

Firewise Communities: Recasting the Future of the Wildland/Urban Interface

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What is this thing, this area, this place we refer to as the “wildland/urban interface”? Once thought of in the U.S. as a problem primarily in the western states, wildland fires are now a dangerous reality in the south, the lake states, and a growing possibility in other parts of the country. But the wildland/urban interface is only a fire problem when there’s a wildfire approaching it or in it. The nature of the interface is land use planning and the solution to fire losses in the interface lie in land use planning and community infrastructure.

First, we should look past the geographic connotations of the majority of definitions of the interface – those that begin “The wildland/urban interface is where...” Past experience has shown us that the “where” is really a “when” – when conditions for interface fires are present. The conditions have existed historically by the evidence of wildland/urban interface fires in Maine, Michigan, Missouri, Minnesota, as well as the expected locales of California, Montana, Idaho, Wyoming and the other western states.

The incidence of fire in the wildland/urban interface (WUI) is dependent more on a set of environmental and human conditions than on a geographical location. Although the geographic location does dictate a set of general climatic conditions that encourage fires, the conditions in which wildland/urban interface fires occur (or have occurred) exist in nearly every community (in North America and the world). It is these conditional elements of weather, humidity, vegetation, building construction, road construction, lot size, housing density, topography, and other factors that simply make some communities more vulnerable to wildfire losses than others.

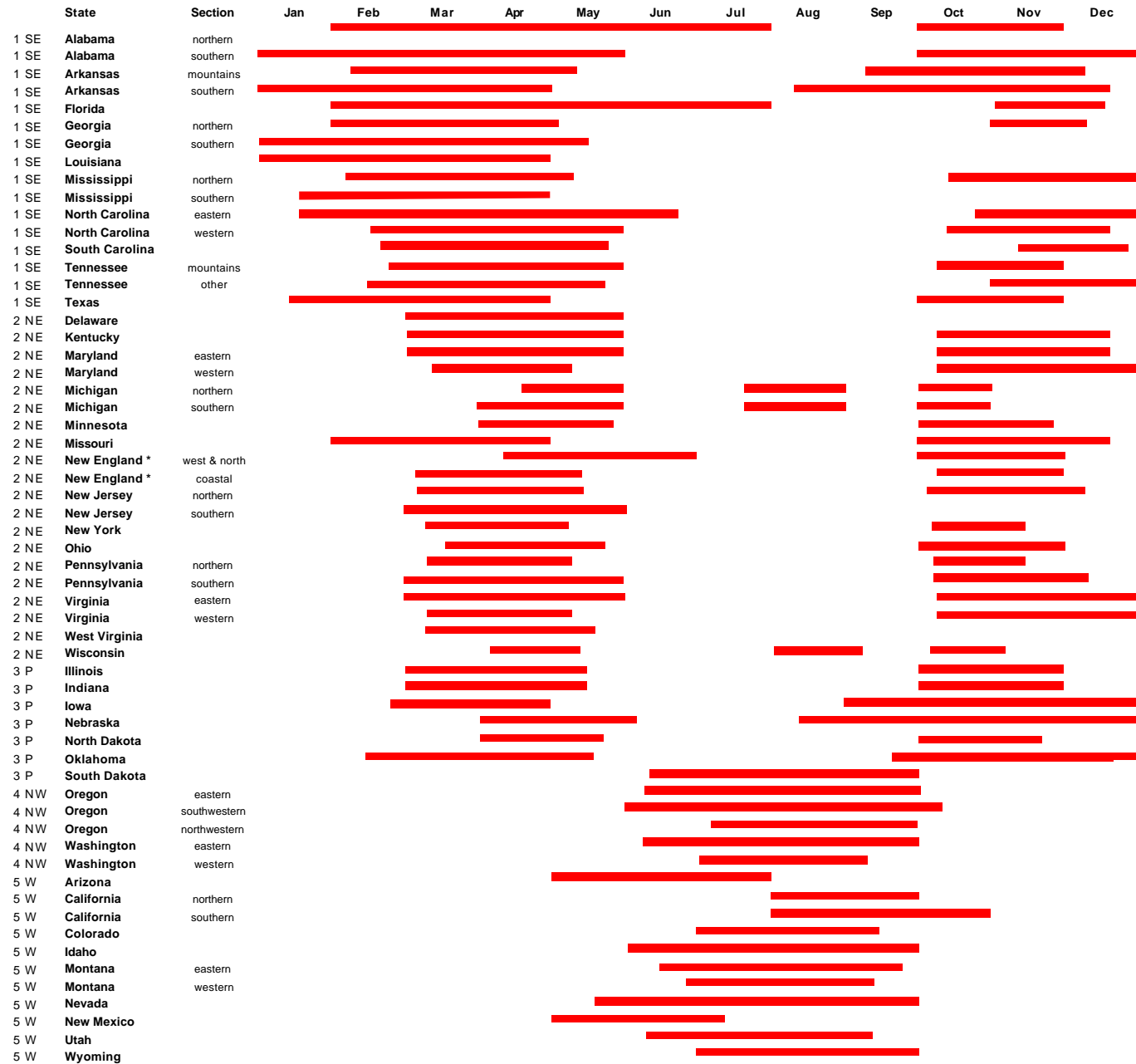
The Wildland/Urban Interface is First a Land Use Planning Problem

To examine the relationship between growth or housing densities and the natural cycle of peak fire seasons around the United States, begin with Figure 1 *Chart of Normal Peak Fire Seasons*. This matrix shows the months of the year in which the contiguous states (lower 48) experience their traditional peak fire season(s). Notice that some states have two or more fire seasons, one in the spring and another in the fall, and some a third for a brief period in the summer. The states that are most often thought of as the wildfire states (the wildfire belt) have one extended fire season. Perhaps this is one reason that we fail in traditional efforts to agree upon a solution to the problem. The development and execution of a single policy or method to meet the needs of not only the random occurrence of fire itself is now thwarted by the moving target of the probability (or historical reference) of normal peak fire seasons. For a more graphic view of the information look at the series of maps in Figure 2 *Normal Peak Fire Seasons in the United States (Lower 48 states)* that illustrates the general movement of the fire seasons from the data in Figure 1.¹

Figure

1

— Chart of Normal Peak Fire Seasons



* Includes Maine, New Hampshire, Massachusetts, Rhode Island, Vermont and Connecticut
 Sources: USDA Forest Service, Washington and Regional Offices

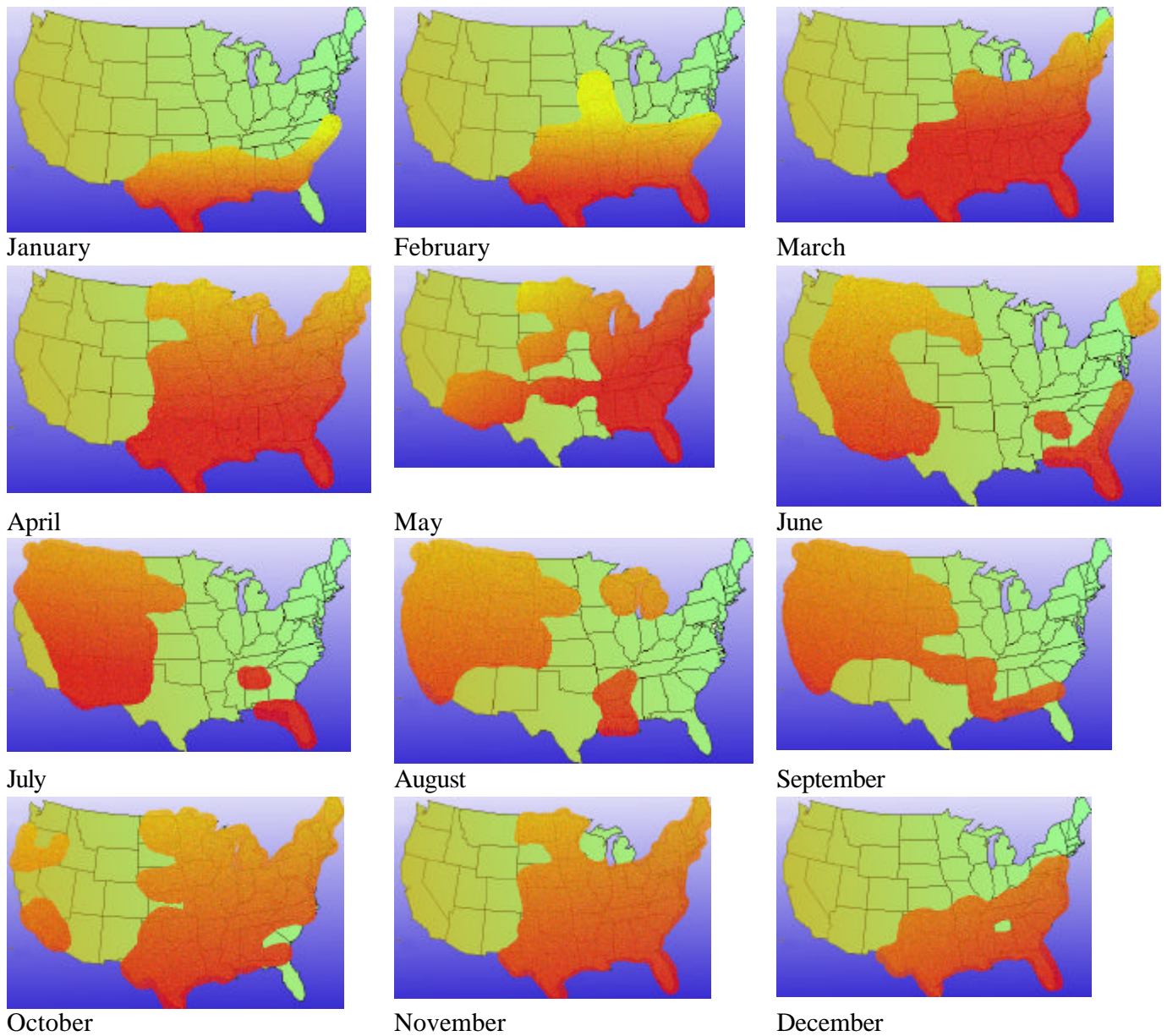


Figure 2. Normal Peak Fire Seasons in the United States (Lower 48 states)

Another part of the moving target is the shift in population and the resulting housing pressures. For a glimpse of the present and the future, data from the United States Census (conducted nationally every decade) provides us with some information on population shifts in the country over the ten year period (1991-2000). Figure 3 *CENSUS 2000 population changes by County* highlights the fifteen fastest growing areas in the US. Of those, nine are in wildland fire prone areas or, as a result of rapid growth and urban sprawl, are encroaching into those areas.

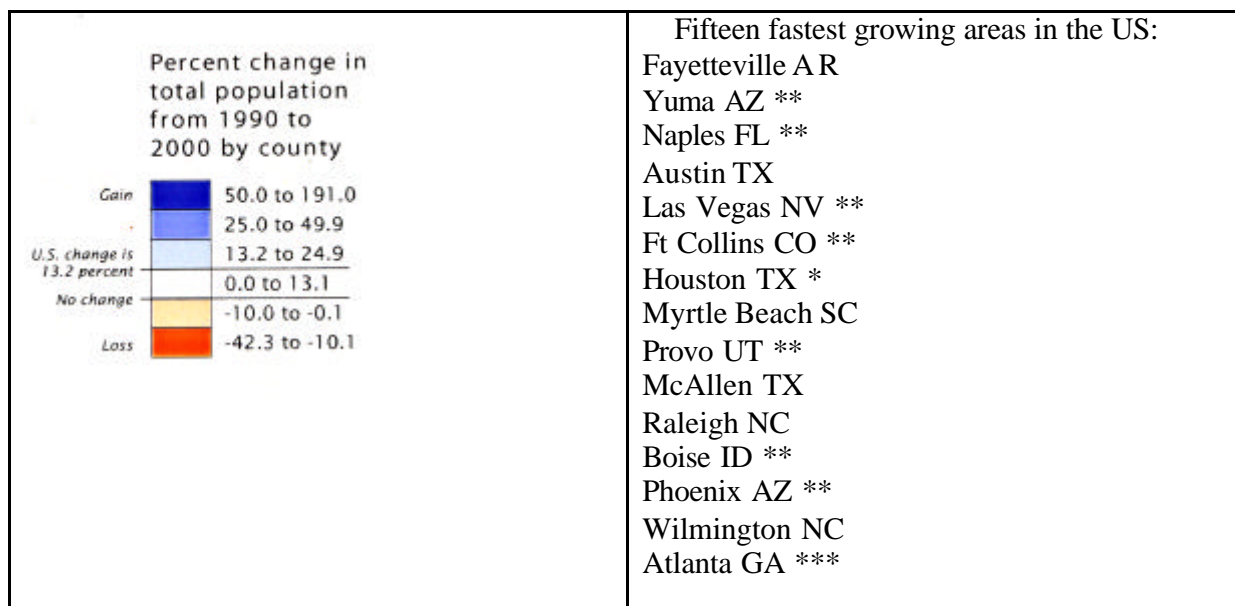
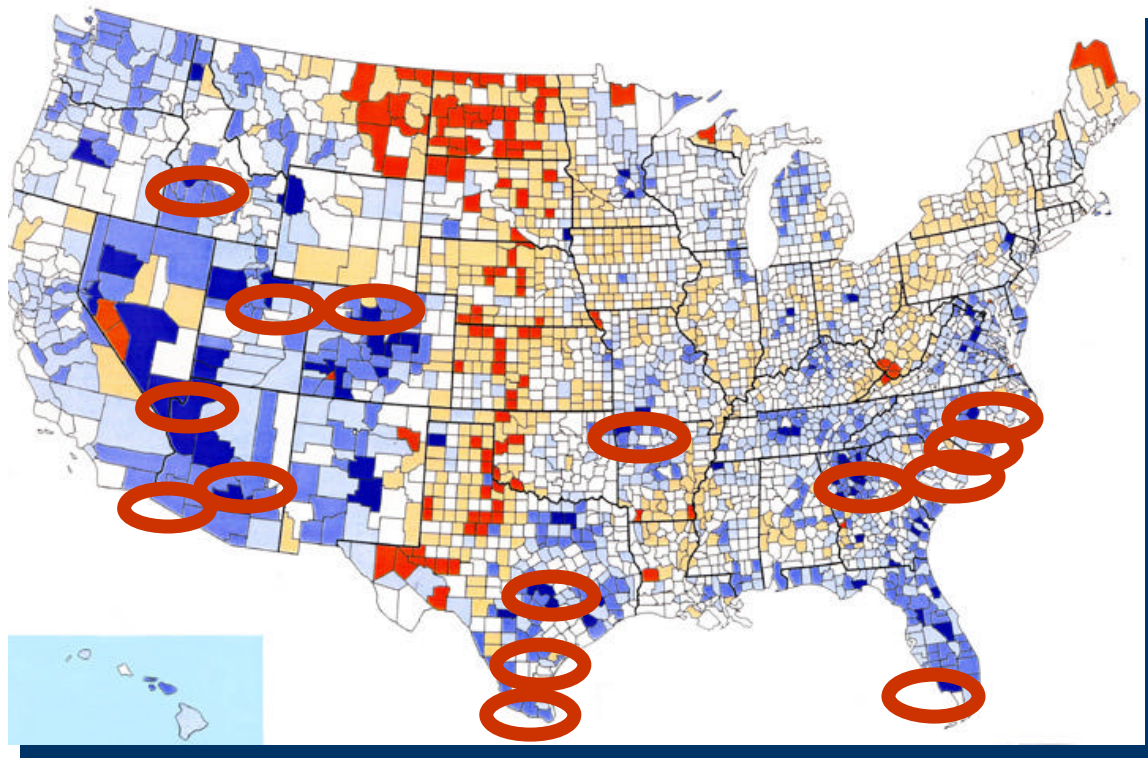


FIGURE 3. CENSUS 2000 population changes by County

* Houston TX has experienced large losses from fires involving wood shingle roofing from the 1950s, common cause of fire losses in the interface. Interestingly, Houston is the only community in the US that has no zoning ordinances, separating business and industry occupancies from residential occupancies.

** States or areas with wildfires and structure losses of historic proportion.

*** The state of Georgia typically has the largest number of wildfires each year (than any other state), but does not experience the acreage nor structure losses of other states.

Sources: National Geographic Society and US Census 2000

The Most Likely Future or the Most Desirable Future – It's Time to Decide

For the past three or more decades, officials have studied and contemplated and attempted to get control of large loss fires. Given that only a small percentage of wildfires become the huge media events, the concerns are common ones. One of the more costly factors in a wildland fire regardless of size is often the protection of structures. From the landmark 1988 Yellowstone National Park fires, national policy was adjusted to account for natural fires. Since then, further adjustments in policy have been made, debated, evaluated, and enacted. In the meantime, thousands more homes have been lost, firefighters killed or injured, and fire apparatus destroyed or damaged, not to mention the thousands of acres of forests burned. Failure to break with tradition will result in a Most Likely Future – more damage to the environment, the economy, and personal losses of homeowners in interface areas.

In fact, the growth of communities into previously forested areas is one of the three major factors that will propagate the pressures of the interface on communities. The other two are unusually severe weather events (from prolonged drought to severe heating periods and floods that erode soils and vegetation) and inadequate infrastructure due to the rapidity of growth or aging. It is this last issue of the wildland/urban interface that the Firewise concept and Firewise Communities Programs can most effectively impact when implemented locally.

The Firewise Concept

The development of the Firewise concept is a product of the National WUI Fire Program that began in 1986, following a particularly bad fire season. In 1985, the states of California and Florida had fires so extensive that 1,400 homes were lost that year, 600 of those in Florida and 400 of those in one day (Black Friday, 5/17/85). From that fire season, the national scope of the problem (as opposed to only a western states problem) was recognized.

Even though the majority of WUI losses are usually smaller in scale than the 1991 Oakland fire or even the average structure fire losses in cities, the ramifications of urban interface losses add up to a national problem. The loss or damage to watersheds, the effect on wildlife and air quality, and the widespread disturbance of businesses and individuals indicate the impact to an area might parallel the impact of the loss of a major industry in a city.ⁱⁱ On a national level, American technologists and politicians are very adept in recognizing problems of national proportions, but the solutions to the aggregate national problem are at the local level, and, because of the local immediate pressures (perceived or real) of waste management, schools, public transportation, and so on, local government is generally unconcerned (or too overwhelmed) in taking on yet one more task to solve. The most reliable entity for addressing the interface fire problem is the local fire department. Ironically, the traditional methods and knowledge base of fire departments do not include land use planning, development design, landscaping, environmental impact and similar expertise needed to address the complex issues of the WUI.

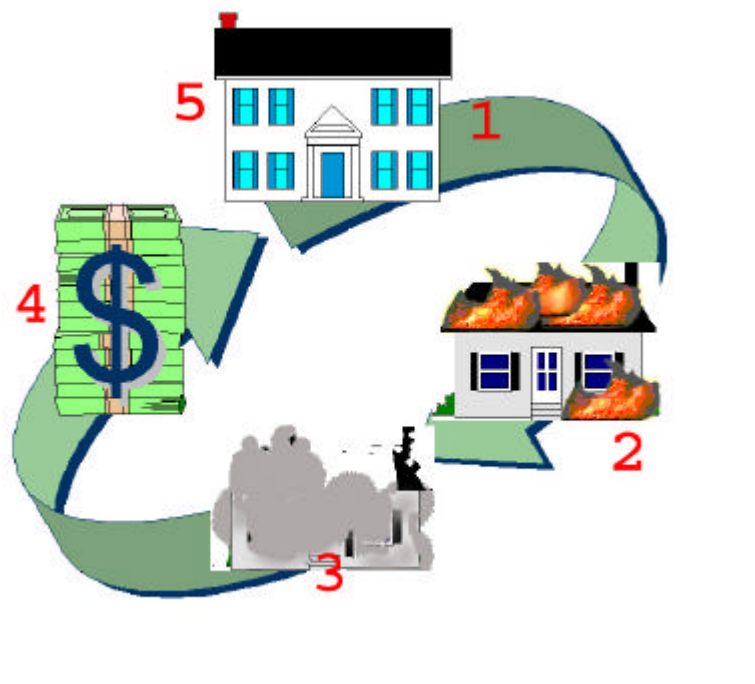
From 1986 the National WUI Fire Program developed a number of publications and programs for fire fighter safety and homeowner actions. Following three particularly major interface fires, the National Program issued case studies (Oakland, California; Grayling, Michigan; and Boulder, Colorado). The program directed its attention to the disciplines that affect the interface in the early 1990s: *Firewise Landscaping* (a three-part video and series of regional workshops) and *Everyone's Responsibility* (a publication and video based on three distinctly different communities of different sizes and organization in three geographic locations that were doing

very much the same thing in using a multi-disciplined approach to solve local problems). This last piece brings us to the recognition and basis for FIREWISE.

Everyone in an Interface Community has a Responsibility for Safety

Let's look at an observation of what typically happens in interface fires. Begin with a home in or near a forested area (refer to the illustration of the wildfire disaster cycle in Figure 4). Perhaps this is state forest, national forest or national park, or private land (position 1). To a wildland fire, fuel is fuel; it doesn't matter who owns it or what form it takes (trees, homes, etc.). In many parts of our country, these homes are built in areas where fire is (and has been, and will continue to be) a factor in the ecological landscape. Assuming that where fire has occurred on the landscape, it will occur again, we can expect that at some point the non-Firewise home will be caught in a wildfire (position 2) and be destroyed (position 3).

Almost immediately following the wildfire event, assistance pours in, normally in the form of insurance payments, low interest loans, small business recovery assistance. Normally, homeowner insurance will cover the loss of the structure and its contents, but this is in replacement costs. Insurance policy seldom cover 100% of the loss, yet residents insist that one reason they don't take preventive steps to avoid loss is that they have insurance.



If the wildland fire is large enough and destructive enough to be declared a natural disaster by the federal government, additional funds are likely available to assist residents in re-building. In an effort to regain the former comforts and familiarity of lost surroundings, homes are quickly rebuilt on the site just as they were before the fire - same construction, same vegetation, and so on. This "re-creation" of what was sets up the situation for the next wildland fire. With one possible change: the homes are usually larger. With low interest loans and insurance settlements, homeowners often take advantage of the opportunity to build their "dream home", but many times with the same construction and vegetation as the smaller original house. More fuel for the future wildland fire, and these larger homes on the same size lot offer more exposure threats than before. Thus the disaster cycle is completes itself. Of course, the occurrence of a wildfire is only a disaster when human elements are involved (e.g., home loss, life loss, and injuries). Otherwise, most would characterize the wildfire as natural event.

Breaking the cycle

Planning for fire events and establishing creative incentives for encouraging homeowners to take appropriate responsibility are two things that community leaders should be doing immediately. Insurance companies are not going to give significant premium adjustments for positive action, nor are they willing to increase premiums or cancel insurance for perpetuating hazardous conditionsⁱⁱⁱ. Reliable formulae to predict losses or project the mathematical expectations of wildfire occurrence are not available. Therefore, the data (loss and predictive) are not available to justify the financial decisions for adjusting rates and wildfire risks that affect their bottom line. Floods, yes. Earthquakes, yes. Hurricanes and hail, yes. Wildfire, no.

By the same token, citizens should stop demanding that fire agencies accept the total responsibility for 100% protection. They've got enough to do just trying to keep up with suppression, emergency medical response, and other emergencies. They cannot be responsible for protecting wildland homes from forest fires when the owners neglect cleaning the gutters of pine needles and leaves, build unprotected wood decks, prefer planting conifers next to their wooden homes, and store firewood on the porch. In a wide scale wildfire event, the chances that a fire department can effectively protect every home are small. Worst case: 200 homes on fire at once – five fire engines. Expecting that they can actually extinguish every home places the firefighters in danger, the public in danger, and wastes resources.

What is needed are local solutions to encourage “doing the right thing.” For example, if homeowners want to make improvements in their property (e.g., putting on a non-combustible roof in place of an aging, dried out shake roof) the local government should provide real incentives. Perhaps waiving building permit fees for Firewise improvements; waiving higher taxes on the Firewise improvements, or providing community guidelines for Firewise improvements.

It's time to change the future

We cannot expect reach our desirable future using traditional methods that will ensure the most likely future. The wildland/urban interface will not be going away. Its roots are not a fire problem at all. The interface is a result of urban sprawl, changing life styles, decentralized e-business, population growth, and other non-fire-specific results of living on this planet. The fire problems wildland agencies experience on a larger scale in the interface are the same kind of problems that urban fire departments experience: exposures, limited water supplies, delayed alarms, delayed response, citizen safety and evacuation, and personal protective equipment and training of fire fighters.

The traditional roles, reinforced by media, traditional fire department response, and the general public is that the fire fighter is the “protector”, the “hero”. Citizens have become use to the idea that it's someone else's responsibility to come to their rescue when fire threatens them^{iv}. Likewise, the homeowner is traditionally seen as the “helpless victim” as their homes burn from wildfire.

While fire protection is really the core responsibility of the fire department or the wildland fire management agency, in truth, the responsibility for fire protection belongs to everyone in the community. In varying degrees, these agencies and groups and INDIVIDUALS have something to offer toward the total fire protection system - all interdependent and all definable. This is one of the objects of Firewise Communities planning - to define these responsibilities and to encourage the appropriate action by each group.

A community water department's responsibility is to plan, design, operate and maintain the water distribution system to ensure adequate and safe drinking water but also to work with fire officials to make sure that adequate resources are also developed for fire suppression. Police and law enforcement agencies often assume emergency response responsibility in the event of evacuation. Street and road departments provide safe roads and hopefully assure the public efficient (if not fast) transportation to jobs, schools, shopping, and back home again. Those in fire protection recognize the importance of wide roads, turnouts on narrow ones, modest grades and adequate drainage. But how well are the reasons for requirements explained to builders and developers? More importantly, are ordinances and codes so written to accept only one method of meeting their intent? Flexible, performance-based codes and ordinances will allow multiple methods of achieving equivalent levels of safety.

The media, often criticized for their coverage of fires, but seldom educated about the physics of fire behavior, play an important communications role. But without the needed education to help understand fire behavior, reporters will continue to create sensational headlines that personify a natural occurrence. Reporting the event is a basic essential of news broadcasts but providing some insight into the meaning of the event – what people can learn from the event or its possible impact – is public service and could much to further educate all citizens.

Finally, look at public education. The fire protection responsibilities of thousands of public schools in the US include offering fire safety education in selected grades, including wildland fire, outdoor, personal and home safety. But do we really think that passing out fliers, pamphlets, and announcements will result in people actually acting on the information? Again, citizens should expect and receive a complete picture of the risk situation, be provided the recommended actions that they can and should take and then be encouraged to act through appropriate incentives. Community leaders need to make sure that the incentives are realistic, valued and will result in the desired behavior changes.

If all these others (i.e., agencies and organizations) are willing to accept some responsibility in Firewise Communities, what's missing? Homeowners, especially, must share the responsibility through active participation. When the responsibilities are clearly defined and direction is provided, the paradigm of "protector/victim" is re-defined. Fire fighters and homeowners (along with other organizations) become PARTNERS. Community-wide and community-based fire protection can exist through mutually agreed-upon and mutually-respected responsibilities.

What might the Most Desirable Future look like?

What if? Land use planners understood the behavior and effects of wildfire? Homeowners accepted an active role in protecting their properties rather than relying on emergency response or post-emergency assistance? Codes, ordinances, and restrictions were written to encourage creative solutions to meeting levels of safety? Insurance companies assisted in assessing the risk of wildland homes and worked cooperatively with fire agencies to manage the risks? Builders and developers recognized the value-added aspects of Firewise residential developments and incorporated Firewise principles in their designs and specifications? Landscape architects and designers and nursery professionals shared their knowledge and advised homeowners and businesses about plants and ornamental vegetation with low flammability in wildfire prone areas? Fire officials actively encouraged and supported all the above disciplines in achieving success? What if the wildland/urban interface were filled with Firewise Communities? And the homes in these communities could survive a wildfire without the intervention of the fire department?

Fire agencies would not have to endanger fire fighters by placing them in untenable situations. Natural fires would be allowed to run their course (within reasonable parameters). Fire suppression resources would be freed up to concentrate on the fire itself rather than attempting to protect numerous homes with too few engines and crews. The cost of wildfires might be reduced by improved resource management, fewer structure losses, fewer injuries, reduced demand on fire fighters. The tax base and economic health of communities (many already struggling to maintain basic services and businesses) would be more secure.

In order to reach this future, we must share this common vision now and direct our efforts to make it real. We should strive make Firewise Communities commonplace for our future generations.

Additional sources and for further information:

Urban Sprawl, National Geographic Magazine, July 2001

Public Lands Go Public, National Geographic Magazine, August 2001

When City and Country Collide, Daniels, Tom, Washington DC: Island Press, 1999.

Mapping the 2000 Census, ESRI Press, Sept 2001

www.firewise.org

ⁱ Maps of Alaska and Hawaii are not included. Alaska has a very distinct (though abbreviated) fire season April through September, starting along major drainages and recreational areas to include much of the entire state by mid-to late-summer. Hawaii is most susceptible to wildfires in the summer heat and because of trade winds the problem may exist on different islands at different times. For more information, visit www.firewise.org

ⁱⁱ Several models are available to estimate the impact of a major fire on a community. One, known as the urban multiplier model, suggests that the economic and social impacts may ripple through the community from direct loss of employee jobs and therefore community tax base to the reduction or loss of service industries (food, sales, etc.) that support the employees who lose jobs to savings institutions whose reinvestment funds are affected by the unemployed workers who use savings accounts to make up the differences in lost wages. For a major industrial loss, this has been evident for decades. In the wildland/urban interface, perhaps the most dramatic case is the massive loss of homes (and resulting tax base and pressure on infrastructure) is the 1991 Oakland CA fire. Reference: *Fire in the Hills*, National Wildland/Urban Interface Fire Program, 1992.

ⁱⁱⁱ At this time, at least one insurer in the US is re-examining its policy on insuring homes in the interface. Also, insurance companies must meet numerous and stringent legal requirements. For example, state insurance commissions (or similar) regulate what insurance products are offered in the state.

^{iv} Ironically, citizens are generally distrustful of government. Many claim that they don't want more government regulations and requirements. They seldom take the time to understand the risks of living in the wildfire interface or in flood zones or on earthquake faults and accept little responsibility to do more than any regulation or ordinance requires. Yet, in the time of emergencies, the governmental agencies (i.e., fire departments, forestry, emergency management) are first to be called and even then they can't do enough fast enough to alleviate their losses.