

A White Paper by



Solutions to the Rising Costs of Fighting Fires in the Wildland-Urban Interface

December 2009

Updated

Solutions to the Rising Costs of Fighting Fires in the Wildland-Urban Interface

Headwaters Economics, Bozeman, Montana

September, 2009, updated December, 2009

PUBLISHED ONLINE:

www.headwaterseconomics.org/wildfire.php

ABOUT HEADWATERS ECONOMICS

Headwaters Economics is an independent, nonprofit research group. Our mission is to improve community development and land management decisions in the West.

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I. ABSTRACT

A principal reason for the escalating cost of wildland firefighting is the growing number of homes being built in the wildland-urban interface (WUI). This fact has been quantified and demonstrated repeatedly, yet most proposed solutions to hold down or reduce fire suppression costs fail to address it. Suggested fixes—such as increased coordination among agencies and educating homeowners how to live more appropriately near fire-prone lands—are focused on increasing the safety of existing residences in the WUI, but lack the means to control future costs and may unintentionally have the effect of increasing residential growth and subsequent fire suppression costs near fire-prone lands. This paper offers ten ideas for controlling the rising cost of protecting homes from wildland fires. They are:

1. Publish maps identifying areas with high probability of wildland fires.
2. Increase awareness of the financial consequences of home building in fire-prone areas.
3. Redirect federal aid towards land use planning on private lands.
4. Add incentives for counties to sign firefighting cost share agreements.
5. Purchase or obtain easements on fire-prone lands.
6. Create a national fire insurance and mortgage program to apply lessons from efforts to prevent development in floodplains.
7. Allow insurance companies to charge higher premiums in fire-prone areas.
8. Limit development in the wildland-urban interface with local zoning ordinances.
9. Eliminate home interest mortgage deductions for new homes in the wildland-urban interface.
10. Induce federal land managers to shift more of the cost of wildland firefighting to local governments by reducing their firefighting budgets.

The pros and cons of each idea are explored, along with a discussion of the likelihood that each idea will succeed in controlling future firefighting costs.

Addressing the issue of ever-escalating fire suppression expenses could achieve a number of related public policy goals: increasing fiscal responsibility, introducing a fairer and more equitable distribution of those costs among those benefiting from wildfire protection, and improving the safety of future homeowners and wildland firefighters.

To succeed, several ideas will have to be applied concurrently, and they will require government support and direction. The tremendous scale of the problem (in terms of acres, ownership complexity and cost) means that federal government will have to play a role. The involvement from Congress and the federal agencies is also important because the current system of incentives is part of the problem. By spending large sums every year to protect homes from wildfires, the federal government is subsidizing the true cost of development. Without financial disincentives to building homes on dangerous, fire-prone lands, the problem will get worse.

At the least, the proposed solutions presented here should begin a public dialogue on the need for policies that will decrease the future cost of protecting homes from wildfires. At the best, the ideas offer an array of options for the Forest Service, Bureau of Land Management, and Congress to explore and adopt.

II. PURPOSE OF THIS PAPER: TO EXPLORE IDEAS FOR CONTROLLING THE RISING COST OF FIGHTING WILDFIRES

The purpose of this paper is to explore ways to control the rising expense of wildland firefighting that takes place both on public and private lands and costs the federal government more than \$3 billion per year.¹ Many studies, including those noted throughout this report, have delineated the rising costs of forest and other wildland fires, and all point to the expanding pattern of residential development adjacent to public lands as a significant contributing factor to the rising costs. As Roger Kennedy, former head of the National Park Service, notes: “In the last half century, about one-fifth of the American people have moved into flame zones, insufficiently aware of the perils awaiting them and inadvertently testing the limits of nature’s tolerance.”²

However, little has been done to address the growing number of homes being built in high probability fire areas (the wildland-urban interface, or WUI; see sidebar for full definition). An underlying challenge—one we address directly in this paper—is the lack of cost accountability by those who build homes in the WUI, and by local governments who authorize new residential development in dangerous, fire-prone areas.

Currently only a small portion of homes are located adjacent to fire-prone federal public lands, yet the cost of protecting these homes is spread among all taxpayers. This paper explores policies that could be used to change this inequitable situation by either requiring that homeowners pay the true cost of protecting their homes from wildfires or controlling further development of homes in and around highly flammable federal public lands. Although the cost of protecting homes from wildfires in recent years has been alarming, policy makers and land managers should be aware that these costs will grow significantly as development and warming trends continue.

¹ United States Government Accountability Office (GAO). April 2009. Testimony Before the Subcommittee on Interior, Environment, and Related Agencies, Committee on Appropriation, House of Representatives. *Wildland Fire Management: Actions by Federal Agencies and Congress Could Mitigate Rising Fire Costs and Their Effects on Other Agency Programs*. Statement of Robin M. Nazzaro, Director, Natural Resources and Environment. (GAO-09-444T).

² Kennedy, Roger G., *Wildfire and Americans: How to Save Lives, Property, and Your Tax Dollars* (New York: Hill and Wang, 2006), p. 19.

This paper is divided into the following sections:

- An explanation why wildland firefighting continues to rise.
- An analysis of how development of the WUI contributes to rising costs.
- A prediction that costs will continue to rise if there is no shift in who pays for protecting private property from fires.
- Ten ideas, and their pros and cons, for controlling future WUI-related firefighting costs.
- Conclusions.

Our goal is to control the rising costs of fighting forest fires by finding ways to bring a measure of accountability into the current system for funding the protection of homes in the wildland-urban interface. While a large number of homes have been built in the WUI in the past decades, the majority of the interface, (86 percent in the West, for example) is not yet developed.³ This paper focuses on ways to prevent escalating costs that would occur if homes were developed in the remaining, undeveloped portion of the WUI.

The audiences for this paper are members of Congress, the leadership within the Department of Agriculture (including the Forest Service) and the Department of the Interior (including the Bureau of Land Management and National Park Service), and anyone else interested in controlling the cost of fighting wildland fires.

Ten ideas are proposed in Section VI for curtailing or more fairly apportioning who pays the rising cost of protecting homes in the WUI. Headwaters Economics does not advocate one idea over another. Rather, we present them all, give background, explain how each idea could work, and explore the pros and cons of each. Realistically, several of the ideas proposed should be implemented in unison if Congress and the federal land management agencies want to control the rising cost of fighting wildfires.

³ Gude, P.H., R. Rasker, J. van den Noort. 2008. Potential for Future Development on Fire-Prone Lands. *Journal of Forestry* 106(4): 198-205 (Gude et al 2008). Available online: http://www.headwaterseconomics.org/wildfire/PGude_2008_Forestry.pdf.

Definition of Wildland-Urban Interface

As defined in the National Fire Plan, the WUI includes areas “where structures and other human development meet or intermingle with undeveloped wildland.”⁴ Other federal documents define the WUI similarly as areas “where humans and their development meet or intermix with wildland fuel”⁵ or “the line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuel.”⁶ In general, the WUI (both existing and potential) is an area rich in natural amenities, where population growth and new housing is on the rise.⁷

The term WUI is a misnomer to some extent, since much of it is developed at densities lower than what is typically thought of as urban. In the West, for example, residential lots near wildlands in the WUI take up more than six times the space of homes built in other places. On average, 3.2 acres per person are consumed for housing in the WUI, compared to 0.5 acres per person on other western private lands.⁸ This is an important characteristic of the WUI because low-density housing is more costly to protect. WUI homes are also much more likely to be second homes. In the West, one in five homes near public forests is a second home, compared to one in twenty-five on other western private lands.⁹

Perhaps the most relevant characteristic of the WUI is its potential for growth. Only 14 percent of forested western private land adjacent to public land is currently developed for residential use, leaving tremendous potential for future development on the remaining 86 percent.¹⁰

We define the wildland-urban interface as private forestlands that are within 500 meters of public forestlands.¹¹ We use the threshold of 500 meters to identify both existing and potential WUI since guidelines for the amount of defensible space necessary to protect homes range from 40 to 500 meters around the home.¹² We focus on adjacency to public forests since roughly 70 percent of western forests are publicly owned and since wildfire is a natural disturbance in many of these forests, creating a potential risk to adjacent private lands. In this paper, the term “wildland-urban interface” (WUI) is sometimes used interchangeably with “fire-prone lands.”

⁴ U.S. Department of Agriculture. Office of Inspector General. November 2006. Audit Report: Forest Service Large fire Suppression Costs. Report No. 08601-44-SF. (OIG 2006)

⁵ U.S. Department of Agriculture, U.S. Department of the Interior. 2001. Urban Wildland Interface Communities Within The Vicinity Of Federal Lands That Are At High Risk From Wildfire. Federal Register 66: 751. See also: Teie, W.C., B.F. Weatherford. 2000. Fire in the West: The Wildland/Urban Interface Fire Problem. Report to the Council of Western State Foresters. Rescue, CA: Deer Valley Press.

⁶ National Wildfire Coordinating Group. 2008. Glossary of Wildland Fire Terminology. <http://www.nwccg.gov/pms/pubs/glossary/index.htm>.

⁷ Radeloff, V.C., R.B. Hammer, S.I. Stewart, J.S. Fried, S.S. Holcomb, and J.F. McKeefry. 2005. The Wildland-Urban Interface in the United States. *Ecological Applications*. 15(3):799-805. Theobald, D.M., and W.H. Romme. 2007. Expansion of the US Wildland-Urban Interface. *Landscape Urban Plan*. 83(4):340–354.

⁸ Gude et al 2008, *Ibid*.

⁹ *Ibid*.

¹⁰ *Ibid*.

¹¹ *Ibid*.

¹² Cohen, J.D. 2000. Preventing Disaster: Home Ignitability in the Wildland-Urban Interface. *J. Forestry*. 98(3):15-21; Butler, B.W., and J.D. Cohen. 1998. Firefighter Safety Zones: a Theoretical Model Based on Radiative Heating. *Int. J. Wildland Fire*. 8(2):73-77; Nowicki, B. 2002. The Community Protection Zone: Defending Houses and Communities from the Threat of Forest Fire. Available online at <http://www.biologicaldiversity.org/swcbd/programs/fire/wui1.pdf>. Accessed 07/30/07.

III. WHY THE COST OF FIGHTING WILDFIRES CONTINUES TO ESCALATE

The agencies responsible for fighting wildland fires on federal lands are the Forest Service within the Department of Agriculture and the Bureau of Land Management, Bureau of Indian Affairs, Fish and Wildlife Service, and National Park Service within the Department of the Interior. From 2001 to 2007, the annual appropriations to these agencies for wildland fire management to public land managers averaged \$2.9 billion per year.¹³ This is a doubling of costs compared to the period from 1996 to 2000, when the average appropriations were \$1.2 billion. When adjusted for inflation, this represents an increase from \$1.5 billion to \$3.1 billion (in 2007 dollars).¹⁴ Seventy percent of the appropriations for wildland firefighting go to the Forest Service. The remaining 30 percent goes to the Department of the Interior.¹⁵

The statistics reveal staggering costs. In 2008, there were 78,949 wildfires nationwide that burned almost 5.3 million acres.¹⁶ The National Oceanographic and Atmospheric Association (NOAA) estimates that wildfires in 2008, exacerbated by drought conditions in the western, central, and southeastern U.S., resulted in 16 deaths and over \$2 billion in property damage (1,000 homes were destroyed in California alone).¹⁷ In 2008, 26 firefighters died in association with wildland fires. Over the past 10 years, the average number has been 21 wildland firefighters killed per year.¹⁸

The reasons wildland fires on federal lands have become expensive and dangerous include:

1. A build-up of fuels resulting in part from past fire suppression policies,
2. A warming climate, including drought in the West, and
3. The development of homes adjacent to fire-prone public lands.¹⁹

¹³ Firefighting appropriation figures for 2008 and 2009 are not yet available from the Congressional Research Service or the Government Accountability Office.

¹⁴ GAO-09-444T, Ibid.

¹⁵ Ibid.

¹⁶ National Interagency Fire Center (NIFC 2009)

http://www.predictiveservices.nifc.gov/intelligence/2008_statsumm/historical_data.pdf. Accessed 6/17/09.

¹⁷ National Oceanographic and Atmospheric Association (NOAA). Billion Dollar U.S. Weather Disasters, 1980 – 2008, National Climatic Data Center <http://www.ncdc.noaa.gov/img/reports/billion/billionz-2008.pdf>. Accessed 5/18/09.

¹⁸ U.S. Fire Administration, Federal Emergency Management Agency, Department of Homeland Security. USFA Releases Provisional 2008 Firefighter Fatality Statistics. (USFA 2009) <http://www.usfa.dhs.gov/media/press/2009releases/010709.shtm>. Accessed 5/18/09.

¹⁹ GAO-09-444T. See also: National Academy of Public Administration. September 2002. Wildfire Suppression: Strategies for Containing Costs. Washington, D.C. (NAPA 2002), which states that an additional factor responsible for rising firefighting costs is the increasing costs of firefighting resources (air support, firefighting crews, equipment costs, etc.). Reasons for the escalating costs of firefighting can also be found in: Joint Statement of Mark Rey, Under Secretary for Natural Resources and Environment, U.S. Department of Agriculture, and Nina Rose Hatfield, Assistant Secretary, Business Management and Wildland Fire, Department of the Interior, Before Senate Committee on Energy and Natural Resources Concerning Wildland

Fire is necessary and plays an important part in wildland ecosystems. However, many years of fire suppression, much of it undertaken to protect private property, has resulted in dangerous fuel buildup, which in turn makes the probability of a large, expensive fire even more likely.²⁰

Warmer temperatures, less snowpack, and drier forests also have resulted in longer and more intense fire seasons across the West. Other factors, such as bug infestations, can exacerbate fire intensities (see sidebar).

Development of the wildland-urban interface is accelerating, forcing agencies to focus their management efforts on fighting fires to protect private property. A recent study by the Forest Service estimates that 21.7 million acres of rural land within 10 miles of the national forests and grasslands in the lower 48 states will experience increased housing development by 2030.²¹ The agency estimates that close to 6,000 acres of open space are lost to development every day.²² According to a 2007 report by the White House, “190 million acres of public land and surrounding communities are at risk of extreme fires.”²³ Under current policies, many of the private lands adjacent to these public lands could eventually have homes on them.

When homes are built in the wildland-urban interface, it also increases the cost of fuels reduction. According to one group of researchers, per-acre costs of fuels reduction in the WUI are 139 percent higher when compared to non-WUI areas.²⁴

Neil Sampson, a former Senior Fellow with American Forests, has gone so far as to argue that it is wasteful of taxpayer dollars to allocate staff to protecting homes that have been built in fire-prone areas when those resources could have been utilized elsewhere.²⁵ (See sidebar for discussion of the opportunity costs of fighting wildland fires).

Fire Suppression Costs Containment. January 30, 2007. (Rey/Hatfield 2007)

²⁰ USFA 2002, Ibid; Forest Service. Fire and Aviation Management. Wildland Fire Policy. <http://www.fs.fed.us/fire/management/policy.html>. Accessed 8/4/09.

²¹ Forest Service. National Forests on the Edge: Development Pressures on America’s National Forests and Grasslands http://www.fs.fed.us/openspace/fote/national_forests_on_the_edge.html. Accessed 5/18/09.

²² Forest Service. Open Space Conservation. http://www.fs.fed.us/openspace/loss_space.html. Accessed 6/2/09.

²³ Reducing the Threat of Catastrophic Wildfire and Improving Forest Health. September 29, 2007. Available from <http://www.scribd.com/doc/342017/White-House-Fact-Sheet-Reducing-the-Threat-of-Catastrophic-Wildfires-and-Improving-Forest-Health>. Accessed 5/18/09.

²⁴ Berry, Alison H., Geoffrey Donovan, and Hayley Hesseln. 2006. The Economic Effects of the Wildland-Urban Interface on Forest Service and BLM Prescribed Burning Costs in the Pacific Northwest. *Western Journal of Applied Forestry*, 21(2):72-78. Also, the cost of prescribed burns in the Pacific Northwest were found to be 43 percent higher: Berry, Alison H., and Hayley Hesseln. 2004. The Effect of the Wildland-Urban Interface on Prescribed Burning Costs in the Pacific Northwestern United States. *Journal of Forestry*, 102(6):33-37.

²⁵ Sampson, Neil. 1996. Living With Nature: Are We Willing To Pay The Price? *Wildfire News & Notes*, Article located: http://www.firewise.org/fw_youcanuse/files/materials.pdf. Accessed 5/13/09. Also cited in USFA 2002, Ibid.

The literature on wildland fire reveals a frustrating trend. Home building is identified as one of three reasons costs are increasing, yet most discussions evade this issue, suggesting instead such fixes as increased coordination among agencies and educating homeowners how to live more safely on fire-prone lands.²⁶

Increased coordination, educating landowners, and reducing fuels around homes are good ideas. Encouraging fire-safe practices is particularly important for those parts of the wildland-urban interface that already have been developed. At its best, fire-safe education can save lives and property. At its worst, too much emphasis on this type of effort serves as a distraction, focusing energy and resources on how to build a better residential subdivision in hazardous areas, rather than redirecting development, through zoning or other means, to less dangerous places on the landscape.

Better coordination among agencies, landowner education, and fuels reduction around homes are not enough. The rising cost of wildland firefighting will not be controlled without also influencing the pace, scale, and pattern of residential development in the wildland-urban interface.

²⁶ The multi-agency supported Firewise program offers many useful resources for landowners and community leaders on how to minimize danger from wildfires before a fire breaks out. See: <http://www.firewise.org/>. For a map of recognized Firewise communities, see: <http://www.firewise.org/usa/index.htm>. Web sites above accessed 6/12/09.

The Opportunity Cost of Spending Money on Defending the Wildland-Urban Interface

Federal dollars spent on protecting homes from wildfires could have been used by the Forest Service and BLM for scientific research, recreation management, vegetation management and other activities. From 1999 to 2003, the diversion of money and efforts has resulted in a transfer of \$2.7 billion from other programs (sometimes called “fire borrowing”), only 80 percent of which were reimbursed through additional appropriations.²⁷

Congress has started to address the issue. The House of Representatives recently passed the FLAME Act, which will create a separate account to fund fighting the most expensive wildland fires. This is a step in the right direction. But, the FLAME Act by itself will do little to address a root cause of why forest fires have become so expensive—the increasing number of homes on private land near forested public lands.

²⁷ For a more detailed analysis of the cost of funding transfers (or “fire borrowing”) see United States Government Accountability Office (GAO). June 2004. Report to Congressional Requesters. Wildland Fire Suppression: Funding Transfers Cause Project Cancellations and Delays, Strained Relationships, and Management Disruptions. (GAO-04-612).

Insect Outbreaks and Forest Fires

In addition to development and warming trends, widespread tree mortality caused by forest insect outbreaks may elevate future fire-suppression costs. According to a recent story in the Denver Post, mountain pine beetles will kill the majority of Colorado’s large-diameter lodgepole pine forests within the next three to five years.²⁸ Will insect outbreaks like these lead to higher fire suppression costs? The answer is not simple. As needles dry out but remain on the trees, the trees become highly susceptible to crown fires. Eventually, as dead trees lose their needles, crown fires can be less likely. Beetle-killed trees eventually will fall to the forest floor, adding fuels that may increase the probability of high intensity fires, but fallen trees that do not ignite will gain moisture and slowly decompose, decreasing their flammability. In other words, changes in fuels caused by insect kill after an epidemic are complex, at times leading to higher fire intensity and at other times leading to lower fire intensity.²⁹

²⁸ The Denver Post. January 14, 2008. “Beetle-Kill Rate in Colorado Catastrophic”.

²⁹ Jenkins, M.J., E. Hebertson, W. Page, C.A. Jorgensen. 2008. Bark Beetles. *Forest Ecology and Management* 254(2008): 16-34; Brown, J.K., 1975. Fire Cycles and Community Dynamics in Lodgepole Pine Forests. In: Baumgartner, D.M. (Ed.), *Management of Lodgepole Pine Ecosystems: Symposium Proceedings*. Washington State University: Volume 1 of two untitled volumes, pp. 429–456; Romme, W.H., J. Clement, J. Hicke, D. Kulakowski, L.H. MacDonald, T.L. Schoennagel, and T.T. Veblen. 2006. *Recent Forest Insect Outbreaks and Fire Risk in Colorado Forests: A Brief Synthesis of Relevant Research*. Colorado State University, Fort Collins, CO, p. 24; Lynch, H.J., Renkin, R.A., Crabtree, R.L., Moorcroft, P.R., 2006. The Influence of Previous Mountain Pine Beetle (*Dendroctonus ponderosae*) Activity on the 1988 Yellowstone Fires. *Ecosystems* 9, 1318–1327.

IV. THE WILDLAND-URBAN INTERFACE CONTRIBUTES SIGNIFICANTLY TO WILDFIRE COSTS

The U.S. Department of Agriculture's Office of Inspector General (OIG) recently completed an audit report on the costs of large fire suppression. From fiscal year 2003 to 2004, 87 percent of the large fires OIG investigated referenced "protecting private property as a major strategy for the suppression effort." When land managers were asked what portion of the firefighting costs were attributable to the defense of private property, some estimated it ranged between 50 to 95 percent. Based on this figure, the cost of protecting private property from fires ranged between \$547 million to \$1 billion between 2003 and 2004.³⁰

The OIG report states that, because of having to defend private property from fires, the federal agencies cannot let many fires burn, even if those fires would be beneficial for the condition of the land, including the reduction of fuel loads. They estimated that from 1998 to 2005 only two percent of natural ignitions were allowed to burn. According to the OIG, the public will continue to expect the Forest Service to suppress most fires unless the financial burden is shifted away from the federal government.³¹ The OIG report notes:

Homeowner reliance on the Federal government to provide wildfire suppression services places enormous financial burden on FS [the Forest Service], as the lead agency providing such services. It also removes the incentives for landowners moving into the WUI to take responsibility for their own protection and ensure homes are constructed and landscaped in ways that reduce wildfire risks. Assigning financial responsibility to State and Local government for WUI wildfire protection is critical because Federal agencies do not have the power to regulate WUI development. Zoning and planning authority rests entirely with State and local governments.³²

A 2002 study by the U.S. Fire Administration estimates that in the West, "38 percent of new home construction is adjacent to or intermixed with the WUI." They state:

Fire prevention programs in WUI areas are extremely important. And homeowners must accept a measure of responsibility and be fully aware of the risks when deciding to locate in such an environment.³³

³⁰ U.S. Department of Agriculture. Office of Inspector General. November 2006. Audit Report: Forest Service Large Fire Suppression Costs. Report No. 08601-44-SF. (OIG 2006)

³¹ Ibid., pages II-III, (Executive Summary)

³² Ibid, page I (Executive Summary)

³³ U.S. Fire Administration, Federal Emergency Management Agency, Department of Homeland Security. 2002. Fires in the Wildland/Urban Interface. Topical Fire Research Series. Volume 2(16): 1-4. (USFA 2002) <http://www.usfa.dhs.gov/downloads/pdf/tfrs/v2i16-508.pdf>. Accessed 5/13/09.

Headwaters Economics (HE) conducted an analysis to quantify the potential for more home construction next to fire-prone public lands in the western United States and implications for future wildfire fighting costs. In a county-by-county study of the 11 continental western states, HE found that only 14 percent of the available WUI in the West is currently developed, leaving potential for new home construction in the remaining 86 percent (more than 20,000 square miles). Based on the OIG's estimates of firefighting costs related to protection of private property, HE found that if just half of the wildland-urban interface is developed in the future, annual firefighting costs could increase from \$2.3 to \$4.3 billion. By comparison, the Forest Service's total average annual budget has been about \$4.5 billion.³⁴

The HE study also found that homes built near forested public lands are much more likely to be second homes, and they occupy more acreage. One in five WUI homes is a second home, compared to one in twenty-five on other western private lands. Residential lots built in the WUI take up more than six times the space of homes built in other places. On average, 3.2 acres per person are consumed for housing in the wildland-urban interface, compared to 0.5 acres on other western private lands. This pattern suggests that the national taxpayer is, to some extent, subsidizing the affluent homeowner, who often could afford to pay for protecting these homes.³⁵ Since four percent of homes in the West are in the WUI, it can also be said that the federal subsidies to protect private property benefit a select few.³⁶

On behalf of the Montana State Legislature, Headwaters Economics also conducted a more detailed analysis of the costs of protecting homes from wildfire in the state of Montana.³⁷ HE analyzed daily fire suppression costs across 18 large fires that burned in Montana during 2006 and 2007, systematically distilling out the portion of total fire suppression costs directly associated with housing. The study discovered that in Montana firefighting costs are highly correlated with the number of homes threatened by a fire. More importantly, the pattern of development is an important contributing factor, with dispersed development contributing more to the cost of fighting fires.³⁸ For example, one dense subdivision is less costly to protect than the same number of homes spread across a large area of land.

³⁴ Headwaters Economics. 2007. Home Development on Fire-Prone Lands. <http://www.headwaterseconomics.org/wildfire/> Accessed 5/14/09. (HE 2007) Note: the Forest Service's budget has increased in recent years. The 2010 budget request from the agency is for \$5.2 billion: U.S. Department of Agriculture, Forest Service. Fiscal Year 2010. President's Budget. <http://www.fs.fed.us/publications/budget-2010/overview-fy-2010-budget-request.pdf>. Accessed 6/2/09.

³⁵ Ibid. Also, Gude et al 2008. The number of homes in the WUI that are second homes or seasonal residences varies by state. The highest is in Wyoming (44%), followed by Colorado (38%), and Utah (36%).

³⁶ Gude et al. 2008, Ibid.

³⁷ In 2008, the cost of suppressing wildfires left the state with a \$40 million budget shortfall, requiring a special legislative session to determine how to cover these costs. Montana's legislature subsequently called for a special Fire Suppression Interim Committee to discuss how to avoid or cover these costs in the future. At the time, a thorough quantitative assessment of the wildfire suppression costs in the WUI was unavailable. Headwaters Economics was hired to conduct the study.

³⁸ Gude et al 2008, Ibid. Also see Headwaters Economics: August 2008. Montana Wildfire Cost Study. http://www.headwaterseconomics.org/wildfire/HeadwatersEconomics_FireCostStudy_TechnicalReport.pdf. Accessed 5/8/09 (HE 2008).

When a large forest fire burns near homes in Montana, costs related to housing usually exceed \$1 million per fire. As few as 100 threatened homes, if spread across large lots, could result in a \$10 million increase in suppression costs in a single year. This discrepancy in cost between dense versus sprawled development is important since, in the western U.S., residential lots in WUI take up more than six times the space of homes built in other places.³⁹

The average annual cost of protecting homes from forest fires in Montana in recent years was \$28 million. The National Academy of Public Administration (NAPA) estimates that in the United States 2.2 million homes are expected to exist in the WUI by the year 2030—a 40 percent increase over 2001 levels.⁴⁰ Similarly, the HE study estimates that Montana will experience a 55 percent increase in the number of WUI homes between 2005 and 2025.

The HE study estimated that if no restrictions are placed on future home construction in Montana, similar fire seasons to those experienced in recent years could cost an additional \$12 million by 2025 (up from an average of \$28 million per year), bringing the state's total fire suppression costs associated with homes to \$40 million dollars. If, in addition to increased housing in fire-prone areas, average spring and summer temperatures increased by one degree Fahrenheit, home protection costs in Montana would, on average, grow by another \$44 million. This means that with future home construction and warmer temperatures, the average cost of protecting homes in Montana could rise from \$28 million per year to \$84 million per year.⁴¹

³⁹ Gude et al 2008, Ibid.

⁴⁰ National Academy of Public Administration reports “Wildfire Suppression: Strategies for Containing Costs”, September 2002; and “Managing Wildland Fire: Enhancing Capacity to Implement the Federal Interagency Policy”, December 2001.

⁴¹ Gude, P.H., J.A. Cookson, M.C. Greenwood, M. Haggerty. 2009. Homes in Wildfire-Prone Areas: An Empirical Analysis of Wildfire Suppression Costs and Climate Change. In preparation for submission to journal. Available at http://www.headwaterseconomics.org/wildfire/Gude_Manuscript_4-24-09_Color.pdf.

Average Annual Cost of Protecting Homes from Wildfires in Montana



The HE study estimated that the State of Montana’s annual share of home protection costs would be between \$15 million and \$28 million by 2025, with the remainder of the costs being paid by the Forest Service and BLM. This range of home protection costs exceeds the state of Montana’s total fire suppression costs in the majority of recent years.⁴²

⁴² Montana does not budget for wildfire suppression costs on an annual basis (Montana Legislative Fiscal Division 2008). As a result, the Department of Natural Resources and Conservation is forced to pay suppression costs by spending funds appropriated for other purposes, seeking disaster funds from the Governor, or taking a loan from the state’s General Fund. Fire suppression costs are typically reimbursed from the General Fund at the end of the fiscal year, but this requires that the General Fund have a positive ending balance. In case of a shortfall, a special session of the legislature must be convened (as in September 2008) to make appropriations to cover costs. As costs increase in the future, and state budgets are stressed during recessions, Montana’s current budgeting system will become untenable. If the state is forced to make annual appropriations for tens of millions of dollars, funding will be cut from other programs unless new revenue is generated to cover fire suppression costs. To put this into context, projected fire suppression cost associated with housing development and climate change in Montana, even at the lower end of the range (\$15 million), is greater than the Montana Department of Agriculture’s entire budget. It also exceeds the state’s annual contributions to such programs as Child Support Enforcement, the Department of Military Affairs, the Library Commission, and the Department of Environmental Quality.

Headwaters Economics' study found that in Montana, when fires burn near homes (in the WUI), 30 percent of the total firefighting cost is attributable to home protection. This is lower than the response the Forest Service's Office of Inspector General received when they asked public land managers, who estimated that 50 to 95 percent of the firefighting costs were attributable to the defense of private property.⁴³

One reason for the difference is that Montana is a sparsely populated state with fewer than a million residents, and many of the fires occur in remote backcountry areas with no homes nearby. HE calculated that for fires that burned near homes, the portion of total costs attributable to protecting these homes rose to 27 percent. A further reason for the discrepancy is that OIG's estimate includes the protection of all private lands, including timber and ranch lands, whereas the HE study is focused on the protection of residences.⁴⁴

This example from Montana illustrates that while home construction is not the only contributor to the rising cost of fighting fires, it is a significant factor, one that is expected to rise with continued development, particularly in the absence of well thought-out land use planning. A warming climate will exacerbate the costs even further. While comprehensive analysis like this is not available for all states, the Montana example serves to illustrate a plausible outcome if development of the WUI continues.

⁴³ Gude et al., 2009, Ibid.

⁴⁴ Ibid.

V. FIREFIGHTING COSTS WILL CONTINUE TO ESCALATE UNLESS THERE IS A FINANCIAL DISINCENTIVE TO BUILDING HOMES ON FIRE-PRONE LANDS

A root cause of the problem of rising wildland firefighting costs is that a large portion of the expenses related to protecting private structures is borne by the federal and state taxpayers, and not enough of the costs are paid by the landowner or local jurisdiction making the land use decisions.

The U.S. Department of Agriculture's Office of Inspector General (OIG) stated the challenge as follows:

If State and local agencies became more financially responsible for WUI protection, it would likely encourage these agencies to more actively implement land use regulations that minimize the risk to people and structures from wildfire.⁴⁵

In other words, regulations that limit development in the WUI will be enacted only when a larger share of the burden of protecting homes is shouldered by people who build homes in forested areas, and by local governments that allow such new subdivisions. Until such a shift in cost responsibilities has happened, development in the WUI will continue to grow, contributing to rapidly escalating firefighting costs.

While OIG cites both "State and local agencies" as not sharing enough of the burden, conversations with state foresters, as well as research conducted by Headwaters Economics, reveals that state governments do spend large amounts on fire suppression and, given that fires cross jurisdictional boundaries, documenting who should pay for what share of the costs is difficult. It therefore may be easier to understand where the solution lies by imagining the following scenario: County commissioners are presented with a proposal for a new subdivision next to Forest Service, BLM or state lands, on what is known to be a dangerous, fire-prone landscape. As the commissioners consider whether to accept or reject the subdivision, do they, under the current system, have to ask themselves: Can we afford to protect the homes from wildfire?

It is unlikely this question is even asked. With the Forest Service and the BLM spending more than \$3 billion every year in fire suppression, and with help from state agencies and FEMA, there is not enough of a financial disincentive to persuade county governments to change the scale, pace and pattern of development away from fire-prone lands. If there were, we would not be seeing the current rate of development in the WUI.

Montana is a good illustration of the challenge and typical in many ways. In Montana the responsibility for fighting forest fires falls under multiple jurisdictions, depending on land ownership. Except where fire protection responsibilities have been exchanged between state and federal agencies (approximately 1.5 million acres), federal agencies provide fire protection on

⁴⁵ OIG 2006, Ibid. page 9.

federal lands, and state and local government protect state and private lands. When a wildland fire crosses ownerships and/or threatens private property in the WUI, costs are usually allocated between state/local and federal agencies proportionate to the amount of acreage burned or proportional to the firefighting effort that occurred on each entity's land. For fires that threaten a significant number of structures in the WUI (among other criteria), the state may apply for financial assistance from FEMA, through its Fire Management Assistance Grant (FMAG) program. If the state receives an FMAG declaration, it is reimbursed 75 percent of qualifying costs for that fire. In a Headwaters Economics study of 18 wildland fires in 2006 and 2007, the state of Montana paid approximately 25 percent of the total fire suppression costs on those fires where more than 1,000 acres of residential land were within one mile of the fire. Federal agencies (including FEMA) paid the remaining 75 percent, proportionate to the acreage burned or effort expended on federal lands and fire protection, or consistent with the terms of the FMAG declaration on qualifying fires.⁴⁶

In 2009, the Montana Legislature introduced 40 bills related to wildland firefighting, but only a handful attempted to curtail the building of homes in fire-prone areas by redistributing cost accountability to local jurisdictions or homeowners.⁴⁷ Perhaps not surprisingly, the few bills that did attempt to localize the costs failed. If the bulk of the costs are covered by the Forest Service, BLM, the state's general fund, and, eventually, through a reimbursement by FEMA, then what incentive is there for the state to control costs or to guide residential development to safer and less costly areas? The current system of federal subsidies in effect discourages responsible land development.⁴⁸

⁴⁶ Personal communication, Bob Harrington, Montana State Forester, Department of Natural Resources and Conservation (DNRC), Missoula, Montana. May 15, 2009. According to Bob Harrington, several criteria need to be met to qualify for FEMA's Fire Management Assistance Grant Program. They include imminent threat to residential and commercial structures; the fire danger is extreme and expected to stay that way; and firefighting resources are overextended and insufficient to protect the threatened structures. The majority of fires where DNRC is the lead agency do not qualify for Presidential Disaster Declaration. For details on FEMA's program for assisting states with firefighting costs, see: <http://www.fema.gov/government/grant/fmagp/index.shtm>. Accessed 5/28/09. From 2003 to 2009, the state of Montana paid a total of \$106 million in wildland firefighting costs. On average, 44% was reimbursed per year through a combination of cost share agreements with the Forest Service, BLM, and FEMA. Source: Smith, B. September 10, 2008. Fire Suppression Costs, FY 2009: A Report Prepared for the Legislative Finance Committee. Full report is available online at http://leg.mt.gov/css/Committees/interim/2007_2008/fire_suppression/default.asp. Accessed 5/28/09.

⁴⁷ The Fire Suppression Interim Committee held its last meeting on September 11 and 12 of 2008. At that meeting, 41 pieces of legislation and 12 letters of recommendation were requested. These requests ranged from defining the wildland-urban interface (WUI) to fire management on state lands to long-term funding of fire suppression costs. Smith, B. September 10, 2008. Fire Suppression Costs, FY 2009: A Report Prepared for the Legislative Finance Committee. Available online at http://leg.mt.gov/css/Committees/interim/2007_2008/fire_suppression/default.asp. Accessed 5/18/09. Bills introduced during the 2009 session of the Montana Legislature related to fire can be found at: [http://laws.leg.mt.gov/laws09/law0203w\\$.startup](http://laws.leg.mt.gov/laws09/law0203w$.startup)

⁴⁸ Other reasons why bills did not pass in the last session of the Montana legislature include the efforts of a powerful insurance lobby, the strong "private property rights" sentiments of the Montana Legislature, and the fact that Montana at the time had a budget surplus. These arguments would carry less weight if the federal government did not spend large sums each year to protect homes from wildfires, if the effects of the proposed bills were evaluated in the context of today's recession, and if the Legislature was fully aware of the potential for growth in future home-related fire suppression costs.

This does not suggest that all wildland firefighting costs should be covered by state or local governments. Because fires burn across federal, state, and private lands, firefighting will always be a joint responsibility. However, a more responsible pattern of residential development would emerge if the county's share of costs were to become a part of the calculus that state and county governments go through to evaluate the fiscal effects of a proposed new subdivision.

VI. SOLUTIONS TO THE GROWING WILDLAND-URBAN INTERFACE AND ASSOCIATED COSTS

One of the reasons federal land management agencies have focused on increased coordination, fuels reduction, and landowner education is because of current aversion against the federal government exerting too much influence over what happens on private lands.

Federal agency efforts concerning private residences have focused on voluntary programs such as Firewise. While this will make homes safer, it will not necessarily reduce costs, restore fiscal responsibility, or provide fairness to the national taxpayer. The thesis of this paper is that the cost of fighting wildland fires only can be significantly reduced, or at least prevented from escalating further, if the pattern of future residential development alters from often building in the most dangerous, fire-prone areas.

By one estimate, 71 percent of the WUI is privately owned.⁴⁹ However, it does not necessarily follow that there is nothing the federal government can do to prevent WUI-related firefighting costs from escalating. Ten possible solutions—ways in which the federal government can control wildland fire costs—are explored below. Each section provides background on the proposal, explains how the idea could work, explores the pros and cons of each, and concludes by asking how effective each idea would be in controlling future wildland fire suppression costs.

⁴⁹ Schoennagel T., C.R. Nelson, D.M. Theobald, G.C. Carnwald, and T. B. Chapman. 2009. Implementation of National Fire Plan Treatments Near the Wildland-Urban Interface in the Western United States. *Proceedings of the National Academy of Sciences*. 106 (23): 10706-10711. This article can be found at: <http://www.pnas.org/content/early/2009/06/05/0900991106.abstract>. Accessed 6/10/09.

Proposed Solutions

1. MAPPING	Publish Maps Identifying Areas with High Probability of Wildland Fires
2. EDUCATION	Increase Awareness of the Financial Consequences of Home Building in Fire-Prone Areas
3. REDIRECTING FEDERAL AID TOWARDS LAND USE PLANNING	Provide Technical Assistance and Financial Incentives to Help Local Governments Direct Future Development Away from the Wildland-Urban Interface
4. COST SHARE AGREEMENTS	Add Incentives for Counties to Sign Agreements that Share the Costs of Wildland Firefighting between Local and Federal Entities
5. LAND ACQUISITION	Purchase Lands or Easements on Lands that are Fire-Prone and at Risk of Conversion to Development
6. A NATIONAL FIRE INSURANCE AND MORTGAGE PROGRAM	Apply Lessons from Efforts to Prevent Development in Floodplains
7. INSURANCE	Allow Insurance Companies to Charge Higher Premiums in Fire-Prone Areas
8. ZONING	Limit Development in the Wildland-Urban Interface with Local Planning and Zoning Ordinances
9. ELIMINATE MORTGAGE INTEREST DEDUCTIONS	Limit Development in the Wildland-Urban Interface with Local Planning and Zoning Ordinances
10. REDUCE FEDERAL FIREFIGHTING BUDGETS	Induce Federal Land Managers to Shift More of the Cost of Wildland Firefighting to Local Governments

1. MAPPING

Publish Maps Identifying Areas with High Probability of Wildland Fires

The Idea

Mapping high wildfire risk areas and the WUI is both a pragmatic policy tool and powerful visual educational tool. The idea is to identify and map fire-prone areas, including those places where existing structures are at risk and where new home development would pose a risk to property and human life, and where the cost of protecting homes from wildfire would be a substantial burden on the taxpayer.

Background

By one estimate, 92 percent of the area where structures are at risk of wildfires occurs on non-federal lands.⁵⁰ Another study shows that more than half of the WUI in the West is in forest types that, when fires strike, burn at high intensities and are difficult to control.⁵¹

The increasing awareness of the cost and safety issues surrounding WUI fires, combined with the availability of more detailed and more affordable mapping tools, has resulted in a variety of fire risk maps at the private, local, state and federal levels.

A limited number of states, including California, Oregon, and Montana, currently have legislation in place that requires their state agencies to create maps depicting fire risk. For example, in California, a state law requires the California Department of Forestry and Fire Protection to produce a fire map that indicates fire risk throughout the state.⁵² The fire hazard severity zone map assigns three levels of fire danger—moderate, high, and very high—to properties throughout a county. Local government is directed, under state code, to adopt the fire risk map. This allows local government to require better fire construction techniques and materials for new homes built in fire-prone areas. For instance, Napa County, California can legally reject a new development due to location in fire hazard areas, steep topography, dense vegetation, and inadequate roads and water supplies for firefighting.⁵³

⁵⁰ Menakis, J.P., J. Cohen, and L. Bradshaw. 2003. Mapping wildland fire risk to flammable structures for the conterminous United States. Pages 41-49 in K.E.M. Galeey, R.C. Klinger, and N.G. Sugihara (eds.).

⁵¹ Teobald, T. D. and W.H. Romme. 2007. Expansion of the U.S. Wildland-Urban Interface. *Landscape and Urban Planning*, 83: 340-354. Also cited in: Schoennagel et al., 2009, *Ibid*.

⁵² California Department of Forestry and Fire Protection.

http://www.fire.ca.gov/fire_prevention/fire_prevention_wildland_process.php. Accessed 06/09/09.

⁵³ Napa County Zoning Ordinance, CA — Chapter 18.84 FR Fire Risk Combination District: 18.84.010 “Intent of Classification,” as listed in <http://www.wildfireprograms.usda.gov/> by searching “Napa County.” Accessed 6/2/09. To view the California Fire Hazard Severity Zone Map, see: http://www.fire.ca.gov/fire_prevention/fire_prevention_wildland_zones_maps.php. Accessed 6/9/09.

In addition to state mapping efforts, the Southern Group of State Foresters and the Council of Western State Foresters have, with support from federal agency partners, commissioned detailed wildfire risk assessments.⁵⁴ A standardized and peer-reviewed modeling approach has been applied to 13 southern states and is currently being applied to 17 western states to generate maps of wildfire threat and communities at risk.

In addition to government efforts, the Insurance Services Office has produced wildfire risk maps for nine western states.⁵⁵

How the Idea Could Work

Much like the National Flood Insurance Program (NFIP, discussed later in this paper) has generated maps rating flood risk, an important first step toward better wildland fire policy would be to create an agreed upon set of criteria. The standardized approach undertaken by the Southern Group of State Foresters and Council of Western State Foresters also serves as a good example that could be repeated for other regions. Federal sponsorship of uniform mapping—through grants, incentives or regulation—could coordinate existing efforts to produce uniform standard maps illustrating the most dangerous, fire-prone areas. Much like the NFIP program, these maps could be readily available (through planning offices, libraries, on the web, etc.) and amendable through a formal process as developments warrant.

Pros and Cons of the Idea

Uniform mapping of the wildfire threat and the WUI is necessary baseline information for any significant education or policy action. Accurate, accepted and regularly updated maps are vital to any successful long-term reform effort.

One concern about mapping is that it will influence property values. It is unlikely, however, that maps showing fire hazard areas will reduce property values. In 1998, California passed the Natural Hazard Disclosure Law (AB 1195), which requires sellers to disclose to potential buyers whether their residence is in a hazard zone, including wildfire hazard. A recent study on the effect of this law on property values revealed that location of a home in an identified fire hazard area actually increased property values by 3 percent after the passage of the law, “probably due to the unmeasured amenity values associated with location in the urban-rural interface.”⁵⁶

⁵⁴ Southern Group of State Foresters. <http://www.southernwildfirerisk.com/about/aboutswra.html>. Accessed 6/9/09. Western Forestry Leadership Coalition. <http://www.wflcenter.org/wwra/>. Accessed 6/9/09.

⁵⁵ Wildfire Services. <http://www.iso.com/Products/LOCATION/LOCATION-Wildfire-Services.html>. See also a private firm Proxix, which has mapped fire risk as a fee service to insurance companies. <http://www.proxix.com/Products/Data/Insurance/Wildfire/>. Web sites accessed 6/9/09.

⁵⁶ Austin, T. and J. Romm. 2006. An Assessment of the 1998 California Natural Hazard Disclosure Law (AB 1195). California Policy Research Center, University of California, Berkeley. <http://www.emeraldinsight.com/Insight/viewContentItem.do;jsesonid=6D6DC6DB8F7B790EB7185C415C9B7805?contentType=Book&hdAction=lnkpdf&contentId=1757374>. Accessed 6/9/09.

Will the Proposed Solution Reduce Fire Suppression Costs?

Not by itself, but WUI mapping will be an essential element to any long-term improvement. The following sections of this paper provide greater detail about other means towards improvement, such as education, insurance reform, and redirecting federal funding. Education efforts could involve publicizing the fire probability maps (for use by county government and their planners, local fire districts, developers, and/or community groups). Mapping information also can be used by insurance companies to establish accurate risk ratings for properties. These and other reform efforts would not be possible without a baseline assessment of wildfire risk.

2. EDUCATION

Increase Awareness of the Financial Consequences of Home Building in Fire-Prone Areas

The Idea

Federal and state land management agencies can inform local governments of the financial impacts of fighting fires to protect homes in the counties where the fires take place. This information can be used by local elected officials to: (1) steer development away from the most fire-prone (and therefore expensive) parts of the county; and (2) justify to their public the use of land use planning tools (e.g., zoning, transferable development rights) for the purpose of preventing future development in the WUI.

Background

As noted earlier, when the fighting of wildland fires is discussed, in the scientific literature, in policy briefings, and in studies by government agencies, three reasons are conventionally given for the rising costs: (1) fuel buildup from decades of fire suppression and/or lack of timber harvesting, (2) a warmer and drier climate, and (3) the rapid acceleration of home building in the wildland-urban interface. The studies conclude that the solution is therefore: (1) increased coordination between firefighting agencies, (2) fuels reduction, and (3) educating homeowners on how to live more safely in fire-prone areas. With very few exceptions, the discussion stops short of addressing the rapid and continued development of homes in harm's way.

One of the reasons for a lack of public discussion of means to control the pace, scale, and distribution of homes in fire-prone landscapes is the lack of education on the subject in general. For example, it is not widely understood that a large portion of the federal government's \$3 billion fire suppression budget is used for the protection of private property; that only 14 percent of the potential WUI in the West is developed, leaving much of the remaining 86 percent open for more; and that with climate change the situation will get worse. While the cost of protecting private property may be expensive today, we are only seeing the beginning of this problem.

How the Idea Could Work

Educating local governments on the rising cost of development in the WUI can consist of three efforts: mapping, custom research, and distribution of information.

1. *Mapping.* A national map, available with county-level details, can be published on an interactive web site or in hard copy that shows areas of high fire probability in the wildland-urban interface.
2. *Studies on the cost of home protection from fires.* Publish studies and examples—several for each state—of the cost of fighting wildland fires, showing:

- a. The portion of costs attributable to the protection of homes and other private property.⁵⁷
- b. A build-out analysis showing future costs, under “no zoning” versus “zoning” scenarios; i.e., illustrating how costs will rise if no control is taken of growth in the WUI.
- c. The cost of protecting WUI homes in the future under climate change scenarios.

Knowing the cost of protecting homes from wildfires is a critical piece to several ideas presented later in this paper. For example, through cost share agreements (discussed elsewhere in this paper) it is possible for county governments—those responsible for residential land use decisions—to be required to pay for their share of firefighting costs in the WUI.

3. *Distribution of information.* Distribute the maps and cost modeling information to state and county governments, beginning in the western states. This information could become a standard part of the agency’s Firewise education program, and could be integrated into other federal assistance programs (see following sections for descriptions of these programs).

Pros and Cons of the Idea

Maps have already been produced West-wide detailing the development of homes in the WUI in the West. For Montana, developed detailed analysis has been conducted on the portion of the firefighting costs that are due to the need to protect private property, including build-out analysis and climate change scenarios. In 2009 the Montana state legislature had the opportunity to use this information to curtail future development in the WUI, yet took no significant steps. This means mapping and education, by themselves, are not sufficient to change the pattern of land use development. Other ideas presented in the sections that follow hold more promise.

Will the Proposed Solution Reduce Fire Suppression Costs?

Education by itself will not necessarily change the pace or pattern of development. When combined with mapping of the WUI, it will help community and county leaders identify the extent of problems associated with further development of fire-prone lands. One benefit from education will be a search for solutions. The following sections offer an array of ideas aimed at influencing the pace, scale and pattern of future development in the WUI.

⁵⁷ For an example of the methods for how to accomplish this, see Headwaters Economics: August 2008. Montana Wildfire Cost Study. http://www.headwaterseconomics.org/wildfire/HeadwatersEconomics_FireCostStudy_TechnicalReport.pdf. Accessed 5/8/09 (HE 2008).

3. REDIRECTING FEDERAL AID TOWARD LAND USE PLANNING

Provide Technical Assistance and Financial Incentives to Help Local Governments Direct Future Development Away from the Wildland-Urban Interface

The Idea

Use the various federal programs that currently help non-federal entities control wildfire hazards by modifying them so they: (1) assist communities with land use planning, encouraging development away from the WUI; and (2) offer financial support as an incentive, giving preferential treatment to communities that have directed development away from the WUI.

Background

Several federal programs provide assistance to counties and communities that respond to the growing risk from wildfires. These programs could be expanded, altered, or redirected towards a heavier emphasis upon assisting counties with land use planning. A few of these are reviewed below.

The *State and Private Forestry* (S&PF) division of the Forest Service assists states, tribes, communities, and non-industrial private landowners. While the Forest Service tends to shy away from affecting land use planning policies on private lands, this program can help county commissioners redirect development away from the most dangerous and flammable areas by offering technical and financial assistance. The 2009 budget for S&PF was \$265.9 million. For 2010, the Forest Service has requested \$306 million for this program.⁵⁸

One of the programs of S&PF is the *National Fire Plan* (NFP). Current priorities have been to decrease the risk of danger on existing developments through the reduction of hazardous fuels. Since 2001, for example, the federal land management agencies, working with local and state governments, have been able to treat 8.5 million acres. More than 60 percent of the federal land management agency's fuel treatment dollars are being spent in the WUI.⁵⁹

A recent assessment has revealed that from 2004 to 2008, 44,000 fuels reduction treatments were conducted under the NFP, with 80 percent of the treated land occurring under the justification of objectives of "wildland-urban interface" or "defensible space." The study found that the vast majority of the fuels treatments were conducted in remote areas, away from the WUI: 3 percent of the treatments were inside the WUI, and another 8 percent was in a 2.5-kilometer buffer around the WUI, totaling 11 percent. The authors of the study point out that the percentage of WUI lands treated by federal agencies could be this low, in part, because much of the WUI is privately owned,

⁵⁸ U.S. Department of Agriculture, Forest Service. Fiscal Years 2009 and 2010. President's Budget. <http://www.fs.fed.us/publications/budget-2009/fy2009-forest-service-budget-justification.pdf> and <http://www.fs.fed.us/publications/budget-2010/overview-fy-2010-budget-request.pdf>. Accessed 6/2/09.

⁵⁹ Healthy Forests and Rangelands http://www.forestsandrangelands.gov/plan/documents/10-YearStrategyFinal_Dec2006.pdf. Accessed 5/18/09.

where the agencies have no jurisdiction. They therefore recommend “shifting management and policy emphasis from public to private lands.”⁶⁰

While there is disagreement on the findings of this recent study,⁶¹ their findings do reiterate the same findings as that of earlier GAO and OIG reports: to deal effectively with the growing costs of protecting homes in the wildland-urban interface, the federal agencies have to find ways to exert influence on private land development.

One of the programs where this could have happened was the Community and Private Lands Fire Assistance (CPLFA) program, which was authorized via the 2002 Farm Bill at \$35 million per year, but did not appear in the 2008 Farm Bill.⁶² This program served to help in restoration following a fire.⁶³ Through this program, if it were reinstated, the Forest Service could also fund communities in their land use planning efforts.

In 2004, the National Academy of Public Administration (NAPA) reviewed all the federal programs that were available at that time to assist state, local, and other cooperators in reducing hazards from wildland fires. It identified more than 14 programs that are available through the Forest Service, Department of the Interior, and FEMA. These programs provide a variety of hazard mitigation and firefighting services, including helping communities reduce fuel loads in the wildland-urban interface, educating landowners, and improving coordination among firefighting entities.⁶⁴ None of them are aimed at influencing development away from fire-prone lands.

Reducing dangerous fuel loads, educating landowners, increasing public safety, and improving firefighting effectiveness are all important goals, particularly for the portion of the WUI that is already built with homes and commercial buildings. But, there remains an urgent need for land use planning to steer the pace, scale, and pattern of future development in the WUI.

A portion of the more than \$300 million of federal dollars that goes to non-federal entities (for that matter, a portion of the more than \$3 billion appropriation to the federal agencies for wildland firefighting) could be used to prevent further building in the wildland-urban interface, or at least, in the most dangerous parts of the WUI. In other words, there could be a significant shift in programs such as *State and Private Forestry* to, in addition to their current assistance with fuels treatment, equipment, and training, also help communities and county governments in land use planning.

⁶⁰ Schoennagel et al., 2009, Ibid.

⁶¹ Barnard, Jeff. June 26, 2009. “Forest Service Disagrees with Study on Thinning.” Associated Press. The Forest Services says 43 percent of the 10.8 million acres treated by federal agencies was in and around communities threatened by wildfire.

⁶² National Academy of Public Administration. January 2004. *Containing Wildland Fire Costs: Enhancing Hazard Mitigation Capacity*. Washington, D.C. (NAPA 2004). For a legal description of the Community and Private Lands Fire Assistance program, see Cornell Law School, http://www.law.cornell.edu/uscode/16/usc_sec_16_00002106---c000-.html. Accessed 6/3/09.

⁶³ Paul Ries, Director, Cooperative Forestry, Forest Service, personal communication. 8/25/09.

⁶⁴ NAPA 2004. Ibid.

How the Idea Could Work

The various federal programs that assist non-federal entities could be modified in two ways. The least politically sensitive is to offer financial and technical assistance in land use planning. The second, more difficult politically but perhaps more effective because of its financial ramifications, is to provide assistance to local entities based on their ability to curtail development away from the WUI.

County Land Use Planning Assistance (Technical and Financial Support)

County governments are continually faced with growth pressures, particularly in the West, yet often have understaffed planning departments insufficiently trained in the tools available for effective land use planning. Federal agencies—the Forest Service and BLM in particular—could provide grants and technical assistance to help communities with:

1. Identification of the tools for land use planning (zoning, transferable development rights, incentives for cluster development, density bonuses and others).
2. Review of state enabling legislation to clarify what land use planning tools are available for counties in each state.
3. Dissemination of examples of successful land use planning that resulted in development that was directed away from the most dangerous fire-prone lands.
4. Facilitation for collaborative, community-based approaches to county land use planning.
5. Dissemination of examples of successful resolution to legal challenges to zoning and other efforts to control development in the WUI.
6. Development of partnerships with organizations that provide land use planning assistance to county governments.

A new division or program could be created within the Forest Service's *State and Private Forestry Program* that is dedicated solely to assisting county governments with land use planning to help direct development away from dangerous, fire-prone lands. The agency's expertise in mapping, identification of fire probabilities, legal matters, and collaborative approaches to planning and community organizing could all be directed towards helping county governments.

Performance-Based Financial Assistance

The federal government assists local governments in a number of ways, through disaster relief, fuels reduction programs, landowner education, and grants programs. However, to date, that assistance arrives without regard for whether the county governments have attempted to steer development away from the WUI.

The federal government could give preferential treatment (larger grants, or smaller matching requirements) to counties that have successfully controlled where future development takes place. For example, Napa County, California, has a zoning ordinance, explained later in this paper, which limits development in the WUI.

How would the granting agency know the efficacy of the efforts made by each county? The Forest Service maintains a searchable online National Database of State and Local Wildfire Hazard Mitigation Programs.⁶⁵ To qualify for assistance (or for higher levels of assistance) the granting program could make it a condition of the grant that the county enter proof into this database that they have adopted land use control measures to steer future development away from the WUI. Guidance for how to evaluate the effectiveness of these ordinances could fall to the National Institute of Standards and Technology (NIST) or a similar agency.

In 2007, U.S. Senator Dianne Feinstein (D-CA) introduced a bill (which did not pass) called the Safe Communities Fire Act (S.2390). This bill would have tied federal assistance to a municipality's ability to demonstrate adherence to ordinances that reduce the risk of damage from wildland fires in the wildland-urban interface.⁶⁶

The bill called for NIST to publish federal model ordinances for municipalities in fire hazard areas. These ordinances would have included specifications on building materials for new construction; standards for roads, culverts and bridges; and other "fire-safe" practices. The bill also directed the Under Secretary of Agriculture to provide grants to municipalities in fire-prone areas to encourage responsible "fire-safe" development. It also required states to create or update fire hazard maps. Under this bill, local municipalities would have received an incentive to encourage "fire-safe" development by directing FEMA to modify its *Fire Management Assistance Grant Program* to require only a 10 percent non-federal match on its grants. The Congressional Budget Office (CBO) estimated that this bill would have cost about \$100 million over five years.

⁶⁵ Forest Service. National Database of State and Local Wildfire Hazard Mitigation Programs <http://www.wildfireprograms.usda.gov/>. Accessed 6/2/09.

⁶⁶ The full text of S. 2390 is available at <http://www.thomas.gov/cgi-bin/query/D?c110:1:./temp/-mdbs9hYXTZ>. A summary of the bill by the Congressional Research Service is available at: <http://www.thomas.gov/cgi-bin/bdquery/z?d110:SN02390:@@D&summ2=m&>. The Congressional Budget Office's analysis of the bill is available at: <http://www.cbo.gov/ftpdocs/91xx/doc9137/s2390.pdf>. All three of the above web sites accessed 6/5/09. A related bill, which also did not pass, was introduced in 2009 in the House (H.R. 5218) by Representative Mark Udall (D-CO). Both bills failed; neither received a hearing. Both web sites above accessed 6/5/09.

While S.2390 did not pass, it was an attempt to tie the amount of federal aid given to local municipalities to a performance standard. In April of 2009, Senator Feinstein submitted another bill, called the Safe Communities Fire Act of 2009 (S.762).⁶⁷ The language of the bill states that grants will be available to encourage and reward responsible development. Among others, the bill gives authority to the Secretary of Agriculture and Secretary of the Interior to carry out a pilot program to assess the feasibility and desirability of awarding grants to increase the fire safety of communities near federal lands. Grants funds may be used to develop local “fire-wise” ordinances; complete Master Cooperative Wildland Fire Management Agreements (see next section of this report for a description); and for education, training, and equipment purchases.

Senator Feinstein’s efforts represent an attempt to tie federal aid to proof of performance on the part of local governments. The various federal aid programs could similarly come with conditions that reward those with acceptable demonstrations of land use planning, such as zoning ordinances.

More than 14 federal assistance programs can be directed, in part, towards encouraging “fire-safe” practices and preventing the escalating cost of future development in the WUI. This means the federal government has the capacity to step across its own boundaries, the way the *State and Private Forestry* program of the Forest Service already does, to assist in land use planning on private lands.

This assistance could be based on demonstrated ability on the part of county governments to control where future development takes place. Otherwise, with continued rapid development of the wildland-urban interface, there is no way for the numerous federal fuels hazard mitigation programs to keep pace with development. Without dealing with one of the root causes of the rising cost of wildland firefighting, all that the existing federal programs will be addressing is the symptom (high fuel loads next to homes) and not the problem (too many homes built in the wrong place).

⁶⁷ The full text of S 762 is at available at: <http://www.thomas.gov/cgi-bin/query/z?c111:S.762>. Accessed 6/5/09.

Pros and Cons of the Idea

The obstacles to implementing this idea are cultural, and historical; the agencies have never done this before. In the short term, there will be a lack of expertise of the agencies' workforces in the field of private land use planning. Agencies such as the Forest Service understand forestry, but have very little experience in assisting communities in land use planning. Yet, the rising cost of protecting homes from fires is significant enough to warrant the development of a new program or division within the Forest Service, with its own resources, dedicated to land use planning on private lands. Alternatively, FEMA could take on this responsibility. FEMA already provides land use planning assistance through their floodplain program (discussed later in the paper).

Another obstacle, as evidenced in Senator Feinstein's bills, is the temptation to focus on tying federal assistance to the performance of local municipalities only in terms of how to build better, "fire-safe" developments. While this is a laudable and important goal for lands that are already developed, the Feinstein bills did not go far enough to address the pace and pattern of future development. To be successful, federal programs—technical and financial support—need to be tied to evidence that local municipalities are taking steps to steer future development away from the wildland-urban interface.

Will the Proposed Solution Reduce Fire Suppression Costs?

Yes, particularly if combined with an increased financial responsibility on the part of county governments, which would form a powerful incentive to seek assistance in land use planning.

This idea also will work if federal performance-based forms of assistance are tied to evidence of local zoning ordinances that steer development away from the WUI.

4. COST SHARE AGREEMENTS

Add Incentives for Counties to Sign Agreements that Share the Costs of Wildland Firefighting between Local and Federal Entities

The Idea

Master Agreements are an accepted tool whereby federal and nonfederal firefighting entities can agree to share the costs of fire suppression. However, agreements can be difficult to implement and some take years to negotiate. In the West, few are signed by county governments. If more of them were signed by counties, local officials would be more likely to consider the impact on their county budgets from their land use decisions (e.g., approving new residential subdivisions in fire-prone areas). What is needed are incentives to sign these agreements and disincentives for not signing them.

Background

A mechanism exists for sharing the cost of fighting wildfires among the federal agencies and nonfederal governments and tribes. These are called *Master Cooperative Wildland Fire Management Agreements*, or simply *Master Agreements*. The purpose of these agreements is to document the commitment of various agencies—federal agencies such as the Forest Service and Department of the Interior, and firefighting entities of local governments and tribes—in order “to improve the coordination and exchange of personnel, equipment, supplies, services and funds.”⁶⁸ Part of the agreements is a section called a *Cost Share Agreement*, the purpose of which is “to establish and document the cost sharing and basic organizational structure in response to specific fires” (emphasis in original).⁶⁹

The Master Agreement sets the general framework for how to fight fires and pay for them. The Cost Share agreement spells out the specifics for how to pay for individual fires.

In 2006, GAO produced a report entitled *Wildland Fire Suppression: Lack of Clear Guidance Raises Concerns about Cost Sharing between Federal and Nonfederal Entities*.⁷⁰ The report concluded that Master Agreements between federal and nonfederal firefighting entities were inconsistently applied and lacked guidance for which methods to use for specific fires. As a result, cost share methods are inconsistently applied. The lack of clear guidance also makes it difficult to reach agreement, and some agreements

⁶⁸ Formally, these agreements are called a *Master Cooperative Wildland Fire Management and Stafford Act Responses Agreement*. The agreement template can be obtained from the National Wildfire Coordinating Group (NWCG): www.nwcg.gov/teams/ibpwt/documents/cooprelations/master_coop_agreement_template.pdf. Accessed 6/5/09. (NWCG 2009)

⁶⁹ NWCG 2009, Ibid. *Cost Share Agreements* are formally called the *Supplemental Fire Suppression and Cost Share Agreement*. The agreement cannot be used to assign liability for costs based on the origin of the fire.

⁷⁰ United States Government Accountability Office (GAO). May 2006. *Wildland Fire Suppression: Lack of Clear Guidance Raises Concerns about Cost Sharing between Federal and Nonfederal Entities*. (GAO-06-570).

take years to negotiate.⁷¹ GAO also noted that according to some federal officials:

“[T]he current framework for sharing costs insulates state and local governments from the increasing costs of protecting the wildland-urban interface.”⁷²

Under the current system, even with recent changes that have been made to the Master Agreement template, there is still a fundamental challenge. There is a disincentive for county governments to agree to sign a cost share agreements if, in the end, the vast majority of the cost of defending homes in the WUI is borne by the Forest Service, BLM, FEMA and the state firefighting agencies. Under these conditions, why would county firefighting entities enter an agreement to share firefighting costs?

The challenge is to find ways to get counties to agree to pay a higher share of the costs, thus bringing cost accountability into their land use decisions. As the Office of Inspector General’s recent report points out, over-reliance on the federal government removes incentives for taking local responsibility. The report states:

“Assigning more financial responsibility to State and local governments for WUI wildfire protection is critical because Federal agencies do not have the power to regulate WUI development.”⁷³

How the Idea Could Work

This idea could work in three ways: by providing incentives for signing Master Agreements, or disincentives for not doing so, or by administrative changes—making the signing of Master Agreements part of a federal agency’s land use planning process.

Provide Incentives for Signing Master Agreements

1. *Provide financial and technical assistance.* The various forms of federal aid available for local governments (see previous section) could be modified to include a higher level of assistance to counties that have signed Master Agreements.

⁷¹ According to Rick Prausa, Deputy Director of Fire and Aviation Management for the Forest Service, some Master Agreements have been under negotiation for over 15 years. Personal communication, 2/17/09.

⁷² GAO-06-570, Ibid.

⁷³ OIG 2006, Ibid.

Provide Disincentives for Not Signing Master Agreements

2. *Provide a lower level of financial and technical assistance.* Federal aid programs available for local governments (see previous section) could be withheld, or offered at significantly less funding, if Master Agreements are not signed.
3. *Withhold reimbursement.* Federal agencies could not reimburse county governments, or reimburse them at lower levels, if Master Agreements and Cost Share Agreements were not signed.
4. *Bill the county governments.* After a fire, the Forest Service and BLM could bill the counties for the share of the firefighting costs that went to protecting private structures recently built in places that had been clearly identified as the most dangerous fire-prone places. Even if never applied, the threat alone of this happening might be incentive enough to encourage land use planning and the signing of Master Agreements.⁷⁴
5. *Withhold PILT payments.* Withhold, delay or reduce Payments in Lieu of Taxes (PILT) to counties that have not negotiated a Master Agreement.

Administrative Solutions

6. *Integrate Master Agreements into planning process.* Make the development and signing of Master Agreements part of the Forest Service and BLM's land use planning process.
7. *Make Signed Master Agreements a Requirement for being a Cooperating Agency.* Make signing of Master Agreements part of the condition for county governments to sign on as Cooperating Agencies in the Forest Service and BLM's planning process.

Pros and Cons of the Idea

Billing counties for their share of the costs of protecting homes and withholding PILT payments for not signing Master Agreements are, on the surface, tough measures to propose. These actions would have to have strict sideboards on them in order to be politically feasible, and they should be applied in rare instances.

For example, billing counties for their share of the costs could be applied if:

1. The structures that had to be protected were built in areas that were clearly identified by federal and state agencies as posing a high risk of wildland fire;
2. County government had been notified of the risk;

⁷⁴ The methods for measuring the portion of total firefighting costs attributable to protecting homes were developed by Headwaters Economics for the Montana Legislature, August 2008. See Montana Wildfire Cost Study: http://www.headwaterseconomics.org/wildfire/HeadwatersEconomics_FireCostStudy_TechnicalReport.pdf. Accessed 5/8/09. This method could be replicated for other states.

3. Land use planning assistance (technical and financial) had been offered by the federal agencies;
4. There was no demonstrated effort on the part of the county to redirect development away from fire-prone areas; and
5. Structures that had to be protected were built recently, after conditions 1-4 had been met.

When federal and county governments enter into agreements on how to share costs of firefighting, each will try to negotiate the best possible deal. One of the challenges on Cost Share agreements is that they sometimes are negotiated in the field for specific fires, sometimes as the fire is burning. The federal official in charge of negotiating these agreements will be a line officer who is also a member of the local community. There is a strong disincentive for that person to negotiate in a way that asks the county and their community to pay a high proportion of the costs.

Will the Proposed Solution Reduce Fire Suppression Costs?

Yes, with direction from Congress. Any idea that penalizes counties is politically difficult, and will not likely be implemented by federal agencies without Congressional direction and support. Ideas that succeed politically will likely have a combination of incentives and disincentives.

5. LAND ACQUISITION

Purchase Lands or Easements on Lands that are Fire-Prone and at Risk of Conversion to Development

The Idea

Identify fire-prone private lands that are most at risk from development and purchase these outright for public ownership or obtain an easement on them that prevents development.

Background

Three federal programs—the *Land and Water Conservation Fund* (LWCF), the *Forest Legacy Program* (FLP), and the *Community Forest and Open Space Conservation Program*—could be used by state and federal government to acquire the most fire-prone private lands, or to purchase conservation easements on these lands. The purpose of these funds is to prevent development and fragmentation and preserve working forests. By buying land or acquiring easements, the funds could help prevent further escalation of firefighting costs by eliminating the need to protect homes that might have been built without these protections. This strategy was summarized in a recent report:

Using the LWCF for strategic land purchases in and adjacent to public lands to prevent private development in the most fire-prone areas will allow agencies to implement better fire prevention management in these critical zones and throughout federal units. The Forest Legacy Program provides states and private landowners with another important tool to maintain key areas bordering public lands as private working forests and to prevent development of important state and local forest resources.⁷⁵

The *Land and Water Conservation Fund* (LWCF) was established by Congress in 1965 to direct money from a tax on offshore oil and gas production into an annual fund that can be used by state and federal government to protect parks, forests, and wildlife habitat. Congress has authorized LWCF for \$900 million per year. However, that level is rarely met. A more typical annual amount is \$113 million for federal acquisitions and \$30 million for states.⁷⁶

The Forest Service's *Forest Legacy Program* (FLP) is designed to protect private lands from development and allows the Forest Service to purchase lands or easements on lands that are under threat of conversion to non-forest uses, including residential subdivision.⁷⁷ To date the FLP program

⁷⁵ The Trust for Public Lands. http://www.tpl.org/content_documents/lwcf_report_webfinal.pdf. Accessed 6/2/09.

⁷⁶ The Trust for Public Lands. http://www.tpl.org/tier3_cd.cfm?content_item_id=10566&folder_id=191. Accessed 6/2/09.

⁷⁷ Forest Service. Forest Legacy Program. <http://www.fs.fed.us/spf/coop/programs/loa/aboutflp.shtml>. Accessed 6/2/09.

has not used fire risk as a reason to purchase land or put an easement on land.⁷⁸

Funding for the FLP program rose, from less than \$4 million in FY1998 to \$60 million or more per year since FY 2001. In 2009, the Forest Service's budget for the FLP was \$49.4 million. The Forest Service has requested \$91 million for the FLP in 2010.⁷⁹

A new federal program, called the *Community Forest and Open Space Conservation Program*, was authorized by the 2008 Farm Bill.⁸⁰ It provides federal matching 50-50 grants to local and state government, tribes, or nonprofit organizations to purchase forest lands threatened by conversion to non-forest uses. Proposals can be submitted through state foresters, and final granting decisions are made by the Forest Service.⁸¹

How the Idea Could Work

With a combination of the three federal funds, preferably appropriated at levels higher than in the past, key fire-prone lands could be purchased as public property, or conservation easements could be sought, to prevent them from being developed.

This idea could work best if it is combined with a national identification and mapping of the most dangerous, fire-prone areas—places where new home development would pose a risk to property and human life, and where the cost of protecting homes from wildfire would be a substantial burden on the taxpayer.

Pros and Cons of the Idea

The biggest challenge is that the federal government does not have enough money to buy up all the at-risk WUI lands, nor would it be appropriate or politically feasible to do so. Even if the funds are limited to the acquisition of development rights through conservation easements, there still would not

⁷⁸ Based on conversations with Jaelith Hall-Rivera, Program Specialist, Fire and Aviation Management, Forest Service on 6/2/09; Nancy Parachini, Program Officer, Forest Legacy Program, Forest Service on 6/3/09; Sandy Cantler, State and Private Forestry, Forest Service on 6/2/09; and Jeff Calvert, Forestry Assistance Program of the California Department of Forestry and Fire Protection on 6/5/09 and 6/8/09.

⁷⁹ Congressional Research Service. November 22, 2005. Forestry in the Farm Bill. Ross Gorte, CRS Report for Congress. RS22329. Washington D.C. (CRS 2005). The Forest Legacy Program is part of Cooperative Forestry, under the Forest Service's State and Private Forestry program. <http://www.fs.fed.us/spf/coop/programs/loa/flp.shtml>. Accessed 6/2/09. U.S. Department of Agriculture, Forest Service. Fiscal Years 2009 and 2010. President's Budget. <http://www.fs.fed.us/publications/budget-2009/fy2009-forest-service-budget-justification.pdf> and <http://www.fs.fed.us/publications/budget-2010/overview-fy-2010-budget-request.pdf>. Accessed 6/2/09.

⁸⁰ This program is not yet funded. The Forest Service's 2010 budget request includes \$1 million from the Forest Legacy Program to be used to start this program: <http://www.fs.fed.us/publications/budget-2010/overview-fy-2010-budget-request.pdf>. Accessed 6/2/09.

⁸¹ U.S. Department of Agriculture, Economic Research Service. 2008 Farm Bill, Forestry. <http://www.ers.usda.gov/FarmBill/2008/Titles/TitleVIIIForestry.htm>. Accessed 6/2/09. A differentiating feature of this program, compared to the Forest Legacy Program, is that the funds can go directly to local governments and nonprofits for the purchase of lands rather than easements.

be enough funds or personnel in the agencies to negotiate easements on all fire-prone WUI lands. However, if taken in conjunction with a national WUI fire hazards map, this idea could be used to prioritize purchase of the most dangerous lands that are at greatest risk of immediate development.

Another challenge in the current economic climate is to ask Congress for full appropriation of each of these land acquisition programs.

To ensure support from local governments, the tax return to counties from these lands should ideally not be different from what they would be if the land were privately owned (or what they would yield without a conservation easement). Local government should include into their benefit/cost calculus the savings from not having to defend homes in the portion of the WUI protected through these programs (see adjacent sidebar). They should also include the cost savings from not having to provide services to far-flung residential subdivisions.

Finally, some administrative changes could make this idea more viable. Programs like the *Forest Legacy Program* currently do not consider risk from wildland fires as part of the evaluation criteria for purchasing land or acquiring easements. If this were added as a criteria, priority could be given to lands that are both at risk of conversion to non-forest uses and have a high probability of having a wildfire in the near future.

Will the Proposed Solution Reduce Fire Suppression Costs?

Yes, in a handful of important places, especially if the land purchases can be justified on principles other than solely fire prevention, such as conservation and recreation.

Buying Land is Cheaper than Fighting Fires: An Example from Northwest Montana

Over the last decade, Plum Creek Timber Company began selling off its lands in Northwest Montana for residential development. Communities, local governments, and land management agencies have voiced concern over loss of habitat and working forests, altered fire regimes, and the costs of providing services, including fire protection, to the new developments.

In 2007, The Trust for Public Land and The Nature Conservancy began negotiating to acquire approximately 310,000 acres of Plum Creek land at a cost of \$490 million. These organizations viewed the purchase as a once-in-a-lifetime opportunity to permanently protect crucial lands in an area where the demand for recreation properties and second homes has led to high rates of conversion of forestlands to development.

During Montana's 2009 legislative session, state legislators voted to issue a bond for \$21 million to purchase a block of these lands in Missoula County. This effort was termed the Montana Working Forests Project. The costs and benefits of the land purchase for the state of Montana were hotly debated. Headwaters Economics provided state legislators information that showed that the long-term reduction in firefighting costs would far outweigh the initial investment in purchasing the land.

Over the long term, new residential development on Working Forest Project lands could increase the probable costs of wildfire suppression by up to \$73.7 million (in 2007 dollars). This figure represents the additional cost of fire suppression if Working Forest Project lands were developed at an average density of at least one residential unit per 160 acres, and were also threatened by wildfire. If 75 percent of these lands are developed, costs could be as high as \$55.3 million; if 50 percent developed, costs could be \$36.9 million; and if only 25 percent developed, costs could still reach \$18.4 million. Based on this and many other arguments in favor of the land purchase, the state legislators agreed to issue the \$21 million bond.⁸² Buying land proved to be cheaper than paying to fight fires.⁸³

⁸² A full copy of the Montana Fire Cost Technical Report is available at www.headwaterseconomics.org/wildfire.php. Accessed 7/17/09.

⁸³ These calculations are based on the state purchasing 111,000 acres of Plum Creek land. <http://www.montanaworkingforests.org/facts.html>. Accessed 08/12/09.

6. A NATIONAL FIRE INSURANCE AND MORTGAGE PROGRAM

Apply Lessons from Efforts to Prevent Development in Floodplains

The Idea

Congress could develop a national wildland insurance program, modeled after the *National Flood Insurance Program* (NFIP), that would require insurance coverage and provides disaster relief to landowners and communities in the wildland-urban interface. As with NFIP, participation in this program would be contingent on adoption of local ordinances that minimize the future threat from wildfires. Homeowners building in the most fire-prone lands would be required to purchase firefighting insurance.

Background

Congress created the *National Flood Insurance Program* (NFIP) more than 40 years ago to provide funding for disaster assistance while reducing the escalating costs of repairing damage to buildings and their contents that was caused by floods. Congress believed that people who choose to live in areas prone to flooding should pay for that risk by buying insurance; and that they should not expect taxpayers around the country to rescue them from their own recklessness. The goal of the program is to: (1) ensure flood victims of compensation; (2) protect taxpayers; and (3) deter risky construction, both in location and building materials.

Today, NFIP has more than 5.6 million policyholders insured for about \$1.1 trillion, and the program collects about \$2.9 billion annually in premiums.⁸⁴ Flood damage has been reduced by nearly \$1 billion per year as communities implement floodplain management requirements and property owners purchase flood insurance. Buildings constructed in compliance with NFIP building standards suffer approximately 80 percent less damage annually than those not built in compliance.⁸⁵

NFIP is administered by the Federal Emergency Management Agency (FEMA) and has several components:

1. *Mapping.* The NFIP identifies and maps the nation's floodplains to help create broad-based awareness of flood hazards. NFIP provides the data needed for floodplain management programs and for rating new construction for flood insurance. Areas deemed at flood risk are called Special Flood Hazard Areas (SFHA). Over the years, FEMA's mapping program has become more detailed, with regular updates and amendment processes.

⁸⁴ Government Accountability Office (GAO), February 27, 2009, Information on Proposed Changes to the National Flood Insurance Program. (GAO-09-420R).

⁸⁵ Federal Emergency Management Agency (FEMA), Federal Insurance and Mitigation Administration, www.floodsmart.gov. Accessed 5/18/09. (FEMA 2009).

2. *Community participation.* Nearly 22,500 communities across the U.S. and its territories participate in the NFIP. To participate in NFIP, communities are required to adopt a floodplain management ordinance that regulates all development—alterations, improvements and new construction—within Special Flood Hazard Areas.

The minimum NFIP requirements that a community must adopt to participate in NFIP vary depending on the severity of flood risk for a particular area as determined by FEMA's floodplain maps. Most of the floodplain management requirements established by NFIP for community ordinances establish building codes such as specifying that the floor level must be above base flood level, "dryproofing," elevating on piles, or withstanding hydrostatic pressure.

The NFIP also stipulates that community floodplain ordinances require the review of any subdivision or other new development to ensure that such development is "reasonably safe from flooding" and built to "minimize or eliminate flood damage."⁸⁶ Before a property owner can undertake development, a permit must be obtained by the community to ensure that the proposal complies with the community's floodplain management ordinance as well as with applicable state or federal laws such as wetland permits from the Army Corps of Engineers.⁸⁷

3. *Insurance and Mortgages.* Homes and buildings in high-risk flood areas are required to have flood insurance as a condition of receiving a mortgage from a federally regulated lender. These areas are defined as having a one percent or greater chance of flooding in any given year, which is equivalent to a 26 percent chance of flooding during a 30-year mortgage. In other words, when a loan is made on a property that is located in a flood plain, no federally regulated lender may make, increase, extend, or renew any mortgage loan unless that property is covered by flood insurance. At a minimum, the amount of the insurance coverage must equal the outstanding principal balance of the loan. Coverage must be obtained and maintained during the term of the loan.

All federally-regulated lenders are required to complete a Standard Flood Hazard Determination form whenever they make, increase, extend, or renew a mortgage, home equity, home improvement, commercial, or farm credit loan to determine if the building or manufactured (mobile) home is in an SFHA. It is the Federal agency's or the lender's responsibility to check the current Flood Insurance Rate Map (FIRM) to determine if the building is in an SFHA.

The NFIP offers flood insurance through nearly 90 private insurance companies. Homes and businesses located in moderate-to-low risk areas that have mortgages from federally regulated or insured lenders are typically

⁸⁶ FEMA 2009, *Ibid.* The details from the Insurance and Mortgages section all stem from this source.

⁸⁷ FEMA, Federal Insurance and Mitigation Administration, August 1, 2002, National Flood Insurance Program: Program Description. (FEMA 2002).

not required to have flood insurance. However, flood insurance is highly recommended because 25 percent of all flood claims occur in moderate-to-low risk flood areas. On property that is not subject to the federal flood insurance statutes, a requirement for flood insurance is a matter of contract between the lender and borrower.

4. *Disaster Assistance.* The Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act) requires flood insurance upon eligibility for disaster assistance if the insured entity has received disaster assistance in the past and/or the entity seeking disaster assistance is a government or nonprofit organization located in a SFHA.⁸⁸

Flood insurance may be a prerequisite for federal disaster assistance if the damaged or destroyed property has been previously restored or improved using federal disaster assistance. In most cases, receipt of past federal disaster assistance creates an obligation on part of the recipient to maintain flood insurance on the property, and any flood damage incurred during a period in which flood insurance has lapsed is not eligible for federal disaster assistance.

For example, should a city receive funding to rebuild a police station damaged from flooding, the city must promise to obtain and maintain flood insurance on the police station as a condition of receiving assistance, and the flood insurance is a prerequisite for future federal flood disaster relief. If the policy lapses and the police station is subsequently damaged, it would not be eligible for federal assistance.

How the Idea Could Work

If the federal government is expected to come to the rescue during a wildland fire, it is not unreasonable to ask that insurance and local ordinances reduce the costs to national taxpayers. The floodplain insurance precedent encourages the federal government to make wildland fire insurance compulsory—either in the way NFIP ties assistance to mortgages or disaster aid for those living in wildland fire-prone areas; or in a way similar to an auto insurance model, where insurance is universally required. In either scenario, Congress would mandate insurance coverage and then develop a mechanism to enforce compliance. Regulators could oblige insurers that offer homeowners' policies to bundle wildland fire insurance into their protection against theft, flood, and other hazards. Alternatively, public authorities could collect fire insurance premiums at the same time they collect property taxes.

The idea could work like NFIP, as a national insurance system for protection from wildfires. (This could be called the Federal Wildland-Urban Interface Insurance Program.)

⁸⁸ Congressional Research Service (CRS), September 5, 2008, Flood Insurance Requirements for Stafford Act Assistance. (CRS - RS22945, 2008). This paper provides a concise, six-page overview of the Stafford Act.

The Federal WUI Insurance Program would:

1. Mandate federal responsibility for identification and mapping of fire-prone areas (the WUI).
2. Require communities to adopt and enforce WUI management regulations and ordinances in order to qualify for the program.
3. Require federally regulated mortgage lenders to make homeowner participation in the Federal WUI Insurance Program a condition of the loan (i.e., no mortgages could be made, increased, or extended without participation in this program).
4. Require any business, government or nonprofit organization that receives fire-related disaster assistance to purchase fire insurance as a condition of receiving that funding.

Pros and Cons of the Idea

A few problems need to be overcome for this idea to work:

1. *Repetitive loss properties (RLPs)*. According to FEMA, a relatively small number of properties account for a disproportionate share of paid flood claims. Most of these properties were grandfathered into the NFIP system and have been repaired multiple times—hence the term Repetitive Loss Properties (RLPs). The Bunning-Bereuter-Blumenauer Flood Insurance Reform Act of 2004 created two programs that attempted to rectify this problem by buying out RLPs, but neither program has been fully funded and success is not yet tested.⁸⁹

Unlike floods, wildfires frequently do not damage all structures in an area but instead often burn in a mosaic pattern. Some structures are exposed to high fire risk while nearby buildings can experience far less danger from the same fire (i.e., water spreads evenly, fire often does not). Should a property burn, a rebuilt house would be unlikely to experience fire again soon because of the reduced fuel load near the structure. However, recent research on the cost of defending structures from fire shows that one structure may incur repeated costs.⁹⁰ Fire could approach a structure from several directions over several years and may occasion suppression costs for each of those years, even without burning down the structure. That is, firefighting crews show up to defend structures each time they are threatened.

⁸⁹ Congressional Research Service, June 30, 2005, Federal Flood Insurance: The Repetitive Loss Problem. RL32972. (CRS – RL32972, 2005)

⁹⁰ Gude et al 2008, Ibid.

2. *Large disaster.* After a disaster like Katrina, the federal government has shown a tendency to assist everyone, whether they are insured or not. Because the likelihood of a federal rescue is strong, it reduces the incentive to buy insurance.

Similarly, federal fire disaster assistance for large fires may undermine the need to participate in a National Fire Insurance and Mortgage Program. That said, even with the possibility of Katrina-sized rescues, the NFIP saves federal taxpayers roughly \$1 billion annually through its insurance requirements.⁹¹ A similar, though smaller, savings could be generated through a national fire insurance program.

3. *Proper pricing.* The current NFIP system is subsidized; this allows people to buy flood insurance relatively cheaply, build houses in exposed locations and then collect a federal check when the inevitable occurs, sometimes repeatedly. By pricing flood insurance more closely to the associated risk of flood, the government would create price signals that would drive housing development to higher, drier land. In some areas that have acute shortages of safe land (e.g., New Orleans) this might inflict hardship on the poor, and some kind of means-tested subsidy might be needed in a few jurisdictions.

A national fire insurance program similarly would have to make sure that costs are accurately accounted. Some state-level regulations, for instance, now require single pricing for home insurance and prohibit accounting for higher risks to those living in fire-prone areas. Modifying or removing such a single-rate policy would provide a more accurate, market-based reflection of the insurance cost of living near fire risk. Such a policy shift would lead to a more accurate pricing of insurance via the market.

4. *Insurance costs may not be a deterrent.* Compared to flood damage, national property losses annually from wildfires are relatively small and insurance costs are therefore lower. This means the cost of purchasing fire-related insurance is less than flood insurance and would be therefore be a less significant deterrent to building in high-risk areas.

One possibility, explored in the next section of this report, is to require homeowners and/or communities to pay a portion of firefighting costs through an insurance program. Such a requirement would be costly to existing and potential new development in the WUI, and could affect the rate of future development and the cost to the national taxpayers.

A few recent examples illustrate how high insurance rates could be for the most expensive homes that have been built in the WUI. Firefighting insurance policies in Idaho and California—some of which were used to bring in private crews to protect homes during wildfires in Sun Valley and outside San Diego—cost roughly \$10,000 annually per home and can range up to \$19,000

⁹¹ FEMA 2009, Ibid.

annually per home.⁹² Amounts like these, or a share of these amounts, would influence future location decisions made by possible homeowners or a county approving a subdivision proposal and design.

Will the Proposed Solution Reduce Fire Suppression Costs?

Yes, if two conditions are met: (1) the program requires the adoption of ordinances by local governments that are designed to limit development in high-risk fire-prone lands, and (2) the cost of purchasing insurance is relatively high and accurately reflects the government's cost of defending homes from wildfires. As with other solutions presented in this paper, accurate mapping of the location of the most dangerous, fire-prone lands (the WUI), and associated education efforts, are essential for idea to work.

⁹² Private firefighting insurance attracted public attention following the California fires in 2007. Since that time, a number of major media outlets, editorial pages, and bloggers have commented on a new trend in high-end insurance policies. For examples, see: Los Angeles Times, June 5, 2007. "Another way the rich are different: 'concierge-level' fire protection;" Bloomberg, October 26, 2007. "AIG's Fire Trucks Save Homes of Wealthy Californians;" Los Angeles Times, October 31, 2007. "Burn, burn, burn, burn the rich: examining the sick mind-set that would prevent people from paying for supplemental fire protection;" Associated Press, July 27, 2008. "Private Firefighting on the Rise;" and Casper Star-Tribune, December 30, 2008. "Make land management make sense." Private firefighting has become common enough that the Forest Service has established guidelines for how public and private firefighting resources should interact safely: http://www.fs.fed.us/r1/fire/nrcg/BulletinBoard/private_resource_guidelines.pdf. Accessed 6/5/09.

7. INSURANCE

Allow Insurance Companies to Charge Higher Premiums in Fire-Prone Areas

The Idea

The U.S. Fire Administration (USFA, a division of FEMA) has suggested that one solution to increasing development in the WUI and escalating fire suppression costs is for the insurance industry to adjust premiums based on an assessment of the level of wildland fire risk for each property.⁹³ The price should be sufficiently high to discourage development in the WUI.

Background

Homeowners requiring financing to purchase or build a home must have homeowners insurance, at least for the value of the loan. Even homeowners who own their homes outright desire insurance to protect what is likely their most valuable possession.

Fire is a standard part of all homeowner's insurance policies. The policies are underwritten and priced using a wide variety of factors, including an assessment of fire risk, which is based on both the conditions at the home and on the location and capacity of the responding fire department. For example, the private Insurance Services Office maintains the Public Protection Classification that rates all fire departments and districts nationwide on criteria including the type and age of the department's equipment, staffing, training, communications and dispatch services, and the water supply system available for fire suppression.⁹⁴

The location and condition of the home and surrounding landscape also factor into the fire risk assessment. For example, State Farm Insurance lists vegetation characteristics, topography (slope and aspect), population density, lightning strike density, and the proximity of roads and railroads as conditions they consider when looking to underwrite a policy.⁹⁵

Ideally, the private insurance market should be sending price signals that reflect wildfire risk. As fires become more frequent and costly in recent years, insurance companies have begun to respond, although not necessarily by raising prices.

State Farm Insurance started a wildfire hazard inspection program in 2003, designed to educate homeowners about risks and identify simple and inexpensive actions that can reduce fire hazard and risk to firefighters. This assessment boils down to "insurability."⁹⁶ If a homeowner is willing to take action to mitigate fire hazard, then rates will be similar to properties in other

⁹³ USFA 2000, Ibid.

⁹⁴ For example, see the Public Protection Classification maintained by the Insurance Services Office. <http://www.isomitigation.com/ppc/0000/ppc0001.html>. Accessed 6/10/09.

⁹⁵ National Database of State and Local Hazard Mitigation Programs: State Farm Home Inspection Program. <http://www.wildfireprograms.usda.gov/search.html?displayId=263>. Accessed 6/10/09.

⁹⁶ Jim Lord, State Farm Insurance, personal communication. 6/8/09.

areas with lower fire risk.

State Farm Insurance, however, rarely declines to renew policies if homeowners are unwilling to create defensible space and take other steps to facilitate fire suppression activities (e.g., making the home address and the structure itself visible from the street). Of 42,000 property inspections, 33 percent of inspections identified minor issues (usually clearing vegetation from roofs and gutters), and 20 percent identified major concerns including property access and creating defensible space. Only one percent of inspections resulted in cancellation or non-renewal of the insurance policy.⁹⁷

Other companies, including Chubb, are going one step further and contracting with fire suppression companies to create defensible space and to protect homes during fires.⁹⁸ There is no policy premium or charge for the wildfire defense service; all homeowners have to do is indicate that they desire the Wildfire Defense Coverage. (Other companies, including AIG, do charge a premium for similar wildfire defense services.)

The one instance where the insurance market is constrained from charging prices that would discourage development in the WUI, or that would lead to rejection of coverage because of risk, is in states that guarantee insurance to homeowners in fire hazard areas. Most notable among these is California. California's FAIR Plan Property Insurance law essentially offers subsidized insurance to homeowners living in the state's designated brushfire hazard zones in the cases where private insurance companies refuse coverage.⁹⁹ With the FAIR Plan, homeowners in these hazard zones are guaranteed coverage regardless of whether they have been rejected by a company in the past. A study by the California Policy Research Center found that:

[H]istorically, fire insurance has been difficult to obtain or very expensive in many urban-wildland interface zones in California, which has helped to limit development in the most hazardous areas. This changed with California's Fair Access to Insurance Requirements (FAIR) Plan, instituted in 1968, which offers basic homeowner's insurance to property owners in brushfire zones who are unable to obtain it in the private market.¹⁰⁰

The authors of this report had not set out to discover the impact of California's FAIR Plan law on land use patterns. Instead, they were trying to understand how the state's fire hazard disclosure law was affecting home prices in designated fire hazard zones. They discovered that the FAIR Plan

⁹⁷ Josh McDaniel. Facing up to reality in the WUI. Wildland Fire Lessons Learned Library <http://www.wildfirelessons.net/Additional.aspx?Page=99>. Accessed 6/9/09.

⁹⁸ "Chubb takes aggressive measures to help protect homes from Santa Barbara wildfire." Marketwire. Chubb Group of Insurance Companies. 5/8/09. <http://www.marketwire.com/press-release/Chubb-Group-Of-Insurance-Companies-NYSE-CB-986864.html>. Accessed 6/3/09. See also <http://sanfrancisco.bizjournals.com/sanfrancisco/stories/2008/07/21/story8.html>. Accessed 6/3/09. Personal communication, David Hilgen, Chubb Group of Insurance Companies. 6/3/09

⁹⁹ California FAIR Plan Property Insurance. <http://www.cfpnet.com/>. Accessed 6/3/09.

¹⁰⁰ Austin and Romm 2006., Ibid.

was distorting the market in brushfire zones sufficiently to mask the effect of the fire hazard disclosure law. Properties that required disclosure actually had higher selling prices than their peers with the exception of properties within a short distance of a recent fire.

Insurance market distortions are only a small part of the problem across the West. Indeed, most Western states do not have FAIR Plans.¹⁰¹ In states that have FAIR Plan laws, homeowners are guaranteed low-cost insurance in many fire hazard areas. By changing these laws so that they do not apply to fire-prone landscapes, homeowners would not be able to obtain insurance in some extreme fire hazard areas, which would serve as a deterrent to building in the WUI. At the least, eliminating the brushfire provision from California's FAIR Plan (we do not advocate scrapping other provisions of the FAIR Plan) is an important consideration, and would save taxpayers money.

How the Idea Could Work

Insurance companies may reject applications for insurance if they do not meet their criteria for fire safety, but to date appear to offer relatively affordable insurance in the WUI for all homeowners willing to take modest preventative steps that reduce fire risk. As a result, the cost of insurance does not act as a deterrent to building in places with a high danger of wildfire.

One way to raise insurance rates is to increase the risk to companies that insure homes in fire-prone areas. This would require diminishing the amount of protection provided by federal taxpayers. In other words, the risk of insuring homes in the WUI is currently less than it would be without the Forest Service, BLM, and FEMA paying the bulk of the cost of protecting homes.

By eliminating federal subsidies and changing the FAIR Plan laws, insurance companies could use fire hazard maps to inform their policies and set rates that truly reflect the risk, and the cost, of building homes in the WUI. For example, the Insurance Services Office (the same organization that maintains the Public Protection Classification) has a product called "Location" that can provide detailed wildfire risk maps for nine western states.¹⁰² Federal and state agencies could further assist by making their WUI maps available to the public, and the insurance companies.

Pros and Cons of the Idea

High-cost insurance could discourage development in the WUI, and there is some evidence that this was the case in California before the passage of that state's FAIR Plan. Today, however, the insurance market is not serving as a disincentive to building on fire-prone lands because fire risk is being under-priced. There are several possible reasons:

¹⁰¹ See insure.com article on how to get a FAIR Plan policy. It includes a list of states with FAIR Plans. <http://www.insure.com/articles/homeinsurance/fair-plan.html>. Accessed 6/3/09.

¹⁰² <http://www.iso.com/Products/LOCATION/LOCATION-Wildfire-Services.html>. Accessed 6/3/09. See also a private firm Proxix, which has mapped fire risk as a fee service to insurance companies <http://www.proxix.com/Products/Data/Insurance/Wildfire/>. Accessed 6/3/09.

1. Federal fire suppression spending reduces the risk of fire related damages. This subsidizes the cost of living near fire-prone areas, and benefits insurance companies, who can offer lower insurance premiums than they otherwise would.
2. Wildland fire losses are not a significant cost risk for insurance companies when compared to other home insurance threats.
3. State policies (for example, FAIR laws) make it difficult or impossible for insurance companies to reject homeowners on the basis of fire risk, or to make the rates so high as to discourage development.

The availability of cost-competitive insurance in the WUI is the result of billions of dollars of federal fire-suppression efforts—essentially a subsidy to the homeowner that allows them to benefit from low-cost policies, and a subsidy to the insurance companies that allows them to charge low fees. The insurance industry is taking small steps to leverage the federal spending by requiring defensible space and providing targeted structure protection, but these actions do little or nothing to steer development away from fire-prone lands. At worst, “defensible space” requirements could serve to encourage more development, rather than send the correct price signals called for by USFA.

It is often argued that wildfire is simply not a large enough risk for the insurance industry to steer clear from insuring homes on fire-prone lands. Nationally, catastrophic fires account for 2.2 percent of insurance losses, compared to 26 percent for tornadoes, 46.3 percent for hurricanes and tropical storms, 7.5 percent for terrorism, 7.8 percent for winter storms, 6.4 percent for earthquakes, and 3.1 percent for wind/hail damage (insurance losses are costs paid by the insurance industry after a natural disaster).¹⁰³

To the extent that there is a problem with insurance markets, the problem is subsidized insurance that guarantees homeowners coverage in the few places the market has deemed too risky, most notably the extreme brushfire hazard areas in Southern California and the San Francisco Bay Area. Eliminating brushfire coverage from California’s FAIR Plan would be a small step, but overall the insurance industry is an unlikely solution to the problem of development in the WUI and escalating fire suppression costs.

There will also be strong opposition to the insurance industry declining to insure America’s homes. The Consumers Union (the organization that publishes Consumer Reports) lobbied for the California legislature to intervene and prevent insurance companies from penalizing those who choose to live in harms way after a series of wildfires in San Diego destroyed nearly 2,500 homes in 2004.¹⁰⁴

¹⁰³ Your Guide to Understanding Insurance Catastrophes: Wildfire. Rocky Mountain Insurance Information Association. http://www.rmiia.org/Catastrophes_and_Statistics/Wildfire.htm. Accessed on 6/9/09.

¹⁰⁴ Consumers Union Supports Emergency Insurance Regulations in Wake of Southern California Fires. ConsumersUnion.org October 25, 2007. http://www.consumersunion.org/pub/core_financial_services/005059.html. Accessed 6/3/09. -

Will the Proposed Solution Reduce Fire Suppression Costs?

Not under current regulatory or market conditions. The trend is for insurance companies to support fire-wise education, require modest defensible space activities at the home site, and even contract with fire suppression companies to protect homes during fires.¹⁰⁵ On the shoulders of massive federal and state fire suppression efforts, these activities at the home site save structures, and are cost effective, allowing insurers to continue to write policies in the WUI at competitive prices. Insurance rates will not go up, and therefore will not serve as a deterrent to future development, as long as the federal government continues to spend billions on fire suppression.

One idea, presented at the end of this paper, is to reduce the amount of money available to the federal agencies for firefighting.

¹⁰⁵ Chubb takes aggressive measures to help protect homes from Santa Barbara wildfire. Marketwire. Chubb Group of Insurance Companies. May 8, 2009. <http://www.marketwire.com/press-release/Chubb-Group-Of-Insurance-Companies-NYSE-CB-986864.html>. Accessed 6/3/09. See also <http://sanfrancisco.bizjournals.com/sanfrancisco/stories/2008/07/21/story8.html>. Accessed 6/3/09.

8. ZONING

Limit Development in the Wildland-Urban Interface with Local Planning and Zoning Ordinances

The Idea

Local governments can regulate where future homes are built, directing them away from the most fire-prone parts of the WUI, by using planning tools, including zoning ordinances.

Only if the federal government ceases to carry most of the suppression costs of protecting homes from forest fires will local governments attempt to find ways to direct development away from the WUI, and therefore protect their budgets.

Background

Some state and county governments use regulations to control the danger and costs associated with home building in the wildland-urban interface. Many of these are listed in the Forest Service’s searchable online *National Database of State and Local Wildfire Hazard Mitigation Programs*.¹⁰⁶

The vast majority of these regulations are aimed at encouraging the creation of defensible space around homes, ensuring fire crews can access the property, educating landowners, and establishing building codes, with “Firewise” recommendations directed at either existing or potential new developments. Most of these ordinances and regulations are not aimed at preventing further development in the most dangerous fire-prone lands. Two examples of counties that have restricted future WUI development through regulations are reviewed briefly below.

Napa County Zoning

Napa County, California has a zoning ordinance that was adopted in the 1970s that limits growth in areas where the “combination of natural fuel, loading, slope and fire weather frequency produce a high fire hazard.” The intent of the ordinance is to minimize the potential for wildfires, minimize property damage and limit urban development in highly dangerous, fire-prone parts of the county. An important component of the ordinance is the mapping (by the California Department of Forestry) of high fire hazard areas. Applications for new developments can be rejected because of location in fire hazard areas, steep topography, dense vegetation, and inadequate roads and water supplies for firefighting.¹⁰⁷

The Napa County fire-zoning ordinance has never been applied because new

¹⁰⁶ Forest Service. National Database of State and Local Wildfire Hazard Mitigation Programs <http://www.wildfireprograms.usda.gov/>. Accessed 6/2/09.

¹⁰⁷ Napa County Zoning Ordinance, CA — Chapter 18.84 FR Fire Risk Combination District: 18.84.010 “Intent of Classification,” as listed in <http://www.wildfireprograms.usda.gov/> by searching “Napa County.” Accessed 6/2/09. Also, Personal communication, John McDowell, Deputy Planning Director, Napa County. 6/10/09.

legislation, passed in the 1980s, prevents land from being developed if it is zoned for agricultural use. This legislation was passed at the behest of the wine industry in order to protect valuable agricultural lands from being urbanized in the manner of neighboring counties. In effect, the result is the same—zoning to prevent further home development.

Skagit County Zoning

Skagit County, Washington uses a zoning ordinance to limit development to inside the boundaries of the Rural Fire Protection District. The ordinance acts as an urban growth control by limiting residential and commercial development to areas that are defensible by firefighters. Some building may occur under special circumstances, and then it is accompanied by requirements for vegetation management.¹⁰⁸

Enacted in 1992 by the Skagit County Board of Commissioners, acting on the recommendation of the Fire Marshal's office, section 14.04.190 of Skagit County Code uses county zoning controls to limit or prevent residential and commercial development located outside of Rural Fire Protection District Areas. This code was enacted in response to two large developments that occurred without planning requirements. A provision in previous code allowed timberland to be swapped in 20-acre parcels. These 20-acre parcels became residential lots, allowing growth and development to spread unchecked and without adequate planning for infrastructure (roads, access, etc.).

Section 14.04.190 addressed this by eliminating the 20-acre exemption. Road access, driveway standards, and location within a Rural Fire Protection District are now required for residential development, effectively curtailing growth in development outside existing fire districts.

The only way to develop property outside fire district boundaries in Skagit County today is the process of annexation. Property owners outside Rural Fire Districts who wish to develop property can apply to have their property annexed into a fire district. This can only occur if the property is adjacent to a fire district, which also prevents “checkerboard” type development. The decision is made by the rural fire district (usually in consultation with the Fire Marshal), which typically consists of local volunteers, and the Washington State Review Board. If the fire district feels that it cannot adequately offer protection to the annexed property, the annexation can be denied. Furthermore, the State Review Board, again made up of local citizens, can also deny annexation.¹⁰⁹

¹⁰⁸ Skagit County, WA, Zoning Ordinance and Growth Policy, as listed in <http://www.wildfireprograms.usda.gov/> by searching “Skagit County.” Accessed 6/2/09. Exceptions are granted if the lot was a legal lot of record prior to the adoption of the ordinance in June of 1990, if approved non-combustible roofing materials are used, if vegetation management is undertaken to minimize fire risk, and if fire suppression sprinklers are installed.

¹⁰⁹ Personal communication, Dan Cain, Fire Marshal, Skagit County, Washington. 6/10/09. See also: <http://www.skagitcounty.net/Common/asp/default.asp?d=FireMarshal&c=General&p=main.htm>. Accessed 6/15/09.

A recent assessment of efforts to control wildland fire hazards on expanding development in the WUI in six counties on the Front Range of Colorado revealed that “wildfire mitigation techniques (defensible space, fire-wise programs) can reduce wildfire risks, but do nothing to limit the growing number of people moving into wildfire-prone areas.” After reviewing county rules, policies and efforts to control wildfire hazards, the study concluded:

None of the six counties except Boulder has yet addressed its growing WUI in a way that connects its county growth management goals to its wildfire risks. On the contrary, counties have been welcoming growth and satisfying themselves with wildfire mitigation plans and regulations.¹¹⁰

The author points out that Boulder County, Colorado has had some success in limiting its growth boundaries by buying open space (an idea suggested earlier in this paper) and by engaging in land swaps with federal agencies. The author also suggests that Urban Growth Boundaries or Transfer of Development Rights programs (e.g., Pitkin County, Colorado and Teton County, Wyoming) could be used to curb growth in the WUI.

Despite few current examples of WUI zoning, interest in the idea is growing. For example, the Rocky Mountain Land Use Institute (RMLUI), affiliated with the Sturm College of Law at the University of Denver, is developing a sustainable community development code, including a section on mitigating “Wildfire Hazard in the Wildland-Urban Interface.” The draft WUI code sets Bronze, Silver and Gold “achievement levels” for communities as they seek to reduce risk and provides examples of regulations and mitigation techniques that will help reduce risk while saving funds and property. The recommendations include thinning and providing access and defensible space at the Bronze level. At the Gold standard level, the model ordinance offers a number of stricter recommendations, ranging from prohibiting development—“Restrict or prohibit development in high-hazard fire areas,” and “eliminate residential uses in the WUI”—to incentive-based ideas, such as redirecting development using a transferable development rights system.¹¹¹

How the Idea Could Work

Zoning ordinances are rarely used to limit or restrict development in the WUI, or to redirect it away from the WUI. It is plausible, even highly likely, that county governments (and state legislators working on enabling legislation) will accelerate the use of zoning ordinances if the federal government transfers a higher portion of the costs of protecting homes from wildfire to local

¹¹⁰ Mowery, M.A. 2008. Wildfire and Development: Why Stronger Links to Land-Use Planning are Needed to Save Lives, Protect Property, and Minimize Economic Risk. Master’s Thesis. Department of Urban Studies and Planning, Massachusetts Institute of Technology. <http://hdl.handle.net/1721.1/44338> Accessed 6/9/09.

¹¹¹ Rocky Mountain Land Use Institute. Wildfire Hazard in the Wildland-Urban Interface (Revised 1-28-09). <http://law.du.edu/documents/rmlui/sustainable-development/Wildfires-in-the-Urban-Interface%201-30-09.pdf>. Accessed 6/8/09.

jurisdictions. In other words, zoning development away from the WUI may work, if there is a higher level of cost responsibility.

Pros and Cons of the Idea

Whether counties can effectively zone in such a way as to redirect development away from the WUI depends on several factors, including:

1. *Presence of enabling legislation.*

Counties can develop good ideas that are sometimes not permissible by state law, or for which no enabling legislation exists. Sometimes new state laws need to be enacted before successful county-level planning efforts can proceed.

2. *Availability of models for states and counties to follow.*

The work by RMLUI and others to provide references, code examples, and commentary—of how some counties and communities are addressing wildland fire risk in the WUI— will provide tested examples that local governments can more easily adopt or modify. As suggested earlier in this paper, this form of land use planning assistance could be provided by the federal government through programs like the Forest Service’s State and Private Forestry program.

3. *How strictly the rules are written and enforced.*

Even strict rules will not curtail development if they are not enforced, or if they contain loopholes. Skagit County’s idea of preventing development outside the Rural Fire Protection District would be less effective if the District were so broadly defined that it included fire-prone forested areas. Exemptions, such as zoning variances, are another way the effectiveness of a program could be limited. The Skagit ordinance, for example, allows for limited development outside the Rural Fire Protection District if certain criteria are met.

4. *Political will.*

Zoning is a tough political obstacle, especially in the West. As noted by Harold Blattie, executive director of the Montana Association of Counties:

“The reality in this state is that zoning is a four-letter word, and it’s the only tool counties have to control building in the wildland-urban interface.”¹¹²

The decision to prohibit development in fire-prone landscapes is in the hands of elected officials, who may or may not be inclined to use regulatory tools. The Growth Policy of Gallatin County, Montana, for example, contains language regarding the need for water supply, access and evacuation, building densities, vegetation management, and defensible space, if the development is in the WUI. However, the approval of a proposed new subdivision is at the discretion of the county commission on a case-by-case basis; if a proposed new

¹¹² “Fire Bills Went Up in Smoke.” Brett French. June 10, 2009. Billings Gazette. <http://www.billingsgazette.net/articles/2009/06/10/news/state/24-firebill.prt>. Accessed 6/10/09.

development is deemed to be too risky, it may be denied.¹¹³ (This is a typical example of where detailed fire hazard maps can be used to justify such decisions).

Zoning is more likely to succeed if it is backed by powerful political and economic interests who stand to gain from it. Napa County is a good example of this, where more recent agricultural protection zoning (rather than fire-protection zoning) was initiated to protect the interests of powerful vineyard owners.

The political impediment to zoning would be less difficult to overcome if county governments had a strong financial incentive to curtail development and control costs. Being asked to pay a higher share of the firefighting costs in order to account for local land use decisions would raise local expenses. This would necessitate stricter land use planning tools such as zoning (or transferable development rights programs), and the need to control costs would provide local elected officials with the political cover they need.

Yes, if combined with the incentives and penalties suggested in the other ideas presented in this paper that would make the county consider the financial implications of their land use decisions. The land use planning tools exist, there is precedence for using tools like zoning and transferable development rights and there are organizations that can help county governments implement these ideas.

Will the Proposed Solution Reduce Fire Suppression Costs?

¹¹³ Gallatin County, MT — Regulating Development in the Wildland/Urban Interface, as listed in <http://www.wildfireprograms.usda.gov/> by searching “Gallatin County.” Accessed 6/8/09. Personal communication, Warren Vaughn, Assistant County Planner, Gallatin County. 6/1/09.

9. ELIMINATE MORTGAGE INTEREST DEDUCTIONS

Eliminate Home Interest Mortgage Deductions for New Homes in the Wildland-Urban Interface

The Idea

Greatly reduce or eliminate the federal home mortgage interest deduction for new homes built in fire-prone areas.

Background

Through the federal tax code, homeowners may deduct the interest on loans to buy, build, or improve a home for mortgages up to \$1,000,000 on a first or second home.¹¹⁴ This deduction is one of the most expensive in the federal tax code. The Joint Tax Committee estimates the deductions will cost the federal government \$90 billion in Fiscal Year 2010, increasing to \$107 billion in FY 2012. The average benefit to an individual or couple filing for this deduction is roughly \$2,000 per year.¹¹⁵ For homes in the WUI, which are generally on larger lots, the mortgage interest deduction may be much higher.¹¹⁶

Among its effects, the mortgage interest deduction encourages home buyers to purchase more expensive homes; which generally means larger homes on larger lots.¹¹⁷

As noted earlier in this paper, a study by Headwaters Economics contained two findings related to the mortgage interest deduction: one in five homes in the WUI is a second home, and homes built near forested public lands are much more likely to occupy more acreage than non-WUI residences. Residential lots built in the WUI take up more than six times the space of homes built in other places. On average, 3.2 acres per person are consumed for housing in the wildland-urban interface, compared to 0.5 acres on other western private lands. This pattern suggests that the national taxpayer is, to some extent, subsidizing the more affluent homeowner and second homeowner, who often is better able to pay for purchasing, protecting, and insuring these homes.¹¹⁸

Our research in Montana showed that wildland firefighting costs are highly correlated with the number of homes threatened by a fire and that the pattern of development is an important contributing factor, with dispersed development contributing more to the cost of fighting fires.

¹¹⁴ Congressional Research Service (CRS), August 8, 2005, *Fundamental Tax Reform: Options for the Mortgage Interest Deduction*. (CRS – RL33025).

¹¹⁵ U.S. Congress, Joint Committee on Taxation, October 31, 2008, *Estimates of Federal Tax Expenditures for Fiscal Years 2008-2012*, JCS-2-08.

¹¹⁶ For example, a homeowner with a \$400,000 mortgage at 5% interest would be eligible for an average annual deduction of \$3,700; an owner with a \$800,000 mortgage under the same conditions would be eligible for \$7,500 in annual interest deductions. For a mortgage calculator, see Bankrate.com: <http://www.bankrate.com/calculators/mortgages/mortgage-calculator.aspx>. Accessed 8/27/09.

¹¹⁷ Glaeser, Edward L. and Shapiro, Jesse M., *The Benefits of the Home Mortgage Interest Deduction* (October 2002). Harvard Institute Research Working Paper No. 1979.

¹¹⁸ Headwaters Economics, 2007. Also, Gude et al 2008.

For example, one dense subdivision is less costly to protect than the same number of homes spread across a large area of land. When a large forest fire burns near homes in Montana, costs related to housing usually exceed \$1 million per fire. As few as 100 threatened homes, if spread across large lots, could result in a \$10 million increase in suppression costs in a single year.¹¹⁹

This discrepancy in cost between dense versus sprawled development means that the mortgage interest deduction—by encouraging second homes and subsidizing larger lot sizes—is increasing fire suppression costs. In a sense, the federal taxpayer is often paying twice: first to provide a mortgage deduction for homes in the WUI, and then for the additional firefighting cost caused by the larger lots in the WUI.

How the Idea Could Work

In 1986, as part of comprehensive tax reform legislation, Congress and President Ronald Reagan agreed to eliminate the ability to deduct interest on credit-card interest or other consumer loans—but left the mortgage interest deduction in place.

As part of a future reform, Congress could require extensive mapping of fire-prone lands (as discussed in greater detail in the mapping and flood plain insurance solution sections of this paper). Once the mapping is completed, and allowing for an appropriate education and phase-in period, Congress could legislate that new homes build in the WUI would either not qualify for a mortgage interest deduction or that the mortgage interest deductible for those new homes would be phased-out over a period of years (say \$100,000 annually) until the allowable deduction reached zero.

Pros and Cons of the Idea

Eliminating or greatly reducing the mortgage interest deduction would have benefits in terms of reducing future fire suppression costs by decreasing both the number of new homes built in the WUI and the lot size of those new homes.

The obstacles to implementing such a proposal are large and widespread. Home ownership is a requisite part of the American dream. The mortgage interest deduction has existed much longer than any prospective homebuyer and is protected by a strong coalition of important interests in Washington, D.C. Previous reform efforts to reduce or modify the mortgage interest deduction have failed outright, and there is no indication that future restructuring proposals would enjoy greater success, especially in light of the current economic turmoil and housing downturn.

¹¹⁹ Gude et al 2008, Ibid. and Headwaters Economics 2008.

Will the Proposed Solution Reduce Fire Suppression Costs?

Yes, a measure to eliminate or phase out the mortgage interest deduction for new residences built in the wildland-urban interface would impact both the number of homes built in the WUI and decrease the size of the lots for new homes near fire-prone public lands. Both impacts would reduce fire suppression costs.

10. REDUCE FEDERAL FIREFIGHTING BUDGETS

Induce Federal Land Managers to Shift More of the Cost of Wildland Firefighting to Local Governments

The Idea

Reduce the amount of money available to the Forest Service and BLM for wildland firefighting, which will force these agencies to shift the costs down to the local level, closer to where private land use decisions are made. County governments currently enjoy a firefighting subsidy from the Forest Service, BLM, FEMA and state governments, so there is no financial disincentive to curtail the building of more homes on fire-prone lands. If the federal government has less money available to spend, more of the burden of protecting homes will fall on county-level jurisdictions. This, in turn, will serve as a powerful disincentive to permit more homes in the wildland-urban interface.

Background

Annual spending by the Forest Service and BLM for wildland firefighting is substantial and continues to grow. From 1996 to 2000, the average annual appropriation to the agencies for wildland firefighting was \$1.5 billion. From 2001 to 2007, the annual average appropriation more than doubled, to \$3.1 billion.¹²⁰

The factors that drive up cost—fuel build-up, warmer weather, and more homes built in dangerous places—also continue to grow. It is intuitive, therefore, to imagine the problem could be solved by spending more money. Unfortunately, despite the rapidly escalating firefighting budget, the growing residential development in the WUI, and the cost burden it brings, is not adequately addressed.

How the Idea Could Work

A smaller federal firefighting budget could significantly influence the pace, pattern and scale of development on fire-prone private lands, if it results in local jurisdictions (and insurance companies) paying a larger share. If a higher proportion of the costs are borne by county governments then, to balance their budgets, county commissioners will be more judicious about permitting new developments in the WUI.

A higher share of the cost responsibility for local governments could also provide county commissioners with the political cover they need to do land use planning that incorporates fire risk and to reject applications for new proposed residential developments that are in high-risk areas.

If the Forest Service and BLM had smaller budgets for firefighting, this may lead to:

¹²⁰ In 2007 dollars. GAO-09-444T, Ibid.

VI. SOLUTIONS: *Shift Firefighting Costs to Local Governments*

1. Prioritization on how to spend limited funds; for example, defense of life and property on the existing built-up portion of the WUI may become the first priority.
2. County governments taking up a larger share of the responsibility for defending homes from fires.

To be fair, the federal agencies could continue to protect already developed WUI properties and educate those landowners on Firewise practices. For new developments proposed in areas identified as having a high risk of wildland fire, the Forest Service and BLM managers could warn county governments that, if a fire breaks out, the county will receive a bill for a portion of the total cost of defending the homes.

The conditions for when federal agencies shift more of the cost to the county level could therefore be:

1. The proposed new residential area is in an area that is well documented as being at risk of a wildland fire.
2. The Forest Service and/or BLM have made this information readily available.
3. County commissioners have been apprised of the risks and warned that if they permit the new development, and a wildland fire needs to be fought, they will be asked to pay for a portion of the costs.

Pros and Cons of the Idea

A great deal of disagreement exists between county, state and federal governments, on who should shoulder the burden of wildland firefighting. This disagreement is most acute between state foresters and federal agencies. Federal and state governments have different management practices, dictated by different bodies of law, and influenced by diverse expectations by the public, and even tradition. This can sometimes lead to accusations that one entity is not managing the land correctly (often phrased in terms of not doing enough to reduce fuel buildup), or not fighting the fires aggressively enough (the “let burn” policy of one entity may run counter to the “protect merchantable timber” mandate of another).¹²¹

For this idea to work, it must not result in a transfer of cost responsibility from the federal government solely to state governments. Rather, the shift in financial responsibilities should go directly to the level of government where land use decisions are made: the county.

¹²¹ Kirk Rowdabaugh, Director, Office of Wildland Fire Coordination, Department of the Interior, personal communication, 2/18/09. (Also, former state forester for Arizona and former director of National Association of State Foresters).

Another important consideration is that a reduced firefighting budget may increase the danger from fires. There is an expectation that one of the roles of the federal government is to protect public safety, including defense from the dangers of wildland fires. This challenge could be resolved by prioritizing, making the defense of existing development in the WUI the first objective. As has been pointed out previously in this paper, across the West 14 percent of the WUI is developed, representing four percent of all homes. The objective of this idea is to bring cost share responsibility into the decision whether (or how) to develop the remaining 86 percent of the land.

While this idea is controversial, the spirit of this white paper is to examine all options, even ones that are politically difficult, if not impossible. This particular idea may receive the biggest opposition from the federal agencies themselves. Because the firefighting budget now occupies a significant portion of the agencies' budgets, it supports many people who have dedicated their careers to studying, preparing for, fighting and educating around the topic of wildland fires. A reduced firefighting budget would affect entire departments and many individuals.

Will the Proposed Solution Reduce Fire Suppression Costs?

Yes. However, a reduced firefighting budget must never lead to increased danger to people and properties on the already developed portion of the WUI.

VII. CONCLUSIONS

Defending private property from wildfires is expensive and dangerous. From the perspective of federal land management agencies, fighting wildland-urban interface wildfires presents a tough political obstacle because the majority of the WUI is on private lands. Yet with continued pressure for more development, a warmer climate and a lack of fire-related county land use planning, we are only beginning to see a small part of the potential magnitude of this problem.

Today, few if any of the costs of protecting private property are borne by elected county officials, who make the land use decisions on private lands. The current system therefore lacks cost accountability. As long as someone else is paying the bill, those who permit the development of homes in dangerous, fire-prone landscapes have no incentive to change.

Roger Kennedy, the former National Park Service Director, states the situation succinctly:

We must cease making the problem worse by encouraging more people to settle where they cannot be protected and where nature cannot be protected from them. We should stop subsidizing and encouraging people to join the land rush into fire danger, a danger increasing with global warming.¹²²

To combat the rising danger and cost associated with wildfires, Congress should direct federal agencies to find ways to influence where future private land development takes place and how much of it will occur on the most dangerous, fire-prone lands. If the federal government will not exercise its influence on the pace, scale, and pattern of development on private lands, then all other efforts—public lands fuels reduction, coordination between agencies, and landowner education—will have minimal impact on controlling costs.

Mapping the location of the most fire-prone lands is an important step in the right direction because it will alert county commissioners, insurance companies, and firefighting agencies where the dangers lie, and whether proposed new residential subdivisions will be built in harm's way. Educating a broad public about the costs of protecting homes in the WUI also is important. This information could lend political cover for county officials who want to steer development away from danger. By themselves, these ideas will not alter the course of development on private lands, but they are an essential ingredient to any long-term solution.

Federal land management agencies—the Forest Service and Bureau of Land Management in particular—have long been reluctant to influence development patterns on private lands. Yet, there is much the federal government can do. There are numerous financial and technical assistance programs that help with land acquisition for conservation, provide education

¹²² Kennedy, *Wildfire and Americans*, *Ibid.*, p. 19.

of landowners on how to build “fire-safe” homes, and provide firefighting resources for local governments.

Incentives also need to be created to convince county officials it is in their best interest to sign Master Agreements that spell out how the county will pay for their share of firefighting costs. Eventually, disincentives need to be tried, including simply billing those counties for their share of the cost of home protection for fires where homes have been recently permitted in clearly known and dangerous fire-prone lands.

Of the more than \$3 billion annual appropriation the agencies receive for wildfire, Congress should direct the agencies to spend a portion of this (along with funds from sources such as the Land and Water Conservation Fund) to acquire fire-prone lands (or easements on them). The funds could be used to protect land from development, and to assist counties in implementing land use policies, including zoning, that direct development away from the most dangerous places. The level of assistance could be tied to performance standards, with county governments that have successfully steered new development away from fire-prone land receiving higher levels of financial and technical support.

The model of reforming flood insurance and mortgage insurance also offers an opportunity. New programs that would require the adoption of ordinances by local governments to limit development in high-risk fire-prone lands would help reduce future fire-suppression costs now borne by the national taxpayer.

These and other possible solutions for restraining development in the WUI will work only if Congress eliminates the federal subsidies for protecting homes in the wildland-urban interface. Ideally, increased risk of building in fire-prone lands should be reflected in higher insurance premiums, and these should be high enough to dissuade people from wanting to build in the most dangerous fire-prone places. However, currently the homeowners benefit from having the federal and state firefighting agencies shoulder the burden for protecting homes, which lowers the risk to insurance companies, and keeps premium costs relatively low. In light of these market conditions, there could be a national insurance requirement that limits the risk to the national taxpayer by making local fire-safe ordinances (and eligibility for home mortgages) contingent on proven efforts to direct development away from the WUI.

Another subsidy that could be terminated with the effect of altering development on private lands is elimination of mortgage interest deductions on new homes in the wildland-urban interface.

Zoning and other county-level land use plans can be used to change the pace, scale, and pattern of development on private lands. There are many tools in the land use planning toolbox, and some have been successfully applied in the West. However, without sharing the cost of firefighting down from the federal to the local level of government, there is little incentive, and little political cover for county commissioners, to use these tools.

One final solution mentioned in this paper is to reduce the firefighting budget of the federal agencies and let them find ways to share the cost of firefighting down to the level of the county, where the land use decisions are made. This idea may be difficult politically. For many who live in the wildland-urban interface, there is a long-held expectation that protection from wildfire is part of the federal government's obligation. In the years following Hurricane Katrina, it is no longer an option for the federal government to not assume a lead role. However, in the spirit of this white paper, all ideas are worthy of some examination.

There is a growing sentiment that individuals and local governments should take a higher level of responsibility for their land use decisions. The ideas presented in this paper are offered as a way to start the conversation on how to do that. Above all, we ask the reader to consider this: without addressing future development in the wildland-urban interface, the already significant firefighting costs, and the substantial risk to people and property, will continue to escalate.



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