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STEPHEN J. PYNE\*

## The Perils of Prescribed Fire: A Reconsideration

THE CRISIS BOILED OVER in 1935. The previous summer's fires in the Northern Rockies had sparked a board of review that questioned whether fire protection in the backcountry was possible, or to the mind of one dissenter, even desirable. The January meeting of the Society of American Foresters (SAF) had sponsored a session, under the direction of Professor H.H. Chapman, its president, on the value of controlled burning along the southern coastal plain. The papers, which argued for fire, were a revelation. This was, E.V. Komarek blurted out, the "first time we have been told the facts." The proceedings were published in March. Two months later, with competing claims before him, Chief Forester F.A. Silcox promulgated the 10 A.M. policy as a universal standard for fire suppression and stipulated that every fire would be controlled by 10 A.M. the morning following its report, or failing that, by 10 A.M. the next day. Questions of whether fire suppression was the right strategy or whether it was truly possible were brushed aside. Even critics characterized themselves as "heretics."

In truth, professional critics were few. Wildland fire control had fought a bitter battle to establish itself before a skeptical public. The Forest Service had begun fire protection only in 1905 or, more effectively, after the Great Fires of 1910. As a bureaucratic exercise, it had thrived, under heavy pressure and with mixed results, for only 25-30 years. Its supporters believed that the public could accept only a simple, unified message: fire was bad and fire suppression good. Anything less would gut fire protection's grander mission. Enthusiasts explained away continued breakdowns by the failure of the policy to enjoy the political support it deserved and the money it required. The 10 A.M. policy gave suppression virtual *carte blanche*, the Roosevelt Administration lavished men and money on it, and professional forestry drowned out the voices of doubters.

There are echoes of an eerie symmetry between then and now. Prescribed burning commenced as a formal policy in 1967-68 with the National Park Service; the Forest Service modified policies until, in 1978-79, it adopted a parallel program; a common federal-agency policy emerged in December 1995, a charge to handle fire in an "appropriate" way, a mix of fire fighting and fire lighting. Depending on when one chooses to date its

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origins, the doctrine of prescribed fire has lasted roughly as long as the doctrine of systematic fire protection before the 1935 crisis. Prescribed burning is not a new program. Its breakdowns—and they have been many, even lethal—can no longer be explained away by bureaucratic stupor, public hostility, or the need to build up a repository of experience. The time has come to ask whether the existing regime of prescribed burning is, in fact, fundamentally flawed, or whether it only requires a fuller commitment, a kind of Clintonesque healthcare program for wildlands. That the National Park Service lost two widely separated prescribed fires, both set under extreme conditions in spring 2000, recalls the passage from *The Importance of Being Earnest* in which Aunt Augusta observes that to lose one parent may be regarded as a misfortune, while to lose both sounds like carelessness. In this sense we have returned to 1935, with the escaped Cerro Grande and Outlet fires taking the place of the Pete King-Selway fires of 1934.

Now the eerie part. Where is the board of review, questioning whether prescribed fire should expand as suppression did? Where are the equivalents of the SAF session on controlled burning? Where are the professional skeptics, suggesting that prescribed burning may not be a universal solution? The fire community, rather, seems determined to defend prescribed fire as an idea, despite its lapses; to continue to believe that the public cannot accept any kind of nuanced message; to behave as though any doubt cast onto the value and technical possibilities of prescribed burning will kill an irreplaceable program. Instead, they present controlled burning as necessary. Often advocates describe it as easier, cheaper, and safer than suppression. It is, inherently, none of these.

The fire community has presented the public with a false dichotomy: either fire suppression, which has failed, or prescribed fire, which continues to limp only because it has not been granted sufficient support. We must light fires because we cannot fight them. The only way to protect Los Alamos from burning down is to risk burning it down accidentally. Fire is natural; fuels are excessive; there is no other option. Nonsense. As in 1935, the fire community seems to fear that, confronted with a compromised message, the public will throw the good out with the bad. Yet that is, in fact, what will happen if bad burns are justified as good.

**PRESCRIBED BURNING** has racked up an impressive litany of failures. Ouzel, Mack Lake, Seney, Gallagher Peak, Pocket, Yellowstone, Lowden Ranch; these are among the best known. But escapes have occurred yearly. Official statistics often hide more than they reveal. Over the past 20 years the worst fires of several entire seasons have been prescribed fires gone bad. Since 1979 seven prescribed fires have killed firefighters (a new twist on the concept of friendly fire). Smoke flooding across roads has caused fatal car accidents. In 1980 an escaped fire burned Mack Lake,

Michigan, to the ground. The two most costly firefightings of American history were controlled burns that blew up. Because escaped fires become reclassified as wildfires, such failures are not always reckoned in final tallies. These breakdowns will continue, and if prescribed burning scales up, so will their size and cost.

The more serious failures, however, are those fires that simply don't do the job they should. They burn too cool, too hot, too long, too spottily, too infrequently. They create as much dead fuel as they remove. They occur as an isolated burn, not amid a suite of practices and a series of sustained fires. More broadly, the program has simply not racked up the necessary acreage. Controlled fire simply isn't happening on the order promised or required. Much of the burning is occurring not where it is most needed (the West) but where it can most easily be done (the South). Some acreage that was formally logged under "wildfire" is now registered as "wildland fire use." And then there are the promised fires that are never lit. None enter formally into the running register of failures.

Why has prescribed fire not flourished? The reasons are legion. Liability law, smoke, threats to endangered species and cultural resources, complicated land ownership, narrow "windows" for burning, insecure expertise, competing purposes, lands overstuffed with fuels. Returning fire to a landscape that has not known it for five to ten decades is tricky. Preparations—thinning, mostly—are expensive and often arouse public ire. Fires in heavy duff or logs will smolder, perhaps for weeks. The fire community has hardly begun to address issues of greenhouse gases (has barely begun to explain why, given global injunctions to sequester carbon, they find it necessary to uproot and burn off tens of millions of acres laden with living carbon). Controlled burning is re-emerging out of institutions and funding designed to extinguish fire, which is a structurally different task than igniting them. Wildfires create crises, which must be addressed; unlit prescribed burns pass unnoticed. The list goes on.

But the nuclear reason may be the absence of a truly compelling reason to burn, one that engages the public and links fire to culture as well as to ecology. The problem is not one of policy but of poetry, a passionate conviction of the heart, ideally expressed in a story, that can inspire as well as inform. Fire control has that poetry—has had it since the Great Fires of 1910 invented the modern narrative of fire suppression and has seen it revived with Norman Maclean's 1992 best-seller *Young Men and Fire*. Controlled fire has no such story to tell.

It has instead two narrower convictions, that fire is natural and that wildland fuels are excessive. Both are true, and both irrelevant. The fire-is-natural argument calms critics worried that the proposed meddling is something that the lands cannot tolerate. It notes that fire has been on the planet for 400 million years and that many biotas are as adapted to particular fire regimes as they are to patterns of rainfall. Since the mid-1960s

the "restoration" of fire has enjoyed the same cachet as the reintroduction of wolves—a necessary cog refitted into broken ecological machinery, a powerful symbol of wild America, and penance for past environmental wrongs. The preferred means was to let natural fires free-burn over wild lands in the form of "prescribed natural fires." This was the program under which, at a cost of more than \$130 million, Yellowstone National Park burned 945,000 acres, although Yellowstone didn't bother with the nuisance of prescriptions. Unsurprisingly, the term is no longer used.

The more serious critique is that the fires to which the Western landscapes had adapted were not really natural. They were, rather, the result of complicated interactions between nature and people. Nature contributed rhythms of wetting and drying, grew fuels and readied them for burning, and broadcast lightning over select landscapes. But humans were there to push their own ignitions, to rearrange fuels en masse, and to carry fire where lightning couldn't. American Indians burned widely, and so did frontiersmen, and they created a matrix within which lightning fire had to operate. This had gone on since the end of the Wisconsin glacial. It ended in the West only when overgrazing cropped off the grasses that had carried the flames and when settlement removed the Indians who had started them. Creating national parks and forests confirmed the trend toward fire exclusion by making fire protection a deliberate policy. Granted this history, it is hard to know what "natural" means or why it justifies prescribed burning. The ancient chronicle of human burning, however, does argue for people putting fire back in.

The more useful plea, or rather threat—the alarm that has pried money out of Congress—is that a history of excluding fire has stockpiled the public wildlands with surplus fuels to the point that a fire, from any source, can virtually detonate. This is unquestionably true in places, and high-intensity fires beyond the historic range of burning are becoming normal, again in select places. There's no fuel like an old fuel. But it is not true everywhere. Woods clogged with combustibles do not spontaneously erupt into flame, and there are many long-unburned sites in temperate lands that become less fire-prone with the passing years. Piling pine needles does not add to fire hazard, since only the upper crust will carry the flaming front. Adding annual rings to old-growth Douglas fir does nothing to worsen fire hazards, and may lessen them by serving as a heat sink. In places without regular wet-dry cycles, deciduous forests may crowd out conifers and smother fire in the shade. It certainly does not follow that restoring fire is the only means to check conflagrations. Fire's exclusion did not, alone, create the current crisis, and fire's reintroduction will not, unaided, correct it.

Fire works best in nature as it does in the lab, as a catalyst. It interacts. It quickens, shakes, forces. What caused the fuel buildup was not simply the forced absence of fire but the linked changes between fire and

human land use—grazing, logging, hunting, farming, foraging. Fire by itself cannot reverse those massive shifts, and thrusting a torch into fuel-choked sites today, without suitable preparations, is an incitement to ecological riot. Even if the fire does not escape, it may burn under conditions far different from those of the past. The places that most need fire are often those whose fuels cannot now readily accept a spark. It is not possible to flash-burn a forest the way oil wells can flare off unwanted gas. Too many foresters, in particular, continue to conceive of fire as a “tool,” to imagine it as a mechanical force for removing, thinning, shuffling, harvesting, to imagine that it behaves rather like, well, foresters rather than as a biological presence whose power derives from its setting.

The argument that only prescribed fire can reduce fuel is absurd. If excess fuel is the problem, then remove it. Haul it off, burn it in fireplaces and powerplants, mulch it into compost, send it through woodchippers. Crush it; crop it. Browse it with goats. Thin and stack it before burning. Burn sun-dried cuttings while the surrounding woods are still green. Burn piles in the snow. On sites dense with combustibles, a burn may yield more dead fuel than it consumes. A fire may sputter and smolder, unable to gnaw through thick veneers of woody matter. Fire, remember, is a catalyst: it synthesizes its surroundings. Messed-up landscapes will yield messed-up fires. Prescribed fire, in brief, is not a miraculous cure that, on touching, dissolves away the leprosy of woody litter. Some experimental fires have succeeded in killing large trees and sparing small ones, exactly the reverse of historic patterns and intended outcomes. Besides, a prescribed burn is not a vaccination, a one-off inoculation against conflagration. It typically involves a series of burns, often with complex preparations, then repeated in perpetuity. Presumably, the burns become easier as they successively return, and once a site has plumped into such a state, regular burning is a marvelous means to keep fuels under wraps. But that must be part of a 20-30 year program.

Prescribed fire requires a better justification. For burning to be mandatory, worth almost any risk, the critical consideration is not reducing fuel but promoting the biotic cycling that fire sets into motion. No alternative technology exists because free-burning fire is not so much a tool as a captured ecological process, less a flaming ax than a dancing grizzly. Combustion works biologically in ways that chain saws and woodchippers don't. We have it backward. We don't need fire to reduce fuel, we need fuel to allow fire to work its ecological magic. After all, “fuel” is not carbon bullion; it is the product of living organisms. Our determination of ecological needs should select the kind of fire we want, which will determine the kind of fuel necessary.

The outcome will be mixed, as it should be. There will be some places where fire is mandatory, some where it is useful and optional, some where it is irrelevant or simply dangerous. The outcome should not be

merely a fuel-reduced landscape but a fire regime suitable for the biota and, where people reside, habitable.

PURPOSES CANNOT be separated from practices. Part of why controlled burning has faltered may lie in how we do it. The federal agencies conduct prescribed fires as they do firefights. The legal and regulatory environments in which flame must today exist push agencies in this direction, and so does their own history. Controlled burning is re-emerging out of institutions designed to fight fire. This is awkward, and the National Park Service, in particular, has tried to counter it by creating parallel, mirror-image organizations.

The scheme is understandable, and mad. It ignores the fact that the two tasks depend on each other, that fire suppression requires burning and that prescribed fire requires control, and their divorce can lead to situations like that at the Cerro Grande fire in which the burn boss in charge of ignition is not certified to oversee suppression should the flames escape. Equally, it dismisses the fundamental differentness of the tasks, that fighting and lighting should operate through divergent styles and methods on the ground. Suppression looks much the same everywhere, because it is a reaction. Prescribed fire should look different with every site. A peril of prescribed fire is that it will simply invert suppression, in both principle and practice; that it will repeat with the left hand the failures of the right. To conduct prescribed fire on a fire-suppression model is, in the end, to share its costs, risks, and dangers. Any single factor may shut the project down, while none allows it to jump ahead. Scheduled burns are a formula for constant attrition. The program will regress year after year.

Instead, on larger landscapes, fire managers may need to be fire foragers—constantly searching out small niches of fuels, as a bear might seek out huckleberry patches; prowling the snowline with piddling burns; constantly moving and burning, not in one grand set-piece of fire-kindling but in a finicky gathering of fuel and flame. Such a program requires lots of fire, lots of smoke, lots of time in the field. It means that most places can't accept such a regimen because they have changed too profoundly since fire's forced removal. It means that urban critics will object to the chronic smoke and wilderness critics to the fact that people, not nature, are setting the fires. It means that fire's reintroduction will not succeed in many places, that the domain of fire will be a scant fraction of what it was a century and a half ago, that it will cluster especially in remote places. That may be the best we can do.

Be sad. Many of us believe the Western landscapes need more fire of the right sort. Some of us consider the manipulation of fire, a species monopoly, as a species obligation to see that it happens properly. We shouldn't turn the task back to nature because nature gave it to us. (If we really want to appreciate the awfulness of bungled fire, wait until nature

grants the power to another species.) But if the right fire is the right thing for the land, then we have to find a way to do it, and not pretend that bad fires are good. We can't allow feral fire to roam through towns like ravenous grizzlies. Rogue burns like the Cerro Grande and Outlet deserve to be hunted down and shot.

FAILURES OF OMISSION, failures of commission—all of them could be excused, and were excused, when prescribed fire was fresh and experience sparse. The practice is no longer new, and if 30 years is not a long enough learning curve, then one might question on what basis we should expand programs and push them into new lands. Thirty years was enough for fire suppression's critics to recognize its limits. Yet the suppression crowd could shout back that it had never been given the tools—the men, the money, the machines—it needed to do the job right. If the choice was between continuing the firefight or reverting to light burning, they wanted the fight. They would never turn back to the pre-suppression era.

Now it is prescribed fire's turn. How long will it take before critics rise up and declare that prescribed burning has failed to live up to its promise? Most fire officials came of age during the controversy over free-burning fire in wilderness; too many seem locked into the Good Fight against the Smokey-Bear-kill-every-fire era, insisting that fire is natural, that there can be no return to the old ways, that prescribed burning has never received the money and staffing it needed to do the job right. This misses the point precisely. The antagonist is no longer fire suppression. The debate is internal, over the right ends, means, and places to reinstate fire. The choice is not between fighting fires and lighting them but over the proper ways and times to do each, and that within a context that transcends either practice alone. The danger is that programmatic momentum will simply roll on and that, as in 1935, there may be a tendency among those full of conviction and frustration to replace on-the-ground facts with political fiat and agency "targets" for burning, thinning, expending, and staffing that may or may not have much relevance in the duff.

As the 2000 fire season migrated from the feral controlled burns of the Southwest to the wildfires of the Northern Rockies, the spreading conflagrations deflected the early-season critique of prescribed fire, much as disappearing hard drives from the vaults of the Los Alamos National Lab diverted attention from the scandal of careless burning into the scandal of sloven security. Fire observers scrambled to find a different standard, some index for comparison. Steadily the cry rose that this year might rival the millennial Big Blowup of 1910. It didn't, though its burned acreage on the national forests might have come close. Still, a surprising consensus flourished that the whole fire establishment dated, in some ineffable way, from that distant summer; that the entire apparatus of wildland fire—its



politics, the terms of its philosophical discourse, its funding, its very narrative—had emerged in that dreadful year; and that this year might not only challenge the Great Fires' physical dimensions but their historical significance. Neither proved true. But the popular allusion held a hard kernel of truth within it, and it became embedded in the formal proposal issued by the White House in September for the rehabilitation of the fire-scarred lands. The Great Fires of 1910 became the metric for interpreting the Flawed (Lesser) Fires of 2000.

The real lesson of 1910 lay in its explication of fire's political ecology. Perhaps appropriately, the dynamics much resemble the logic of swidden (that is, slash and burn). One can plant successfully in the ash. A year later, however, the proper occasion has passed. After two years the site is overrun with the weeds of everyday life and politics. Whatever effect the Fires of 2000 might inspire, they have until the summer of 2001 to act, and that amid a presidential election that will see a change of administration but which safely ignored the flames once they had lapsed from nightly television news.

In brief, fire assumes the character of its context—cultural as well as environmental. Real reform requires a reconstitution of that context. It means, ecologically, rehabilitating tens of millions of public-domain acres, through thinning, restricted grazing, prescribed fire, exotic weed control, suppression, and a dozen other tweakings. It means resituating programs within the federal bureaucracy. Probably only a fundamental reorganization of the federal land agencies—their wholesale merger and reengineering—could provide sufficient political momentum to carry through a reformation of fire programs even approximately equivalent to that which succeeded the Great Fires. Even more vexing, it means inventing a new narrative to explain our relationship to fire. It means a story more nuanced and powerful than either the firefight or its stood-on-its-head twin, prescribed burning.

The likely outcome is that nothing on this scale will occur. But it might. As long as we have wildlands in fire-prone climates, which is the indisputable status of the West, we will have fires. The option still exists to choose what kind we can live with.