

2014 Pinchot Distinguished Lecture

Between Two Fires:
America's Wildland Fire Scene Since 1960

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Well, good afternoon. I'd like to begin by thanking the Pinchot Institute not only for the opportunity to talk about one of the subjects I am most passionate about, which is fire, particularly fire on the public lands - a very Pinchot-esque topic - but also for arranging this setting. I began my adult life on the North Rim of Grand Canyon. I had a full immersion baptism into the saga of John Wesley Powell, and then wrote a master's thesis, largely on Clarence Dutton, the man who suggested to Powell that they found the Cosmos Club. I then wrote my dissertation on Grove Karl Gilbert, the third of that triumvirate. There is a real sense of historical synergy if you will, or personal closure, to be here on this topic, in this place.

The slide you saw before is an apt one for the subject. We see people caught between two fires - one coming at them, and one they are setting to escape. But, the time period is wrong. Instead, I am going to look at the last century and break it into three parts. One is an era, roughly fifty years, dominated by US Forest Service and a policy of fire exclusion. Fifty years we spent trying to take fire out of the landscape. Then we will look at a fire revolution, fifty years of institutional fragmentation and attempts to reassemble those pieces. Fifty years trying to put at least some of fire back in the landscape, on as much as possible, our terms. Then we'll segue into where we are now. We may be on the cusp of yet another tipping point on a large scale.

So, in 1910 Gifford Pinchot dismissed arguments that nothing could be done on fire. He said, "To think otherwise was childish, and hopeless..." and "indeed it is now clear that forest fires are wholly within the control of man." At that time, the national forest had roughly one fire guard for every 670 sq miles, that they thought they could begin this project is an undertaking of heroic stature or hubris depending on your point of view. Earlier that year Pinchot got himself fired by Taft, and that

summer the agency he left behind was consumed by one of its great and early crises. The Big Blowup, three and a quarter million acres in the northern Rockies alone, killed 78 fire fighters in six different incidents in the same afternoon. It put the agency nearly a million dollars in debt, and that was real money in 1910. In effect, it traumatized a generation.

All of the apparatus of modern firefighting, everything that has happened in the last century, was all there. It's fascinating. It's like seeing the whole thing coming together and all the parts working. The call-ups the inner regional exchanges, the emergency money, the firefight as a kind of set-piece of management, even the call-out of the army, essentially all of the standing army in the Northwest. (We didn't have a large standing army in 1910.) What we had was fighting fires. And all of the controversies: what to do with rehabilitation; what to do with salvage logging; what to do about replanting? Or some kind of restoration project? All those controversies were rehearsed and fully brought before the public. And not least, what to do with all those dead firefighters, a question not resolved until 1933.

So it was all there. And in fact, the controversies that are still with us were still there. We also had the imperishable saga of Ed Pulaski, leading his crew, panicking crew, down the west fork of Placer Creek in the midst of a firestorm, herding them into a mineshaft, and then holding them there at gunpoint while the firestorm passed across - a story that was subsequently given physical expression by his invention of an axe-hoe combination tool that is still carried by firefighters today. But there was another controversy that same month, August 1910. A group argued that the whole firefight is wrong. They said, "What we should be doing is emulating the American Indian, and many settlers. We should be light-burning this landscape frequently, and if we don't do that, we will create horrific fires, unhealthy forests..." everything that came to pass. Here is Henry Graves puzzling over light burning. And here is a photo he took in November of 1910 of light burning in progress in northern California.

But of course, there was a subtext to this, because the fight over fire had a deeper political context, which is the question of whether state-sponsored conservation could work. Gifford Pinchot and others of his generation had made fire protection the index of their success. To fail at fire suggested that the entire concept and the political arrangements behind it might be wrong. In 1910 secretary of interior, Richard Ballinger, whose quarrel with Pinchot had led to Pinchot's dismissal, argues for light burning. Gifford Pinchot himself said, in this as in all other conservation matters, there is no third choice; you are either with us or against us. So the debate got polarized as well as politicized, and even that oracle of ecological wisdom and the land ethic, Aldo Leopold, in 1920, stands firmly with the Forest Service in opposition to light burning as a potentially subversive act that will undo a great amount of what the agency is trying to achieve. All this is the first great trauma as faced by Graves as chief. The next three chiefs of the Forest Service all the way through 1939 were personally on the fire line in 1910. This entire generation would internalize that experience. It would be a kind of Valley Forge or Long March for a generation. They would never tolerate another option for fire other than to fight it as long as they were on the watch.

A third element. In August 1910, part of the Progressive Era, one of our great philosophers, William James, published his final essay in which he called for a moral equivalent of war that would redirect all of that militarism, which would soon be re-sent to the trenches of World War I, toward

constructive purposes. He called for a national conscription to begin a war on the forces of nature. Well, there it is at all levels, a grand convergence. The Big Blowup in many ways creates a foundation story, a creation story if you will, for what's to follow. That gets institutionalized the next year with the Weeks Act, and we can begin talking about a national framework. As the numbers show, the states have done the heavy lifting. Fire has disappeared from the vernacular landscape of the country largely through the states and other jurisdictions, although often with federal help.

We then begin an extraordinary time of innovation - of technological invention, of tenacity, of pursuing fire in all sorts of settings, with all sorts of devices. But my favorite photo from the era is this one, and this comes from the National Archives. Here is a tree in the northwest, the top has been blown out by lightning, it's smoldering. And two guys were sent out to fight it. And they cut this small tree to lean against it, and then as one guy put it, "I raccooned" up to the top, while the other guy fills a bucket of water. So, we ought to chuckle, but the fact that they would undertake this for something that would seem so trivial, I think is a pretty vivid testimony to the intensity with which they approached and the agency approached the problem. Nonetheless, even if you are willing to do this, you can only do it so far. What about that back country? What about all that land that's been cut over and burned over? How you handle fires on such lands that? That requires a big investment, and the investment came with the New Deal, emergency conservation work and especially the Civilian Conservation Corps. That created, in effect, an army for fighting fire.

It's estimated that half or more of the CCC's projects went toward fire in one form or another. And almost overnight, we were able to create an infrastructure to handle fire across the country. One of the most astonishing projects was this: in California the Ponderosa Way, a six hundred and fifty mile long field burning. The entire west-front of the Sierra Nevada, this is sort of the flip side to the shelter belt program. So we are planting trees in one place and we are uprooting them in the other, only imaginable with these bottomless reserves of labor that the CCC represented. And it's in the middle of all this, in 1935, that chief forester, Silcox, the number two man in the fight in 1910, announces the 10 AM policy as a single universal standard of control.

There was lots of political enthusiasm. Here's President Roosevelt, who always thought of himself as a gentleman forester, approving a new campaign of fire prevention fosters. A couple of officials from the Forest Service. And here is the artist, James Montgomery Flagg, who bears a rather striking resemblance to Uncle Sam; yes, he modestly modeled the character on himself. Then all this was overwhelmed by World War II, in many ways a fire-war that ended with a horrific new fire weapon, the atomic bomb. So we see one of these periodic re-militarization of fire. By the time the Korean War ended, much surplus equipment was being put towards firefighting. These are staged photos, both in California, and see our armored divisions and air support off to fight fire, though maybe it's an iconography better suited for Guadalcanal than the back country of the national forests. But the stuff is there, we'll use it. We enter into a Cold War on fire, made plausible by the fact that large fires are still running through the landscape. The big fires in Maine in '47 helped to convince what would become the Office of Civil Defense that fire should be a part of its mission. In '61 we see the modern era of the excerpt burning replacing the former rural fires with back lots of Hollywood. We also get what will become one of the iconic images of this era: which is of some doofus on a roof, a wood shingle roof, in California with a garden hose. Never pass up a photo-up.

The Forest Service by now is the indispensable institution; it has controlled nearly everything in fire. Its policy, its research, its prose, its resources, its connection with the states. Even prevention programs. And indeed, in 1960 it's identified as a model of public administration. It was a hegemon, a benign hegemon, but nonetheless it controlled the apparatus, and in the same way, fire had increasingly become a government monopoly. It was treated as though it were atomic energy or something, that's too dangerous to be loosed upon society. Well, that's the high watermark. Now we enter a period of fifty years in which the monolith will fragment, and indeed the public domain will do the same. What had been a kind-of multiple-use melting pot is going to become a special interest mosaic. That will be true for the national public domain, but also for national politics. Those who try to hold all the pieces together, in effect to be a cameo of the country, in effect internalize all those stresses and strengths. Those who take off on single missions will be far more successful.

So the revolution is bi-coastal. Maybe, bipolar. One group is in Florida, it looked at prescribed fire and at working landscapes, and this became a model really for Tall Timbers, for the Nature Conservancy, Fish and Wildlife Service, the Florida department of forestry and others. The other model came out of California, and this was really tied to wild landscapes and public lands. And it wanted natural fire. Each had common cause against the suppression juggernaut, but they're not the same. They can conflict. The conversation between them was easy to avoid when they had a common foe to argue against but became more difficult when the foe in effect disintegrates, and they have to start negotiating with one of the various competing interests. So America's great cultural revolution on fire gets underway. The backdrop included an environmental movement and re-chartered public agencies. Virtually every agency either got a charter for the first time or had a new one issued. And then a real upheaval in demographics and workforce swept through the country. Regime change came. Intellectually, with lots and lots of separate agencies, each with their own mandate, each wanting its own fire program. Intellectually, as fire can be seen as useful, even necessary. But reintegration prove far, far more difficult than anyone thought.

There are lots of contributing factors to this, but I think fundamentally it was a revolution in values. And I would say this, even for the science of the period, it seems to me clear, reading the record, that the science followed the change in values; the values did not follow the scientific literature. So the revolution begins, the torch indeed is about to pass to a new generation. 1962, Tall Timbers opens its first Fire Ecology Conference outside the Forest Service, outside the institutional framework that existed. In effect, the beginning of a civil society for fire. 1962, the nature conservancy conducts its first burn on a prairie in Minnesota. Again, an alternative presence. 1963, the Leopold Report for the National Park Service in effect re-charters that agency. 1964, the Wilderness Act, this was a huge event because it created a new category of land, and potentially made putting out a lightning-caught fire illegal. Unusually, we created a category of land without creating an agency to manage it. Previously when we created something like Parks or refuges, you would create some institution to deal with it. Now, all the existing institutions would have to absorb that tension within themselves. This became a different and difficult institutional problem. 1967, the Forest Service begins tinkering at the margins of the 10 AM policy. 1968, National Park Service, renounces the 10 am policy and opens up a period of experimentation in fire restoration; and we're off.

It was a revolution from above, and in looking back at it, I have been struck by how fast it went for agencies that normally move very slowly. In some ways, it's like watching the disintegration of the Soviet Union. At one point, it seems monolithic and implacable, and then suddenly it's all in pieces. By 1970, the Boise Interagency Fire Center is opening as a way of consolidating some firefighting. Natural fire programs for both the park service and the Forest Service are in play. By 1973, the Forest Service has converted its fire control to a division of fire management; and it's accepted a concept of total mobility, a remarkable act on the part of the agency, and identifies that fire is an inextricable part of land management. That fire will not be a stand-alone service, that it has to bond with a strong nuclear force to land. So as we change our land uses, reallocate the public domain, we are having to deal with lots and lots of new fires, all of which will have to be somehow absorbed or dealt with.

In '74 the Department of Interior adopts a fire by prescription policy. 1976, National Wildfire Coordinating Group, but nonetheless a way of bringing common standards to make total mobility happen. 1977 The Park Service begins to throttle down a bit on its experimentation, creates a national manual, a national standard for doing fire planning. And the Forest Service follows the next year, though with a large overhaul of the agency that includes rechartering state and private forestry and rechartering fire research. Lots of things. And then, to complete the mix, let's add Alaska. So by 1980, essentially it's all in place. The debate was laid out under pretty much the terms that it still enjoys today. The institutions, the critical institutions had adopted the policies were in place, but it was a revolution from above, it needed to take root in the ground. Looking back at it, I've always thought, "Well, they were all laggards. They didn't get on with it. They didn't do it." No, they really did. At least formally it was all there, a long time ago. What happened?

Let me first describe briefly what the policy was. It was, most simply, a policy of fire by prescription. And this could be prescribed burning of the traditionally known sort. Prescribed fire as a term was invented in the South as an alternative between laissez-faire folk burning and fire exclusion, neither of which made any sense. It offered a controlled application of fire, with perhaps some scientific and institutional regulation applied. This concept was extended to natural fire, so we get the prescribed natural fire. For wildfires, we were given a set of options: you could control it in the traditional sense or you could contain it within some barriers, or you could confine it. Confinement and containment could look an awful lot like prescribed natural fire. In practical terms, they can be almost interchangeable. Anyhow, it's done. So it's all there.

Then we come to a lost decade, and a bit more. Everything polarizes. The revolution had gone on in a very bi-partisan way, as indeed the environmental movement had. It had not been a political, or a distinctly political issue. Now, it is about to become that. We also see large transfers from civilian agencies and civilian work force to the military. Even the weather begins polarizing. The early-80's were really wet; Great Salt lake was overflowing; climatologists were telling us we were heading into a new ice age - Milanchovic cycles make it inevitable, get ready for it.

By the end of the decade, everything has flipped. What had been thirty relatively benign years for climate and fire become thirty very difficult ones. Indeed, explosive ones; if there was an interest in fire, it was nuclear winter, concern that we might provoke a nuclear war that would spark such great fires that indeed it would lead prematurely to a new ice age. There was a great deal of

environmentalist blowback, now this is becoming politicized and polarized in ways. Same ways it was in 1910. We had few fires as the decade begins, we end with big ones. We also, in the middle of that, begin hearing about a wild land-urban interface. A pretty geeky term; but if it's a dumb name it's a dumb problem to have because it's a fixable one. There are technical solutions to this in ways that are not possible for other issues. But not only was this fire on the fringe a problem, it also began suggesting that land agencies ought to begin segueing or morphing into emergency services on an urban model. That this would be the future of fire management. California shows where it went; I think of Cal Fire, the metamorphosis, the sequential reincarnations from the California division of forestry to just plain Cal Fire, which is an urban fire service out in the woods.

Add it all together, and we have a decade of counter-revolution. It didn't roll everything back, but it stalled it. It pretty well stopped it in its tracks. Bill Sommers, in the audience, will testify that fire research was nearly distinguished in this period. The climax, the Ragnarok if you will, came in the summer of 1988, particularly in Yellowstone. I used to think of this as potentially a Second Big Blowup for its size and the attention it drew and perhaps the influence it had. I don't believe that's true at all now, I think of it as the Big Blowout. It was more the celebrity fire, it didn't affect policy. Policy for the Park Service was already twenty years into operation. It didn't change national effects, it did alert the public and the media to fire reforms. But I think it was also a lost opportunity for the American fire community. The question was framed, partly to protect Yellowstone. The question became: do big fires, including high intensity fires, belong in Yellowstone? And the answer to that is easy; of course. The question should have been: how do big fires belong? Under what terms, and at what cost, and with what rules of engagement? And that was not answered. Yellowstone had a let-burn program, and it was protected by the fire community instead of exposed. A discussion that needed to happen didn't. Okay, the right thing is always easier in hindsight; people were afraid, given the political atmosphere at the time, that any criticism would ripple too far beyond. But now we can see, I think, a lost opportunity.

We then enter what I think of as a kind of nightshift. It doesn't get worse, but it doesn't get better. Lots of stuff is reshuffled, lots of players come in and we see them for the first time. The resolution of the Consent Act. A reboot of the natural fire programs. Review of federal policy; the GAO comes in for the first time. More and more stuff, fewer and fewer resources to do it. 1991, the flipside to Yellowstone, what Yellowstone was to natural fires, the Oakland Tunnel Fire is to the wildland-urban interface. In 1992, a book, *Young Men and Fire*, which will change how the fire community sees itself, but also engage fire with the national cultural centers in ways that had not been true before. These big western wildfires were seen as a freak of regional violence, they're like a grizzly bear attack. They're an oddity, a quirk. They're not fundamentally tied in with the nation and our character in some ways. *Young Men and Fire* begins to change that conversation. Then we come to what I think of as Fire Revolution 2.0. It starts over again.

The '93 fires highlighted issues. Then came '94, a major turning point, and we're off. This is the decade of celebrity fires, with the media sensitized by Yellowstone. So from 1993 in Southern California to 2003 in Southern California, we have an interesting sequence of large fires. All of them, you'll note, except the California ones, happen in election years. And I wonder what would have been, what would have happened had it been one year out of sync. But even the 2003 fire in California coincided with a gubernatorial recall. So fire gets brought into the political discussion, but

in very quirky ways. '93, Southern California fire siege, I would take this as the onset of what I would call our sub-prime fire era, when suburban sprawl finally begin colliding in big ways with fire. But '94 was the turning point, not Yellowstone. Back to '94: the South Canyon Fire burned over a mixed crew of Forest Service employees. In a sense it's a Mogadishu moment if you think of the army rangers killed in that intervention. It acted on the fire community in the same way, and now they have something else to refract it through, that is, Maclean's book. It was as though life were imitating art. Now it is seen, interpreted differently.

Back to '94: Glacier National Park. Partly because they were stripped by resources (we saw our first nearly-billion dollar suppression bill that year), the park had to manage long-duration fire, one of them particularly the Howling fire in the back country, without being able to suppress it, even if they had wanted to. And they devise some techniques to do this, to bring some fire behavior science to bear. To make some calculations and then manage it for the long term. So at this point all the catalytic fires, if you will, are in place. I see we have a participant from that Era also in the audience. In '94, secretary of interior, Bruce Babbitt, went to the fire lines, a secretarial first, by joining the Midnight Suns hotshot crew. So '94 is the catalytic year, '98 is a reorganization year. This is something I had not recognized at the time. We create a series of training centers. A Joint Fire Science Program begins. The only big fires, and they were whoppers, were in Florida; 100,000 people evaluated suddenly, fires moving out of its traditional lairs.

It's also the first time we have standardized statistics. Think about that for a moment, we have no statistics on prescribed fire, prescribed natural fires, and in some ways, even wildland fire statistics, until '98 begins to formalize them. Secretary Babbitt ends the decade by declaring that we are in a national fire crisis. If 1994 was the catalyst, the 2000 season was the consequence. Big fires, loping over the Northern Rockies. Ninety after the Big Blowup, it's all burning again. We're sending out more people, spending more money. We're doing the same thing all over again; we just didn't lose all of those fire fighters. And then, prescribed fire escaped the National Park Service in New Mexico and burned into Los Alamos. This did for prescribed Burning what the Yellowstone fires did for natural fire, or what the South Canyon did for suppression. It said, "You're not going to be allowed unlimited discretion in doing this. It's going to be a lot tougher, a lot more people are going to be watching what you're doing."

So then we begin an era, it's hard to know quite what to call it. I think of it as the great scramble. Because now, we're going to try to catch up. But all the instruments are pointing the wrong way. It's all against us now. Still, a national fire plan is enacted in the waning months of the Clinton administration to put a great deal of money into building up fire suppression, fuel treatments; we doubled the investment, and before the decade's out, we've also doubled the amount burned, and we've doubled the suppression costs. Suggesting either that it's misguided or we're really way, way behind the curve. It's an era of megafire - the term is coined now - suddenly 1% of nature's fire economy is taking everything else. It's also an era that I think of as metafire. This is fire's MBA moment, a time when we're overloaded with consultancies, reports, everybody is piling in. And you know, everybody's saying the same thing. The GAO in this period issues fifty reports. They end in 2009 saying "We have nothing new to add." We know! There are no new solutions to this; it's just applying what everyone is saying, making it happen. So again, just our inability to apply it. And of course the era of meta bucks. Fire is starting to gobble up more and more of everything else the

agencies do. We started a war on fire, but like some other wars at this time, we decided not to pay for it. Congress refuses to back up its call to arms, and so agencies are being stripped of everything else. It's not a happy time. If we look back, say to 2007 or 2008, everything looks the same; big fires in the back country. More big fires, more houses burning, more firefighters dying.

Then we come to a period of reconstitution. Since we're so close to it, it's a little hard to understand how it's going to play out. Not enough parallax to frame it. But new policy guidelines appear, appropriate management response, or at least that's what it was called then. That was redefined, and now I believe it's called appropriate strategic response. It changes yearly; in some respects, I think it may change monthly. I don't know how anybody in the field can keep track of any of this. But in effect, it liberalized what you could do with particular fires that you were presented with. Meanwhile, the Flame Act was intended to straighten out fire financing, but Congress didn't fund all of it, so we're right back to the same problem. But it also required, as the GAO had been demanding for ten years, that there be a national cohesive strategy. And this, finally, has been working through the mill and is about to come online. It seems to be the project that everyone loves to hate. And I will speak a little bit more about it in a minute, as we get into our next century, or at least our next half-century. Are we at a tipping point? We may very well be.

So, let me offer a few observations. Not in a syllogistic form; just some thoughts.

One is that we don't have a fire problem; we have lots of fire problems. And we need lots of solutions. We need lots of different things for different kinds of fires in different settings. Fire is a very local phenomenon. For some things we have technical solutions, for others we don't. But let's not let each of these confound the other. Also, if any single agency tries to take it all on, that agency is going to be torn apart. I have bold hopes for the cohesive strategy; I'm sure I'll be frustrated in it, but nonetheless, I can see this as a renegotiation, or replacement, if you will, for the Weeks Act. That this will create a kind of fire constitution for how we deal with fire, from the BLM to volunteer fire departments in Texas, the whole cavalcade of new players, and how we are going to put all of this together. We've gone from interagency cooperation to intergovernmental and in fact to nongovernmental, because we have a lot of civil society players as well. Take the Prescribed Fire Councils or Firewise and other programs like that, and let's not forget The Nature Conservancy, a significant player in the American fire scene.

TNC now burns as much each year as the National Park Service (some 80% of what the Park Service burns comes from two parks in Florida). TNC has also taken a role as kind of an honest broker where other Federal agencies have been unable to create the partnerships and so forth. All these have to be brought in. I think of the politics as the fire community's euro moment. Do we go with austerity or do we go with investment? I think we have three choices: we integrate, either through the cohesive strategy, or some other variant. Or we break up. What do Greece and Finland have in common, that they should share a currency? What does the NPS have in common with a volunteer fire department in Indiana? Why are they willing to negotiate? Those who are big players can afford to go into gated communities and survive. Are we going to take it on as a national political project or are we just going to let it fall apart? Well, the other alternative is that you just have bailouts without end. And I suspect we will respond as the Europeans seem to be doing: we'll

integrate so far as it's not very painful, we'll have a little bit of breaking up, and we'll continue to subsidize with dollops of emergency dollars.

Climate change - of course it's a significant factor. You know, we've taken away a lot of our spatial flexibility by recolonizing rural America with houses. The old buffer zones for fire don't exist anymore. Likewise, we don't have temporal zones anymore, it seems we're losing that. We used to have one or two bad fire years in a decade; now, they are the norm. But let's be clear, global warming can also be considered a subset of fire history, because we changed how we, as the planet's keystone species, do things. We would still have very serious fire problems, even if we were within the realm of historic limits. Take the Wallow fire in Arizona, 540,000 acres - people exclaimed, "Wow, we'd have to go back to 1977 to see conditions like that." "Really?" "Maybe back to 1955." Those are both within my lifetime. We don't need extraordinary climate change to still have a fire problem, so let's not have the fire problem hijacked by climate.

What you see here is the plume of a wildland fire use burn, when that term was still allowed. (None of those terms is stable, they all come up and they disappear.) The 2006 Warm fire blew up about 58,000 acres in the Kaibab Plateau north of Grand Canyon. Here's a map of what the large fires in the last few decades have looked like. The graph is for the park itself, the last bar only six years, to 2005. And you can see the escalating increase in burned area, and many people conclude, that's got to be driven by climate. Well, it's got to be hot, dry, and windy, yes. But if you break down those fires, most of these fires were prescribed fires that escaped or they were wildland fire use fires that went feral. In other words, there were other factors involved including how we choose to handle those fires, how we reconcile land use and our understanding with the series of conditions we've got.

I get in trouble on this one, but here is a familiar graph, and here are Forest Service fire suppression expenditures since 1970. And the lower graph tracks scientific publication. The premise has always been that science will inform, and management apply, right? The formula may not yield the desired result, but that's the goal. Peter Frost actually tallied up fire publications in the same era, and it's the same curve. So, the miracle of correlation, what do we make of it? Well, if the top graph says that all of this money chasing fires isn't getting at the fundamentals, maybe the bottom curve is saying exactly the same thing with research. Not that we need to quit fighting fires, not that we need to quit doing science. But the issues are fundamentally about values, about how we choose to live on the land, what kind of economy we have, what kind of political processes we have or don't have. Those are the fundamentals that are behind both, I would suggest. It's clear that culture trumps science. You know this book (*Young Men and Fire*) by a professor of Renaissance literature at the University of Chicago affected the fire community as much as anything that ever came out of one of the labs. This is not an argument to get rid of our fire physicists and replace them with literature profs, but it an argument that we need everybody on the field. We need to empty the bench, we need everybody out there.

So, other challenges. All of our other social and political dysfunctions are also, it seems, being channeled back onto the land and synthesized by fire. Land use is polarized. You know the protected wild and the urban are doing pretty well. The wildland-urban interface has gone from a feature to an informing principle of what our lands look like. We're coming apart; the middle is

being stripped out. Depending who you ask, you get different numbers, but we clearly see the escalating numbers by decade – here houses burned by year up to 2007. And this slide shows the numbers by state. Okay, we don't have the most recent ones from Texas and Colorado, but the WUI is clearly a California pathology, which is now infecting other parts of the country. This kind of fire is to California what hurricanes are to Florida. We need to think about what this means. What is the problem? Is this a wildland fire issue? Well, it's certainly a problem for wildland agencies, but this is really an urban fire problem. These are little patches of city with funny landscaping. And if you think of it in those terms, we know very well how to end those fires; we treat those settings like cities. Our cities used to burn as frequently as our wildlands in the 19th century, we ended that. We can end it again.

Then the question is what to do with this urban fire service model. This is a global trend; it's a very serious challenge. Every place that has tried it has failed to manage fire on the land. One way to think about what we've done is that we created an ecological insurgency, and we're not going to suppress it by sending summer surges of air tankers and engines. You've got to control the countryside. We give up that countryside if you go to the all-hazard model. Well, what about that countryside itself? This is what we've lost, our working landscapes, and I don't think we will see a revival for large scale commodity production. But how about ecological goods and services? Active intervention, working landscapes, but for different purposes - that I think is where we need to create a buffer zone. And then the whole megafire thing, the one percent that's deforming things. This may, in the end, be a nifty term in search of a referent.

Okay, what are the options available to us? I will speak now of the Western public lands where most of the action is. One possibility I think of as a regressive move. There're still people who say, if we just commit enough resources, we can fight these things. We fought them before, we kept escape fires to a small fraction. We need to do it again. A select lobby argues strenuously for just that, and when fires boil up, it looks very attractive to politicians. A second group is proactive: harden your assets, get fire back in some form. I think the collaborative forest landscape restoration act is a good example of this; Firewise program to protect human communities. The problem is one of scale and timing. The largest of our restoration projects, the Four Forests Restoration Initiative in Arizona, is looking at a 30, maybe 50,000 an acres a year for ten years. The Wallow fire in 2011 burned more than that in two weeks. So we're way behind. It's going to take a lot of money, a lot of political capital. We can do it selectively, but as a large scale project I think the time has passed. The third strategy is reactive. Not the best term, but it seems to be the default setting for a coming generation of fire officers in the West. They sense the old game's over, we're not going to get ahead of this. We're going to have to deal with what's coming at us.

Prescribed fire is too complicated, too expensive, too politically cumbersome. We're going to take whatever wildfires we get, and we're going to manage those to try to reduce costs, protect communities, keep firefighters safe, and get fire back on the land. We're going to go back to defensible ridge tops, or roads or lakes, and burn out. We're going to get a lot more fire on the land; a lot of it's going to be pretty bad, a lot of it's going to be pretty good, but these are the options available to us. Nobody lit up a drip torch, nobody's going to be sued, nobody's going to be fired. The money will be there because you are, technically, managing wildfires. This is not a future I would necessarily like to see, but I think it's coming. It's not about restoration to a preferred

condition we liked in the past; it's not about anticipating a desired future condition we want to get to. It's not about applying science to get from here to there. It's about crossing the river on a bunch of rolling logs and trying to scramble through. I think of the three in competition. It's like a game of rocks, scissors and paper. I don't think anyone will come out on top.

So finally, I get to wrap up here, what about the challenges to disciplines like mine? Where is the narrative for this? You know, we've been dressing up these arguments in a Smokey Bear costume for 50 years. We're beyond that. We're far beyond that. History, I think, can tell us we've spent fifty years trying to resist fire, fifty years trying to restore it. I think we're looking next at fifty plus years of attempted resilience.

What is fire's story? It's multiple. Here's a lightning-fire forest fire map for the US. Here's what fire looked like according to the 1880 census. Not a lot of overlap. Here's what fire looked like to the USGS for over a twenty-three year period; not much similarity either. In fact this map is pretty much a map of public lands. And here's what it looks like to NASA 2012. So there is no simple narrative here, there are lots of narratives, and we will have to find some way to reconcile them.

So finally, one of my favorite pictures, two choices for the future. That's Biosphere 2, a completely engineered and sustainable world. It's a model you could take to the Moon; you could take this to Mars. Behind it, the Santa Catalina Mountains. There is no room in Biosphere 2 for fire, not even birthday candles. But there is no way you're going to keep fire out of those mountains, and indeed you need it. Two very different visions of fire in the world, and our relationship to it, two antithetical views. If I had to suggest two prevailing views to the American public of fire, they would be: Elk Bath from the 2000 fire season, a benign wilderness fire, and the WTC fire, a very malevolent fire in our built landscape. A few years ago a Dutch sociologist produced a book called *Fire and Civilization*. Here is the cover for the European edition. We see fire in a built landscape, completely at the service and use of people, a tool. And if they could find a better tool without all that smoke, they would do it. And here for the American audience: we have a nice view of fire, but I don't see much civilization. It's the same polarity as in the landscape images.

What is missing in all of it? Ourselves, as active creatures, using fire to make a more habitable world, and finding a place for ourselves in it. We don't have that narrative yet, and along with everything else we are doing, we need that story.

Most of us are familiar with the Jeremiad - fire-laced denunciations coming out of the 18th century, full of fire and brimstone and raining down devouring fires. But we might want to consider Ezekiel, and create an Ezekiad. Ezekiel said, "They shall go out from one fire, and another fire shall devour them." I think that may be a more apt description of our circumstances. We are trapped between fires. Nature's fires and our fires, prescribed fires and wild fires, fires that are burning surface biomass and fires that are burning in machines. We're caught between all of them, and our task will be in the future to try to find some way to pass between them. This is what we have always had to do. The fires will continue to change, as their circumstances change. It is our task to find some way between them.

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