

MAKING PEACE WITH WILDLAND FIRE

by **Bruce Babbitt**

It is June of 1996, Washington is hot and stifling, the Congress has recessed, and I am walking out of my office, dragging an orange fire pack, stuffed with a nomex fire uniform, hard hat, boots, sleeping bag and fire shelter. Settled onto a United flight to Phoenix, I begin to reflect on my motives for going back onto the fire lines at this time of my life. I have a "red card" in my wallet, proof that I have completed the training course, passed the fitness test and learned to strip and deploy my fire shelter in less than twenty-five seconds. My destination is the Hochdoerffer fire on the San Francisco Peaks in Northern Arizona. And my staff are wondering why the Secretary of the Interior is headed out to the front lines to work with a hotshot crew of men and women half his age.

Yes it may have something to do with mid-life passage, taking a break from the dreary politics of this city, finding some excitement and reliving my youth out west. But it's a lot more than that. We are in a national fire crisis. Wildfires are on a sharp increase, burning bigger, threatening communities and taking more and more property and lives.

In the last decade, the number of acres burned has doubled; the number of lives lost has tripled. Our response has been to escalate the war. Wherever the fires go, they are followed by armies of firefighters, equipped with all manner of tools and machines, supported by a burgeoning air force of surveillance planes, helicopters and air tankers. The federal firefighting budgets have gone up ten times since 1960 to a billion dollars a year. And still the fires multiply. The contending forces of man and nature seem to be caught in an escalating confrontation with no end in sight. I mean to find out why, and whether we can do anything to establish a truce.

It was the summer of 1994 that brought a sense of urgency to my inquiry. In July of that year, I arrived in Boise to be met at the jetway with bad news - fourteen firefighters from the Forest Service and the Bureau of Land Management were missing and unaccounted for in a firestorm on a mountainside in Western Colorado. I went straight to the Interagency Fire Center, located a sabreliner crew preparing to fly infrared runs over fires in the Great Basin and persuaded them to drop me off in Grand Junction. By morning we were at the fire incident command center in the Glenwood Springs Elementary school. The exhausted members of the incident team briefed us on the accident scene. Four smoke jumpers from Missoula, seven Prineville hotshots and a helitack team had been caught in a firestorm as it exploded up the mountainside. Some had made a run for safety over the top, others tried to deploy their fire shelters. Rescue workers found one still clutching a melted chain saw; another had made it partially into a shelter, a protruding leg and axe handle were completely incinerated. The two members of the helitack team had got a head start on their run up a nearby slope; they were finally located, their charred bodies huddled under a rock outcrop in a burned-out ravine.

We reviewed the progress of family notification, heard status reports on several hospitalized firefighters who had escaped over the mountaintop, and prepared to convene an investigation. By mid-afternoon we were ready to release the names and explain the situation. Outside it was a dazzling summer afternoon, down across the Colorado River the mountain cliffs were green with Gambel oak, broken by outcropping of blood-colored sandstone. High on the mountain overhead the fire was still flaring in the brush; helicopters trailed pitiful little buckets of water up from the river. Scout planes lingered over the mountain followed by slurry bombers trailing orange streams of retardant that seemed to hang in the air. It all seemed timeless and dreamlike and unbearably sad, like the frame of a motion picture stopped forever.

A Forest Service press officer began to read the names: James Mackay, smoke jumper, Missoula, Montana... She choked up, composed herself, then proceeded through the list - ten men, four women, a smoke jumper

team from Missoula, seven from the Prineville Hotshots, two from the Grand Junction helitack crew. Fire wars produce casualties. All the technology, helicopters, air tankers, satellite imagery, infrared, instant communications, can't eliminate the risk. When nature is on a rampage, whether a "perfect storm" at sea, or a fire exploding up a mountainside, technology only adds to the sense of helplessness. Like Rob Fischer dying in a blizzard at the summit of Everest, beyond rescue, saying farewell by satellite to his wife in New Zealand.

In the following days we met with the leadership of the Forest Service and the Bureau of Land Management to begin picking up the pieces. With fires still burning across western Colorado and spreading across the west, our first task was to rebuild morale, emphasize safety and get through the summer without any more accidents. We quickly convened an official investigation. I spoke with several grieving parents; they all felt what one said explicitly, "I hope that you are going to change things to make sure this doesn't happen again."

Even with these actions, we still had not confronted the changing conditions that are making western forests ever more dangerous and explosive. The problem, long simmering in academic and professional journals, increasingly recognized by front line fire fighters, came straight back to top management - to us. Jack Ward Thomas, the Chief of the Forest Service, told it straight, "My people are strung out. There is too much fuel building up out there." We agreed to gather an interagency team to examine how we got backed into this corner and what to do about it.

It was weeks after South Canyon that I decided to go back to the firelines. I needed to learn what had changed, both in the forests and in the culture of firefighting, in the forty years since I had spent my summers fighting fires. Perhaps out there in the fire and smoke of the battlefield, I could learn how to conduct this war more effectively. That brings me here to the Hochdoerffer fire camp outside Flagstaff. The incident commander briefs us: a lightning strike on a mountain side in thick forest of mixed conifers, the fire moving rapidly north and east downslope through descending vegetation zone from mixed conifer into the ponderosa, then down in to the pinon juniper and beyond toward the high desert lands of the Navajo Indian reservation. Four firefighters trapped by the front were forced to deploy into fire shelters, no fatalities, one hospitalized for burns. I locate my crew, the Arrowhead Hotshots, sprawled out asleep on the ground and join them.

We are up before dawn. In the morning light hundreds of firefighters in yellow and green nomex uniforms are preparing for the day shift. The place has a chaotic, makeshift look: personnel carriers, semi trailers and engine units scattered across the meadow, interspersed with heaps of supply boxes, water tanks, rows of pink and blue porta johns.

Then the organization kicks in. We arrange our packs, top off bottles of drinking water and chain saw fuel, march through the breakfast line and then gather for the morning briefing. The Incident Command team explains the overnight progress of the fire, discusses the scouting reports and gives out assignments. Our crew, the Arrowhead Hotshots from California, will be deployed on Division D to construct and hold line. The weather officer lays out the spot forecast for gusty winds, that means a "red flag" warning to take extra precautions. The safety officer lectures us: "Fire has large potential for rapid spread. Know your safety zones and escape routes and keep alert. Watch for falling snags, the 'widow makers.'"

An hour later we are on the fire line deployed in proper tool order, sawyers first, followed by pulaskis and shovels. The fire front has moved downslope to the north leaving a charred landscape of blackened trees and smouldering snags. The morning is cool and still, the tang of pine smoke hangs in the air, shafts of sunlight cut through the haze.

We go to work mopping up a smoking, incinerated landscape. We clean and widen the fire line, chopping out clumps of grass, and then we begin "gridding" inside the line to cut down burning snags and clean hot embers out of smouldering stump holes. We check our work by "cold trailing," gingerly sifting through the ashes with bare hands to make sure it's out cold. The basics of fire fighting haven't changed; this is pretty much the way

we worked a fire when I was in high school.

What has changed is air support. When I was on a fire out here in 1954 there was nothing in the sky but clouds. Now at midday, as the sun warms up the air and the humidity drops, the fire starts to kick up, and the air show begins. We are struggling to pull apart and spread huge piles of burning slash just inside the fire line. But they are too hot to get at with our pulaskis. So the crew chief radios for help, and a helicopter dangling a bambi bucket comes over sprinkling a shower of water. Still too hot, the crew chief radios again and this time a giant Sikorsky thunders across the clearing, its snorkel dangling like an umbilical cord, red lights flashing. The bay door opens and a deluge comes forth; another run and another deluge, and now we get in close and clean the fire out.

A few miles down the line is an inholding of private land with several residences. "Structure protection" is a priority, so a fire crew had surrounded the buildings with wide fire lines. Now an air tanker is overhead dropping a shower of fire retardant, turning the houses and yards bright pink. This aerial war is new to me; the precision flying mesmerizing. For a moment I fantasize that somehow we might turn the fire wars in our favor with unlimited massive air strikes. The Canadians have even invented a "super scooper," an airplane that scoops up its load of water by skimming the surface of lakes or the ocean. But there aren't any real lakes, much less an ocean, in this neighborhood.

The following day we move down into a pinon juniper forest where the head of the fire has slowed as the trees thin into grasslands. The fire has been spotting - jumping across the landscape to ignite isolated clusters of pinon pine. We go to work to line the trees and then root out fire smouldering in piles of duff. Lining the trees, cutting down to mineral soil, scraping, spraying water from backpack "piss bags" and then mixing the mess all together, all the while choking on soot, ash and dust, is not very glamorous or exciting. By the end of the day the Hochdoerffer fire is headed nowhere; it is simply running out of fuel as it moves downslope into a barren landscape of cinders and volcanic cones.

At sundown we gather for tool work; my task is to clean and file a shovel until the blade is sharp enough to slice a strip of duct tape. It is a mellow evening - we have whipped this fire, and the crews will start demobilizing and moving out in the next day or so. Yet looking out across the landscape where the fire had burned from the high conifer mountains down to pinon-juniper and then into the desert, I begin to wonder: did we really put this fire out or did it just run out of fuel?

Perhaps we should have spared the expense and avoided the danger by just letting this fire run, at least down in the low country. This scraggly forest of pinon and juniper on the downslope end has no commercial value - in fact it is not even a natural forest. These trees are invaders, encroaching into good grasslands that were once kept open and park-like by naturally occurring fires. Was this an unnecessary battle? What about the fire suppression effort at South Canyon? Was it justified in light of the risks?

These questions that took me back to Flagstaff where I met Wally Covington, a soft spoken researcher in fire ecology at Northern Arizona University. He explained his research by showing me a turn-of-the-century photograph of the forests at the base of the San Francisco Peaks. The ponderosa pines appear large and well spaced in an open, park-like landscape. He then handed me a recent photograph taken from the same vantage point. The open spaces are filled in with thickets of young trees. Covington has established that prior to European settlement in the 1870s, there were an average of about 50 trees per acre in these forests; today there are about 2,000 per acre. That means a lot more fuel to feed a fire. The thickets of small trees, "gasoline rags" in forest parlance, provide fire ladders for flames to reach up into the forest crown. The buildup of ground fuel, pine needles and dead branches littering the forest floor adds still more fuel to feed even bigger fires.

He took me across the hall to a laboratory where shelves were stacked with cross cut slabs of ponderosa

trunks. He selected one and explained. "This comes from Mt. Trumbull, an isolated ponderosa forest north of the Grand Canyon. You can count the annual growth rings; this tree is about 450 years old." Call it the area's oldest historian. Every tenth ring or so had the telltale traces of black smudge - a record of the light ground fires that regularly swept through the forest, burning out the undergrowth and thickets of small seedlings. The result was open park-like forests like the one in the early photograph.

Why have the forests changed so extensively in this century? Covington traced a finger across the rings to the year 1870. After 1870 there were no more smudges. That is when the first pioneers entered the area with their large, unregulated herds of cattle and sheep. The grazing herds trimmed the grass so completely that it could no longer carry light fire along the forest floor. Then, a few decades later, the newly organized Forest Service came along to suppress any remaining fires. Similar sequences occurred all over the mountain west and California.

Without cleansing fires, dead material piled up on the forest floor, and thickets of young dog hair pine sprouted in formerly open spaces. Across the decades, the forest became a tinderbox, ready for the inevitable big fire that, instead of sweeping lightly across the ground, would ladder up into the tree crowns incinerating the entire forest in an uncontrollable inferno, what the foresters call a "stand replacing fire."

Several months later Covington took us to Mt. Trumbull. After driving 50 miles across a sagebrush plain, we ascended into the forest where we walked through a landscape crowded with sickly-looking pines. These trees, he explained, are from the prolific 1919 seed crop; they should be thirty to forty feet tall; instead they are starving one another as they compete for scarce water and nutrients. Nearby was a cluster of decadent New Mexico locust trees; a sun loving tree being shadowed out by the pine thickets. The forest floor beneath us was barren of shrubs and grasses, covered instead with mats of pine needles like mulch put down to suppress garden weeds. "It's the same effect," he said. The cover of pine needles and dead branches smothers out the flowers and grasses that once grew here. That means less diversity and less forage for wildlife.

We inspected a hillside where Covington had recently burned the landscape in an experiment to replicate the natural fire cycle. The forest was open and clear of ground fuel; the large ponderosas, with their clean trunks free of lower limbs and protected by platy, fire resistant bark, were untouched except for some scorching at the base. "Come back this summer, and you will see a great display of wildflowers and the butterflies and other insect pollinators, much like it was before the onslaught of grazing cattle and government fire suppression."

The natural fire cycle is also implicated in the fate of many endangered species. Sportsmen have long known that fire helps elk, deer, turkey and game birds by maintaining meadows, open spaces and "edge" habitats preferred by these species. Scientists are now discovering that the linkages between fire and many endangered species are even more complex.

Around the Great Lakes a butterfly called the Karner's Blue is wavering on the edge of extinction. The larvae of this butterfly develop by feeding on a species of purple lupine that grows only in sunny spaces opened by fire. No open spaces in the forest means no lupine means no butterflies. In California the giant sequoia will not reproduce without fire to heat and pop open its seed cones.

The endangered red cockaded woodpecker nests and forages in the long leaf pine forests of the south. Like western ponderosa forests, these southern forests evolved with frequent light ground fires that maintained an open, sunlit forest floor where the woodpeckers forage for insects. With fire suppression, however, oaks and other hardwoods filled in the spaces making a dense forest. And as the oaks flourished, the woodpeckers left and drifted toward extinction.

Now both the Forest Service and private landowners are using fire to control the understory, providing better

pine growth and bringing back the woodpeckers. In late 1995, the Forest Service and the Interior land management agencies, after months of discussion and consultation, completed their report, "Federal Wildland Fire Management." It nailed the issue. "Agencies and the public must change their expectation that all wildfires can be controlled or suppressed," and drove it home that, "wildland fire, as a critical natural process, must be reintroduced into the ecosystem." It committed our agencies to a major change of direction. From now on, rather than trying to override the pyrogenic nature of the forest, we would adapt our responses to that reality.

Moving from policy to implementation is not easy. The 10 a.m. rule, attack every fire with sufficient resources to have it under control by 10 a.m. the next day, is deeply rooted in the government fire culture. Skeptics question whether the public really accepts the notion of burning the forest to save it.

Opinion polls show, however, that the public does understand the need to fight fire with fire and that it was the Yellowstone fires of 1988 that brought the change. Americans watched the evening news for weeks as the Yellowstone firestorms advanced on Old Faithful, jumped across river and canyons, and nearly engulfed the community of Cooke City. Commentators proclaimed a disaster, and you could almost hear the lamentations of Smokey Bear in the background.

But now, on the tenth anniversary of that fire, the landscape has revived, hillsides are greening with lush stands of young lodgepoles and fields are resplendent with purple fireweed. Park rangers explain to visitors that fire is as essential to the Yellowstone landscape as the newly restored grey wolf is to the health of the elk herds. When Robinson Jeffers wrote, "What but the wolf's tooth/ whittled so fine/the fleet limbs of the antelope?" he could have asked just as accurately, "What but the flame shaped the structure of the forest?"

This past summer, fire outbreaks in Idaho provided a demonstration of our progress in implementing this new fire policy. Lightning had ignited a fire in the Frank Church Wilderness north of the town of Salmon. Under the new, fire friendly regulations, the fire manager for the Challis National Forest had up to 72 hours to either attack the fire under the 10:00 am policy or to classify it as a prescribed natural fire, thereby allowing it to burn.

Sensing an opportunity, the fire management team assessed the type of forest, the amount of ground fuel, fuel moisture, terrain, and long range weather forecasts. The data was then integrated into a fire behavior model, expressed on a map showing a set of irregular concentric circles projecting spread of the fire across the mountains clear up to the middle of October, when autumn cold and snow would naturally snuff out the fire.

On the basis of that model the fire management team gave the green light to let the fire burn. Then a few days later another lightning strike ignited a second fire nearby, bringing another round of analysis and a decision to let it burn. Then a third and a fourth lightning strike and let-burn decision. Eventually the fire manager drew a boundary line around 300,000 acres of wilderness as the management zone in which the fires would be allowed to run without suppression.

In mid-August I went to Salmon to have a look. After a briefing by the forest supervisor, we made a helicopter survey of the fire zone. It was still early morning, the sun had not yet broken the inversion, and smoke lay in the valleys and canyons like huge grey lakes extending to the horizon.

We flew across the imposing gorge of the Salmon River, the "River of No Return," into a jumble of mountains. I peered down at the 60 degree slopes, studded with clusters of douglas fir rooted in huge rock slides that flowed down to the edge of the river. This is the place where, in 1806, Lewis and Clark turned away from the Salmon River, judging it impassable.

Down below, patches of fire were kicking up as the temperature rose and humidity dropped. By afternoon as

the inversion broke and the wind came up, fires would be making a run up these slopes.

I tried to imagine what it would be like down there sweating and stumbling, trying to put down a line without starting a rock slide, wondering when the wind would kick up, throwing burning embers across the line, and wondering how the hell you would ever get out if it did blow up. As if reading my thoughts, the fire manager came over the intercom. "Look at the slope over there at two o'clock. Back in 1985 a fire started a run up that slope and 77 firefighters had to make an emergency deployment into their fire shelters. It was a close call." On this fire we don't need to take such risks.

Which is not to say that all risk can be eliminated. Even when you let a fire run, it has to be managed to stay within the prescribed conditions and to protect inholdings of private property. This fire is no exception. By afternoon there may be helicopters out here doing bucket drops to take the edge off flareups and hot spots. Back in Salmon, we discussed the economics of the new fire policies. The fire manager estimated that allowing this fire to burn with light handed management was costing about \$35 per acre. An all-out suppression effort on this mountain terrain would cost from \$500 to \$1,000 per acre. Good news for our congressional budget committees.

There remains one difficult, intractable obstacle to implementing this fire tolerant policy. It is our life-style, our new found taste for living in the woods - rural sprawl. When forests and residences are intermixed, it becomes difficult to let a natural fire run, much less to ignite a prescribed fire.

Lake Tahoe is a case study in the problems of managing this urban wildland intermix. From a distance Tahoe is still picture perfect, a sapphire lake sparkling in a setting of emerald green forests. But up close you can see evidence of impending crisis. The thick forests, the result of a century of fire suppression, are crowded with grey skeletons, trees dead of insect infestation, drought and crowding. And tucked away throughout this tinderbox forest are thousands of residences.

The communities around Lake Tahoe are at last responding to the fire threat by clearing trees and vegetation around residences. Building codes now mandate the use of fire resistant building materials. Shake shingle roofs, the gasoline rags of residential construction, are banned. (In San Diego in 1996 I saw a subdivision where burning embers had showered down selectively destroying houses with shake shingle roofs while leaving untouched the houses with mission tile roofs.)

Yet even with these defensive measures, there is still that brooding, decadent, tinderbox forest, ready to explode, overwhelming homeowner defenses and turning this whole basin into an inferno. Prescribed fire is an especially tricky proposition in these intermix forests. They are too dangerous to burn, unless we can get the fuel load down before lighting a prescribed fire. That means that a fair proportion of the younger trees must be thinned out in advance so the ground fire doesn't ladder up into the forest canopy, reducing the whole forest, and the houses in it, to ash.

In the Lake Tahoe Basin local fire agencies and the Forest Service have begun to thin and burn with prescribed fire. But thinning is labor intensive, and traditional sawmills, accustomed to cutting old growth trees, are slow to retool and develop markets for small diameter products. The work is complicated by summer residents who come up here from Los Angeles expecting to enjoy green forests and demanding smoke free views from their porches.

The obvious solution to fire hazards of the urban wildland intermix is to maintain more separation between forests and subdivisions, thereby allowing natural fire to function without constantly alarming residents, threatening property and endangering fire fighters. In the words of one California writer, "The new density of hillside housing has transformed the battle against wildfire from a wide ranging war of maneuver into the equivalent of street fighting."

Fire hazard zoning is not a new idea. It was proposed for California by Frederick Law Olmstead, Jr. clear back in 1930 as a way to limit destruction from the notorious Malibu fires that sweep down from the mountains on an average of every twenty years. The Malibu fires were back once again in 1993 and 1996. Each time houses are rebuilt with insurance which is still available. Eventually we must zone for fire hazards, just as we zone for flood plains to limit damage. If these Malibu residences that are periodically destroyed were in a twenty year flood plain they would never have been built or insured.

Last summer I returned to South Canyon. I climbed above a small subdivision and then up the mountain face where the tragedy unfolded on that July afternoon two summers before. The fire scars are fading and the resprouting gambel oak is waist high and brilliant green. Near the top I followed the faint trace of the fire line where ten young men and women perished at 4:32 p.m. on that July afternoon. I located the twelve stone crosses, each placed at the exact point where a life ended. I thought of my promise to the parents - that we will honor the memory of their sons and daughters by doing everything possible to prevent another tragedy.