THE WEST'S WILDFIRE CRISIS:
The Urgent Need to Restore Safer, More Resilient Conditions
In the West's Dry Forest Types

EXECUTIVE SUMMARY

The Western United States is in the grips of an ongoing wildfire crisis. Nearly every year, over the past two decades, one record-breaking fire season has been eclipsed by another...unimaginably worse. Some of our best, most experienced firefighters have been killed trying to control these fires. Whole communities have been incinerated and civilian fatalities have exceeded levels not seen since the nation first organized for wildfire protection at the turn of the last century. Estimates place wildfire-related costs, losses, and damages well in excess of $100 billion since 2000. Knowing that the figure does not include a full measure of human suffering, loss of irreplaceable natural resource values, and the emotional impact of fatalities among friends and families, it is surely a conservative estimate.

The wildfire protection objective, *"Protect lives and property and – without compromise to firefighter safety – minimize natural resource damages at the least suppression cost"* has become an unrealistic expectation when the worst wildfires strike...and more strike each year.

Despite public pleas to "do something," political pledges to act, and agency promises to do better, the situation is only getting worse. The convergence of climate change, a century of over-accumulated biomass, and unconstrained housing development at the forest-urban edge have brought us to this place. Unable to agree on a unified way forward, firefighters are left trying to match increasing wildfire threats with greater suppression force. In the absence of real change, the crisis compounds. Meanwhile, our current regulations and policies continue to imperil the very values that they were intended to save. Any limit of "acceptable loss" seems to have become boundless.

Fundamentally, the crisis is not a fire operations failure. It is a land management and land-use failure abetted by regulations and policies that don't reflect the realities of climate change or the ecologies of fire disturbance regimes. It is a failure to adequately manage fire-adapted, fire-dependent, fire-prone ecosystems. The onset of climate change has made manifest the deteriorated condition of the West's dry forest types. It is a condition that history and science tells us bears the hand of man. At its core, the West's wildfire crisis is also a failure of imagination. We seem unable to imagine that things can get much worse, when almost every year they do. We seem unwilling to imagine a whole new approach to wildfire protection; one rooted in how we might better manage the land.

This overview attempts to challenge the notion that we can "stay the course," "try harder," or make only slight changes at the margins and, in so doing, effectively protect people, private property, public land values, and our own firefighters. This overview presents the problem as we see it, briefly outlines some of its causal and contributory factors, describes the core alternatives available to us, and puts forward a set of recommendations for a safer, more sensible, more sustainable way forward.

The overview recommends a non-partisan, science-grounded, and evidence-based commission, supported by strong field expertise and the best available research to help chart a way forward. It is not without reservation that we recommend a commission. They can be slow and ponderous when the urgency of this crisis demands action – now. It is understood that the idea of a commission should not hold up positive actions that the agency can take immediately. Restoration work is a priority that needs to ramp up rapidly.

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THE ISSUE

Western wildfires have reached crisis stage over the past two decades. It is a crisis urgently waiting on decisions that can no longer be put off without unbearable consequences to more and more people. From 2000 through the last available data year (2019), the 11 western states have suffered 224 catastrophic wildfires (defined here as those costing $20 million or more, each, to control). The total reported suppression costs for these incidents, alone, was over $10 billion. These costs do not include property losses, natural resource damages, impacts to local economies, infrastructure damage, human health effects, crop losses, rehabilitation and recovery costs, damage from post-fire events (e.g. mudslides), loss of life and human suffering, or other wildfire-related costs. These other attendant costs are not fully accounted – many are simply not tracked; others cannot be assigned a value – but conservatively they are estimated to exceed well over $100 billion for just these 224 incidents.

The nation's worst wildfires exceed all efforts at control until firefighters get some relief in weather or can exploit a break in fuels. At present, suppression-centric protection strategies are not working at the highest fire danger levels, where wildfire-related costs, losses, and damages are concentrated. There are a number of reasons that other, more effective protection strategies are not more fully emphasized, but, because we have not confronted these reasons, we remain tethered to a wildfire protection strategy that does not reliably work when protection matters the most.

Most experts believe that the West's wildfire crisis will worsen without a change in course. However, the nation has not come to agreement on a path forward. Adrift, our threshold of "acceptable loss" continues to climb.

BACKGROUND

In most places, we continue to react to wildfire emergencies, instead of more proactively addressing the predisposing factors that influence the onset of these disasters. From a policy-making standpoint, effective direction is encumbered by a lack of important data and an incomplete realization of the causal and contributory factors at play. There is not a full understanding of how regulatory, fiscal, market and other factors limit or work against policy options; an understanding that might have policy-makers revisit those factors and adapt them to a changed climate circumstance. Budget appropriators are without benefit of knowing the true and total wildfire costs involved; an understanding that might help them redirect or reconfigure protection budgets and consider where price supports for mitigation work might be wise. Among the public at large, there is not a widely shared understanding of how the West's wildfire problem has developed and continues to incubate. Without this knowledge it's difficult to imagine that the public can support a more effective strategy, especially one that is not without its own set of risks. The absence of a comprehensive cost: benefit assessment that compares the efficacy of alternative protection strategies over time makes it next to impossible to explore other options and find more sensible, more sustainable solutions.

FOREST CONDITION AS A FACTOR IN SEVERE WILDFIRE POTENTIAL:

The West's wildfire crisis stems from how we have used and managed its fire-prone ecosystems. It is, fundamentally, a land management problem, not a fire operations issue.

"The most extensive and serious problem related to the health of national forests in the interior West is the over-accumulation of vegetation which has caused an increasing number of large, intense, uncontrollable, and catastrophically destructive wildfires."

-*G*eneral Accounting Office Report RCED-99-65
(2 April 1999)

Virtually any vegetation can burn. This past summer, unusually damaging wildfires affected communities on the west slope of the Cascades, a zone normally protected by its relatively wetter, cooler environment. These surprising wildfires may be an indicator that the effects of climate change are beginning to move up the moisture/temperature gradient. Some vegetative types are perennially dangerous and destructive (e.g. southern California chaparral). But, this overview draws attention to the condition of the West's dry forest types. In the past twenty-years, close to two-thirds of the highest cost wildfires started within the natural distribution of ponderosa pine, a key dry-site indicator species. No known assessment has been completed to determine the percentage of wildfire burned acres with respect to forest type, its current condition and any departure from historic condition, but for several decades ecologists have established a clear cause and effect relationship between the deteriorated condition of ponderosa pine forests (including late successional associated species) and the potential for high severity burning. This deterioration represents a significant departure from these forest's historic condition.

Ironically, most of the West's worst wildfires now occur in stands that, 100 years ago, commonly burned at much lower intensities than they do today. At the turn of the last century, these relatively warm, dry habitats had fewer trees and were typically dominated by more open, more widely spaced ponderosa pine with sparse understories. Frequent, low-intensity fires maintained that condition. It kept dead fuels from building up. Ponderosa pine-dominated forests were adapted to this kind of fire; it cycled nutrients, maintained a water balance, and shaped their structure and composition. Generally, it rejuvenated grasses and shrubs, but prevented small trees and fire-intolerant species from encroaching. In its historic condition, ponderosa pine forests were healthier and less susceptible to severe burning.

In the intervening years - without frequent, low-intensity burning - forest structure and density, species composition, and fuel build-ups have changed dramatically. Logging and grazing accelerated those changes. Throughout much of its historic range, type conversions have occurred, displacing ponderosa pine with other, less fire-tolerant species. Today, these dry, fire-prone forests are typically choked with dense, desiccated vegetation, continuous across broad landscapes. In some places, biomass and dead fuels have accumulated for several decades. Wildfire potential has become much exacerbated by the effects of climate change, including drought and extreme weather events. Insect infestations and disease outbreaks add to the crisis. Houses built at the forest edge continue to compound an already untenable situation.

CONSIDERING WILDFIRE PROTECTION OPTIONS

Four broad wildfire protection strategies dominate discussions over how to deal with western wildfires:

- Increase firefighting capabilities:

  Better trained firefighters, improved coordination between agencies, and larger airtankers, engines, and helicopters have all been employed over the past several years. Despite massive increases in preparedness funding and suppression spending, however, there has not been anything close to a corresponding reduction in wildfire costs, losses, and damages; in fact, they are going up. The West's worst wildfires continue to exceed all efforts at control until firefighters get a break in weather or can exploit a break in fuels. Perhaps contrary to a pervasive belief otherwise, these observations are telling us that the West's wildfire crisis won't be fixed with more firefighters, more engines, and more airtankers. Nor will it go away by re-organizing into a Federal Fire Service.

- Make houses at the wildland-urban interface more fire-proof:

  "Hardening" houses and learning to live with free-burning fires in the general forest has been proposed as a solution. In some places, National Fire Protection Association-endorsed FIREWISE standards are required for new construction, but in most places these precautions are voluntary. Governments remain reluctant to impose mandates.

  At the same time, protecting private property at the expense of public land values is a growing concern. It is one thing to lose mostly insured houses; another to incur damage to watersheds, critical wildlife habitat, air quality, and other irreplaceable values that define the larger community or region. The cumulative damage to these public values has not been inventoried and is not fully known.

- Use wildfires to rob future fires of available fuel and put fire back onto the land.

  Using wildfires to reduce fuels and lessen the potential for future fires has more recently been tried (federal fire policies changed in 2009). Fire-use can be beneficial, but – at the scales where it may be effective – there are significant social, economic, and ecological risks involved, particularly under the influence of drought when fires tend to burn hotter and last longer.

  With few exceptions, many of the West's dry-site fire-prone forests are so deteriorated that opportunities to use fire at ecologically appropriate intensities are limited. In stand-replacement fire regimes, opportunities appear much greater.

  It's not altogether clear how using excepted events to meet management objectives complies with the National Environmental Policy Act (1970). There is also a concern that these large burned-over areas – if left to grow back unattended – will only set the stage for the next generation's mega-fire. It is not clear what level of monitoring has occurred or what that monitoring might reveal.

- Restore resilience in dry forest types by replicating more open, more heterogeneous landscapes.

  Restoration work in fire-adapted ecosystems attempts to "put back" an historically more

resilient landscape. It is not simply fuel reduction or logging; it is more about what we leave on the land than what we take from the land. Restoring more resilient forest structure, more fire-tolerant species composition, and, in time, replicating fire's ecological function at appropriate intensities, scales, and intervals is the long-term goal.

Sequencing treatments over time is an important component of restoration. In deteriorated dry forest types, restoration work will involve selectively removing some intermediate-sized trees (favoring fire-tolerant leave trees) and thinning a significant number of smaller, understory trees, followed by lower intensity prescribed surface burning.

Restoration work should be tailored to the ecological dynamics of different fire regimes and unique habitat types. Restoration objectives and methods will be different for different forest types. Restoration does not attempt to "fire-proof" an area; it aims to reduce potential wildfire severity. Restoring resilience is a promising strategy; it has worked at smaller scales in the West and it has been successfully used elsewhere (e.g. Southeastern United States and Western Australia).

CONFRONTING OBSTACLES

This overview encourages a stronger commitment to the restoration alternative. We believe it offers the safest, most cost-effective and most ecologically appropriate way forward over the long-term. It is also likely the strongest hedge against worsening climate change forecasts.

Restoration treatments have proved effective, but at the scales needed, the work is hamstrung by a complex set of inconspicuous regulatory, fiscal, market, and other obstacles. These, and other obstacles, need to be addressed as a critical part of moving toward a more effective wildfire protection strategy. Here, we describe three:

- Regulatory: Most of our environmental regulations were conceived and enacted before the onset of climate change and before the science of disturbance ecology emerged in our thinking.

  Although managers are held to account to display the effects of proposed actions on air quality, critical habitat, watersheds, human health, and other values, wildfires are "excepted events." Despite man's hand in creating the conditions that set the stage for the severity of many fires and their subsequent damage to the human environment, wildfires are irrationally exempt from environmental scrutiny. In important ways, many of the West's worst wildfires are the least natural of the natural disasters that the nation confronts.

  Under the National Environmental Policy Act, the "no-action" alternative is measured against current conditions, not expected future conditions in the absence of treatment. The regulatory language tends to favor stasis over active management. In highly dynamic, fire-adapted ecosystems, this omission invites disaster when ecological function has been disrupted for so long that deteriorated forest conditions and drought combine to burn at intensities far beyond adaptive limits.

  Although wildfire impacts, today, are often far greater and more far-reaching than proposed treatments, they tend to be overlooked in the planning process. Inexplicably, there is no requirement to anticipate wildfire impacts in the absence of mitigating treatments. As a

consequence, wildfire impacts continue to pile up unaccounted. We simply do not know the cumulative effects to watersheds, critical habitat, air quality and other values. If these oversights are not soon corrected, our environmental regulations – as currently practiced – will continue to imperil the very values that they originally set out to protect.

- Fiscal: Our fiscal policies are heavily weighted to reacting to disaster, rather than preventing disaster. On federal lands, the country spends many times more fighting fires than it does directly trying to prevent or mitigate them. Fuel reduction and restoration funds are a part of the constrained budget. Fully funded fuel reduction or restoration budgets occur at the expense of other program areas within the agencies. The highest priority areas are also often the most expensive to plan and implement and can take years to accomplish. The pressure to meet targets frequently forces managers into projects that are in lower priority areas or too small.

  On the other hand, monies for firefighting are outside of the constraint. They are all but unlimited. Recently, suppression spending has been climbing at alarming rates. Efforts to rein in firefighting costs and re-direct a greater share of the budget to mitigation work, have been mostly futile. Managers have found that it is virtually impossible to broker cost-effective spending in the midst of an emergency when public and political pressures to "do more" prevail.

  Program budgets (and targets) are "line-itemed," or arranged along functional interests. In practice, it is difficult to coordinate or consolidate monies from these functional accounts in order to achieve over-arching restoration objectives that might be for common benefit of a number of natural resource management areas.

  There has been no formal cost-benefit analysis conducted that might better display the costs, losses, damages, and benefits between the strategic mix of prevention, mitigation, and suppression. As a result, there has remained a misdirected emphasis on reacting to disasters, rather than preventing or mitigating them.

- Markets: There are few markets currently available for the kinds of material – that once removed – can reduce the severity of wildfires. Stewardship Contracting has been introduced as a means to offset high thinning costs, prescribed burning costs, and other mitigation measures, but its implementation has been limited. Removal of larger trees often evokes strong protest. Limited markets affect the economics of restoration projects, particularly when benefits are delayed into the future.

  Subsidized property insurance for houses at the wildland-urban interface has allowed (even encouraged) development on lands that would otherwise be too risky for homeowners to build upon. FAIR programs (Fair Access to Insurance Requirements) give developers opportunities to build and provide local governments an increased tax base, but these programs distort the real dangers and long-term costs involved. FAIR programs beg the question, "If it is acceptable for government to insure high-risk private properties against wildfire losses and put firefighters in harm's way, why isn't it reasonable to invest public monies into restoration work that better protects public values...and, in the bargain, is safer and reduces risks to adjacent private lands?"

  As a part of the country's alternative energy goals, and in answer to alarming climate change projections, there seems to be a good opportunity to connect restoration needs and biomass reduction with clean energy markets, including electric co-generation. Resilient forests may be one of the best hedges against expected warming, drying climate trends and offer an important

counter-balance to the forces accelerating climate change. In dry fire disturbance regimes, especially, using frequent, low-intensity prescribed burning may be the best way to sequester carbon when gauged against the amounts of carbon released during severe wildfires.

There may be good reasons to consider price supports for restoration work, but, in the absence of a comprehensive cost-benefit study, it will be a difficult sell. Given the high "sunk" costs, losses, and damages resulting from wildfires it seems reasonable to reconsider our reluctance to subsidize this kind of work.

RECOMMENDATIONS

Policy-makers are urged to develop a comprehensive, long-term action plan aimed at putting in place a safer, more cost-effective and ecologically aligned wildfire protection strategy for National Forest System lands in the 11 western states. Actions might include:

- Re-engage national and international initiatives to confront climate change
- Provide incentives to states and homeowners for FIREWISE planning in fire-prone areas
- Direct CEQ to require a display of expected wildfire impacts in the project planning process under NEPA's evaluation of alternatives, including "no-action."
- Evaluate Land/Resource Management plans to ascertain that objectives are aligned with fire regime dynamics or, otherwise, display the short- and long-term risks involved.

- Appoint a non-partisan, science-grounded, evidence-based commission with strong field support and the best available research to chart an enduring course forward. The commission should:

    - Develop a more complete accounting of wildfire-related costs, losses, and damages.

    - Strengthen data collection to better display high-consequence wildfire burned areas in relation to habitat type, fire regime, and forest condition.

    - Lead a rigorous cost: benefit assessment among the range of wildfire protection alternatives and conduct a trajectory analysis of where each alternative is headed, forecasting the social, economic, and ecological effects over time for each option. Consider climate change scenarios.

    - Examine the full range of causal and contributory factors surrounding the West's wildfire crisis, including regulatory requirements, fiscal policies, market forces, and other factors that may be at cross-purposes with restoring resilience in high-risk ecosystems.

    - Evaluate the feasibility of price supports for restoration strategies that may otherwise be dismissed for their high up-front costs.

    - Establish measurable, attainable objectives and prioritization criteria using the latest Forest Service Research simulation modeling for restoration treatments. Introduce a system that strengthens how targets are assigned, reported, and monitored, with respect to treatment needs in high priority areas.

    - Address workforce capacity needs, in terms of fire ecology skills, fire science skills, and overall personnel needs.

- Consider establishing an inter-disciplinary Restoration Task Force, comprised of subject-matter experts from across each Deputy Area, and reporting to the Chief's Office. The goal of the task force should focus on accelerating restoration actions in the high priority areas in the West's dry forest types. Not waiting on a final report, the task force should coordinate with the commission in order to expedite on-the-ground progress, whenever possible.

SUMMARY

The National Fire Plan (2000), the Healthy Forest Restoration Act (2003), the "wildfire funding fix (FY2018 Omnibus Spending Package)," and recent proposed legislation (e.g. Emergency Wildfire and Public Safety Act, S.4431) offer useful ways to accelerate hazard mitigation and restoration work, but these actions are not fully matched to the scale and scope of the West's wildfire crisis.

Among the four broad wildfire protection alternatives this paper overviews, we believe that the restoration option holds the most promise. This is not to say that other options should be dismissed; they should all be employed, but restoration should be more strongly emphasized as a central component of an overall wildfire protection strategy in the West's dry forests. It has an ecological basis. Although it is expensive to implement, its costs may, in fact, be far less than other options, when compared against the true and total costs, losses, and damages involved among the alternatives. It is probably the most sustainable, particularly against alarming climate change projections. Although it is not without risk, it may also be the safest.

Restoring resilience to the West's deteriorated fire-prone forests will be an enormous task. In 2000, a science-based optimization assessment identified the need to treat about 3 million acres per year in the West's highest risk forests, then estimated to cover about 39 million acres. Certainly, not every acre needs to be treated. Strategically placed treatment areas, as used in the Southeastern United States, Western Australia, and elsewhere can go a long ways in reducing large, high-severity wildfires. In some potentially high-risk fire-prone ecosystems, where risks have been ameliorated through on-going hazard mitigation, practitioners have found that a treatment regimen of approximately 6-8% of their lands annually is required to maintains healthy, lower risk, resilient conditions. These maintenance treatments are scheduled at ecologically appropriate intervals, usually once every 5-15 years.

Restoration work will call into question workforce capacity. Presently, the Forest Service simply does not have the fire ecology, fire science, and technical skills – nor workforce numbers – to take on a ten-fold increase in thinning and prescribed burning work. Although firefighters are already stretched thin, it would be unwise to create two separate organizations; one tasked with fighting fire; the other given fire-use responsibilities. The work is compatible. Personnel can benefit from experience in both areas, and they can support one another in advocating the same outcome: safer, more resilient conditions. Separation runs the risk of creating a kind of destructive competition. When prescribed burning escapes occur (and they will occur), or when firefighting accidents occur (and they, also, will happen), we cannot have one "side" denigrating the other. They need to be working hand-in-hand toward a common, overarching objective.

Restoration will carry high up-front costs (estimated at between $1.5 to $2 billion or more per year in high-priority areas). It will take time, with an estimated initial commitment of at least 15-years. It

won't be without risk from escaped prescribed burns or consequence from prescribed fire smoke (although research has demonstrated that wildfire emissions are 5-10 times higher than prescribed burning emissions (and certainly more toxic when structures are involved)). There is a caution, here, in thinking that restoration work can be done "on-the-cheap." Too many high-risk forests will require multiple entries if restoration is to be managed within acceptable limits of risk. There are too many areas with too many trees, too much fuel, and not wide enough windows of opportunity to rely on "once-and-done" strategies of prescribed burning or fire-use, alone.

This overview's recommendations envision two parallel tracks: One, doing all possible, now, to accelerate restoration work and mitigate wildfire impacts. Forest Service Research has powerful simulation models and predictive models that can help prioritize work. There may be opportunities to consolidate available dollars. Stewardship Contracting is another avenue that may be better used.

The second track represents a longer-term, more far-reaching effort. It relies on the commission described above to dig into the full range of causal and contributory factors involved, including governing regulations, fiscal policies, market forces, and other factors. Although some will argue that commissions "are where good ideas go to die," that they represent a "loss of control," that they take too long given the urgency of the threat, or that they can be influenced by other agendas, a well-directed, well-led, carefully staffed, and fully supported commission can be helpful in illuminating the complexities of the West's wildfire crisis and reporting out a recommended course forward. At $100 billion and more in recent wildfire-related costs, losses, and damages, it seems clear that the West's wildfire crisis requires an impartial, more comprehensive examination.

Some – maybe most – recommendations will be costly or controversial. It will be difficult to make restoration investments and accept restoration work if we lose sight of the consequences of "staying the course." Presently, our wildfire protection objective is collapsing at the highest levels of threat, where losses are the greatest. Our regulatory, fiscal, and market policies have not adapted to the "changed circumstance" of climate change and, as a result, threaten to imperil the very values that we hope to save. It is unclear that there is any longer a limit of "acceptable loss."

In her book, "The March of Folly," the historian Barbara Tuchman observes that our past is replete with examples where governments pursue policies contrary to their own best interests. Even when there is ample evidence for the need to change course, governments can habitually overlook the obvious, refuse to benefit from their failures, and stubbornly stick with policies and strategies that are not working.

We hope for better.

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