

FIRES AND FOREST HEALTH: OUR FUTURE IS AT STAKE*



Dale Bosworth

In the last 40 years, we have seen tremendous changes—changes in the marketplace for forest and rangeland products; changes in demographics and development patterns, particularly in our Western States; changes in public values and expectations from public lands; and changes in the landscape itself and in our scientific understanding. In terms of wildland fire science alone, we have made tremendous progress in our understanding of the critical role fire plays in shaping ecosystems.

Our problem is not really change; change is inevitable. Our problem is that too many people seem to be stuck in the past. When you read the newspapers, you often find the same old folks being quoted in the same old way on both sides of the same old issues. You might think nothing about our forest management has changed in the last 40 years.

We need to move beyond the conflicts of the past if we are to strike the right balance for the future. The point is this: We have a serious forest health problem, and we aren't doing enough about it. We need to get on with the job of restoring forest health. For that, we first need to move beyond the conflicts of the past.

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* This article is based on Chief Bosworth's McClure Lecture at the University of Idaho in Moscow, ID, on September 18, 2002.

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Stuck in the Past

In 2002, our firefighters were more effective than ever, controlling about 99 percent of the fires during initial attack. Yet we still had one of the biggest fire seasons in memory. Four States in the West—Arizona, Colorado, New Mexico, and Oregon—had their largest fires in history, and California had its fourth largest. Almost as many acres burned as in 2000, when we had our biggest fire season since 1954.*

People looked hard for someone to blame. Some blamed environmental groups for not letting us cut enough trees, thereby making forests too dense. Environmentalists responded that this was just an excuse for more logging; big fires, they said, are normal under drought conditions. There was a kernel of truth in what both sides said, but the reality is far more complex.

The point is this: The blame game gets us nowhere. It does nothing to address our forest health problem, and therefore it misses the point. It focuses instead on battles fought long ago, and that is not where our

* According to statistics collected by the National Inter-agency Fire Center in Boise, ID, as of October 11, 2002.

focus should be. To understand this, you need to step back in time.

When I first started working for the USDA Forest Service in the 1960s, we had a very different situation. The focus was on efficient, cost-effective timber production. State and private timber supplies were exhausted after World War II, and there were fears of a timber famine. The Nation needed national forest



Extreme fire behavior on the 2000 Valley Complex Fire, Bitterroot Valley, MT. Since the 1980s, a growing number of fires have burned outside the historical range of variability in forests that evolved with frequent low-intensity fire. Photo: USDA Forest Service, 2000.

Today, long-term ecosystem health drives everything we do. It determines whether or not—and where and how—we decide to cut trees.

timber to help realize the American dream of owning a single-family home.

From 1960 to 1985, the national forests met about 25 percent of America's softwood timber needs. That gave State and private stocks time to recover. Today, fears of a timber famine are over. Fifty years from now, we expect that timber growing in the United States will be nearly double the levels in 1960.

In 1970, the first Earth Day signaled a change in public values. The environmental movement was born, and I think it did a lot of good. Congress passed a number of environmental laws aimed at sustainable management for the long-term health of the land. Science contributed by laying the basis for new multidisciplinary, ecosystem-based approaches.

With the help of science, we began basing much of our management on watershed health. Today, the Forest Service no longer focuses on the most efficient, cost-effective way to remove timber. Instead, we focus on long-term ecosystem health, measured in terms of healthy watersheds.

Zero-Sum Game

So the battle is over—or, at least, it should be. But some still seem to want to snatch defeat from the jaws of victory.

There is a common misconception that all logging is one thing—that the primary goal is economic, and that the focus is on providing timber to mills for a profit from

Federal lands. We need to help people understand that there are different types of tree removal. It all depends on what you are trying to achieve.

On the national forests, our purpose for tree removal is not what it was 40 years ago. Today, long-term ecosystem health drives everything we do. It determines whether or not—and where and how—we decide to cut trees. Our vegetation management projects are guided by the principle that what we leave on the land is more important than what we take away. It's the exact opposite of the old "pick-and-pluck" philosophy of taking the best and leaving the rest.

So the debate today—focusing on limits to diameter size—misses the mark. It continues to focus on what we take, not on what we leave. On a landscape scale, diameter size doesn't matter. The number and size of the trees we remove doesn't matter. What matters is the number, size, and type of trees we leave on the land to achieve healthy landscape conditions. The goal is to meet the desired future condition of the land.

Too often, we focus on the wrong thing because we are playing a zero-sum game. In the zero-sum game, people measure their own success in terms of the misfortune of their adversaries. So if you're in a timber group and you see something the environmentalists like, you jump to the conclusion that it must be a bad idea, even if it really isn't. Or if you're an environmentalist and you see some people getting jobs in one

of our vegetation management programs, you automatically think we must be in bed with the timber industry. Your focus is not on the land and what it needs. Instead, your focus is on how well your adversaries are doing, because if they seem to be winning, you must be losing. That's the zero-sum game.

Of course, not all timber and environmental groups are so short-sighted. A lot of people on both sides understand just how divisive and destructive that can be. Too often, though, the debate is driven by conflict. Caught between the extremes, people often lose sight of long-term ecosystem health, which is where our focus should be.

Forest Health Problem

The fact is, we can no longer afford to play the zero-sum game. Our problems are simply too pressing. They have been building for a long time. Fires started getting bigger in the 1980s, while we were still removing record volumes of timber. In 1987, for the first time in almost 70 years, we saw more than a million acres burn on the national forests. Since then, the problem has just kept on growing. Today, we have some 73 million acres (30 million ha) of national forest land at risk from wildland fires that could compromise human safety and ecosystem integrity.

The problem took generations to develop. For most of the last century, we focused on removing big trees and suppressing all fires. In the process, we altered the land. Many of our lands at highest risk are in the ponderosa pine forests of the Interior West, from the Sierras and eastside Cascades to the Colorado Plateau, the Rockies, and the Black Hills. Some of our worst fires

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Aftermath of the 2000 Valley Complex Fire, Bitterroot Valley, MT. Many areas historically covered by open ponderosa pine forest burned far more intensively than they had for centuries. Photo: USDA Forest Service, 2000.

occur in forests historically governed by frequent low-intensity fire.

Climate fluctuations in the arid West have helped to alter these forests. In New Mexico, for example, the last 200 years have been the wettest in more than a millennium (RMRS 2002a). Within that 200-year period, the last 30 to 40 years have been the wettest. Fire exclusion, a wetter climate, and deferred management in recent years have combined to make many forests more dense than they were historically, because trees have grown faster than fire, harvest, and mortality have combined to remove them. For example (USDA Forest Service 2002a):

- From 1952 to 1997, net annual softwood growth more than doubled in the West.

- On the national forests, net annual softwood growth also more than doubled.
- In the next 10 to 20 years, we expect the upward trend to continue.

Just to give you some idea of what that means, in the Southwest—in Arizona and New Mexico—net annual growth is enough to cover a football field 1 mile (1.6 km) high with solid wood (Johnson 2002). Recent removals have only been about 10 percent of this.

Historically, these forests were relatively open; today, they are overcrowded with trees. Beset by drought and under stress from competition, the trees are more susceptible to insect attack and catastrophic fire than ever before. In summer 2002, for example, bark beetles multiplied exponentially in

an outbreak of unprecedented proportions in Arizona. The beetles killed millions of ponderosa pines on more than 500,000 acres (200,000 ha) on the national forests and American Indian reservations alone (RMRS 2002b). At the same time, we got record-breaking fires—the Rodeo-Chediski Fire in Arizona, the Hayman Fire in Colorado, the Ponil Fire in New Mexico, and the Biscuit Fire in Oregon.

The situation is simply not sustainable—not socially, not economically, not ecologically. Socially, our communities are increasingly disrupted by catastrophic fires and the associated evacuations. Economically, these fires cost jobs and income from recreational activities on Federal lands. Besides, they can sweep from Federal lands onto State and private lands, threatening jobs and futures there, too. Ecologically, sensitive species cannot find suitable habitat in overcrowded forests, and catastrophic fires can destroy the few remaining refuges they have.

Some good examples come from Colorado, where the Hayman Fire affected habitat for five threatened species (USDA Forest Service 2002b): the Canada lynx, bald eagle, Mexican spotted owl, Preble's minnow jumping mouse, and Pawnee montane skipper. The skipper, a butterfly, lost 40 percent of its known habitat. It might not even survive.

Active Management

Some people say we ought to leave the land alone to heal itself. But it is an illusion to think that just leaving nature alone will restore the open old-growth pine forests that once dominated lower elevations

across the Interior West. Competition for limited resources will keep the dense trees that are there now small forever—or until they are destroyed by insects or fire. In fact, the original open forests were probably never entirely natural; studies suggest that they evolved together with American Indians and their land management practices, particularly burning (Bonnicksen 2000; Boyd 1999; Pyne 1982; Whitney 1994).

Historically, the fires that burned in these open forests were relatively cool and low to the ground. Today, the fires are like nothing the American Indians ever saw. They burn extremely hot and destroy entire stands, with catastrophic results for soils, waters, and wildlife habitat.

Our American Indian heritage teaches the need for active management. We have got to remove some of the small materials that are threatening the health of our forests and fueling our worst fires. We have two choices: The excess trees can either go up in smoke or out on the back of a truck. The most important thing we can do in a good part of the West is some thinning and burning in a controlled manner.

We have been saying and doing that for years, but it has not been enough. Through the National Fire Plan, we are now picking up the pace. In 2002, the Forest Service and U.S. Department of the Interior together plan to treat about 2.5 million acres (1 million ha). By September, we had already treated more than 1.5 million acres (0.6 million ha), a 30-percent increase from 2001. But it is still not enough. We must do much more.

Treated areas must be large enough for a fire crew to have enough time to get in and contain it while it is still on the ground and not too dangerous.



Green spots mark houses that survived the 2000 Valley Complex Fire in Montana's Bitterroot Mountains. Homeowners might have saved their houses, but they lost their homes in the surrounding blackened landscape. Photo: USDA Forest Service, 2000.

Fire is part of the solution. Today, we no longer practice fire exclusion. Our policy is to restore fire's ecological role on the land. We do that by allowing natural fires to burn in remote areas and by conducting carefully controlled burns in other areas. In both cases, we can only do so where conditions permit and where we have an approved fire management plan in place.

Where we cannot burn, the only alternative is to remove the excess trees. In such places, we need to carefully thin the forest before restoring fire to the land. Some areas will require a combination of thinning and controlled burning. We now have the tools, techniques, and technologies for low-impact tree removal. We are not talking about clearcutting majestic old-growth stands. We are talking about thinning and burning where needed

to restore the healthy, fire-adapted forests that historically dominated the Interior West.

Priority Areas

Our first priority should be treating the areas most at risk, areas where people live and work—the wildland/urban interface. Homeowners need to take responsibility for making their properties firesafe, and we are doing what we can to help by working with our local communities.

But it is not enough just to thin right around homes and communities. You might save your house from a catastrophic fire, but you have lost your home if it is surrounded by a blackened landscape. You probably can't even sell and move, because who would buy?

Besides, values most at risk include municipal watersheds in the backcountry. This year's Hayman Fire, for example, burned much of the area that supplies Denver's water. The wildland/urban interface is really much bigger than most people think.

We know that our treatments work where the areas we treat are big enough. When a large fire enters a treated area, it will often drop to the forest floor and leave most trees unburned. But a large fire can throw firebrands a half mile or more, so it can easily ignite dense forest beyond a small treated area.

Treated areas must be large enough for a fire crew to have enough time to get in and contain a fire while it is still on the ground and not too dangerous. The Hayman Fire burned right through some small treated areas; it just dropped to the ground and came out the other side. Some of the treated areas were so small that the fire just blew right through without even dropping down.

But when the Hayman Fire reached the Polhemus Burn, it changed dramatically (Egan 2002; RMRS 2002c). On the Polhemus Burn, we had treated about 8,000 acres (3,200 ha) in October 2001, less than a year before the Hayman Fire, so surface fuels were few. The fire hit the area and dropped down, giving us a chance to get in and construct fireline. In some places, the fire even went out on its own. Hundreds of homes were saved. It's a great example of the kind of treatment that works.

Adaptive Management

Admittedly, we still have much to learn about the effects of our forest health treatments. Forest science

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did not traditionally focus on the long-term effects of thinning and burning. In the past, we mostly asked questions related to timber harvest—for example, what is the level of growth where returns are greatest if you harvest?

In the last 10 to 15 years, we have begun asking more questions about forest restoration. Forests are long-lived, so it takes a very long time—decades or even centuries—before some of the answers are known. Ecosystems are also tremendously complex. Former Forest Service Chief Jack Ward Thomas used to say, quoting the ecologist Frank Egler (1977), “Ecosystems are not only more complex than we think, they are more complex than we can think.” So I would never say that we have all the answers.

But does that mean we should do nothing? I would say no. At least we are asking the right questions now, and we are learning a great deal from the answers. For example, our Rocky Mountain Research Station in Flagstaff, AZ, has been working with the Ecological Restoration Institute at Northern Arizona University to improve our understanding of burning and thinning treatments. There is much that we have already learned.

Wally Covington, who is in charge of the program, has pointed out that we used to think we had enough time for all the answers to come in, but now we see that we don't (Robbins 2002). We no longer have that luxury. We must act now.

Then we must carefully monitor the results, see what works, and change our management accordingly. It's called adaptive management, and it makes sense.

Collaborative Solutions

We cannot act alone. The days are gone when we could narrowly focus on national forest land. Today, we need to think strategically on a landscape scale. That means connecting our fuels and forest health treatments to our efforts to help homeowners make their properties firesafe. It means engaging our State and local partners, including our local communities, in deciding what our priorities should be.

We are not talking about treating every acre at risk of catastrophic fire—all 73 million acres (30 million ha) of national forest land. Even if we had the means, it might make more sense in some areas to leave the land alone. We have got to strategically focus our projects where they will do the most good—where they will help us achieve the desired future condition of the land.

The highest priority areas are where the risk to people, property, and wildland resources is greatest. Those are often the areas next to or near to the wildland/urban interface. For example, the burn that stopped the Hayman Fire backed up to a settlement and protected it. Other high-priority areas are in or near our municipal watersheds. Some projects might be designed to restore a healthy landscape mosaic or the original open pine forest. For

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all of our projects, we must carefully monitor the results and adapt our management accordingly.

I think we can find common ground for deciding at the local level what our priorities and treatments should be. Today, we have amazing new opportunities for collaboration. New technologies such as the Internet allow us to work together with partners all across the landscape.

We've got some good examples in place, such as the Blue Mountain Demonstration Area in Oregon or the Greater Flagstaff Forests Partnership in Arizona. Our partnerships are based on broad areas of agreement, such as focusing on reduced risk, using multidisciplinary

science, managing at the landscape level, measuring success in terms of watershed health, and monitoring results for adaptive management.

If we work together based on shared goals for the land, everyone benefits. Ecologically, we can benefit the land by restoring ecosystems to something more resembling their condition at the time of European settlement. Socially, we can benefit our local communities by helping people make themselves safer from wildland fire. Economically, we can benefit our citizens by providing jobs and by helping them take advantage of local business opportunities to utilize excess trees and brush.



Fire effects in treated versus untreated areas. Long before the 2002 Rodeo–Chediski Fire charged through, the area in the foreground was thinned and prescribe-burned; the ponderosa pines, though scorched at the base, will survive. In the untreated area behind the people, the stand was much more dense, and the trees totally burned. Photo: Tom Iraci, USDA Forest Service, 2002.

I for one would much rather see Americans use products from our forests and in turn get jobs out of it than import the wood from countries with fewer environmental protections. I would also much rather see wood used than most substitutes; wood takes far less energy and water to produce, and it is a better insulator than steel or aluminum. Best of all, it is renewable. I think we can use forest products in a way that meets our shared goals for long-term ecosystem health.

Process Predicament

So what's stopping us? Well, we have a big problem. The Forest Service is caught in a bind. On the one hand, we strongly encourage collaboration through partnerships on a landscape scale. On the other hand, when it comes to delivering on our partnership commitments, the Forest Service often finds itself mired in process and unable to move forward with actual projects on the ground. When we fail to fulfill our promises, all the trust and goodwill we spend so much time building evaporates.

The many reasons for the problem are outlined in a report we delivered to Congress (USDA Forest Service 2002c). Part of the problem is our process for appeals. I believe that people ought to have the right and the ability to question our decisions. But I also believe that the right to appeal carries with it a responsibility. Those who question our decisions have a responsibility to all the other people who are involved in the decision or have a stake in the outcome. They have a responsibility to engage upfront in the discussion instead of waiting in the wings while others hammer out an agreement, then using procedural or legal maneuvers to torpedo it.

Understandably, our partners are deeply discouraged by our process predicament. Governor Kitzhaber of Oregon, for example, has written that “the current procedure-bound, litigious, cumbersome, and glacial process that has engulfed federal land management agencies does not produce sustainable land management” (Kitzhaber 2001). I would have to agree.

It is time to reevaluate our tools and processes if we are truly committed to sustainable land management. That does not mean overhauling our environmental laws; we need the national sideboards they give us for managing healthy lands. But I think we can do much better in terms of how we apply the laws. We need to fix the processes that are so clearly broken.

In August 2002, President Bush announced the Healthy Forests Initiative (see the sidebar). The purpose of the initiative is to improve some of our processes for more timely decisions and greater efficiency, specifically with respect to fuels treatments and forest health restoration projects. I am pleased that the President’s announcement has raised the level of consciousness about our forest health crisis and the need for the tools to address it. With the right tools, we can spend less time tucked away in windowless planning rooms and more time working with people to reach agreements that everyone can live with—and that we can act on to deliver results.

A Great Experiment

When you think about it, the national forests and grasslands are a great unfinished experiment. We as a Nation are testing a hypothesis—the hypothesis that a great system of public lands can provide benefits

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The experiment hinges on the answers to these questions: Do our communities get enough economic benefit from the national forests and grasslands? Do the American people derive enough social and personal benefits? Are ecosystems still as healthy as they were a century ago? Will we leave a legacy for our children that we can all be proud of?

We need affirmative answers to every one of these questions if our experiment is to succeed. The jury is still out. People all over the world are watching and waiting to see if what we are doing is the right thing. A lot is at stake.

In a great experiment like this, the outcome is never certain. There will always be ups and downs. Despite the best of intentions, we have made some really big mistakes. We have also found that people’s values and expectations change. We do not have all the answers, and we never

HEALTHY FORESTS INITIATIVE

On August 22, 2002, President George W. Bush announced the Healthy Forests Initiative. The initiative is designed to help implement the Ten-Year Comprehensive Strategy and Implementation Plan under the National Fire Plan. The Ten-Year Plan was adopted in spring 2002 by Secretary of Agriculture Ann M. Veneman, Secretary of the Interior Gale Norton, and 17 Western Governors, in cooperation with county commissioners, State Foresters, and tribal officials. The plan establishes a framework for local collaboration on forest restoration projects to protect communities and the environment.

The Healthy Forests Initiative has several parts. Under the initiative, the Forest Service is working, among other things, to:

- Improve procedures for developing and implementing projects, in collaboration with local governments;
- Reduce the number of overlapping environmental reviews;
- Develop guidance for weighing short-term risks against long-term benefits;
- Ensure that procedures under the National Environmental Policy Act are consistent, partly by developing a model environmental assessment; and
- Simplify the Forest Service’s appeals process.

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will. All we can do is learn from our mistakes, adjust to change, and work to make the experiment a success.

One thing is clear: We cannot succeed unless society works together. If there is anything that will cause this experiment to fail, it will be people's desire to have it all their own way. If people cannot work together enough to give everyone a stake in the outcome, that will be the end of the national forests and grasslands as we know them. And the biggest losers will be the next generation.

It's a new day and a new time. It's time for people to stop refighting the battles of the past. It's time to start finding broad areas of agreement, then working together to strike the right balance for the

future. Ultimately, conservation is about our obligation to the next generation. We owe the next generation at least that much.

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WEBSITES ON FIRE*

Community Preparedness for Wildfire

The first of 15 case study summaries that evaluate what each community is doing to increase wildfire preparedness is posted on this Website. Researchers at the USDA Forest Service's North Central Research Station studied the northeastern Minnesota commu-

nity of Gunflint Trail to determine its level of wildfire preparedness, what could be done to improve wildfire preparedness, and how other communities can learn from the Gunflint experience. The researchers developed a model that demonstrates how individual and community decisions affect actions to increase wildfire preparedness, suggesting actions that the community might take within the confines of its social and landscape characteristics.

*Occasionally, *Fire Management Today* describes Websites brought to our attention by the wildland fire community. Readers should not construe the description of these sites as in any way exhaustive or as an official endorsement by the USDA Forest Service. To have a Website considered for inclusion, contact the managing editor, Hutch Brown, at USDA Forest Service, Mail Stop 1111, 1400 Independence Avenue, SW, Washington, DC 20250-1111, tel. 202-205-1028, e-mail:hbrown@fs.fed.us.

Found at <<http://www.ncrs.fs.fed.us/4803/highlights.htm>>