

# Megaburning:

## The Meaning of Megafires and the Means of the Management

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### Abstract

In recent years the expression “megafire” has arisen to describe the outbreak of large fires, particularly in the American West but by extension to other regions of the world. These outbreaks have many contributing causes, but they group conveniently into climate, land use, and human fire practices. All three causes are present, and all have pointed in the same direction. Behind all these pressures, however, lies the specter of industrial burning, which has restructured humanity’s relationship to the Earth and the way fire appears upon it. Similarly, the fires may be interpreted in various ways. To date they have been considered primarily as physical events; but it makes more sense to liken them to biological events, and as cultural events. Each interpretation brings different prescription for response. The challenge of megaburning, broadly conceived, calls for a reformation in institutions and ideas. It is no longer enough to consider fire in wildlands; and the critical burning is no longer limited even to flame.

## I The meanings of megafires

### *Fire’s emerging plague*

Over the past 20 years, the world has witnessed an epidemic of large burns. 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. In some ways it is a new name for a renewed phenomenon, recalling the great fires that routinely ravaged public lands in the early decades of the 20<sup>th</sup> century. Still, the expression has been adopted by other countries, whose similar colonial histories have likewise

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bequeathed large national estates and fire protection agencies and who have also witnessed an unwanted revival of largescale wildfire. Free-burning fire, however, has acquired a much vaster reach. It embraces 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. Call them collectively “megaburns.”

### **Contributing causes**

Considered on this scale, three general factors explain the megafire's surprising appearance. The outbreaks have resulted from favorable changes in climate, in land use, and in 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. It is now clear that the modern era of wildfire records, dating from the 1930s, occurred during a time of relatively benign climate, and a period in which the establishment of a first-order fire-protection system could yield big results. Those favorable circumstances have apparently ended; weather has worsened, the easy work accomplished. That collusion of conditions, however, should remind us that burned area is not a proxy for climate alone but an index of climate interacting with people.

This observation segues into the land use component, which is more subtle. Fresh fuels may result from landclearing, land abandonment, exurban settlement, or a reclassification of land for 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, most spectacularly 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, the process represents the recolonization of a once rural countryside by an urban outmigration. In fire-prone environments the compound has proved volatile, both increasing the combustibles available for conflagration and the assets at risk. The last change describes the deliberate expansion of more strictly protected nature preserves, many such sites formerly dedicated to other public-land uses such as forestry. 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. They are not negligible, and they compromise many of the studies that have sought to attribute the recent increase in burned area solely to global warming. A major thrust of these programs has been to "restore" fire, which is to say, to increase the amount and type of burning on the land. By the standard of burned area, 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 found I 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 within the park itself). 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 unsustainable, it is clear that choices about how to contain fire, about how closely to attack fires, about when and where to set fires, have altered the equations. They have done exactly what they were supposed to do. They have boosted burned area. Of course, one case study is an anecdote, not a statistic, but until similar studies have examined America's remaining public domain, it is impossible to blame global warming or extended fire seasons or a legacy of fuels buildup alone or even together for the inflation of burned area. The era of boosted burning coincides precisely with the era of fire policy reforms. The three components of megafires were all present, and they have all acted in the same direction .

### ***Interpretations***

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 a physical phenomenon. Fire simply follows the tidal rhythms of climate and the fuels that drought makes temporarily plentiful. Only in limited circumstances can people modify the master parameters, and then 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 public-land 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 changes 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 changes promoting natural regulation and increased opportunities for free-ranging fire. Horrific outbreaks 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. Are megafires in Yellowstone National Park a social problem or an ecological wonder? Are the wildfires that savaged Scripps Ranch in San Diego, California a problem of active fire protection or of building codes? Is the driver behind the exurban fire regime a lengthening of fire seasons or the subsidizing of mortgages through tax deductions? Do the fundamentals of megafires lie in the mechanisms of heat transfer, or in ideologies of wilderness and budgets of fire institutions? Simply saying these choices conveys exactly the dominance of the cultural interpretation.

### ***The industrial megaburn***

There is yet another interpretation possible. It holds that 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 becomes one of fire's steady disappearance. The Earth is dividing into two grand combustion realms, one to each type of fuel. Only in a few places (and then conditionally) do these realms overlap. When they meet face to face, industrial combustion drives out open burning by a process of technological substitution and active suppression. In the industrial world it is gone from vernacular landscapes and fast going from agricultural settings (save Australia's pastoral north). It flourishes – more and more often as megafires - only in select sites. It thrives in nature reserves, which have become the permanent habitat of free-burning fire, and most vividly it thrives where land-use is morphing. But everywhere, in both developed and developing countries, 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 contributing causes 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 our 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. Every link in the contemporary chain of fire causality returns to humanity; and unlike the case with wildlands it is not possible to imagine an alternative source in nature. Industrial burning belongs uniquely to people. Or to restate the issue, the three grand factors behind megafires collapse into

one agent, ourselves.

## **II The management of megaburning**

### ***Ways and means***

Megaburns are many; their strategies for management, multiple.

A casual survey may suggest that the megafire is primarily a supersized version of that ancestral incubus of fire management, the big fire or big-fire season that wipes out in one rush the careful labor of many decades. Historically, big fires have run up the greatest costs, inflicted the most profound damages, and disproportionately upended plans. That issue, never truly solved, has metamorphosed in recent decades into a conundrum as experience has argued that some such fires are not only inevitable but necessary. Even as the number of big fires shrinks, those that remain burn with greater ferocity, duration, and areal extent, and it seems unlikely that they can be abolished altogether. Equally, the appreciation has grown that high-intensity fires are, for select biotas, an ecological asset. Among big fires, some are inevitable, some are useful, and some essential.

This, however, is a concern for public wildlands. Its likely resolution will pivot on two reforms. One is to move such burns from the status of anomalies and statistical outliers to core phenomena. Assume they will occur and build an apparatus for management accordingly. Such fires are not escapes, or breakdowns of a normal order; they are the essence, around which all other practices should orbit. The second change is to separate size from intensity and prescribe crown fires. These would be small in area, individually, but yield comparable ecological effects in aggregate. Still, such fires are only a minor subset within the planetary constellation of megaburns, which far transcend public wildlands. Their technical resolution is a matter for another occasion.

What global megaburning points to is something else, for megaburns are not likely to be solved by more of the same. They require a reformation in both imagination and institutions. They demand we think about fire in new ways and that we devise new means to apply that understanding.

The institutional scene may be the simplest to characterize. The national administration of wildland fire originated in organs of state-sponsored forestry, the residue of European colonialism over the previous century. They established policy and practice and sponsored research. They claimed in effect a public monopoly over fire. Yet the past 60 years have witnessed the collapse of that old imperium, and its relict institutions have been subject to the forces of decolonization. In some countries, they have collapsed; in some, shrunk; and the networks that once bound them to imperial interests or colonial commonwealths have dissolved. Where they have persisted, they have often undergone a renovation of purpose and personnel, moving, for example, from timber protection to nature preservation, and from border battles with an expanding agriculture to frontiers with urban sprawl.

Today, private owners and NGOs have further challenged their hegemony. Institutions such as The Nature Conservancy and the World Wildlife Fund have established their own fire missions, often on their own lands, and have begun to broker between state fire agencies and the general citizenry. The problem of megaburning is no longer restricted to public domains – is no longer even associated with open fire. While a global fire network is emerging, it has not yet enjoyed the support that national (or imperial) institutions had in the past. That web must involve

more than mutual-aid agreements during emergencies. Of particular concern is the continued monopoly over research funding that the old institutions retain.

This matters because it influences the second concern, how we imagine fire. We all recognize that an emergency requires an emergency response, and that to protect a built environment the physical paradigm of fire is useful. We also recognize that we cannot contain megafires by simply massing emergency responses, and that the physical paradigm fails to address the dominant concerns of administering fire landscapes. More and more, the quarrels over fire strategies are really fights over social values and cultural perceptions. To address these concerns we need an understanding of fire as biologically constructed, and of ourselves as fire creatures with a unique agency over fire's appearance on Earth. We need biological controls as well as physical countermeasures. We need an appreciation that, at a time when even climate is being unhinged by our combustion habits, people remain at the vortex of fire's presence.

Yet we don't have a scholarship that addresses these matters; and so long as the old agencies control fire research funding, we are unlikely to get it. We need, rather, to relocate fire into the biological sciences and to establish genuine support for the investigation of humanity and fire as indispensable to the social sciences and even the humanities. We need a network for global research to match that of global management. This may appear a quixotic ambition; probably it is. But if megaburning teaches us anything, it is that more of the same will not do. What will not succeed is more of the old ways, even if outfitted with glitzy computer graphics and mutual-aid treaties that will let us collect airtankers and ICS-trained fire officers from the four corners of the world. We need a different vision, and for that, a different suite of institutions.

### ***Making means into ends***

The originating use of "megafire" left little scope for human response, save for emergency evacuations and heroic gestures, whether to reconstruct whole landscapes or to mass counterforces of equal ferocity. It was as though the Earth were being struck by asteroids: our only recourse was to hide, attack the bodies in space, or flee the planet. The recentering of megafires from a cosmic disruption to our flawed selves suggests instead that since the core problems lie with us, so do the solutions. A suitable response requires that we define the situation correctly and then, with prudence and vigor, seek to improve upon it. If this seems a too-daunting task, we should look around us.

No countries have been harder hit by wildfire in recent years than Spain and Portugal. To those who see free-burning "fire" only as something that happens in true wildlands, the outbreaks that have blasted the Trás o Montes, laid siege to Coimbra, and savaged the Galician countryside hardly merit the label "megafire." Yet these fires belong fully with a larger constellation of megaburning that has, over the past decades, redefined the dynamic geography of fire on Earth. These are burns originating not in A Wild desperate for preservation but in cultivated landscapes gone feral. Our host country is symbolic of both that problem's complexity and its prospects for containment. Thirty years ago Iberia was emerging from decades of dictatorship, and the European Union was a small fraternity. Spain and Portugal joined the EU in 1986, only three years before the inaugural International Conference on Wildland Fire.

Today, as it celebrates its 50<sup>th</sup> anniversary, the European Union has expanded in all directions, an extraordinary exercise in institution-building and one that has

challenged the very conception of a European identity. In 18 years Iberia has gone from an outlier in the international fire community to center stage in the drama of wildfire havoc and from being an observer to being a host of international fire conferences. In a macabre way, its megafires are an index of how profound those changes have been, for it is this enormous social transformation that has altered these ancient landscapes and allowed fire to emerge on a scale probably unprecedented for millennia. The experience suggests, too, how these fires might be addressed: with careful attention to institutions, to capacity-building, to policies crafted to the particulars of place, to multi-national science, to a more nuanced and accurate conception of our identity, in this instance as a unique fire agent.

It has been the historic task of wildland fire management in the New Worlds to remind the Old that fire has a valued place in the ecology of Earth. It will be the task of the Old World to remind the New that humanity has a valued, even transcendent, place in the ecology of fire. This charge will not be easy. The origins of fire protection lay in competing empires and emptied colonial landscapes. It is no simple task to retrofit such institutions and ideas to address a world of collective union and once-cultivated landscapes. The patient task of redirecting institutions and rebuilding capacity offers little glamour and few immediate rewards, while the strains it induces are real: it is naïve to expect 50 years of European Union to reverse 500 years of competitive European expansionism. And so it will prove with fire management.

It is much simpler to evacuate whole communities, launch airtankers, dispatch nomex-outfitted troops, all of which makes good TV and grand political theater. But such gestures may only disguise a failure of understanding and imagination. Megafires will not be contained by marshalling megaforces against them. They will not succumb to romantic rhetoric, or by efforts to match them force by force or telegenic image with telegenic image. They will be smothered where we don't want them and promoted where we do by working patiently on the real and often mundane tasks that change facts on the ground. That is not a message to inspire or an easy message to send political minders. But it is the message we need to give, for in it lies genuine hope.