
Final Recommendations to Reduce Wildfire Risk: Medford, Oregon



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ABOUT

Community Planning Assistance for Wildfire Program

The Community Planning Assistance for Wildfire (CPAW) program works with communities to reduce wildfire risks through improved land use planning. The CPAW program is a partnership between Headwaters Economics and Wildfire Planning International. It is funded by grants from the USDA Forest Service and private foundations.

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Cover Image Credit

James Gerhardt, Rogue Valley Council of Governments (RVCOG)



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OVERVIEW

Since its founding in 2015, the national Community Planning Assistance for Wildfire (CPAW, pronounced “SEE-PAW”) program has assisted dozens of communities across the U.S. in reducing wildfire risk by providing technical land use planning assistance. The program is funded by the U.S. Forest Service and private foundations, which allows communities to participate in the program and receive assistance at no direct cost. CPAW teams bring expertise in planning, forestry, wildfire hazard, and other related skills and provide a set of final recommendations for voluntary implementation by each jurisdiction receiving assistance.

In November 2019, Medford was selected as one of six communities to receive technical assistance by the CPAW program for the following calendar year (2020). The scope of CPAW’s assistance included:

- Reviewing and analyzing applicable land use and wildfire-related documents and materials: draft Wildfire Risk Reduction ordinance developed by city staff; sections of the City of Medford Municipal Code (Land Development Code, Fire Code, Nuisance and Abatement Code, Building and Residential Specialty Codes); Comprehensive Plan and Urban Growth Boundary (UGB) amendment, and; wildfire hazard and mitigation outreach materials provided on the city website.
- Hosting multiple conference calls and an all-day virtual site visit with the Medford steering group (representatives from the city’s Planning and Fire Departments) to discuss local conditions that may contribute to current or future wildfire risk.
- Facilitating a conversation between the Medford steering group and City of Ashland Fire & Rescue staff to discuss Ashland’s approach to regulating the wildland-urban interface (WUI) through recently adopted mitigation requirements.

This final report is a culmination of the CPAW process and provides a set of recommendations to reduce wildfire risk in the City of Medford. These recommendations are primarily intended for implementation by the city’s Planning and Fire Departments but will benefit from collaboration with other stakeholders and community members who play an important role in wildfire risk reduction. Participation in CPAW is voluntary and implementation of CPAW recommendations is under the authority of the local jurisdiction responsible for land use decisions.

SUMMARY OF FINDINGS

The City of Medford currently addresses its wildfire risk through a combination of policy, regulation, and voluntary strategies, including:

- Recent adoption of residential construction requirements for ignition-resistant building materials and methods on new homes constructed in the city’s wildfire hazard area.
- Regulation of uncontrolled weeds, grass, brush, and other vegetation that may result in a fire hazard or other health and safety concerns.
- Neighborhood outreach and public engagement that leverage national mitigation programs, including the Firewise USA® and Ready, Set, Go! programs.



- Development and participation in hazard plans that address wildfire, including the City of Medford Natural Hazards Mitigation Plan and the Rogue Valley Integrated Community Wildfire Protection Plan.

However, there are several gaps in the current approach that provide opportunities to strengthen wildfire threats. For example, there is no regulation of landscaping, attachments (such as decks or fences), accessory structures, and other susceptibility factors that contribute to wildfire ignitions at the parcel scale.¹ In addition, the approval of the city's Urban Growth Boundary (UGB) may prompt an evaluation of appropriate uses and densities in future areas of expansion that are also in the designated wildfire hazard area. Finally, some areas of the city, such as the Bear Creek Greenway, have a history of wildfire but do not have any specific plans or policies that prioritize risk reduction in this area, nor are they considered part of the wildfire hazard area. As a result, there are vulnerabilities across the city that can contribute to increased fire behavior and threats to life and property during a wildfire.

RECOMMENDATIONS

The following recommendations address existing gaps identified by CPAW at multiple scales in the city to provide a more comprehensive approach toward wildfire risk reduction.

1. Amend the Medford Land Development Code to Address Wildfire

During the course of this CPAW assistance, Medford city staff drafted a Wildfire Mitigation Area Overlay Zone and other potential amendments to the Land Development Code. CPAW reviewed the staff draft and provided suggested revisions to help improve its clarity and effectiveness. Those comments are provided as a separate attachment to this report.

In addition, CPAW has created a number of images that support the implementation of regulations related to the Home Ignition Zone (HIZ). Those images have been provided to Medford as part of this assistance.

2. Evaluate and Expand Wildfire Hazard Area

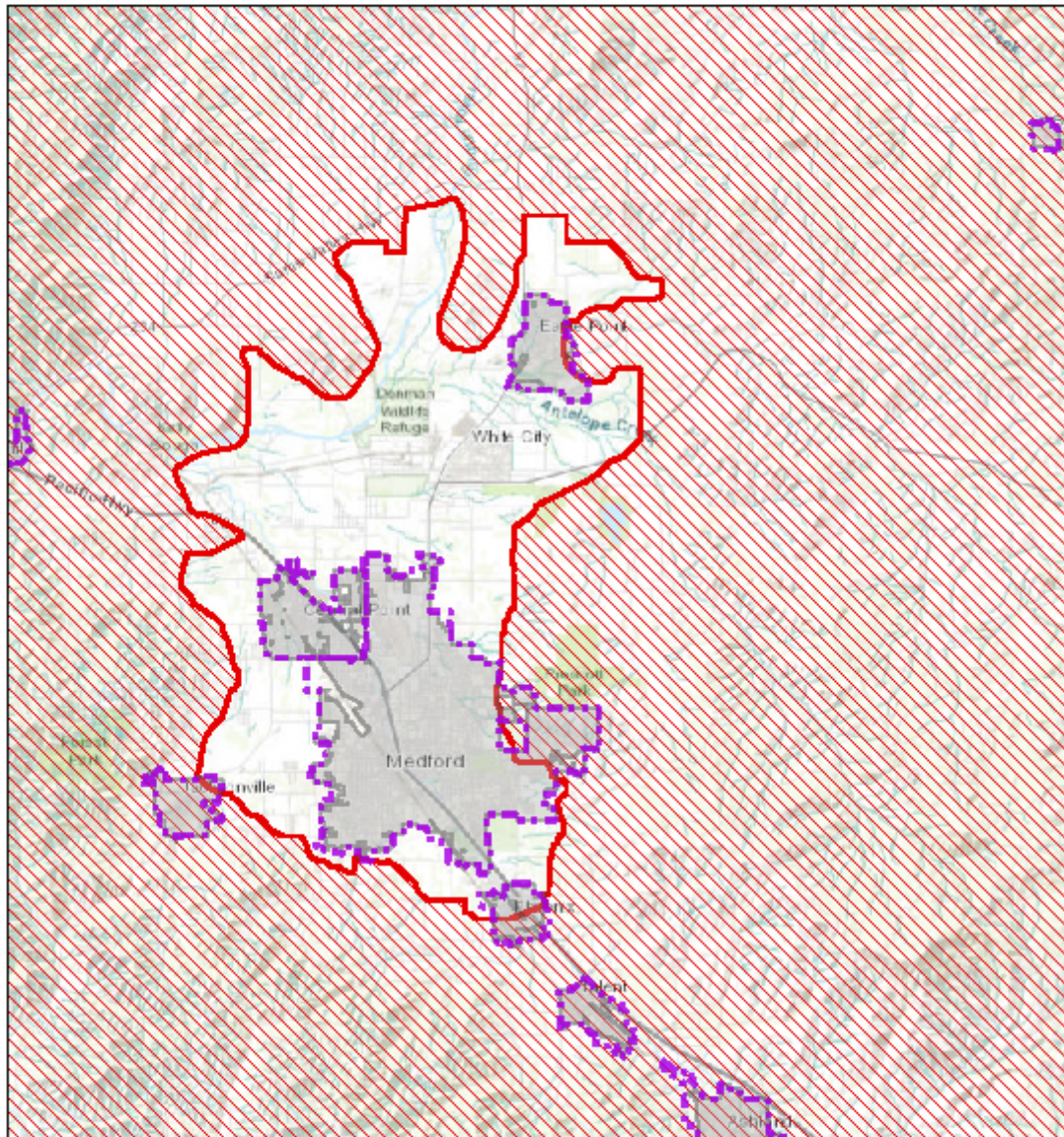
Currently, the City of Medford is using the Jackson County wildfire hazard overlay that is based on the Oregon Department of Forestry methodology developed in the 1990's (Figure 1). The result is one standard hazard class that is applied mostly outside the current city limits and UGB, regardless of the varying building and landscaping conditions of the individual lots and structures. This layer also does not account for ember impacts, which current science and case studies indicate are the dominating heat transfer process that influences structure loss extending up to a mile (in Ponderosa Pine forests) into City of Medford urban environments^{2,3}. At this county scale, it is difficult to measure changes, or provide decision support at the city's scale of operation. Based on this assessment, the CPAW team has identified the following options to evaluate and potentially expand its wildfire hazard area.

¹ These issues and opportunities are further discussed in a staff memo from the Planning Department to the Mayor and City Council (dated October 3, 2019).

² National Wildfire Coordinating Group. PMS 437 Spotting Fire Behavior <https://www.nwcg.gov/publications/pms437/crown-fire/spotting-fire-behavior>

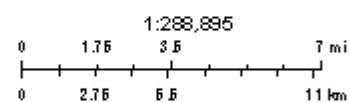
³ Stewart, S.I., V.C. Radeloff, R.B. Hammer, and T.J. Hawbaker. 2007. Defining the Wildland Urban Interface. Journal of Forestry 105:201-207 <http://silvis.forest.wisc.edu/wp-content/uploads/2018/10/Stewart-et-al-JOF-2007.pdf>

Jackson County Development Overlays



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- County Boundary
- Urban Growth Boundary
- City Limits
- Within Hazard Area



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, NOAA, NPS, NRCAN, GeoEye, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Jackson County - Public User
Data within this application may contain inaccuracies. Maps produced are not intended for legal purposes and do not substitute for a professional land survey. For more information, see OPCS

Figure 1. Jackson County Fire Hazard Development Overlay currently used by the City of Medford

Option 1: No Initial Change – Continue to Use Current Wildfire Hazard Layer

The current Jackson County wildfire hazard mapping is a very simple and easy layer to understand and apply. This approach is also widely accepted by the public, elected officials and the development community. It also aligns with the applicability of the building code. Although this is initially the easiest option, it does not necessarily provide the most accurate representation of the WUI extent, or the level of potential hazard. For this reason, the CPAW team recommends that the city seriously consider increasing the robustness of the wildfire hazard layer in the future. The most readily available option is to adopt the Oregon Explorer (Option 2). We also recommend further expanding this layer with the addition of an ember impact buffer (Option 3), using specific layers that help identify the hazard and risk to structures. Finally, adding a comprehensive individual home assessment program (Option 4) would provide the tool to collect structure susceptibility information needed for a complete wildfire risk assessment, while educating and engaging residents in risk reduction.

An alternative is for the city to develop their own hazard assessment methodology. However, this requires significant expertise and financial resources to undertake.

Option 2: Oregon Wildfire Risk Explorer

The CPAW team recommends that its wildfire hazard assessment be updated to assess the wildfire risk based on the most current science and at a scale that can provide decision support and a measure of success with regards to land use planning policy and regulation implemented by the city. To implement this option, the City of Medford should take the necessary steps to address the current shortcomings related to its WUI and hazard identification:

1. Adopt the Oregon Wildfire Risk Explorer as the new wildfire risk assessment
2. Consider adding Option 3 (below) to account for the ember impact zone
3. Consider adding Option 4 (below) to enhance this assessment over time by collecting structure susceptibility information with individual HIZ assessments

This will also provide a clear definition of the City of Medford's WUI and integrate a defensible risk assessment map as a component of the decision support tool and measure of success for land use policies and regulations.

The Advanced Oregon Wildfire Risk Explorer includes a variety of wildfire risk assessment layers that can be useful in land use planning. Guidance for each step is outlined below.

Overall Wildfire Risk Layer

The overall wildfire risk (Figure 2) is the product of the likelihood and consequence of wildfire on all mapped highly valued resources and assets combined (e.g., critical infrastructure, developed recreation, housing unit density, seed orchards, sawmills, historic structures, timber, municipal watersheds, vegetation condition, and terrestrial and aquatic wildlife habitat.)

This dataset considers the likelihood of wildfire >250 acres (likelihood of burning), the combined susceptibility of resources and assets to wildfire of different intensities, and the likelihood of those intensities. The data values reflect a range of impacts from a very high negative value where wildfire is detrimental to one or more resources or assets (e.g., structures, infrastructure, early seral stage and/or sensitive forests) to a very high positive value where wildfire will produce an overall benefit (e.g., vegetation condition/forest health, wildlife habitat). This layer may not be directly useful in connecting to land use policy or regulation, but it provides an excellent summarized view of the wildfire risk faced by the City of Medford.

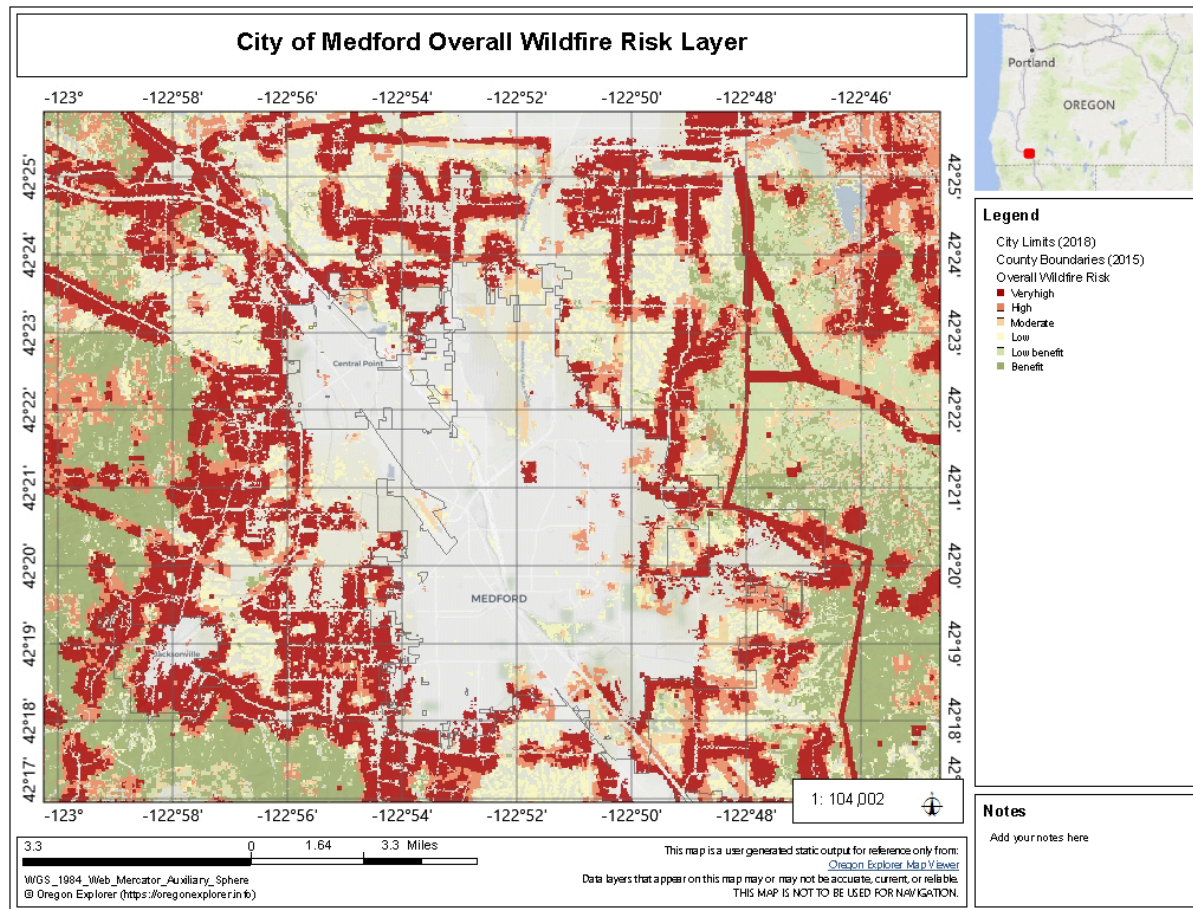


Figure 2. Oregon Wildfire Risk Explorer overall wildfire risk layer (source: https://tools.oregonexplorer.info/OE_HtmlViewer/Index.html?viewer=oe). A full page map is provided in Appendix A.

Hazard to Potential Structures Layer

The Hazard to Potential Structures layer shows impact levels to structures within 150 meters (approx. 500 feet) of a burnable fuel type, as if structures were present, and if a wildfire occurs. This data is based on modeled vegetation and not on building construction materials, which actually provides a measure of wildfire exposure (likelihood and intensity) as opposed to the complete wildfire risk. Building construction material and building design conditions, or conditions within the HIZ of individual structures, have the greatest influence on the susceptibility of a structure and are not accounted for in this layer. Therefore, this data can be further refined through the undertaking of individual parcel-level wildfire assessments (Option 4).

The impact levels are as follows:

Very low: The potential impact to structures when wildfire occurs is expected to be very low. Fuel in the area is largely non-burnable or very sparse. If a fire ignites near a home, there is low potential for loss.

Low: The potential impact to structures when wildfire occurs is expected to be low. If a fire ignites near a home, there is potential for loss. Low represents up to the 50th percentile of values across the landscape.

Moderate: The potential impact to structures when wildfire occurs is moderate. If a fire ignites near a home, there is high potential for loss. High represents the 50th to 80th percentile of values across the landscape.

High: The potential impact to structures when wildfire occurs is high. If a fire ignites near a home, there is high potential for loss. High represents the 80th to 95th percentile of values across the landscape.

Very High: The potential impact to structures when wildfire occurs is very high. If a fire ignites near a home, there is high potential for loss. High represents the 95th to 100th percentile of values across the landscape.

This layer can be used to determine the potential hazard (exposure) for future development or the potential hazard (exposure) for existing development (Figure 3).

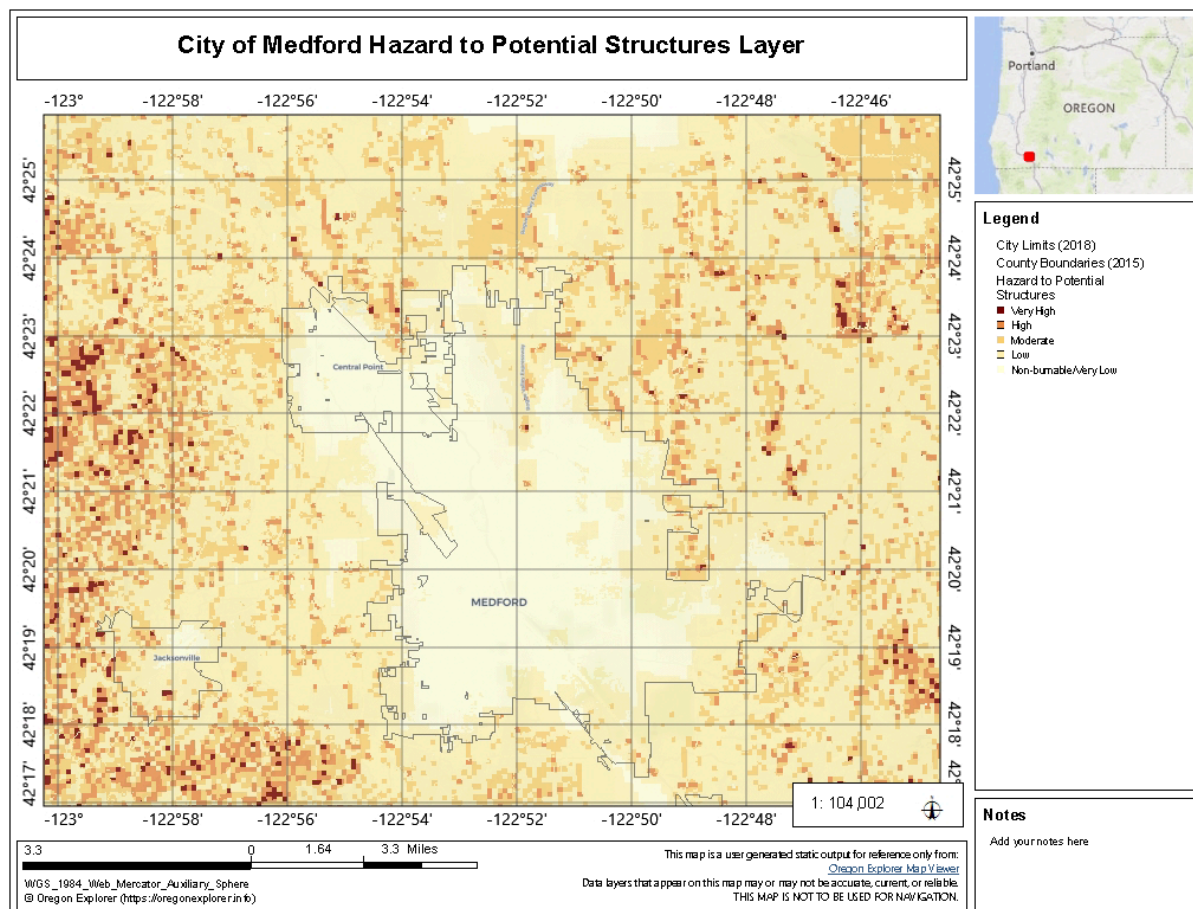


Figure 3. Oregon Wildfire Risk Explorer hazard to potential structures layer (source: https://tools.oregonexplorer.info/OE_HtmlViewer/Index.html?viewer=oe). A full page map is provided in Appendix A.

Potential Impact to People and Property Layer

This layer represents the consequence of wildfire, if it occurs on mapped housing unit density and USFS private inholdings (Figure 4). The potential impact is delineated from very low to very high. This layer can be used to determine the potential exposure of existing structures and people, based on the mapped presence of structure (address) points. Again, this data can be further refined through the undertaking of individual parcel-level wildfire assessments.

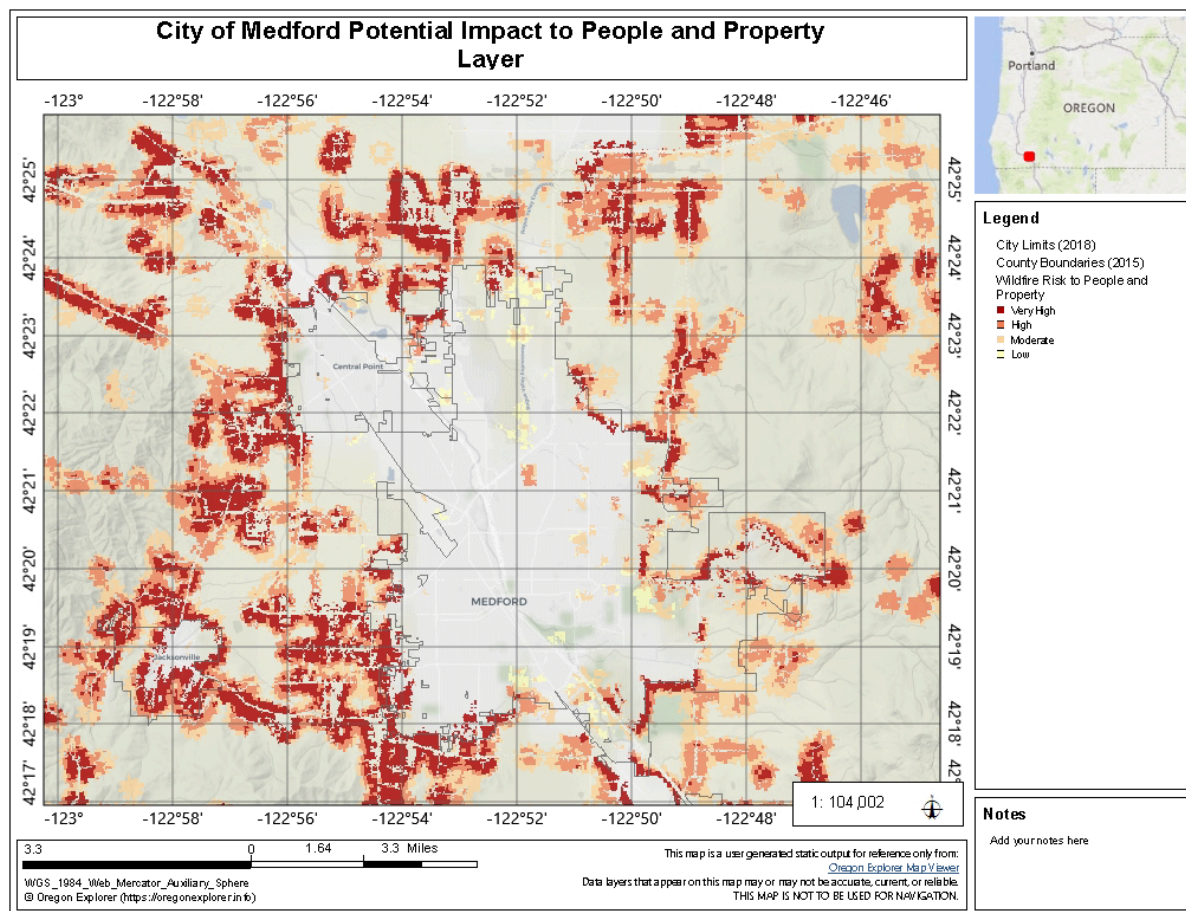


Figure 4. Oregon Wildfire Risk Explorer potential impacts to people and property layer (source: https://tools.oregonexplorer.info/OE_HtmlViewer/Index.html?viewer=oe). A full page map is provided in Appendix A.

Potential Impact to Infrastructure Layer

This layer represents the consequences of wildfire to mapped critical infrastructure, recreation values, seed orchards, etc. The potential impact is also delineated from very low to very high (Figure 5).

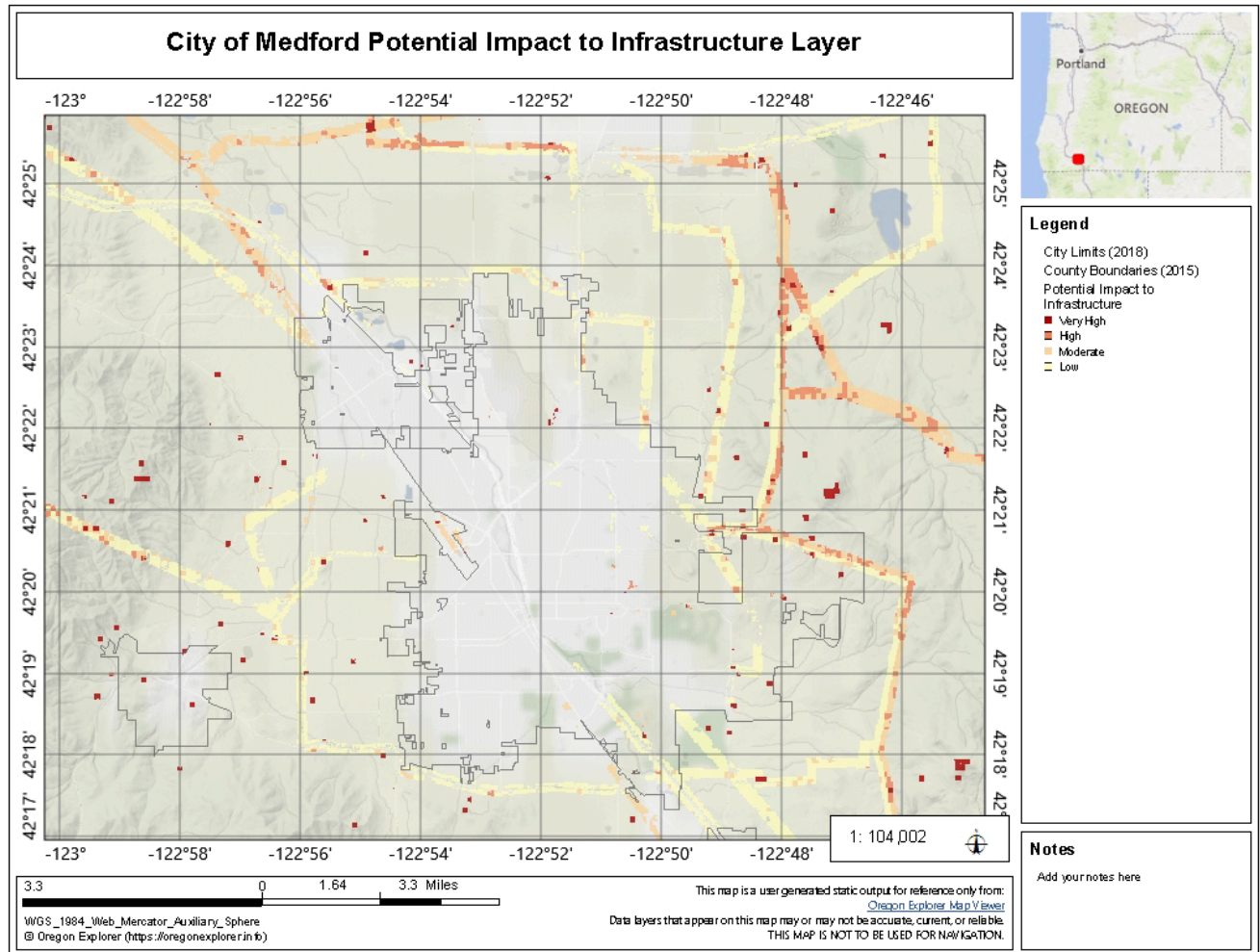


Figure 5. Oregon Wildfire Risk Explorer potential impacts to infrastructure layer (source: https://tools.oregonexplorer.info/OE_HtmlViewer/Index.html?viewer=oe) A full page map is provided in Appendix A.

Option 3: Expand with an Ember Impact Buffer

To provide a spatial reference in defining the wildfire hazard layer to include an ember impact area, the city can rely on a modification of the approach used by the SILVIS Lab⁴. The SILVIS Lab's approach originated in the Federal Register report on WUI communities at risk from fire. This approach further expands on the Federal Register definitions and focuses on the following inputs:

1. Housing density
2. Landcover
 - a. WUI Intermix: Areas with ≥ 16 houses per square mile and ≥ 50 percent cover of wildland vegetation

⁴ The SILVIS Lab is part of the University of Wisconsin-Madison and provides spatial analysis on land use, conservation, and other topics including the wildland-urban interface. WUI data is available for free download at: <http://silvis.forest.wisc.edu/>

- b. WUI Interface: Areas with ≥ 16 houses per square mile and < 50 percent cover of vegetation located < 1.5 miles of an area ≥ 2 square miles in size that is ≥ 75 percent vegetated.
- c. Non-WUI Vegetated (no housing): Areas with ≥ 50 percent cover of wildland vegetation and no houses (e.g., protected areas, steep slopes, mountain tops)
- d. Non-WUI (very low housing density): Areas with ≥ 50 percent cover of wildland vegetation and < 16 houses per square mile (e.g., dispersed rural housing outside neighborhoods)
- e. Non-Vegetated or Agriculture (low and very low housing density): Areas with < 50 percent cover of wildland vegetation and < 128 houses per square mile (e.g., agricultural lands and pasturelands)
- f. Non-Vegetated or Agriculture (medium and high housing density): Areas with < 50 percent cover of wildland vegetation and ≥ 128 houses density per square mile (e.g., urban and suburban areas, which may have vegetation, but not dense vegetation)

Figure 6 (below) illustrates the resulting spatial representation of the SILVIS Lab modeling for the City of Medford.

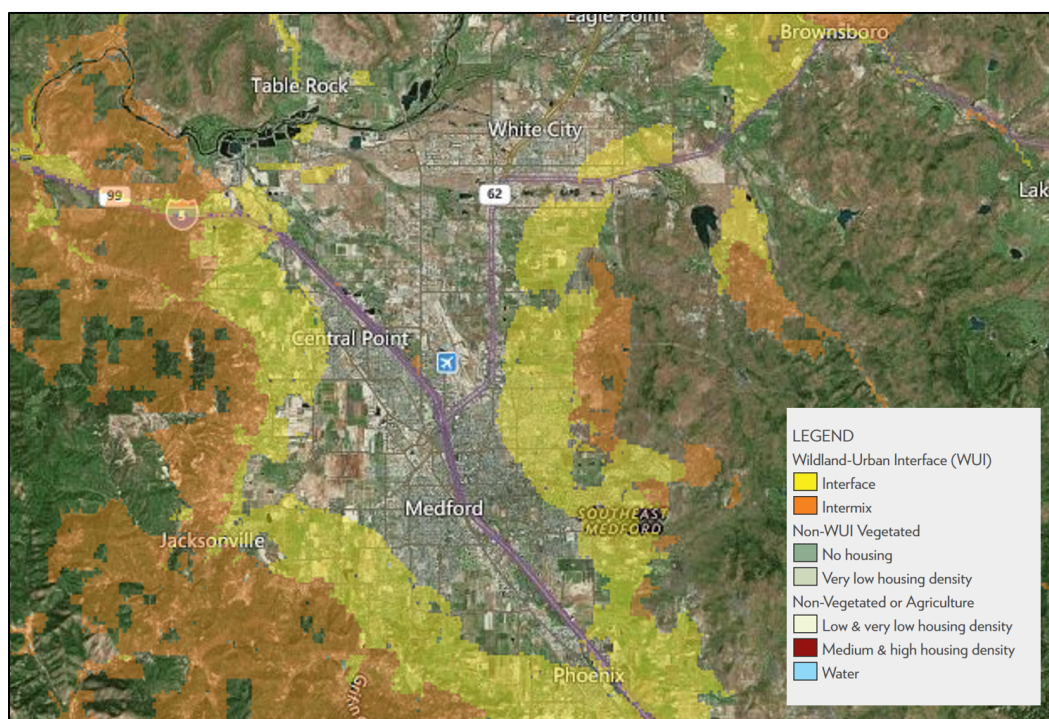


Figure 6. Spatial illustration of the Wildland-Urban Interface and Wildland-Urban Intermix for the City of Medford based on the SILVIS Lab's approach. A full page map is provided in Appendix A.

Ember impacts from wildfires have the potential to extend well into the city, igniting vulnerable buildings, accessory structures, vegetation and combustible materials in yards. This typically leads to structure to structure ignition. To account for this in a simplified form, the above Landcover definitions can be modified to the following:

- WUI Intermix: Areas with houses (or other structures) present and ≥50 percent cover of wildland vegetation
- WUI Interface: Areas with houses (or other structures) present and <50 percent cover of vegetation

The resulting product would provide a map that shows both the extent of the existing WUI (i.e., where policy and regulation should be focused) and the general delineation of the stringency of the policies and requirements from most stringent (WUI Intermix) to least stringent (WUI Interface) for all structure values of concern (structures and infrastructure). Since this map is based on census data of existing housing units, the map does not take future development into account. In order to account for future development, this layer would have to be combined with either Option 1, or Option 2.

Option 4: Implement a Home Ignition Zone (HIZ) Assessment Program

The City of Medford can create mechanisms to support voluntary compliance for existing properties that are interested in wildfire mitigation but are not subject to the parameters that trigger the regulations. Research and case studies have shown a direct link between the HIZ condition and the susceptibility (survival) for structures during a wildfire event.⁵ We recommend the implementation of a coordinated voluntary HIZ assessment program that provides property-specific assessments and mitigation recommendations that meet the same criteria as those associated with the city's regulations. This program should be available in all areas of the city that are identified as interface or intermix on the maps, and roll-out can be prioritized using the potential hazard to structures map (if adopted). Otherwise, the program should be available throughout the identified hazard area, if the current hazard map is retained without enhancements.

This type of program not only supports the systematic collection, storing, and tracking of important structure wildfire susceptibility information, but also provides individual property owners with a customized (property specific) mitigation work plan. Examples of this type of integrated voluntary and regulatory approach include the Eagle County (Colorado) REALFire[®] program and the Boulder County (Colorado) Wildfire Partners program. Both programs currently provide parcel-level wildfire assessments to property owners on a voluntary "by request" basis. Assessments are conducted by trained staff using a mobile device-based application and online platform with an integrated reporting function. The mobile application and database are designed to address limited staff capacity by significantly decreasing the administrative load on staff.

Through this program, the local jurisdiction provides HIZ mitigation advice in the form of a wildfire mitigation report. Upon the property owner implementing the mitigation recommendations, the local authority provides a follow-up inspection using the same technology to confirm the work has been completed. The platform also has the ability to issue a certificate recognizing successful completion of the mitigation work. These programs align with the most current wildfire mitigation research and best practices. The structure of both the Eagle County REALFire program (realfire.net) and the Boulder County Wildfire Partners program (wildfirepartners.org) are very similar but customized to the local needs of each county. The latter program is currently directly linked to the county's land use and building code regulatory process. Establishing a similar program that is linked to the city's requirements would likely result in a standardized and comprehensive HIZ assessment that can support the development

⁵ Cohen, J. 2010. The Wildland-Urban Interface Fire Problem. *Fremontia* 38(2) 17-22

review process while also addressing the wildfire vulnerabilities of existing development. Furthermore, some residents who participate in these programs have realized insurance benefits related to their mitigation efforts.

3. Review Municipal Code To Resolve Conflicts

The purpose of this recommendation is to identify other areas of the existing municipal code that could be affected if the city adopts new requirements for a Wildfire Mitigation Area Overlay Zone. We recommend reviewing the municipal code to add appropriate section references to the Wildfire Mitigation Area Overlay Zone, and reviewing the code for any potential areas of conflict that require resolution between new and existing requirements. For example, landscape and irrigation requirements should reference the new overlay zone and ensure that it is clear which provisions take precedent. Potential sections to review for adding cross-references and/or resolving conflicts may include, but are not limited to, the following (listed in sequential order):

- Fencing of Lots (§10.732)
- Landscape and Irrigation Requirements (§10.780)
- Concealment of Trash Receptacles (§10.781)
- Concealment of Heating, Ventilation, Air Conditioning (HVAC) Equipment and Roof-Mounted Wireless Communication Facilities (§10.782)
- Bufferyards (§10.790)
- Agricultural Buffering in Non-Urban Reserve Areas (§10.801)
- Urban-Agricultural Conflict Mitigation in Urban Reserve (§10.802)
- Accessory Dwelling Unit (ADU) (§10.821)
- Outdoor Storage, Display and Sales of Merchandise (§10.831)
- Temporary Uses and Structures (§10.840)
- Riparian Corridors (§10.920)
- Hillside Ordinance (§10.929)

In cases where a conflict may arise with wildfire mitigation standards, a statement should be added to the applicable section that clearly states which standards take priority or if there are exemptions.

4. Create Greenway Management Plan

The Bear Creek Greenway is a 20-mile, paved, multi-use trail that links the cities of Ashland, Talent, Phoenix, Medford and Central Point.⁶ The greenway's benefits are myriad, including providing recreational opportunities, improved air quality, and riparian habitats for flora and fauna.

The portion that runs through Medford also elevates wildfire concerns in multiple ways:

- A transient population congregates along the greenway during the summer and lights campfires or cooking fires, which have resulted in uncontrolled grass and brush fires.

⁶ <https://jacksoncountyor.org/parks/Greenway/Bear-Creek-Greenway-Map>

- Blackberry bushes, a nuisance species, are overgrown throughout portions of the greenway. These bushes contribute to wildfire spread by igniting easily and acting as 'ladder fuels'⁷ that can carry fire from the surface into tree canopies, contributing to a wildfire scenario that is more difficult to control.
- Restrictions on mitigation (e.g., tree/vegetation removals) in the riparian zone can make it difficult to balance ecological requirements for a wetland zone while reducing hazardous wildland vegetation.
- Excessive dumping of debris or other combustible materials—sometimes hazardous—without proper disposal measures in place has also resulted in unsafe conditions for emergency responders during wildfires.

The city has begun to actively mitigate wildfire hazard along the greenway by funding projects to thin areas of hazardous fuels. However, there is no comprehensive approach that enables a sustainably funded and collaborative effort to support long-term management of the greenway with respect to wildfire and related fuel management concerns.

CPAW recommends that the fire and planning departments work in partnership with other agencies and organizations to develop a management plan for the Bear Creek Greenway. The intent of the management plan would be to address fire mitigation concerns, including transient populations and other human-caused ignitions, priority areas for hazardous fuels reduction, nuisance management, balances approach with sensitive riparian areas, coordination with adjacent property owners, and long-term maintenance. This recommendation should be implemented in conjunction with a re-evaluation of the wildfire hazard areas in the city (see Recommendation 2), to ensure that future applicability of regulations appropriately consider wildfire hazard areas.

CONCLUSION

Recommendations provided in this report were based on CPAW's engagement with the City of Medford's Planning and Fire Departments and an internal analysis of current city plans and codes. Four specific recommendations were identified in this report to strengthen the city's approach toward wildfire planning. These recommendations present immediate opportunities for change and address wildfire risk reduction at multiple scales.

We also recommend that the city consider other regulatory, policy, and programmatic activities to support wildfire risk reduction in the short and long-term. Some of these activities are already underway, such as efforts to further educate the community on the HIZ through participation in the International Association of Fire Chief's Ready, Set, Go! risk reduction campaign. Other efforts, such as a review of subdivision regulations that ensure adequate access, water supply, and appropriate housing densities in wildfire hazard areas, may require additional coordination across the planning and fire departments. Finally, stakeholder collaboration will be essential as the city takes on any regulatory changes. Based on its successful history of local building code amendments, the city is well-positioned to move forward with future activities.

⁷ Ladder fuels are defined as fuels which provide vertical continuity between strata, thereby allowing fire to carry from surface fuels into the crowns of trees or shrubs with relative ease. They help initiate and assure the continuation of crowning. (National Wildfire Coordinating Group Glossary of Wildland Fire, PMS 205)

APPENDIX A: MAPS

- City of Medford Overall Wildfire Risk Layer
- City of Medford Hazard to Potential Structures Layer
- City of Medford Impacts to People and Property Layer
- City of Medford Impact to Infrastructure Layer
- City of Medford Wildland-Urban Interface and Wildland-Urban Intermix Map

