high into the air. Acres of timber went down in a flash and no power on earth could save it...

"Appalling desolation"

In all directions there was nothing left but the burning stumps of once-beautiful trees; a downed monarch of the forest, fallen to the ground, fed the fire along its entire length. There were hot ash-heaps where trees had criss-crossed in falling and met hot destruction together. Appalling desolation everywhere.



Eighteen firefighters were burned alive at Dittman's cabin, a rock cellar at the bottom of this photograph. The rest of Lee Hollingshead's sixty-man crew worked its way through the fire and took refuge in an open area. Ranger Joe Helm took this photograph in September 1910 (USFS photograph).

WAS THE **1910** FIRE THE LARGEST EVER?

No one can say for certain that the 1910 fire was the largest forest fire ever, but if size alone is the measure, it was indeed the largest forest fire in U.S. history. Other U.S. fires – including some listed below – were more deadly, but none moved as swiftly or as savagely over such a vast uncharted expanse as did the 1910 fire.

1825 - The Miramichi fire in Maine and New Brunswick; three million acres burned; 160 people killed.

1846 - The Yaquina fire in Oregon; 450,000 acres burned.

1853 - The Nestucca fire in Oregon; 320,000 acres burned.

1865 - The Silverton fire in Oregon; one million acres burned.

1868 - The Coos fire in Oregon; 300,000 acres burned.

1871 - The Peshtigo fire in Wisconsin; the most deadly in U.S. history; 1,500 killed; 1.2 million acres burned.

1876 - The Bighorn fire in Wyoming; 500,000 acres burned.

1881 - A Michigan forest fire destroyed a million acres of timber and killed 138 people.

1894 - The Hinckley fire in Minnesota; 160,000 acres burned; twelve towns wiped out; 418 lives lost.

1903 - The Adirondack fire in New York; 450,000 acres burned.

1910 - The great fire of 1910, Idaho and Montana; more than three million acres burned; 86 lives lost.

1918 - The Cloquet fire in Minnesota. Cloquet, a thriving sawmill town of 12,000 was gutted; timber land and property losses estimated at \$30 million; 400 perished.

1932 - The Matilija Canyon fire in California's Santa Barbara National Forest; 256 square miles burned; 2,500 fire-fighters on the lines; no lives lost.

1933 - The first of four Tillamook burns, in the Oregon coast range; subsequent fires burned in 1939, 1945 and 1951. In all, 355,000 acres of some of the finest timber in America were destroyed.

1947 - Texas; in September and October, 900 man-caused fires burned 55,000 acres of timber in eastern Texas; losses exceeded \$ 1 million.

1947 - Maine; series of disastrous fires raged for ten days; 16 died; nearly 10,000 required first aid; 175,000 acres burned; Red Cross spent \$2.4 million on disaster relief.

1988 - Yellowstone National Park, Montana and Wyoming; a fire that was being allowed to burn broke out of the park. In all, more than one million acres of national park, national forest and private forest land were burned.



The 1910 fire burned three million acres of virgin forest land in northern Idaho and western Montana - in just two days. The handwritten inscription on the back of this photograph says all there was to say: "The way 200,000 acres of the Lolo forest was left - This picture taken in cedar bottom - Trees are all overthrown by wind. Silver Creek - Lolo forest." (USFS photograph)

Parts of this chronology are taken from *The Big Blowup*

A Clash Of Titans

Bill Greeley, Gifford Pinchot and the 1910 Fire

By Jim Petersen

No single event in American history did more to shape the United States Forest Service than did the 1910 fire, and no two men ever cast longer shadows over the Forest Service than did Gifford Pinchot and W. B. Greeley, the agency's first and third chief foresters. Beyond all doubt, the way the Forest Service views forest fires today – indeed the way the public views forest fires – is rooted in their handling of events that occurred during and immediately following the 1910 fire.

Prosperity of the nation

On March 26, 1903, President Theodore Roosevelt made a speech at a Society of American Foresters meeting in Washington, D.C., outlining – in unmistakably clear terms – his reason



Gifford Pinchot, first chief of the U.S. Forest Service (USFS photograph)

for pushing creation of a system of national forest reserves. Here is what he said.

“And now, first and foremost, you can never afford to forget for one moment what is the object of our forest policy. That object is not to preserve the forests because they are beautiful, though that is good in itself, nor because they are refuges for the wild creatures of the wilderness, though that, too, is good in itself; but the primary object of our forest policy, as of the land policy of the United States, is the making of prosperous homes. It is part of the traditional policy of home making in our country. Every other consideration comes as secondary... You yourselves have got to keep this practical object before your minds; to remember that a forest which contributes nothing to the wealth, progress or safety of the country is of no interest to the Government, and should be of little interest to the forester. Your attention must be directed to the

preservation of the forests, not as an end in itself, but as a means of preserving and increasing the prosperity of the nation.”

The forces of destruction

It was no accident that Gifford Pinchot was selected in 1905 to be the first chief forester of the newly created Forest Service. He and President Roosevelt were kindred spirits. They shared a belief the agency's first job was to save western forests from the forces of destruction, to wit: western lumbermen.

Pinchot was much more than a forester. He was a crusader, and in powerfully delivered speeches he told a nation that if something wasn't done to curb the appetites of western lumbermen, there would be a timber famine.

He hand-picked his disciples – a mixture, he said, of “college-trained foresters, cattlemen off the range and lumberjacks fresh from the woods.” Bill Greeley was among the chosen.

Pinchot was outraged. He labeled Greeley's report “one of the ablest I have seen, and altogether one of the most dangerous. [It] puts the Forest Service in the position of throwing contempt upon its basic reason for existence.”

From the beginning, Greeley was uncomfortable with Pinchot's fervent belief in the mercenary character of the average lumberman. It was a discomfort that would later boil over in a series of very public debates that were destined to shape the entire National Forest System, and the Forest Service itself. But this was 1905, and for now the show was Pinchot's.

Pinchot's orations – and Roosevelt's – stirred long dormant public opinion. Newspaper reports about timber fraud involving public figures added fuel to the fire. In the end, over the objections of cattle, mining and lumber interests who had come to view western public lands as their own, congress created a series of forest reserves that became the National Forest System.

Not all beer and skittles

Bill Greeley loved his work, and he seemed to thrive on the chaos created by the emergence of the new Forest Service. He, however, had spent enough time laying out timber sales in northern California to know that all lumbermen were not the mercenaries Pinchot said they were.

“It is not all beer and skittles,” he told a friend. Perhaps, he said, there is “another side to forest devastation.” Perhaps lumbermen could be persuaded to cut less and replant where they cut if something could be done to reduce the risk their investments would burn up in a forest fire.

At first, lumbermen scoffed at Greeley's gentle prodding. He was, he said, frequently greeted with "expletives about taxes and carrying charges, mill investments to be liquidated and stockholders demanding dividends."

Still, Greeley pressed on; but it would take the greatest forest fire in American history to light the way.

Their common enemy

During the Pinchot years, an Adirondacks forester named H. M. Suter wrote an article in which he reduced the often high-minded aims of early day foresters to a single sentence. The first objective in forest protection, Suter wrote, was "to extinguish small fires promptly and thus avoid the great expenditures inherent in well-nigh hopeless struggles with conflagrations."

"It should be the concern of the public not only to keep the industry competitive but to cooperate with the lumberman in making his business more efficient... Progress toward an adequate forest policy rests mainly on cooperation between the public and the lumberman."

Bill Greeley never forgot this axiom. And when he assumed command of District One in September 1908, he began immediately to make plans for dealing with fire. But he faced a daunting task. Scattered through the 22 national forests under his jurisdiction were hundreds of thousands of acres of private forest land. Somehow, he had to convince lumbermen they should join forces with the government to defeat their common enemy: fire. Reduce the threat of fire, Greeley reasoned, and "the intelligent lumbermen, seeking their own interests, would flock to the banner of planned forest management."

Greeley found an ally in George S. Long of the old Weyerhaeuser Timber Company. Weyerhaeuser had lost a tremendous amount of timber in 1902 fires, and thereafter led a drive to encourage the formation of private fire-fighting cooperatives. Long invited Greeley to participate in a lumbermen's conference in Spokane in January 1909.

It was the opening he needed. By June, Greeley had negotiated agreements for cooperatives throughout District One, and the campaign spread to Oregon, Washington and California where other forest protection associations were soon established. Many of these cooperatives survive today and form a private industry network that continues to work hand-in-glove with state and federal fire fighting agencies.

There is no way of knowing how much more death and destruction the 1910 fire might have spread had not the fire cooperatives been in place, but in the aftermath, A. F. Potter, who was then acting chief of the Forest Service, paid tribute to Greeley's genius.

"The cooperation of railroad companies and private timber landowners in the Northwest has been a great help," he said. "We are in a much better position now to protect the forests than we would have been a few years ago."

What could not be measured was the strength of the forged-in-fire bond that now existed between the Forest Service and lumbermen who had together, and for the first time, faced down a common enemy.

Pinchot fired

For the young Forest Service, the 1910 fire added insult to injury. Earlier that year, Gifford Pinchot had been dismissed from his post by none other than the president of the United States, William Howard Taft. The president fired Pinchot for publicly castigating Secretary of Interior Richard Ballinger, for his role in what Pinchot thought was a fraudulent coal deal



W.B. Greeley, 1908, first District One Forester, and third chief of the Forest Service (USFS photograph)

involving public lands in Alaska. Pinchot's departure left the Forest Service without its guiding spirit. His absence together with the 1910 fire had much to do with the agency's decision to declare war on fire.

Canvas-wrapped bodies

In 1911, Congress ratified the Weeks Act. It put the federal government in the forest fire fighting business, and laid the groundwork for a vast network linking the Forest Service, state agencies and local cooperatives. That same year, Henry Graves, who replaced Pinchot, transferred Bill Greeley to Washington, D.C. and put him in charge of administering the Act. Greeley would later recall being "spurred on by vivid memories of blazing canyons and smoking ruins of little settlements and rows of canvas-wrapped bodies."

He became, he said, "an evangelist out to get converts."

A patriotic cause

In 1906, Bill Greeley and Gifford Pinchot rode the high lonesome together. In California's Sequoia National Forest, they marked timber in sale areas, scaled peaks to inspect possible lookout sites, and talked long into the night beside flickering campfires.

Greeley was a Pinchot disciple. Around him, Greeley said he felt "like a soldier in a patriotic cause."

"The appeal he...[made] to young people...[was] irresistible," Greeley later wrote. "He...[carried] a class of collegians with him almost as if he owned them...[and] trained a staff of young subordinates who fairly worshiped him, whose loyalty... remained unshaken by any later vicissitudes."

But it would not last between Greeley and Pinchot. Both were strong-willed men, and where lumbermen were

concerned, they disagreed sharply on how the government might best deal with them.

Pinchot believed regulation was the only answer, and he continued to beat the drum for federal control of private timberlands from his new post with the Society of American Foresters. Greeley preferred cooperation. It had worked on the fire lines in District One in 1910, and it would work in the future.

A clash of titans

In 1914, the Forest Service, the Bureau of Corporations and the Federal Trade Commission conducted a joint investigation of the lumber industry "to obtain and place before the public in a constructive way the essential facts regarding this industry and their bearing upon forest conservation."

Greeley participated in the investigation, and his subsequent report became the fault line between Pinchot-led forces who distrusted lumbermen outright and a more pragmatic Greeley-led contingent who recognized the role lumbermen were playing in opening the West.

In *William B. Greeley: A Practical Forester*, a 1961 book he wrote for the Forest History Society, George Morgan, Jr. described the position Greeley took in the 1914 report:

Unlike many of the intense idealists, Greeley recognized the value of the lumbermen to the development of the country's economy. In his opinion, they 'must be credited with public and economic service...through large contributions to the support of local government and of community institutions and improvements and, in the main, through...general and increasingly efficient protection of forest resources from fire.' But, [Greeley] continued, they had 'fallen down in...speculation...financing and...wasteful use of the forests.' These detrimental aspects of their business methods were the price the United States has paid for the means used to develop its new States.

Among Greeley's recommendations: Cutover timberland had to be protected from fire as a first step toward reforestation. Tax law changes were needed too, so lumbermen could afford to make long-term investments in forestry. And, he added, "public regulation of private forest lands...[would play] a necessary and important part" in the development of an overall plan for managing the nation's forests. "But," he added, "in the face of many economic, business and legal obstacles, the process must be one of gradual development."

Although Greeley knew there was only so much the government could do to help lumbermen, he was convinced "it should be the concern of the public not only to keep the industry competitive but to cooperate with the lumbermen in making his business more efficient...Progress toward an adequate forest policy rests mainly upon cooperation between the public and the lumberman. Little can be done by either single-handed...Suspicion and hostility...[would] not help the public and...[would] get nowhere in the practical needs of conservation."

Pinchot was outraged. He labeled Greeley's report "one of the ablest I have ever seen, and altogether one of the most dangerous." In his opinion, it accepted the "commercial demands of the lumber industry as supreme over the need of forest conservation and the right of the public...and puts the Forest Service in the position of throwing contempt upon its basic reason for existence."

The fault line had become a chasm.

Greeley's finest hour

On April 15, 1920, Bill Greeley became the third chief of the United States Forest Service. But Pinchot was still very much a force to be reckoned with. Now the head of the Society of American Foresters, which he helped found in 1900, he repeatedly and publicly challenged Greeley's leadership. But the two men did not disagree on everything. The realities of forest devastation and the need to regulate private timberlands were apparent to both of them, but they could not agree on how best to do it.

Greeley could not accept Pinchot's "starting point that direct police action by Uncle Sam...[was] necessary to bring about decent treatment of our forests."

"Cooperation in forest fire prevention is the first and at present by far the most important step," Greeley declared. Moreover, Greeley did not see fire prevention as an end unto itself. It was, he said "the most effective step the National Government...[could] take to secure the growing of timber on the private forest lands of the country."

Pinchot rejected Greeley's belief fire prevention was essential to reforestation. What was more important was a rigid national program limiting harvesting on commercial timberlands. He was convinced lumbermen were predators, and he told members of the House Committee on Agriculture, "These are the men who have already destroyed this country and reduced to desert conditions an area larger than the forests of Europe...The only control...these gentlemen have any fear of is national control."

Greeley never let his own emotions get in the way of winning the debate. "Timber can be grown on much of the forest land in the United States by private owners as a commercial enterprise," he told committee members. But first, he said, there must be "reasonable encouragement in the way of general and effective fire protection, tax adjustments, and education the timber supply of the United States can be largely grown by private enterprise."

In the end, cooperation won out over regulation. On June 6, 1924, Congress ratified the Clark-McNary Act institutionalizing cooperative firefighting and reforestation policies that remain in force today. It was Bill Greeley's finest hour.

A flood of memory

It takes about three hours to drive from Missoula, Montana to Wallace, Idaho. Interstate 90 rolls west down the Clark Fork River Valley through some of the prettiest country there is. Near St. Regis, the mountains close in. It is especially beautiful here in the fall when, for mile after mile, the summer-green of tamarack needles gives way to blaze orange and yellow. The colors are every bit as brilliant as they are in New England.

There is nothing left now that hints of what happened here in 1910, or in the halls of Congress thereafter. If, however, you had been on one of the Missoula-bound trains that rumbled down the St. Regis River Canyon on August 21, 1910 – through Saltese and Deborgia and Haugen and St. Regis – you would now be riding through a forest fire so near and so hot that it would melt the varnish off the cars.

West of St. Regis the canyon narrows, and near Deborgia, the Interstate, the old Milwaukee Railroad bed and the eastbound St. Regis River all run in the same bedrock groove. I still fish here now and then, as I did for the first time almost 40 years ago. Always there is a flood of memory, but the one that lingers closest is of my grandmother who rode the rails down the St. Regis River Canyon through the greatest forest fire in American history.

"Paiute Forestry"

The Nation's Fire Fighting Policy Was Itself Forged in Fire

In August 1910, an ideological fire that had been smoldering in California for 30 years collided head-on with the Great 1910 Fire. The 1910 fire won.

It was called the "light-burning" controversy, and it began in northern California in the 1880s. Lightburners were mainly settlers following what they believed to be "the Indian way" of managing land, especially forest land. Professional foresters of the day dismissed the practice as nothing more than 'Paiute forestry', rooted in Indian lore.

"Let us recognize frankly that light burning is simply part of the game of timber mining. To the gutting of heavy cutting, it adds the gutting of a total destruction of young growth. To cheapen the protection and utilization of old timber, it deliberately transforms the forest into a brush patch."

—W.B. Greeley, chief U.S. Forest Service, *The Timberman*, March 1920

Historian Stephen Pyne has written widely about the controversy, and in an article titled *Paiute Forestry: A History Of The Light-Burning Controversy*, [Princeton University Press], he traces its history:

"The controversy was at base a conflict between two sets of forest practices: one set learned largely from Indians and sustained by a frontier economy of hunting, herding and shifting agriculture; the other set, better suited for industrial forestry."

But light burning was not unique to the frontier West. Indeed, there is abundant evidence Indians used fire all along the eastern seaboard to clear land, to improve game habitat and to keep the always encroaching forests at bay.

"American foresters eventually learned the same lesson, recognizing the potential value of broadcast burning under certain conditions," Pyne wrote. "What they refused to admit, however, was that frontier laissez-faire fire practices could substitute for systematic fire protection under the direction of expert foresters. They saw light burning as a political threat, not as a management technique."

"Juvenile vandalism"

The explorer John Wesley Powell, was among the earliest advocates of light burning; and in 1889, when he was head of the U.S. Geological Service, he lectured then Secretary of Interior John Noble on the virtues of Indian fire practices. Bernard Fernow, who many credit with bringing forestry from Europe to America, later recalled, "Major Powell launched into a long dissertation...[about how] the best thing to do for the Rocky Mountain forest was to burn them down, and he related with great gusto how he himself had started a fire that swept over a thousand square miles."

Gifford Pinchot, who arranged Powell's meeting with Noble, and who would go on to become the first chief of the U.S. Forest Service, dismissed the incident as "juvenile vandalism."

Who coined the term "Paiute forestry" is not clear, but Pyne credits both Powell and Pinchot – Powell because he had earlier studied use of fire by the Paiute tribe in southern Utah, and Pinchot because he rejected fire as a land management tool. There are no historic references suggesting the term ever had racial overtones;

indeed, many early white settlers practiced "Paiute forestry" after observing how well it worked for Indians.

In the late 1880s, with establishment of the first western forest reserves, the light-burning controversy gained momentum; in 1902, a San Francisco newspaper endorsed light burning in an editorial. But others, including conservationist John Muir, opposed it; in a special report, the National Academy of Sciences argued for a tough fire control policy.

The ideological struggle came to a head in an experiment involving privately owned pine forests near Mount Shasta in northern California. The Diamond Match and the McCloud lumber companies had sided with foresters and were suppressing fire on their holdings, but T. B. Walker, another prominent Shasta lumberman had thrown in with the light burners. In 1909, he wrote an article for the National Conservation Commission endorsing the use of fire. Then, in a second article published in *Sunset* magazine in August 1910, fellow lumberman, G. L. Hoxie, went so far as to say light burning should be mandatory. Forest owners who did not practice it were a menace to neighboring landowners, he said.

The collision

Only a few days later, on the afternoon of August 20, 1910, the light burning cause collided with the Great 1910 Fire; much to the embarrassment of light burners everywhere, one of T. B. Walker's deliberately set fires also got away. It burned 33,000 acres before it was stopped on the Klamath National Forest boundary line. But it was an unlikely third event – the endorsement of light burning by Secretary of Interior Richard Ballinger – that convinced the Forest Service light burning was a bad idea. Ballinger had earlier orchestrated Gifford Pinchot's dismissal as Forest Service chief.

In *Fire In America*, Pyne described what happened next. "When the victor in the controversy that had resulted in Pinchot's ouster, [Secretary Ballinger]... then lent his support to light burning as a means of controlling the fires that the Forest Service was apparently unable to contain otherwise, the Service could easily equate light burners with its political enemies. It knew, moreover, that the larger conflagrations of the last half century, including the 1910 holocaust, had resulted from traditional

woodburning habits and that such practices were responsible, in the form of surface fires, for the deforested landscape that would lead the United States into a timber famine."

Nothing less than destruction

Henry Graves, who replaced Pinchot, led the fight against light burning. "The first measure necessary for the successful practice of forestry is protection from fire," he wrote. "As long as there is any considerable risk from fire, forest owners have little incentive to make provisions for natural reproduction, to plant trees, to make improvement cuttings, or to do other work looking to continued forest production...Merely setting fire to the woods [Paiute burning] without control is nothing less than forest destruction."

But the controversy would not go away, and at Graves' suggestion, Walker contributed \$100,000 to the Yale School of Forestry for a series of light-burning field experiments to be conducted on Forest Service ground in the West and South. The experiments were inconclusive, and the Forest Service dug in.

"The Forest Service," Pyne wrote, "took the position that light burning was at best an expedient to be used until formal protection could be established; at worst, it was a cynical sham promoted by timber barons in order to avoid their responsibility for the management of a public resource."

Again, the controversy would not die. By 1920 it was being debated in popular magazines. *Sunset* promoted an article written by Stewart White, a novelist and timberland owner who was attracted to light burning as a means of controlling both insect epidemics and the buildup of dead woody debris. Only after the Forest Service threatened to sue did *Sunset* agree to publish Graves' rebuttal. White's position was also advertised on street cars in Seattle, and again the Forest Service threatened to sue.

"Mere Paiute forestry"

Just before he retired, Graves wrote an article for an early day industry magazine called *The Timberman*, in which he called light burning "mere Paiute forestry, impractical for the management of industrial resources like timber, and not worthy of a professional cadre of scientific experts." Two months later, in the March 1920 issue of the same



Fires deliberately set by Indians and early white settlers helped keep forests free of debris and disease. Like lightning-caused fires, "Paiute forestry" also helped promote natural regeneration of ponderosa pines, which dominated vast portions of the West before the westward migration began after the Civil War.

magazine, the new chief of the Forest Service threw down the gauntlet. His name was W. B. Greeley.

"Let us recognize frankly that light burning is simply part of the game of timber mining," Greeley wrote. "To the gutting of heavy cutting it adds the gutting of a total destruction of young growth. To cheapen the protection and utilization of old timber, it deliberately transforms the forest into a brush patch."

"Prescribed fire," Greeley wrote, could be used to clear away logging slash or other forest debris that posed a fire hazard in recently replanted areas; but the idea that deliberately set fire should be allowed to run indiscriminately through forests was, in Greeley's words, "preposterous."

"Now comes an insidious doctrine telling everyone that this system of fire protection which has been built up with so much effort is unnecessary; that all we need to do with our western pine forests is to 'touch them off.' The plausible arguments advanced in advocacy of light burning make this proposal exceptionally dangerous. It weakens the confidence of the general public in real fire protection, [undermines] the support given by

timber landowners to organized protective efforts such as state and federal agencies and many associations have been successful in bringing about...[and blocks] progressive fire legislation in the western states. It [also] encourages incendiary fires by the settler, prospector or stock grower who has reasons of his own for wishing to clear the woods. It is a direct challenge to a national policy of forestry for it strikes unmistakably at the effort to keep timberland productive rather than permit them to become waste."

An official heresy

By 1924, half way through Greeley's tenure as chief of the Forest Service, light burning had become an official heresy. In the late twenties, the controversy moved from California to the Southeast, where fire-dependent longleaf pine provided a much more stable scientific platform from which to argue the merits of light burning. So serious was the lack of regeneration that Forest Service field officers began arguing the case for re-introducing fire to help restore longleaf regeneration.

By 1928, it appears even Greeley had been persuaded fire might be a useful reforestation tool in certain situations. However his memories of 1910 and years spent lobbying Congress for funding for reforestation and increased fire protection stood in the way of his ever endorsing light burning.

Shortly before he retired from public life in April 1928, Greeley conceded "a big public relations program" would be needed to explain to the public the difference between good forest fires and bad forest fires.

Heresy becomes gospel

In 1932, the Forest Service quietly modified its near-total opposition to fire to allow its use where wildlife habitat could be improved. Then, in 1934, the agency sanctioned its expanded use in the South. A fire that began in cedar and white pine forests in northern Idaho in 1910 was finally burning itself out in longleaf pine forests three thousand miles distant.

By the late 1940s the Paiute forestry debate had become a discussion between scientists arguing the finer points of when and where to use or not use fire. By the 1970s the Forest Service had itself become a champion of what by then was called "prescribed fire." It had taken the Forest Service almost sixty years to come full circle.

"In the early years the consensus among foresters was that forestry would be impossible if surface fires were tolerated," Pyne wrote in *Fire In America*. "By the 1970s it was asserted with equal conviction that forestry and land management would be impossible if prescribed surface fires were excluded. So complete was the conversion that when threats to prescribed burning appeared, foresters – with the Forest Service in the lead – rushed to its defense."

Ironically, the arguments now advanced by defenders of prescribed fire are in many cases indistinguishable from those put forth more than 100 years ago by disciples of light burning.

"The techniques and concepts had not changed," Pyne wrote, but their context had. The concept of light burning had assumed a new form, one wholly accepted within the context of the counter-reclamation."

What had been heresy in 1924 was now gospel.

Forty Years A Forester

By Elers Koch

Editor's note: Elers Koch grew up in Bozeman, Montana and worked for the U.S. Forest Service for forty years, from 1903 through 1942. He was – in the vernacular of his time – one of “Gifford Pinchot’s boys.” The two men met in Tacoma in the summer of 1899 where Koch was working as a summer assistant with the old Bureau of Forestry, which Pinchot headed. The Bureau became the U.S. Forest Service in 1905.

Koch graduated from Montana State University, then attended the Yale School of Forestry, which was then headed by Henry Graves, a friend of Pinchot and who became chief of the Forest Service after President Taft fired Pinchot. When Graves retired, W. B. Greeley became chief. Koch and Greeley were also good friends.

Koch was one of the Forest Service’s earliest and most skilled surveyors. In fact, the present-day boundaries of several national forests in Oregon, Washington, Idaho, Montana and California are based on work he did on horseback between 1903 and 1907. He went on to become supervisor of the what later became portions of the Bitterroot and Lolo national forests, which cover parts of both Idaho and Montana. From 1921 until he retired in 1943, he was Region 1 assistant regional forester.

After he retired, he wrote *Forty Years A Forester*, a largely autobiographical work describing his Forest Service experiences, including numerous narrow escapes from forest fires – among them, the 1910 fire. Excerpts from his book are reprinted here, and provide an insider’s perspective on what it was like to be a forest ranger when the U.S. Forest Service was still new.



Lookout station on Mt. George in Idaho's Nez Perce National Forest, 1934. (USFS photograph)

No American texts

The faculty of the [Yale] forest school was small, and so were the classes, so we had close individual contact with our professors. Henry S. Graves, the dean, was a man of the highest ability and distinction, and a good teacher. There were practically no American text books in forestry at that time, so we had to use European ones, mostly English. Schlich's *Manual of Forestry*, in five volumes was our standby, though we tried hard to wade through Gayer's *Waldbau* in German. At any rate we learned the elements of forestry, silviculture, dendrology, forest management, forest economics, wood technology, surveying and some of the kindred sciences...

A few dingy rooms

I have always been proud of being one of Gifford Pinchot's young men. It was a fine, enthusiastic, and inspired a group of public employees as was ever assembled. Now, when I arrived in Washington June 17, 1903, I had, to my satisfaction, an appointment signed by the Secretary of Agriculture as Forest Assistant at a salary of \$1,000 a year. I found the Bureau of Forestry established in a few dingy rooms in the old Atlantic Building, which was to be the home of the expanding Forest Service for a good many years...

No time to lose

The best public forest lands were rapidly passing into the hands of lumber companies through all of the devices of the public land laws, homesteads, timber and stone claims, and scrip. There was no time to lose, and G. P. was sending his young men to ride the forests and mountains of all parts of the West, from Canada to Mexico, to map and report on all the considerable bodies of forest land still remaining in public ownership...

Thrilling wild country

One was given a map of say California, or Montana or Wyoming with an area of a few million acres roughly blocked out in green. One proceeded to the nearest point by rail, and then rode all summer, seeing thrilling new wild country every day, sometimes with a pack outfit and packer, more often riding alone, stopping when night overtook one at small towns, ranches, sheep camps or mines or sleeping out if necessary...

Growing forest reserves

At the end of the field season we returned to Washington and took up

desks in a big room in the Atlantic Building to prepare our reports and maps and draw in the boundaries for a new reserve. As fast as completed, proclamations were drawn and dispatched to President [Theodore] Roosevelt who signed them and thus added another million or two acres to the growing forest reserves...

Great open fields

I was delighted with the first view of Shasta, that most beautiful of mountains towering in virgin white above the timbered plateau. On the slopes just below timberline were great open fields, and I remarked to [Albert] Potter what wonderful mountain meadows those must be. Potter smiled his little smile, and said wait till I see them. Little did I know then of the great California brush fields, products of past forest fires, and almost impenetrable either afoot or horseback...

A real job

The spring of 1905 saw a new chapter opening for the Forest Service. Gifford Pinchot had finally persuaded the administration that the forest reserves should be transferred from the General Land office in the Department of Interior to the Department of Agriculture, and management placed under the Forest Service. Now we had a real job of forest management on our hands...

Men who could shoot straight

G. P. had promised the western people that so far as possible the reserves would be put in charge of local men who knew the country and its traditions. As pioneer conditions prevailed, the aim was to select competent woodsmen for rangers – men who could shoot straight, handle horses, travel with a pack outfit in the hills, and generally take care of themselves...

A tone like a rattlesnake

Gifford Pinchot was a hard taskmaster for us young fellows. We had a buzzer system for interoffice signals, but G. P. had a special buzzer of his own for our quarters, one buzz for me, two for Riley, and three for DuBois – and this buzzer had a tone like a rattlesnake that fairly lifted one out of his chair and across the room when G. P. pressed it. When we wrote a letter for G. P. to sign, we always awaited in fear and trembling. If he signed it without change, it was an occasion for triumph. Often the letter came back with a big blue question mark

scrawled across it. Then we had to figure out if it was basically wrong or merely a punctuation point out of place. G. P. was merciless with careless errors...

He [Pinchot] was a man of the most impressive appearance and magnetic personality. It was his almost religious devotion to the cause of forestry and conservation that inspired loyalty and interest in the job for its own sake that was probably never equalled in any government bureau. In some ways his character resembled that of Franklin D. Roosevelt. Both men professed, and I think sincerely, the greatest solicitude for the small man, the under dog. At the same time both men were aristocrats by birth, training, environment and inherited wealth. While G. P. could be very affable and free and easy with woodsmen and mountain men and small ranchers, he never could quite make himself one of them; similarly to Roosevelt, he was always the aristocrat, and his affability contained something of patronage. One never forgot that he was Gifford Pinchot, the chief, and no one ever dreamed of taking any liberties with him. I recall one young man in the office routing a document to his desk marked simply, "Pinchot". He was given a severe personal reprimand for leaving off the "Mr."...

Everything to do

In December, 1906, I moved to Missoula, Montana with all my lares and penates, including a new bride, and took over administration of the Lolo, Bitterroot and Missoula national forests...The feeling of proprietorship of a good [forest] supervisor is so great that it is almost as though he owned the land himself, and he gets about the same pleasure and satisfaction out of it...There was everything to do, the selection and appointment of an adequate ranger force, the exploration and mapping of the basic territory, ranger stations to locate and build, the planning, location and construction of the trail system, and later a telephone system. We had not yet reached the stage of thinking about road building...I established an office in a couple of rooms in the old Hammond Building and installed an ancient Oliver typewriter, a desk and a few filing cases...

Practicing real forestry

This was my first opportunity to really apply the principles of forestry I had learned at Yale. I knew all about the different silvicultural systems in theory,

the shelterwood system, the selection system, the single seed tree system, and so on, as used in Europe, but when I came to apply them in our native timber with no precedent to go on, that was something else. I got a crew of rangers together and we started marking the timber to be cut. Fortunately ponderosa pine, or yellow pine as it is commonly called, lends itself well to common sense forestry. One approaches a great yellow bark pine with the growth beginning to thin out and flatten at the top. No doubt about that fellow, he is mature and ready to cut, and the sharp marking axe takes out a chip from the bark, and the raised letter U.S. on the poll of the axe stamp him for removal. Perhaps the next tree is a black barked tree with a full crown. That fellow is growing fast and we will leave him for the next cut. So one goes through the stand, taking out the mature trees and leaving the more thrifty to grow. This is the best part of a forester's work; now we are practicing real forestry...

Propaganda unnecessary

After 45 years it is a pleasure to see the results. The trees left have grown enough so the area is ready for a second cut, and all the openings have seeded up densely to a fine new crop of sapling pine and fir...

I did little in the way of propaganda. I always figured that if the Forest Service did a good job without fear or favor, opened up the country with trails, administered our timber sales and grazing permits fairly, and kept down the forest fires, and made a good showing of efficiency and economy, the works would speak for themselves, and much education and propaganda were unnecessary...

Incendiary fires

There were three principal lines in which the Forest Service could be useful [during World War I]. First, to maintain the protection of the national forests, particularly against the danger of incendiary fires, and to make the national forest timber available for use in the war. Somebody had to stay home and handle this job. There was the big field of wood technology. The Forest Service, with its forest products laboratory at Madison, Wisconsin, knew more about wood than any other agency, and almost inevitably it was called on to advise the Army and Navy on a great many technical questions on the uses and availability of wood for various military purposes, such things as design and fabrication of laminated wooden airplane propellers, plywood



Ranger Griffin, with map and compass, at work in what is now Idaho's Kaniksu National Forest. 1909. (USFS photograph)

airplane fuselages, walnut for gunstocks, oak for army wagons, quick kiln drying of wood for all the many, many purposes for which vast supplies were needed immediately...

A complete defeat

I have lived through at least nine years, which could be classed as really bad forest fire years, 1910, 1914, 1917, 1919, 1925, 1926, 1929, 1931 and 1934. It is well known that drought years come in cycles, and without much doubt my contemporaries and I lived through a fire period which may not occur again in equal intensity for a hundred years. It started off with a bang in the historic year of 1910, when fire swept the northwest from end to end, culminating in the terrific blowup of August 21, when in this region, 85 lives were lost besides the destruction of several towns, mines, ranches and livestock, and millions of acres of forest land left a blackened waste. It was a complete defeat for the newly organized Forest Service...

Very satisfying results

It is only of late years that, with the snags mostly down, and a new growth of trees springing up on many of the burns, that the 1910 burns are becoming a protectable area. Much of the area was burned a second time in the succeeding series of bad fire years, and it is on these doubly burned areas that most of the tree

planting in Montana and Idaho has been done, with some very satisfying results...

Shell bursts ahead

Fire fighting is perhaps the nearest thing there is to war, and not without its dangers, and always requiring extreme physical exertion, long hours, lack of sleep, and constant nervous tension...In a way it is like troops moving into the front line, and listening to the artillery and shell bursts ahead...

Brains spilling out

If I have had any success in controlling big fires, it is because I have never believed in generalship from the rear...Scouting outside the burned area there is always danger of getting caught in sudden uprush of a crown fire, and many a breathless climb have I had escaping such a thrust...On fires in which I have taken part, at least six or eight men have been killed by burning snags crashing down on them, and it is not a pretty sight to see a man with his head smashed and the brains spilling out...

Punks and stew hums

In the earlier [fire fighting] days of the Service we had to gather together such men as we could get from the streets, saloons, and off the freight trains. As a result, there was almost as much misery connected with handling the men as with fighting the forest fire. Such transients

were almost like children, unreasonable, irresponsible and acting purely on impulse...If we were lucky there would be enough good lumberjacks in a crew to fill the axe and saw gangs, and the punks and stew bums would be given a shovel or mattock to get the best they could out of it...I remember an old ranger calling me on the phone and saying a fire had broken over badly and he needed some men right away. "How many do you need?" I asked. "Send me ten men; that is ten men if they wear hats; if they wear caps I'll need thirty." The distinction was that the respectable lumberjack never wears a cap in summer, always a felt hat, usually a black one, whereas the pool hall boys and general bums in those days usually wore caps and shoved their hands deep in their pockets...

The bravest crew

Burning conditions [on the Lochsa River] could not have been worse [than in 1929]; heavy dead timber killed in the 1910 fire, and grown up to dense brush. The timber was mostly white fir and cedar. Rotten white fir snags could catch fire in the tops and throw showers of sparks which again and again blew across our fire line and started fires in

rotten wood back of the line. Big hollow dead cedars came crashing down across the line, shattered into kindling wood, and burst into flames. The falling snags were a constant hazard to the men. A 150 foot dead tree comes down with a slam that shakes the ground like a burst of a high explosive shell, and is calculated to put fear into the hearts of the bravest crew of men...

Masses of flaming gas

Even as I watched, the fire crossed the small creek just above our fire line and swept up the slope, great masses of flaming gas rolling out of the black smoke and whole acres bursting into flame spontaneously...The smoke was so dense nothing much could be seen, but we could hear the muffled roar and crackle of the fire and the crash of falling trees along the slope to our right. An occasional swirl of the high wind parted the smoke so that the flames could be seen sweeping wildly through the heavy stand of dead timber...

Violent and destructive

I never cruise a virgin timber tract, destined for sale and logging, without a feeling of distaste for the inevitable destruction of so much beauty. As a forester it is my job to grow timber for

use. Much of this beauty must be destroyed to provide wood for the use of the nation, when the trees are mature or over-mature. But even with the best forestry practice calculated to reproduce the stand for a new crop, logging the white pine type must inevitably be violent and destructive...

A big forest

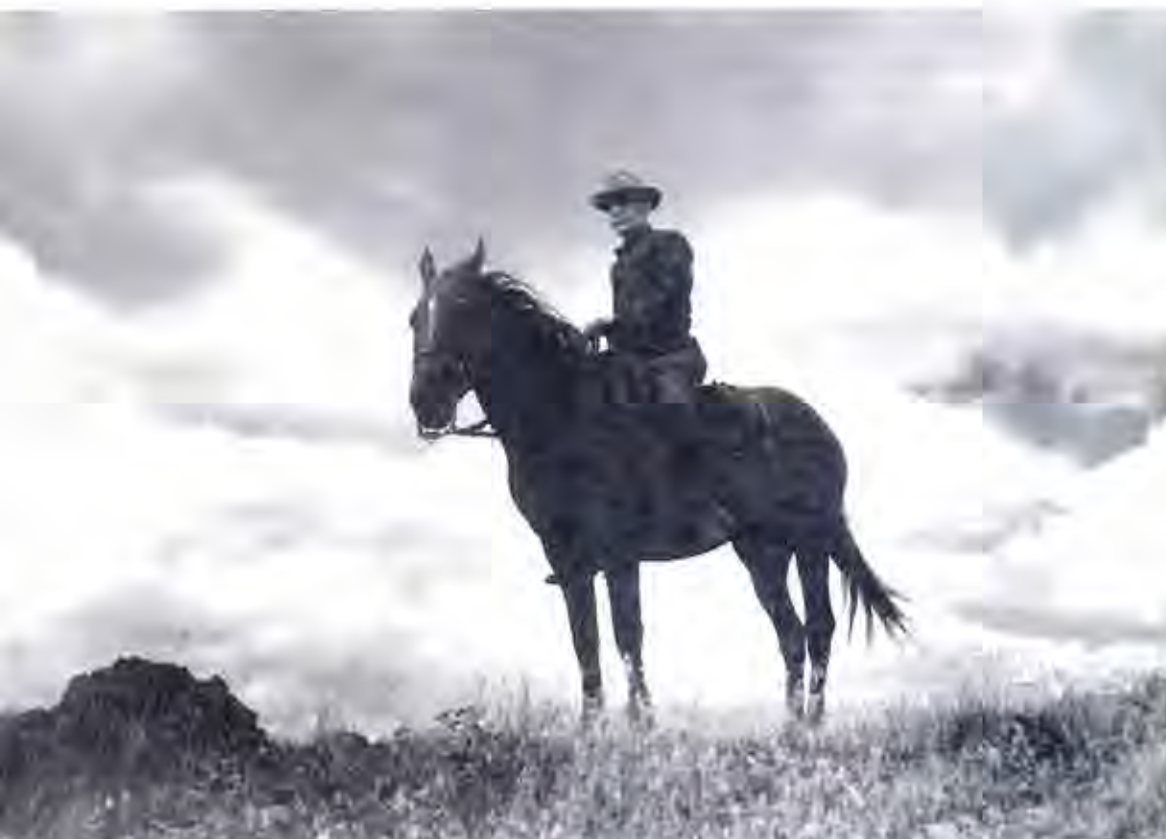
I sometimes go over our old timber sale operations, and while as a forester I may be highly gratified at the success in re-establishing a fine stand of seedling pines, offspring of the seed trees left, still I cannot help recalling what the virgin stand looked like, and knowing that it will be 100 years or more before we again have a big forest, and of course we will never again grow three or four hundred year old trees like the ones we have cut down...

Blackened and devastated

One of the activities which has given me great pleasure and satisfaction as a forester is tree planting. As forest supervisor on the Lolo Forest, I early established the Savenac Nursery, which was at one time the largest of the Forest Service nurseries, and which has for more than 35 years produced from two million to seven million young trees a year. The great 1910 fires left millions of acres of mountain country blackened and devastated, and it was our job for years to restore such areas to productivity by artificial planting...

A final accounting

If one is fortunate one may come back again in 30 years and walk under the crowns of a splendid pole stand of vigorous young trees. Some of my oldest plantations are nearly 35 years old, and it is always a joy to see them and watch their development year by year. When a forester goes to St. Peter for a final accounting, I am sure that when he is asked what he has done with his life, if he can point to thousands of acres of once ugly burn now covered with a growing forest, it will offset many sins of omission and commission...



Elers Koch in 1941, two years before the end of his forty-year career with the U.S. Forest Service (USFS photograph)

The Relation of Forests and Forest Fires

By Gifford Pinchot

Editor's note: In 1899, six years before the Forest Service was born, Gifford Pinchot wrote an article for *National Geographic* titled, "The Relation of Forests and Forest Fires." He was then the head of the federal government's Division of Forestry, which would later become the Forest Service, with Pinchot again at the helm.

Excerpts from Pinchot's article are reprinted below, and reflect a remarkably clear understanding of the ecological role fire was playing in forests then under his jurisdiction. Even so, he could not bring himself to side with fire. Thus, in the article's concluding paragraph, he wrote, "I hasten to add that these facts do not imply any desirability in the fires which are now devastating the West."

Some historians believe this remark may have had something to do with the fact arson was widespread at the time, a western reaction to creation of federal reserves. Read John Leiber's comments in "Could What Happened in 1910 Happen Again," page 37.

In any event, Pinchot's explanation of fire is as instructive as it was ninety-five years ago, and should help readers understand the relationship between fire and other natural forces at work in forest ecosystems.

It is unfortunate that our acquaintance with what might almost be called the creative action of forest fire should be so meager, for only through a knowledge of this relation and through the insight which such knowledge brings can there be gained a clear and full conception of how and why fires do harm, and how best they may be prevented or extinguished...

There is but little of all the vast forest area of this country which does not bear, either in actual scars and charcoal or in the manner and composition of its growth, the marks of fire...

Where such forest lands have been protected from fire, as they are very largely through the progress of settlement, young trees have usually sprung up in great numbers under or between the scattered veterans which had survived the fires, and a dense and vigorous young growth stands ready to replace by a heavy forest the open park-like condition which the fire had created and maintained...

Perhaps the most remarkable of the regulative effects of forest fires relates to the composition of the forest - the kinds of trees of which it is composed and the proportion of each. This effect depends upon the action of fire in combination with the various qualities of resistance which trees possess. These qualities are of two chief kinds; one adapted to secure the safety of the individual tree directly through its own powers of defense, the other to assure the continuance of the species with little regard for the single tree.

An example of the first kind is the western larch, whose enormously thick bark is almost fireproof, and so good a non-conductor that it protects the living tissue beneath it even against fires hot enough to scorch the trunk 50 or 75 feet above the ground. It is this quality of their bark, as well as their marvelous vitality, that the big trees of California owe their power to reach an age of 3,000 to 4,000 years...

Almost all trees yield readily to slight surface fires during the first ten or fifteen years of their life. To this statement the longleaf pine is a conspicuous and rare exception. Not only do the young trees protect themselves in early youth by bark which is uncommonly as thick as the



Where Douglas-fir grows



Where western larch grows



Where lodgepole pine grows



Where longleaf pine grows

wood [the whole diameter being thus two-thirds bark and one-third wood] but they add to this unusual armor a device specially adapted to their safety when growing amid long grass, usually a most fatal neighbor to trees in case of fire. It is to be noted that the vast majority of longleaf pines are associated with grass from the beginning to the end of their lives. During the first four or five years, the longleaf seedling reaches a height of but four or five inches above the ground. It has generally been erroneously assumed that this slow growth made it specially susceptible to injury from fire; but while the stem during these early years makes little progress, the long needles shoot up and bend over in a green cascade which falls to the ground in a circle about the seedling. Not only does this barrier of green needles itself burn only with difficulty, but it shades out the grass around the young stem, and so prepares a double fire-resisting shield about the vitals of the young tree...

The second method of protection against fire is that which sacrifices the individual but secures the safety of the species. Perhaps the most striking example of this method is furnished by the lodgepole pine, which is being distributed over hundreds of square miles in the Rocky Mountain region by the action of fire. It is a fact that this thin-barked tree, which succumbs with the utmost readiness to fire, is gaining ground by the action of its enemy, replacing over great areas thick-barked species like the red fir and the western larch...[It does this by] hoarding for several years the ripe seeds in the cones. Fire rarely burns down the lodgepole pine, but in nearly every case simply kills the standing tree and leaves it to be blown down years after, when decay shall have weakened the roots. In the meantime, the hoarded winged seeds are set free by the opening of the cones, are distributed

and germinate and the new crop contains a larger proportion of lodgepole than the old. By the repetition of this process great stretches of burned land are finally covered with a pure, even-aged younger growth where formerly the forest was composed of other and usually much more valuable species...

A somewhat less obvious, although not a less interesting, instance of distribution controlled by fire is that of the red [Douglas] fir in those portions of Washington [and presumably Oregon also] where it reaches its best dimensions and greatest commercial importance. Here the young seedlings are found in remarkable abundance on unshaded spots wherever the vegetable covering of the mineral soil has been burned away...Continuous stretches of miles without a break were covered with a uniform growth of Douglas fir [red fir] from two to three feet in diameter, interspersed with numerous rotting stumps of much larger trees bearing the marks of fire. The young firs were entirely unscarred, but charcoal was found at the roots of some specimens which had been thrown by the wind...I did not see a single young seedling of Douglas-fir [red fir] under the forest cover, nor a single opening made by fire which did not contain them. In a word, the distribution of red fir in western Washington, where it is by all odds the most valuable commercial tree, is governed, first of all, so far as we know at the present time, by fire. Had fires been kept out of these forests in the last thousand years the fir which gives them their distinctive character would not be in existence, but would be replaced in all probability by the hemlock, which fills even the densest of the Puget Sound forests with its innumerable seedlings. I hasten to add that these facts do not imply any desirability in the fires which are now devastating the West.

A Conversation with Dr. William "Bud" Moore

One of the nation's leading experts answers questions about the role fire plays in forests

Editor's note: Dr. William Moore was for six years the chief of fire management for the Forest Service's Northern Region. Now 77 years old, he lives in Condon, Montana where he manages some 240 acres of private land and counsels his neighbors on his version of sustainable forestry. He also logs and runs his own small sawmill.

Dr. Moore retired from the Forest Service in 1974, ending a distinguished 40-year career that began in 1934 on the fire lines



A young Bud Moore, on the porch at the Powell Ranger Station on the Lolo National Forest, early 1940s. (Bud Moore photograph)

in the Lolo National Forest. For many years, he directed the agency's safety and training programs. He also worked on a top secret Department of Defense study, modeling the types and sizes of fires that might result from a nuclear attack, and he is the principal architect of the Forest Service's wilderness fire management strategy.

Recently, Dr. Moore completed the manuscript for a long-awaited book about the history of northern Idaho's Lochsa River, where he spent his early Forest Service years.

Among the chapter titles: "The Common Enemy Was Fire," "Testing the Ranger's Resolve," "Ending the Illusion of Superabundance," and "A New Look at Conservation and Multiple Use." Much of the inspiration for his Lochsa story came from his good friend, the late Norman Maclean, who wrote an American classic titled, *A River Runs Through It*, and more recently, *Young Men and Fire*, published posthumously and featured in the March-April 1994 issue of *Evergreen*. In *Young Men and Fire*, Maclean described Dr. Moore [he prefers to be called "Bud"] as one of "two of the Forest Service's greatest fire experts."

Perhaps even more revealing is this passage describing Dr. Moore's pivotal role in a 1957 Forest Service task force that studied ways to prevent loss of life among forest fire fighters. "The task force developed a practical set of recommendations and at a meeting in Washington, D.C., it was decided these orders should be modeled on the military services' General Orders." Bud Moore, who had been a Marine all over the Pacific in World War II, found a Marine standing outside at a bus stop, and together they quickly reconstructed the Marines' General Orders, which became the model for the Forest Service's ten Standard Fire Fighting Orders.

"Norman loved the old Forest Service and all that it stood for," Dr. Moore recalled during our interview. "He liked people who were doing things he wished he could have done more of. I think that's what attracted him to me. He wished he could have spent more of his life in the woods and less of it teaching English at the University of Chicago."



Bud Moore: "Some forests look at you and say, 'leave me alone.' Other forests say 'spend many years with the U.S. Forest Service.' (Miko McMurray photograph)

The two men were neighbors and fishing companions for many years, and Dr. Moore reviewed portions of both of Maclean's books. "He used to say, 'If you write a book about a hammer, you better have a carpenter read it,' so I guess he felt it was important to have someone who had lived through the Forest Service's many trials by fire read what he wrote about us."

Among Dr. Moore's mementos are several handwritten letters Maclean wrote him over the years they knew one another. "They are masterpieces," he said. "Each sentence has a message in it, and if you string these messages together, there is almost always a bigger message at the end."

Dr. Moore recalled a talk he heard Maclean give a few years before he died. "He said no matter the lifelong search for success, when you get to the twilight years, close to the end of life, all you are left with is nature, the people and your spiritual beliefs. I agree with that."

Dr. Moore recently joined The Evergreen Foundation. In this interview, he discusses his views on fire, logging, ecosystems and forest health.

EVERGREEN: Dr. Moore, what role does fire play in forests?

DR. MOORE: Fire clears away dead or diseased trees and other vegetation, and recycles their nutrients which are needed to perpetuate healthy land capable of hosting vigorous forests. In the northern Rocky Mountains – in the context of topography and climate – fire is nature's most important agent for regeneration and diversity.



use me for the wood I can grow." Idaho's Lochsa River, where Bud Moore

EVERGREEN: Are all forest fires similarly beneficial?

DR. MOORE: Some forest fires are beneficial, but others are destructive, which was the primary reason the public rose up in opposition to them after the 1910 fire. Too many people had died in fires, and too many frontier towns had been destroyed. People realized progress on the frontier was impossible so long as large fires burned unchecked. In response, Congress put the federal and state governments in the business of putting out forest fires.

EVERGREEN: What has been the result?

DR. MOORE: There have been positive and negative results. A lot of valuable timber has been saved, for present-day use, that would not have otherwise been available. Excluding fire has also favored old-growth-dependent wildlife species, but has led to a decline in forest diversity, which has been detrimental to other species.

Publicly mandated fire protection has also led to unnaturally large accumulations of woody debris, which fuel large fires; but in most western forests, this wildfire threat has been countered

by a removal of fuels during logging operations.

The current program of allowing fires to more nearly play their natural role in wilderness areas has also helped reduce the threat of larger fires.

Beyond these positive and negative forces, there are indications that many forested ecosystems cannot maintain their health and productivity in the absence of a positive role of fire.

EVERGREEN: Would it be accurate to say the dead and dying forests we see now add up to what is generally called "the forest health problem?"

DR. MOORE: Dead and dying trees are one of many examples of what is called "the forest health problem," and excluding fire from forests is one of several causes for what we are witnessing. The pace of timber removal from some drainages in the northern Rockies has opened so much of the forested landscape that logging cannot proceed further without unacceptable damage to the land, streams and wildlife. In other areas, we cut too many trees for too many years, and left too few big trees behind to promote natural re-seeding. This is particularly true in portions of eastern Oregon, eastern Washington, Idaho and Montana, where ponderosa pine was a dominant species before white settlement began.

EVERGREEN: What happened in these forests?

DR. MOORE: The structure and species composition of ponderosa pine-Douglas-fir forests has changed. In the absence of abundant natural seed source – and a forest floor nurtured and kept open by fire – ponderosa pine reproduction tends to give way to shade-tolerant species, usually Douglas-fir, which now dominates the understory in many forests where ponderosa pine once thrived. But the fir doesn't do well in this unnatural situation. There is too much competition for soil, water, nutrients and crown space. Consequently, some trees in the understory are dying from root rot, and woody debris continues to accumulate on the forest floor because most forest fires are put out immediately. To make matters worse, this understory creates ladders of fuel that can generate stand-replacing fires when forests are especially dry.

EVERGREEN: Some believe the solution to this problem is to simply let nature take its course, to allow natural fire to consume these dead and dying forests. Is this a reasonable or natural solution?

DR. MOORE: It depends on what you want to achieve on the land. In today's forests, we seldom deal with truly natural problems; and in this instance, we are dealing with unnatural forest conditions brought on by over ninety years of intentional fire suppression, plus changes that are a result of a variety of forest uses, including logging and grazing.

It is also very important to remember that the changing forest I described a few moments ago is only one of many forest types present in the West. Each type is different, and each situation within each type is also different. Each of these types and situations requires a unique treatment to keep them healthy, whole and productive. Fire does not play exactly the same role in each forest type, so it would be incorrect to assume allowing fires to burn would automatically restore forest health.

Also, the forest I described – and a few others I could name – aren't simply dead or dying forests. They are also places where our lack of understanding or disregard for natural laws have created unsustainable situations where ecosystem health and productivity are concerned.

EVERGREEN: What then is the solution?

DR. MOORE: It depends on the management objectives set out for a particular ecosystem. For example, in wilderness, where the objective is to allow natural forces to prevail, it makes sense to allow fire to more nearly play its natural role. But if we are talking about the forest I was describing a moment ago – and if the objective is to restore the sustainability of ponderosa pine – the best course is to protect the few remaining large pines as a seed source, remove or thin the fir understory by logging and, after that, carefully prescribe fire to assure nutrient recycling and a seed bed capable of sprouting ponderosa seedlings.

EVERGREEN: Where does the “let-burn” policy enter this discussion?

DR. MOORE: The so-called “let-burn” policy is one of the most misunderstood and misleading of all land management issues. There is no “let-burn” policy, and I know of no Forest Service policy in which “let-burn” is authorized. I was one of the principal authors of the Forest Service’s wilderness fire management policy, which is probably the basis for the let-burn misunderstanding. What we were trying to do was *allow fire to more nearly play its natural role*. There is a great difference between allowing forest fires to burn indiscriminately and allowing them to more nearly fulfill their natural role.

EVERGREEN: What is the difference?

DR. MOORE: Allowing fire to more nearly play its natural role requires clearly stated land management objectives for each ecosystem considered. When I was the northern region’s chief of fire management, I helped advance the Forest Service’s fire policy from strict fire control to fire management. My goal was to organize fire programs to help managers attain the objectives they wanted to achieve on each unique ecosystem, large or small, under their jurisdiction.

Where carefully applied fire was needed – such as in my ponderosa pine example – that is what we did. Where uncontrolled fire could not be tolerated – such as among forested residential areas, recreational areas or plantations – that became our goal. Where fire was needed to perpetuate natural conditions – such as wilderness, natural areas, or primitive recreational areas – we allowed fire to more nearly play a natural role, but always under prescription and surveillance. Where necessary, to protect other objectives on adjacent land, we maintained partial or complete control.

EVERGREEN: So a properly managed fire is a land management tool?

DR. MOORE: Yes, but in the absence of tightly focused land management objectives, you invite real disaster. No matter how fire is used, fire management must always be placed in the hands of experienced teams.

EVERGREEN: Give us an example of such a disaster?

DR. MOORE: We had one here in Montana in 1988 called the Canyon Creek Fire. It started in June in the Scapegoat Wilderness Area. The decision was made to allow it to more nearly play its natural role, which is compatible with wilderness management. A prescription was prepared for the fire, surveillance practiced, and some measures taken to control parts of the fire that approached the wilderness boundaries. But by late summer the fire burned out of the wilderness, and substantial damage was done to public and private property.

In this instance, the clearly stated land management objective was to allow the fire a more nearly natural role in the

wilderness, with a strict fire control policy outside the wilderness. What wasn’t clear was the risk in allowing the fire to burn in June, when the severity of July, August and September fire weather could not be predicted. Also, the effect of four years of drought on forest flammability was not fully recognized.

Beyond these considerations, the wilderness portion of the fire burned with unexpected intensity because past fire protection measures had resulted in excessive fuel buildups. This would not have happened if we had been allowing fire to more nearly play its natural role.

In short, Canyon Creek was an unnatural fire fueled by unnatural conditions. And by the time it reached the explosive stage, numerous fires burning elsewhere in the West took up much of the suppression capability needed to contain Canyon Creek in the wilderness. By the time a strong fire-fighting force was assembled, it was too late.

EVERGREEN: What is the potential for a repeat of the 1910 fire?

DR. MOORE: It could happen, and I know some fear it will, but I don’t think it is likely. Logging has removed much of the woody debris that was in forests when I went to work for the Forest Service in 1934. The fact that fire is now playing a more natural role in wilderness areas is also helping to reduce the risk. Also, we have more roads, better fire detection, and a far superior fire-fighting capability than existed in 1910. So long as we stay alert and always respect fire’s awesome power, I’m not too worried.

EVERGREEN: If you were still the Forest Service’s fire chief, what would be the policy?

DR. MOORE: Managing fire by land management objective fits well within the idea that there should be an ecological basis for ecosystem management. I would continue to support this idea, and I would work to achieve governmental and citizen agreement on land or ecosystem management objectives. My policy would then be to apply or preclude fire accordingly, always recognizing that forest and range fires on the loose can be awesome forces to deal with. The strength of my fire-fighting capability would be my primary constraint. If I couldn’t control fire when I needed to control it, I wouldn’t ignite it or let it burn.

EVERGREEN: What should we do to reduce unnatural accumulations of dead woody material in forests?

DR. MOORE: Allowing fire to more nearly play its natural role in wilderness and natural areas is an important current and long-term objective. But outside wilderness or natural areas our two most practical ways to work the forest are *use of fire and harvest of wood products*. These are our working tools. And, as shown earlier in our ponderosa pine example, prescribed fire and logging can often be worked together to sustain land and forest health in the context of ecosystem management.

EVERGREEN: We have yet to see a definition of forest health that makes much sense to us. How would you define it?

DR. MOORE: Forest health is probably too abstract a term to be useful, except in high-level politics. I consider a healthy forest to be one that contains – in good condition – all of the parts and associated support systems required to perpetuate its vigor and productivity, with productivity constrained by the natural ability of the ecosystem to sustain itself.

EVERGREEN: How is forest health achieved?

DR. MOORE: I think we must first consider the health of the

land or the ecosystem we are discussing. Though important, the forest – the trees if you will – are only one of many interdependent parts of a forest ecosystem.

To be healthy, the land has to be whole with all of its parts and connecting links in good condition. We, the people, are a part of this whole, not apart from it. We are dependent on the land for a sustainable flow of commodity, recreational and spiritual values. So long as we remain focused on individual parts of the ecosystem, we will not fully recognize or understand the interdependency of the parts.

Historically, our land management practices have centered on managing the parts. We inventoried and measured what could be extracted, and planned from that vantage point. Now we need a new vantage point, one that will help us discover and understand the whole forest and its myriad interconnections. From this new vantage point, we will begin to understand how to achieve forest health.

EVERGREEN: Blaming others for what has happened in western forests is very fashionable now. Care to comment?

DR. MOORE: No society perpetuates its culture without a combination of trial, error and success. Of course we've made mistakes, including several I've described. But I think it is important to remember that these mistakes were made by dedicated people doing what seemed right – and probably was right – at the time. In the national forests with which I am most familiar, the most serious problems facing us today have risen from an illusion that we knew more than we did about managing forested landscapes. The lesson here is that, when in doubt, take a conservative approach that leaves plenty of margin for error.

EVERGREEN: Where did this illusion begin?

DR. MOORE: I think it is rooted in the idea that science can provide all of the answers needed for sustainable land and forest management. As important as science is, it can provide only a small portion of the knowledge we need to fully understand the workings of complex ecosystems.

EVERGREEN: What else is needed?

DR. MOORE: A knowledge and feel for the land and its forests is also important. Where science leaves off, there is plenty of room – indeed plenty of need – for what I would call decisions of the heart.

EVERGREEN: What do you mean by decisions of the heart?

DR. MOORE: When you have a feel for the land, some forests look at you and say, "leave me alone." Other forests say, "use me for the wood I can grow."

EVERGREEN: How can we turn ecosystem management – including decisions of the heart and soul – into public policy?

DR. MOORE: Our experience is evolving, and time and trial are needed before anything definitive can or should be written. As we proceed toward a new, more ecological way of viewing the lands we are managing, I think it important that we retain the remarkable store of knowledge and experience accumulated over the years we've been managing public and private forest lands. We have had some notable failures and some great successes. Both can help us bridge the gap between on-the-ground experience and public policy.

EVERGREEN: Where should we begin?

DR. MOORE: Fundamental to ecosystem management is an understanding and respect for nature's processes. Nature

removes nothing from the land. The pieces are recycled through processes that include fire, weather and decay. By contrast, meeting the needs of people requires removal of materials that nature would otherwise recycle. The question ecosystem managers must constantly ask themselves is not "How much should I take out?" but "How much must I leave behind so this ecosystem can sustain its vigor and productivity?" The answer to this question will vary from one ecosystem to another. As a beginning point, "people needs" should be prioritized in a way that accounts for the strengths and limits of each ecosystem. What will emerge is a set of alternatives for managing and protecting the ecosystem in a way that benefits both people and the land.

EVERGREEN: On what scale should this process be undertaken?

DR. MOORE: We are now spending considerable money and talent defining and studying large landscapes, such as the entire Columbia River Basin. This effort is needed to identify cultural and social dependence within an area and to expose the broader linkages connecting smaller landscapes and ecosystems to each other. For example, the anadromous salmon depend on and are linked to ecosystems from the Pacific Ocean to the crest of the Bitterroot Mountains in western Montana. Similarly, the welfare of far-ranging wildlife demands linkages between a variety of ecosystems. People and communities far removed from the forested landscape are likewise dependent on distant ecosystem vigor and health.

But if ecosystem management is to succeed, attention must also be paid to smaller, local ecosystems. These are unique landscapes, each different from the other, yet linked to one another and to larger landscapes in a variety of ways. It is here that citizens and managers should join together to decide how the land will be used; and it is here where dedicated land managers should decide what must be left intact to keep the land sustainable, and what can be removed or otherwise used to meet some of the needs of people.

EVERGREEN: How small are these local ecosystems you describe?

DR. MOORE: Some are smaller than individual stream drainages.

EVERGREEN: Is this where ecosystem management becomes a reality?

DR. MOORE: This is the heart of ecosystem management as I understand it and would define it.

EVERGREEN: Do you have any advice for citizens who may want to be involved in local-level ecosystem management decision making processes?

DR. MOORE: When in doubt, go slow. Look back to learn, not to blame. Be humble. Leave some room for errors. Learn from your mistakes.

EVERGREEN: How will we protect the local decision making process you envision from outsiders who disagree with consensus agreements made at the local level?

DR. MOORE: I think it is critical for the Administration and Congress to lend strong support to local-level ecosystem management, honoring decisions made jointly by federal forest land managers and broad-based citizen groups. Without this support, it will be difficult to turn the corner where forest health and fire management are concerned.

The Canyon Creek Fire

Editor's note: Reproduced below is a statement by Ray Krone, an Augusta, Montana cattle rancher whose land was burned by the 1988 Canyon Creek Fire. Mr. Krone's account is taken from film footage shot by Ken Eurick, a Butte, Montana cinematographer, who is working on a documentary about forest fires. Our purpose here is not to blame the Forest Service for what became a tragic fire, but to remind readers that forest fires can escape, even in today's world of sophisticated fire-fighting techniques. More than anything else, the Canyon Creek Fire underscores the need for humility when dealing with nature's awesome forces.

"The Canyon Creek fire started on June 26. There was an outfitter there who saw it strike – saw the lightning hit. It was a single tree. They [the Forest Service] could have put it out in nothing flat.

The outfitter kicked the fire together [in the hope it would burn itself out], and the next morning it rained, so he was surprised to see it was still smoking. He went up to put it out, but there was a lady ranger there and she said, "No, we better call in." So she called the Seeley-Swan Ranger Station and reported it, and they told her, "No, let it burn."

That was the start of the Canyon Creek fire. It took a long time, but it finally got out of the mountains. On August 29, it moved over right onto the edge of our country, and then on September 6 – that was the night of terror – it broke out of the mountains and ran wild on the prairie.

Before it was done, the fire burned 240,000 acres altogether: 40,000 acres of private land [were burned], 200 head of cattle perished, 200 miles of fence [burned] and 2,000 tons of hay [burned]. And besides [there was] all the anguish of people being moved from their homes. It was a helluva mess, and what a waste.

We think the Forest Service should be liable for this fire. They didn't start it, but they let it burn, and they couldn't handle it, and it got out on private land, and we think we're entitled to compensation.

If this fire had started on my land and burned on Forest Service ground, they would have been on my door the next



More than 200 cattle burned to death in the Canyon Creek Fire in Montana in 1988. This heifer was so badly burned she had to be shot. Read Ray Krone's description of the fire, and discover again why so many people fear the unintended consequences of forest fires that are purposefully allowed to burn. This photograph is from the *Sun Valley Sun*, Augusta, Montana.

morning with the bill, saying, "Mr. Krone, you owe us for this fire." But this fire started on Forest Service ground, and broke out onto private land, burned 40,000 acres, and they're saying, "Hell, that's too bad. Nothing we can do about it."

The Forest Service said very few wild animals were killed in the fire. That's not right. My son found four [elk] cows and calves and one bull elk. The bull was behind driving the cows and calves, and they only lacked about a hundred yards of getting in the clear. The bull was a seven-point on one side and a six on the other. Besides the elk, there was a lot of mule deer, and some white-tailed deer and all the grouse. There isn't a grouse left in the mountains.

I wish the public could see the poor cattle that were killed in this fire – cattle with their feet burned off, cattle with their bags burned off, cattle with their eyes blinded and staggered. We went around and shot them and put them out of their misery. It was the only humane thing to do.

As soon as the fire was out, the Forest Service came in with backhoes and buried everything. The bear were starving – the fire burned up everything they had to eat. But instead of letting them eat the carcasses, the Forest Service – you know, out of sight, out of

mind – dug a trench, piled the carcasses in and covered them up.

So many of the do-gooders – the environmentalists – all have a theory about what a helluva deal this is gonna be when this [the fire] all clears up. [They say] "Boy, the grass is gonna be so high you won't be able to see a cow through it – it's gonna be so much better."

The next guy that tells me that I'm gonna hit right between the eyes because I liked it the way it was.

One of my little grandsons said, "Grandpa, isn't that where we chased that old bull elk around last fall for a couple of hours and couldn't get him?" I said, "Yes, that's where it was," and he said, "Well, we won't be able to do that again will we?" and I said, "No, we won't be able to do that again...[then speaking to the cameraman, Mr. Krone said]...I'm sorry..."

At this point in the interview, Mr. Krone broke down and was unable to continue. He later sued the federal government for \$1.6 million for damage the fire did on his ranch. The government ultimately paid him \$600,000. Losses were greatest along the Dearborn River, a tributary of the Missouri River, about 50 miles south of Great Falls, Montana. "Six years later, it still looks like a moonscape," Mr. Krone laments.

Could what happened in 1910 happen again?

Yes, we could have another forest fire in the West the size of the 1910 Fire. But we are better at detecting fires than we were in 1910, and we have better equipment and better road access, so the losses might not be as great. In other words, events would probably play themselves out differently.

One man's opinion; but in this case, the man is an expert.

His name is Bob Mutch, and he has been fighting forest fires since 1953, the summer he joined a blister rust crew in Idaho. While on the fire lines, he met some smokejumpers and decided he wanted to jump. The following summer, he did.

Smokejumpers are paratroopers who fight forest fires. They jump into landing zones near fires, providing a first-strike capability that often makes the difference between "a ten o'clock fire" and one that burns for weeks or months. Smokejumpers pride themselves on being able to control a fire by ten in the morning. Hence, a ten o'clock fire.

The tools smokejumpers use follow them through the sky on parachutes dropped from their jump aircraft. It is an exact replica of war, complete with the opportunity to die in the line of duty.

Once you have been a smokejumper, you are always a smokejumper, even after you are too old to jump and must find a new line of work. There are even reunions where old smokejumpers gather, like old soldiers, to talk about the big battles they fought and won.

Mutch jumped onto his first forest fire in 1954. He was a junior at Albion College in Michigan, stationed for the summer at the smokejumper base in Grangeville, Idaho. He was so taken by the immense beauty of the northern Rockies that he decided to make fire management his life's work. He retired earlier this year, ending a distinguished career with the U.S. Forest Service. In his last assignment, he was research applications leader at the Intermountain Fire Sciences Laboratory in Missoula. He



Bob Mutch

is now doing consulting work for others who are trying to understand where and how to use fire as a forest management tool.

Only the wind was missing

The best descriptions of what smokejumpers and fire managers do are contained in *Young Men and Fire*, the late Norman Maclean's remarkable book about the Mann Gulch fire that burned in Montana in 1949. Twelve smokejumpers died there, less than two hours after they stepped into the skies above the smoke below. A thirteenth local fire-fighter also died in the blaze.

Maclean's search for answers to unanswered questions began within months of the 1949 tragedy and continued until his death in 1990. In *Young Men and Fire* [See *Evergreen*, March/April, 1994] readers are introduced to the science of fire fighting. We learn there are formulas for calculating how fast a fire will travel up or downhill, depending on how dry it is, how hot it is, how hard the wind is blowing, and the type and amount of timber – live and dead – the fire is consuming.

The Intermountain Fire Sciences Laboratory worked out these formulas, using scale-model wind tunnels to replicate what happens when big fires and big winds swoop down on forests with blinding speed. In *Young Men and Fire*, we learn that in a race against death, the will to live is no match for blinding speed. And from Mutch, we learn that in 1994 we veered very close to 1910. Only the wind was missing.

"If we had experienced sixty and seventy-mile-an-hour winds for twenty-four hours, as was the case in 1910, I think we might have seen fires on the same scale," Mutch said. "Especially on the Kootenai National Forest in northwest Montana where we saw lightning start 160 new fires in one night."

John Bernard Leiberger

What is happening on the Kootenai is happening all over the West. Forests are dying, a result of prolonged drought, intentional exclusion of forest fires and early-day logging practices that profoundly changed the structure of forests.

Before settlement began western ponderosa pine forests were not as dense as they are today. There were fewer trees with more open spaces – prairies and savannahs – between the trees that were here. Fires burned more frequently, which helped maintain the open spaces, while minimizing the accumulation of woody debris on the forest floor.

Much more is known about these early forests than is generally believed. John Bernard Leiberger, a European-trained forester with the U.S. Geological Survey, surveyed northern Idaho's Coeur d'Alene Mountains in the summer of 1895, and in subsequent years, conducted equally detailed examinations of forests in western Montana, western Oregon and Washington, and all of California. He died in 1913, but his vividly written narratives survive in a series of U.S. Department of Interior reports presented to Congress in 1898, 1899 and 1900.

The section headings in each of his reports reveal an attention to detail rarely attributed to early-day foresters: topography, water supply, soil, forest conditions, aspect of the forest, amount of available timber, soundness of the timber, means of transportation of lumber, local demand for lumber, timber cutting, present condition of forests, fires, effect of fire on reproduction, agricultural lands and mineral resources.

Each report also included a set of tables summarizing his survey work: list of tree and vegetation species, proportion of species by forest zone, size and age of trees – by zone, second growth and old growth; amount and value of timber – sawtimber, railroad ties and telegraph poles; destruction by fire – sawtimber, railroad ties and telegraph poles.

Earlier fires

In his travels, Leiberg found abundant evidence that most of what burned in 1910, and re-burned in subsequent years, had also burned much earlier.

"Forest fires occurred in the Priest River Basin years ago," he wrote in his 1897 report. "About one hundred and fifty years ago the area surrounding the lower and, in part, the upper [Priest] lake was burned over to the extent of more than 60 percent. Later, a large tract south of the lower lake shared the same fate. This is proved by the large quantities of young growth, less than 100 years old, that exist in many places with very old trees in their midst."

Leiberg found evidence of similar burns in western Montana's Bitterroot Valley, which became the eastern-most edge of the 1910 fire.

"Above the zone of the yellow pine and extending to about 6,500 feet elevation there is often found an excessively close growth of lodgepole pine...The growth is a replacement of an older forest of subalpine fir and white-bark pine burned off a hundred or more years ago...The closeness of the growth is very striking. The trees frequently stand so close that it is difficult for a man even on foot to force his way between them. The individual trees are always of slender growth, but of no great height, and the majority of them are short lived."

The lands Leiberg examined varied widely in appearance, from brush fields grown up in the aftermath of great fires, to forests that contained as few as 10 or as many as 2,000 trees per acre. He attributed these differences to the frequency and intensity of past fires, and



he wrote detailed explanations of the role fire was playing in clearing away what was dead or dying.

Pioneer arsonists

What concerned Leiberg far more than evidence of great past fires was his discovery that Priest River area pioneers were setting fire to newly-designated federal forest reserves to protest their creation by Congress.

"It has been a common occurrence to hear such remarks as, 'If the Government intends to guard and to preserve the timber from fires and prevent unlimited cutting, we will try to burn up what is left as soon as possible'; or, 'Since the reserve has been set aside, every prospector carries an extra box of matches along to start forest fires with.'"

"These sayings," Leiberg wrote, "were not made in a spirit of bravado, but with the conviction that the course outlined was the proper one to pursue to show their disapproval of Government interference in what they have heretofore considered their rights, namely to cut, slash or burn, as convenience or fancy might dictate."


In summary remarks in his Priest

River report, Leiberg revealed much about the mindset present among early-day foresters who would later become rangers in Gifford Pinchot's U.S. Forest Service.

"Gigantic and appalling"

"Mere reserve lines will have no effect whatever in preventing the destruction so long as public sentiment regarding forest preservation remains indifferent," he wrote. "The forest-fire evil is gigantic and appalling. If not checked, within twenty-five years there will be no accessible forests to furnish lumber products between the Rocky Mountains and the Cascades except such tracts as are under private ownership. Up to the present time the public has not suffered any particular inconvenience from the fires, but signs are rapidly multiplying that a pinch is beginning to be felt in the home timber supply. If the next ten years see as large a percentage of burnt-over tracts as the last decade, the pinch will become decidedly painful. To combat the evil, heroic measures are necessary."

What Leiberg and others wanted most would – in the aftermath of the 1910 fire – become public policy. Fire would be driven from the forest, no matter what.



On August 16, 1994, lightning started 180 forest fires in northwest Montana's Kootenai National Forest. In communities already surrounded by fire, many thought 1910 was coming again. More than 350,000 acres of the Kootenai stand dead, providing more than enough fuel for a 1910-scale firestorm. On August 24, the Intermountain Fire Sciences Laboratory reported the Energy Release Component has passed the 100th percentile, twenty points above the upper limit for effective fire suppression. Most scientists agree salvaging some dead and dying timber would help reduce the fire danger throughout the West.

could ravage these dead and dying forests. On the other hand, there is the knowledge fire, used on a limited scale in combination with forestry techniques, could actually help clear out some of the dead and dying trees, paving the way for a return to more natural growing conditions.

The space between these alternatives is filled with voices arguing about how best to tackle "the forest health problem." Some argue that letting forest fires burn is the natural thing to do. Others say harvest what is dead and dying, then replant in ways that will bring back the forests that were here before white settlement began.

The forest health problem

How a near-century of publicly mandated fire exclusion has affected forests is now most visible in Oregon and Washington, central and northern Idaho, and western Montana. Ponderosa forests that for thousands of years reseeded themselves naturally have given way to fir forests which overtook open spaces once kept clear by fires caused by lightning, or set by Indians who used fire to sculpt their lands in the images of their cultures.

To make matters worse, early-day loggers and farmers removed too many big trees, making it difficult for ponderosa to reseed itself. Fir trees that had been kept at bay by fires invaded open areas once occupied by pine. Now these forests are collapsing under their own weight. Put simply, there are too many trees for the ground they occupy. Crowded together in areas where once only a tenth as many trees grew, they have no chance for survival. Years of drought have turned a bad situation into a disaster now widely referred to as "the forest health problem."

For Mutch and others who study fire, it is a perplexing problem with scientific and political underpinnings. On the one hand, there is the very real fear a 1910-scale fire

sound logical to generations of Americans that grew up with Smokey Bear and learned that only they could prevent forest fires.

"We've done a great job of making the public aware of their role in preventing forest fires," he says. "Now we need to do the same good job to help the public understand the role fire plays in maintaining forest health. What has been missing is an understanding of the inevitability of fire. We do not live in a risk-free world, and where forest fires are concerned, the question is not 'if' but 'when' they will occur."

Even so, Mutch believes deliberately setting fires or allowing lightning-caused fires to burn unchecked must be done under very carefully controlled conditions.

The sickest forest

"Eighty years of fire exclusion have left us with enormous accumulations of dead woody debris in our forests," he explained. "If we allow fires to run wild in these forests, we'll destroy the very things we are trying to save, including an enormous amount of fish and wildlife habitat. In many areas, we need to harvest some trees first to reduce the amount of dead and dying biomass."

But others disagree, and in eastern Oregon salvage timber sales are routinely appealed by environmental groups that believe allowing fires to burn unchecked is the only solution to the forest health problem. Mutch shakes his head in disbelief.

"Recently, I saw the Blue Mountains for the first time in several years," he said. "I could not believe my eyes. It is one of the sickest forests on the continent. Hundreds of thousands of acres of dead and dying timber just waiting for the conflagration. Salvage logging would substantially reduce the risk."

Eastern Oregon's forest fires are not the gentle under-burns they were before white settlement began. Flames frequently shoot 200 to 300 feet into the sky, and in several watersheds important to spawning fish, even the soil has been cooked.

Years spent on fire lines have made Mutch a strong believer in the importance of preventive action.

"I hope it doesn't take another 1910 fire to arouse the public," he laments. "After big fires burn, we can only pick up the pieces. The work is not very satisfying."

"A bad idea"

In some ways, not much has changed since Gifford Pinchot and Bill Greeley first argued about who could be trusted to do what is right in forests. Those who trust people trust foresters to do the right thing in forests, and those who distrust people trust fire.

"A good deal of what is wrong in forests today is the result of what people unknowingly did wrong in the past," Mutch concedes. "It is not hard to see why many now believe the best thing to do in forests is to get out of the way and let nature take its course."

But, Mutch adds, letting nature takes its course is a bad idea. "The worst has already occurred. We harvested too many trees in the wrong places, and we excluded fires where allowing them to burn would have cleared out dead and dying trees. What's needed now is a combination of logging and fire management techniques that will gradually reduce the danger of catastrophic fire, opening the door for an eventual return to forest conditions more like those that were present before white settlement began."

Mutch admits his viewpoint will not

Forest Health in Idaho: Concepts, Conditions, Causes, Cures and Concerns



Dr. Jay O'Laughlin

On August 29, 1994 – while Idaho's Boise and Payette national forests were burning – members of the U.S. Senate Subcommittee on Agricultural Research, Conservation, Forestry and General Legislation were in Boise, Idaho trying to figure out what to do about the "forest health" problem.

Among those whose advice they sought was Dr. Jay O'Laughlin, director of the Policy Analysis Group in the College of Forestry at the University of Idaho. In testimony before the subcommittee, Dr. O'Laughlin laid bare the underlying causes of the West's fire and forest health crisis.

"National forests are unhealthy because they have the wrong kind of trees and too many of them," he told subcommittee members. "The cause is a combination of past timber harvesting practices and fire suppression. The cure involves (a) removal of some of the trees to alleviate stress by reducing competition for limited moisture and nutrients, and (b) management practices favoring tree species best suited to individual sites. Public policy and public trust are two closely related barriers standing in the way of an effective cure."

Dr. O'Laughlin's testimony was taken

from a recently completed forest health study conducted by a six-member scientific team assembled by his policy analysis group. The two-year study drew a conclusion that came as no surprise to anyone who has been watching western forests die: Managed forests appear to be healthier than unmanaged forests. In Idaho, and elsewhere in the West, most managed forests are privately owned or belong to states or counties. Most of what is unmanaged is federally owned.

More broadly, the Idaho study answered two strung-together questions: *Is there a forest health problem in Idaho, and if there is, what can be done about it.*

Dr. O'Laughlin's answers: Yes, there is a forest health problem, and "forest management practices can be used to modify unhealthy forest stand conditions while protecting other forest values."

Sandwiched between this question and its answer, Dr. O'Laughlin asked and answered seven more questions of interest to subcommittee members: *When are forests sick? What is a healthy forest? What caused declining forest health? How have environmentalists reacted to these findings? How serious is the forest health problem? What can be done? Why don't we do it?*

The hottest story in forestry

Idaho's Policy Analysis Group is unique among an increasing number of public-private sector partnerships now trying to understand why western forests are dying. Created by the Idaho legislature in 1989, its agenda is set by a nine-member advisory committee that includes the directors of three state agencies (lands, fish and game, and commerce) plus representatives from the U.S. Forest Service, Idaho Travel Council, Idaho Farm Bureau Federation, Idaho Recreation Initiative, the forest products industry and environmental groups. Among the group's major

scientific studies: four related to stream corridor management and water quality, wolf recovery in central Idaho, land acquisition, endowment lands, pulp and paper mill feasibility in northern Idaho, a national park for Idaho, and roadless areas and wilderness proposals.

Of all of PAC's studies, none has attracted more attention from afar than *Forest Health in Idaho: Concepts, Conditions, Causes, Cures and Concerns*. With characteristic candor, Forest Service Chief, Jack Ward Thomas, explained why in a *Washington Post* interview conducted in 1992, when he was still stationed in eastern Oregon where national forests are dying in epidemic proportions.

"If we weren't blathering about old growth and owls, this would be the hottest story in forestry," he declared.

"Hot was indeed the right word for the situation," Dr. O'Laughlin told subcommittee members. "Today uncontrollable fires rampage through Idaho's national forests, and salvage logging remains a hotly contested topic."

Hot or not, the Idaho policy analysis group has weighed in with a report that answers the most frequently asked questions about why forests are dying and what can be done to stop it.

"Forest health does not compare perfectly with human health, but is nonetheless a useful concept," Dr. O'Laughlin told subcommittee members. "When we get sick, we seek remedy from scientifically trained medical professionals. When forests are sick, they need professional help, too."

That Idaho's forests are sick is no longer in doubt. In some areas on the Boise and Payette national forests, trees are now dying at a faster rate than they are growing. Although some believe what is happening is no more than a change in natural ecosystem dynamics, Dr. O'Laughlin sees an unnatural cause and an unnatural result.

A debate not easily explained

"In this region, one cannot overemphasize the role of wildfire in creating and maintaining forests," he testified. "By effectively suppressing fire and excluding it from performing its natural role, the species composition and density of Idaho's forests have been changed. Forest conditions have been altered to the point where Idaho's forests cannot be considered natural, if natural means unaffected by humans."

Although many groups have struggled to agree on a definition for "forest health," the Idaho group apparently had little difficulty crafting a definition it liked: "Forest health is a condition of forest ecosystems that sustains their complexity while providing for human needs."

Even so, Dr. O'Laughlin conceded the definition is less important than the concerns it represents.

"Forest health is part of the larger idea of managing forest ecosystems in a sustainable manner," he explained. "Judgements about forest ecosystem health are subjective because the health concept involves different perspectives and values, including political, social, scientific and professional."

Indeed they are different, which is why a crisis so easily explained has become a debate that is not easily explained.

Forest fires have been suppressed because people fear fire, but suppression of once frequent, low-intensity forest fires has had ecological consequences that are just now becoming apparent.

"Forest species have changed and forests have become denser," Dr. O'Laughlin told subcommittee members. "These changes favor insects and diseases that kill trees in great number during periods of stress, such as the drought that has affected Idaho for the past eight years. Combined with past timber harvesting, fire suppression has created different kinds of forests than were here before European settlers arrived. Dense stands of firs have replaced pines as the most common trees in Idaho. Pines are more resistant to many insects and diseases, especially during drought conditions. Unlike pines, firs have branches from the ground up that can turn otherwise beneficial ground fires into catastrophic crown fires, especially in dense stands."

The forest health-forest fire crisis, explained in 109 carefully chosen words. The explanation has not pleased most environmentalists, who express dismay



The Inland Northwest is the focal point of Dr. Jay O'Laughlin's U.S. Senate Subcommittee testimony, "Forest Health In Idaho: Concepts, Conditions, Causes, Cures and Concerns." (UI College of Forestry, Policy Analysis Group)

because – from their perspective – the forest health issue is an industry invention, and is nothing more than a trumped up excuse to cut more trees.

Lack of public confidence

Again, Dr. O'Laughlin sees a different picture. "A fundamental problem with the forest health concept today is the lack of agreement on appropriate ways to measure forest ecosystem health," he explained. "Not everyone agrees with the premise

that unhealthy stands of trees represent unhealthy ecosystems. The most frequent criticism I have received is that all we used to measure forest health was tree growth and mortality, which some critics say only foresters are interested in. As a professional forestry researcher and educator,

I wonder how someone who cares about a forest can say they do not care about the condition of its trees."

In a broader-sense, environmental gridlock in the West underscores a lack of public confidence in forestry, and no where is public uneasiness about the limits of forestry more in evidence than in the division of opinion over what, if anything, to do about the West's forest health crisis. Although Dr. O'Laughlin and other scientists see forestry playing a critically important role in any serious attempt to heal sick forests, he concedes building public support for action will not be easy. Still, he is hopeful public interest in restoring forests will provide the impetus to proceed.

A real shocker

"Forest health could be the metaphor for framing the discussion because it relates forest conditions to something people understand," he told subcommittee members. [Forest health] "could inspire solutions based on human intervention rather than natural processes. [It] could be the catalyst for beginning the discussion because it focuses interdisciplinary attention on the prevention of unhealthy conditions and the restoration of desired and presumably healthy conditions."

PAG's full report is 244 pages long and includes an appendix summarizing its major findings. These findings were presented to Senate subcommittee members and are reprinted nearby. What is not included is this thought provoking statement from Dr. O'Laughlin's summary remarks in Boise.

"Two things shocked me during our study. One was the high level of tree mortality in Idaho's national forests, which we documented in our report. This is a concern because in the absence of frequent low-intensity fires, trees killed by insects and diseases accumulate and can contribute to hazardous fuel conditions.

The other shocker, which we did not document, was the high level of budget and personnel resources used to comply with procedures mandated by existing policies, especially the National Environmental Policy Act. To restore and maintain forest health, resource managers need to get out from behind piles of paperwork in the office and get out on the ground."

Idaho Forest Resources Species Change, 1952-1987



Idaho Forest Resources Species Volume Change, 1952-87



The mix of tree species present in Inland Northwest forests has changed dramatically in this century, a result of early-day logging practices and intentional suppression of forest fires. In his Senate subcommittee testimony, Dr. O'Laughlin outlined a management plan for restoring tree species present in the West when white settlement began. (UI College of Forestry, Policy Analysis Group)

The major findings contained in the University of Idaho's report, "Forest Health Conditions in Idaho," are summarized with the following points taken from the conclusions of each chapter in the 244-page report. These findings are presented in the order they were developed in the report and appear under the headings of the four parts of the complete report.

Towards a Definition of Forest Health

- Forest health is a condition of forest ecosystems that sustains their complexity while providing for human needs.
- Judgments about forest health involve different perspectives and values, including political, social, scientific, and professional. Because of these different

viewpoints, forest health has subjective elements.

- In 1992, 85% of 801 randomly sampled Idahoans who were polled considered insect infestations and disease in Idaho forests a problem (Dan Jones and Associates, 1992, for the Idaho Forest Products Commission).
- Sustaining forest health is a principal focus of the evolving concept of ecosystem management.
- Forest health is concerned with a forest ecosystem, not just trees or stands of trees. But without trees, there is no forest.
- Ecosystem integrity is not currently a measurable concept and, therefore, not useful to make judgments about forest health.

- A healthy forest is resilient. It has the ability to respond to natural and human caused disturbances (fire, insects, disease, climate change, air pollution, and timber harvesting) and recover to a socially desired state within a characteristic period of time.

- Forest health is a multi-disciplinary concept, rarely mentioned in forestry literature before 1990.

- Forest health is a useful communications device for relating forest conditions to something people understand, thus attracting their attention to management problems and inspiring them toward socially desired solutions.

- As is true in other health contexts, it may be easier to identify when a forest is unhealthy in one or more aspects than it is to define exactly what healthy means.

- Forest health focuses attention on: [1] the *prevention* of socially undesirable forest conditions by integrating the various concerns of protecting the forest from insects, diseases, and wildfires in an ecological framework; and [2] the restoration of socially desired forest conditions.

Management and Policy Considerations

- Many factors affect forest health, including natural and human-caused disturbances and variations in climate.

- Trees weakened by moisture stress are more susceptible to insects and diseases as well as wildfires. A prolonged drought that began in 1987 has affected Idaho forest conditions.

- The importance of the role of fire in Idaho's forests cannot be overstated. Idaho forests were formed and maintained by fire. Suppression has excluded fire from its historic role and led to changes in species composition and dense forest stands. In hindsight, fire suppression may not have been the best way to manage forests. However, the U.S. Forest Service and other public agencies were directed to prevent and stop wildfires, and they performed this dangerous and challenging assignment very well.

- Salvage logging is useful for reducing the fuel levels to protect remaining vegetation and soils from catastrophic wildfires and for recovering economic values. It does, however, need to be conducted under ecologically and socially acceptable guidelines. Some

dead woody material needs to remain on site for wildlife habitat and soil development. Salvage logging on root-diseased sites may not be appropriate unless accompanied by reforestation of species less susceptible to root disease.

- Wildlife are a component of forest ecosystems. The direct use of wildlife as indicators of ecosystem health is difficult because of the diversity of wildlife species, their different habitat requirements, and lack of sufficient knowledge about these requirements.

- Forest health stands on its own as a concept and is a goal of ecosystem management. The 1993 Society of American Foresters task force report on Sustaining Long-Term Forest Health and Productivity said the condition of the forest landscape is the dominant focus of ecosystem management. Forest health, being the condition of a forest ecosystem, is thus a dominant focus of ecosystem management.

- Declining forest health, however measured, is a symptom of a problem. Treatment of the symptom may improve the condition of the ecosystem, but as in human health, it may not alleviate the cause of the problem.

- A healthy forest is sustainable, capable of meeting the socially determined needs and aspirations of the present without compromising the ability to meet those of the future.

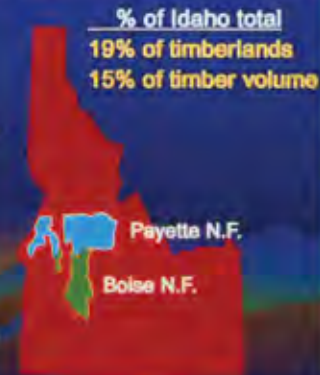
- Factors that predispose forests to pest outbreaks include tree species composition poorly suited or adapted to a site, overstocking and old age. All of these risk factors can be reduced through management activities. Unless that is done, all ecological, economic, and social values associated with forests are at higher risk than need be.

Additional research efforts focused on the development of hazard and risk rating systems would be useful to help managers determine which stands of trees need attention and what management programs could help ensure sustainable forest ecosystems.

- Legislation at the national level has been introduced to address some of the forest health situations that have arisen in the Inland West. Additional funding and management flexibility to treat unhealthy conditions have been proposed. Such action may be necessary on some national forests.

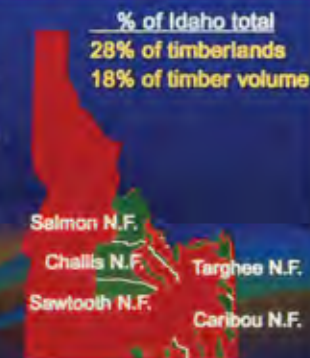
Forest Health Southwestern Idaho

- mostly national forests
- annual mortality > growth during 1988-1992 (i.e., forests are dying faster than they are growing on national forest lands suitable for timber production)
- intermingled industrial forests do not have similarly elevated mortality rates



Forest Health South Central & Eastern Idaho

- mostly national forests
- Targhee & Caribou N.F.s had slightly elevated mortality-to-growth ratios in mid-1980s
- early 1990s inventory of BLM lands in south-eastern Idaho showed elevated mortality levels (44% of trees dead or infested w/ bark beetles)



In Idaho, the forest health problem is most serious on the Boise and Payette national forests, where trees are dying faster than they are growing. The problem is less serious – but nonetheless a concern – in south central and eastern Idaho. (UI College of Forestry, Policy Analysis Group)

Determining Forest Health Conditions

- Objective indicators of forest ecosystem conditions can be specified and measured, but forest health assessments contain subjective value judgments which must be clearly recognized.

- Forest health can be measured, but at least three judgments need to be made: [1] selecting a representative set of indicators to measure ecosystem health – vegetation, wildlife, and watershed as a minimum; [2] developing standards for using indicator measures to assess conditions; and [3] resolving value conflicts regarding these judgments.

- Forest scientists and managers, working with their customers, can

identify, define, and determine ranges of desired conditions for a set of measurable characteristics in each forest ecosystem. These measurements can be useful in helping evaluate the condition of the forest at any time, in relation to conditions desired by society.

- The presence of non-native vegetation and wildlife may be a key indicator of ecosystem condition.

- “Forests can be considered healthy when there is an appropriate balance between growth and mortality” (Society of American Foresters task force report on Sustaining Long-Term Forest Health and Productivity, 1993).

- Comprehensive and intensive inventories of a few indicators representing

commodity and non-commodity values will improve forest health assessments, as well as forest planning and management decisions, by enabling understanding of ecosystem characteristics of stands, habitats, streams, and landscapes.

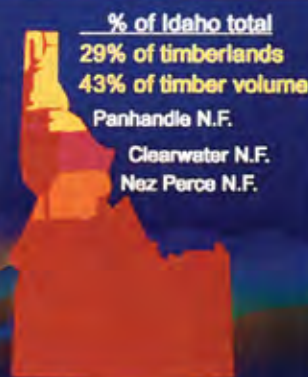
- The species composition of trees in Idaho forests has changed. Ponderosa pine and western white pine were once predominant. Douglas-fir and grand fir are now the predominant species.
- Wood volume in Idaho forests increased by 12% between 1952 and 1987. Annual volume growth has been twice the annual timber harvest during that period.
- On the Boise and Payette National Forests in southwestern Idaho, forest stands identified as suitable for timber production were dying faster than they were growing in the late 1980s and early 1990s. Neighboring private industrial forests did not experience similarly high mortality rates.
- In northern Idaho, mature stands on the national forests are experiencing elevated levels of mortality from root disease. Inventories of private and other public lands do not indicate similarly elevated levels of mortality. However, the two different data sets are not directly comparable. Some attention to improved forest health inventory information seems necessary.

Towards a Forest Health Management Strategy

- To promote healthy forests throughout the state, management attention should focus on two things: [1] restoration of tree species best suited to each site, in most cases ponderosa pine, western larch, and rust-resistant western white pine; and [2] prevention of unhealthy conditions by maintaining stand density levels that reduce competition between trees for moisture, nutrients, or both.
- Thinning to alter species composition and reducing stand density are the most important parts of a forest health management strategy. Root-diseased areas require different approaches.
- Formal plans for national forests have not adequately considered the impacts of insect, disease, and wildfire outbreaks in Idaho and the subsequent actions necessary to sustain forest health and long-term productivity.
- The forestry profession is currently undergoing substantial changes. New planning approaches and management

Forest Health Northern Idaho - National Forests

- no problem apparent in mid-1980s forest resource inventory data
- forest pathology surveys since 1985 show elevated levels of mortality from root disease and 40% reductions in productivity



Forest Health - Northern Idaho Private & Other Gov't (non-N.F.)

- much forest land is intermingled with national forests
- no mortality problem evident in 1990 forest resource inventory data



Forest health problems were first sighted on northern Idaho national forests in the mid-1980s. More recent surveys conducted on private and state forest lands indicate the problem is still confined to national forests. More active management regimes are frequently cited as the reason why disease is less prevalent in private and state-owned forests. (UI College of Forestry, Policy Analysis Group)

strategies are being developed to sustain the broad range of forest ecosystem values desired by society. These changes need the support of forestry professionals and forest owners, including the public, who collectively own more than three-fourths of Idaho's forests.

- Forests are in decline in Idaho, and because of the diverse nature of these forests, there is no single causal variable, and thus no easy fix. Forest health has promise as an integrating concept whereby scientists from different backgrounds can work together in support of management to sustain ecosystems while providing for the range of forest values society desires.

• The forest health research agenda includes silviculture, hazard rating and risk analysis, integrated inventories and modeling. Special attention needs to be given to wildlife as indicators of forest ecosystem health.

- Forest health is related to ecosystem management. Much work still needs to be done to develop and implement ecosystem management, especially in the social dimension. In the end, only when forests are viewed from the larger landscape perspective that ecosystem management promises that multiple use can be considered a feasible strategy.

Using Forestry Techniques to Heal **Sick** Forests

Editor's note: These photographs, taken in central Idaho and western Montana, show how "prescribed" fire and thinning can be used to initiate the long process of restoring ecosystem health. Montana photographs are courtesy of Dr. Steve Arno, a research forester at the Intermountain Fire Sciences Laboratory, Missoula, Montana. Idaho photographs are courtesy of the Boise National Forest and Idaho State Representative, Judi Danielson. Additional material was taken from "Fighting Fire with Prescribed Fire, A Return to Ecosystem Health," by Robert W. Mutch, *Journal of Forestry*, November 1994. We interview Mutch in "Could What Happened in 1910 Happen Again?", page 37.



Photograph No. 1: A scene on the Boise National Forest. There are too many trees here, which is why most of them are dying. The immediate causes are drought and disease, but the underlying causes are early-day logging methods and successful exclusion of fire, which has disrupted two or more fire cycles, contributing to greater stand density and an increase in crown fire potential. Crown fires move through the tops or "crowns" of trees, sometimes faster than birds can fly.



Photograph No. 2: Fire on the Boise National Forest. Dead woody debris – an end product of exclusion of fire – is fueling this fire. The fire is using “ladder fuels” – dead and dying tree limbs and other standing dead trees – to climb into the tops of other trees. Once there, the fire can jump from treetop to treetop at blinding speed.



Photograph No. 3: “Prescribed fire” in progress on Idaho’s Payette National Forest. This fire looks from the fire seen in Photograph No. 2. Here, the area was first thinned, reducing the danger the prescribed fire will escape control. Burning this site will further reduce the amount of woody biomass, stimulating nutrient recycling processes.



Photograph No. 4: This scene is on Lick Creek, near Hamilton, south of Missoula, Montana. The area was heavily logged in the early 1900s. Fire was also excluded from the area, allowing an unnaturally dense understory of fir and cedar to overtake a site once dominated by ponderosa pine. The Forest Service’s Intermountain Fire Sciences Laboratory used this site to test some ideas for eventually restoring the forest that was here before it was first logged. The rest of this photographic sequence shows the result.



Photograph No. 5: This is the same scene on Lick Creek, from the same photo point in Photograph No. 4. The logger has removed individually marked trees. The timber stand is much more open, and you see the tan-skinned ponderosa pine trees that once dominated this site. You can also see logging slash on the ground, including some trees that were cut down and left to rot for their nutrient value.



Photograph No. 6: Prescribed fire in progress on Lick Creek. See how the fire is burning around the ponderosa pine in the foreground. One of the challenges facing those who prescribe fire is what is called the "duff" layer – bark, needles, branches and other woody debris that accumulates at the base of a tree. In overly dense forests, this layer can be two feet deep. If it is not cleared away, the duff layer can provide a perfect route for fire to eat its way below ground to the tree's roots. The tree is killed.

Photograph No. 8: After thinning and prescribed fire, the Lick Creek site looks very different than it did in Photograph No. 5.



Photograph No. 9: The Lick Creek site, a year later. It probably looked something like this before it was first logged in the early 1900s, though it is likely the ponderosa pines were much larger than what can be seen here. Now that other competing vegetation has been removed, these trees will grow rapidly and will provide a natural seed source for new ponderosa seedlings. Forest managers may want to use prescribed fire on this site again in another ten to twenty-five years. Where debris accumulations are especially heavy, two or three prescribed fires may be needed.

A SEASON OF **FIRE**

This year there were 69,357 forest fires in America. They burned almost four million acres of forest land. Putting these fires out cost taxpayers \$768 million.

As bad as it was, this was far from the worst fire season on record. In 1930, the year record keeping began, 53 million acres were burned. There were no record keeping systems in 1910 when the greatest forest fire in U.S. history incinerated three million acres of Idaho and Montana forest, most of it in just two days.

Most of what burned this year burned in the West, where most of what is forested belongs to the federal government. There were 23,873 fires and more than two million acres were burned.

"This is the most intense fire season in anyone's memory," said Arnold Hartigan of the National Interagency Fire Center in Boise, Idaho.

Indeed it was. On Wednesday, July 6, fourteen smokejumpers were overrun in seconds by a fire turned firestorm on Colorado's Storm King Mountain.

The fires seemed to be burning everywhere, from Lake Chelan, Washington to Silver City, New Mexico, where three more fire fighters were killed in a helicopter crash. Another volunteer fire fighter died when flames overtook his bulldozer on the Hull Mountain Fire near Medford, Oregon. An Oregon Department of Forestry spokesman later called the blaze one of the scariest he had ever seen. In some gullies, the fire moved so swiftly it caught up with birds in flight. Wildlife without wings had no chance at all.

The biggest losses occurred in Idaho's Payette National Forest, where 298,000 acres burned. Close behind, the adjacent Boise National Forest lost 205,314 acres. In north central Washington, another 170,065 were lost on the Wenatchee National Forest.

Tourism also paid a heavy price. There are unconfirmed reports businesses in the Leavenworth, Washington area lost more than a million dollars a day during the thirteen days that roads in and out of the Bavarian theme town were blocked. Fires burned on three sides of town and reached the city limits at one point.



Repeat "after me," "Only you..."

"Repeat after me, 'Only you...' Is there anyone out there who cannot recite the rest of Smokey Bear's admonition about fire? This is one of the most recognizable faces in the world, and the Smokey Bear advertising campaign is widely believed to be the most successful in American history. Small wonder most Americans want forest fires extinguished immediately and do not understand the important role fire plays in maintaining the health of forest ecosystems. (USDA Forest Service)

The fire made a believer of Jerry Weidenborner, past president of the Levenworth Chamber of Commerce. "Before I experienced the fire, I would have been reluctant to trust any forest management decision to deal with the underlying causes of fire," he conceded. "Now that I have seen what can happen when nothing is done, I have changed my mind. It was a chilling experience."

Levenworth city manager, Mike Cecka agreed. "I hope to see environmentalists and the timber industry move closer to center on this issue. Environmentalists need to realize doing nothing is going to leave us in worse shape than any management approach. Professional forestry, responsibly done, has a lot to offer."

Near McCall, Idaho and across northwest Montana businesses dependent on tourists also suffered when national forest campgrounds were closed because of fires burning nearby.

Though most of the fires burned in national forests, a few spread to neighboring privately owned tree farms. Longview Fibre lost more than 10,000 acres. A company spokesman estimated the loss at a "ballpark" \$2 million.

It could have been worse

Ironically, this season of fire may be remembered more for what *did not* burn up than for what did. By all counts, it could have been much worse than it was.

Throughout the West, from Alaska to Arizona, forests are dying and becoming fire traps on the same scale as the fire trap that became the 1910 fire.

Most of the dying is occurring in eastern Oregon, central Idaho and western Montana. It has been going on for so long now in eastern Oregon that the dead have names. They are called "grey ghosts," and they stand silently on more than six million acres of once-green forest land.

To the east, in Idaho's Boise and Payette national forests, there are places where trees are dying faster than they are growing. The worst of Idaho's 1994 fires burned in these areas.

A day's drive north, in northwest Montana's Kootenai National Forest, the dead and dying are scattered across 350,000 acres in some of the most remote timberland in America.

This is big mountain country, and where you find big mountains you will find big lightning storms, especially in

July and August when hot and cold air masses collide in the night sky. One such collision on the night of August 14 started 160 forest fires. Those who watched in darkness thought 1910 was coming again.

An August 24 assessment by the Intermountain Fire Sciences Laboratory concluded: "Threats to life and property are greatest within the fire complexes on the Kootenai National Forest where large numbers of uncontained fires are burning in areas characterized by Energy Release Component values above the 100th percentile level. (The 80th percentile level marks the upper limit of effective fire suppression actions.)"

To prepare for the worst, the Forest Service ordered fire trucks to Libby. They came in on trains from as far away as Wisconsin.

The forest health problem

There is a name given to what is happening in western forests. It is called "the forest health problem." It would be easier to understand its causes and possible cures if it were called "the forest sickness problem." But when the subject is forestry, nothing is ever as easily explained as it should be. There is not even an agreed-upon definition for forest health, and there is wide disagreement on how to heal sick forests.

But the sickness itself can be described in only five words. *There are too many trees.* In some places, they grow so close to one another it is difficult to walk between them. There is fierce competition for sunlight, rainfall and growing space. The same thing would happen in your garden or flower bed if you didn't thin your plants to a proper spacing. There are two reasons why there are too many trees in forests throughout the West. These reasons are best viewed as a chain of events, with two links in the chain.

The first link

The 1910 fire so outraged a conservation-minded nation that Congress had no choice but to put the U.S. Forest Service into the business of putting out forest fires. A public already worried about reports of a possible timber famine, demanded that its national forests be protected from fire. Few were observant enough to spot the ecological role fire was playing in forests, and those who did were routinely held up to public ridicule.

[See "Paiute Forestry: The Nation's Fire Fighting Policy Was Itself Forged in Fire," page 23.]

In their diaries, many who came to Oregon in covered wagons described the "blue mountains" they saw from Farewell Bend, where the Oregon Trail started its long climb up out of the Snake River Valley. The blue was smoke from distant fires that burned all summer in what would later become the Blue Mountains.

When the smoke cleared, the Blues were a sight to behold. In her Oregon Trail diary, Miss Rebecca Ketcham described what she saw from a plateau overlooking the Grande Ronde River the evening of September 6, 1853.

"After dinner, when we ascended the first hill, we looked back upon the country we had passed through. I can almost say I never saw anything more beautiful, the river winding about through the ravines, the forests so different from anything I have seen before. The country all through is burnt over, so often there is not the least underbrush, but the grass grows thick and beautiful. It is now ripe and yellow, and the spaces between the groves, which are large and many, look like fields of grain ripened, ready for the harvest."

The second link

Early-day loggers and farmers while clearing land cut down too many big old trees, especially ponderosa, lodgepole and white pine that dominated so much of the landscape east of the Cascades in Oregon and Washington and across portions of Idaho and western Montana. A valuable natural seed source was lost.

White fir and grand fir began to appear in spaces where pine once reseeded itself. In Miss Rebecca Ketcham's time, fire would have blocked this invasion because whites and grands are more susceptible to disease and fire than is ponderosa pine. But with fire outlawed and the big pines gone, fir began to creep over big meadows where big wagon trains once traveled.

At higher elevations where mixed conifer forests were more prevalent, similar changes began to occur. Fire-resistant larch, ponderosa and Douglas-fir were slowly replaced by less-resistant grand and white fir.

Faster than birds can fly

Where present-day forests are sickest, there are twenty times as many trees crowded onto sites as there were less than 100 years ago. Idaho's Boise National Forest is a good example. A survey conducted in 1906 found there were twenty-eight Douglas-fir trees per acre, and another six western white pines. Today, there are 533 Douglas-fir crowded onto each acre, and another 155 pines. Shouldered together in tight quarters, these trees have little chance for survival. When the dying is done the dead fall across one another like giant pick-up sticks. In some places, the piles are knee deep.

Across the West, years of drought have made a bad situation much worse. The limbs of trees dying of thirst droop in stair-step fashion, providing a perfect runway for fire. Even the smallest blaze can quickly climb into treetops. Once there, it can jump from tree to tree faster than birds can fly.

How to heal these sick forests is now the subject of the hottest debate in forestry. Predictably, the war of words and ideas is being waged along the cultural fault line that distances urban environmental groups from people living in rural communities throughout the West.

For most who live in logging communities, fire is as an old enemy, a random killer of forests, wildlife and people, a polluter that fills clear blue skies with smoke, sometimes for weeks on end. Harvesting dead timber is an article of faith in timber communities, as deeply felt as is planting trees. Small wonder then that the solution to the forest health problem seems so simple to people who look out on forests every day of their lives. Harvest what is dead and replant.

Forests at risk

Environmental groups disagree. They blame loggers for the death of forests, and they characterize the forest health issue as nothing more than a trumped up excuse to cut down some more trees.

Environmentalists see a solution that is the exact opposite of what is seen in timber communities. Because they distrust logging and those who log for a living, environmentalists believe nature should be allowed to take its course,



A satellite view of the 1988 Yellowstone Fire. It galvanized public sentiment against forest fires in much the same manner as did the 1910 fire, after which Congress put the U.S. Forest Service into the fire-fighting business. (USDA Forest Service and the American Forestry Association)

even if it means larger, more destructive forest fires. The result, they say, would be a new, more natural forest that looks more like what Miss Rebecca Ketcham first saw from a bluff overlooking the Grande Ronde River on a September evening in 1853.

In timber communities, most people cannot believe what they are hearing. Leaving to burn what can be salvaged and put to good use is unconscionable.

Many in the scientific community cannot believe it either. In an interview in the September/October 1993 issue of *Evergreen*, University of Washington

forest silviculturist, Dr. Chad Oliver, warned of the dire consequences of allowing fires to once again roam free in the region's forests.

"Our region's forests have a history of frequent, violent, large scale disturbance," he explained. "If we walk away and leave these forest to nature, we run the risk of losing the very ecosystems we are trying to preserve. Moreover, we have no assurance that forests set aside [under the Clinton Administration's plan for preserving Pacific Northwest old growth] will actually grow older. There is a greater probability they will burn up or blow down first."

Environmentalists who are much better at crafting vivid phrases than are scientists or townspeople sum up their argument in favor of doing nothing: Logging fire-killed timber is "like mugging a burn victim," or "like picking a scab on a badly scrapped knee."

The war of words rages on, and somewhere amid the hum and chant of snappy sound bites and feel good phrases, fire becomes water and water becomes salmon. Then the salmon sprout wings and fly away, looking very much like spotted owls.

Spokane, Washington, 1909

On January 4, 1909, W. B. Greeley arrived in Spokane, Washington to attend what would become the most important meeting in the history of forest fire fighting in America.

He had been District One forester for barely four months, and already he understood that he faced a near impossible task in laying out forest protection plans for the forty-one million acres under his jurisdiction.

Greeley attended the Spokane conference as the invited guest of George S. Long of the old Weyerhaeuser Timber Company. Long shared Greeley's concern for protecting forests from fire and had earlier pioneered creation of several private forest protectives in the Pacific Northwest.

It was the opportunity Bill Greeley had been looking for. With a briskness that would later be his trademark, he laid out plans for establishing agreements pledging the Forest Service and private forest landowners to the mutual protection of their neighboring forests. Many of the agreements survive today and form the basis for the public-private fire fighting mechanism that puts men and women and equipment on fire lines in western forests.

Spokane, Washington, 1994

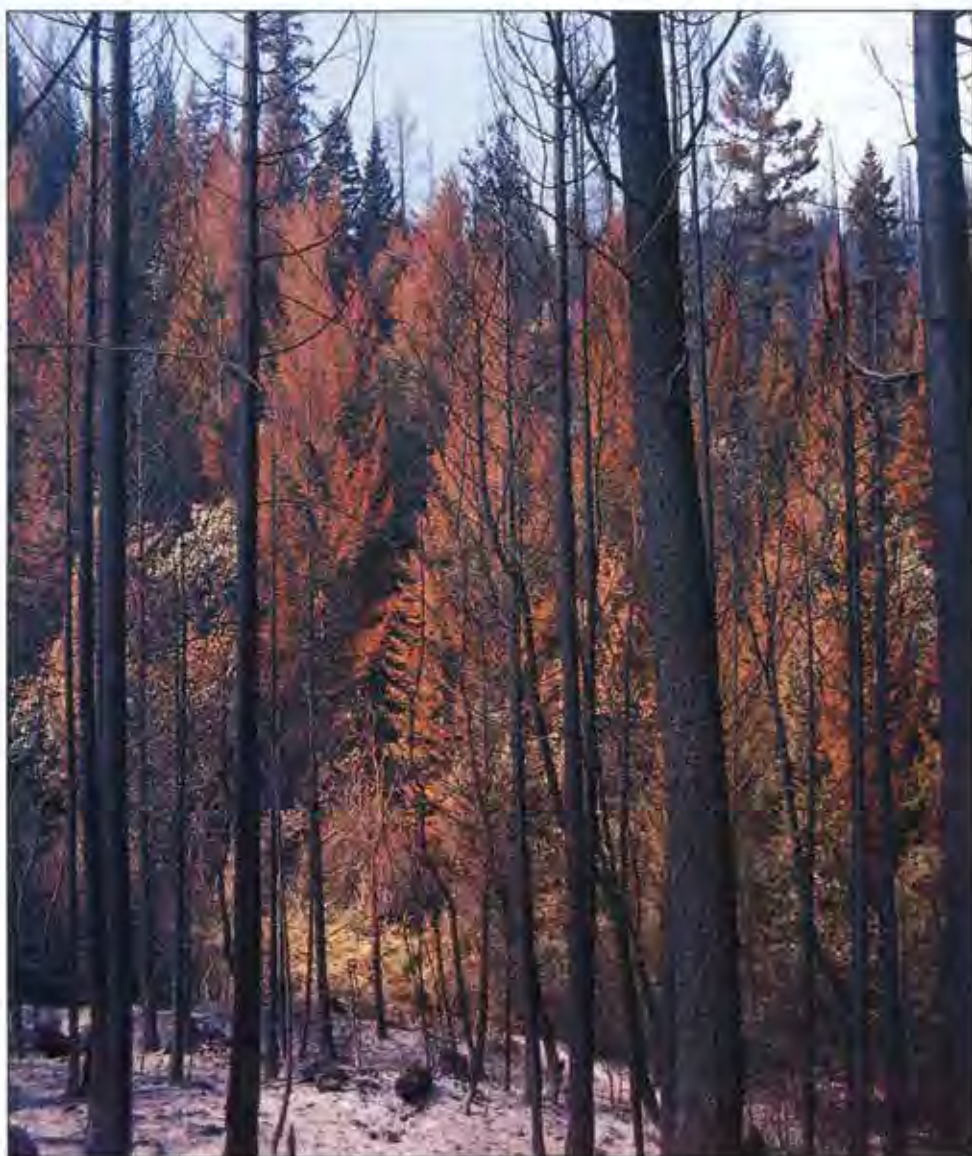
History repeated itself in Spokane this past September. More than 300 forest scientists and forest landowners gathered to reconsider the role forest fires have played in western forests. Many who attended work for the same companies, federal agencies and fire cooperatives that met in Spokane in 1909, but the conference title, "Forest Health and Fire Danger in Inland Western Forests" would have meant something much different to those who were there in 1909 than it did

to those who were there this past September. Fire is no longer seen as the enemy of forests, and there is now an agreed-upon need to figure out how to allow fire to more nearly play its natural role in the region's forest ecosystems. Separating good forest fires from bad ones will not be easy, and it will be just as difficult to explain the difference to a public long ago convinced there is no such thing as a good forest fire.

"Fire suppression is not the problem," declared Robert W. Mutch, one of the conference's keynote speakers. [See "Could what happened in 1910 happen again?", page 37.]

Mutch retired recently from his position as research applications leader at the Forest Service's Intermountain Fire Sciences Laboratory in Missoula, Montana. He reminded his colleagues the Forest Service had been suppressing fire for eighty-four years for "two very important reasons: to protect property and lives."

"What we have failed to do is balance our fire suppression program with an equally ambitious prescribed fire program," he reasoned. "Periodic use of fire will make the fire fighting job easier by reducing fuel buildups that lead to very large, very dangerous fires like the ones we are now experiencing in the West."



This is what a forest looks like after a firestorm moves through. The scene here is of the Hull Mountain Fire, a 1994 fire that burned on public and private land in southwest Oregon. This fire moved so fast it caught up with birds in flight. Everything you see in this picture is dead. (Jim Petersen photograph)



The West's sick forests stretch north to Alaska where almost one million acres of spruce have been killed by spruce beetles. Exclusion of fire is a primary cause of this epidemic, as both fires and beetles have been primary disturbance factors in creation of Alaska's spruce forest ecosystem. Beetle-killed forests are most visible on the Kenai Peninsula, where there is now great concern for catastrophic forest fires and for related impacts on tourism, watersheds and wildlife habitat. Scientists familiar with the problem say over half the Peninsula's forested area lacks the potential for natural spruce regeneration without some form of intervention. There is a fear infested spruce forests will become grass lands. (Information and photograph, Roger Burnside, Natural Resource Manager, Insects and Disease, Alaska Department of Natural Resources.)

Although Mutch believes prescribed fire can play an important role in reducing the risk of larger fires, he sees an equally important role for salvage logging, and he spoke in glowing terms about the salvage job the Forest Service did in the aftermath of the Foothills fire that burned two years ago in the Boise National Forest.

"I don't like to go look at salvage logging jobs," he began. "They often are not done very well, and you walk away saying, 'Oh my God, did we make it better or worse.' But the Foothills salvage logging job was a sensational piece of work with few signs there had even been an active logging job. Even though they were dead, every third tree in every age class was left behind. It looked great."

Mutch's plainly spoken conclusion: "Salvaging dead timber, thinning green timber stands that are too dense and careful use of prescribed fire are, together, the only game in town."

Dr. Jay O'Laughlin agreed with Mutch's conclusion. O'Laughlin, who heads the University of Idaho's forest wildlife and range policy analysis group,

described five different strategies for dealing with Idaho's forest health crisis. His alternatives ranged from intensive management to no management at all - with a mid-range proposal for blending salvage logging, forest thinnings and re-introduction of fire. [See "Forest Health in Idaho: Concepts, Conditions, Causes, Cures and Concerns," page 40.]

"Whatever alternative is selected, the strategy should be two-fold," Dr. O'Laughlin said. "The first objective should be to restore trees species best suited to specific growing sites, and in most of the inland West, that means pine, western larch and western white pine. The second objective should be to prevent unhealthy forest conditions, mostly through reducing timber stand density."

Stop the "forest butchers"

Environmental groups look at the same forests and see a much different picture. On the morning the conference began, this headline appeared in a full-page advertisement in Spokane's *Spokesman-Review*:

WHERE THERE'S SMOKE. ...THERE'S LIARS "Forest Health" Scare Tactic Is Public Forest Ripoff!

The advertisement, paid for by the Missoula-based Alliance For The Wild Rockies, opened with this barrage:

"Public officials in the Forest Service, Congress, and timber industry are using the threat of wildfires to scare the public into allowing massive new logging operations on public forestlands. This new boondoggle will lead to higher taxes, and will damage habitat for salmon, steelhead, bull trout and elk."

The advertisement went on to accuse the Forest Service and the timber industry of conspiring to propose "massive logging operations disguised as thinning the forest to promote forest health and prevent catastrophic wildfires."

It then urged readers to "stop the forest butchers" and "stop voodoo forestry" by making a financial contribution to the Alliance For The Wild Rockies.

Outside the conference, the *Spokesman-Review* reported "a pair of bearded environmentalists associated with the radical group Earth First!...picketed, toting large banners" [which read] Forest Health is Voodoo Forestry and No Chainsaw Medicine." Earlier the pair had been thrown out of the conference lobby.

Dave Crandall, a member of the Spokane-based Inland Empire Public Lands Council, complained to *Spokesman* staff writer, J. Todd Foster, "Timber companies always want to find ways to cut down more trees. It seems no matter what the problem is, the answer is always more logging."

In September, five scientists, including one from the University of Georgia, wrote President Clinton urging him to block efforts to log fire-killed timber, citing "considerable scientific reason to believe that salvage logging and the accompanying road building is one of the most damaging management practices that could be proposed for burned areas." Copies of the letter were sent to eight governors, seventeen U.S. Senators and twenty-eight Congressmen, all from western states.

Evergreen asked two scientists and one retired Forest Service supervisor to review the letter. Dr. Ben Stout, who taught forestry at Harvard and Rutgers universities for many years, and was later dean of the forestry school at the University of Montana, described the letter as "meaningless and full of subjunctive words like 'may' and 'can'." Dr. Stout's conclusion: "It says don't salvage, don't do anything. It is not science."

Retired Kootenai National Forest supervisor, Jim Rathbun, offered a near-identical assessment. "Their letter talks about what 'can' or 'may' happen if burned areas are salvage-logged," he said. "Unfortunately, the words 'can' and 'may,' when used by college professors, have a way of becoming 'will,' especially when the press gets involved. The alarmists in our society count on this happening."

Idaho's Dr. O'Laughlin described the letter as "resource management by epistle, letter filled with gross generalizations."

"I don't know who these people are, and that bothers me," he said. "I assume they are biologists, which does not qualify them to make public policy."

Socially unacceptable conditions

Scientists invited to participate in the Spokane conference appeared to agree

action is necessary to restore the health of forests throughout the West.

Dr. Wally Covington, a Northern Arizona University conservation biologist who has recreated presettlement timber stand conditions experimentally in Arizona, told participants restoring "thinning to recreate open park-like timber stands, coupled with prescribed burning can emulate evolutionary processes, helping to restore healthy, viable ecosystems."

As if to urge foresters to take a more aggressive stand where forest health is concerned, Dr. Covington said, "It seems obvious that unless we do something to restore more nearly natural forest conditions, our legacy to future generations will be the perpetuation of non-adaptive, simplified ecosystem structures and processes throughout the entire range of ponderosa pine."

"Natural conditions no longer dominate."

Dr. David Adams, a University of Idaho forest health specialist, traced the history of ecological change in inland pine forests.

"People assume that if forests are left alone they will remain natural, but inland forests are today much different than pre-settlement forests," he explained.

According to Dr. Adams, two significant changes have occurred, a result of logging, grazing and fire suppression policies: Fir has replaced pine as the dominant tree species, and there are many more trees in forests – in one Arizona forest, 37 times as many trees as were present when western settlement began.

Dr. Adams warned that leaving inland forests alone now would not cause an unaided return to natural conditions and might result in socially unacceptable forest conditions, including widespread disease and increasingly serious fires.

"A total fish kill"

But the sternest warning came from Dr. Victor Kaczynski, a limnologist who has been working for several years on salmon recovery strategies for Pacific Northwest rivers.

"No single forest practice – not timber harvesting, not road building – can compare with the damage wildfires are inflicting on fish and fish habitat," he declared. "It is a paradox that the very fish we are trying to protect from

extinction are now being threatened by fires many so-called environmentalists believe should be allowed to burn unchecked."

Dr. Kaczynski used the 1989 Tanner Gulch Fire, which burned along the upper Grande Ronde River in eastern Oregon, as an example of what fire can do.

"It was a total fish kill," he said, "including endangered spring chinook salmon – all of the adults, all of the 1988 fry and all of the 1987 smolts were lost in a debris torrent that was measured thirty-six miles downstream."

Dr. Kaczynski recited a litany of post-fire impacts that kill fish: increased spring runoff, decreased summer water volumes, increased erosion, decreased stream-side vegetation, increased summer-time water temperatures, decreased winter-time water temperatures, loss of spawning gravel, loss of soil nutrients

"This situation is not unique to the Grande Ronde River," he said. "The same risks are present in the Willamette and Umatilla river systems in eastern Oregon, and in rivers in Washington, Idaho and Montana."

"The big lie"

But environmentalists were unmoved by warnings issued in Spokane. In an August 31 press release cited in the *Spokesman-Review*, the Inland Empire Public Lands Council said, "Big timber wants you to think the forests need to be 'saved' from fires – with a chain saw massacre. They are using their enormous financial resources – and you, if they can – to sell the big lie."

The selling is being done by the Coeur d'Alene-based Intermountain Forest Industries Association, which is sponsoring an advertising campaign to build public support for thinning, salvage logging and re-introduction of prescribed fire.

Responding to environmentalist criticism of the campaign, IFIA's Ken Kohli told the *Spokesman*, "The issue [forest health] is a huge loser for them [environmentalists]. The longer it stays in the limelight, the more political capital they squander. If these ads are getting underneath the skin of people who believe a chain saw doesn't have any place in the forest, then so be it."

IFIA and the Public Lands Council are not the only messengers clamoring to be heard. Throughout the West, loggers and professionals to foresters are urging rural

homeowners to take steps to defend their property against forest fires. The risks are greatest in what is called the "wild-land-urban" interface, where millions of westerners live in homes tucked away in canyons, surrounded by overly-dense stands of timber. Thousands of these homes are destroyed annually in fires many experts believe could be prevented or minimized if more homeowners took responsibility for cleaning up dead and dying trees around their houses.

"Removing the brush and thinning the timber on your property helps provide a natural barrier against fire," says Larry Brown, a Grants Pass, Oregon forestry consultant who has been working with rural homeowners for about three years. "The trees left behind will

grow faster, and the value of the property generally increases."

Even so, Mr. Brown reports most of his clients aren't interested in the money their timber can bring or the increased value of their land. In many cases, they re-invest their profits in landscaping work, which Mr. Brown's crew also does.

"What really impresses them is the more open park-like setting they see when we are finished," he reports. "Most admit they had no idea logging could actually beautify their property."

Although Mr. Brown and other forestry consultants report increasing interest in their services, most interface homeowners have no idea they are in danger until it is too late. In separate studies released this year, the National

Commission on Wildfire Disasters and the National Association of State Foresters warn of worse disasters if steps are not taken to reduce the fire danger.

In its study, the Wildfire Disasters Commission estimated it cost \$5,670 per acre to fight the 1992 Cleveland Fire, which burned 24,500 acres near Lake Tahoe, California. By comparison, the commission estimated thinning the timber before the fire would have cost \$1,000 per acre, and might well have prevented the fire.

The problem – and the danger – is worst where homes are closest to commercial timberland, especially government lands which usually hold more woody debris than do privately owned tree farms. Although most tree



Dan Thorpe's remarkable photograph of an air tanker swooping down on the Indian Creek Fire is a powerful illustration of the nation's modern-day forest fire-fighting ethic. Thorpe is a unit forester in the Oregon Department of Forestry's Medford District, in southwest Oregon. He took this photograph July 15, 1994.

farmers have remained silent, many quietly support regulations limiting or prohibiting housing developments close to tree farms.

"Urban dwellers want to live close to town, but be in the woods surrounded by trees," one tree farmer said. "They don't realize their trees need care. The same people who regularly check the batteries in their smoke alarms think nothing of allowing their back yard woodlands to become fire traps."

In her new book, *California Wildfire Landscaping*, horticulturist, Maureen Gilmer, shows rural homeowners how to protect their property from woodland fires.

"One acre of chaparral is the equivalent of 5,000 gallons of gasoline," she declared during her Spokane presentation. "What we do in the handbook is show homeowners how to reduce the danger with wildfire-proof landscaping techniques. It can make the difference between saving a home and losing everything, including life."

Elsewhere, homeowners who have tried to protect their woodland homes from fire have run head-on into the Federal Endangered Species Act. Last year, the U.S. Fish & Wildlife Service warned homeowners near Riverside, California they faced fines and imprisonment if they tilled fire breaks around their houses. Reason: tilling might harm the habitat of the Stephen's kangaroo rat, a threatened species.

"We have the knowledge"

On August 29, 1994 – with more than a million acres of western national forest land on fire – Jack Ward Thomas became the latest in a long line of Forest Service chiefs to fight fire with fire. He told members of a Senate subcommittee dead and dying forests in the West will not wait for perfect knowledge, and, in a pointed reference to environmental groups, Thomas declared, "We cannot, in my opinion, simply step back and wait for 'nature' to take its course. I do not believe that what has happened this fire season is acceptable as a solution to the [forest health] problem. These fires at this scale and intensity are too hot, destructive, dangerous, and too ecologically, economically, aesthetically and socially damaging to be tolerable. We have learned much about fire science since the 1950s. It is time to begin to apply

what we have learned with a new vision of what we want from our forests and our forest managers."

Thomas also told subcommittee members the problem will not go away if ignored. Action is necessary "to return fire to the environment in a way that achieves desired outcomes, to improve forest health and reduce the risk that fire will damage site productivity or destroy human life and property."

The action plan Thomas recommended is discussed in broad terms in a document the Forest Service completed last April titled, "Healthy Forests for America's Future," and in a series of more specific treatment plans now in various stages of completion.

"We have the basic knowledge to begin treatment of the forest health problem in the short-term by restoring high risk sites to some semblance of their historic condition," he said. "This can be approached through a combination of salvage logging, reducing fuels through mechanical means, prescribed fire and thinning of densely stocked stands."

"Salvage is done for money"

Environmentalists responded quickly. "We do not feel it is necessary to issue emergency orders or exemptions from public interaction and public involvement with standard procedure in order to get at burned trees," said Sara Folger in a *Coeur d'Alene Press* story. Folger is a spokesperson for the Inland Empire Public Lands Council, a frequent challenger of Idaho timber sales.

In a separate *Spokesman-Review* story, Folger said, "We have to remember that salvage is done for money. It's not done as a restorative activity. The rhetoric out there flying around and the hype being perpetuated on the public is we have to salvage everything to save the forests."

But there is nothing in any of the Forest Service's many studies that suggests a willingness to quickly harvest every dead or dying tree in the West. In eastern Oregon, where dead and dying trees are scattered across six million acres of public forest land, the Forest Service has been studying possible management strategies for more than three years. Thus far, no timber has been salvaged. [See, "A View from Walla Walla," page 59.]

The Forest Service appears to be moving faster on Idaho's Boise National Forest, where an extraordinarily detailed

landscape analysis called, "Deadwood" was completed in August in compliance with the National Forest Management Act.

The document traces the geologic, ecological, fire and cultural histories of the 152,966-acre Deadwood area and lays out a ten-year management plan aimed at turning nature's clock back more than one hundred years. If it works, the Deadwood region will one day again look like it looked when John Work of the Hudson's Bay Company first saw it in 1832.

The study divides the Deadwood area into eight fire groupings based on climate, elevation, historic fire frequency, current fuel conditions, tree species and stand structure. Further subdivisions and groupings describe vegetation types, sub-watersheds and fish and wildlife habitat. The area is further divided into seven ecological management units, and thirty different management treatments are recommended, each one based on specific site conditions and desired future conditions.

Among the treatments: harvesting some dead and dying timber, thinning timber stands that are too dense, re-introducing fire to help clean up what has accumulated over eighty-plus years of fire suppression, and re-planting fire-resistant tree species that once dominated Deadwood.

Which "natural" condition?

University of Washington silviculturist, Dr. Chad Oliver, was the first forest scientist in the Pacific Northwest to openly challenge the widely-held belief invisible forces keep forests in perfect balance.

"The idea that nature exists in perfect harmony, or that there is a delicate balance or equilibrium in nature, has been abandoned by a great many scientists, including me," he said in a 1993 *Evergreen* interview. [September/October 1993] "We are surrounded by evidence that nature is actually in a continuing state of disturbance or fluctuation. Change and turmoil, more than constancy and balance, are the rule."

Then, referring to the belief that nature always restores perfect balance, Oliver said, "It makes nice poetry, but not very good science. What science reveals is that natural disturbances,

including weather patterns, wind, fire and disease, prevent ecosystems from ever settling into a steady state."

Dr. Daniel Botkin, who is one of the nation's best known biologists, added significantly to Dr. Oliver's view in a luncheon speech he made during the Spokane conference.

"It is assumed nature will preserve itself if left alone," he said. "It won't. In nature, change is constant."

Dr. Botkin founded the Center for the Study of the Environment, a non-profit research organization, and is the author of two widely-praised books, *Discordant Harmonies* and *Forest Dynamics*. His research group is currently under contract to the State of Oregon, working on a study of factors that are impacting salmon and salmon habitat.

Dr. Botkin cited several examples to support his contention nature changes constantly, then asked, "Which natural condition do you want to preserve? The Ice Age, the tundra that followed, brush fields, or forests? Each of these conditions existed naturally on the same land base at varying times."

Botkin used a Maine wilderness and a New Jersey park to illustrate the role fire has played in creating and re-creating forests and wildlife habitat. In both instances, attempts were made to "preserve" the areas in what were erroneously assumed to be "natural" conditions. Left untouched, both areas changed dramatically, and continue to change.

"In forests, and elsewhere in nature, change is natural," he said. "Based on our twentieth century experience, it is clear we get ourselves into trouble with nature when we try to suppress change. But if we accept change, our land conservation and forest management objectives can be met."

Everything has changed

Of course, everything has changed since Bill Greeley and Gifford Pinchot rode the high lonesome together in 1903. The world is a much smaller place, shrunk by speed-of-light technologies that bring distant lands into our living rooms at the press of a button. But technology has its own caveat. The more we know, the more we realize how much we do not know; and nowhere is this more true than in dead and dying forests in the West.

Bill Greeley would probably not

recognize today's Forest Service, or today's timber industry for that matter. Theirs is a much different relationship than it was in his time, re-made in the image of a society Greeley would not recognize either.

The Forest Service and the industry have also changed within themselves and are no longer as easily pegged as they once were. Nothing is as cut-and-dried as it used to be. In forestry, as with other great social undertakings, black and white have given way to shades of gray.

But the forest cooperatives Greeley envisioned are stronger than ever and now compose the most sophisticated fire-fighting machine on earth. Sophisticated enough, some say, to be as adept at using fire as it has been at putting out fires. Time will tell.

Happy birthday, Smokey

Smokey Bear celebrates his fiftieth birthday this year. What a life it has been. Just about every school-age youngster in America knows him well, and most parents do, too. Smokey's "Only you can prevent forest fires" admonition is beyond a doubt one of the most successful advertising campaigns in history, and his is surely one of the most recognizable faces of all time. His likeness floated above the Tournament of Roses parade last New Year's Day, and he made guest appearances at the Super Bowl and in Macy's Thanksgiving Day Parade.

There really was a Smokey Bear. Fire-fighters rescued him from a New Mexico forest fire in 1950. Until his death in 1976, he lived well at the Smithsonian Institution's National Zoological Park.

But the Smokey image was crafted



This is what a forest looks like after the firestorm. The wind has snapped off trees and blow-torch-like flame (USFS photograph)

before there was a real Smokey. He was an invention of the World War II Wartime Advertising Council, created in the aftermath of a Japanese submarine attack near California's Los Padres National Forest. The war effort consumed enormous quantities of timber, and there was a concern saboteurs might try to burn down the nation's forests. Of course, the world is a much different place than it was in 1942, but the following headline from an article in the January 1994 *Smithsonian* magazine suggests convincing the public that re-introducing fire in America's forests is a good idea will be easier said than done.

**Where there's Smokey,
there's never any fire.**

"Old fur face has been prowling, growling and sniffing the air for a half-century; it's about time someone threw him a party..."



has cooked everything else, including the soil.

Manage Today . . . or Fry Tomorrow

Not all environmental groups believe the West's sick forests should be left to the always unpredictable forces of nature.

At least one group – the Applegate Watershed Conservancy – has taken a noticeably aggressive stance in favor of thinning overly dense timber stands in southern Oregon's Applegate Valley.

"We support a forest products industry functioning at truly sustainable levels within a healthy ecosystem which provides a variety of benefits, including timber and recreation, while strictly enforcing habitat protection for plants, wildlife and fisheries," the Conservancy declared in an article titled, "Manage Today...or Fry Tomorrow."

The article published in August 1994 appears to distance the group from other environmental organizations that oppose logging outright.

"A number of environmental groups have proposed that logging on all public lands should be discontinued," the Conservancy noted. [We believe] this extreme approach would cause more harm than good to forests in southwestern Oregon."

In staking out its position, the Conservancy sides with scientists who believe leaving dead and dying forests to "nature" is a prescription for disaster.

"Allowing no timber cutting will not return the forest to its 'natural' state in the foreseeable future," the article explains. "Forestry experts and scientists recognize that frequent low-intensity fires were a key component of southwestern Oregon's natural forest condition. The current overcrowded forest condition makes such fires far more devastating than would have been the case under natural forest conditions. Unlike the fires in natural forests, fires in today's overcrowded forest would destroy entire timber stands and bake and sterilize the soils, causing serious soil erosion, stream pollution, and very

slow regeneration."

Most Conservancy members live in southern Oregon's rural environs, where increasingly frequent forest fires have destroyed many homes in recent years. The risk of catastrophic fire is particularly acute in the Applegate Valley, where private rural home tracts often border federal lands, where overly dense timber stands are commonplace.

"Since there are thousands of acres of overcrowded forests, the Applegate Watershed Conservancy proposes that an aggressive forest thinning program be initiated to improve forest health, reduce fire danger and supply timber to the industry."

To back its position, Conservancy members are circulating petitions urging the Forest Service and the Bureau of Land Management to implement a thinning program by spring 1995.

"Every summer we are at risk of major fire and the risk is growing," the petition reads. "Trees are dying at an accelerated rate due to overstocking, drought, disease and insects. We recognize that we, as private landowners, have responsibility to do what we can do together to reduce the risk of fire and insects. But we can't do it by ourselves with so much of the land managed by federal agencies. We feel strongly that the federal land management agencies have a responsibility, as good neighbors in our community, to participate directly with us in planning how we will deal with this problem."

How the federal government will react to the petition drive is not known, but in a related development, the Forest Service recently withdrew a nearby salvage and thinning operation it had prepared with strong support from the Applegate Partnership, whose members include members of the Conservancy. Reason for the withdrawal: fear of litigation.



This is the forest health problem described without words. Scenes like this one are repeated thousands of times in forests in eastern Oregon and Washington, northern Idaho and western Montana. In eastern Oregon alone, dead and dying trees stand on six million acres. In fires, trees like these become Roman candles in the blink of an eye. (Boise Cascade Corporation photograph)

A View From Walla Walla:

Searching for Common Scientific Ground

An *Evergreen* interview with
Tom Goodall, Assistant Region Timberlands Manager
Boise Cascade Corporation

Editor's note: Tom Goodall is a forest manager for Boise Cascade Corporation in the Blue Mountains region. The area, in northeast Oregon and southwest Washington, includes four National Forests which are among the most severe examples in the country of blight from insect infestation and other forest health problems. As a key stakeholder in the management of those four National Forests, Mr. Goodall was heavily involved in the Blue Mountains Ecosystem Restoration Strategy project. That effort produced a keystone report leading up to current Forest Service efforts towards ecosystem management and forest health recovery in the Blue Mountains. In addition to his forest management duties, he presently serves as Boise Cascade's representative at the Eastside Ecosystem Management Project (the EEMP, or Eastside Project). The project, based in Walla Walla, Washington, is the first multi-state federal ecosystem management implementation effort since the Forest Ecosystem Management Team (FEMAT) project on the west side of the Cascades mountain range.

EVERGREEN: Mr. Goodall, you and your company have been involved nearly from the beginning in what the federal government now calls ecosystem management. Is there one word that best describes what it has been like, as a stakeholder and as a member of the public, participating in the development of a management strategy for public lands?

GOODALL: The word would be "change." Public lands management has changed forever. In fact, it is still changing, and no one can yet be certain where these changes will take us. For me, and for my company, it has been important to be flexible, to keep an open mind. It really has been a challenge – sometimes encouraging, sometimes discouraging and frustrating, but always exciting.

EVERGREEN: Describe the biggest change you see taking place.

GOODALL: We are experiencing a fundamental shift in the emphasis for federal land management efforts – from a focus on multiple use outputs to a much broader emphasis on a whole range of environmental values. The change is a big one, and it is still in progress. Prior to the adoption of the current forest plans a few years ago, federal forest management goals were based on traditional resource outputs measurements – outputs such as recreation visitor use days, animal unit months and board feet of timber. This approach gave federal managers specific, quantifiable targets to shoot for. Forest products companies also knew what to expect since the timber harvest goals were clearly defined as part of the long term management strategy. Those clearly defined objectives are being reexamined under the new ecosystem-based approach. So, even though federal forest managers always had long term environmental goals in mind as they worked to meet their plans, there's a new key focus in formulating public lands management strategy. The overriding goal has now become one of defining ecosystem management and designing ways to implement and to monitor it.

EVERGREEN: That being the case, what advice do you have for others who may want to help in this process of shaping ecosystem management? How can they be most effective in this new policy discussion?

GOODALL: The key vehicles for shaping ecosystem management are science and participation – those are the two key words to keep in mind. Ecosystem management is a new way of thinking about all the disciplines that go into modern forestry. It takes a systems

approach that's much more complex than any previous land management philosophy, requiring the integration of social, ecological and economic components. Not only are there many such factors to be considered, but ecosystem management also demands the creation of mechanisms to evaluate how those diverse variables interact with one another. Furthermore, ecosystems are not static. They are dynamic and constantly changing. All these variables elevate the preparation of a comprehensive environmental impact statement to a new and higher level of complexity.

Effective participation in this complex process takes a special type of commitment. File cabinets full of reports and papers must be analyzed to comprehend the entire process, and to be most effective you must attend every possible meeting and field trip during development of the scientific assessment and environmental impact statement (EIS) documents. That's the only way you can evaluate how the ecosystem management process is going. For example, the scientists supporting the EIS will be evaluating all the various scenarios for forest management. As you observe the process you will want to see that the team of scientists working on endangered species of fish under these scenarios are coordinating their studies with the social and economic scientists who are studying human quality of life. At some point the data from all the scientific teams must be pulled together in order to shape the EIS alternatives. If the science teams aren't coordinating their data so it can eventually be linked up by tools such as computerized Geographic Information Systems, a vital piece of the ecosystem management puzzle can be distorted or missing.

EVERGREEN: Specifically, how has Boise Cascade been participating in Walla Walla, in the Eastside Project?

GOODALL: We have done everything we can to bring additional scientific information and expertise to the public process. Our goal has been to emphasize the importance of objective science and to bring to the public discussion a methodical approach that distinguishes science from policy and emotion. Forest management policy should be built on a foundation of objective scientific information and Walla Walla is where that foundation is being built right now.

In addition to utilizing our own staff of scientists, we have commissioned the internationally recognized scientific consulting firm, CH2M HILL. To supplement their own scientists and planners, they have also contracted with some of the finest specialists available. Dr. Chad Oliver of the University of Washington, and fisheries consultant Dr. Vic Kaczynski are just two examples of the kind of expert assistance we are receiving, so we can offer the highest quality scientific input in our effort to help improve the outcome of the process.

EVERGREEN: What previous experiences has Boise Cascade had with ecosystem management? Has that experience helped?

GOODALL: Our ecosystem management experience has definitely helped us, by giving us practical forestry background in an ecosystem management context. Our experience has been applied to our scientific work, helping us to see how ecosystem management can work in a commercial forestry operation.

As part of our commitment to ecosystem management, we are developing a comprehensive scientific assessment on our own lands. Last spring we announced that we are initiating a set of ecosystem management and biodiversity study projects. Together, these state of the art studies make up one of the largest such efforts ever undertaken on private forest lands. The package includes an ecosystem demonstration project at Teanaway in central Washington and another demonstration in Idaho, for which the company has dedicated a total of nearly 250,000 acres. Both of the demonstration projects are being conducted in cooperation with the U. S. Forest Service and others. In addition, an extensive watershed analysis study will encompass all of the company's 1,300,000 acres of land in the Northwest. The total cost of the package will be approximately \$8 million over the 5 year data gathering and experimental research commitment.

EVERGREEN: But the process of developing ecosystem management for the Eastside is not simply taking place in a meeting room in Walla Walla.

GOODALL: That's right. It's important to understand that land management decisions are ultimately public policy decisions. Those policy decisions should be based on sound science, and that means making a commitment to helping the policy makers fully understand the issues. That's one reason why we decided to help sponsor the recent science and public policy conference in Spokane. [See "A Season of Fire," page 48.] In most cases, policy makers are influenced by what the public thinks. So, to be as effective as possible, organizations that want to help shape the forest management process must also work to help the public understand how it will be affected by upcoming forest management decisions, as well as the costs of hesitation in making those decisions. The conference helped us in our public education efforts.

Also, because of the need for more education on forest management, we have engaged in public awareness efforts on forest health issues. The more informed the public becomes, the better able they will be to understand the consequences of all the various proposals for changes in forest management.

EVERGREEN: You mentioned Boise Cascade's demonstration projects. How do privately managed lands compare to public lands, in terms of forest health?

GOODALL: In my area, the Blue Mountains, Boise Cascade's land is in the middle of the country's hardest hit forest insect infestation area. At least half of the acreage in the four National Forests of the Blue Mountains has been severely affected by spruce budworm – 3,000,000 acres out of 6,000,000. However, although surrounded by an epidemic, on our actively managed forests, Boise Cascade has a relatively small amount of acreage infected by insect outbreaks.

We regret the massive destruction from the fires this year, but one of the clearest lessons coming out of the tragedy was this: if you apply active management techniques such as thinning and salvage harvesting, you can improve forest ecosystem health and at the same time reduce the loss of resources due to catastrophic wildfire.

Aside from reducing the risks of catastrophic fire, ecosystems are healthy



Ponderosa pines grace a meadow on Boise Cascade Trail pioneers described in their diaries 140 years ago?

on Boise Cascade managed lands. Our forests include some of the most productive fish spawning streams in the Northwest. Up in our central Washington region, we even have large second growth forests with substantial populations of spotted owls.

EVERGREEN: Going back to the Eastside Project for a minute, how will we like the outcome of that project? What do you think so far?

GOODALL: It's too early to tell. This will be an evolving process. However, I do believe the work being done in Walla Walla will be at the heart of the national process of describing the methods for applying ecosystem management to public lands. We've already seen the Eastside Project expanded to the entire Interior Columbia River Basin. We also understand that other Forest Service regions are monitoring the process in Walla Walla so they can use it as a model as they initiate their own regional ecosystem management projects. That's another reason why participation is so important, and why my company has made such a large commitment.



Corporation land in eastern Oregon. Is this setting - in a managed forest - similar to the meadows Oregon Historic and scientific evidence suggests it is remarkably similar. (BCC photograph)

EVERGREEN: With everyone looking to the outcome, how soon can we hope to see the results of the Eastside Project?

GOODALL: It's taking longer than we had hoped, especially now that the project has been expanded beyond eastern Washington and Oregon to include a second EIS for parts of Idaho, Montana, Wyoming, Utah and Nevada. This is the third time it's been postponed.

The Scientific Framework document that will actually define the process of achieving ecosystem management for the project, the one that other regions are looking to as a possible template, won't be published until January of 1996, if the process stays on its current schedule. The draft environmental impact statements have now been scheduled for release in the fall of 1995. The final environmental impact statements are supposed to be released in August of 1996. Then, actual implementation of the plan can't begin until there's been a Record of Decision, and that may take us into 1997.

That's one of the frustrating things, the length of time it is taking. We think it's critical to assure that a thorough, careful and objective analysis is performed. It's just that important forest management and forest health restoration activities are on hold - intentionally or unintentionally - while the EIS is being drafted.

EVERGREEN: Aside from the time it is taking, how do you feel the process has been going?

GOODALL: The process in Walla Walla has been much more open than FEMAT. That's a positive sign. It's also a good sign that Forest Service managers have made statements that people are to be considered as part of ecosystems and that economic and social factors must be considered along with biophysical factors when making forest management decisions. However, everyone involved in the process has his or her own view of ecosystem management. There's no doubt that others involved in the ecosystem management debate would like to exclude humans from the equation and

lock up the forests. The participants in this major policy discussion clearly recognize that the outcome will shape the future of land management for our public forests.

EVERGREEN: Do you see any good news in the short term situation?

GOODALL: It's good news that Judge Hogan recently ruled the Eastside screens were illegal, although we don't know yet about the appeals process. It's also encouraging to see the Forest Service respond to the recent fire season losses by putting together the Western Forests Health Initiative, and we can only hope that politics and the continuing debate over long term forest policy won't get in the way of taking the kind of immediate action envisioned in that Initiative.

With the extensive news reports on last season's destructive fires and their causes, there's some hope that the public has gained a new understanding of the need for active management to reduce catastrophic risks to Eastside ecosystems resulting from poor forest health and fires. For example, I was on a field trip recently with representatives of virtually every point of view in the ecosystem management debate. It was encouraging to watch one exchange that took place between a Forest Service soils expert and a representative for an environmental organization. The soils expert was quite critical of some minor soil compaction, following a salvage harvest operation to reduce fire risk in a stand of dead and dying trees. But the activist had a sharp reply, "We can live with a little soil compaction over a small area, or we could risk a fire so hot that it could lead to permanent soil damage over the whole area."

EVERGREEN: Assume for a moment that this debate will eventually be resolved. In your view, how would ecosystem management work?

GOODALL: Well, it certainly shouldn't be a simplistic set of rules pretending that one size fits all. Ecosystem management, inherently, means managing a defined ecosystem - taking into account site specific conditions. Detailed rules that might help us restore forest health alongside a creek in Montana won't have the same results when applied to a creek in eastern Oregon or Washington. Ecosystem management plans should provide broad guidance for local federal



Somewhere on national forest land in eastern Oregon. The word "firetrap" is frequently used to describe scenes like this one. What you see here is what happens when forests grow too dense. When fire strikes here, as it surely will, it will burn hot and fast, and there will not be much left when the smoke clears. You can find scenes like this throughout the West. (BCC photograph)

managers who would then be empowered to take local actions based on their detailed environmental studies and knowledge of local conditions. This decentralized empowerment will be more effective in managing ecosystems than the cookie cutter approach taken by the Eastside screens and PACFISH. In fact, we have practiced decentralized management on Boise Cascade timberlands, acknowledging the expertise of our own foresters and wildlife and fisheries biologists regarding the uniqueness of their areas. Rigid rules, applied over multi-state regions, just don't make sense scientifically since they don't take local conditions into account. PACFISH, for example, pretty much bans all forest management along all streams, regardless of the specific forest health conditions in a particular watershed. Instead of rigid rules, local management should take place under the broad guidance of a landscape management plan, such as the one currently being attempted by the Eastside Project for the Interior Columbia River Basin. This approach would help to ensure healthy ecosystems at the local watershed level, and still

keep local management actions in context over the entire landscape.

This last fire season should serve as a warning to all about the dangers of extreme policies that bar active management of the forest. This year's fires were some of the most destructive in recent history, and that's because our public forests are crowded with too many trees and in many cases with the wrong species of trees. As a result, fires tend to be intense, stand-replacement wildfires made worse by accumulations of dead wood from insect infested trees.

EVERGREEN: You began this interview with the word "change." Let's close on the same topic. Where will these changes take us?

GOODALL: Changes will lead us to even more change. That's one thing we can be sure of, that forest policy will change again. The trap of this process is thinking the change will end, and we will someday find all the scientific answers to managing our forests. That just isn't going to happen. Look at the forest plans that were adopted

on the Eastside just a few years ago. At the time, those plans included state of the art, environmentally conscious forest management strategy, but now we are in a new process of re-evaluation. Adaptive management, an important conceptual part of implementing ecosystem management, means accepting change as a fact of life. It means acting on current information, then making adjustments as you go along, as you acquire new knowledge about the effects of your management actions.

The point is, there's enough knowledge to take action now to begin restoring health to our federal forests. We will never have perfect science or perfect plans. Intelligently managing our forests now, with enhanced environmental sensitivity, would be a lot better than seeing our forests killed by insects or destroyed by catastrophic wildfire. Forest management is a life long effort. We must continue to refine the science and remain sensitive to changing public attitudes. We need to keep doing both of these things to find the best possible balance between America's needs for wood and Americans' need for the woods. ■



In 1989, as a centennial gift to the citizens of South Dakota, the Black Hills Forest Resources Association and its member sawmills underwrote the cost of reprinting one of the most remarkable photographic histories ever done in a forest.

Yellow Ore, Yellow Hair, Yellow Pine was first published in 1974, but was so popular that the entire press run was quickly exhausted. Small wonder. It featured photographs taken in 1874 by William Illingsworth, then one of the finest outdoor photographers in America. Illingsworth had been hired by the War Department to photograph George Armstrong Custer's 1874 Black Hills expedition, a 1,000-man military exercise that included scientists, Indian scouts, interpreters, newspaper correspondents and a sixteen-piece military band that rode matching white horses.

The book was written by Dr. Donald Progulske, a wildlife biologist and former head of South Dakota State University's Department of Wildlife and Fisheries Sciences. Dr. Progulske teamed with Richard Sowell, a South Dakota State University photographer hired to re-photograph Illingsworth's work from the same locations.

Yellow Ore, Yellow Hair, Yellow Pine took its name by inference from three other names - yellow ore, for Black Hills gold; yellow hair, the name Indians gave the flamboyant Custer;

and yellow pine, for the ponderosa pines that dominated the Black Hills Custer saw.

In the book's preface, Dr. Progulske wrote, "By comparing 'then and now' scenes, an appreciation can be gained of the vegetational and manmade changes which have occurred at some sites over the past 100 years. With my associates, weeks were spent in the field attempting to locate key rocks and other prominent features so that our camera could be set in the precise spot upon which pioneer photographer Illingsworth set his tripod in 1874."

What Dr. Progulske was most interested in illustrating was how a near-century of excluding fire had changed forests and wildlife habitats. Comparing Illingsworth's photographs with Sowell's leaves no doubt about the fact Black Hills forests are much more dense now than they were when Custer's Seventh Cavalry explored the region. Where once ponderosa pine punctuated grassy meadows, dense stands of pine now block Illingsworth's camera positions.

Two years before the book was published, the magazine, *South Dakota Farm & Home Research*, featured photographs taken by Illingsworth and Sowell in a special section that retraced Custer's route. In an interview, Dr. Progulske explained his work then in progress.

"The then-and-now picture pairs help illustrate stages in development of a forest and its wildlife component, which in the case of Black Hills ponderosa pine, has extended new growth into open areas, including some of those so vividly described by General Custer and his expedition scientists," he explained.

In letters written to his

superiors, Custer described grasslands dominated by "bountiful wildlife, vegetation and beautiful scenery [that] can hardly be matched anywhere." What he described was a product of fires, ignited by lightning or set by Indians who used fire to keep their hunting grounds in good grass.

In his 1972 interview, Dr. Progulske described what was happening then in the Black Hills, and what he thought ought to be done to bring back the scenes Custer saw.

"Unless controlled by removal of some trees through management planning or natural causes, the pine may develop into 'dog-hair' stands so thick that only a third of the moisture that falls gets into the ground. This depletes natural water sources. Overcrowded, stunted trees prevent penetration of sunlight to the soil. Thus, forbs and grasses do not grow, resulting in lack of cover and food for wildlife. Overcrowding inhibits growth, so that trees do not reach sawlog size and proper thinning becomes more costly. Additionally, the hazard becomes greater for 'hot' wildfires that destroy all vegetation."

The troubled future Donald Progulske saw in 1972 in a set of 100-year-old glass plate negatives is now plainly seen on millions of acres of western forest land.



General George Armstrong Custer

After words

No story about forest fires would be complete without some mention of Oregon's Tillamook Burn.

The first of the great Tillamook fires burned in 1933. Three more fires followed – 1939, 1945 and 1951. Almost 355,000 acres of virgin forest were destroyed, including some of the finest 400-year-old Douglas-fir in the world. Countless birds and animals also burned to death.

Although it pales in size when compared to the Great 1910 Fire, the Tillamook Burn fostered the largest salvage logging and re-planting operation in U.S. history.

Of the thirteen billion board feet of timber killed in the fires, about seven and one-half billion feet, worth \$100 million, were salvaged. Enough lumber was recovered to construct more than one million homes.

In the aftermath, 325 square miles of forest land were restored by the hand of man. Seventy-three million seedling trees were planted, and another thirty-six tons of seed were spread by helicopters, one-half to three-fourths of a pound to the acre.

For many years, the time for planting trees in the old burns was spring for Oregon school children; and although most of them are now in their 50s, many say they still feel a strong connection to the forest they helped bring back to life.

So far as we know, the Tillamook represents the only actual vote of confidence ever given to forestry. In a statewide referendum in 1947, Oregonians approved spending 10.5 million tax dollars to restore what fire had taken away.



John Hossack

By any measure you could apply, their confidence has been rewarded. In 1983, a Sheridan, Oregon logger paid \$35,000 for the first commercial thinning timber sale. The first tree he felled was a 35-year-old Douglas-fir, more than two feet thick. It was then estimated that the timber growing in the new Tillamook forest was worth \$2 billion, 190 times the initial \$10.5 million investment.

But the new Tillamook is much more than a fine tree growing forest. It is also a park, with eleven campgrounds, and trails for hikers, horseback riders and bicyclers. There are places to hunt, fish, swim and boat. Or you can pick berries, or simply sit and watch the world go by. There is room for everyone here, including loggers.

We can only wonder what Oregonians would do today if faced with another Tillamook Burn. Would they do what they did at the ballot box in 1947, or would they want to let "nature" take its course? Given the choke hold federal courts have on public forests, it is likely

their 1947 choice would today be overruled. But with Tillamook as a milepost, consider the following passage taken from a letter to the editor, published last August in *The Daily Inter Lake*, Kalispell, Montana.

"The timber in the Yaak (a river drainage in northwest Montana) is presently being harvested by Mother Nature. The harvest method is fire. Her logging system is more environmentally destructive than any devised by man. There will be an uncontrolled increase in water yield resulting in heavy siltation and stream bank erosion. Soil erosion is a major harmful effect from wildfire.

It takes one thousand years to create an inch of soil that fire can remove in one season. Wildlife habitat will be a major temporary loss with no concern for hiding cover. Grizzly bear habitat will

not recover for many years. The timber burned in these fires will not serve a useful purpose for our people. It will eventually send up one great big smoke signal that says we are such an affluent nation that we can afford to let our timber resources burn rather than harvest them by conventional means."

The letter was written by John Hossack, Eureka, Montana. Mr. Hossack worked for the U.S. Forest Service for forty years and was the supervisor on Idaho's Clearwater National Forest when he retired in 1983.

We telephoned Mr. Hossack and asked if he could summarize his message in a sentence or two. Without hesitation he said, "We are wasting valuable forest resources we know how to save; resources that could be used to help Americans improve their standard of living. Waste is a sin."

— The Evergreen Foundation

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4025 Crater Lake Hwy.
Medford, Oregon 97504
Tel. (503) 770-4999

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