

*In this wide-ranging essay, Stephen Pyne, the preeminent historian of wildfire around the world, explores the past, present, and future of the term “wildland-urban interface” and the policies regarding fire in that setting. He argues that, while we need to remove fire from the urban side of the interface, we also need to boost it on the wildland side.*

# SPARK AND SPRAWL

A WORLD TOUR

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“**W**ildland-urban interface” is a dumb term for a dumb problem, and both have dominated the American fire scene for nearly twenty years. It’s a dumb term because “interface” is a pretty klutzy metaphor and because the phenomenon of competing borders it describes is more

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complex than that geeky term suggests. At issue is a scrambling of landscape genres beyond the traditional variants of the American pastoral. It is a mingling of the quasi-urban and the quasi-wild into something that, depending on your taste, resembles either an ecological omelet or a coniferous strip mall. That means it also stirs together urban fire services with wildland fire agencies, two cultures with no more in common than an opera house and a grove of old-growth ponderosa pine. It is an unstable alloy, a volatile compound of matter and antimatter, and it should surprise no one that it explodes with increasing regularity.

It’s a dumb problem because technical solutions exist. We know how to keep houses from burning on the scale witnessed over the past two decades. We know convincingly that combustible roofing is lethal; we have known this for maybe ten thousand years. The wildland-urban interface (WUI) fire problem (a.k.a., the interface or I-zone) thus differs from fire management in wilderness, for example, where fire practices must be grounded, if paradoxically, in cultural definitions and social choices; there is no code to ensure that the right fire happens in the right way. That the intermix problem persists testifies to its relatively trivial

standing in the larger political universe, even as construction pushes ever outward into the environmental equivalent of sub-prime landscapes, which from time to time then crash catastrophically. In that regard it remains on the fringe.

Yet enough has happened to begin framing the historical geometry of the experience. It may be worth noting that there are many ways to trisect an angle, but not if you restrict yourself to a compass and straightedge. So too the current attempts to cope with what appears to be an intractable fire problem might benefit from new intellectual tools besides the compass of fire behavior and the straightedge of agency policy. In this case, it might benefit from adding a third dimension—history—and comparing placing the figurations with others throughout the world.

After all, the problem is not restricted to the American West, the clash of public with private lands, or the United States. Cognates can be found wherever industrialization is busy redesigning landscapes, where the global economy meets the global climate. Outbreaks have occurred throughout the Mediterranean basin, from Portugal to the Peloponnese; in the outskirts of Australia’s city-states, from the Blue Mountain exurbs of Sydney

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BY STEPHEN J. PYNE

to the Dandenongs outside Melbourne; along the fynbos coasts of South Africa; and even amid postindustrial exurbs in British Columbia and Alberta. In long-cultivated landscapes the cause is the disintegration of traditional agriculture and its tentative reclamation by exurbanites and tourists while the countryside fluffs up with combustibles. On extensively used land (say, recreational or lightly ranched sites) the source motive is the conversion to ranchettes, trophy homes, and seasonal suburbs. The incentives—economic, aesthetic, and political—for such conversions are powerful. In most cases the amount of vegetation swells, for even where it is cleared, dense slash heaps called houses replace it. Flame leaps from roofed slash pile to roofed slash pile.

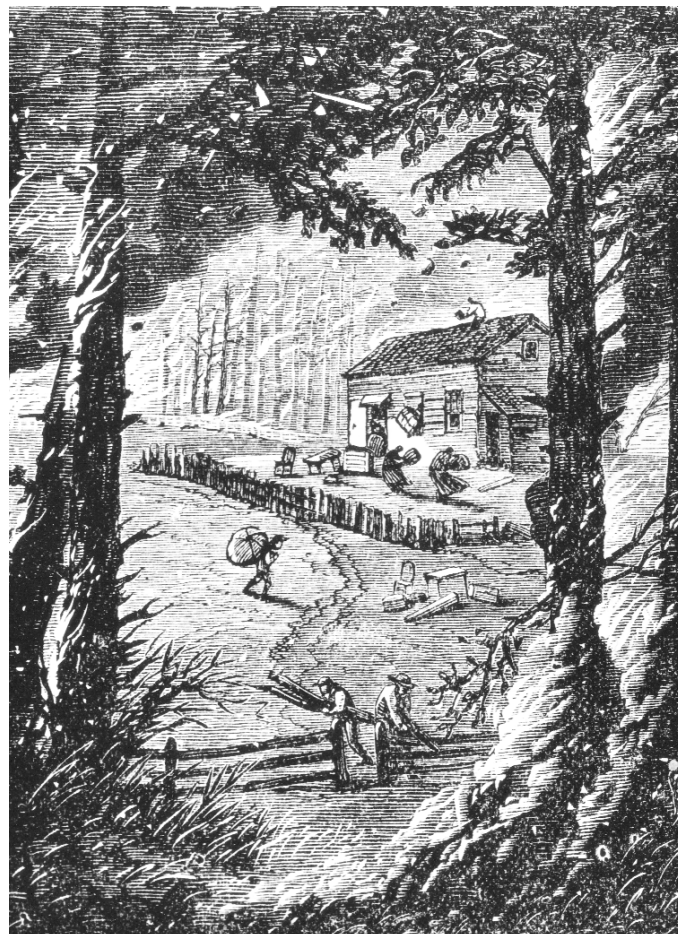
It is not inevitable that such upheaved landscapes will burn. The new developments are interbreeding with whatever hazards lie around them, and in most of the United States, fire is a minor threat. In New England, where urbanites are reclaiming old farmsteads like hermit crabs crawling into new shells, the occasions for WUI fires are slight, save along the sandy coasts. In the desert Southwest, stucco-and-tile McMansions may be annoyed and sullied by the occasional fire through saguaro and cheatgrass but will not burn down. In the Pacific Northwest or Lake States, only the rare meteorological event—an east wind, an autumn drought, and dry cold front—will put exurbs at risk for a day or two. In Florida the crowding is acute, the threat chronic, and the mix of fires from working landscapes and suburban scenes a staple of life, like collapsing sinkholes and the stray alligator. In the West, the threat is constant along the montane forests that often front public land, and the Santa Ana-flushed fire-floodplains of Southern California.

In fact, although bits and pieces of the WUI are everywhere, the real damage—the events that can shake insurance companies and mesmerize action news video cameras—is in California. California is to the interface fire scene what Florida is to hurricanes. The defining fires of the era, those that have branded themselves into national memory and registered among insurers, are those that incinerated Oakland in 1991, the Los Angeles basin in 1993 and 2003, and San Diego in 2003 and 2007. The others, including Colorado's 2002 Hayman Fire and the sad saga of Los Alamos in 2000, rack up losses on rough par with tornadoes. California has gotten its long-anticipated Big One, but it has come not with earth-shaking tremors but with flames riding a shattering wind. Much as settlement fires plagued particularly the Lake States during the old frontier, so the epicenter of the intermix fire resides with special intensity in California.

Moreover, it is worth recalling that wind and water do far more damage than wind and flame. One well-placed Category 4 hurricane is worth a century of wildfire. Barring California's exceptionalism, the problem would remain a telegenic freak of fringe-city life, like the occasional car hijacking or home invasion, or an expression of western violence, like a grizzly bear attack.

## TWO CULTURES OF FIRE

To its credit, however, the wildland fire community (practitioners, researchers, administrators) recognized the challenges posed by changing demographics and after the Yellowstone debacle of 1988 moved to install the WUI as an informing concern. It sought alliances with fire institutions outside the provenance of wildlands, notably the National Fire Protection Association, and



U.S. FOREST SERVICE, FOREST HISTORY SOCIETY PHOTO COLLECTION, FHS2525

*Part of a one-million-acre complex that burned the same day as Chicago and took between 400 and 1400 lives, the Peshtigo (Wisconsin) burn of 1871 became the most famous of the classic settlement fires.*

through the state foresters, many of whom had responsibility for fire protection on unincorporated lands, crafting partnerships to publicize the problem and promote firewise responses. It has warned that shifting resources to protect communities would divert efforts from controlling the larger fire and deflect attention from the critical task of managing, not just suppressing, fire on the land; that the WUI would put firefighters at risk in new ways; and that it might, through stealth and mission creep, result in a reinvigoration of fire suppression and thus reverse the great cultural revolution in American fire management that had swelled out of the 1960s.

The WUI was not an assignment that America's wildland fire agencies either sought or wanted. Beginning in the 1960s, a bold campaign—nominally based on ecological science but in reality powered by philosophy and changes in values—had committed the federal agencies to embedding fire within land management: against the odds, and uniquely in the world, they had put the fire-fighting genie partially back in the bottle and did not want to see it released. The fire institutions that best addressed the WUI were those, like California's Department of Forestry and Fire Protection, that had the protection of lives and property as their charge, that were becoming urban fire services out in the woods.

The WUI forced cheek to jowl not only very different land-

scapes but very different cultures of firefighters. Urban and wildland fire have little in common; one might as well link surfers and irrigation farmers because both rely on water. For both fire cultures, the I-zone was a stretch. But urban fire services had always been predicated on the protection of life and property in the built landscape. The life safety code has long lain at the heart of building codes, and the image of the firefighter as lifesaver dominates the iconography of the guild. Wildland fire was premised on other concerns, originally a moral equivalent of a war on nature, and more recently, a reconciliation that sought to put the “wild” back into wildlands. Its self-image has morphed but today seems to resemble a government-sponsored extreme sport. The histories of these two approaches have prepared neither culture for the environmental chimera that is the I-zone. The wildland fire community simply wants the houses to go away; the urban fire community wants the wildlands cleared, and it wants to wish away the hazard represented by a wildland that not only hosts fires but is encouraged perversely to nurture more.

Yet both fire cultures have analogues in their past for the current uncertainties. Frontier cities had burned as routinely as their surrounding woods, and an earlier frontier had threatened protected woods along their exposed borders. The present has inverted that former story. Instead of an encroaching and oft-scattered agricultural frontier, there is an urban one. Instead of creating fuel by chopping up the natural landscape, now homesteaders encourage fire by leaving natural growth alone and then stuffing the openings with combustible structures. Whereas fires once threatened to enter the reserved lands from private holdings outside, now the reserves have become permanent habitats for fire that threaten private lands beyond. Where once the Forest Service in particular sought alliances and mutual-aid agreements to help shield its holdings from the threats of outside developers, now it laments those old arrangements, which compel it to protect these developments from the threats that spill out from lands under its administration. It is a setting as overgrown with irony as with conifer reproduction.

### WHAT CAN WE LEARN FROM THE PAST?

The nineteenth-century jeremiads over the agricultural frontier went nowhere. Fulminating over valuable forests converted to stump farms and slash burning that bolted into the bush made not a whit of difference. It did nothing to halt the tide of settlement and only made politicians suspicious and neighbors cranky. The public, after all, was obeying powerful incentives, just as people are today. The pressures were quite beyond the capacity of fire agencies to contain. If we really want to slow the pace of WUI, we should eliminate the mortgage tax deduction for second homes, charge developers the full cost of public services, and instigate a carbon footprint tax. Exurbia will respond less to environmental hazards like fire and bark beetle than to economic ones like a credit crunch and wallet-emptying gas prices.

What did abate the old crisis was on-site help. Rather than ban slash burning outright, rangers would demand permits, and rather than use a permit system to shut down burning, they used it to channel the burning that settlement required into more careful times and procedures. What eliminated open burning was, in the end, not moral outrage or law but an industrial economy that made small-landholder farming inefficient and that

substituted internal-combustion machinery for open flame. In today’s circumstances, assisting with inspections, urging the adoption of suitable building codes, enlisting support from insurers and promoting suitable landscaping will influence the combustibility of the structure and its near-surroundings, which is where fire protection should focus.

It will also help if public agencies clean up their own side of the border. In the past, it was reckless burning outside the reserves that was the threat; today, it is the burn, prescribed or allowed or just wild, within the reserves that threatens adjacent communities. The assumption by the agencies is that, once again, they are at risk from outside development, not only from exurbs but also from de facto fire protectorates that such communities establish over broader areas, often through demands for clean air. Yet it takes two to make a fence line. Denunciations of private landowners have become a ritual, along with demands that they do what many landowners consider destructive, namely, strip away the vegetation around their lots. Private landowners might invoke the same logic—that wildlands take steps to remove the threat they pose, even if such measures might compromise the value of the land. Instead of an armed legal border, the I-zone might become a different landscape, one that is both fire-safe and bio-friendly. Both sides have to find common ground.

### WHAT IS THE LIKELY FUTURE?

The near future will likely resemble the near past. But it may well be that, just as reservations and frontiers clashed at their mutual peak, one rising and one falling, so the contemporary scene may be cresting. I suspect it has already done so. (Recall that C. Northcote Parkinson of the eponymous law<sup>1</sup> coined a second, which held that perfection of planning was a sign of imminent collapse. So the universal dissemination of FireWise schemes may signify—tongue-in-cheek—that the problem is no longer acute.) The crisis will persist as the baby boom cashes out on suburban housing and some fraction of them seek retirement homes in the I-zone. And it will fester among those older communities that pock the landscape like abandoned mine shafts: these will be the scene for continued outbreaks of intermix fire. How to retrofit them into more fire-safe modes will preoccupy fire services and planners. But those scenes need to be parsed from more recent landscapes constructed with an understanding of the threat and some accommodations to it.

At some point the intermix will lose its inherent instability. Either it will fall under the purview of one side or the other, or it will become a stable landscape in its own right. It is hard to imagine such landscapes as wildland. It makes more sense to site the problem within an urban setting, if with eccentric landscaping, or as an exurban landscape, distinct from others in the American constellation. Perhaps it may evolve into a new kind of vernacular landscape, and architects may seek to reduce some of its dysfunctional ugliness as they have with strip malls, or as New York City has struggled to cope with rashes of fires in parklands in Staten Island. But the critical shift will be one in emphasis, from defensible space to defensible structures. Such a relocation of effort will place the problem within the realm of the built environment. Modern urban fire services will eventually follow urban migrants to the fringe. Wildland fire management will retire to the woods.





COURTESY OF THE U.S. FOREST SERVICE

Many nineteenth-century wildland fires began with the classic association of rails, landclearing, and fires—in this case one part of the burns stretching from Fernie, British Columbia, to New England as seen in Metz, Michigan, in 1908.

If the problem is the structure, then that might also be where firefighters go. Most houses are consumed not in a tsunami of flame but from embers and contact flame after the fire's front has passed. Why stand against the onrushing flames when you can weather the passage inside a building and then emerge to swat out embers? And if that is the case, why have professional firefighters at all? Why not let homeowners defend their own residences? Australia is light years beyond us in this regard. Its mantra: "Houses save people, people save houses." Communities are taught to go early or stay and defend. The present American scene is embarrassing, at once paranoid and ineffective. I can legally defend my house with a semiautomatic rifle if I choose but not with a rake and a garden hose. Besides, knowing that you might be called upon to protect your house should concentrate the mind wonderfully with regard to wood-shingle roofing, house-clinging shrubs, and firewood stacked under decks.

There is another if off-key historical logic that may be at work. No issue claims the center forever. Since their foundings, American fire agencies, notably the Forest Service, have followed a rhythm of problem fires—that is, fires that above all others have dominated the discourse and commanded the greatest resources. These seem to come in roughly twenty-year increments. (Discounting appeals to historical astrology, it is unclear why this should be so, but the evidence suggests that the pattern exists alongside other long-wave rhythms that collectively make up the behavior of fire institutions.) The advent of the WUI might well date from the

aftermath of the Yellowstone fires of 1988. If this is so, then we are approaching the outer limit of its twenty-year life cycle. This is not to say the problem is fixed—no such problem ever is. As John Dewey said of grand philosophical issues, they are never resolved in any technical sense; the community just moves on to something else. Certainly, the American wildland fire community would dearly love to move on.

A century ago the reservation of public lands collided with the flood tide of land clearing, but one was rising and the other already falling. That is likely to prove true today as well. A credit drought and recession may join dry spells and arcing power lines to make some of today's exurbs the equivalent of abandoned stump farms and mining towns. Already there are indications that the country is wildly overbuilt, that as many as twenty-two million homes may be surplus, that the edge city is about to topple over a cliff. Nature's economy might collude with securitization and creative financing to yield subprime landscapes, tinder for the flames of recession. The WUI might find itself on Wall Street. But however it comes, some system of fire governance other than through wildland agencies must claim practical jurisdiction.

### DOMESTICATING THE I-ZONE

Throughout the nineteenth century, frontier settlements burned routinely, and brash new cities incinerated with disheartening regularity. Yet both flaming fronts ended—the one when settle-





*Fed in part by windfall from the 1938 hurricane, the quarter-million acre burns that struck southern Maine and elsewhere along coastal New England in 1947 were the first of the postwar conflagrations and led to a regional response (the Northeastern States Fire Protection Association). Note that even here, the houses burned and the trees survived.*

ment slowed and shunned the woods, and the other as institutions, both public and private, determined to end conflagrations. For the first, the political economy redirected the American drive westward away from land clearing. For the second, engineers found technical solutions, and companies and codes applied them. The same may be happening today.

Certainly the federal agencies would like to shed responsibility for the WUI. The Forest Service in particular has not wished to become the nation's nonurban fire service. It has wanted other institutions to take on the burden of the I-zone and leave the Forest Service to pursue its alternate destiny in fire management. And that is what is likely to happen. The methods that tamed fire in cities will push to the fringe and bring those exurbs under a similar regimen. The process is already well underway. The public

understands the fire hazard, codes are being implemented to govern standards in new construction, and the wildland-urban interface is becoming an open space—exurban medley. The fires are moving from status as an alien specter to a seasonal annoyance. They are being naturalized and domesticated, as urban fires were a century ago.

The deeper threats from the WUI are two. One, it creates fire protectorates that extend well beyond redwood decks and concrete trailer pads. Not only the zone of active fire but that of smoke matter: air quality may determine the kind of management allowed on adjacent lands. The WUI's environmental reach, that is, exceeds its grasp. Two, so long as the I-zone fixates wildland fire agencies as it has, they will tend to follow the trajectory of urban fire services, which is to become all-hazard emergency



*Driven by vicious Santa Ana winds, major fires spread across the region, striking with special fury against San Diego. Those houses with combustible roofs burned, even when (as here, at Scripps Ranch), the surrounding vegetation and suburban landscaping should have furnished defensible space. The 2003 fires culminated a decade of media-hyped burns that began with the 1993 fire season in Southern California.*



COURTESY OF THE AUTHOR

services. They will lose their valence to land management, which is the core of America's great cultural revolution on fire. Wildland fire needs to return to its wildlands.

## THE NEXT NEW THING

For wildland fire agencies, this is surely the grand problem that motivated a reformation in policy and practice almost half a century ago: how to reinstate fire on fire-adapted landscapes. It is worth observing that this issue is not new—it has been around twice as long as the WUI. Some federal agencies, like the National Park Service, have had a longer reign under the new policies than they had under the old all-suppression mandate. Since 1905, some thirty-five to forty percent of America's history of wildland fire has occurred after the advent of that revolution. Within a handful of years the saga will approach its half-century mark, and within another decade or two, the nominally new era will have lasted longer than its predecessor.

Yet the story told is essentially the one created during the 1960s. The discourse continues to be dressed up in a Smokey Bear costume, as though the only meaningful choice is between fire's suppression and its accommodation. The old fire prophets have become patriarchs. There is far less dissent within fire philosophy today than four decades ago. For this the emergence of the WUI has contributed, for it reinvigorated fire suppression, however narrowly, and it furnished an excuse for not reexamining the profound differences among the many ways of restoring fire. This is where the wildland fire discussion should have been, and because of generational considerations as well as the WUI, it has not.

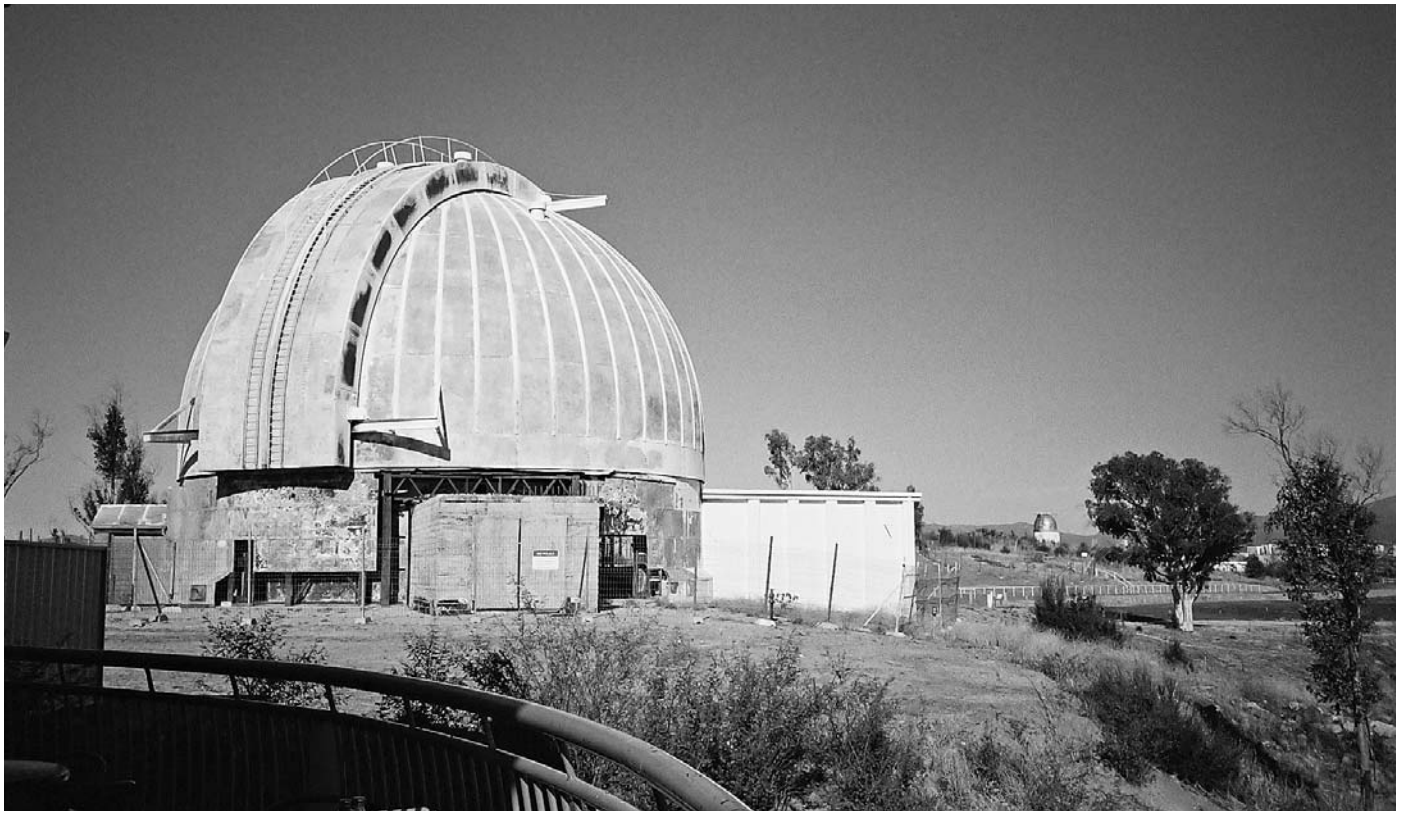
But as the WUI fades from prominence—still a problem, but manageable and one among many, no longer an alien specter—this discussion should take center stage. If it does not, wildland fire management in America will go the way of most fire services and become an all-hazard emergency response agency and

become, as in most countries, a stand-alone service, disconnected from active land management. Our current problems are historically constructed, but more and more that history is one that began fifty years ago, not the fifty years prior. The unity that fire suppression's critics enjoyed was shallow: the result of a common cause accepted in the face of a common foe. The internal divisions within fire management—the choices between prescribed fire and wildland fire use, between creating fire habitats and allowing fire to shape its own setting, between fire in wilderness and in working landscapes—are the new interface of the coming decades of fire in America.

Behind this border, however, lies another—the deep driver of fire on Earth. Humanity's replacement of open burning by internal combustion, and surface biomass by fossil biomass, has rerouted the flow of fire on a planetary scale. Fire science has barely begun to appreciate that these two combustions share a historical continuum, that industrial fire has its ecology, that a climate unhinged by the effluent of industrial burning is only one phase of a massive cascade of reconfigurations set into motion by humanity's change of combustion habits. If the Holocene should be renamed the Anthropocene, as some suggest, it is because of humanity's firepower.<sup>2</sup> Behind the perturbed climate, behind the transportation that allows for exurbs, behind the abandoned agricultural landscapes, behind the conditions that make the intermixed fire both possible and prominent lies industrial combustion, the latest expression of our species' monopoly over fire. The interface between wildland burning and industrial fire is the physical frontier that matters most.

## WILDLANDS MUST HAVE FLAME

In 1910, Forest Service Chief Henry Graves announced that fire protection was ninety percent of American forestry. In the 1920s, his successor William Greeley downgraded that figure to seventy-five percent. By the late 1960s, when the revolution began



Australia's 2003 fire season dwarfed America's, with nearly 134 million acres burned. Most occurred in the lightly inhabited tropical north and interior, but some spectacular conflagrations boiled over in New South Wales and even struck Canberra, where they destroyed the national observatory at Mount Stromlo (pictured).

reforming policy to restore fire, it was less than fifteen percent of agency budgets. Since then, that proportion has risen; it can now routinely command sixty percent or more of available monies. At the onset of the 2007 season, five former chief foresters warned in an open letter that fire costs threatened to drive out everything else the agency might wish to do. If trends continued, fire would consume nearly all. A century of engagement with wildland fire has come full circle.

Something there is that doesn't love a wall. As it has in the past, fire has followed disturbance and broken down the cartographic and political walls that inscribe the American landscape. Yet as Robert Frost's poem concludes, good fences make good neighbors. We need to allow wildland fire to pursue its eccentric destiny, bonded to the land, so distinct from urban fire services, always tied to people. The ambition to impose a common regimen over both city and country was a mistake. The fringe will constitute a distinct borderland, different from either wildland or metropole. But the border may be necessary. Fire will survive in cities only in demonic or virtual forms—sublimated into machines and manifest as war, crime, or violent accident. But it will thrive in public wildlands, at least those dedicated to nature preservation, because there it does work that nothing else can. The city can replace the hearth with a television. Wildlands must have flame.

So it remains as true today as in Graves's age that getting fire right is an obligatory foundation. A century ago that meant removing bad fires; today it means promoting good ones. Both eras too often put fire on the fringe. It remained something you

did to get to the real task. History suggests otherwise. It suggests that in fire-prone public lands, fire is the essence—that it is both an agent of change and its index—for flame synthesizes everything else. It is the one thing that must be right.

If wildland agencies today regret the pull of fire on their fringes, it may be because they have too often failed to put it at the core. □

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## NOTES

1. Parkinson's first law states that "work expands so as to fill the time available for its completion." C. Northcote Parkinson, *Parkinson's Law: The Pursuit of Progress* (London: John Murray, 1958).
2. In 2000, the Nobel Prize-winning atmospheric chemist Paul Crutzen coined the term *anthropocene* because he regarded the influence of human behavior on Earth since the eighteenth century significant enough to constitute a new geological era. The term has gained support in recent years, though there is debate about when the era began. See P. J. Crutzen and E. F. Stoermer, "The 'Anthropocene,'" *Global Change Newsletter* 4 (2000): 17–18; and William F. Ruddiman, *Plows, Plagues, and Petroleum: How Humans Took Control of Climate* (Princeton, NJ: Princeton University Press, 2005).