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Of the International Association of Wildland Fire (IAWF)*



## **WUI FACT SHEET<sup>®</sup>**

Updated August 1, 2013, Used by permission from ICC and NARCD Councils from the national program Wildfire, Safe, Sound and Code Smart<sup>®</sup> program. This document is a condensed version of the original document. .



### **What is the wildland/urban interface (WUI)?**

The wildland/urban interface (WUI) is a geographic location where structures and flammable vegetation merge in a wildfire-prone environment.

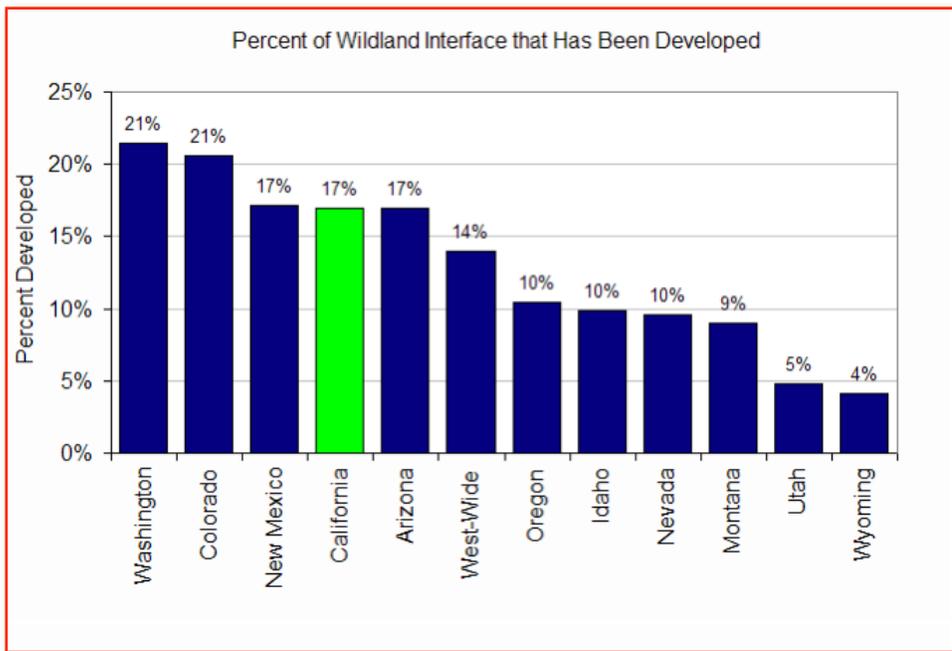
### **Geography of the wildland/urban interface**

The U.S. encompasses about 2.3 billion acres of land. Within these acres are 1 billion acres of government (federal, state and local) and privately owned wildlands (without structures). In addition to these 1 billion acres, there exists over 220 million acres (twice the area of California) that have been designated by each State Forester, as at high-risk of wildland/urban interface fire. This is not a static figure. Increased development near wildlands is ever-accelerating the continued growth of the WUI.

Since 1990, the U.S. has experienced an unprecedented conversion-growth rate of 3 acres per minute, 4000 acres per day and close to 2 million acres per year of conversion from wildlands to wildland/urban interface.<sup>1</sup>



<sup>1</sup> Natural Resource Conservation Service

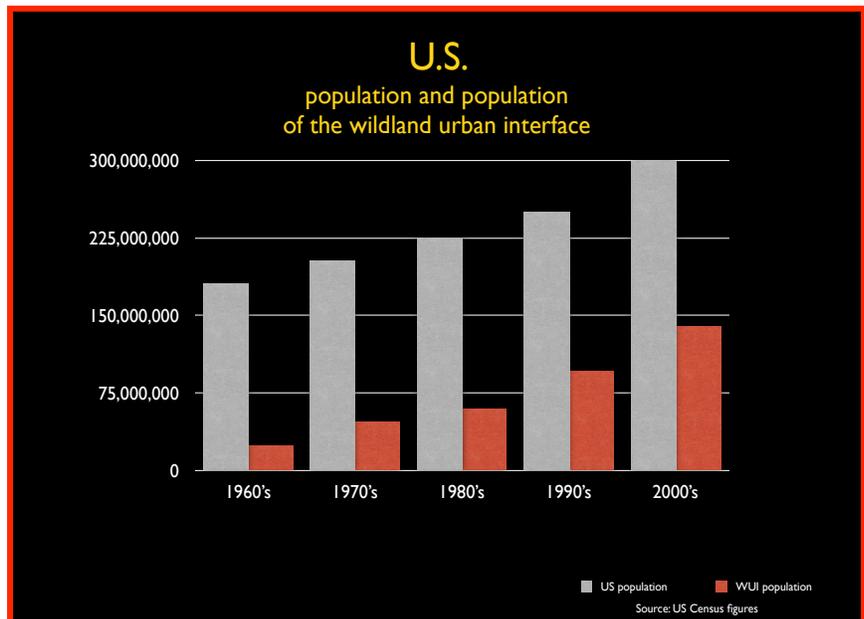


## United States WUI growth projections

Recent research<sup>2</sup> indicates that in the west, on average about 14% of the available WUI lands have been developed, 86% remains available for development. Nationally these figures have not been verified, but projections are that about 30% of the WUI has been developed with 70% still available to be developed in the future.

## Demographics of the wildland/urban interface

These 220 million acres of wildland/urban interface are overlaid with 46 million single-family homes, several hundred thousand businesses, and a population that is estimated over 120 million people. This demonstrates the magnitude and the complexity of the growing WUI fire protection problem facing the United States.



<sup>2</sup> Headwaters Economics, data can be found at [www.headwaterseconomics.org](http://www.headwaterseconomics.org)

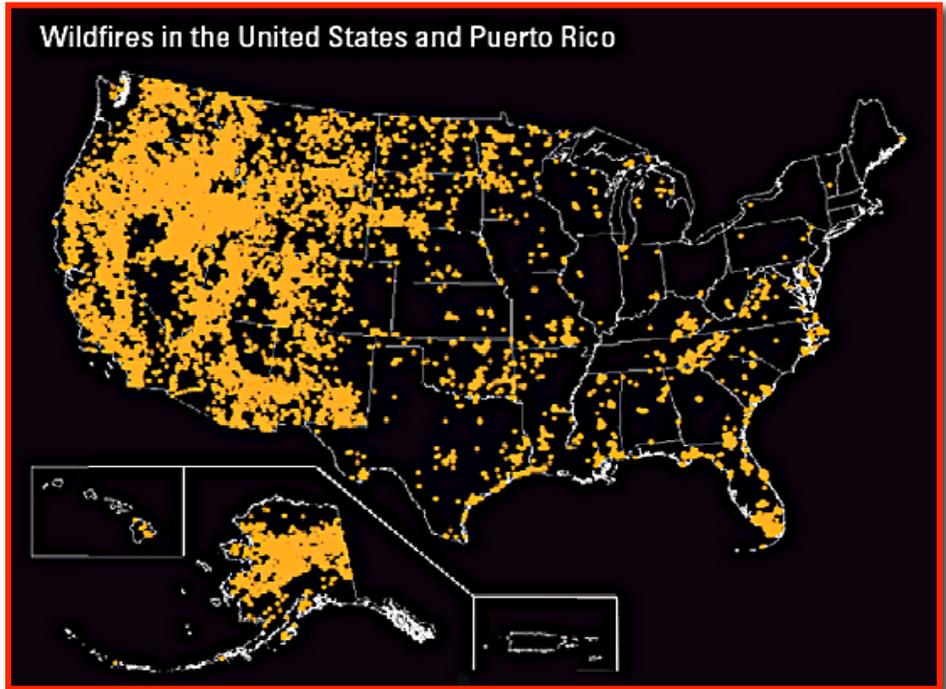
## 2012 U.S. Census statistics about homes in the WUI

| Total existing homes in the WUI | Existing homes that are more than 10 years of age. | Existing homes that are less 10 years of age. | Projected new homes in next 10 years | Projected number of existing homes meeting IWUIC® |
|---------------------------------|--|---|--------------------------------------|---|
| 46 million                      | 25 million or 54%                                  | 21 million or 46%                             | 8 million                            | 15 million or 35%                                 |

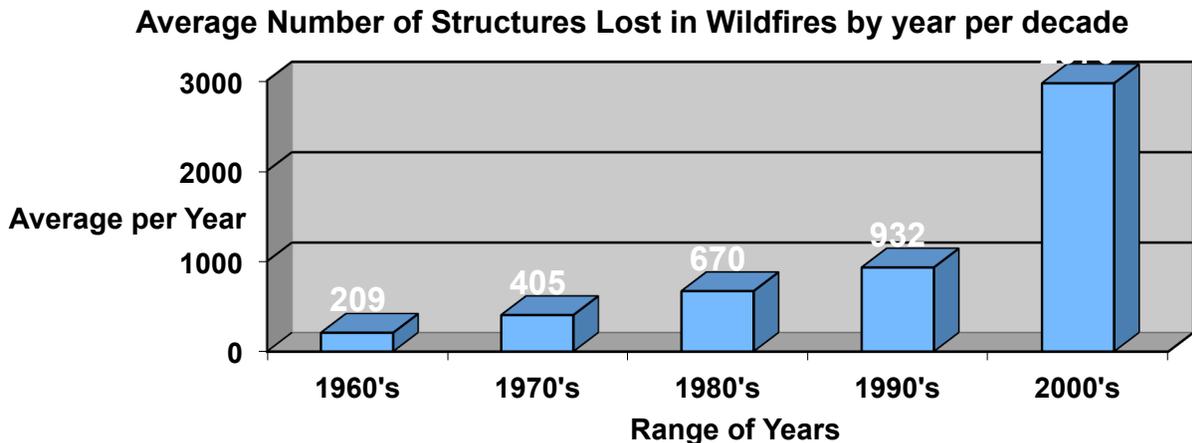
### The wildland fire problem and the wildland/urban interface

Nearly 100,000 wildfires burn approximately 7 million acres of land each year. Most of the past century's wildfire activity has been seasonal in nature. However, recent years have proven otherwise and we have experienced fire activity in every month of the calendar year.

Firefighters were successful in extinguishing 97% of these 100,000 fires and containing these fires to less than 10 acres in size. No other country comes close to this benchmark of success, and America's first responders are given high marks. But, the 3% of fires that escape initial action occur during critical weather conditions and are usually located in the wildland/urban interface.



### Statistics of the wildland fire problem



## Home loss from wildfires in the United States from 2000-2012

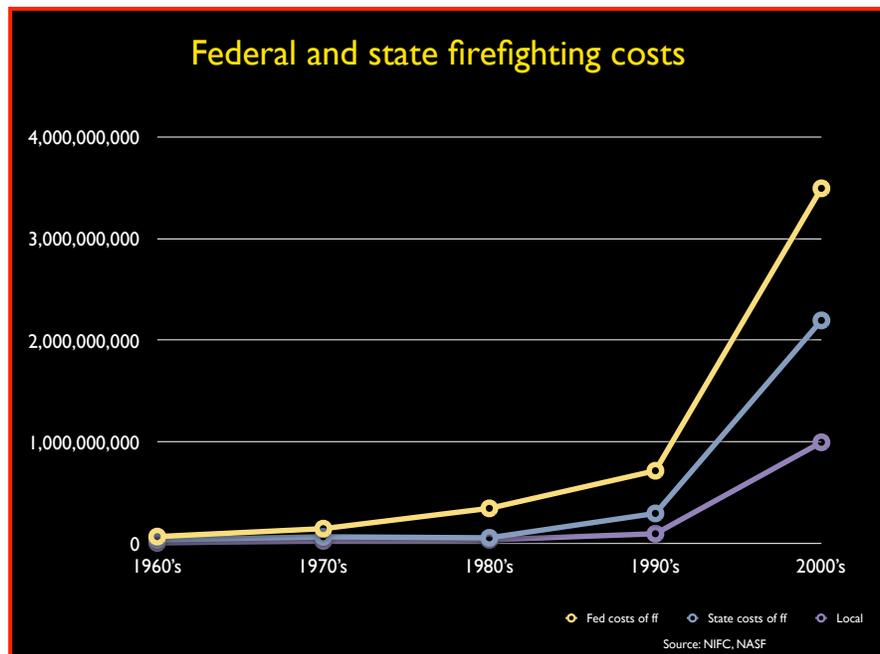
|      |      |                             |
|------|------|-----------------------------|
| 2000 | 861  | Structures lost to wildfire |
| 2001 | 731  | Structures lost to wildfire |
| 2002 | 2381 | Structures lost to wildfire |
| 2003 | 5781 | Structures lost to wildfire |
| 2004 | 2400 | Structures lost to wildfire |
| 2005 | 2200 | Structures lost to wildfire |
| 2006 | 2251 | Structures lost to wildfire |
| 2007 | 4900 | Structures lost to wildfire |
| 2008 | 2800 | Structures lost to wildfire |
| 2009 | 2300 | Structures lost to wildfire |
| 2010 | 2002 | Structures lost to wildfire |
| 2011 | 5850 | Structures lost to wildfire |
| 2012 | 4244 | Structures lost to wildfire |

**Total 38,601 homes lost to wildfires since 2000 or 2970 homes lost on average per year for the period 2000-2012.**

Source: NIFC, INCINET and ISO from 2000-2012

## **Costs are over \$4.7 billion per year for federal, state and local governments for suppression wildland fires**

- Firefighting costs for all federal agencies are averaging \$2.5 billion per year
- Firefighting costs for state agencies are in excess of \$1.2 billion per year
- Firefighting costs for local governments are estimated at close to \$1 billion per year.



## An overview of firefighters dealing with wildland fire



Photo courtesy of USDA Forest Service

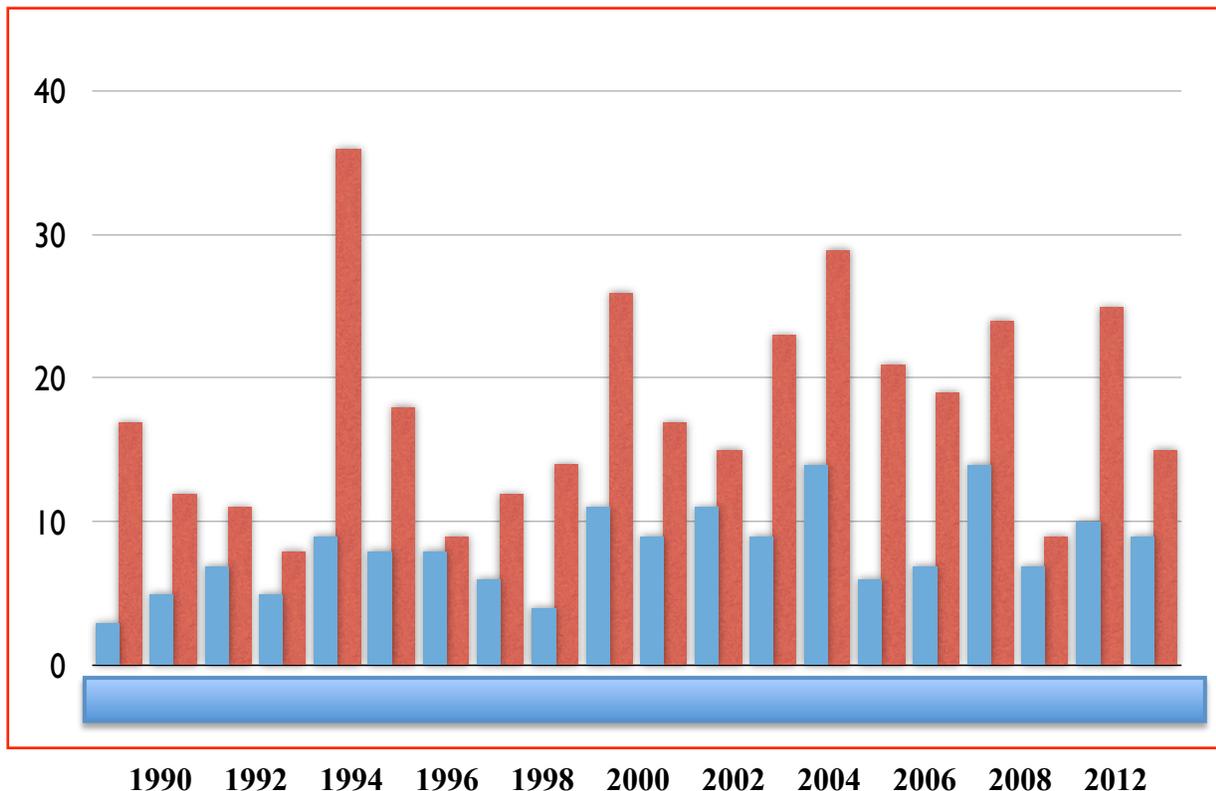
- There are 56,000 wildland firefighters within the federal and state governments this includes all employees utilized for firefighting.
- There are 1.1 million structural firefighters (825,000 volunteer 275,000 career paid). It is estimated that about 100,000 are involved with wildland firefighting.
- There are 18,590 contract wildland firefighters.

- Insurance Company firefighters used specifically for wildland firefighting estimated at 1100 contracted for use in wildland/urban interface fire situations.

Number of wildland firefighters by category based on statistics from USDA, DOI, USFA, IAWF, NWSA and NASF.

| Federal | State  | Local <sup>3</sup> | Contract | Insurance | Private |
|---------|--------|--------------------|----------|-----------|---------|
| 31,000  | 25,000 | 100,000            | 18,590   | 1470      | 2500    |

### Firefighter and civilian fatalities associated with wildland fire 1990-2012.<sup>4</sup>



<sup>3</sup> Local represents volunteer and career paid 1.1 million structural firefighters, it is estimated that about 100,000 are involved in wildland firefighting. Based on figures from USFA, USDA Forest Service, DOI, IAWF, NWSA and Insurance companies.

<sup>4</sup> Compiled from US Fire Administration, IAWF, and NBRP statistics.

The chart on page 5 reflects in red, firefighter fatalities and blue represents civilian fatalities for the years 1990-2012.

## **Of the 70,000 communities at risk of wildland fire, how are we doing?<sup>5</sup>**

Of the 70,000 communities at risk of wildland fire, a decade of federal funding and support, the following are the accomplishments.

- **>2%** of the 70,000 at risk communities or 900 communities have been designated as Firewise Communities.
- Less than **3%** or approximately 120,000 of the 46 million homes that are located in the at-risk communities have been inspected by insurance companies for wildfire survivability and insurability about 2% of the policies were cancelled due to lack of homeowner follow-up.
- Federal and states have treated somewhere between 5-8% (11 to 18 million acres) of the estimated 220 million acres of WUI in the United States since 1999. It is estimated that a total of about \$4 billion federal and state dollars have been spent treating these lands.
- About 11% have completed community wildfire protection plans (CWPP's). Approximately 8000 plans that have been completed to date.
- Less than 10% or about 7000 communities in the U.S. that are at risk of a WUI fire, have adopted or utilize a WUI code.

## **What do communities need to do?**

Getting community leaders involved in any planning or code development and adoption process would add to the benefits, as they could then respond to concerns from the citizens in their jurisdiction and promote the efforts of the emergency management community. The term “community leaders” is not only the political leaders of a community, but also the de facto leaders of areas and subdivisions, the actual leaders of the community.

## **What about Building Code, Fire Code and WUI Code adoptions?**

Many rural areas lack proper Building, Fire or WUI Codes. A portion of the population feels that since they own the property they should be able to do what they please and suffer the consequences. A growing consensus even in rural areas, however, is that WUI codes may assist in the prevention and impact of wildfires. For example:

- A code that regulates the layout of a structure may help avoid heat traps.
- The establishment of a water supply on properties, which are more than a certain distance from a hydrant or existing natural water supply, can increase the value of the property.

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<sup>5</sup> Figures from USDA Forest Service National Fire Plan Reports 2008-2009, NIFC Boise, ID, State Farm Insurance, International Code Council, National Blue Ribbon Panel Report Statistics, 2008 and U.S. Census.

- The requirement for a certain driveway width can allow access for more than fire department vehicles, as most companies have large vehicles for delivery purposes.

Because of damage from many recent wildfires, there is interest in many states to adopt statewide building, fire and WUI codes. Adopting specific codes would allow developers to build in various locations throughout the state and be familiar with the regulations in the codes. Supporters of this idea also believe that it will provide reassurance to homebuyers that their home is safe from many of the natural hazards that exist in many states.

The **IWUIC**® regulates building materials that are used in the wildland/urban interface areas and provides for the enforcement of a set of standards for building inspectors (a problem that was in March-09 underscored after reviewing damages from recent wildland fires).

## **Recent research on WUI home losses** **Insurance Institute for Business & Home Safety (IIBHS)** and NIST

**Homes with the highest risk of burning are those adjacent to wildlands situated on the perimeter of housing developments.** Properties positioned along the edge of a housing development, which were located on the windward side or along a side that ran parallel to the prevailing wind direction, were exposed to a substantially higher risk of being destroyed. While the increased risk varies from community to community, it was generally found that properties along these edges were nearly twice as likely to burn as properties on the first row back from the edge and three to eight times more likely to burn than homes further back in a housing development.

**Interior homes situated less than 15 feet apart are at high risk from wildfire.** While homes adjacent to wildlands are the most vulnerable to wildfires, homes in the interior areas of housing developments that were located less than 15 feet apart, were much more likely to burn in clusters. In other words, multiple homes right next to each other tended to burn. This finding elevates the importance of a community-wide approach to protecting properties against wildfire where the density of homes is high, and it also emphasizes the potential threat posed by neighboring properties. Cluster burning was not found in homes located more than 45 feet apart from each other.

**All homes, regardless of their value, can be best protected from wildfire by implementing appropriate loss reduction measures.** The value of a home was not found to be a major factor in the risk that it would burn. In the study communities, there was a relatively even distribution of the percentage of homes that burned across a wide range of home values.

This suggests that taking the proper mitigation steps can protect any home.

**The requirements established in the new Codes can effectively reduce losses and damage from wildfires.** San Diego County, which adopted progressive codes in 2001 and strengthened those codes in 2004, experienced lower burn rates in homes built to these wildfire property protection standards in unincorporated areas, according to an analysis conducted by the county after the 2007 fires.

**Policy makers need to take a more proactive, community-based approach to property protection.** Government leaders should critically review the costs associated with the firefighting resources and manpower needed to battle the growing wildfire threat, and implement effective mitigation efforts before wildfires strike.

**Homeowners need to protect their homes.** Homeowners must become familiar with the affordable options available to protect their existing homes and increase their resistance against wildfire.

Local and state government leaders should encourage this education.

**Financial and real estate markets must acknowledge the value of wildfire-resistant construction and retrofitting.** The financial services industry, along with the real estate industry, must recognize the value of making these improvements to existing homes, and new homes should be marketed for the ability to survive in wildfire-prone areas.

For additional information checkout: <http://www.disastersafety.org>



Download a copy of the IIBHS Regional Edition on wildland urban interface fire for your area of the country.

Looking for wildland fire statistical information by state? Check out Headwaters Economics @ [www.headwaterseconomics.org](http://www.headwaterseconomics.org)

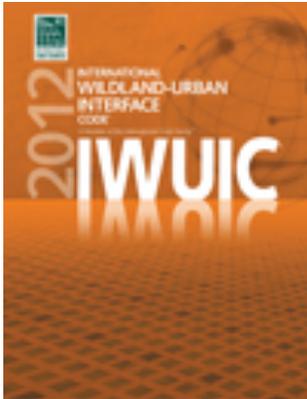
### Socioeconomic Profiles (EPS-HDT)

Free software that produces custom socioeconomic profiles for any geography in the country.

### Data Visualizations

Fresh looks at our research numbers using interactive maps and charts, infographics, and dynamic tools.

Headwaters Economics has excellent WUI fire information by state and other Wildland Fire Research Data available on the Headwaters Economics website.



## **How the International Wildland Urban Interface Code® (IWUIC®) can help mitigate the WUI fire problem in your local area.**

The **IWUIC**® contains a process to evaluate the level of fire risk at individual properties. Based on this level of fire risk, the **IWUIC**® specifies several mitigation measures to address the fire risk. Some of those mitigation measures are as follows:

- **One of the most frequent methods of fire spread is embers landing on the roof.** To prepare for this inevitability, the **IWUIC**® specifies fire resistive roof coverings. The level of fire resistance is based on the level of fire risk, the higher the risk, the higher the fire resistive rating.
- **Depending on the level of fire risk, the exterior walls of the building may need to be of ignition resistant construction.** This limits the ability of a fire approaching a building and igniting the exterior wall covering or components.
  - As the fire approaches a building, heat and embers will be trapped under eaves and exterior soffits. Therefore, these portions of the building must be protected.
  - The same scenario can happen when fire approaches an exterior deck. Heat and embers will be trapped beneath the deck and can ignite the combustible portions of the exposed underside of the deck. This is mitigated by the use of fire resistant materials for the deck, or enclosing the underside of the deck so heat cannot be trapped beneath.
- **Vulnerable points where fire or embers can enter a building are also addressed.** These portions of the exterior of the building have been the routes of fire entering a building in many cases.
- Protecting these openings is critical in keeping fire from extending to the interior of the structure.
  - Windows can be either dual-pane or tempered glass. Items commonly used in dwelling construction already.
  - Doors can be either made of non-combustible materials, or have a thickness of 1¾ inches.
  - Attic vent openings and under floor vent openings must have ¼ inch mesh wire covering and the size of the opening is limited.

- The **IWUIC**® specifies that water supply for firefighting operations are made available when new construction occurs. The method of providing the water supply is not limited and could be provided by a fire hydrant system, a storage tank, a reservoir, lake, canal or stream. This allowance gives the owner leeway in determining the method of providing water. The water supply may be used either for fighting a fire within the building, or for fighting the wildfire as it threatens buildings in the area.
- In the highest level of fire risk, the **IWUIC**® requires that fire sprinklers be installed in the building. The fire sprinkler system limits the potential for a fire in the building to become uncontrolled and spread to the wildlands, and the fire sprinklers also are beneficial for “Defend-in-Place” scenarios where the residents are expected to stay within the safety of their home rather than evacuate.

- The **IWUIC**® contains criteria for creating a “defensible space” around buildings. The defensible space increases the ability for buildings to survive wildfires. The defensible space causes the rate of fire spread to slow and the intensity of fire to diminish as the fire approaches the building, and also creates an area for firefighting operations to occur around the building.



- The **IWUIC**® can be used to create a *Fire Protection Plan* for an entire community or subdivision. The vegetation management plan can include items such as greenbelts, tree thinning, and maintenance of common areas to develop safe communities.
- The **IWUIC**® contains requirements for access roads. The requirements for access roads into the wildland/urban interface area are designed to improve the ability for residents to evacuate, improve the ability for firefighting equipment and personnel to approach the fire areas; limit dead-end access roads, which create problems for both safe evacuation and firefighter access.

**STEPS FOR ADOPTING A MANDATORY OR VOLUNTARY IWUI CODE.**

When local jurisdictions, geographic areas or states are developing and pending the adoption of a WUI code requirement for new home construction it typically involves the following steps.

1. Establish the area to be considered, a jurisdiction, a city, a county, multi-counties, a geographic area or a state.



2. It is important to utilize local land use planning guidance that includes GIS mapping that identifies specific WUI areas. It is also important to have a Community Wildfire Protection Plan (CWPP) that helps analyze the wildland fire problem. In addition targeting jurisdictions that have already adopted the International Residential Code (IRC) and the International Fire Code (IFC) would be beneficial, as this helps in tying all aspects of building, fire and WUI codes into a systematic integrated approach.
3. Establish the performance level or similar guide for a WUI code initiative. Most jurisdictions, communities or states pursue programs that achieve certain requirements for new construction, vegetation management as well as fire suppression requirements. Most processes take anywhere from 6-24 months from start of the planning process to code adoption, this depends on the complexity of the area being considered.
4. Identify what types of homes will be affected. Most WUI codes include new single-family homes, and major renovations or additions to existing homes. Separate standards for multi-family housing (low-rise and high-rise) and affordable/low-income housing may also be considered.
5. Obtain input from affected stakeholders, including elected officials, homebuilders, contractors and trades, green building organizations, fire departments, wildland fire agencies and residents. Municipal building officials, planning staff, and building code enforcement officials should also be consulted.
6. In some instances, basic training may be needed prior to developing legislation to establish the need for this code and develop a basic awareness of provisions with stakeholder groups.
7. Prepare legislation requiring an advanced code. Typically, city, county or state staff prepares a draft ordinance or legislation establishing the advanced code requirements, which is
8. Then implemented by the planning and building departments as a new code, or amendments to existing codes.
9. Adopt and enforce the code, and provide training and technical assistance to planners, architects, developers and builders in complying with the new code requirements. This may include trade and Inspector training programs and certification.
10. Track and evaluate progress toward implementing the code annually, and review and update code requirements periodically (typically every 3 years).