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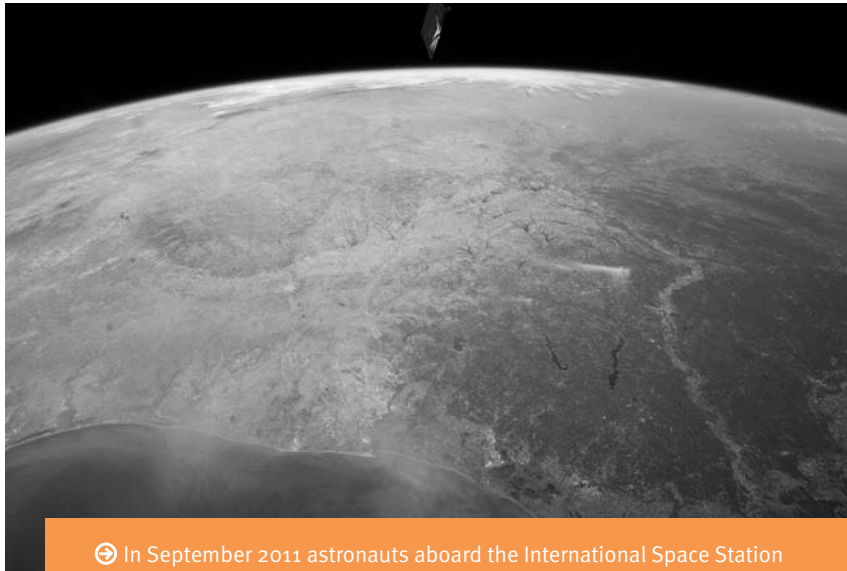
PRACTICE WILDFIRE MITIGATION

A large, bold, black number '5' is centered in the lower half of the cover. The background is a vibrant, abstract image of orange and yellow flames, suggesting a wildfire. The number '5' is superimposed over the flames, with the fire appearing to flow around and through it.

Limiting Wildfire Risk Through Land-Use Controls

By Molly Mowery and Paul Anthony, AICP

Wildfire hazard is a growing threat to communities around the United States.



NASA Earth Observatory

➡ In September 2011 astronauts aboard the International Space Station captured smoke plumes from wildfires burning near Austin and Houston in Texas and near Shreveport, Louisiana.

Preferences for second homes, suburban lifestyles, and the desire to live closer to nature have pushed populations into the wildland-urban interface (WUI)—areas with more vegetation, parks, and forests than their dense city center counterparts. Living closer to nature offers many benefits, but all too often the risk of brush, grass, or forest fires gets overlooked.

The reality of wildfire, however, is one we cannot afford to ignore. In 2011 the National Interagency Fire Center reported nearly 75,000 wildfires in the U.S., the majority of which were a result of human activities. At a time when public-sector

budgets are being slashed, wildfire costs for suppression and damages are soaring. The federal government typically spends more than one billion dollars annually on responding to fires on both public and private land. In fact, the bulk of suppression costs goes to protecting homes, infrastructure, and other community amenities in the WUI (Headwaters Economics 2009). Losses associated with fires occurring on municipal lands also cost local governments millions of dollars annually (Thomas and Butry 2012).

In addition, the impacts to our communities play out in other tragic ways. A recent illustration is the historic 2011 fire season in

Texas. At its peak last October, nearly 97 percent of the state was experiencing extreme or exceptional drought. This was preceded by 12 months of record-breaking temperatures and the driest period on record since the state began record keeping in the late 19th century. The extreme heat and dry conditions resulted in wildfires throughout Texas that burned nearly four million acres of land, destroyed nearly 3,000 homes, and claimed 10 lives. Major disaster declarations were made for 52 counties. Damage from the fires was estimated at roughly a half-billion dollars (Dutzik and Willcox 2012).

Texas is not alone. Trends throughout the country remind us that many different regions are facing prolonged droughts, longer and hotter summers, a rising number of climate-related threats to forest health such as pine beetle infestation, and the limited ability to manage landscapes—all of which can significantly increase wildfire risk (Bachelet et al. 2007). As communities push for strong economic, social, and environmentally responsible agendas, we should not be caught off guard by the next wildfire disaster. We know fires will continue to happen; the question is, how can we reduce wildfire threat to communities living close to nature and enjoying its benefits without causing harm and compromising safety?

The National Fire Protection Association (NFPA), a nonprofit organization whose mission since 1896 has focused on protecting lives and property from fire, has made it a priority to answer this question. For the past 25 years NFPA has been engaged with

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About the Authors

Molly Mowery manages the Fire Adapted Communities program and International Outreach for the National Fire Protection Association’s Wildland Fire Operations Division. Her background includes community planning throughout the U.S. and abroad to address land-use, sustainable development, and hazard mitigation issues. She holds a BA from Naropa University and a Master in City Planning degree from the Massachusetts Institute of Technology.

Paul Anthony, AICP, is an attorney and planner and is currently an associate with Clarion Associates in Denver. He has been involved in numerous code projects for a range of local agencies and nonprofit organizations throughout the country. He also helps communities to identify and reduce regulatory barriers to affordable housing in their codes and provides land-use litigation support to help communities uphold their development regulations.

a host of federal, state, and local government agencies to support voluntary and mandatory measures that address wildfire risk. These efforts range from outreach and education, such as the successful Firewise Communities/USA recognition program, to the more recent Fire-Adapted Communities initiative, a major awareness campaign to increase public knowledge of resources and actions to reduce wildfire risk in the WUI.

NFPA has also been building stronger connections with the planning and development community, seeing a significant opportunity to influence the wildfire outcome through proactively planning for safer, more resilient communities. Very little research, however, has been done on the effectiveness of current land-use tools that planning professionals can employ as a means for reducing wildfire risk.

With WUI fire risks rising and public budgets shrinking, NFPA embarked on a study to assess the potential effectiveness of using local regulatory and planning tools to address community wildfire risk. The ultimate purpose of the study, however, was not to provide an inventory of wildfire regulations used by local communities, but to identify how planners can (and should) become more active participants in keeping their communities safe from wildfire. Clarion Associates was hired to conduct the study because of its broad national practice and expertise in sustainable development practices including hazard mitigation and efficient public administration.

The good news, as reinforced by the study’s findings, is that the current tech-

nical tools and approaches available for addressing wildfire risk, such as defensible space and fire-resistant roofs, are effective at protecting structures and lives if used appropriately. Planners can confidently rely on the proven work of professional firefighters, foresters, landscape architects, and others who have developed these tools to fight wildfire, many of which are published in model codes and are easy to find.

serve as advisors for the study. The communities were selected to include a mix of geographic, demographic, and regulatory environments and were located in the regions with the highest wildfire risk—the Southwest, Rocky Mountains, West Coast, and Florida.

We then prepared a comprehensive inventory of the regulatory techniques used in each community to address wildfire risk. Few

With WUI fire risks rising and public budgets shrinking, NFPA embarked on a study to assess the potential effectiveness of using local regulatory and planning tools to address community wildfire risk.

The focus of this article will be on the lessons learned and regulatory implications of the study for planners, rather than a comprehensive recitation of the raw data or a listing of all the wildfire-related techniques used in local codes, both of which are available in the full report (www.nfpa.org/regulatorytools). We begin with an overview of the study’s methodology and results.

REVIEW OF WILDFIRE REGULATORY TOOLS

Forty-two communities were initially selected for a targeted review of their local wildfire regulations. This selection was based on a literature review of current wildfire regulatory issues and included input from a panel of technical experts formed to

studies have collected this type of regulatory data in one place. Voluntary programs such as Community Wildfire Protection Plans or Firewise Communities/USA were not included in the research because our focus was on local regulatory controls (not advisory, voluntary, or educational programs) and especially those in fire, building, and land-use codes.

The inventory separated wildfire tools into one of four categories: 1) community scale, 2) neighborhood or subdivision scale, 3) individual lot scale, and 4) individual building scale. This approach provides a hierarchy of tools that allows planners to quickly assess and compare at what “level” each WUI tool regulates and to select the tools that correspond most closely with

PROFILES OF INTERVIEWED COMMUNITIES

Community	Population	State Regulatory Environment	Primary WUI Official(s)	Community-wide tools	Neighborhood subdivision level tools	Lot-Specific tools	Structural tools
Palm Coast, Florida	74,000	State WUI mapping	Building Dept.	High	Medium	Medium	None
North Port, Florida	56,000	State WUI mapping	Fire Dept.	High	Low	Medium	None
Clark County, Washington	425,000	No state WUI requirements	Building Dept.	Medium	Medium	Medium	Medium
Missoula County, Montana	110,000	No state WUI requirements	Fire Dept.	None	Low	Medium	Low
Bend, Oregon	76,000	State WUI mandate	Code Enforcement	High	High	High	Medium
Boise, Idaho	205,000	No state WUI requirements	Fire Dept.	Low	High	High	High
City of Santa Barbara, California	88,000	State WUI mandate	Fire Dept.	High	High	High	High
Glendale, California	192,000	State WUI mandate	Fire Dept.	High	High	High	High
Douglas County, Colorado	285,000	State WUI mapping	Building (Fire Specialist)	High	High	High	High
Utah County, Utah	530,000	State WUI model code	Fire Dept.	Medium	High	Medium	High
Village of Ruidoso, New Mexico	8,800	No state WUI requirements	Forestry Dept.	High	High	High	High
Prescott, Arizona	40,000	No state WUI requirements	Fire Dept.	High	High	High	High

their wildfire hazard needs and political environment.

INTERVIEWS WITH LOCAL COMMUNITIES

Based on the literature review and categorization of regulatory tools, 12 communities were selected for phone interviews with those local officials most responsible for the creation, implementation, and enforcement of local wildfire regulations (usually the fire marshal, building official, planner, local forester, landscape architect, or WUI specialist, as applicable). These discussions analyzed how well local wildfire regulations were working and where improvements could be made. This “ground truthing” is critical because, as planners know too well, regulations that appear innovative and desirable on paper may prove to be ineffective, unenforceable, or even counterproductive in practice.

The full text of the interview questions can be found in the report, but the purpose of the questions was to find out why communities adopted WUI standards, how the political process went, how their standards are working, whether enforcement was a problem, and how WUI regulations can be improved.

The 12 communities were selected to represent a range of cities and counties within each of the following four regulatory

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categories, namely: 1) states with a WUI regulatory mandate; 2) states with a WUI model code; 3) states that provide WUI mapping; and 4) states without WUI mapping, models, or requirements. These categories are important because a community’s regulatory response to wildfire is often heavily influenced by state regulations and resources or the lack thereof. The table above provides a summary of each community’s WUI profile.

The interview responses did not lend themselves to quantitative summary (i.e., five of 12 respondents said X) because the questions often required nuanced or multi-layered answers. Thus, answers were summarized according to the levels of general agreement and central themes, with indications of frequency where applicable (i.e., “most” communities do X).

The most significant general responses are summarized below:

- Most interview communities adopted their first set of WUI regulations in response to a major wildfire or due to state requirements or incentives. A smaller minority adopted wildfire regulations proactively based on historical trends and concerns about imminent wildfire danger.
- The public was often skeptical of proposed WUI regulations at first but usually came to accept or support the wildfire standards if a strong public education effort (such as

Firewise Community initiatives) was made to address concerns and correct misinformation in a transparent and open manner. Reaching out to stakeholders with a vested interest in wildfire regulations, such as home builders, second-home owners, and real estate brokers, was often necessary.

- Some communities adopted some portion of a NFPA uniform standard, an International Code Council model WUI code, or both. No community adopted a model WUI-related code from either organization in full, usually because those “packages” of standards were more comprehensive and complex than the community needed. Many communities used the models codes for guidance in crafting their own regulations, but did not adopt them in any formal way.
- Most communities were generally happy with the technical aspects of their WUI standards because wildfire standards are based on proven science and techniques for reducing wildfire risk.
- By far the most common WUI enforcement problem was the lack of ongoing maintenance

of wildfire risk than new development because there is usually more of it in high-hazard areas and it is often served by nonconforming infrastructure (narrow streets, inadequate water supply, etc.), while new development is typically constructed in accordance with the latest WUI standards.

- Public education and nonregulatory programs that provide direct assistance to home owners (e.g., free expert consultations, free “chipper” days, or regular debris pick-up days during fire season) are important contributors to the effectiveness of WUI regulations.
- WUI regulations were usually administered and enforced by the fire or building department, and planners were rarely directly involved. However, because fire department personnel were usually not trained to perform enforcement duties, shifting enforcement to staff specifically trained in enforcement often resulted in better compliance. In all cases, having one or more persons with clear responsibility for and expertise in wildfire regulatory implementation was a significant aid to effective and consistent enforcement of wildfire regulations.

sections, reflecting the need for interdepartmental enforcement of many wildfire programs. For example, the structural protections (e.g., fire-resistant roofs) may be in the building code, the fire-fighting water supply and road access requirements may be in the fire code, and the vegetative (e.g., defensible space) requirements may be in either the fire or land-use code. In other cases a separate, stand-alone wildfire ordinance may be adopted. Generally speaking, land-use codes were the least likely to contain significant wildfire regulations.

USING LAND-USE REGULATIONS TO REDUCE WILDFIRE RISK

So how can the report’s findings help planners address (or improve) wildfire regulations in their community? As mentioned above, land-use planners have traditionally not played a significant role in wildfire mitigation, instead deferring responsibility to the fire marshal, building official, or other professionals. The number of ways planners can positively influence the outcome, however, is myriad. The following recommendations represent an abbreviated list of ways that planners can engage in addressing wildfire risk while working in their community. Many of these tools overlap and can be combined in unique ways to respond to local circumstances.

Comprehensive Plan/Zoning Policies

Zoning requirements that are explicitly supported by public policy through, for example, the goals and policies in a comprehensive plan tend to be much more legitimate and legally enforceable. Thus, the reduction of fire risk and protection of the ability to fight fires in the WUI should be added into local comprehensive plans and zoning purpose statements.

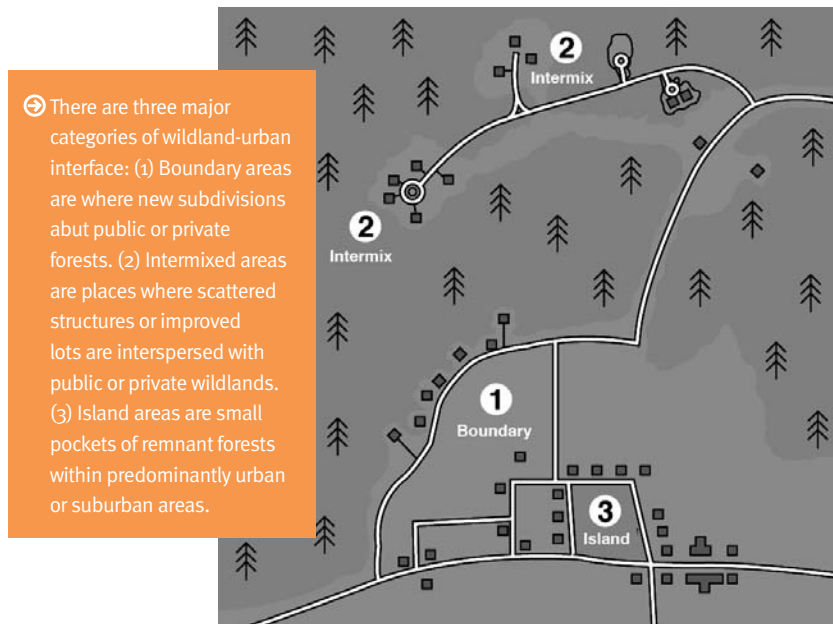
Subdivision Ordinances

Subdivision controls are one of the two most fundamental land-use regulatory tools—the other being zoning. In most states local government powers to regulate subdivision are independent of their powers to zone (i.e., to control the use of land). In communities that have not adopted zoning, subdivision controls may be the best and only option to address wildfire risk at a landscape level. Here are a few possible approaches to reducing fire risk through subdivision standards:

- For unplatted and undeveloped areas, add mapped high and extreme fire risk areas as types of sensitive lands where plats may not locate buildable lots, where allowed density

nance of defensible space (i.e., control of vegetation that creates wildfire risk) due to the lack of landowner knowledge, political will, or local financial resources. In addition, the lack of funding to conduct public education and vegetative clearing was cited as a significant deficiency.

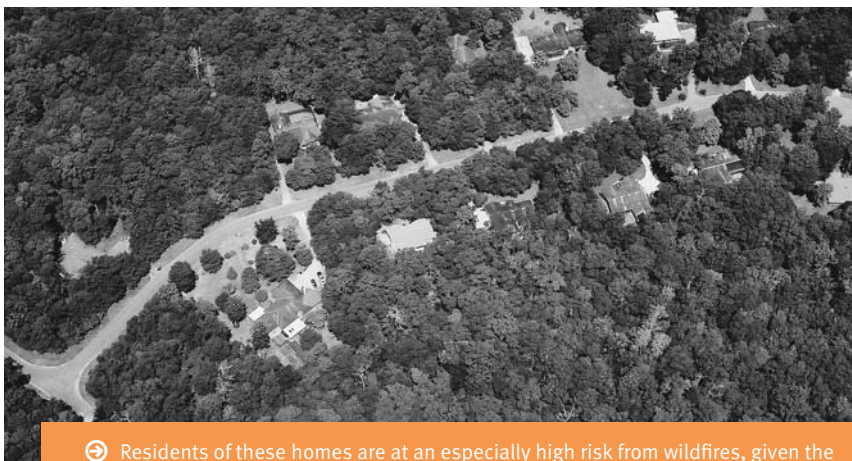
- The interview communities agreed that existing development presents a greater



- Flexibility in the administration of WUI regulations is critical for maintaining community and political support. One-size-fits-all solutions that are unable to respond to unique wildfire and development circumstances in the community are seldom effective and often create political opposition.
- Wildfire regulations typically are scattered throughout multiple local codes and code

is reduced, or where building envelopes located to reduce fire risk must be shown.

- Ensure that subdivision regulations include adequate standards for fire protection water supply and access roads to allow efficient firefighting.
- Adopt a cluster subdivision regulation that requires lots to be grouped away from high and extreme fire risk areas.
- Require or encourage new subdivisions to adopt defensible space standards in their covenants, conditions, and restrictions with clear language for enforcement by the home owner’s association.



USDA Forest Service

📍 Residents of these homes are at an especially high risk from wildfires, given the lack of defensible space around many of the structures and the subdivision’s single access route.

- Require that open space areas, whether required or part of the project’s design (e.g., golf course), be located to also serve “double-duty” as a community wildfire break.

Zoning

Zoning is the local government’s right to control what uses can occur on legally platted lots and tracts of land as well as the size and location of structures on those lots and tracts. Cities and counties can use zoning to prohibit risky businesses (industry using or storing combustible or hazardous materials, gas stations, etc.), sensitive populations (hospitals), and large assembly uses (schools) in high and extreme fire risk areas. Alternately, the local zoning may only permit these risky or sensitive activities and operations as conditional uses subject to a public hearing, where fire risks can be considered and a permit denied if the risks cannot be adequately mitigated. Possible conditions include limitations on the size or capacity of the facility or requirements for an evacuation plan.

Overlay Zoning

Overlay zones are most useful when the intent is to regulate development on a geographic basis rather than a parcel basis. And because high wildfire risk area can usually be mapped clearly, a wildfire overlay is often the centerpiece of a local wildfire program. An analogous and common example is the Federal Emergency Management Agency’s flood risk maps that create overlay zones to govern the uses, location, and design (i.e., “floodproofing”) of buildings in floodplains. The risks involved in WUI areas are different, but the legal principles are the same—local governments can always prevent risky busi-

nesses in the overlay zone or require specific construction techniques (e.g., fire-retardant roofs, special soffit, or vent design) or specific site management practices (e.g., vegetation control) within the overlay zone.

Development and Design Standards

When development is allowed in the WUI, it is important that specialized development standards be included to minimize the risk of wildfire:

- Ensure that all existing code standards, especially those for landscaping, scenic protection, stream/riparian buffers, steep slopes, and tree preservation, are consistent with defensible space/vegetation management requirements.
- Ensure that sign regulations do not prohibit signs required by WUI regulations or those necessary to allow firefighters to locate rural and remote properties and structures.
- Consider requirements for postfire recovery to, in particular, protect soils from erosion where vegetation has been damaged by fire.

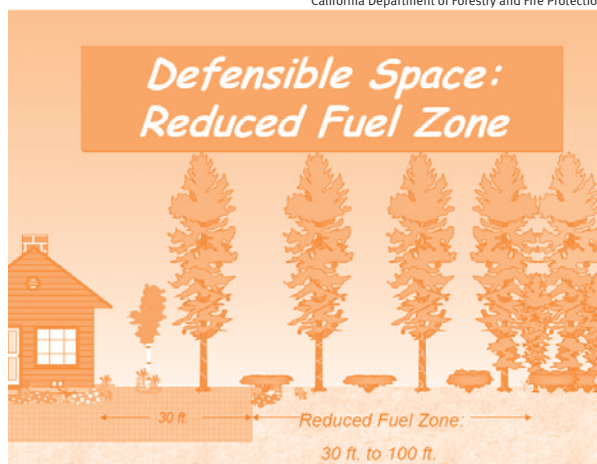
Incentives

For communities not ready to adopt mandatory WUI standards, especially rural or low-density communities, incentives may be the more politically acceptable option:

- Waive platting or site plan approval fees for development applications that agree to implement and maintain defensible-space protections or install fire-resistant roofs.
- Allow construction of a larger house in return for commitment to build a more fire-resistant house and to implement good vegetation management practices.
- In many cases any regulation that can be imposed on a mandatory basis can be con-

nesses, sensitive populations, and large assemblages of people from occupying lands with higher risks to public health and safety. Cities and counties can draft an overlay district based on high and extreme fire risk mapping to prevent the establishment of risky

California Department of Forestry and Fire Protection



- 📍 Defensible space requirements, either in development regulations, or in the covenants, conditions, and restrictions for new residential subdivisions are one of the most important pieces of a local wildfire mitigation strategy.

verted into an incentive by offering landowners something of value in exchange for voluntary wildfire mitigation.

Site Plan Review

Site plan review allows a “second look” at the proposed development (after subdivision and zoning) before issuing building permits. If zoning and subdivision approvals are not needed, site plan review can be used to ensure, for example, that high and extreme fire risk areas are avoided, that adequate and well-signed access is provided, and (if possible) that defensible spaces are included.

Transfer of Development Rights

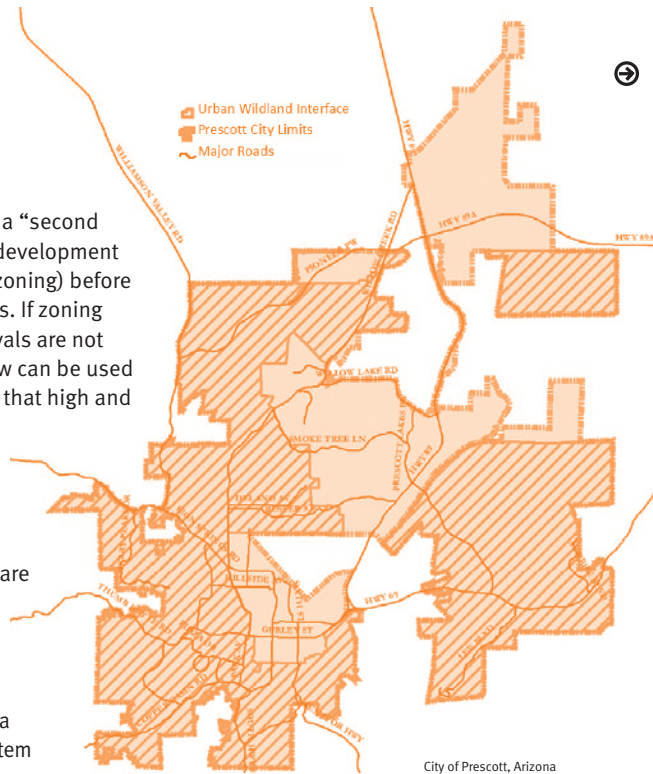
If the city or county uses a growth management system to ration development approvals, it can ensure that avoidance of high and extreme fire risk areas is reflected in the criteria for evaluation of proposals or for admission to a lottery system.

Maintenance and Operation Standards

Communities can include operating and maintenance standards in the zoning code that obligate all property owners subject to defensible space requirements. These standards may include provisions to ensure that vegetation is removed and the resulting debris disposed of safely on an annual basis and that required address or directional signs on the property be maintained in legible condition. Perhaps the simplest and most effective strategy is to adopt a jurisdiction-wide “weed ordinance” that requires all properties to prevent the growth of vegetation that could become a wildfire hazard (or be deemed a public nuisance subject to corrective actions and fines). Alternatively, these types of requirements can be added to development agreements.

Enforcement

Cities and counties can ensure that the land-use code enforcement provisions clarify that failure to maintain required fire risk reduction features is a violation of that code. List violations of the fire code as violations of the land-use code so they can (at the local



➡ Prescott, Arizona, has some of the nation’s most comprehensive WUI standards. The city entrusts primary enforcement responsibilities to its Wildfire Code Enforcement Officer, who has demonstrated expertise in WUI implementation.

wildland-urban interface is not just a wildfire problem, it is a development location problem, just as building in a floodplain is not just a flood problem but an issue with dangerously located development.

If planners continue to assume that fire and building professionals will handle this issue, the result will be regulatory schemes that fail to address the underlying risks and costs created by the approval of development in high risk areas. In short, “planning” to prevent or minimize structures in the WUI is different than merely “bracing” structures for an impending wildfire event with regulatory controls.

Instead of just deferring to fire and building officials, planners should embrace their role as being uniquely qualified and positioned to assist the public in creating a more comprehensive approach to wildfire risk—one that goes beyond traditional fire-centric mitigations and applies land-use planning tools and regulations to fundamentally change the location, design, and type of development in high wildfire zones. These actions can complement and augment the already well-proven techniques applied in local fire and building codes for addressing wildfire risk.

government’s option) be enforced through administrative land-use enforcement procedures often available in land-use codes.

CONCLUSION

Although traditional roles may have dictated that the wildfire problem was someone else’s responsibility, planners can and should have a significant role in protecting communities from this hazard. After all, the

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AMERICAN PLANNING ASSOCIATION

205 N. Michigan Ave.
Suite 1200
Chicago, IL 60601-5927

1030 15th Street, NW
Suite 750 West
Washington, DC 20005-1503



HOW DOES YOUR COMMUNITY
LIMIT ITS WILDFIRE RISK?

5