

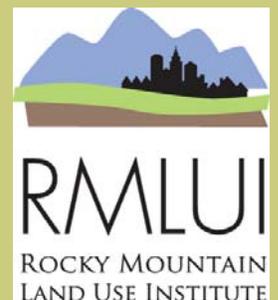


# Wildland-Urban Interface

*Joe Holmes and  
James van Hemert*

**The Rocky Mountain Land Use Institute**

**Sustainable Community Development Code**  
Research Monologue Series:  
*Environmental Health*



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## **About the Research Monologue Series**

The Sustainable Community Development Code, an initiative of the Rocky Mountain Land Use Institute, represents the next generation of local government development codes. Environmental, social, and economic sustainability are the central guiding principles of the code. Supporting research for the code is represented by a series of research monologues commissioned, presented and discussed at a symposium held at the University of Denver in September of 2007. RMLUI and the University of Denver's Sturm College of Law extend its gratitude to the authors of the papers who have provided their talents and work pro bono in the service of the mission of RMLUI and the stewardship of the creation.

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## About the Authors

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The National Association of Conservation Districts defines the wildland-urban interface (WUI) as “the area where houses meet or intermingle with undeveloped wildland vegetation.”<sup>1</sup> Due to increased growth in previously undeveloped areas, the boundary between the urban and the wildland is increasingly blurred. As cities expand and new communities emerge there is an ever increasing encroachment on the natural ecosystem. In fact, the single greatest disturbance to the ecosystem is human disruption. For example, the introduction of practices, such as agriculture, substances, such as nuclear waste, and technologies, such as the suppression of fire, into an environment where these elements did not previously exist.<sup>2</sup> In turn, the WUI has become an ever-increasing center of attention for natural resource challenges such as wildland fires, habitat fragmentation, invasive species, and biodiversity decline.<sup>3</sup>



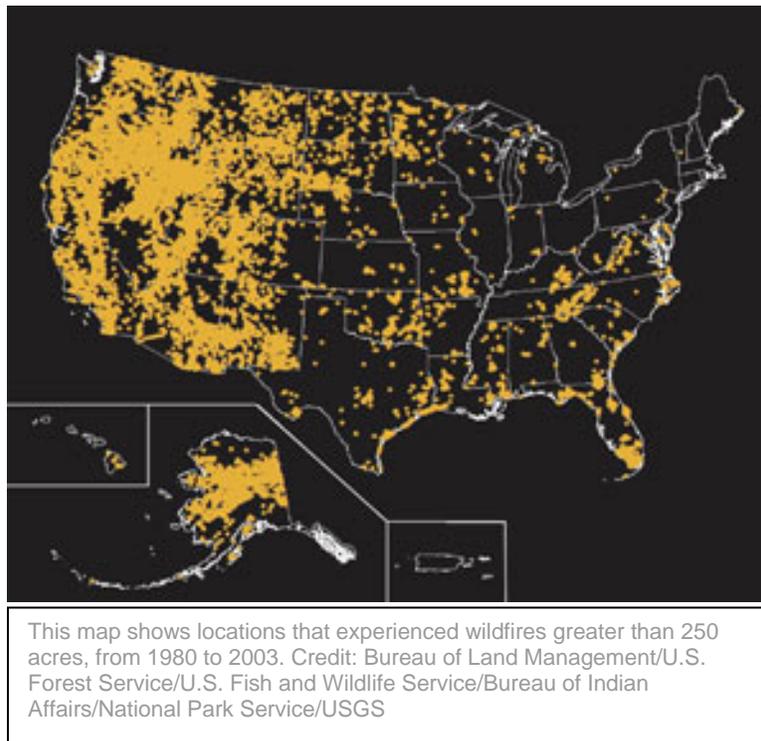
The Mine Fire in San Diego County, California, burned through the wildland-urban interface in 2003. Credit: U.S. House of Representatives, Committee on Resources (USHRC)

Nearly all wildland areas have unique, fragile ecosystems. Consequently one size-fits-all solutions should not be imposed in these diverse areas. As such, changing a once diverse landscape into a standard urban or suburban development has profound consequences. The spread of disturbances such as floods, fires, windstorms, and outbreaks of insects, coupled with disturbances from human society such as urbanization, increased sprawl, and pollution, create important processes that shape our physical environment.<sup>4</sup> The WUI covers nearly 10 percent of all land area in the United States; furthermore, 37 percent of all housing units in the U.S. fall within the interface zone.<sup>5</sup> As development continues to expand outward, the land area falling within the WUI is expected to increase.

One recent disturbance of the WUI is evidenced through the recent increase in the size and severity of wildland fires throughout the country. This spike can largely be attributed to the build-up of fuels, such as brush, overcrowded forests and dead trees since the onset of fire suppression. When the scale of fires is limited, nature is not

allowed to run its course. Consequently, when massive fires occur they are usually far more destructive based on the accumulation of fuel due to the artificial limiting of natural fires that would have depleted the available fuel source;. our attempts to minimize the scale of fires often disturbs fragile WUI areas most. As a result, huge scale fires become more expensive to control and increasingly threaten and damage private property and lives.

Similarly, outbreaks of plant-damaging insects and disease spread more rapidly over areas of forest and rangeland that have been strained through the removal of natural disturbances, to which they are adapted and which control an area's insects and



disease.<sup>6</sup> One recent example is the Rocky Mountain Pine Beetle. The Rocky Mountain region loses many millions of pine trees to this beetle annually.<sup>7</sup> In Colorado, the beetle infestation is expected to kill all of the state's mature lodgepole forest within five years (The Denver Post, January 14, 2008.).

Stability within an ecosystem largely flows from the patterns of relationship that have developed over time among the diverse species in the ecosystem.<sup>8</sup> When human development disturbs this process, catastrophe can result. Ecosystems generally have a threshold of external factors they can cope with; once this threshold is exceeded, ecosystems can break down and natural disturbances can quickly turn into serious threats to wildland, wildlife, and human development in the WUI. To create viable development in the WUI, we must curtail landscape fragmentation caused by such commodity-producing artifacts as forest clear cuts, agricultural fields, and livestock-grazing allotments. Since ecological sustainability and adaptability are dependent upon

the connectivity of the landscape, we must integrate our developments within nature's evolved patterns.

The enactment of the Healthy Forests Restoration Act (HFRA) in 2003 gave WUI communities an added incentive to develop comprehensive forest plans because it requires local governments to prepare a Community Wildfire Protection Plan (CWPP) in order to receive federal assistance in implementing forest management and hazardous fuel reduction projects from the U.S. Forest Service and the Bureau of Land Management. Simply developing a CWPP can be helpful for a community to assess its vulnerability and preparedness for wildfires. A CWPP requires local communities to work with State officials and local landowners to develop a community risk assessment that considers fuel hazards, risk of wildfire occurrence, homes, businesses, and essential infrastructure at risk, other community values at risk, and local preparedness capability.<sup>10</sup>

In Ashland, Oregon, city leaders were able to engage the community in developing a comprehensive plan seeking to reintroduce more fire adapted species of vegetation in areas that had previously been replaced by homogeneous, fire intolerant species.<sup>11</sup> While Ashland's CWPP emphasizes prevention, the plan also adopts standards for response and evacuation. Perhaps most importantly, the plan emphasizes cooperation and flexibility. In order to be successful, CWPP's must reflect the unique and dynamic ecological threats that a particular WUI area faces.

The City of Colorado Springs has passed a number of zoning ordinances to manage potential fuels. In addition, the City has unique restrictions for various parts of the WUI that fall within the city. For example, in the Hillside Overlay zone, brush patches or clusters may be left in the safety zone, but must be separated by clear areas of ten feet or more of noncombustible materials or grass mown to no more than four inches. Similarly, larger trees are not allowed to have overlapping limbs and are required to be pruned of dead limbs to a height of ten feet above the ground. Additionally, tree branches are not allowed to extend over or under the roof eaves and shall not be within fifteen feet of a wood burning appliance chimney. The City also promotes using native woods for construction when possible as to lessen the use of foreign woods that may be more prone to fire. Additionally, the City encourages development in the WUI to consist of non-wood roofs and siding that is non-combustable.<sup>12</sup>

In addition to the regulations and ordinances utilized in Ashland and Colorado Springs, cities could require fire trails and open space to lessen the chances of fire spreading. Furthermore, cities and conservation districts can require effective fire fighting strategies and effective evacuation plans that are well known. The length of roadways can also be limited if they do not have more than one access; roads with secondary access make for smoother evacuations. Cities can also propose impact fees on developers who choose to develop in remote areas. And, most importantly, cities need to remember that instead of simply mitigating the damage from wildfires, they should also restrict development completely in areas of high hazard risk. For instance, areas with steep slopes and areas where roads can only have one access due to the terrain.

Zoning regulations may not be enough, particularly in communities where development has already occurred or entitlements are in place. Many conservation districts have been formed to help address the difficulties that come from increased human encroachment into wildlands and to address the problems due to development already in existence. In Lakewood, Colorado, the Jefferson Conservation District was established in order to promote conservation efforts within the fragile ecosystem leading from urban Denver into the Rocky Mountains. The district works with the State Forest Service and private land and home owners to lessen the environmental impact of encroaching urbanization. The district helps coordinate fire rehabilitation efforts, forest thinning, and aerial seeding. The Jefferson Conservation District also helps to raise community awareness of the diverse ecosystems in the foothills through soil identification and improvement, windbreaks and tree planting, erosion and sediment control, and water improvement efforts. Additionally, the district promotes and helps provide native grass to local homeowners in an effort to blend the natural and built environments and to reduce the negative impacts associated with introducing alien vegetation into a new environment.<sup>9</sup>



The Jefferson Conservation District helps coordinate fire rehabilitation efforts, forest thinning, and aerial seeding.

<http://www.jeffersonscd.org/JEFFERSON%20CD%20FLYER.pdf>

Striking a balance between continued expansion into the WUI and sustainability requires careful planning. Often times human attempts to mitigate hazards in the WUI ultimately leads to more disastrous outcomes. In the end, all communities can agree that reducing the loss of lives, property, and resources is a desirable outcome. This can

only be achieved by building and maintaining communities in a way that is compatible with our natural surroundings.<sup>13</sup> Since ecosystems vary greatly, no universal system of rules and regulations is viable. Communities preparing a CWPP gain the advantage of federal assistance, but also gain the more valuable advantage of assessing WUI dangers and disaster preparedness. It is also important to engage all community members – citizens, businesses, and developers – in the process. Ultimately, dynamic solutions are necessary to truly solve the problems continued WUI development raises.

#### Potential sustainability measures:

- The percentage of new development in the WUI (the lower the better)

#### Land Use Code Strategies

##### **Removing Obstacles**

- Eliminate permissive zoning that encourages growth in wildland areas
- Encourage participation of citizens, homeowners, large landowners, and developers in a discourse on sustainable practices in the WUI
- Increase community education about precautionary measures to limit harmful impacts in the WUI

##### **Incentives**

- Offer siting incentives or fee breaks for individuals or developers who use certain types of building materials that are less prone to fire
- Provide information and discounts on vegetation that is ecologically appropriate in a particular WUI zone

##### **Regulations**

- Require fire trails and open space to lessen the chance of fire spreading
- Require secondary access; limit the length of roadways with no secondary access
- Require impact fees to recoup the costs of development and management in remote areas

#### Strategic Success Factors

- Form conservation districts in WUI areas as to promote cooperation and ecological preservation
- Councils should require city officials to draft Community Wildfire Protection Plans in order to assess community vulnerabilities and disaster response strategies
- Design and make widely known effective evacuation and fire fighting strategies
- Implement ISO/fire standards

## Notes

1. The National Association of Conservation Districts, "Wildland-Urban Interface," [http://www.urban.nacdnet.org/urban\\_wildland\\_interface.htm](http://www.urban.nacdnet.org/urban_wildland_interface.htm).
2. Chris Maser, *Sustainable Community Development: Principles and Concepts* (Delray Beach, FL: St. Lucie Press, 1997), p. 142.
3. The National Association of Conservation Districts, "Wildland-Urban Interface," [http://www.urban.nacdnet.org/urban\\_wildland\\_interface.htm](http://www.urban.nacdnet.org/urban_wildland_interface.htm).
4. Chris Maser, *Sustainable Community Development: Principles and Concepts* (Delray Beach, FL: St. Lucie Press, 1997), p. 143.
5. The National Association of Conservation Districts, "Wildland-Urban Interface," [http://www.urban.nacdnet.org/urban\\_wildland\\_interface.htm](http://www.urban.nacdnet.org/urban_wildland_interface.htm).
6. Chris Maser, *Sustainable Community Development: Principles and Concepts* (Delray Beach, FL: St. Lucie Press, 1997), p. 143-144.
7. D.A. Leatherman and I. Aguayo, "Mountain Pine Beetle" <http://www.ext.colostate.edu/pubs/insect/05528.html>.
8. Chris Maser, *Sustainable Community Development: Principles and Concepts* (Delray Beach, FL: St. Lucie Press, 1997), p. 145.
9. The Jefferson Conservation District, <http://www.jeffersonscd.org/>.
10. Society of American Foresters, "Preparing a Community Wildfire Protection Plan," <http://www.safnet.org/policyandpress/cwpphandbook.pdf>.
11. City of Ashland, "Community Wildfire Protection Plan," <http://www.ashland.or.us/Files/Ashland%20CWPP.pdf>.
12. City of Colorado Springs, "Wildfire Risk Management," <http://www.springsgov.com/Page.asp?NavID=1225>.
13. Firewise, <http://www.firewise.org/>.