Resolving the Increasing Risk from Wildfires in the American West

by Ray Rasker

State Farm

A wildfire threatens a home near Possum Kingdom, Texas.

In Brief

Wildfires have always been part of living in the American West, but today they are bigger, burn longer, cause more damage, and kill more people than ever before. This situation is getting significantly worse in large part because more and more people are choosing to live in forested landscapes, further risking lives and property and putting a significant strain on agency budgets. Add to this scenario the lingering effects of past management practices that have exacerbated fire danger and the expectation of continued changes to the Earth's climate, and we have a management situation where the solutions don't match the severity of the problem. This article describes the trends in wildfires, the challenge of defending private property, the solutions tried so far, and outlines new ideas that could significantly reduce costs and risks by altering the pattern of future home building on fire-prone lands.

Wildfires have always been part of living in the American West, but today they are bigger, burn longer, cause more damage, and kill more people than ever before. Much of this drama plays out on public lands of the West, where almost half of the land is managed by the federal agencies like the Forest Service and Bureau of Land Management. From 2000 to 2013, 88 percent of wildfire acreage burned has occurred in the West.[1]

Wildfires Occur Primarily in the West

The challenge of wildfires center in large part on the need to defend homes on private lands that are at risk from fires that originate either on private lands or nearby public lands. The term often used to describe these lands is the Wildland–Urban Interface (WUI), defined in this paper as private land within 500 meters of forested federal land.[2]

Even though land use planning—the decision of where to allow the building of homes—is a local government responsibility, the cost of defending the homes from wildfires is often a state and federal burden. When a fire breaks out, regardless of where it started, land management agencies like the Forest Service and Bureau of Land Management spring into action, sending ground crews, helicopters, and air tankers to battle the blaze. The priority to defend private property sometimes comes with catastrophic results, as was the case last year when 19 elite firefighters died defending homes in Yarnell, Arizona.

The wildfire challenge is driven by two overriding problems. First, long-term trends indicate the costs and dangers associated with defending homes will continue to increase. In the West, 84 percent of these forested lands are not yet developed,[3] the housing market has picked up once more, and climate change is acting as an accelerator, increasing the size and intensity of fires as well as the length of the fire season.

Wildfire appropriations to the Department of the Interior and to the Forest Service have tripled from US$1 billion per year on average in the 1990s to US$3 billion on average annually from 2002 to 2012.[4] Contemporary fires are more expensive for a number of reasons. Fires are larger in size, driven in part by climate change and fuel buildup resulting from past fire suppression. Fires are also becoming more expensive due to the high cost of defending an increasing number of homes. Estimates of the costs of defending homes from wildfires vary, from around 30 percent of total costs to 50–95 percent.[5,6]

Key Concepts

- **The threat of wildfires in the American West is growing due to past management practices, climate change, and the building of homes on fire-prone lands.**
- **Wildland firefighting budgets of federal land agencies have tripled in size in the last decade, driven in large part by the need to defend homes. As a result, funds that would otherwise be used to reduce risk (by reducing fuels, for example) are instead diverted to fire suppression.**
- **Solutions tried to date—voluntary landowner education and fuel reduction—are important but not sufficient given the magnitude of the problem and future trends.**
- **To create a strong incentive for improved land use planning and direct future home building away from fire-prone lands, local governments must bear a higher proportion of the firefighting costs.**
- **The federal government can create significant rewards for better planning through a community rating system, allocating funds and assistance to communities willing to reduce wildfire risk on private lands.**

The second problem is that communities are not controlling future development on fire-prone lands because the bulk of the firefighting costs are paid for by federal taxpayers and not at the local level where the land use decisions are made. The Forest Service, the Bureau of Land Management, the Federal Emergency Management Agency, and state governments pay the bulk of the firefighting costs. Meanwhile, communities either financially benefit—or perceive to benefit—from tax revenues from new residential developments.

Like government-subsidized flood management programs, firefighting policy in the U.S. has an element of moral hazard; since a significant portion of the costs associated with building in hazardous areas are not borne by the local governments or homeowners, there is little incentive to build on safer lands.[7] Because of this, it will be difficult to control the rising costs, damages, and dangers related to home development in forested areas unless there are negative financial consequences for private land management decisions that increase risk and positive financial rewards for decisions that reduce risk.

Because wildfires will continue to be part of the western landscape, the challenge is to successfully live with fire. This will mean an increase in local responsibility for allowing home building on fire-prone lands and land use regulations that minimize the risk from wildfires.

Long-term Wildfire Trends Indicate a Need for Better Planning on Private Lands

Wildfires are increasing in size and burning longer. In part due to a changing climate, during the last decade, the average acreage burned by wildfires have increased from 44 to 88 acres per fire. The average fire also burns twice as long,[8] and since the 1970s, the length of the fire season has increased by over two months.[9,10] By 2050,

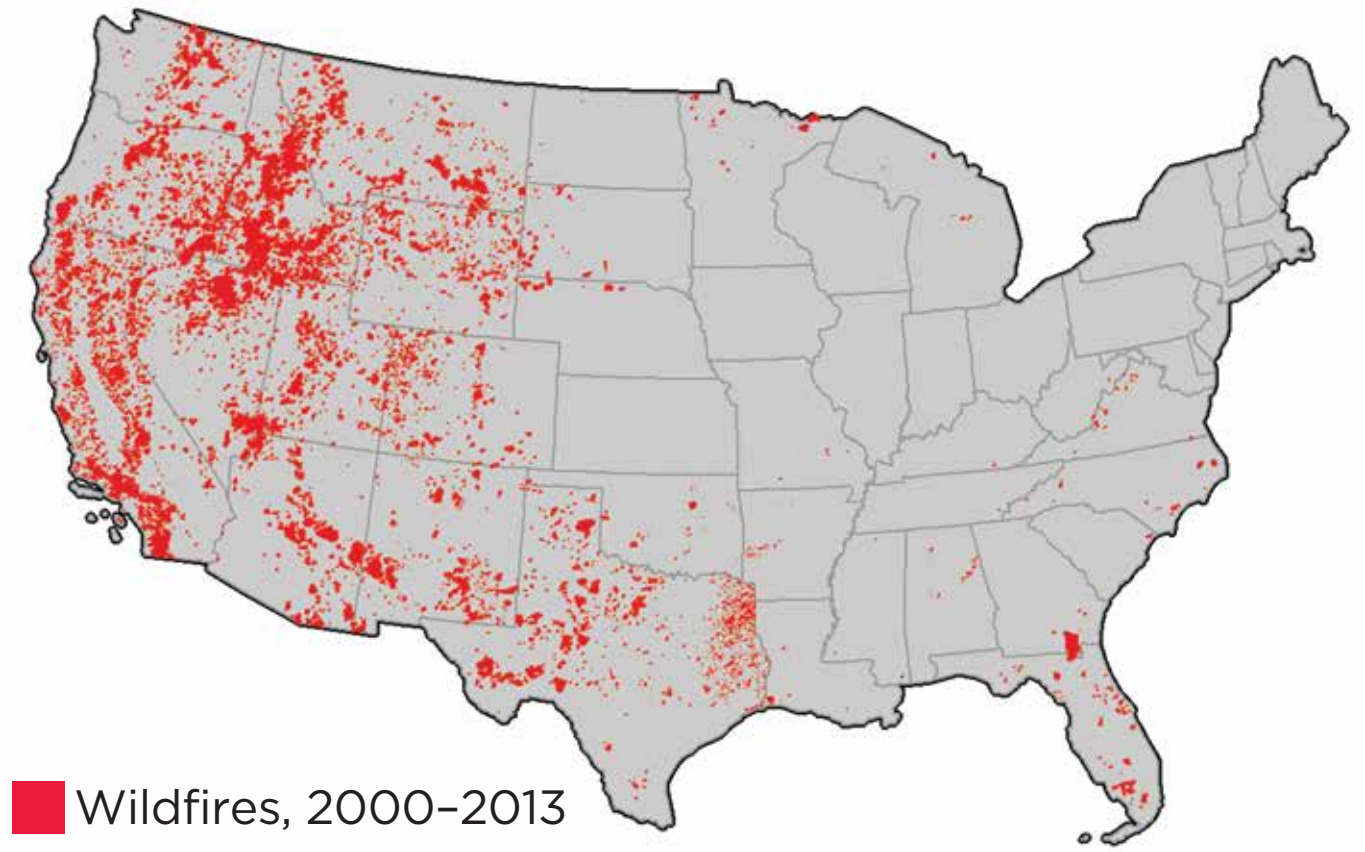

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Figure 1. Wildfires occur primarily in the Western part of the country.

wildfire activity is expected to double in the Southwest, Pacific Northwest, and Rocky Mountain regions.[11,12]

Since 1990, the average number of structures burned per year by wildfires has more than tripled,[13] yet home building continues. Since 1990, 60 percent of new homes in the U.S. have been built in forested areas, and today 40 percent of total single-family homes in the U.S. (46 million homes) are exposed to the risk of forest fires.[14]

The potential for more home development in harm's way is significant. In the West, 16 percent of forest lands open for home building have been built on, which means 84 percent (amounting to almost 13 million acres) is not yet developed. In some states, the potential for further development is high: for example, 91 percent of this forested land in Montana is not yet developed; 89 percent in Oregon; 84 percent in Arizona, 83 percent in California; and 80 percent in Colorado.[3]

The human cost of defending homes from wildfires is also escalating. In the 1990s, the average number of firefighter deaths per year was 17.2, rising to 19.3 per year in the 2000s, and 34 in 2013 (including 19 at Yarnell, Arizona).[15]

One of the consequences of rising costs is that firefighting is consuming agency budgets and robbing money from other projects. In 2014, wildfire management appropriation has grown to 51 percent of the Forest Service's budget, up from 17 percent in 1995.[16] Because of rising firefighting costs—driven in large part by the need to defend homes—agencies have to continually shift money from other departments ("fire transfers" or "fire borrowing") to pay for the rising costs of fire suppression. For example, in fiscal year 2013 the Forest Service transferred $505 million from other departments to pay for fire suppression.[17] As a result, a number of programs—including fuel reduction efforts that would decrease fire risk—are not funded.[18]

Solutions Tried to Date

To date, two solutions have been tried to reduce the costs and risks associated with home development on fire-prone lands: fuel reduction and landowner education.

According to agency estimates, about 230 million acres of Forest Service and Department of Interior lands are in need of treatment (mechanically or through prescribed burning) because they are at risk from ecological damage from wildfires due to excessive fuel loads (75 million acres are at "high" risk, plus 156 million at "moderate" risk). Yet, on average, less than three million acres are treated per

U.S. Department of Agriculture

Firefighters work to control the Springs Fire in the Boise National Forest, Idaho in August 2012. The financial and human costs of fighting wildfires have increased in recent years.

year, which is insufficient to reduce risk significantly.[19,20]

A number of efforts are aimed at landowner education, including the Firewise,[21] Ready Set Go,[22] Living with Fire,[23] the Fire Adapted Communities Learning Network,[24] and others. These programs are aimed at increasing the survivability of homes by creating defensible space around buildings, clearing flammable materials, using flame-retardant building materials, and other means.

Landowner education efforts are essential and important, yet there is still a long way to go. At least 70,000 communities are at risk from wildfires.[25] Of these, less than two percent are designated as Firewise communities, one of the predominant landowner education efforts. Less than three percent of the 46 million at-risk homes have been inspected by insurance companies for wildfire survivability (and only 2 percent of policies were cancelled due to lack of homeowner follow-up). Community Wildfire Protection Plans have been developed by 21 percent of the at-risk communities and less than 10 percent of these communities have a WUI development code.[9,26]

Solutions Not Yet Tried: Improved Planning and Controlling Future Home Development

There is a need for improved land use planning on private lands that would result in directing future home building away from the most dangerous, fire-prone lands. For better local planning to occur, several things must happen simultaneously.

First, local governments, who have the authority to regulate development on private lands, must share a higher percentage of the firefighting costs. This would create a strong incentive for better planning. This is the stick approach. It is aimed at eliminating the subsidy local governments currently receive, where residential subdivisions are routinely approved on lands that have a high chance of burning, yet there is no financial consequence because the cost of defending the homes when a fire breaks out is borne by the federal government.

The second approach is the carrot approach, built around a set of incentives for local government to improve land use planning to reduce wildfire risk. To implement better planning, local governments, especially understaffed rural counties, need assistance. This can come in the form of detailed fire-risk mapping, grants to hire professional planning consultants, and in some cases, funds to purchase lands or development rights to prevent them from being developed.

Shifting Firefighting Costs to Local Governments

A mechanism already exists for sharing the cost of fighting wildfires and assigning responsibilities among the federal agencies and local governments. They are called Master Cooperative Wildland Fire Management Agreements, or simply Master Agreements. Master Agreements set the general framework for how to fight fires and pay for them, and Cost Share Agreements spell out the specifics for who pays for different elements of individual fires. However, there is currently a disincentive for local governments to agree to sign cost share agreements if, in the end, the vast majority of the cost of defending homes is borne by federal agencies and state firefighting agencies. One way to incentivize signing of cost-share agreements is to offer higher levels of financial and technical assistance (described below) to communities that sign Master Agreements.

In addition, the Interagency Standards for Fire and Fire Aviation Operations, also known as the Red Book, clearly states that "structure protection" (defending homes) is a local responsibility.[27] Yet, agencies continue to spend federal dollars to protect homes from wildfires, thereby sending a clear message that if local governments do nothing to reduce risk, the federal government will still act to protect private property. It would be helpful if federal land management

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Figure 2. Worrying trends indicate that toady's wildfires are larger, burn longer, inflict more damage, and kill more people than ever before.

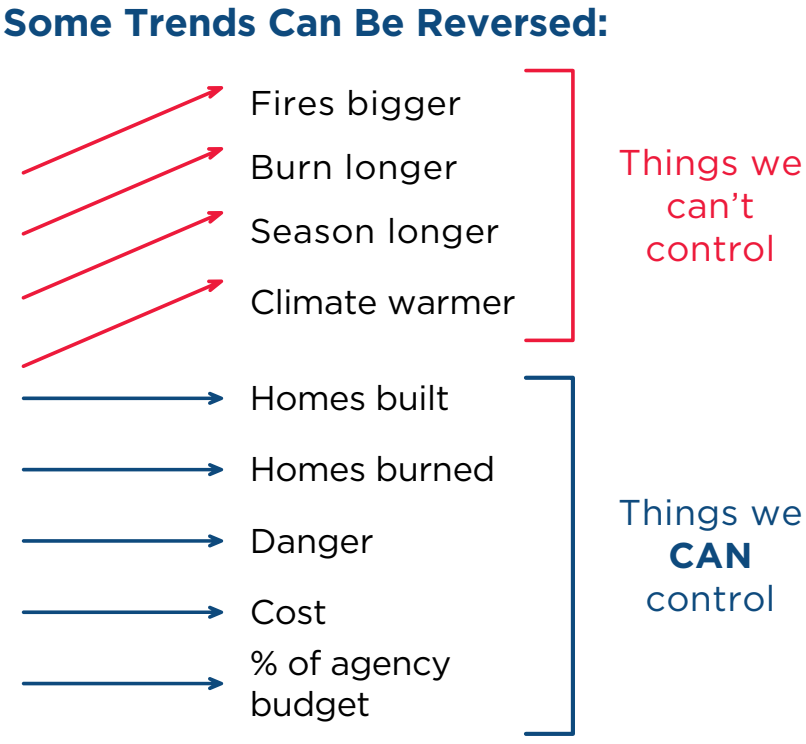

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Figure 3. While we cannot control all variables affecting wildfires, we can mitigate the damage that they cause with better planning and preparedness.

agencies stopping sending these sorts of mixed signals and instead clarified to local authorities what it says in the Red Book: "Local governments assume financial responsibility for emergency response activities, including structure protections, within their jurisdictions."[27]

Provide Financial and Technical Assistance to Local Governments to Minimize Risk from Wildfires

Local governments can regulate future home development by making use of guidance and regulatory documents. These include Comprehensive Land Use Plans, Community Wildfire Protection Plans, and Local Hazards Mitigation Plans. However, many communities are understaffed and lack the technical guidance and finances to develop plans that ensure future development is done in a way that minimizes risk to homes from wildland fire.

Sometimes regulatory documents are even in conflict with each other, making wildfire risk planning a challenge. A community in Colorado, for example, regulates through its comprehensive land use plan that new home developments need to be hidden by mature trees. This is done for aesthetic considerations. Yet, its wildfire protection plan calls for clearing vegetation from around homes, a necessary action to reduce the risk from wildfires. Coordinating planning documents so that they "talk to each other" is necessary but often difficult and time consuming.

County comprehensive plans can also be improved by integrating policy language and tools that give local governments the authority and responsibility to reject, redirect, and redesign subdivision and home site proposals based on fire risk. This could include, for example, regulatory tools, such as zoning overlays and subdivision regulations, development and design standards, landscape regulations, transfer of development rights programs, and incentives to encourage developments away from wildfire danger. In addition, local governments would benefit from understanding the details of how, when, and where wildfires may pose a risk to the community. Yet, they often lack the capability to map in any detail the fire risk.

The federal government can help communities with detailed fire-risk mapping, land use planning, and in selected instances, land purchases. But where would the funds come from, and how would the assistance be prioritized?

The Forest Service in fiscal year 2015 has a US$2.2 billion fire budget, with US$1 billion devoted to its Preparedness fund.[10] While money is allocated for fuel reduction and education programs like Firewise, no funds are spent on assisting communities to direct future development away from fire danger. A modest portion of the fire budget, such as one percent (US $22 million per year), could be devoted to a new program called the Community Planning Assistance Program.

Communities could apply for assistance and they could use the funds to hire consultants, including land use planners and companies that specialize in fire risk mapping. Assuming a generous US$100,000 for planning consultants and another US$100,000 for detailed fire risk mapping, the total cost per community to help them identify and plan to reduce the risk of wildfires would be approximately US$200,000. Using one percent of the Forest Service's fire budget this way, the agency would be able to assist more than a 100 communities per year (or more than 50 communities using only 0.05% of the fire budget).

One way to allocate the funds is to take a lesson from national floodplain management.[28] The National Floodplain Insurance Program, while not without its challenges, has a few elements that are worth considering for wildfire management, namely, flood mapping and assistance allocated based on a community rating system. Mapping of the floodplain is a federal responsibility, managed by the Federal Emergency Management Agency. Fire risk mapping could also be standardized by federal agencies, such as the Forest Service, who could provide course scale maps that could be improved on at a finer scale by local communities.

The National Floodplain Insurance Program also provides an incentive for communities in the form of reduced insurance rates (for homeowners who must carry insurance if they are in the floodplain) based on a Community Rating System. The rating system is based on the community's actions to reduce flood risk. In a similar fashion, a community rating system could be created for wildfires. Because there is no federal insurance program for wildfires, nor is such a scheme likely (see Box 1), a different set of incentives would have to be created.

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The system could be voluntary, and communities could choose to join the program and be awarded points for adoption of different wildfire risk reduction measures, with more points awarded to those policies that have a greater impact. The risk reduction methods could include such efforts as local fuel reduction on private lands, zoning ordinances that limit or redirect development, and the

signing of cost-share agreements by local governments, among others. As communities gain more points, they could be rewarded with greater levels of support. The rewards could be a combination of three elements:

1. **Land use planning assistance:** grants of up to US$200,000 would be awarded to communities to be used to hire planning and mapping services. This could include assistance with tools such as zoning, landscape and subdivision regulations, and growth management policies. The grants could be used for detailed fire risk mapping, improving on the course scale maps provided by federal agencies.
2. **Management priority:** the Forest Service and Bureau of Land Management do not have the resources for active management to thin forests and reduce fuel loads everywhere. They could direct their efforts to the highest-rated communities. Management actions on federal lands, in the form of prescribed burning, mechanical treatment, and forest restoration, could be given to communities that rank high in terms of on-the-ground actions to reduce wildfire risk on private lands (clearing flammable materials near homes; creating fire breaks; clustering future homes away from fire-prone lands; detailed fire-risk mapping; zoning ordinances, etc.).
3. **Land purchase:** federal land purchase programs such as the Land and Water Conservation Fund, the Forest Legacy Program, the Community Forest and Open Space Conservation Program, and others, could be used to buy land or development rights. The criteria for the use of these funds could be expanded to include reduction of wildfire risk, and communities who rank high in terms of actions taken to reduce fire risk get priority access to these funds.

Insurance is Not the Solution to Directing Future Home Development Away from Danger

Insurance may not be the strongest tool for altering the pace and nature of development on undeveloped forested areas. While homeowner premiums may be higher in these areas for some insurance companies in selected locations, reflecting the higher wildfire risk, it appears unlikely that they are high enough currently to be a deterrent to future development. Carole Walker of the Rocky Mountain Insurance Information Association put the situation succinctly: "A homeowner's insurance premium is the result of the decision to live in the Wildland—Urban Interface, but it is not the primary driver of that decision. A government-run high-risk insurance fund would ultimately encourage, rather than discourage people to live in the WUI."[1] It is doubtful that insurance rates will rise high enough in the near term to influence the redesign of a subdivision to direct future homes onto the safest areas, or prohibit home development on the most dangerous lands. And further, replicating a federally funded insurance requirement for people living on fire-prone lands, similar to national floodplain insurance requirements, might exacerbate development on fire-prone lands.

Wildfires are increasingly expensive and dangerous, burning homes and consuming agency budgets. A large portion of the costs and risks are related to the need to defend private homes next to federal lands. Attempts to mitigate, including voluntary landowner education and fuel reduction, are essential, yet these approaches alone are insufficient for the magnitude of the growing wildfire problem. To fully address future wildfire risks, the U.S. needs a national conversation about how to direct future development out of harm's way. Ideas presented in this paper are hopefully the beginning of this conversation.

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