

Community Planning Assistance for Wildfire Recommendations for Bend, Oregon





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Introduction

Community Planning Assistance for Wildfire

The Community Planning Assistance for Wildfire (CPAW) program supports communities' efforts to reduce wildfire risk through improved land use planning. CPAW provides communities with professional consulting services including land use planners, foresters, wildfire risk modelers and hazard mitigation specialists to integrate wildfire mitigation measures into the development planning process. CPAW assistance is provided at the request of the local government, and all advice and assistance is limited to services that are intended to reduce the risk from wildfires.

In 2015, CPAW officially launched in five communities, including Bend, Oregon. For over nine months, a multi-disciplinary team worked with local stakeholders to determine Bend's unique wildfire planning needs. Primary points of City staff contact were the Bend Fire and Rescue Department and Growth Management Department. Information was gathered through in-person site visits, document review and analysis, and frequent stakeholder discussions. The process culminated in a set of recommendations to guide the City's future actions to strengthen its approach to wildfire through the planning process.



Figure 1 *The CPAW team met with local stakeholders in the field to discuss fuel treatments and areas of future development. (Photo credit: M. Mowery)*

CPAW is a partnership between Headwaters Economics and Wildfire Planning International. The program is funded through a cooperative agreement with the USDA Forest Service and private foundations. More information about the program is available at <u>planningforwildfire.org</u>.

Summary of Recommendations

This report provides five recommendations, each of which contains: a brief overview to summarize its importance and relevance; a section on implementation to help guide staff on next steps, and; tips and additional support. Recommendations are presented in a logical priority of implementation:

- 1. Develop a Community Wildfire Protection Plan for the City of Bend
- 2. Define Wildland-Urban Interface (WUI) and Develop a WUI Risk Assessment That Spatially Delineates Risk Levels
- 3. Develop and Adopt Wildland-Urban Interface Regulations
- 4. Inventory and Assess Critical Facilities for Wildfire
- 5. Align and Integrate Wildfire Risk with Ecosystem-Based Fire Management



Implementation

Local governments retain sole authority for implementation of any land use planning recommendations provided through CPAW. As staff consider these CPAW recommendations, it is also anticipated that further refinement may be required to ensure full alignment with City goals.

In addition, general guidance can also be offered to improve the overall success of any future implementation effort:

- **Trainings and Capacity Building.** Many of the recommendations rely on additional education of staff related to technical topics. Future trainings, such as in-depth courses on the Home Ignition Zone, can also improve internal capacity and reduce reliance on outsourcing. Training and capacity building efforts can be coordinated with existing local resources already focused on these activities, such as Project Wildfire, and other departments mentioned throughout this report.
- **Public Outreach and Engagement.** Underlying any successful effort to update community plans, policies and regulations is a concerted approach to engage the public. This component will be essential to moving CPAW recommendations forward, and may include public meetings and presentations on wildfire, information brochures in development applications that illustrate mitigation standards, and one-on-one interactions occurring between fire department and planning staff with residents.
- **Stakeholder Collaboration.** As mentioned throughout the report, collaborating with a number of stakeholders is critical throughout the implementation process. Stakeholders will vary—where applicable, suggestions to individual agencies and departments have been provided. These suggestions serve as a starting point only and are not intended to limit the participants throughout the collaborative process.

Thoughtful execution of a well-designed wildland-urban interface program also takes time. While this set of recommendations is purposefully ambitious in nature, it acknowledges that change does not occur overnight. However, with continued commitment to address its wildlandurban interface, these recommendations serve as a long-term roadmap for Bend's resilient future.



Recommendation 1: Develop a Community Wildfire Protection Plan for the City of Bend

Develop a Community Wildfire Protection Plan (CWPP) for the City of Bend to direct local stakeholders to take wildfire mitigation actions within Bend city limits.

Why This Recommendation Matters

Overview

A Community Wildfire Protection Plan (CWPP) is a plan uniquely focused on reducing wildfire risk to a specified area. It allows stakeholder to collaboratively identify wildfire risk factors and local values at risk, and prioritize mitigation strategies. CWPPs can be implemented at a number of scales, including neighborhood, fire district, city, and county. CWPPs can also "overlap" with their scales and jurisdictional boundaries.

The recently updated and adopted Greater Bend CWPP (February 2016) was a collaboratively developed plan that engaged local, state and federal stakeholders. The Greater Bend CWPP's planning area covers the Greater Bend WUI, which identifies and assesses eight communities at risk (Core Bend, Greater Bend, North, Northeast, Northwest, Southeast, Southwest, and West). Core Bend is within city limits, and Greater Bend has a number of WUI areas within the City limits.



Greater Bend Community Wildfire Protection Plan

Figure 2. Boundaries and subregions of the Greater Bend CWPP (2016).



The Greater Bend CWPP identifies priorities and strategies for reducing hazardous wildland fuels while improving forest health, supporting local industry, and improving fire protection capabilities (CWPP, page 43). The Greater Bend CWPP, however, does not provide a comprehensive set of specific actions for Bend to ensure measurability and accountability for mitigation. Nor does the City of Bend have its own citywide CWPP or any comparable plan that solely focuses on wildfire risk at the City scale.

Developing a Bend-specific CWPP offers many benefits:

- It allows local stakeholders to focus on local risk factors and prioritized actions unique to the City scale.
- The CWPP can become the "collector" of local wildfire and WUI information, and track implementation efforts in a coordinated and organized manner.
- A CWPP complying with the Healthy Forest and Restoration Act (HFRA) provides an avenue for influencing fuel treatment decisions on adjacent national forests, and becomes eligible for Federal and State mitigation grant opportunities.
- When done in collaboration with the County, developing CWPPs on City and County scales would meet multiple stakeholders' objectives for community risk reduction.
- It allows the City to define, identify, and prioritize wildfire mitigation efforts throughout the City, including future growth in the Urban Growth Boundary (UGB).

Relationship to Community Planning

CWPPs are intertwined with community planning. CWPPs focus on many community values at risk, including transportation and access routes, critical infrastructure, neighborhoods and homes, natural resources, and other uses unique to a community. Creating direct links between the CWPP and community planning processes ensure these two dynamic activities remain in sync.

Implementation Guidance

1. Form a CWPP Committee

As a first step, the City should form a multi-stakeholder group to collaboratively work on the development of a CWPP. Include City department representatives from Bend Fire and Rescue, Community Development, Growth Management, Engineering (infrastructure), Public Works, Park and Recreation District, Utilities. Engage others from local community/neighborhood groups, Project Wildfire, Deschutes County Planning Department, Deschutes County Forester, Deschutes County Sheriff, Deschutes National Forest, and Bureau of Land Management.

2. Review CWPP Development Guides

Several guides and handbooks exist to provide best practice advice on the development of CWPPs. These include tips on forming a steering committee, collaborating with stakeholders, engaging the public, meeting CWPP minimum requirements, and evaluating future progress:

- Preparing a Community Wildfire Protection Plan (2004)
- <u>University of Oregon CWPP Evaluation Guide (2008)</u>
- <u>Best Management Practices for Creating a Community Wildfire Protection Plan (2012)</u>



3. Create an Action Table

CWPP stakeholders should create a CWPP action table which identifies the following:

- Action: Specific action to be taken
- **Target Area:** Where it applies—e.g., community at risk, or planning area within community at risk
- Lead: Lead agency responsible and accountable for administration and implementation
- **Coordination:** Supplementary stakeholders (e.g., County and City agencies and departments) critical to implementation
- **Timeframe:** Timeframe for implementation, unless this is an ongoing task
- Links: References to other documents, policies, or community planning initiatives
- **Funding:** Potential funding resources, if necessary for implementation
- Follow-Up: Information on action status updates and accomplishments

4. Draft Community Planning Actions

The Greater Bend CWPP contains several references to community planning throughout the document, including:

- An overview of the Bend Area General Plan and Oregon's planning process
- An update of the Urban Growth Boundary (UGB) expansion project
- References to the Deschutes County Multi-Jurisdictional Natural Hazards Mitigation Plan (NHMP), including actions related to city planning coordination and engagement
- Reference to the CPAW program, and support for forthcoming recommendations

This information should be captured as part of the City's CWPP's community planning actions. Additional specific community planning actions should address:

- 1. A re-evaluation of communities/areas at risk within Bend City limits, resulting from the Urban Growth Boundary (UGB) expansion, to identify additional areas at risk under the responsibility of Bend.
- 2. Mitigation strategies to address updated communities/areas at risk within Bend City limits, including but not limited to:
 - a. Implementation of the Deschutes County Natural Hazards Mitigation Plan (NHMP) actions contained in the City of Bend Addendum related to wildfire planning: MH #3, MH#5, WF#2, WF #3, WF #4
 - b. Evaluation of any neighborhood policies, regulations or neighborhood covenants that may be in conflict with wildfire risk reduction
 - c. Identification of critical facilities and applicable mitigation strategies, such as structural hardening and vegetation management
 - d. Identification of access and evacuation routes within existing and future neighborhoods
 - e. Evaluation of future land uses in areas at high risk and applicable mitigation strategies such as siting, structural hardening and vegetation management



3. Regular crosswalks between the CWPP action table and current/future community planning efforts to ensure consideration of wildfire. This should include the NHMP, General Plan, subarea plans, climate change plans/initiatives, and Parks, Recreation and Green Spaces Comprehensive Plan (Bend Metro Parks).

Tips and Additional Support

Prioritize and Monitor Actions

CWPP action tables can be enhanced by prioritizing different mitigation strategies and connecting them to other community goals. This helps achieve broader planning objectives and justifies additional sources of funding. Keeping the CWPP frequently updated also provides elected officials and fire officials with timely information during wildfire events. Developing a schedule for updating the action table (e.g., quarterly or semi-annually) will ensure the plan is current.

Learn from Others

- The <u>Greater Flagstaff Area CWPP</u> offers an example of a "living" document approach to wildfire planning. CWPP activities are clearly identified, and the status of each activity is updated, including stakeholders engaged in each activity.
- The <u>Boulder County CWPP</u> is rich with maps and visual aids for understanding CWPP objectives and the county's local context. This user-friendly approach also is neighborhood-oriented, and provides clear guidance on mitigation activities, implementation and monitoring.

Additional Resources

- The <u>University of Oregon CWPP Evaluation Guide</u> (2008) can further guide the development, implementation and future evaluation of actions.
- <u>FEMA Region X</u> provides resources and information on topics such as tips and benefits of integrating the CWPP with the Natural Hazard Mitigation Plan.



Recommendation 2: Define Wildland-Urban Interface (WUI) and Develop a WUI Risk Assessment that Spatially Delineates Risk Levels

Define Bend's wildland-urban interface, and replace the current Greater Bend CWPP risk assessment and map with a spatially displayed risk assessment that clearly delineates the City's levels of risk or hazard (e.g. Very Low, Low, Moderate, High, Very High) to allow for appropriate land use planning and the application of future WUI regulations.

Why this Recommendation Matters

Overview

The Greater Bend Community Wildfire Protection Plan (CWPP), adopted in February 2016, defines the wildland-urban interface as "The line, area, or zone where structures and other human development meet or mingle with undeveloped wildland or vegetative fuels. Describes [the WUI] as an area within or adjacent to private and public property where mitigation actions can prevent damage or loss from wildfire. Much of Deschutes County is considered Wildland Urban Interface."

In addition, the *Oregon State Planning For Natural Hazards: Wildfire Technical Reference Guide* (July 2000) defines three different wildland-urban interface (WUI) types:

- "classic wildland-urban interface" as existing where well-defined urban and suburban development presses up against open expanses of wildland areas
- "mixed wildland-urban interface" as more characteristic of the problems being created by exurban development: isolated homes, subdivisions and small communities situated predominantly in wildland settings
- "the occluded wildland-urban interface" existing where islands of wildland vegetation occur inside a largely urbanized area.

There is also risk mapping associated with the Oregon Forestland-Urban Interface Fire Protection Act (Senate Bill 360) which delineates wildfire risk at a state-level scale, depicting the majority of the developed environment within the City limits of Bend to be a "low" risk. This is largely due to the large-scale focus of the map which does not represent the risk at the City level scale.

Finally, the risk map associated with the Greater Bend CWPP is grossly delineated by communities at risk: Core Bend, Greater Bend, North, Northeast, Northwest, Southeast, Southwest, West where each community is assessed and rated for its likelihood of fire occurring, wildfire hazards, protection capabilities, values protected, and structural vulnerability. Even with this further delineation, the scope of the WUI as a "set of conditions" which facilitates the transfer and spread of fire from vegetation to structures, or vice versa, is not depicted. Specifically, there is no current spatial assessment that relates and delineates the probability and potential fire behavior with the probability of consequence (structure, infrastructure and resource vulnerability). The largest challenge that this presents is the inability to effectively assess and



display risk at the scale it can be appropriately mitigated through planning. Consequently, these large areas cannot be prioritized for appropriate land use restrictions, nor can staff assess development applications based on risk levels or track any change in risk levels through mitigation. Taken together, there is not sufficient guidance for current community planning decisions to be made based on a systematic approach to WUI identification and WUI risk.

Implementation Guidance

The clear definition of WUI and a delineated and spatially represented WUI risk assessment is the primary decision support tool for all community wildfire planning initiatives. To achieve this, Bend stakeholders must:

1. Define the WUI

To provide the basis for a true understanding of the risk that Bend faces, the WUI should be more accurately defined as: *Any developed area where conditions affecting the combustibility of both wildland and built fuels allow for the ignition and spread of fire through the combined fuel complex.*

2. Develop a Spatially Represented and Delineated Risk Assessment

Understanding the levels of WUI risk in all areas of the City provides guidance to determine appropriate mitigation requirements and provides a measure of the change in risk over time. The City should therefore work with appropriate stakeholder to develop a risk assessment that uses a defendable process to assess the expected fire behavior and the likely impacts of the fire behavior (based on fuels, weather and topography) on values at risk (based on ignition susceptibility of the values and consequence). The risk assessment should provide a ranked spatial representation of the levels of risk present in different areas of the City (e.g., Very Low, Low, Moderate, High, Very High, Extreme). See Tips and Additional Support (below) for more information on risk assessment development.

3. Initiate Site Specific Assessments

A Citywide risk assessment does not typically include the detailed site-specific characteristics of individual properties, which in turn, does not allow the City the ability to assess the potential consequences of wildfire occurrence. Research and case studies highlight the importance of individual site characteristics as factors that determine the ignition susceptibility of individual structures. Therefore, any Citywide risk assessment process should be enhanced with the individual property assessments of existing properties and proposed developments by qualified professionals of existing properties.

Ideally, the individual property assessment should be detailed risk assessments on both existing properties and future developments; however, as an interim step, data collected through the previous CWPP risk mapping process may be a helpful beginning in providing a "coarse assessment". To enhance this, the City should consider having on duty fire staff (e.g. engine crews) conduct "windshield" assessments of key vulnerabilities in neighborhoods where data is either not available or requires updating. As an added benefit, this option can provide opportunities for public outreach as well as helping fire operations staff gain a further



understanding of wildfire mitigation planning and identify potential wildfire response challenges that were not previously considered (i.e. apparatus access challenges).

The ranked results (e.g. Very Low, Low, Moderate, High, Very High, Extreme) of these individual property assessments can be simply added as an additional attribute to each parcel in the City's existing property information spatial database, which in turn can be spatially displayed. This allows for simple tracking, metrics query, and updating of parcel risk as the assessments are refined or changed.

4. Apply WUI Regulations Based on the WUI Risk Assessment

The final step is to implement the delineated spatial risk assessment into land use planning and zoning and code implementation. Typically, areas of higher risk would be subject to the most stringent mitigation regulations with appropriate scaling through areas of decreasing risk. (City plans and codes informed by the risk assessment should include:

- Bend General Plan
- Bend Development Code
- Bend Building Code
- Greater Bend CWPP
- Deschutes County Natural Hazards Mitigation Plan & Bend Addendum
- Bend Code Title 13: Nuisances Subject to Abatement
- Parks, Recreation, and Green Spaces Comprehensive Plan (Bend Metro Parks and Recreation District)
- Future wildfire regulations

See *Recommendation 3: Develop and Adopt Wildland-Urban Interface Regulations* for further details.

Tips and Additional Support

Choosing a WUI Risk Assessment Methodology

For a risk assessment to be successfully integrated into the planning process, it must be:

- 1. Defendable based on the most current research and best practices
- 2. Universally compatible among stakeholders in the region of use
- 3. Easily interpreted by and integrated into the local planning process

There are a number of defendable spatial risk methodologies and products available to communities. There are also specific wildfire risk assessment initiatives being undertaken by the State of Oregon. Consultation with Oregon Department of Forestry staff and USDA Forest Service staff (Deschutes National Forest) will provide the most up-to date information on the progress of these assessment initiatives.



Undertaking the Assessment

The Oregon State Planning For Natural Hazards: Wildfire Technical Resource Guide (July 2000) provides the following guidance to assessing the WUI risk:

Step 1: Select the areas to be evaluated. Define the area or scope of the assessment. Using a map, display the interface areas. Name or number each area.

Step 2: Select the hazard components to be considered in the assessment. Assemble the list of hazard components that will be included in the assessment (fuel, topography, weather, fire history, construction type and building materials, etc.)

Step 3: Rank the hazard components. Define a system to rank the hazard level of the components. Evaluate and rank each individual component included in the assessment. Develop an overall hazard rating system. Calculate the overall hazard rating.

Step 4: Compile the hazard rankings in a useable format. Use a variety of display methods to make the data usable and understandable. Consider maps, clear overlays and computer modeling as methods for analyzing and displaying data.

Step 5: Develop Future Actions. Use the information developed to reduce the fire-loss potential in the wildland/urban interface.

Addressing Staff Capacity

Undertaking the assessment process requires expertise and time, and may be limited by City staff capacity and expertise. Placing the onus on developers and landowners to supply a standardized assessment by a qualified professional can achieve assessment goals without placing an increased burden on City resources.

The City should also consider implementing a voluntary detailed property assessment program (see Additional Resources below for an example from Eagle County, CO).

Prioritizing and Monitoring the WUI Risk Assessment

Wildfire planning direction and regulation are reliant on the WUI assessment for implementation; therefore, a priority should be placed on the City WUI risk assessment. An individual property assessment program can follow at a later date to further enhance the assessment. As an interim step to a more detailed individual property assessment, data collected through the previous CWPP risk mapping process may be a helpful beginning in providing a "coarse assessment". To enhance this, the City should consider having on duty fire staff (e.g. engine crews) conduct "windshield" assessments of key vulnerabilities in neighborhoods where data is either not available or requires updating. The WUI risk assessment should be updated at least every five years, or if significant changes have occurred that may affect the assessment, such as wildfires, forest structure changes, or new development.

Additional Resources

Eagle County, CO provides an example of comprehensive site-specific assessments incorporated into regulations and voluntary programs. For more information, visit Eagle County's <u>website on regulations</u> or the <u>REALFire program website</u>.



Recommendation 3: Develop and Adopt Wildland-Urban Interface (WUI) Regulations

Develop and adopt wildland-urban interface (WUI) regulations to address increasing development pressures in wildfire-prone areas throughout the City of Bend.

Why This Recommendation Matters

Overview

Bend's existing land use regulations provide a process for development review starting with the delineation of urban growth areas and annexation, and continuing through neighborhood and community planning, site planning, and building design. These regulations do not address development risks associated with wildfire in a comprehensive manner. In some cases, existing City requirements also conflict with recognized wildfire mitigation best practices.

At the time of this report's final publication, Bend's City Council approved an Urban Growth Boundary (UGB) plan to add additional acres of land for housing, jobs, public schools and parks. The planl includes amendments to the text and maps of the Bend Area General Plan (Comprehensive Plan), Bend Development Code, and Bend Urban Area Zoning Ordinance. As part of the UGB process, several new policies within the Comprehensive Plan will address wildfire risk reduction.

New wildland-urban interface regulations will be required to a) fulfill the intent of new policies associated with UGB areas, b) comprehensively address all development subject to wildfire mitigation. Developing clear mitigation standards now will avoid current and future regulatory conflicts and proactively address Bend's growth and development pressures.



Figure 3. The amended Bend Comprehensive Plan Map shows UGB expansion and related comprehensive plan map changes (July 2016). Note: Map for reference only, consult the City of Bend for current version: http://www.bend.or.us/.



Implementation Guidance

Addressing Vulnerabilities

Wildfire regulations typically address the following types of community and property vulnerabilities:

- <u>General Community Features and Design</u>: topography, vegetation, density and layout, open space, urban parks, water sources and trails, utilities, roads, bridges, access, other community amenities.
- <u>Home Ignition Zone, including Structures:</u> roof assembly, dormers, roof and soffit vents, gutters and downspout assembly, structure walls, windows, vegetation management for zones extending out 100 feet from structure(s).
- <u>Other Home Ignition Zone Features:</u> decks, fences, attachments, outbuildings, setbacks, adjacent uses, and slopes.

Alternatives Analysis

During the CPAW recommendation development process, the CPAW team and City staff discussed three alternatives to implementing wildfire regulations:

1) Adopting a model code or set of standards, such as the International Code Council's Wildland Urban Interface Code or National Fire Protection Association's 1141, 1142 and 1144;

2) Creating a customized, standalone WUI Code for Bend;

3) Drafting WUI regulations and integrating them into the Bend Development Code and Building Code.

After further analysis and discussion with City staff on each option and the state building code limitations, the CPAW team determined that the most appropriate path is Alternative 3, drafting new WUI regulations, revising existing regulations, and integrating them into the Bend Development Code only. This determination is based on how the Oregon Building Code is presently adopted and implemented at the local level. Due to current limitations on adjusting local building code requirements to include WUI standards (of which the first two alternatives are strongly connected to), the City can more readily pursue changes to the Development Code.

The following guidance is therefore based on WUI mitigation which can be achieved through the Bend Development Code and does not address the critical component of mitigating building construction and materials. In order to comprehensively address risk mitigation through regulation, it is strongly recommended that the City engage state officials to effect building code changes that will allow for the implementation of further WUI standards for building construction and materials. Several specific topics are noted below where further local coordination will also be required.



1. Identify Applicability of WUI Requirements

The City must first determine *where* WUI regulations will apply, and identify which type of development applications will be subject to wildfire regulations—both of which should be incorporated into application submittal requirements.¹ This should be based on the identified wildfire risk (see *Recommendation 2: Define Wildland-Urban Interface and Develop a WUI risk Assessment That Spatially Delineates Risk Levels*), and is typically either determined by consulting an adopted wildfire risk map (i.e., WUI map), utilizing an overlay zone approach, and/or performing a site specific assessment. Application types not currently subject to planning or fire department review and approval (e.g., single family construction) should be re-evaluated to develop a process to apply the WUI assessment process and appropriate WUI risk reduction regulations. This will require further coordination with the Building Department.

Further, the City must determine whether wildfire regulations are applied to existing structures, such as those undergoing additions or alterations. Some jurisdictions require that additions or alterations of a specific size (e.g., 25% or greater) comply with applicable mitigation requirements as a condition of approval. This is also tied to the risk rating or development location. Due to the nature of the requirement, this discussion may also require further coordination with any changes to the Bend Building Code.

2. Identify Appropriate WUI Mitigation Standards

The City can then identify *what* those requirements and procedures in the Development Code should be to address WUI risk. The following examples provide initial guidance, and may be modified within each Title or referenced to a specific section focused on WUI mitigation standards. In either case, additional staff review and input will be required to further develop and refine standards that address the following:

- WUI Definitions. Add definitions for the wildland-urban interface and wildfire (Title 1).
- **Consistent WUI References.** Ensure references to wildfire mitigation plans, wildlandurban interface and similar terms are consistent throughout all Titles (e.g., fire mitigation plan, urban-fire interface).
- **Permitted Uses.** Review permitted uses to determine if they pose a public safety threat based on location in the WUI. These typically include the storage or use of hazardous or combustible materials, warehouse, campground, and large congregation or assemblies of people (e.g., places of worship, clubs, government offices, community centers, schools). For those uses that may contribute to WUI risk, require applicable mitigation standards as a condition of approval.
- **Building Setbacks.** When possible, require minimum setbacks that allow 30 ft. separation between primary structures. This allows property owners to conduct vegetation management within their Zone 1 (although it will still require neighbors to mutually implement vegetation management activities) to reduce home ignitions. If a 30ft separation distance is not possible, do not allow combustible landscaping materials or

¹ Section 4.2.300.A.1.d. requires an existing site conditions map, including identification of potential natural hazard areas, but specific wildfire mitigation requirements are not further identified elsewhere.



attachments (e.g., juniper, mulch, wooden fences) within the area between primary structures. Accessory dwellings within Zone 1 should also comply with mitigation requirements.

• Landscaping. Landscaping activities should be aligned with Home Ignition Zone principles, including: requiring a noncombustible surface in Zone 1A (first 5 feet of a structure), keeping grass trimmed, using low flammability, low growing, and wellspaced plant material in Zone 1 (5 to 30 feet), removing or reducing surface vegetation, thinning and spacing of trees and shrubs, limbing trees, and eliminating "ladder fuels" in Zone 2 (30 to 100 feet +).



Figure 4. Several neighborhoods in and around Bend use building materials and landscaping techniques consistent with recommended WUI code standards. Sharing local examples with the public can help during outreach and discussion of proposed new standards. (Photo credit: D. Cooper)

- Attachments and Architectural Features. Allowed architectural features such as decks and porches in specified risk areas should require noncombustible materials and have a vegetation management plan. Discourage the use of wood features (roofs, siding) as a predominant building material if located in specified risk areas. Consider an exemption for requiring decks and balconies in specified risk areas (unless constructed from noncombustible materials).
- **Master Development Plans.** Draft additional guidance for new master development plans to comply with WUI mitigation standards, including: access, water supply, vegetation management (including lots and open space), and building setbacks. Consider adding the requirement for a qualified professional to perform a wildfire site assessment (as part of an applicant's submittal package). A helpful example is the recent Charlie Miller's Tree Farm development.
- Access and Circulation. The current Development Code already identifies access and circulation standards for fire protection. Fire personnel should conduct an internal review with planning staff to determine if standards meet WUI risk reduction goals, such as adequate access and egress (including secondary/emergency access), and driveway widths.

3. Reconcile Conflicts

Staff must also determine if new WUI regulations will cause conflicts or confusion with existing regulations. For example:

• Several design standards are at odds with wildfire mitigation, including the protection and retention of trees, allowance for combustible landscaping features such as mulch, and screening requirements for trash receptacles and similar items (which are required to have an evergreen hedge or wooden fence).



• The Waterway Overlay Zone (WOZ) includes requirements for tree retention for erosion and flood control but there is limited guidance on vegetation removal for fire hazard mitigation.

The City should determine when wildfire mitigation standards apply, including how WUI regulations apply to sensitive areas where retention of natural vegetation is required. Ideally, mitigation is done prior to the requirements for other standards. Adding references to key sections of the Development Code will aid applicants' understanding of when WUI regulations take precedent.

4. Define Administration and Enforcement Roles

Finally, the City must determine *who* will draft, administer and implement new regulations, and *how* they will be enforced. Bend's Fire & Rescue, Community Development, and Growth Management are the three primary departments directly affected by the implementation of any new WUI regulations. Roles should reflect the resources, expertise, and interest of the respective departments.² Similarly, enforcement should also be based on technical expertise and the capacity for necessary training. Analyzing key steps in the current review process (Section 4.2.200) will help determine which authority is most appropriate to take action for any process related to the WUI regulations:

- 1. UGB definition
- 2. Comprehensive/subarea planning
- 3. Annexation and development agreement
- 4. Zoning
- 5. Subdivision planning and platting
- 6. Site plan review
- 7. Building permit review
- 8. Site inspection
- 9. Post development review
- 10. Capital Improvements Program (CIP)

It is strongly advised that Bend's Fire and Rescue Department play a larger role in the application review process to provide additional input on risks associated with WUI development (beyond water supply and access). These activities may also include on-site assessments, as staff is already in the field working with residents to conduct mitigation assessments. This information should be linked to the planning process to ensure City departments coordinate efforts that share a similar goal.

 $^{^{2}}$ If the City outsources this task, it is important that staff are engaged to ensure they fully understand the provisions. It should be programmed and budgeted for the upcoming fiscal year and after the UGB update is completed.



Tips and Additional Support

Create Buy-In

Developing wildfire regulations requires buy-in and support from the public and elected officials. Staff will have an easier time justifying wildfire regulations when they help implement the vision, goals or actions of existing plans. In this case, the City has support from the following documents:

- **Bend's General Plan (Chapter 10)** is intended to be revised based on the UGB expansion project. If accepted, new wildfire language and policies will promote the City to adopt strategies to reduce wildfire hazard, including the adoption of a WUI Code or similar regulatory tools.
- **Deschutes County Natural Hazard Mitigation Plan, Bend Addendum** lists wildfirerelated actions, including encouraging the creation and adoption of WUI maps to direct development requirements that assist wildfire mitigation.
- The recently adopted **Greater Bend Community Wildfire Protection Plan** recognizes that proactive land use planning is one of the best ways to address wildland fire conference and to decrease the number of residents at risk or damage from future wildfires.

Initiate Outreach & Communication

Creating an effective outreach and communication strategy can further enhance public buy-in. Highlighting existing development examples can be useful to illustrate what wildfire mitigation looks like (e.g., the Tree Farm development, other design elements within existing neighborhoods that use fire-resistant building construction or vegetation management). As new wildfire regulations get discussed, the City can utilize Project Wildfire and the CWPP Steering Committee members to help promote and disseminate information. Following adoption of any new materials the City should prepare explanatory materials for applicants which summarize how the new policies and regulations are administered.

Coordinate Among City, County, State and other Agencies

Other City departments will be critical to developing policies and initiatives with wildfire in mind. For example, working with Bend Metro Park and Recreation District to develop common and coordinated policies and language to WUI risk and mitigation will ensure the City's approach to open space is comprehensive and includes wildfire along with other management objectives. The City can consider a checklist for all agencies to refer to when initiating new plans or projects that may be affected by, or have an impact, on community wildfire risk. See *Recommendation 5: Align and Integrate Wildfire Risk with Ecosystem-Based Fire Management*.

In addition, coordinating with County efforts will help avoid future scenarios where adjacent neighborhoods take drastically different approaches to WUI risk reduction. Deschutes County recently had a similar review and analysis of the county's Development Code conducted by the University of Oregon. This analysis provided a series of recommendations to implement development standards for mitigating wildfire risk. Finally, coordinating with State agencies, as previously mentioned, will be essential to address issues related to Building Code changes that accommodate WUI mitigation standards.



Explore Incentives

The City currently provides a density bonus as an incentive for developers to create affordable housing. A similar incentive should be explored for developers who perform appropriate WUI mitigation. In addition, the City could explore bigger Floor Area Ratios (FAR) or lot coverage if a vegetation management plan and appropriate construction materials and techniques are used. Due to the nature of the requirement, this discussion will likely require further coordination with any changes to the Bend Building Code.

Learn from Other Communities

While many jurisdictions have adopted WUI regulations, looking at communities in Oregon that have adopted or are considering adoption of regulations may provide helpful examples during the outreach process, such as <u>Ashland</u> and <u>Sisters</u>. Other examples can be found through resources such as NFPA's <u>Community Wildfire Safety Through Regulation</u> and the Fire Adapted Communities Learning Network <u>Quick Guide Series on Wildfire Planning and Regulations</u>.

Utilize Technical Resources

Free online resources provide helpful model standards to consult when drafting new regulations. These include:

IWUIC

The International Code Council (ICC) Wildland-Urban Interface Code 2015 is available for viewing and purchase online.

NFPA Technical Standards for the WUI

Technical standards are also available through the National Fire Protection Association:

- <u>1141: Standard for Fire Protection Infrastructure for Land Development in Wildland,</u> <u>Rural, and Suburban Areas</u> (standards focus more on subdivision)
- 1142: <u>Standard on Water Supply for Suburban and Rural Firefighting</u> (standards focus on water supply)
- <u>1144: Standard for Reducing Structure Ignition Hazards from Wildland Fire</u> (standards focus more on building ignitions)



Recommendation 4: Inventory and Assess Critical Facilities for Wildfire

Develop a detailed understanding of how critical facilities (also referred to as critical and essential facilities) can be designed or protected to minimize the impact of wildfire and other natural hazards, as well as promote long-term community resiliency.

Why This Recommendation Matters

Overview

Mitigating and protecting critical facilities, including buildings and infrastructure, is fundamental to improving Bend's preparedness and resiliency to wildfires and other natural hazard events. Critical buildings are public and private structures where vital community functions are conducted. If these facilities are damaged or destroyed by wildfire, there could be severe consequences to public health and safety. In addition, the functionality of community infrastructure (e.g., drinking water, wastewater, electric power, natural gas, and communications) is essential to maintain in the event of a wildfire. For example, wildfire within a watershed can adversely affect drinking water quality and supply well after the fire occurs.

Critical facilities in Bend have not been comprehensively inventoried and assessed for wildfire risk. These facilities include: schools, hospitals and medical centers, fire stations, police stations, government offices, community centers, electric substations, water storage tanks and pumping facilities, water and wastewater treatment plants, electrical and other utility systems, and communication lines and equipment. Identifying critical facilities, assessing their vulnerability, and formulating appropriate mitigation actions are key steps to improve Bend's resiliency to wildfire and other natural hazards. Results of this effort can be incorporated into the appropriate primary planning documents.

Relationship to Community Planning

The Deschutes County NHMP Bend Addendum includes a preliminary natural risk assessment but does not comprehensively assess critical facilities in relation to wildfire. However, it does include a recommendation to identify and assess critical facilities: "Mitigation Action #3: Prepare a critical buildings and infrastructure inventory, assess the type and magnitude of natural hazard risk, estimate potential damage, and prepare and mitigation projects."

Other Bend planning documents also do not address the relationship between critical facilities and wildfire or other natural hazards, nor do they share a standard definition of critical facilities that is used by all wildfire and natural hazards mitigation stakeholders. Specifically:

- The Bend Area General Plan chapter on public facilities should be updated to address critical facilities and its relationship to wildfire and other natural hazards, as appropriate.
- The Bend Development Code should also be reviewed and updated for references to critical facilities in direct connection to wildfire mitigation.



- The Bend Capital Improvement Plan (CIP) should be reviewed and updated for references to critical facilities in direct connection to wildfire mitigation.
- Future revisions to the Greater Bend Community Wildfire Protection Plan (CWPP) or a Bend CWPP should include actions related to critical and essential facilities.

Implementation Guidance

1. Identify Stakeholders

Public and private utilities in Bend may have critical facilities:

- City of Bend Utility Department (water service, wastewater collection, and storm water management)
- Avion Water Company
- Roats Water System, Inc.
- Pacific Power & Light
- Central Electric Cooperative, Inc.
- Cascade Natural Gas
- PG&E Gas Transmission
- Agate-Apache Water Services
- Bend Garbage & Recycling
- Cascade Disposal
- Bend Broadband
- AT&T
- Bend Tel, Inc.
- Bend Garbage & Recycling
- Cascade Disposal

Local public/private utilities may not want to share information about critical facilities as this topic treads into issues of homeland security. However, they may have already prepared hazard management plans and incident management plans, and should be consulted to leverage their resources and avoid duplication. State and Federal government agencies with a presence in Bend should also be consulted.

2. Develop a Standard Definition of Critical Facilities

Bend and stakeholders should adopt a standard definition for facilities that is consistent with State and Federal definitions. It should be used in all planning documents and by agencies involved in wildfire and natural hazard risk management.



3. Prepare a Critical Facilities Inventory

A critical facilities inventory and assessment work plan should include the following:

- 1. Identify both public and private agencies responsible for these facilities (for example, City of Bend, County, State of Oregon, private utilities, and other districts and agencies.) Involve these agencies as stakeholders, to the degree possible.
- 2. Prepare a comprehensive list of facilities in Bend.
- 3. Identify existing critical facility risk assessments and assess how to incorporate them.
- 4. Determine criteria and evaluate vulnerability to WUI and other natural hazards risk, based on the WUI risk assessment.
- 5. Prepare WUI/natural hazard vulnerability assessments for these facilities, using FEMA and other methodologies.
- 6. Prepare a priority list of key facilities with the accompanying rationale.
- 7. Summarize the results with a written report and maps, where possible (note that some of this information may be sensitive and will need to remain confidential).
- 8. Update relevant portions of Bend planning documents to include policies to protect critical facilities.

Tips and Additional Support

Oregon Office of Emergency Management

The State of Oregon <u>Office of Emergency Management</u> has guidance about critical facilities and water and wastewater systems relative to natural hazards. Some of this may be applicable to wildfire hazards (The Oregon Resilience Plan, February 2013, Chapter 4. Plan – Critical and Essential Buildings and Chapter 8. Water and Wastewater Systems.

Federal Guidance

FEMA has a well-developed methodology for evaluating critical facilities in the floodplain, provides mitigation guidance, and manages the National Flood Insurance Program to implement that guidance. This example could be helpful in developing comparable guidance for wildfire. In addition, the EPA website lists resources for community-based water resilience to help prepare for, and recover from, water service interruptions.

Technical Resources

The ICC International Wildfire Urban Interface Code (2015) does not define critical facilities but does provide several applicable wildfire mitigation standards:

- Appendix A, Section A102 Vegetation Control standards for protecting distribution and transmission lines through vegetation management.
- Appendix A, Section A107 Protection of Pumps and Water Storage Facilities defensible space around these facilities and related power supplies.



- Appendix C Fire Hazard Severity Form provides for evaluation of whether utilities are above or below ground.
- Appendix G Self-Defense Mechanism –provides guidance that is applicable to protecting critical facilities.



Recommendation 5: Align and Integrate Wildfire Risk with Ecosystem-Based Fire Management

Wildfire risk objectives should be aligned and integrated with the ecosystem health objectives of special interest areas, environmentally sensitive areas, community watersheds and open spaces using an ecosystem-based fire management approach.

Why this Recommendation Matters

Overview

The City of Bend is highly dependent on the ecological health of the natural areas and natural resources surrounding and within Bend. Both forestry and tourism sectors share a strong economic reliance on adjacent commercial forests. The Deschutes River corridor is an important community asset, watershed and an environmentally and geologically sensitive area. Finally, the public relies heavily on open spaces and waterways for recreation which yield significant economic benefits. With this in mind, both wildfire and incompatible wildfire mitigation would adversely affect these valuable resources. Incorporating wildfire mitigation into the planning and management of these resources should be an important community priority.

Relationship to Community Planning

In order to minimize the negative impacts and identify opportunities where WUI risk reduction and ecosystem objectives can align, it is important that wildfire risk mitigation and



Figure 5. Bend's unique landscape creates opportunities to integrate fire management into its ecosystem planning. (Photo credit: M. Mowery)

ecosystem objectives be considered in all planning initiatives for these resources. Many of the natural areas surrounding and within Bend are considered fire dependent ecosystems and therefore many ecosystem restoration objectives align with wildfire risk reduction. Typically, this can be achieved through a balanced approach of "ecosystem-based" fire management planning.

Implementation Guidance

1. Identify Resource Areas and Develop a Plan

Implementing this recommendation requires creating an inventory and map of the areas, including ownership, jurisdictional responsibility, resource values, and whether fire or other management plans have already been prepared. Most resource areas are not owned or controlled



by the City of Bend, requiring collaboration with public and private stakeholders who own, manage or control these areas. This is particularly true for properties controlled by Bend Metro Parks and Recreation District, which is independent of the City. Creating an inventory and developing plans can be accomplished by coordinating through the CWPP Steering Committee as part of future CWPP action plan (See *Recommendation 1: Develop an Implementation Framework for Bend in Greater Bend Community Wildfire Protection Plan*).

Based on the inventory, plan development steps should include:

- 1. Comparatively assess and rank the entire inventory of areas of special interest, watersheds, open spaces and the Deschutes River Corridor in relation to ecosystem objectives and wildfire risk reduction objectives.
- 2. Identify areas of opportunity.
- 3. Develop an ecosystem-based fire management plan, which will include wildfire risk reduction and restoration objectives using a number of tools.
- 4. Undertake an overall approach of adaptive management (implement management actionmonitor- adapt management action- monitor).

2. Reference "Ecosystem-Based Fire Management" in Other Plans

The concepts and language of ecosystem-based fire management should be embedded within the following planning documents when referencing natural areas and natural resources:

- Bend General Plan
- Bend Development Code
- Greater Bend Community Wildfire Protection Plan
- Parks, Recreation, and Green Spaces Comprehensive Plan (Bend Metro Parks and Recreation District)
- Wildland-Urban Interface Regulations

3. Develop Area Specific Ecosystem Based Fire Management Plans

Area specific ecosystem-based fire management plans should also be developed for each area of special interest, open space or open space groups with ecological objectives identified in the Parks, Recreation, and Green Spaces Comprehensive Plan (Bend Metro Parks and Recreation District), and the Deschutes River Corridor. Alternatively, an overarching ecosystem-based fire management plan can be developed as a section in the Greater Bend CWPP with area specific reference.

Tips and Additional Support

Qualified Professionals

Wildland fire professionals undertaking similar efforts in adjacent National Forests and state lands can be good resources for assistance in developing local ecosystem-based fire management planning objectives.



Outreach

Public outreach and education are key to the success of implementing ecosystem-based fire management objectives. The population is currently programmed to think that all fire is "bad". An education program that effectively educates on both the positive and negative impacts of wildland fire must be rolled out hand in hand with the development of management planning objectives.

Other Community Examples

Boulder County, Colorado has been engaging in active <u>ecosystem-based forest and fire</u> <u>management</u> with the objectives of reducing wildfire risk and achieving ecosystem objectives for a number of years, and provides a good reference for developing a similar program.



CPAW Definitions

The following list of definitions is intended to aid understanding of terms associated with CPAW recommendations.

Built Fuels- Man-made structures (buildings and infrastructure)

Burn Probability- The probability or effect of a wildland fire event or incident, usually evaluated with respect to objectives

Burn Severity- A qualitative assessment of the heat pulse directed toward the ground during a fire. Burn severity relates to soil heating, large fuel and duff consumption, consumption of the litter and organic layer beneath trees and isolated shrubs, and mortality of buried plant parts.

Community Based Ecosystem Management- With an emphasis on local stakeholder participation, allowing the local community to manage their ecosystem based on the unique characteristics of an area

Community Wildfire Protection Plan (CWPP)-Established by the 2002 Healthy Forest and Restoration Act, A CWPP is a plan that identifies and prioritizes areas for hazardous fuel reduction treatments on Federal and non-Federal land that will protect one or more at-risk communities and essential infrastructure and recommends measures to reduce structural ignitability throughout the at-risk community. A CWPP may address issues such as wildfire response, hazard mitigation, community preparedness, and structure protection

Convection Heat- The movement caused through the rising of a heated gas or liquid

Conduction Heat- Transfer of heat through direct contact of material

Critical Facilities- FEMA defines critical facilities as "facilities/infrastructure that are critical to the health and welfare of the population and that are especially important following hazard events. Critical facilities include, but are not limited to, shelters, police, fire stations, and hospitals". In addition, CPAW recognizes emergency water pumping stations, egress routes, communication facilities, and backup power supplies as critical facilities

Ecosystem Based Fire Management- The incorporation of the natural or desired ecological role of fire into the management and regulation of community's natural areas

Effects- The anticipated benefits and losses associated with exposure to a hazard or event, in this case fire.

Embers- A small piece of burning material that can be thrown into the air due to the convective heating forces of a wildfire. Larger embers and flammable materials have the ability to sustain ignition through transport

Exposure- The contact of an entity, asset, resource, system, or geographic area with a potential hazard. Note: In incident response, fire responder exposure can be characterized by the type of activity

Fire Adapted Communities -A group of partners committed to helping people and communities in the wildland urban interface adapt to living with wildfire and reduce their risk for damage, without compromising firefighter or civilian safety

Fire Effects - The physical, biological, and ecological impacts of fire on the environment.



Fire Intensity- Commonly referred to as fire line intensity, this is the amount of heat energy that is generated by burning materials

Firewise – Program teaches people how to adapt to living with wildfire and encourages neighbors to work together and take action to prevent losses. The program encourages local solutions for wildfire safety by involving homeowners and others in reducing wildfire risks by fostering defensible space and resilient structures for homes and communities

Frequency- The number of occurrences of an event per a specified period of time

Hazard - Any real or potential condition that can cause damage, loss, or harm to people, infrastructure, equipment, natural resources, or property

Hazard Reduction- Coordinated activities and methods directed to reduce or eliminate conditions that can cause damage, loss, or harm from real or potential hazards

Home Ignition Zone- The characteristics of a home and immediate surrounding area when referring to ignition potential during a fire event

Infrastructure- the basic physical structures and facilities (e.g., buildings, roads, and power supplies) needed for the operation of a community.

Prescribed Fire- A planned controlled wildland fire that is used to meet a variety of objectives for land managers

Radiation Heat- Transmission of heat through waves or particles

Residual Risk – Risk that remains after risk control measures have been implemented

Resilience- The ability to recover from undesirable outcomes, both individually and organizationally

Risk- A measure of the probability and consequence of uncertain future events

Risk Acceptance- A strategy that involves an explicit or implicit decision not to take an action that would affect all or part of a particular risk

Risk Assessment- A product or process that collects information and assigns values (relative, qualitative, quantitative) to risks for the purpose of informing priorities, developing or comparing courses of action, and informing decision making

Risk Avoidance- A strategy that uses actions or measures to effectively remove exposure to a risk

Risk Based Decision Making- A decision making process that relies on the identification, analysis, assessment, and communication of wildland fire risk as the principal factors in determining a course of action to improve the likelihood of achieving objectives

Risk Communication- An exchange of information with the goal of improving the understanding of risk, affecting risk perception, or equipping people or groups to act appropriately in response to an identified risk

Risk Management- A comprehensive set of coordinated processes and activities that identify, monitor, assess, prioritize, and control risks that an organization faces

Risk Mitigation- The application of measure to alter the likelihood of an event or its consequences



Risk Perception- Subjective judgment about the characteristics and magnitude of consequences associated with a risk

Risk Reduction- A decrease in risk through risk avoidance, risk control, or risk transfer

Risk Transfer- A strategy that uses actions to manage risk by shifting some or all of the risk to another entity, asset, resources, system, or geographic area

Values-At- Risk- Those ecological, social, and economic assets and resources that could be impacted by fire or fire management actions

Vulnerability- The physical feature or attribute that renders values susceptible to a given hazard

Wildfires- Unplanned wildland fires resulting in a negative impact

Wildland Fire- Wildland Fire - Any non-structure fire that occurs in vegetation or natural fuels. Wildland fire includes prescribed fire and wildfire.

Wildland Fuels- All vegetation (natural and cultivated)

Wildland Urban Interface (WUI)- Any developed area where conditions affecting the combustibility of both wildland and built fuels allow for the ignition and spread of fire through the combined fuel complex

Wildland Urban Interface Hazard- Combustibility of the wildland or built fuels, fuel type or fuel complex

Wildland Urban Interface Risk- the WUI hazard accounting for factors that contribute to the probability and consequences of a WUI fire

References

- Cohen, J. D. (2000, Apil 10). What is the Wildland Fire Threat to Homes? Missoula: U.S Department of Agriculture, Forest Service.
- Mathew P. Thompson, T. Z. (2016). *Risk Terminology Primer: Basic Principles and a Glossary for the Wildland Fire Management Community.* Rocky Mountain Research Station.
- National Wildfire Coordinating group. (2014, August). Wildland Urban Interface Wildfire Mitigation Desk Reference Guide. Retrieved from NWCG.gov: http://www.nwcg.gov

National Wildfire Coordinating Group. (2016, August 26). *Community Wildfire Protection Plan*. Retrieved from National Wildfire Coordinating Group: http://www.nwcg.gov/term/glossary/community-wildfire-protection-plan-%28cwpp%29%C2%A0

