



Forest Carbon and Climate Program
Department of Forestry
MICHIGAN STATE UNIVERSITY

The Wildland Urban Interface and Fire Management Policies

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Introduction

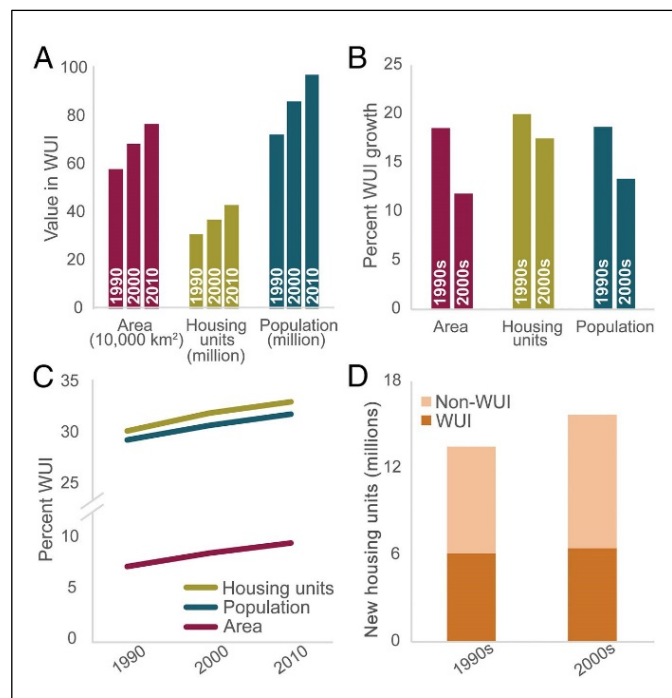
The wildland urban interface (WUI), refers to the area where forest, shrub, or grasslands meet housing or other developed areas (Radeloff et al., 2018). This rapidly expanding area is becoming riskier to develop and live in. Increasing human population and development paired with longer, more intense fire seasons necessitate more focused fire management planning to protect both the public and firefighting crews. This paper focuses on the efforts of four states—California, Colorado, Montana, and Washington—to reduce the risk of property damage and loss of human life through planning regulations and zoning policies. Each of these states have differing levels of jurisdictional intervention, as well as varying amounts of participation in risk reduction programs. This paper will explore how these states have employed different tools to encourage safer development and lower levels of fire risk in the WUI.

WUI Overview

The rapid expansion of the WUI, caused in part by rising human habitation in fire prone areas and wildlands, has exacerbated fire risk posed to life and property. **Figure 1** demonstrates the rapid increase in area of the WUI, as well as growth in units of housing and human population from the 1990s to 2010s. Current estimates place the number of houses in the WUI at approximately 50 million, with that number increasing by a million every three years (Burke et al., 2021).

However, human development is not the sole variable influencing the growth of fire risk in the WUI. Changing fire regimes due to a warming and drying climate, paired with decades of near total fire suppression, have also contributed to increased risk. Wildfire-burned area has quadrupling over the 40 years between 1985 and 2015 (Bure et al., 2021). These climate-driven trends are expected to continue and to intensify the duration and severity of fire seasons (Swain, 2021). With the increasing threat of wildfire and expanding area of the WUI, effective policy responses and management planning are essential to protecting human life, property, and natural habitats.

Figure 1. Area and Population Growth in the WUI Over the Last Three Decades



Note. Figure from Radeloff et al., 2018.

WUI Responses and Planning Solutions

Across the country, states have responded differently to the increased hazard posed to built infrastructure in the WUI. This section highlights responses in four high-risk



states: California, Colorado, Montana, and Washington (Mower, 2021). Planning requirements vary greatly by state and depend upon many factors such as fire risk level, existing state planning documents, and level of public engagement.

California

California uses a classification system created by the California Department of Forestry and Fire Protection (CAL FIRE) that identifies Very High Fire Hazard Safety Zones (VHFHSZs) which require additional hazard reduction beyond the baseline requirement for cities and counties outside VHFHSZs. These requirements are mandated by Senate Bill 1241 of 2012 and include:

1. Minimizing wildfire hazards and newly developed land
2. Building new public facilities (e.g., hospitals, emergency centers, emergency command centers) outside of high fire risk areas
3. Developing infrastructure within VHFHSZs that allow for emergency vehicle travel, visible street signage, and sufficient water supply to aid in fighting structural fires

California also employs State Responsibility Area (SRA) Fire Safe Regulations (California Code of Regulation, 2020) which are implemented by CAL FIRE and must be adopted by counties containing state responsibility areas. These requirements are in place to mitigate fire risk as well as aid in fire response. Some standards include easily visible road signage and house numbering, accessible private water reserves, minimum road width, and vegetation modification and removal.

SRA Fire Safe Regulations are additional to any ordinances adopted by local jurisdictions, which can go above and beyond what is mandated at the state level.

State Responsibility Areas (California Code PRC § 4127):

- Forested land or land that is capable of producing forest products
- Land covered by forest that protects from soil erosion or excessive water runoff if the land is a water source for domestic or industrial use
- Land that is used for range or forage purposes

Excludes:

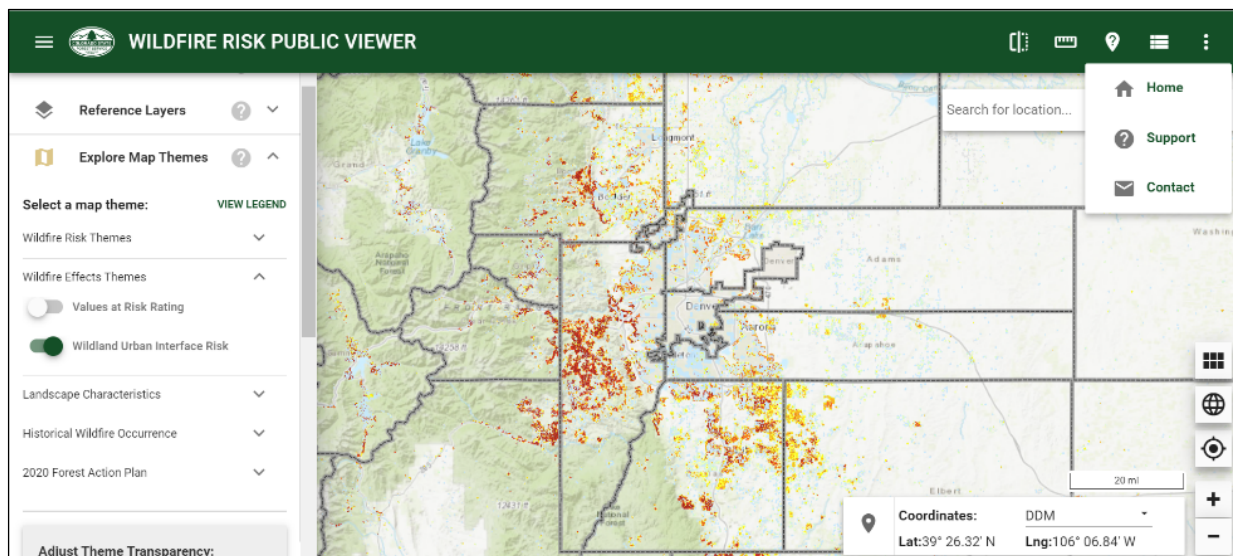
- Federal land



Colorado

As in California, Colorado planning requirements include a methodology to identify areas with high fire risk. Generated by the Colorado State Forest Service, this web-based map allows users to view fire risk within a half mile radius of any location in the state. It also includes layers for local vegetation, WUI risk area (shown in **Figure 2**), previous fire, and a fire intensity predictor. While lacking legal authority, it provides resources to assist residents and developers in minimizing their fire risk. The software also links to Firewise USA, a program administered by the National Fire Protection Association that provides guidance on best practices to reduce fire risk and bring communities together for more cohesive WUI management.

Figure 2. Map Highlighting WUI Risk Areas in the Front Range of Colorado



Note. Figure is from Wildfire Risk Public Viewer, n.d.

In addition to mapping software and fire mitigation suggestions, Colorado has legal frameworks in place which mandate masterplans to address natural hazards such as slope, geologic hazards, wildfire hazards, and more. Further, House Bill (HB) 1041 of 1974 gives local governments the authority to mandate certain planning activities that mitigate fire risk in areas of state concern (e.g., historical, natural or archaeological resources). By adopting HB 1041 regulations, local jurisdictions have the power to mandate HB 1041 permit requirements to undertake specific activities deemed to be of state interest. These activities often include projects involving waterways, airport construction, site selection for mass transit terminals, public utility facilities, solid waste disposal sites, and new communities (Arapahoe County Board of Commissioners, 2006).

Montana

Like other western states, Montana has developed a WUI and wildfire assessment tool generated by the Montana Department of Natural Resources and Conservation (Montana DNRC, n.d.). The state has significant legislation addressing WUI risk, but local implementation of this guidance has been slow. Counties and localities are



allowed to develop growth plans as they see fit provided they follow guidelines outlined by the state. These guidelines include analyzing potential fire risk and deciding whether special WUI designations are needed.

However, growth plans are limited in scope. They are not legally binding and landowners cannot be barred from receiving development permits based on violation of WUI guidelines contained in these plans. Likewise, another piece of legislation, the Subdivision and Platting Act, sets guidelines for new subdivision development in the WUI; but this act does not prevent developers from receiving the proper permits if they fail to comply with WUI development recommendations.

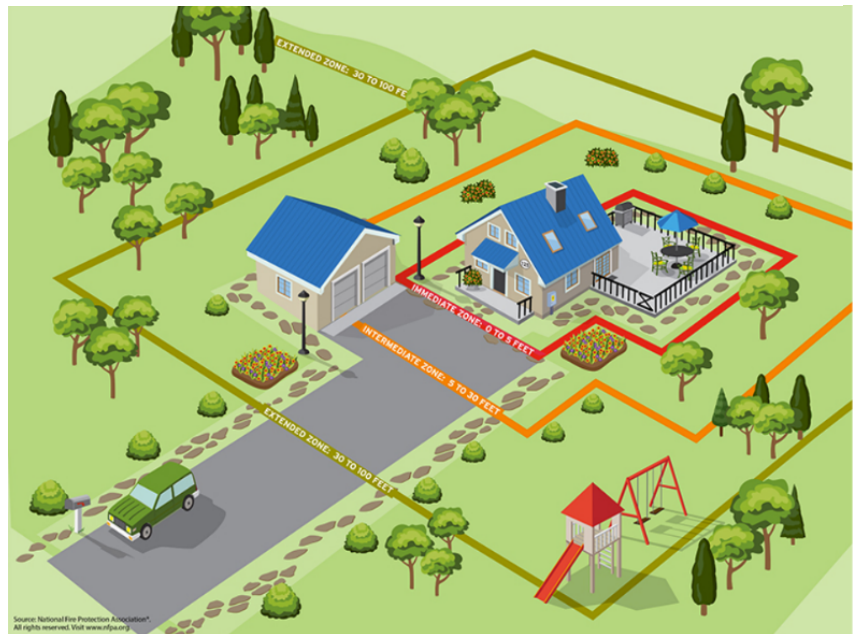
As with growth policies, no state-level WUI regulations are required or legally binding. One example is the set of DNRC-adopted guidelines pertaining to development in the WUI. These guidelines establish best practices for developers such as avoiding steep slopes, integrating fuel breaks, and more. In another example, WUI building recommendations (such as building materials) are regulated by the Montana Department of Labor and Industry (DLI). Local governments can adopt the building codes if they choose, but they cannot be amended.

Washington

Like Colorado, Washington State employs a wildfire risk indicator that, in this case, was developed by the U.S. Forest Service, Pacific Northwest Region, Quantitative Wildfire Risk Assessment. This indicator is used to inform their State Wildland Fire Protection 10-year Strategic Plan, which encourages WUI building standards and provides training and incentives for planning that considers the WUI. One example of building standards includes following Firewise USA recommendations for the home ignition zone. Shown in **Error! Reference source not found.**, this standard

encourages the immediate zone surrounding the home (zero to five feet) to be clear of any combustible material, the intermediate zone (five to 30 feet from the home) to have fire-resistant plants selected and fire breaks incorporated, and the extended zone (30–100 feet from the home) to be clear of dead plant matter so that fire stays low on the ground surface and does not spread up to spark larger crown fires.

Figure 3. The Home Ignition Zone



Note. This graphic shows the recommended amount of flammable material at different distances from, or zones around, homes to reduce wildfire risk to property. Image from NFPA, n.d.



In 1990, the Washington State Growth Management Act was passed requiring many cities and counties to develop plans to manage population growth, land use, housing, utilities, and more. Notably, natural hazards are not addressed in this act, leaving natural hazard planning and regulation to local governments. However, other planning frameworks exist in Washington and the state has adopted portions of the International Wildland-Urban Interface Code (IWUIC) into building code. Under the IWUIC, any building constructed after February 2021 must comply with stated ignition-resistant materials requirements, minimum building and infrastructure standards, and any other part of the international code counties see fit to specify (Washington State DNR, 2019).

In addition to the IWUIC, Washington has adopted the International Fire Code which furthers the extent to which building codes must consider fire risks by requiring site plans, vegetation plans, topographical assessments, and comprehensive language on emergency fire access roads and water supplies.

Conclusion

With rapidly changing fire regimes and an increasing WUI area, the need for strong planning and management policies is ever present. The four states highlighted in this piece have solid foundations in place to address new development, serving as a model for other states to follow. Importantly, states must consider their unique characteristics, such as risk level, public engagement, and existing statutes. Mapping of WUI area, fire risk, vegetation, and other factors is performed by different agencies in each of the states examined in this paper, ranging from state forest services to the National Forest Service. As such, mapping remains a critical thread in policy and decision making. Although WUI risk is continually increasing, the policy solutions currently in place paired with greater efforts to strengthen community resilience will provide the support and guidance needed to protect human life, property, and natural resources.



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