

MULLING OVER MEGAFIRES

A statement by Stephen J. Pyne

Over the past 20 years, the world has witnessed an epidemic of large burns, recently labeled megafires. Countries that thought they had banished open fire into their ancient past have seen it return; countries that assumed they had mastered wildland fire, holding it to a quantum minimum, have seen it break out of suppression with shocking fury; countries eager to develop new lands, either as plantations or parks, whether by clearing old forest or reclassifying former forests, have seen fire and smoke spread like a plague. And all have nervously pondered the growing evidence for an era of global warming, amid the scientific conviction that industrial combustion is an unwanted accelerant. The consensus opinion is that these fires are an irresistible outcome of climatic change, often acting on immense reservoirs of fuel, themselves an unwise legacy of past fire exclusion.

The expression "megafire" was coined to describe the recent massing of large, intense fires on the public lands of the American West. It has been adopted by other countries, including Australia, whose similar colonial histories have likewise bequeathed large national estates and fire protection agencies. But megaburning has a vaster reach. It can also characterize the massive fires that have gutted much of Kalimantan, the mammoth burns of Mongolia, a smoldering Amazonia, the savage outbreaks in Galicia and Portugal, the taiga-leveling blowups in Siberia and the Russian Far East, and a host of lesser known rampages.

Considered on this scale, three general factors explain the megafire's surprising appearance. The outbreaks have resulted from favorable changes in climate, land use, and anthropogenic fire practices.

The climatic component is clear enough. If the weather lacks a suitable cycling of wet and dry, fires will not start, and if the weather remains cold and wet, the fires will not propagate. That the fires have been many and large argues strongly that a warming climate has created more favorable circumstances for large burns. Still, burned area is not a proxy for climate alone but an index of climate and people interacting.

This observation segues into the land use component, which is more subtle. It may result from landclearing, land abandonment, exurban settlement, or a reclassification to nature preservation. The first case is obvious: forest lands slashed for logging, pasture, or palm-oil plantations, or peat lands drained are ideal for fire, and account for much of the megaburning outside public estates. The second explains the revanchist fires of the Mediterranean, particularly in northwest Iberia, in which former agricultural lands, intensively managed since at least Roman times, have broken down and become overgrown with pulp plantations or opportunistic woody weeds. The third - an exurban frontier - now characterizes all the industrial societies. Whether that frontier abuts public wildland (and hence merits the ugly term, wildland/urban interface) or whether it intermingles with abandoned agricultural land, it represents a recolonization of a once rural countryside by an urban outmigration. In fire-prone environments the compound has proved volatile. The last change describes the expansion of more strictly protected nature preserves, many such sites formerly dedicated to other public land uses. This transfer brings a change in fire's habitat, and typically a reformation in fire policy. In the past the creation of state forests, for example, yielded such a change, largely one that led to a reduction in fire's scale of burning; their re-creation as parks is leading to another change, this one prompting an increase in burning.

Anthropogenic fire practices thus comprise the third component of the megafire triangle. It is not negligible, and it compromises many of the studies that have sought to attribute the recent increase in burned area solely to global warming. The point of these programs has been to "restore" fire, which is to say, to increase the amount and type of burning on the land. They have succeeded. Be careful what you wish for.

Recently, I had occasion to examine the history of fire on the Kaibab Plateau (and Grand Canyon National Park, USA) and could map the order-of-magnitude increase in burned area directly to reforms in policy, personnel, and practices. The program committed significant amounts of money and

administrative attention to increasing the amount of burning on the land. Instead of suppressing new fires immediately, they have granted more room for fire to roam. Twice, fires left to burn ("wildland fire use") have blown up, once to 50,000 acres and again to 58,000 acres. Two decades ago, they would have been hit and held immediately (since modern record-keeping the largest burn was 6,000 acres, and 300 acres was considered nearly a fire of record in the park). Similarly, two prescribed fires have escaped, and yielded big burns, one causing the park to be evacuated and closed.

While the old strategy, aiming at fire exclusion, was by itself unsustainable, it is clear that choices about how to contain fire, and when and where to set fires, have altered the equations. They have done exactly what they were supposed to do. They boosted burned area. Of course, one case study is an anecdote, not a statistic, but until similar studies have examined the remaining public domain, it is impossible to blame global warming or extended fire seasons or a legacy of fuels buildup alone or together for the inflation of burned area. The three components of megafires were all present and they all acted in the same direction.

Megafires, then, have multiple causes. So, too, they have multiple interpretations, each of which suggests different strategies of remediation.

The dominant interpretation regards fire as physical phenomenon. Fire simply follows the tidal rhythms of climate and the fuels drought makes temporarily plentiful. Only in limited circumstances can people modify the master parameters through manipulating those fuels; mostly, they must meet force with counterforce. Megafire thus appears like a climatic tsunami, and calls for such measures as physical barriers, early warning networks, relocations, and policies to compel people to adjust their lives to an unalterable reality.

An alternative interpretation considers fire as biologically constructed and would point to disrupted biotas - to broken forests, invasive pyrophytes, the collapse of internal check-and-balances within ecosystems. The fires have behaved rather like an emergent disease, a pyric version of avian flu, with climate helping create favorable conditions (although catalyzed and boosted by human practices), but with the propagating medium and vectors residing in the living world. What had been a seasonal nuisance has now mutated into a virulent and lethal plague. A strategy of containment might look to epidemiological analogues and public-health strategies from vaccinations and sanitation to quarantines and select emergency care. The metrics for determining the seriousness of an outbreak would reside in biological indices.

Yet another interpretation would note that, while drought has magnified and lightning has kindled many of the burns, it is primarily people who are the agents of the outbreaks and the locus for judgment about what the fires mean and what responses, if any, the fires warrant. They would note that the eruptions have resulted from interactions of natural conditions with change in land use, institutions, policies, and perceptions, all of which have created opportunities for fire, and which suggest that megafires are analogous to a riot or an evolving insurgency. Big fires have resulted from breakdowns in the apparatus for fire control that followed political upheaval in Russia and especially Mongolia. Big fires have swept half or more the area of flagship national parks in America, South Africa, and Australia as a result of policy change promoting natural regulation. Horrific fires have plagued Portugal and Provence from rural land abandonment, and Brazil and Borneo from subsidized transmigration schemes. The lightning-kindled conflagrations that have blistered North America have occurred on public lands; had those places been converted to shopping malls, golf courses, or trophy-home suburbs a very different regimen of fire would be likely.

The choice of how we define megafires will determine in large degree what response we believe we should take. Simply saying that, however, conveys exactly the dominance of the cultural interpretation.

There is yet another interpretation possible. Megafires are a temporary expression, an epiphenomenon, of an Earthly epoch in which industrial combustion is replacing open burning. We are routing our firepower through the burning of fossil biomass rather than the open burning of surface biomass. Paradoxically, the real story is one of fire's steady disappearance. In the industrial world it is gone from vernacular landscapes and fast going from agricultural settings (save Australia's pastoral

north). It thrives - as megafires - only in select sites, most vividly where land-use is changing rapidly in industrial societies. The outbreaks will not last because the conditions they require will not persist. The exurban frontier will stabilize; a new fire equilibrium will emerge on public lands; there may be damages aplenty until then, but the megafire will become the stuff of megalegend.

The real megaburning is the combustion of fossil fuel. This is not an act of nature and stands outside the Earth's intrinsic fire regimes: it is our doing. Today all the components of megaburning converge on ourselves and our species monopoly over combustion. In the past humanity's fire practices and landscaping had to submit to some factors well beyond its grasp, particularly climate. But now our burning has reached the point where it can unhinge even climate. And virtually every aspect of how we reconstruct landscapes - from exurban enclaves linked by fossil-fuel transport and electricity to an enthusiasm for inviolate nature reserves to how we apply pumps, planes, and transporting engines to fight fires - derives from our unique ecological firepower. The three factors behind megafires collapse into one agent, ourselves.

I find this perspective hopeful. It says that the problems do lie with us, which is to say, so do the solutions. It requires only that we define the situation correctly and then, with prudence and vigor, seek to improve upon it.

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